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Remarks and Instructions

The complete manual, revision packages, and individual chapters can be accessed at www.wsdot.wa.gov/publications/manuals/m36-64.htm.

For updating printed manuals, page numbers indicating portions of the manual that are to be removed and replaced are shown below.

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Please contact Jody Bywater at BywaterJ@wsdot.wa.gov or 360-570-2557 with comments, questions, or suggestions for improvement to the manual.

To get the latest information, please sign up for email updates for individual publications at www.wsdot.wa.gov/publications/manuals/.

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Approved By	Signature
Glen Scroggins	/s/

Washington State
Department of Transportation

Washington State Bridge Inspection Manual

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Bridge Preservation Office/Local Programs

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Contents

4. Course/Conference date
5. Explanation of how the course/conference provides the latest practices and/or technology in the area of bridge inspections.

Upon PM approval, the class will be added to the pre-approved class list.

2. Supervisor Responsibilities:
   a. Meet annually during the employee's annual evaluation to discuss training completed and overall status for re-certification.
   b. Ensure the employees have opportunity to attend training that qualifies for recertification.

1.06 Bridge Inspection Certification Probation, Suspension, Decertification and Reinstatement

To couple the process of certification above in Section 1.05, a process for decertification has been established to ensure that all PM's, TL's, UBID's are following the proper conduct of their respective positions.

Key Terms:

Appointing Authority – The designated authority that oversees the sanctions of probation, suspension or decertification of a PM, TL and UBID.

Probationary Period – A PM, TL or UBID is allowed to continue their duties for a prescribed timeframe in order to complete an approved Plan of Corrective Action.

Plan of Corrective Action – A personalized plan approved by the Appointing Authority that identifies criteria the PM, TL, or UBID must complete within an established timeframe for inspection re-certification.

Suspension – Temporary removal of inspection certification as PM, TL or UBID.

Decertification – Permanent removal of inspection certification as PM, TL or UBID until a formal Plan of Corrective Action is administered by the Appointing Authority and fulfilled by the PM, TL or UBID.

Three examples in which a certified PM, TL or UBID may be placed on probation or suspended are listed below. Decertification can result immediately upon knowledge of conduct presented below or if the PM, TL or UBID does not meet the terms agreed upon in the plan of corrective action:

1. If a PM, TL or UBID does not fulfill the requirements for recertification (Section 1.05).
2. If a PM, TL or UBID is found to be using poor inspection practices or producing inadequate inspection documents as assessed by the QC/QA process.
3. If a PM, TL or UBID is found to be falsifying bridge inspection records, misrepresenting bridge hours on site or otherwise failing to meet general ethical standards.

Reinstatement of certification from suspension or completing probation requirements will require a formal plan of corrective action. This may be a simple process or more complex based on the nature of the situation.

This formal plan of corrective action consists of the following:

- The suspended PM, TL, or UBID will be notified in writing by the appointing authority that a plan of corrective action is needed.
- A plan of corrective action developed by the employee is to be approved by the appointing authority.
- Based on the circumstances in examples 1 and 2 above, the PM, TL, or UBID may be required to attend additional Bridge Inspector training classes beyond the continuing education requirements of Section 1.05 as specified by the appointing authority involved in the formal review. The PM, TL or UBID may also be required to receive additional field instruction by the direct supervisor.
- For the circumstance in example 3 above, the PM, TL or UBID may be subjected to more strict consequences as determined by the appointing authority.

A PM, TL or UBID who successfully completes the plan of corrective action will be considered to be in good standing. A PM, TL or UBID who does not satisfactorily complete the plan of corrective action may be decertified.

The DPM will notify the SPM when a PM, TL or UBID in a Local Agency is placed on probation or is suspended, as well as the resulting reinstatement or decertification.

1.07 Appendices

Appendix 1.07-A	WSDOT Bridge Inspector Experience and Training Record form
Appendix 1.07-B	Continuing Education Course List
Appendix 1.07-C	SPM delegation letter
Appendix 1.07-D	DPM delegation letter

Appendix 2.06-D Local Agency Bridge Inventory Coding Guide

General

This appendix describes how to create a Washington State Bridge Inventory System (WSBIS) record (Inventory Record). It also describes the procedures which must be followed in order to add, update, and/or delete this inventory information.

The National Bridge Inspection Standards (NBIS) require that a bridge inventory record be established and maintained for each bridge in the state meeting certain qualifications.

1. An inventory record must be kept for all bridges greater than 20 feet* in length and located on public roads which carry vehicular traffic. This is regardless of whether or not the bridge is on the Federal Aid System. Bridges less than 20 feet in length may be inventoried when they meet the qualifications enumerated in Chapter 7. However these records will not be reported to the Federal Highway Administration (FHWA).

   *(6.1 meters)

2. An inventory record must also be kept for all bridges over a federal aid route, Strategic Highway Corridor Network (STRAHNET) route, or any otherwise important route. This can include a pedestrian bridge, a tunnel or even a pipeline. An Agency may also choose to maintain a record for bridges over public routes not listed above.

   Bridges that do not intersect a public road must be carefully coded to avoid submittal to the FHWA.

In Washington, to facilitate the collection and storage of such a volume of information, a computer system called the Washington State Bridge Inventory System (WSBIS) has been developed. WSBIS is composed of two distinct databases and data management applications. The data management applications are known as Bridge Works. This computer system allows the bridge inventory records for every bridge in the state to be stored in their respective computer database, One for State owned Bridges and one for Local Agency owned bridges. This system was developed by the Washington State Department of Transportation (WSDOT) so that all public bridge information in the state could be coded and stored in a standard, consistent, and accessible format. The bridge inventory data from these two databases is then combined in a central database managed by the WSDOT Office of Information Technologies (OIT). From this central database, information can easily be gathered into reports or transferred to the national database called the National Bridge Inventory (NBI).

The correctness of the bridge information stored in WSBIS is the responsibility of the owner agency. Maintaining the databases' is the responsibility of the WSDOT Bridge Preservation Office (BPO) for State owned bridges and WSDOT Local Programs (LP) for local agency owned bridges. BPO and LP each maintain a version of BridgeWorks to be used by bridge program personnel to enter inspection data, correct inventory information, attached files and photos, and submit updated information to the WSBIS.

In some instances, a local agency will contract with WSDOT or a consultant to inspect and update the inventory for a local agency bridge (i.e., when the local agency does not have the equipment or resources needed). In both cases, the inspection information shall be entered in the Local Agency Bridge Inventory through the Local Agency BridgeWorks application. No matter who does the bridge inspection, the Local Agency bridge owner is responsible for the accuracy of all of their bridge data. It is ultimately the owner's responsibility to ensure that all inspection data is correctly entered into the Local Agency Bridge Inventory. The Local Agency Bridge Inventory is the only valid source of Local Agency bridge data used to populate the overall bridge inventory managed by WSDOT OIT. Failure to enter updated inspection data in the Local Agency Bridge Inventory will cause the inspection data to be omitted from the overall bridge inventory and omitted from subsequent submittals to the NBI. This failure will also cause discontinuities in the inspection history available through BridgeWorks and will, in effect, corrupt the Local Agency Bridge Inventory.

The first part of this chapter describes the procedures which must be followed to add, update, and delete an individual bridge inventory record.

The second part provides a field-by-field description of the WSBIS Inventory Report, defining each field and giving the acceptable coding values which may be entered.

The last part describes the computer editing process performed by the WSBIS system to check the values entered on the report as the inventory record is added or updated.

WSBIS Inventory Report

A WSBIS Inventory Report is produced for every bridge record that has been established in the WSBIS database. This report is the hard copy record of an individual bridges' inventory information and should be reviewed for accuracy whenever updates to the record have been made.

The format of this report is a holdover from a time when coding was submitted on paper forms for entry into the database. To make information easier to enter and retrieve, the form was arranged into four distinct sections: Control Fields, card indicator boxes, data entry fields, and a space for error notifications. While data is no longer collected on a paper form an understanding of the reports' layout is useful.

The first three sections are composed of boxes called fields. Each field is uniquely named. Each has numbered tic marks denoting columns, which indicates the number of characters each field is allowed.

A. Control Fields

Along the top of the report (columns 1 to 27) are six fields known as Control Fields. They uniquely identify the individual bridge record in the following manner. First a unique alphanumeric number is assigned to the record called the Structure Identification (SID) Number. The Bridge Number uniquely identifies the bridge within each agency's system. The Owner Code, County Code and City Code uniquely identify the political subdivision which has control over that bridge. The Update Code is no longer used.

There is one other control field that is made up of several fields from the Inventory Report. This field is called the crossing key. It is a 14-character field that combines the owner code, route, and milepost to create a unique address for Main and Secondary Listing records (see WB74-32).

B. Card Indicator Boxes

Along the left-hand side of the Report (columns 28 to 31) are eight boxes (called Cards) numbered WB71 to WB78. These numbered boxes identify information on the Report as belonging to the WSBIS Inventory. These Cards (WB71, etc.) are duplicated on the forms (Tabs) in BridgeWorks where the data is entered. They are also used in field call-outs.

C. Data Display Fields

The data display fields are stacked directly beneath the Control Fields. This has been done so that all the information can be contained on a single page. The data display fields are where the coding information specific to the given bridge is displayed. They are a reflection of the data entered in the BridgeWorks on the forms indicated by that Card Indicator Box. The middle row of each field displays the data as it is recorded in the WSBIS. The bottom row will display any updates made during a specific inspection or informational update when the report is printed from the BridgeWorks application. These fields will be blank again after the next update to the WSBIS and only current changes will be displayed in the bottom row.

D. Error Reporting

The BridgeWorks application calculates and displays error codes to indicate that inventory information is incorrect. If an error code is reported, the record should be reviewed and the error(s) corrected before the submittal is made. In the rare case where an error code is incorrectly reported it can be ignored.

An example of such a case would be the recording of a side hill viaduct (half bridge). The quality control program will return the error code E489, Curb-to-Curb Width is greater than Out-to-Out Deck Width. However, since the correct coding of the Curb-to-Curb Width is the roadway width and the Out-to-Out Width is the actual deck width the coding is not in error. The quality control program simply cannot recognize this record as a half bridge which has unique coding requirements.

Coding Procedures

To establish and maintain the bridge inventory information, the inspector must enter the information into the BridgeWorks application. Currently two versions of the BridgeWorks application are used in Washington State, One maintained by BPO and one maintained by LP. The Local Agency version of BridgeWorks is available for download at www.wsdot.wa.gov/localprograms/bridge/bridgeworks.htm.

This section provides instructions for proper preparation of an Inventory Report.

The Inventory Report is a valuable reference of the bridges' recorded inventory information. It is also useful for determining the number of characters each field allows. The Report format is used as a method of locating the named field on the report, as well as the forms in the BridgeWorks application and Item call out numbers in the error descriptions.

This method combines the last number of the Card identification from the boxes on the left margin with the column number listed below the field being referenced. For example, the field "Bridge Name" would be referenced as (132), and would be found in BridgeWorks under the WB71 tab and referenced in parenthesis as 132 to the right of the field label. The field "ADT Year" would be referenced as (453), and found under the WB74 tab in BridgeWorks with 453 in parenthesis.

Usually, numeric coded values will be right-justified and alpha coded entries will be left-justified. Some fields must have all columns filled in, others do not.

Examples:

1. For ROUTE NUMBER, the value 101 shall be entered as 00101.
2. For BRIDGE NAME, the name Tule Creek Bridge would be left justified. It has 17 characters so there would be 7 trailing spaces (it is not required to enter trailing spaces in Bridge Works).

Special characters from a keyboard should be limited (i.e., the slash (/), the apostrophe (‘), or the ampersand (&) are allowable but others should be avoided). Abbreviations may also be used where space is limited, but the abbreviations must be kept meaningful.

Refer to the descriptions of each field to determine the proper code to enter. Each description should be read carefully as a code having a particular meaning in one field may mean something else entirely in another field. For example, when information does not apply, in some instances a nine will be entered in the field, in other instances a zero will be entered, and in still other instances, the field will be left blank. The field description will explain the proper procedure to follow.

A. Establishing/Reestablishing the Inventory Record

The original inventory record needs to be established only once and is required when:

- A new bridge has been built (usually before it is placed in service).
- An existing bridge has been replaced with a new bridge **(it is required that the existing record and its' SID be deleted before a new record for the bridge is established with a new unique SID)**.
- A detour bridge has been built and remains in service for more than three years or beyond the life of the contract under which it was built.
- An existing bridge not previously inventoried is added to the statewide inventory.

A bridge's original inventory record can be established by the following steps.

1. In Bridge Works, select "Database/Create Structure" from the menu at the top of the main page. A new window will pop up with twelve data entry fields. Two of these fields are automatically filled in by the BridgeWorks application. First, the Provisional (or temporary) SID will be assigned. Second, the "Sort Bridge Number" will be created when you fill the "Bridge Number" field. The last two digits of the Provisional SID are for sequencing the creation of multiple new records (i.e., "01", 02). The permanent SID is assigned by WSDOT when the new record is released to the WSBIS. Enter valid data in all of the other fields.

After completing all fields, click in the "Sort Bridge Number" field to activate the "Create Structure" button. Click the "Create Structure" button to close the window and add the new record to your inventory list. You can then choose the new record off the bridge list and continue adding the required inventory information.

2. Enter appropriate values in the data entry fields on the application forms. The following conditions will apply:
   - Information must be entered in all Fatal Fields. These fields are reviewed during the update process for values that are within a predetermined range. If a Fatal Field is blank or out of range, the record cannot be created.
   - Required Fields should be completed if the information is known. These fields are cross-referenced by the program for relational logic and valid range entries. Normally if the information for one of these fields is unknown, it should be left blank until the correct information can be determined. There are some exceptions that are noted in the field descriptions.

     The Sufficiency Rating generator (described in the appendix) uses a number of the Fatal and Required fields to generate some of the Adequacy Appraisals, the Sufficiency Rating and Deficiency Status. Therefore for accurate ratings these fields must be entered.
   - Other information should then be entered in the Optional Fields, as applicable, to create a complete record. Information entered here is not edited. (See the field descriptions on the following pages for an explanation of what information can be entered in these Optional Fields.)
3. A copy of this Inventory Report shall be kept in the bridge file.

Reestablishing the Inventory Record

If an Inventory record for a bridge has been mistakenly deleted or obsoleted (as sometimes happens when a bridge has changed ownership), it can be recovered by emailing a request to the Local Agency Bridge Inventory Engineer for local agency bridges or to the BPO Bridge Inventory Engineer for State owned bridges. In the request, be sure to provide correct control field information.

Once the record has been recovered, it must be reviewed for errors and corrected. Submit the updated data in the manner described for updating the inventory.

B. Updating the Inventory

The original bridge inventory record needs to be updated whenever new data must be added or whenever changes must be made to the existing record.

Updates to the original inventory data may be required as a result of damage to the bridge, changed conditions noted during an inspection, safety improvements or rehabilitation, when new computations or measurements are made, or when the bridge changes ownership. Updates to a bridges' inventory record must be reported to the Local Agency Bridge Inventory Engineer or the BPO Bridge Inventory Engineer within 90 days. Updates that have not been Released to their respective inventories will not be included in the data for the overall bridge inventory managed by WSDOT OIT and will not be included in any submittals and reports prepared using that data.

To start the update process, select the bridge record from the Bridge List you want to change. Be sure the latest Master Control Data (MCD) in the Control Data Grid is highlighted and then click "edit" to create an updatable copy. This new copy will be in a state of "work" and is called an Update Control Data (UCD). To complete an update, this procedure will be followed.

1. Review the data displayed in the BridgeWorks forms (tabs). All of the forms except BMS, Notes, Repairs, Photos, Files, and Letters are arranged with two data fields after the field name. The left side data field will display existing information. The right side data field is for entering update information.
2. Enter new coding values in each Data Entry Field that must be updated. Make sure your entry is complete. Choosing F9 from your keyboard or clicking the "Check Control Data" button on the NBI tab will cause BridgeWorks to run the error checking process for the selected Control Data (CD). BridgeWorks will then provide you with a list of errors or will let you know that no errors were found. This process can be run on UCD's or MCD's.
   - If you are entering new data, simply enter the appropriate values in the field.
   - If you are making a change to existing data, the entire field must be re coded. For example, if the name shown in Item 232 - Features Intersected, has been misspelled, the entire name must be reentered, not just one or two letters corrected.
   - If you want to blank out an entire field, type an asterisk (*) in the update field. If the field is not a fatal field, the existing data contained in that field will be erased and the field will be blank after the record is processed. Fatal Fields can only be updated.
4. When all updates are complete to the satisfaction of the Team Leader responsible for the bridge inspection, the report is submitted to the state of "review." At this point it is forwarded to the Team Leader's Program Manager or supervisor for their review. This internal review falls under the heading of Quality Control (QC) and is an important step in the release process. Once the Program Manager or supervisor is satisfied with the UCD it is submitted to the state of "Approved."
5. Next, a Selection Set of approved UCD's are sent to the Local Agency Bridge Inventory Engineer for review. The UCD's are then reviewed during a Quality Assurance (QA) process to ensure correctness and consistency before the data is released to the Inventory.

   Any errors found will be noted and returned to the bridge owner for corrections. Once the corrections are made, the UCD is again submitted for review. Once the Inventory Engineer is satisfied with the correctness of the UCD it is released to the Bridge Inventory. At this point, the UCD becomes an MCD and can no longer be changed. An MCD is a permanent part of the bridge record history and further changes must be made through the UCD process.

6. After release, the Bridge Inspection Report and the WSBIS Bridge Inventory Report are printed. The final validation of the inspection report is completed when the Bridge Inspection Team members sign the report. The report is then added to the inspection history in the official bridge file and the previous WSBIS Inventory Report is replaced with the current report.

This process must be completed within 90 days but it is recommended that the release is done as soon as possible. The quality of the inspection report tends to degrade through an extended review. Instead, complete the release process on the UCD and make any later corrections through an Informational UCD.

C. Deleting/Transferring the Inventory Record

When an inventory record becomes obsolete, it needs to be changed from "Active" to "Inactive" status in the WSBIS database. The reasons a record may become obsolete include:

- A bridge has been bypassed and is no longer in use, or
- A bridge has been demolished, or
- A bridge has been permanently closed to traffic.

If a new bridge is built on the site of an old bridge, the agency should first obsolete the old record before establishing a new inventory record. (This will ensure that each new bridge is assigned a unique Structure Identifier.)

To obsolete the inventory record:

1. An email listing the control data for each bridge to be deleted shall be sent to the Local Agency Bridge Inventory Engineer. This email shall include the Structure Identification Number and Bridge Name along with instructions that the record is to be deleted.

   If the jurisdiction of a bridge is being transferred from one agency to another, **the bridge record shall not be obsoleted**.

   Instead, the Owner Code, Custodian Code and, if necessary, the City Code shall be updated by the original owner prior to sending the bridge records to the new owner. For example:

   The city of Selah has expanded its boundaries and annexed a bridge from Yakima County.

   Yakima County would update the Owner Code from 02 to 04, the Custodian Code the same if appropriate, and the City Code from 0000 to 1155 prior to the data being submitted for update. Selah would then be responsible to correct the Bridge Number and all other data for the Inventory record.

   This will ensure that a given bridge retains its unique Structure Identifier throughout the life of the bridge.

   A sample of the entire WSBIS Inventory Report is shown in the forms section.

D. Type of Records

In general, there are two distinct types of Crossing Records (how a highway relates to a bridge and the feature it crosses). The most common is a bridge that carries a highway and the other is a bridge that crosses a highway. Since the design of the Inventory Report only allows the recording of one highway the determination of how that highway relates to the bridge must be made so that all of the Inventory Report fields are consistent.

Structures that carry a public highway are considered "On Records" regardless of the feature crossed. Route information shall be recorded for the highway carried.

An "On Record" shall also be recorded for those bridges that carry a public highway and cross a public highway. Route information shall be recorded for the route on the bridge regardless of classification.

Structures that do not carry a public highway are considered "Under Records" and information about the route the bridge crosses shall be recorded.

Before entering information for a new record, a determination must be made as to whether the record applies to a route "on" the bridge or a route "under" the bridge. There is a distinct difference between the two, and the coding requirements are not the same (see Item 432).

With that in mind, the following is a field-by-field description of the WSBIS Inventory Report.

2.04 Inventory Coding Fields

The following describes the valid codes that may be used and the purpose of each field. It also defines the control fields, fatal fields, required fields, and optional fields.

structure_id **Structure Identifier** *(Fatal)*
Control Field
FHWA Item 8A

This is a unique, eight-character code assigned by the WSDOT Inventory Engineer when the original bridge inventory record is processed. The Structure Identifier is a Primary Key which ties all tables with related information for that bridge together in the WSBIS database. It will not change throughout the life of the bridge.

bridge_no **Bridge Number** *(Fatal)*
Control Field

This is a unique (to the owner agency) alphanumeric code assigned by the owner of the bridge. This field does not require all spaces to be filled; however, the field cannot be left blank.

For local agencies, the bridge number should conform to their agency's numbering system.

The inspector should be aware that special characters can cause undesirable results; therefore, the bridge number should be limited to an alpha-numeric code as much as possible. However, the characters '/' and '-' are acceptable.

Owner Code
Control Field
FHWA Item 022
agency_id

Owner Code *(Fatal)*

This code identifies the agency of record which owns the bridge. Jointly-owned bridges must be reported by only one of the owner agencies.

There will need to be an agreement between the owner agencies as to which agency will be reporting the bridge to WSBIS. This will prevent both agencies from reporting the same bridge under a different Structure Identifier.

Use one of the following codes.

01	State Highway Agency
02	County Highway Agency
03	Town or Township Highway Agency
04	City or Municipal Highway Agency
11	State Park, Forest, or Reservation Agency
12	County Park, Forest, or Reservation Agency
13	City/Other Park, Forest, or Reservation Agency
21	Other State Agencies
24	Other County Agencies
25	Other City or Local Agencies
26	Private (Ports and non-Railroad)
27	Railroad
28	Light Rail
31	State Toll Authority
32	County Toll Authority
33	City or Other Toll Authority
60	Other Federal Agencies (not listed below)
61	Indian Tribal Government
62	Bureau of Indian Affairs
63	Bureau of Fish and Wildlife
64	U.S. Forest Service
66	National Park Service
68	Bureau of Land Management
69	Bureau of Reclamation
70	Corps of Engineers (Civilian)
71	Corps of Engineers (Military)
72	Air Force
73	Navy/Marines
74	Army
75	NASA
76	Metropolitan Washington Airport Services
80	Unknown
91	Canada
92	Idaho
93	Oregon

county_id
Control Field
FHWA Item 003

County Number *(Fatal)*

This is a two-digit code which identifies the county in which the bridge is located. If this is a jointly owned bridge, the county that is responsible for reporting the data to the inventory should be entered here. Use one of the following codes.

County Name	County Code	Region Code
Adams	01	EA
Asotin	02	SC
Benton	03	SC
Chelan	04	NC
Clallam	05	OL
Clark	06	SW
Columbia	07	SC
Cowlitz	08	SW
Douglas	09	NC
Ferry	10	EA
Franklin	11	SC
Garfield	12	SC
Grant	13	NC
Grays Harbor	14	OL
Island	15	NW
Jefferson	16	OL
King	17	NW
Kitsap	18	OL
Kittitas	19	SC
Klickitat	20	SW
Lewis	21	SW
Lincoln	22	EA
Mason	23	OL
Okanogan	24	NC
Pacific	25	SW
Pend Oreille	26	EA
Pierce	27	OL
San Juan	28	NW
Skagit	29	NW
Skamania	30	SW
Snohomish	31	NW
Spokane	32	EA
Stevens	33	EA
Thurston	34	OL
Wahkiakum	35	SW
Walla Walla	36	SC
Whatcom	37	NW
Whitman	38	EA
Yakima	39	SC

city_id **City Number** *(Fatal)*

Control Field

This is the city in which the bridge is located. (Codes for cities and towns are identified according to the most recent U.S. Bureau of the Census Identification Schedule.) Contact the Bridge Engineer for Local Agencies for newly incorporated municipalities.

If the bridge is outside of corporate limits or in an unincorporated city, code all zeros. Use the following codes.

City	Code	City	Code	City	Code	City	Code
Unincorporated	0000	Chehalis	0190	Entiat	0405	Kenmore	0609
Aberdeen	0005	Chelan	0195	Enumclaw	0410	Kennewick	0610
Airway Heights	0010	Cheney	0200	Ephrata	0415	Kent	0615
Bucoda	0013	Chewelah	0205	Everett	0420	Kettle Falls	0620
Albion	0015	Clarkston	0215	Everson	0425	Kirkland	0625
Algona	0020	Cle Elum	0220	Fairfield	0430	Kittitas	0630
Almira	0025	Clyde Hill	0225	Farmington	0440	Krupp	0635
Anacortes	0030	Colfax	0230	Federal Way	0443	La Center	0640
Arlington	0045	College Place	0235	Ferndale	0445	Lacey	0643
Asotin	0050	Colton	0240	Fife	0450	La Conner	0650
Auburn	0055	Colville	0250	Fircrest	0455	La Crosse	0655
Bainbridge Island	0058	Conconully	0255	Forks	0465	Lake Forest Park	0657
Battle Ground	0060	Concrete	0260	Friday Harbor	0470	Lake Stevens	0664
Beaux Arts Village	0070	Connell	0265	Garfield	0480	Lakewood	0665
Bellevue	0075	Cosmopolis	0270	George	0489	Lamont	0668
Bellingham	0080	Coulee City	0275	Gig Harbor	0490	Langley	0670
Benton City	0085	Coulee Dam	0280	Gold Bar	0495	Latah	0675
Bingen	0090	Coupeville	0290	Goldendale	0500	Leavenworth	0680
Black Diamond	0095	Creston	0295	Grand Coulee	0510	Liberty Lake	0684
Blaine	0100	Cusick	0300	Grandview	0515	Lind	0685
Bonney Lake	0105	Darrington	0305	Granger	0520	Long Beach	0690
Bothel	0110	Davenport	0310	Granite Falls	0525	Longview	0695
Bremerton	0115	Dayton	0315	Hamilton	0535	Lyman	0705
Brewster	0120	Deer Park	0320	Harrah	0540	Lynden	0710
Bridgeport	0125	Des Moines	0325	Harrington	0545	Lynnwood	0715
Brier	0127	Dupont	0330	Hartline	0550	Mabton	0725
Buckley	0130	Duval	0335	Hatton	0555	Mccleary	0728
Burien	0138	East Wenatchee	0350	Hoquiam	0560	Malden	0730
Burlington	0140	Eatonville	0360	Hunts Point	0570	Mansfield	0735
Camas	0145	Edgewood	0364	Ilwaco	0575	Marcus	0740
Carbonado	0150	Edmonds	0365	Index	0580	Marysville	0745
Carnation	0155	Electric City	0375	Ione	0585	Mattawa	0750
Cashmere	0165	EllensbuRg	0380	IssaqUah	0590	Medical Lake	0755
Castle Rock	0170	Elma	0385	Kahlotus	0595	Medina	0760
CaThlamet	0175	Elmer City	0390	Kalama	0600	Mercer Island	0763
Centralia	0180	Endicott	0395	Kelso	0605	Mesa	0765

City	Code	City	Code	City	Code	City	Code
Metaline	0770	Port Orchard	1000	Spokane Valley	1221	Winthrop	1465
Metaline Falls	0775	Port Townsend	1005	Sprague	1225	Woodinville	1469
Mill Creek	0778	Poulsbo	1010	Springdale	1230	Woodland	1470
Millwood	0780	Prescott	1015	Stanwood	1235	Woodway	1475
Milton	0785	Prosser	1020	Starbuck	1240	Yacolt	1480
Monroe	0790	Pullman	1025	Steilacoom	1245	Yakima	1485
MOntesano	0795	Puyallup	1030	Stevenson	1250	Yarrow Point	1490
Morton	0800	Quincy	1040	Sulton	1255	Yelm	1495
Moses Lake	0805	Rainier	1050	Sumas	1265	Zillah	1500
Mossyrock	0810	Raymond	1055	Sumner	1270		
Mountlake Terrace	0815	Reardan	1060	Sunnyside	1275		
Mount Vernon	0820	Redmond	1065	Tacoma	1280		
Moxee City	0825	Renton	1070	Tekoa	1285		
Mukilteo	0830	Republic	1075	Tenino	1290		
Naches	0835	Richland	1080	Tieton	1295		
Napavine	0840	Ridgefield	1085	Toledo	1300		
Nespelem	0855	Ritzville	1090	Tonasket	1305		
Newcastle	0858	Riverside	1095	Toppenish	1310		
Newport	0860	Rockford	1100	Tukwila	1320		
Newcastle	0861	Rock Island	1105	Tumwater	1325		
Nooksack	0865	Rosalia	1115	Twisp	1330		
Normandy Park	0870	Roslyn	1120	Union Gap	1335		
North Bend	0875	Roy	1125	Uniontown	1340		
North Bonneville	0877	Royal City	1127	University Place	1343		
Northport	0885	Ruston	1130	Vader	1345		
Oakesdale	0890	St John	1135	Vancouver	1350		
Oak Harbor	0895	Sammamish	1136	Waitsburg	1360		
Oakville	0900	Seatac	1139	Walla Walla	1365		
Ocean Shores	0907	Seattle	1140	Wapato	1375		
Odessa	0910	Sedro-Woolley	1150	Warden	1380		
Okanogan	0915	Selah	1155	Washougal	1385		
Olympia	0920	Sequim	1160	Washtucna	1390		
Omak	0925	Shelton	1165	Waterville	1395		
Oroville	0935	Shoreline	1169	Waverly	1400		
Orting	0940	SKykomish	1175	Wenatchee	1405		
Ohello	0945	Snohomish	1180	Westport	1420		
Pacific	0950	Snoqualmie	1185	West Richland	1425		
Palouse	0955	Soap Lake	1190	White Salmon	1435		
Pasco	0960	South Bend	1195	Wilbur	1440		
Pateros	0970	South Cle Elum	1205	Wilkeson	1445		
Pe Ell	0975	South Prairie	1210	Wilson Creek	1450		
Pomeroy	0985	Spangle	1215	Winlock	1455		
Port Angeles	0990	Spokane	1220	Winslow	1460		

WB71

bridge_name **Bridge Name** *(Fatal)*
WB71-32 This is the name of the bridge.

If the bridge name is more than one word, separate words with a blank space. If the name of the bridge is too long to fit in the field, use abbreviations to shorten it. Left-justify the entry and leave following columns blank. This field does not require a complete entry, but must **not** be left blank.

location **Location** *(Fatal)*
WB71-56
FHWA Item 009 This field gives a narrative description of the physical location of the bridge with respect to the route being inventoried. The location should be keyed to a permanent, distinguishable feature, such as a road junction or a county line. Descriptions should be oriented ahead on station whenever possible. Do not use city limits, as these boundaries may move.

Left-justify this description and do not enter zeroes in remaining blank spaces (otherwise, the zeroes will be considered part of the location description). This field does not require a complete entry, but must **not** be left blank.

section **Section** *(Fatal)*
WB71-81 This is the number of the section in which the bridge is located. Enter a numeric code from '01' to '36'.

Section, township, and range numbers are location markers established by survey mapping.

If the bridge runs along a section, township, or range line, use the smaller of the two numbers. If a bridge crosses any line, use the number at the beginning of the bridge.

township **Township** *(Fatal)*
WB71-83 This is the number of the township in which the bridge is located. Enter a numeric code from '01' to '41'.

Township designations carry a directional suffix (north or south); however, since all townships in Washington are north, this directional indicator need not be entered.

range **Range** *(Fatal)*

WB71-85 This field contains the number of the range in which this bridge is located.

There are two parts to this field. In the first two columns, enter the number of the range in which the bridge is located. Valid ranges are:

01 through 47	If the third column is E
01 through 16	If the third column is W

In the third column, enter the directional suffix which indicates the position of the range in relation to the Willamette Meridian. Enter one of the following codes:

E	East
W	West

latitude **Latitude** *(Fatal)*

WB71-88

FHWA Item 016 This field contains the degrees of latitude at the centerline of the bridge at its beginning milepost. Latitude is designated in degrees, minutes, and seconds to the hundredth of a second. Since all of Washington is located in northern latitudes, the directional suffix (N) need not be entered. It is recommended this field be coded using GPS or an accurate digital mapping program.

longitude **Longitude** *(Fatal)*

WB71-96

FHWA Item 017 This field contains the degrees of longitude at the centerline of the bridge at its beginning milepost. Longitude is indicated in degrees, minutes, and seconds to the hundredth of a second. Since all of Washington is located in western longitudes, the directional suffix (W) need not be entered. It is recommended this field be coded using GPS or an accurate digital mapping program.

WB72

feature_intersected **Features Intersected** *(Fatal)*
WB72-32
FHWA Item 006A

This is the name or names of the features intersected by the bridge, i.e., the features under the bridge. If full names will not fit in the field, abbreviations may be used where necessary but an effort shall be made to keep them meaningful. Left-justify the name or names entered without using trailing zeroes. This field does not require a complete entry, but must not be left blank.

If one of the features intersected is another roadway, indicate the signed route number or name of the highway (i.e., SR 99).

If there is an alternate name for a feature, enclose this second identifier in parentheses. For example a signed number route that is also a named memorial route (i.e., SR 99 (Aurora Avenue)).

If more than one feature is intersected, give both names, signed route first separated by a comma (i.e., SR 99, Blue R, UPR).

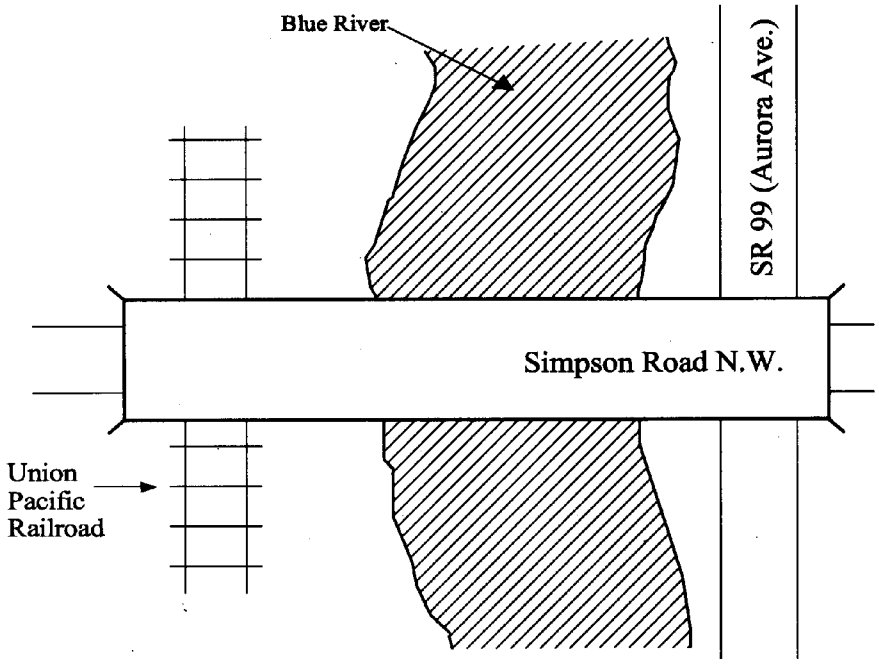


Figure WB72-32

facilities_carried **Facilities Carried** *(Fatal)*
WB72-56
FHWA Item 007

This is the name (or names) of the facility carried by the bridge. In all situations this describes the use "on" the bridge.

Left-justify the roadway name or names (use abbreviations If necessary) and do not enter trailing zeroes.

If there is an alternate name for a feature, enclose this second identifier in parentheses. For example a signed number route that is also a named memorial route (i.e., SR 99 (Aurora Avenue)).

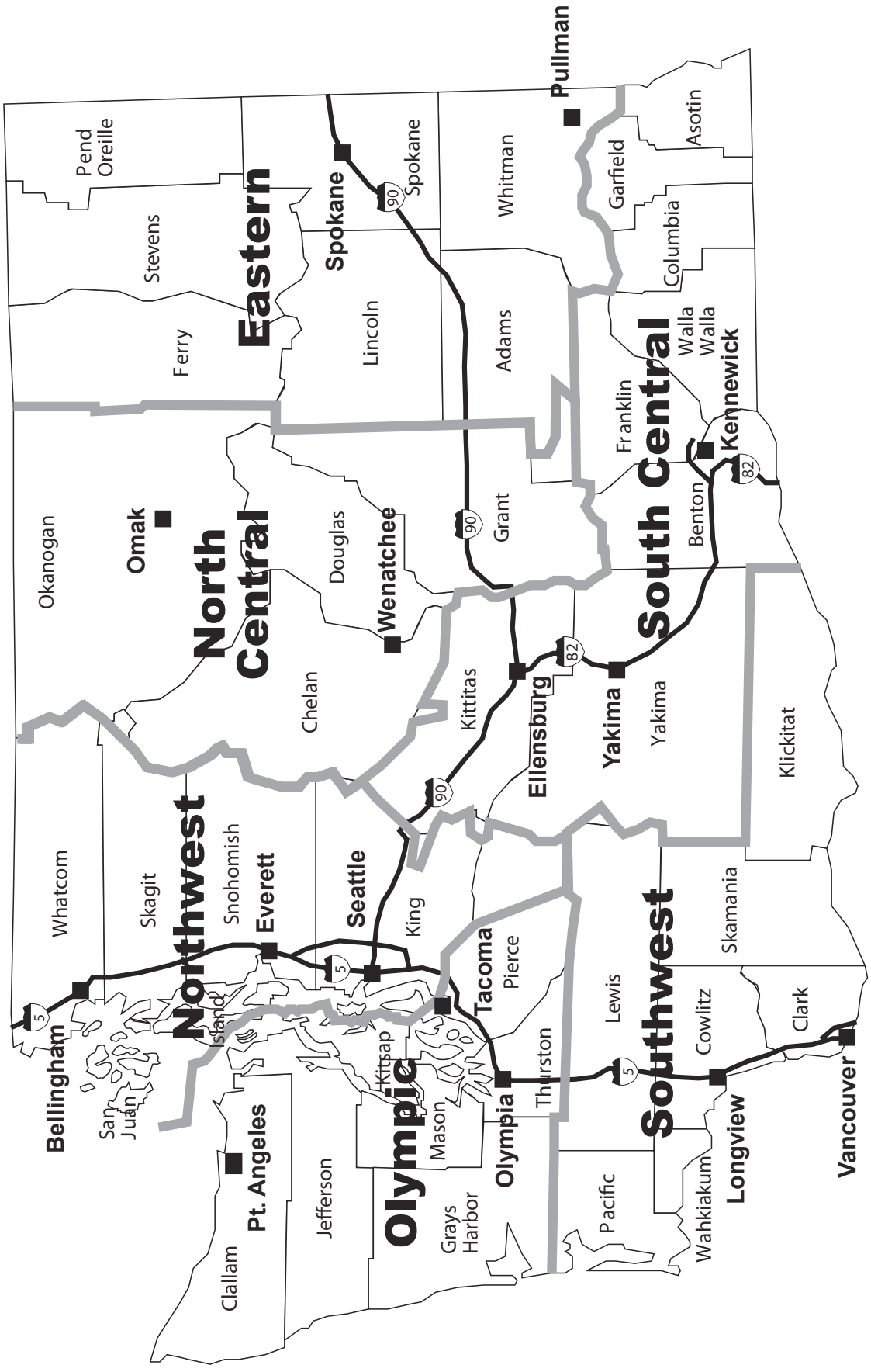
This field does not require a complete entry, but must not be left blank.

region_code **WSDOT Region** *(Fatal)*
WB72-74
FHWA Item 002

This is the WSDOT region in which the bridge is located. Use the following codes. Some counties may be shared by more than one region. Local Agencies should use the regions assigned below.

Region Names (Code)	County Names
Eastern Region (EA)	Adams
	Ferry
	Lincoln
	Pend Oreille
	Spokane
	Stevens
	Whitman
North Central Region (NC)	Chelan
	Douglas
	Grant
	Okanogan
Northwest Region (NW)	Island
	King
	San Juan
	Skagit
	Snohomish
	Whatcom
Olympic Region (OL)	Clallam
	Grays Harbor
	Jefferson
	Kitsap
	Mason
	Pierce
	Thurston

Region Names (Code)	County Names
South Central Region (SC)	Asotin
	Benton
	Columbia
	Franklin
	Garfield
	Kittitas
	Walla Walla
	Yakima
Southwest Region (SW)	Clark
	Cowlitz
	Klickitat
	Lewis
	Pacific
	Skamania
	Wahkiakum


Pullman
Spokane
Eastern
Pend Oreille
Stevens
Ferry
Lincoln
Adams
Whitman
Garfield
Asotin
Columbia
Walla Walla
Kennewick
Franklin
Benton
South Central
Omak
North Central
Okanogan
Douglas
Wenatchee
Grant
Chelan
Kittitas
Ellensburg
Yakima
Yakima
Klickitat
Northwest
Whatcom
Skagit
Snohomish
Everett
Seattle
King
Tacoma
Pierce
Skamania
Lewis
Cowlitz
Clark
Southwest
Bellingham
San Juan
Island
Kitsap
Olympia
Thurston
Mason
Olympic
Grays Harbor
Jefferson
Pt. Angeles
Clallam
Pacific
Wahkiakum
Longview
Vancouver
90
82
5

fips_code **FIPS Place Code** *(Required)*
WB72-76
FHWA Item 004

This field identifies the census-designated place in which the bridge is located using the Federal Information Processing Standards (FIPS 55) code, given in the current version of the Census of Population and Housing – Geographic Identification Code Scheme.

If no code is applicable, enter all zeroes.

leg_dist_code_1 **Legislative District Number (1)** *(Required)*
WB72-81

This field identifies the first or only State Legislative District in which the bridge is located (see Section 2.08).

If the legislative district number is followed by a letter (District 19A, for example), disregard the letter and enter the two-digit number only.

leg_dist_code_2 **Legislative District Number (2)** *(Required)*
WB72-83

For bridges which span a State Legislative District dividing line, use this field to identify the second State Legislative District number.

Use both this and the Legislative District Number (1) field to enter the two separate State Legislative District numbers. If no code is applicable, enter all zeroes.

toll_code **Toll** *(Fatal)*
WB72-85
FHWA Item 020

This code indicates if a toll is required for use of the bridge. One of the following codes will apply:

1. Toll bridge – a toll must be paid specifically to use the bridge.
2. On toll road – a toll must be paid to use the roadway carried by the bridge.
3. Non-toll bridge – no tolls are paid to use the bridge or the roadway carried by the bridge.
4. On interstate toll segment under secretarial agreement. Bridge functions as a part of the toll segment.
5. Toll bridge is a segment under secretarial agreement. Bridge is separate agreement from highway segment.

custodian_id **Custodian** *(Fatal)*

WB72-86

FHWA Item 021

This code describes the type of agency that has primary responsibility for maintaining the bridge (may not be the same as the owner). Acceptable values to enter in this field are as follows:

01	State Highway Agency
02	County Highway Agency
03	Town or Township Highway Agency
04	City or Municipal Highway Agency
11	State Park, Forest, or Reservation Agency
12	County Park, Forest, or Reservation Agency
13	City/Other Park, Forest, or Reservation Agency
21	Other State Agencies
24	Other County Agencies
25	Other City or Local Agencies
26	Private (other than Railroad)
27	Railroad
31	State Toll Authority
32	County Toll Authority
33	City or Other Toll Authority
60	Other Federal Agencies (not listed below)
62	Bureau of Indian Affairs
63	Bureau of Fish and Wildlife
64	U.S. Forest Service
66	National Park Service
68	Bureau of Land Management
69	Bureau of Reclamation
70	Corps of Engineers (Civilian)
71	Corps of Engineers (Military)
72	Air Force
73	Navy/Marines
74	Army
75	NASA
76	Metropolitan Washington Airport Services
80	Unknown
91	Canada
92	Idaho
93	Oregon

parallel_structure_ Parallel Structure *(Fatal)*
WB72-88
FHWA Item 101

This field contains a code to identify situations in which separate bridges carry the same inventory route in opposite directions of travel over the same feature. The lateral distance between bridges has no bearing on the coding of this field.

Right and left are determined by facing in the direction of increasing mileposts or, in the absence of milepost markers, by facing north or east.

R	To indicate the right-hand bridge of the pair
L	To indicate the left-hand bridge of the pair
N	To indicate the bridge is not a parallel bridge

temporary_structure_ Temporary Structure *(Required)*
WB72-89
FHWA Item 103

This code indicates If a temporary bridge has been built or temporary measures have been taken on an existing bridge to maintain a flow of traffic. Temporary bridges or temporary repair measures may be required during the modification or replacement of a bridge found to be deficient.

Any one of the following conditions will require that a code of "T" be entered in this field:

- The bridge has been shored up or additional temporary supports have been installed.
- Temporary repairs have been made to keep the bridge open.
- A temporary bridge has been built to provide an interim bypass that is not under the control of a contractor, such as an emergency bailey type bridge.
- Other temporary measures have been taken, such as barricaded traffic lanes, to keep the bridge open to traffic.

If none of these conditions exist, leave the field blank.

Any repaired bridge or replacement bridge expected to remain in service without further project activity (other than maintenance) for a significant period of time shall not be considered temporary. Under such conditions, that bridge, regardless of its type, shall be considered the minimum adequate to remain in place and shall be evaluated accordingly.

If this item is coded T, then all data recorded for the bridge shall be for the condition of the bridge without temporary measures, except for the following items which shall be coded for the temporary bridge:

WB72-93	Structure Open, Posted, or Closed to Traffic
WB73-70	Minimum Vertical Clearance Over Bridge Deck
WB73-74	Minimum Vertical Clearances Under Bridge
WB73-79	Minimum Lateral Under clearance Right
WB73-83	Minimum Lateral Under clearance Left
WB74-91	Horizontal Clearance Route Direction
WB74-95	Horizontal Clearance Reverse Direction
WB76-60	Operating Level

median_code **Median** *(Fatal)*
WB72-91
FHWA Item 033

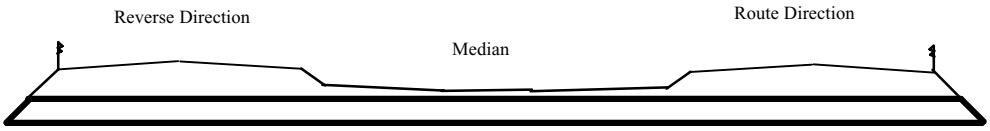
This code indicates If there is a median on the bridge. By definition, a bridge median can only exist on divided highways.

A divided highway can be identified by the use of traffic control devices separating the route and reverse route directions of travel. Devices such as a concrete barrier, or yellow crosshatching between solid double yellow lines 18 inches or more apart, or others, such that vehicles are restricted to the right-hand lanes unless directed or permitted in the left-hand lanes by a police officer, or other official traffic control devices.

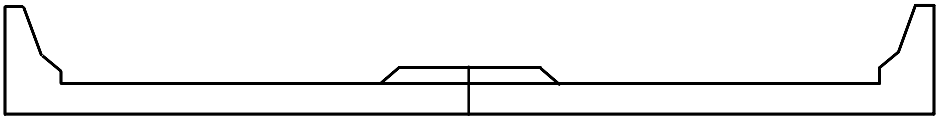
If a structure has been divided into a left and a right bridge so that the median is between the two structures then no median is considered to be on the bridge. Culverts will often have a median similar to the diagram for Code 1.

Use the following diagrams to identify the median device on the bridge.

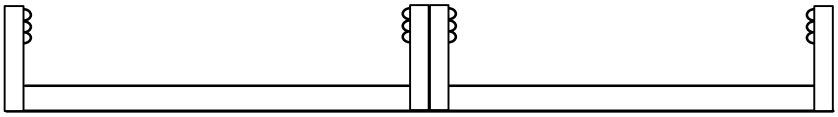
0 No median (undivided roadway).
1 Open median.
2 Closed median – painted (Traffic lanes are separated only by painted median).
3 Closed median – mountable curb or center island.
4 Closed median – flex or thrie beam guardrail.
5 Closed median – box beam guardrail.
6 Closed median – Concrete (i.e., NJB, Type F barrier).
7 Open median – with safety modifications (i.e., a net has been installed).
9 Other type of median.



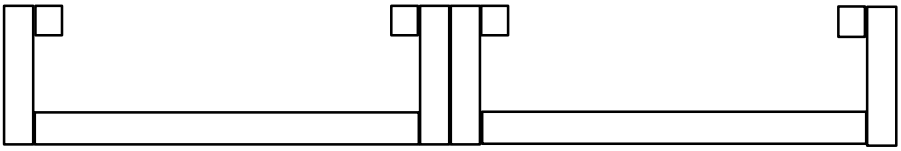
Code 1



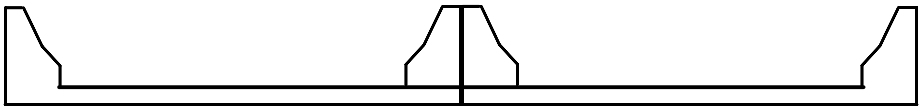
Code 3



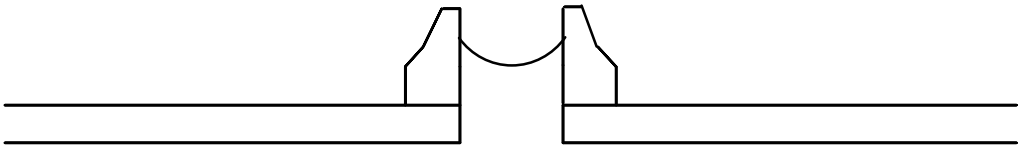
Code 4



Code 5



Code 6



Code 7

Figure WB72-91

hist_signif **Historical Significance** *(Fatal)*
WB72-92
FHWA Item 037

A bridge may be considered historically significant If it is a particularly unique example of the history of engineering, the crossing itself is historically significant, the bridge is associated with historical property, or the bridge was involved in events of historical significance.

If the bridge is only on the National Register of Historic Places (NRHP) list, use the numeric code. If the bridge is only on the Historical American Engineering Record (HAER) list, use the alpha code. If the bridge is on both NRHP and HAER lists, use the numeric code.

1 or A	Bridge is on the NRHP or HAER.
2 or B	Bridge is eligible for the NRHP or HAER.
3 or C	Bridge is possibly eligible for the NRHP or HAER. (Further investigation is required before a determination can be made.)
4	Bridge's historical significance has not been determined at this time. (This code should be used if the bridge is less than 50 years old.)
5	Bridge has been reviewed by the State Office of Archaeology and Historic Preservation and is not eligible for the NRHP, HAER.
6	Bridge has been reviewed and a determination has been made that this bridge has no historical significance.

open_closed **Open, Closed, or Posted** *(Fatal)*
WB72-93
FHWA Item 041

This field provides information about the actual weight capacity status of a bridge. The field review could show that a structure is posted, but WB76-60 Operating Level may indicate that posting is not required. This is possible and acceptable coding since WB76-60 is based on the operating stress level and the governing agency's posting procedures may specify posting at some stress level less than the operating rating. One of the following codes shall be used:

A	Bridge is open with no restrictions.
B	Bridge is open. Posting has been recommended but has not been legally implemented (all signs are not in place).
D	Bridge is open. It would be posted or closed except that temporary shoring, etc., has been used to allow for unrestricted traffic flow. If this code is used, WB72-89 shall be coded T.
E	Bridge is open, but it is a temporary bridge carrying traffic while the original bridge is being replaced or rehabilitated. If this code is used, WB72-89 shall be coded T.
G	Bridge is new and not yet open to traffic.
K	Bridge is closed to traffic.
P	Bridge is posted for weight restrictions.
R	Bridge is posted for other load-capacity restrictions such as speed or limiting the number of vehicles allowed on the bridge at one time.

program_year **Program Year** *(Required)*
WB72-94 If the bridge has been included in an approved six-year construction program, this field contains the year that work is to start on the project, including preliminary engineering.

Work to be performed on the bridge must be major construction or reconstruction. If the bridge is not included in a six-year program, code zeroes in this field.

WB73

built_year **Year Built** *(Fatal)*
WB73-32
FHWA Item 027

This is the year that original construction of the bridge was completed.

If the year the bridge was built is not known, enter an estimate of that date. If the bridge was built during or before the year 1900, enter 1900 in the field.

There are cases where a careful evaluation of the year built and year rebuilt must be made. The first is when an existing bridge has been moved to a new site. The second is when parts of a dismantled bridge from another site are used at a new site. And the third is when parts of the old bridge are used at the same site.

Excluding engineering and safety considerations, an evaluation of the impact on future funding is a factor. The year built and year rebuilt are key fields used to determine If a bridge is eligible for federal funding. Another consideration would be the percentage of used material in relation to new material. The greater the percentage of new material used in the bridge the less need there is of capturing the original date of construction in the inventory.

Since every occasion of these instances will be unique in its application guidance should be sought from your Program Manager when there is question as to the proper year to use.

rebuilt_year **Year Rebuilt (***Fatal)*
WB73-36
FHWA Item 106

This is the year in which the last major rehabilitation of the existing bridge was completed.

Record and code the year of most recent reconstruction of the structure. Code all four digits of the latest year in which reconstruction of the structure was completed. If there has been no reconstruction, code 0.

For a bridge to be defined as rebuilt, the type of work performed, whether or not it meets current minimum standards must have been eligible for funding under any of the federal aid funding categories. The eligibility criteria would apply to the work performed regardless of whether all state or local funds or federal aid funds were used.

Some types of eligible work not to be considered as rebuilt are listed:

- Safety feature replacement or upgrading (for example, bridge rail, approach guardrail, or impact attenuators).
- Painting of structural steel.
- Overlay of bridge deck as part of a larger highway surfacing project (for example, overlay carried across bridge deck for surface uniformity without additional bridge work).
- Utility work.
- Emergency repair to restore structural integrity to the previous status following an accident.

- Retrofitting to correct a deficiency which does not substantially alter physical geometry or increase the load-carrying capacity.
- Work performed to keep a bridge operational while plans for complete rehabilitation or replacement are under preparation (for example, adding a substructure element or extra girder).

Example	Code
Rebuild completed 1970	1970
Bridge has NOT been Rebuilt	0

structure_length
WB73-40
FHWA Item 49

Bridge Length *(Fatal)*

This is the measurement for the length of roadway supported by the bridge. This measurement is taken along the center of the roadway from the back of the backwall of each abutment or from the back of paving notch (seat) to paving notch (seat). Culvert lengths are measured along the centerline of the roadway from inside face to inside face of the exterior walls, or from spring line to spring line, regardless of depth below grade. When the culvert is not perpendicular to the roadway, the centerline length must be calculated. Code this measurement to the nearest foot.

The bridge length entered in this field is considered the length when determining eligibility for federal funding, except when the bridge length is near 20 feet. If that is the case, the length of the bridge as entered in NBIS Length will be used. See Figure WB73-40A and Figure WB73-40B.

nbi_length
WB73-46
FHWA Item 112

NBIS Length *(Fatal, If WB73-40 is between 20 and 23 feet)*

The NBIS bridge length is a measurement along the center of the roadway between undercopings of abutments, spring lines of arches, or the extreme ends of openings for multiple boxes.

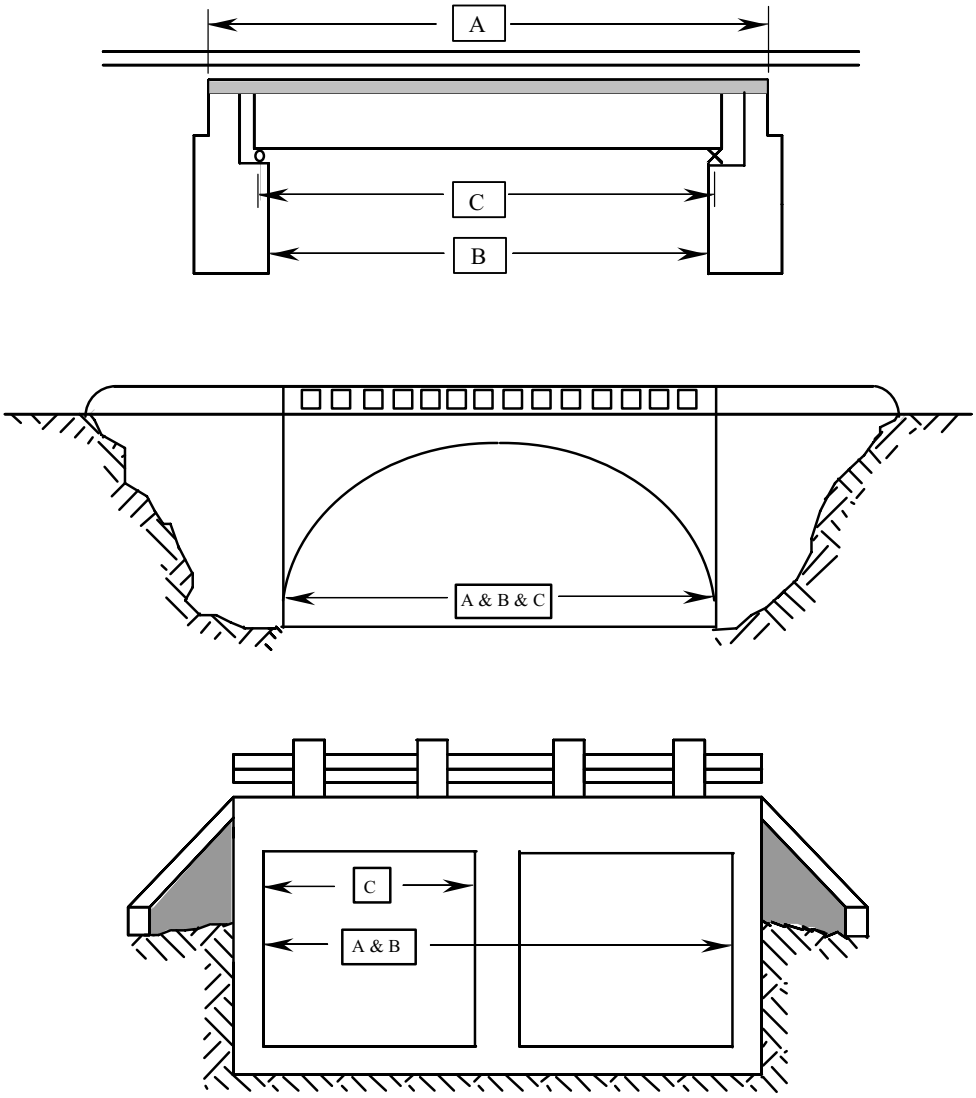
This measurement is coded to the nearest tenth of a foot and may be different from the measurement entered in Bridge Length.

If the measurement as entered in Bridge Length is between 20 and 23 feet, a measurement of the NBIS length shall be coded in this field.

If the measurement as entered in Structure Length is greater than 23 feet, this field shall be left blank. See Figure WB73-40A and Figure WB73-40B.

max_span_length **Maximum Span Length** *(Fatal)*
WB73-48
FHWA Item 048

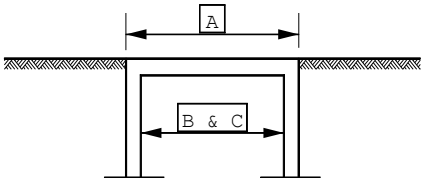
This is the number of feet which the bridge spans at its maximum opening. This length is measured along the centerline of the bridge. The span length is measured either as the center-to-center distance between bearings or the clear distance between piers, bents, or abutments. The preferred measurement to enter is the center-to-center distance between bearings. The span may be either a main span or approach span. See Figure WB73-40A and Figure WB73-40B.



A = Structure Length (WB73-40)
B = NBIS Length (WB 73-46)
C = Maximum Span Length (WB73-48)

For a culvert, it doesn't matter if the roadway is on the slab or on ballast, "A" will remain unchanged.

Figure WB73-40A



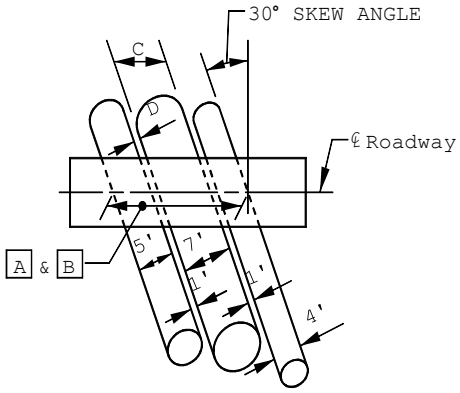
For a structure with ballast (where the ballast is > A/2) such that the live load is not transferred into the deck "A" will be inside the face of the exterior walls.

A = Structure length (WSBIS Item 340)

B = NBIS Length (WSBIS Item 346)

C = Maximum span length (WSBIS Item 348)

D = the distance between consecutive pipes, which must be = or < the diameter of the smallest pipe in the series



Opening Distance = 18' = 5'+1'+7'+1'+4'

A (normal to the pipes) = $\frac{18'}{\cos(30)} = \frac{18'}{.867} = 20.76'$ (Code 21')

C = $\frac{7}{\cos(30)} = 8.08'$ (code 8')

Figure WB73-40B

lane_on **Lanes On** *(Fatal)*
WB73-52
FHWA Item 028A

The number of lanes of motor vehicle traffic carried by the bridge must be entered in this field. It includes all traffic lanes which are striped or otherwise marked as full-width lanes for the entire length of the ridge.

Include any full-width merge lanes or ramp lanes carried on the bridge. The number of traffic lanes is independent of the direction in which these lanes carry traffic. That is, a one-lane bridge which carries traffic in two directions is considered to have only one lane on the bridge.

It should be noted here for purposes of the Deck Geometry Evaluation any one-way bridge (excluding ramps, WB74-34 coded 7) which has a curb-to-curb width 16 feet or greater shall be evaluated as two lanes. Also, If the curb-to-curb is less than 16 feet and the bridge carries two way traffic, then WB73-52 is coded Ø1 and WB74-90 is coded 5. For information to code a half bridge, see Figure WSBIS-1356b.

lane_under **Lanes Under** *(Fatal)*
WB73-54
FHWA Item 028B

This field contains the number of lanes of motor vehicle traffic carried by the highway or highways which pass underneath the bridge.

If the bridge carries highway traffic (WB74-32 is coded 1, regardless of ownership and/or maintenance responsibility), it is the total number of lanes of all inventory routes passing underneath.

If the route being inventoried is under the bridge (WB74-32 coded 2 or A-Z), this is the number of lanes of the inventoried route only.

There may be a separate record of some or all of the routes located under the bridge (see WB74-32 for routes requiring a record in the NBI).

curb_to_curb_width **Curb-to-Curb Width** *(Fatal)*
WB73-56
FHWA Item 051

The curb-to-curb width is the measurement, in feet, of the most restrictive width of the structure from curb-to-curb (or inside face of rail to inside face of rail if no curb). This is a Fatal Field.

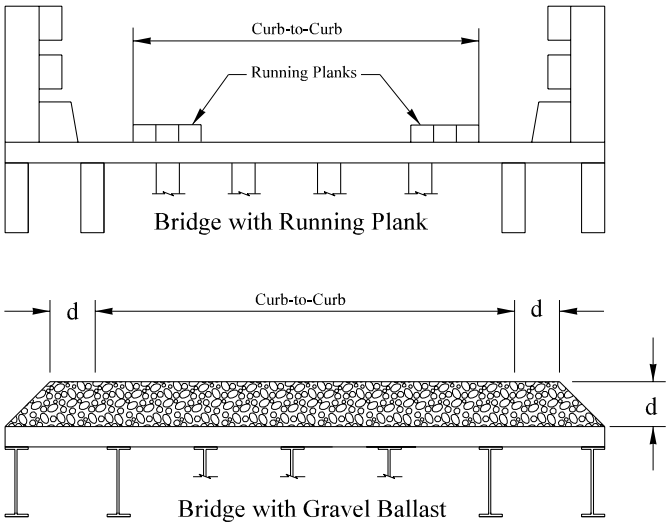
This measurement is recorded to the nearest tenth of a foot. For structures that carry lanes of traffic separated by a median barrier, the curb-to-curb width is the sum of the most restrictive minimum widths of each roadway carried on the structure. The widths of any open medians, raised or non-mountable medians, barrier-protected horse or bicycle lanes, or flared ramps should be excluded from this measurement.

When the roadway runs directly on the top slab or wearing surface of a culvert (such as a reinforced concrete box without fill), the actual roadway width from curb-to-curb or from rail-to-rail is entered in this field. This is also the case If the fill is minimal and the culvert headwalls reduce the roadway width. When there are no lateral restrictions such as curbs or rails the actual usable roadway width is recorded as the curb-to-curb measurement.

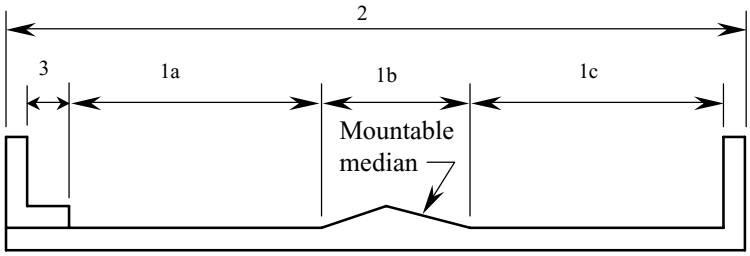
When the roadway is carried on sufficient fill covering a pipe or box culvert so that the load is not transferred into the structure, and when headwalls or parapets do not affect the flow of traffic, a value of Ø should be entered in this field. The filled section over the culvert simply maintains the roadway cross-section, the structure itself is considered to have no deck and thus no curb-to-curb width.

It should be noted, however, that for purposes of Sufficiency Rating calculations the program will default to a curb-to-curb width of 36´ for the S2, D, and E calculations.

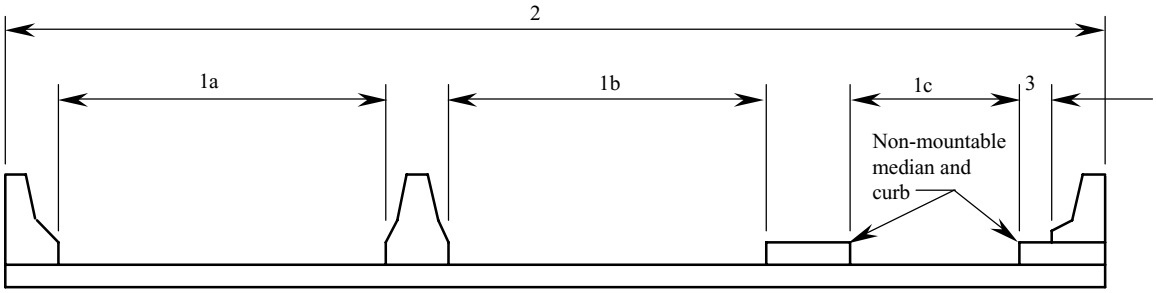
For the correct coding of a Side Hill Viaduct (Half Bridge), see Figure WSBIS-1356b.



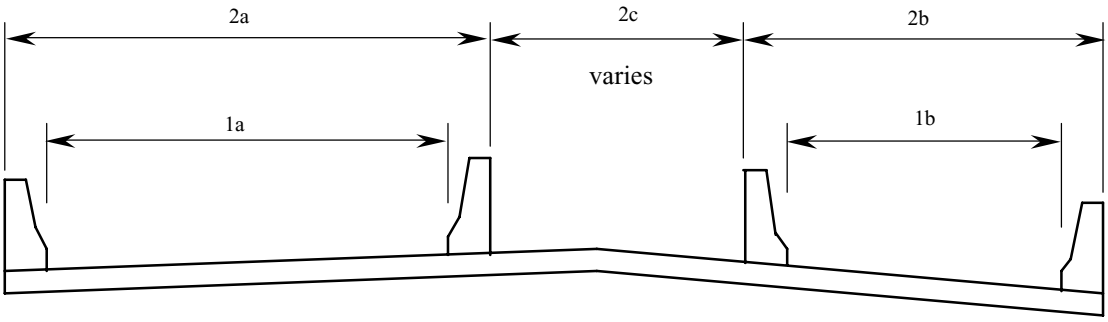
Curb-to-Curb Roadway Width
Figure WB73-56



1 = 1a + 1b + 1c



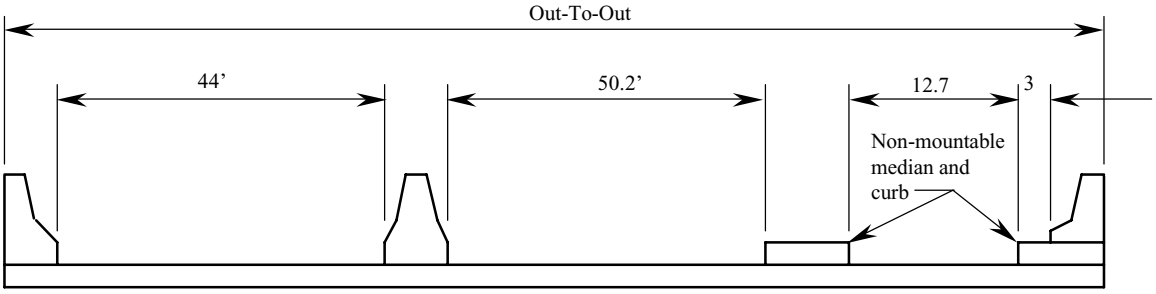
1 = 1a + 1b + 1c



1 = 1a + 1b

2 = 2a + 2b + 2c

WB73-56 (1) Bridge Roadway Width, Curb-to-Curb
WB73-60 (2) Deck Width, Out-to-Out
WB73-64 (3) Curb or Sidewalk Width



Curb-to-Curb Width = 44’+50.2’+12.7’ = 106.9’

Curb-to-Curb Roadway Width
Figure WB73-56

out_to_out_width **Out-to-Out Deck Width** *(Fatal)*
WB73-60
FHWA Item 052

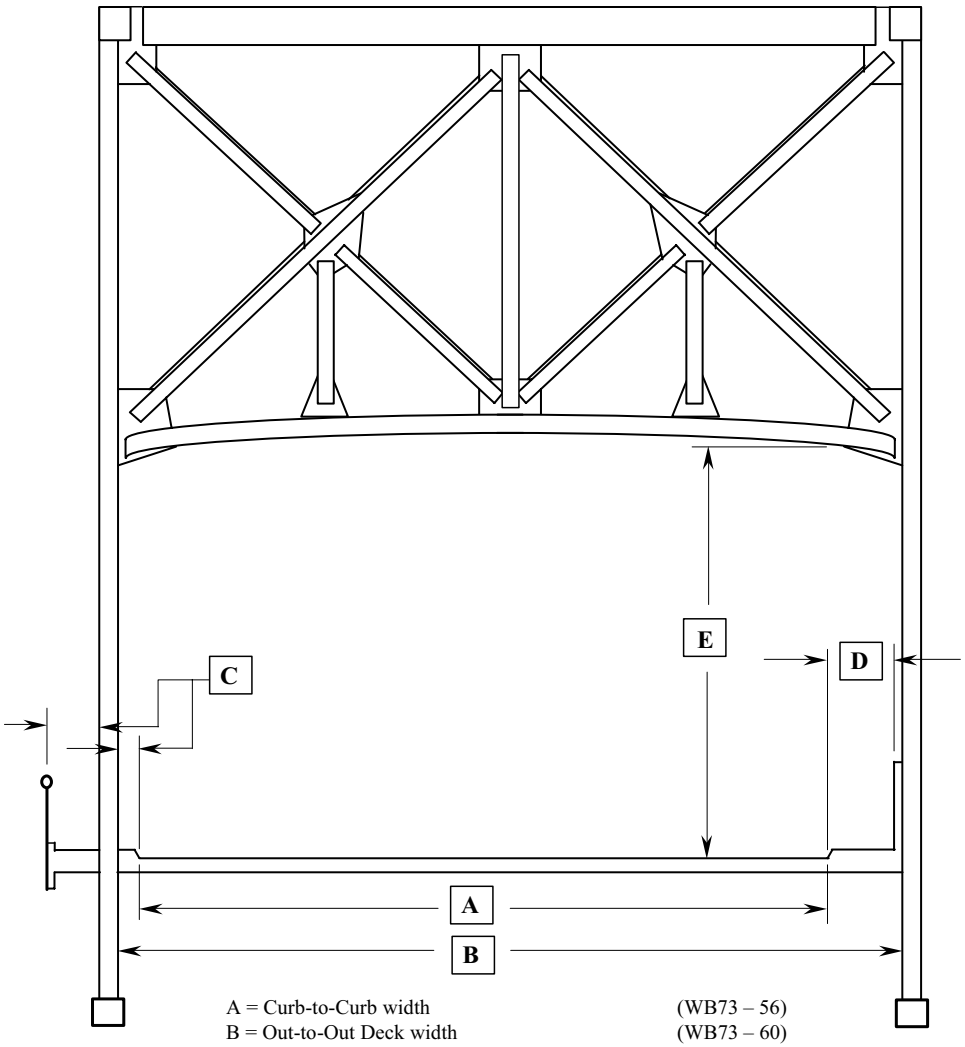
This field contains the measurement of the most representative out-to-out width on the bridge. This measurement should be taken normal to centerline from the outside edges of each side of the deck and coded to the nearest tenth of a foot. The widths of any open medians, or flared ramps should be excluded from this measurement. For through structures, the out-to-out width is a measurement of the lateral clearance between superstructure members. See Figures WB73-56 and WB73-60.

When the roadway runs directly on the culvert (as described in Curb-to-Curb Width), the width of the culvert itself, from outside edge to outside edge, should be entered in this field. When the roadway is carried on fill over a buried culvert (also described in Curb-to-Curb Width), a value of zero should be entered.

See Figure WSBIS-1356b for Side Hill Viaduct (Half Bridge) coding.

HORIZONTAL / VERTICAL MEASUREMENTS

(Looking Ahead on Mileposts)



A = Curb-to-Curb width (WB73 – 56)
B = Out-to-Out Deck width (WB73 – 60)
C = Sidewalks and Curb – Left (WB73 – 64)
D = Sidewalks and Curb – Right (WB73 – 67)
E = Minimum Vertical Clearance Over Bridge Deck (WB73 – 70)

Figure WB73-60

sdwk_curb_left **Sidewalk/Curb Width, Left** *(Required)*
WB73-64
FHWA Item 050A

The combined usable width of the left-hand sidewalk and curb on the bridge is entered in this field. The left-hand side of the bridge is determined by facing in the direction of increasing mileposts. If no mileposts are in use, left is determined by facing north or east. See Figure WB73-64.

This measurement is coded to the nearest tenth of a foot.

If the bridge has no functional sidewalks and/or curbs, code zeroes in this field. If the bridge has concrete barriers for rails and no sidewalks, also code zeroes.

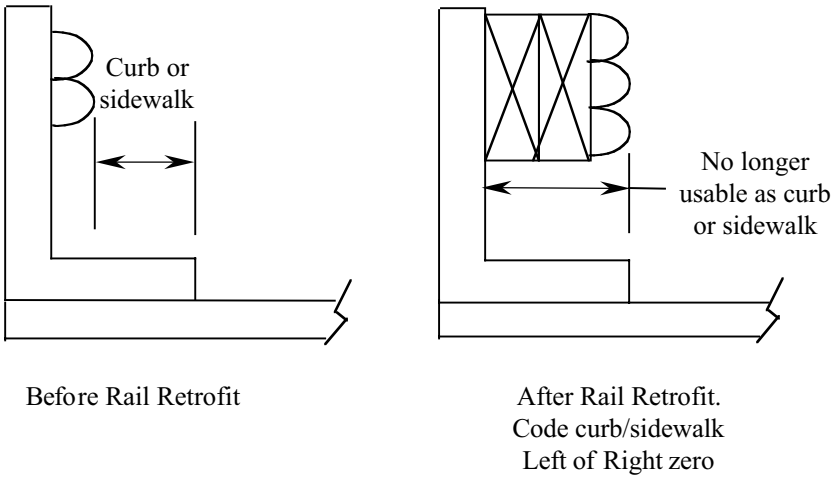


Figure WB73-64

sdwk_curb_right **Sidewalk/Curb Width, Right** *(Required)*
WB73-67
FHWA Item 050B

The combined usable width of the right-hand sidewalk and curb on the bridge is entered in this field. The right-hand side of the bridge is determined by facing in the direction of increasing mileposts. If no mileposts are in use, right is determined by facing north or east.

This measurement is coded to the nearest tenth of a foot.

If the bridge has no functional sidewalks and/or curbs, code zeroes in this field. If the bridge has concrete barriers for rails and no sidewalks, also code zeroes.

min_vert_deck **Minimum Vertical Clearance Over Deck** *(Required)*
WB73-70
FHWA Item 053

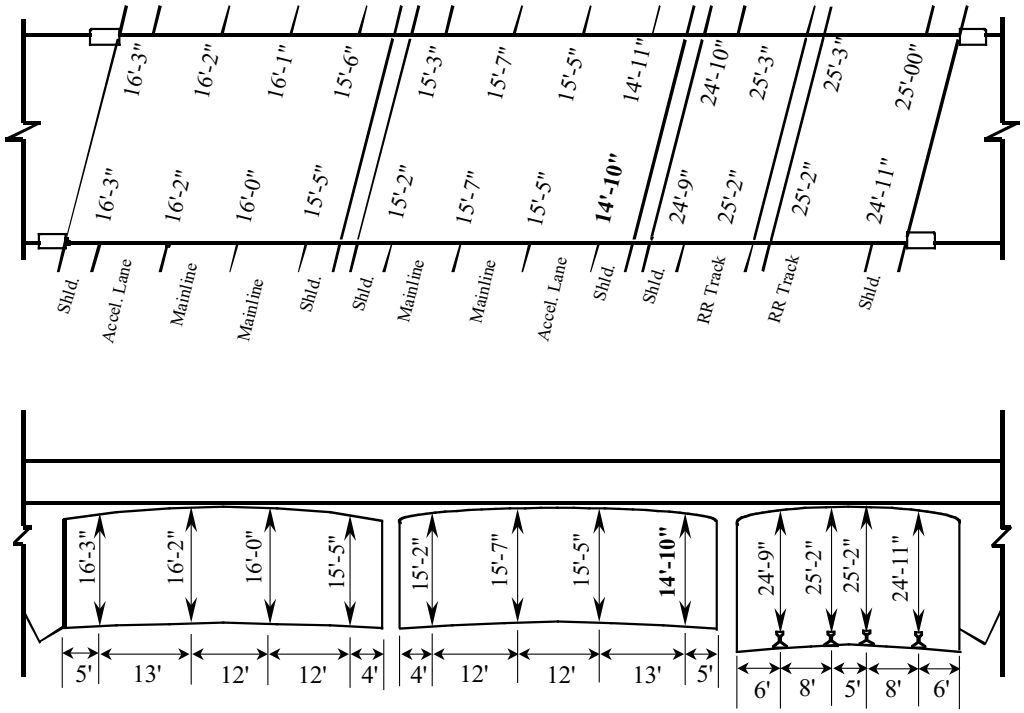
The minimum vertical clearance over the bridge deck is entered in this field. This measurement is coded to the nearest lesser inch and should be taken from the top of the traffic lane or shoulder to a point where the clearance is the most restrictive to include bridge mounted elements. The foot (′) and inch (″) symbols are already marked in the field. See Figure WB73-60.

If there is no restriction, code 9999 in this field. If the minimum restriction is a distance greater than 100 feet, code 9912.

min_vert_under **Minimum Vertical Clearance Under Bridge**
WB73-74 *(Required)*
FHWA Item 054B This field contains the minimum vertical clearance measured under the bridge. This is the minimum vertical clearance from the roadway (travel lanes only) or railroad track beneath the bridge to the underside of the superstructure. See Figure WB73-74.

The value is coded to the nearest lesser inch. The posted clearance is typically less than the measured value. The measured value should be reported in this field. WSDOT typically posts bridges with clearance less than 15′-3″.

If the bridge does not cross a highway or a railroad, zeroes should be entered. If the bridge crosses both a highway and a railroad, code the most critical dimension and note why it is the one recorded in the inspection report. See Figure WB73-78.



Code the most Restrictive Clearances:
WB73 – 74 would be coded **1410**
WB73 – 78 would be coded **H**

Figure WB73-74 and WB73-78

vert_under **Vertical Underclearance Code** *(Required)*
WB73-78
FHWA Item 054A

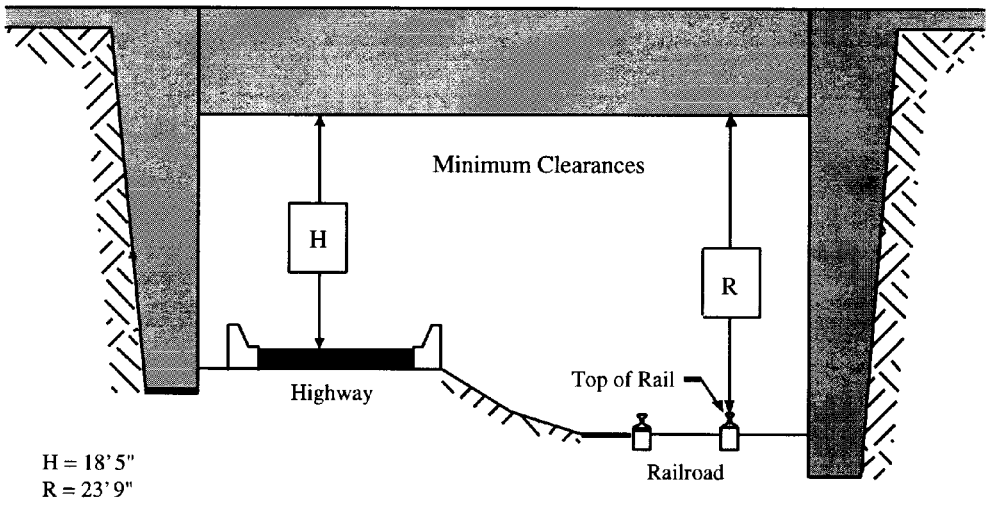
The code in this field identifies the feature from which the minimum vertical underclearance was taken. If the bridge does not cross a highway or a railroad, the letter "N" shall be entered. If the bridge crosses both a highway and a railroad, the measurement of the minimum vertical underclearance should be taken to the most critical feature. See Figure WB73-78.

H Highway
R Railroad
N Neither

From the WSDOT Design Manual 1120.03(5) revised December 1997, the minimum clearance over railroad is 22 feet 6 inches, and minimum clearance over a roadway is 14 feet 6 inches. Select the most restrictive measurement.

The current coding for WB73-74 and WB73-78 is as follows:

- If the bridge crosses neither a highway nor a railroad, code ØØØØN.
- If the bridge crosses a highway with a minimum vertical underclearance of 18 feet 5 inches, code 18Ø5H.
- If the bridge crosses a railroad with a minimum vertical underclearance of 23 feet 9 inches, code 23Ø9R.
- If the bridge crosses both a highway and a railroad, and the highway has a clearance greater than minimum design standards but the railroad is less than design standards, code the measurement to the railroad.



Vertical Clearances
Figure WB73-78

lateral_route_right **Minimum Lateral Underclearance Right** *(Required)*
WB73-79
FHWA Item 055B

Using a three-digit number and a one-digit code (WB73-82), record the minimum lateral underclearance on the right to the nearest tenth of a foot (with an assumed decimal point). When both a railroad and highway are under the bridge, code the most critical dimension. This measurement is determined while facing the direction the traffic flows.

The lateral clearance should be measured from the right edge of the roadway (excluding shoulders) or from the centerline (between rails) of the right hand track of a railroad to the nearest substructure unit (pier, abutment, etc.), to a rigid barrier (concrete bridge rail, etc.), or to the toe of a slope steeper than 3:1. The clearance measurements to be recorded will be the minimum after measuring the clearance in both directions of travel. In the case of a divided highway, this would mean the outside clearances of both roadways should be measured and the smaller distance recorded and coded (see Figures WB73-79 through WB73-83).

If two related features are below the bridge, measure both and record the lesser of the two. An explanation should be written on the inspection form as to what was recorded. When the clearance is 100 feet or greater, code 999.

If the feature beneath the bridge is not a railroad or highway, code ØØØN to indicate not applicable.

The presence of ramps and acceleration or turning lanes is not considered in this item; therefore, the minimum lateral clearance on the right should be measured from the right edge of the **through** roadway.

Examples	Code
Railroad 6.22 feet centerline to pier	062
Highway 6.16 feet edge of pavement to pier	062
Creek beneath bridge	000

lateral_route **Lateral Underclearance Code** *(Required)*
WB73-82
FHWA Item 055A

This code identifies the type of reference feature from which the minimum lateral underclearance measurement on the right was taken. See Figures WB73-79 through WB73-83.

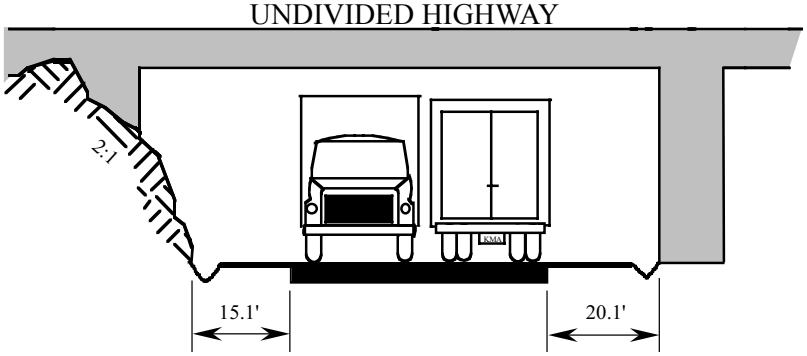
H Highway beneath bridge.
R Railroad beneath bridge.
N Feature beneath the bridge is neither a highway nor a railroad.

lateral_route_left **Minimum Lateral Underclearance Route Left**
WB73-83 *(Required)*
FHWA Item 056 Code only for divided highways, one way streets, and ramps. This is not applicable to railroads or two-way roads with closed medians. Using a three-digit number, record and code the minimum lateral underclearance on the left (median side for divided highways) to the nearest tenth of a foot (with an assumed decimal point). The lateral clearance should be measured from the left edge of the roadway (excluding shoulders) to the nearest substructure unit, to a rigid barrier, or to the toe of slope steeper than 1 to 3. Refer to Figures WB73-79 through WB73-83.

In the case of a divided highway, the median side clearances of both roadways should be measured and the smaller distance recorded and coded. If there is no obstruction in the **median area**, a notation of "open" should be recorded and 999 should be coded. For clearances greater than 100 feet, code 998. Code ØØØ to indicate not applicable.

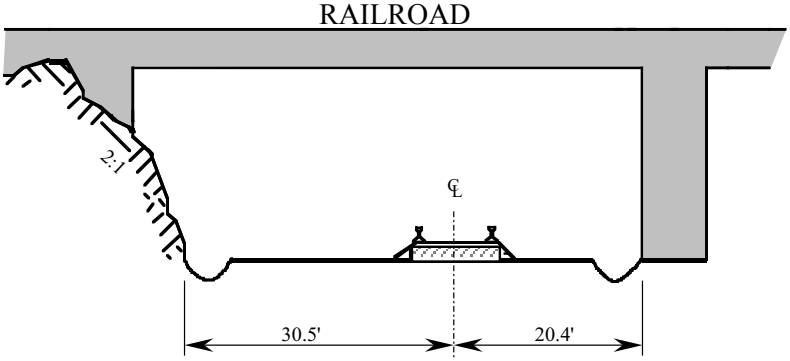
Code	Description
000	Not applicable.
998	Clearance equal to 99.8 feet or greater.
999	Divided highway with no obstructions.

UNDIVIDED HIGHWAY



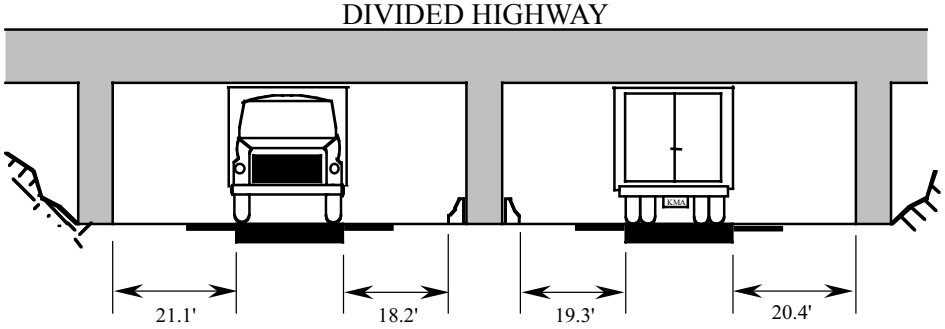
For Minimum Lateral Underclearance Right, Code 15.1H
For Minimum Lateral Underclearance Left, Code ØØØ

RAILROAD



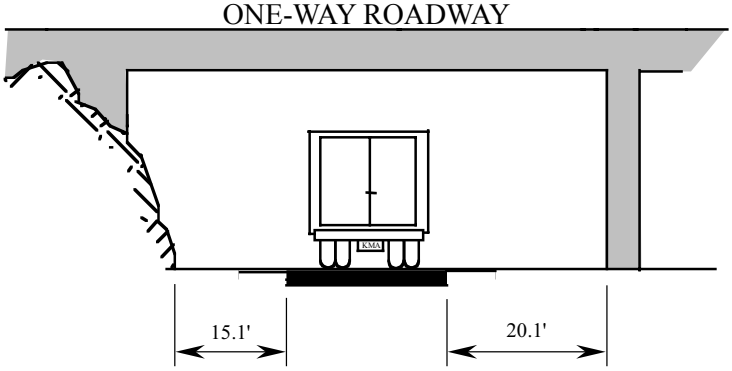
For Minimum Lateral Underclearance Right, Code 2Ø.4R
For Minimum Lateral Underclearance Left, Code ØØØ

DIVIDED HIGHWAY



For Minimum Lateral Underclearance Right, Code 2Ø.4H
For Minimum Lateral Underclearance Left, Code 18.2

ONE-WAY ROADWAY



For Minimum Lateral Underclearance Right, Code 2Ø.1H
For Minimum Lateral Underclearance Left, Code 15.1

Figures WB73-79 through WB73-83

nav_control_code **Navigation Control Code** *(Fatal)*
WB73-86
FHWA Item 038

This field indicates whether or not a navigation control (a bridge permit for navigation as issued by the United States Coast Guard) is required.

0 No navigation control on waterway (bridge permit does not exist).
1 Yes, navigation control on waterway (a bridge permit exists).
N Not applicable (bridge does not cross a waterway).

nav_vert_clrnc **Navigation Vertical Clearance** *(Required)*
WB73-87
FHWA Item 039

This field contains the minimum vertical clearance allowable for navigational purposes. If the Navigation Control code has been coded 1, this field will show the number of feet (to the nearest foot rounded down) of minimum vertical clearance imposed at the site. This is not a field measurement but is the number of feet as measured above a datum point specified on the navigation permit.

In the case of a swing or bascule bridge, the clearance should be measured with the bridge in the closed position. In the case of a vertical lift bridge, the clearance should be measured with the bridge in the raised or open position.

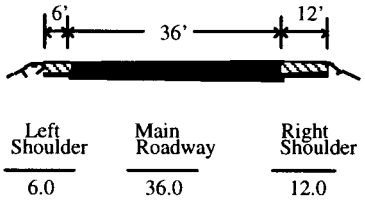
If the Navigation Control code has been coded Ø or N, enter zeros in this field to indicate there is no navigational clearance.

nav_horiz_clrnc **Navigation Horizontal Clearance** *(Required)*
WB73-90
FHWA Item 040

This field contains the minimum horizontal clearance allowable for navigational purposes. If the Navigation Control code has been coded 1, this field will show the number of feet (to the nearest foot rounded down) of minimum horizontal clearance between fenders (If any), or the minimum clear distance between piers or bents. This is the measurement shown on the navigation permit and may be less than the actual clearance distance measured on site.

If the Navigation Control code has been coded Ø or N, enter zeros in this field to indicate there is no navigational clearance.

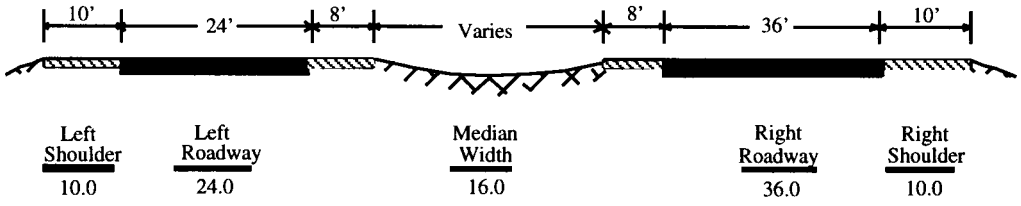
UNDIVIDED HIGHWAY
(as approach roadway)



If the approach roadway is an undivided highway, measure and code the full width of the roadway, including shoulders.

Code: Ø54

DIVIDED HIGHWAY
(as approach roadway)



If the approach roadway is part of a divided highway carried on parallel bridges, there will be two records. Code the width of the approach roadway for the appropriate bridge record.

Code: Ø42 - for left bridge
Code: Ø54 - for right bridge

If the approach roadway is part of a divided highway with a median (one structure record), measure and code the width of the left shoulder and roadway, the right shoulder and roadway, plus the average median width of the approach roadway.

Code: Ø96 (34' + 46' + 16')

Figure WB73-97

vert_lift_min_clrnc **Vertical Lift Minimum Navigation Clearance** *(Required)*

WB73-94

FHWA Item 116

For vertical lift bridges, this value indicates the minimum vertical clearance for navigational purposes when the bridge is in the closed position (that is, when the bridge allows vehicular traffic to cross).

If the Navigation Control code has been coded 1 and the bridge is a vertical lift bridge, this field will show the number of feet (to the nearest foot rounded down) of minimum vertical clearance imposed at the site. This is the number of feet as measured above a datum point specified on a navigation permit.

If the Navigation Control code has been coded 1, but the bridge is not a vertical lift bridge, leave the field blank.

aprch_width **Approach Roadway Width** *(Fatal)*

WB73-97

FHWA Item 032

This is the normal width to the nearest foot of the roadway approaching the bridge. This measurement should include the width of shoulders If the shoulders have been constructed so that they are maintained flush with the adjacent traffic lane and are structurally consistent with these traffic lanes.

This measurement should disregard localized widening. Grass or dirt adjacent to the traffic lanes but not within the maintained roadway should not be considered part of the approach roadway for this item.

For bridges with closed medians, the normal width of the median between the roadways approaching the bridge should not be included in this measurement. Where there is a variation between the approach widths at either end of the bridge, code the narrowest of the approach widths in this field. See Figure WB73-97.

nominal_skew_angle **Skew Angle** *(Fatal)*
WB73-100
FHWA Item 034

The skew angle is a measurement of the angle of intersection between the centerline of a pier and a line drawn perpendicular to the roadway centerline. This angle is coded to the nearest whole degree. See Figure WB73-100.

If the bridge is not skewed, enter 00 in this field. If the skew angle varies from pier to pier, enter the average skew angle, provided it is a representative figure. If it is not, code 99 in this field to indicate that a major variation exists in the skew angles measured from the separate piers supporting the bridge.

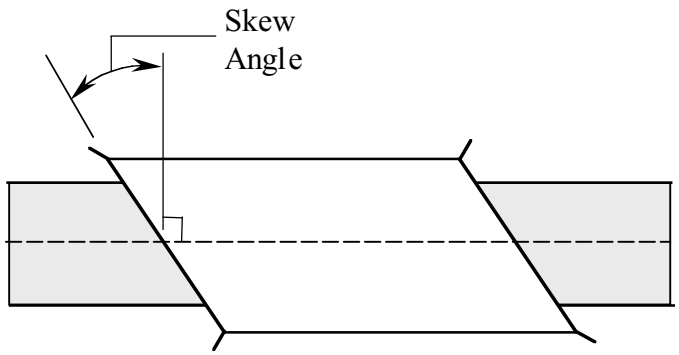


Figure WB73-100

flared_flag **Flared Flag** *(Fatal)*
WB73-102
FHWA Item 035

This code indicates whether or not the width of the bridge varies (or flares). Although there may be other causes, generally such variance is the result of ramps converging or diverging from the structure's through lanes. Minor widening at the four corners of the bridge (i.e., for aesthetic reasons) is not to be considered a flare.

N No, bridge does not flare.
Y Yes, bridge flares.

WB74

on_under_code **Inventory Route On/Under** *(Fatal)*

WB74-32

FHWA Item 005A

This field identifies whether the route being inventoried is carried on or is under the bridge. It cannot be overemphasized that all route-oriented data must agree in the coding as to whether the route being inventoried is "on" or "under" the bridge.

For all records, there are data elements related to the structure and data elements related to the inventory route. The data elements related to the structure (structure data) will not change whether you are coding for the route on the bridge or for the route under the bridge. However, the data elements related to the inventory route (crossing data) are related to the specific route being inventoried.

These two data element types are maintained in two separate tables in the database and are related to each other by the Structure Identifier and a Crossing Key. The Crossing Key is created from the owner code, route number, and mile post to create a unique addressing code for each crossing. Therefore, each bridge will have only one structure record but may have multiple crossing records.

In order for the computer to keep multiple crossings related to their structure elements, it uses a flag known as the Main listing and Secondary listing flag. All structure records are related to the Main listing. The first or only crossing record for a route is also related to the Main listing. The same is true for under routes where no "on" record is coded, such as a tunnel.

However, where a record for a route is coded "on" a bridge and another record(s) will be coded for a route(s) under the same bridge, there must be a Secondary listing(s) created. This Inventory Coding Form was not designed to report Secondary listings. Regardless of whether the code in this field is 1 or 2, this report always displays the Main listing information.

For Secondary listings, another form must be used. If your agency has a bridge over a federal aid route that fits into this category, contact the Bridge Engineer for Local Agencies for the proper procedures.

For entering the code in this field for the Main listing, use one of the following codes:

Code	Description
1	Route being inventoried is On the bridge.
2	Route being inventoried is Under the bridge. This would be the code for a single route under the bridge, for tunnels, pedestrian, and railroad undercrossings or even a building.
A-Z	Multiple routes go Under the bridge. The code A will be used for the most important of the multiple routes on separate roadways under the bridge. Z will be for the 26th route under the bridge. The level of importance is determined by STRAHNET designation and the highway class.

If the code entered here is 2 or A-Z, only the following fields need to be entered:

Field Name	WSBIS Code	FHWA No.
Location	WB71-56	009
Latitude	WB71-88	016
Longitude	WB71-96	017
Features Intersected	WB72-32	006A
Facilities Carried	WB72-56	007
FIPS Place Code	WB72-76	004
Toll	WB72-85	020
Parallel Structure	WB72-88	101
Temporary Structure	WB72-89	103
Critical	WB72-90	06B
Year Built	WB73-32	027
Bridge Length	WB73-40	049
NBIS Length	WB73-46	112
Maximum Span Length	WB73-48	048
Lanes On	WB73-52	028A
Lanes Under	WB73-54	028B
Min Vertical Clearance Under Bridge	WB73-74	054B
Vertical Underclearance Code	WB73-78	054B
Minimum Lateral Underclearance Right	WB73-79	055B
Lateral Underclearance Code	WB73-82	055A
Minimum Lateral Underclearance Route Left	WB73-83	056
On/Under	WB74-32	005A
Highway Class	WB74-33	005B
Service Level	WB74-34	005C
Route Number	WB74-35	005D
Mile Post	WB74-40	01}
ADT On Inventory Route	WB74-45	029
Truck ADT PCT	WB74-51	109
ADT Year	WB74-53	030
National Highway System	WB74-83	104
Base Highway Network	WB74-84	012
Strahnet	WB74-85	100
Fed Functional Class	WB74-87	026
National Truck Net	WB74-89	110
Lane Use Direction	WB74-90	102
Horizontal Clearance Route Dir	WB74-91	047
Horizontal Clearance Reverse Dir	WB74-95	047
Max Vertical Clearance Route Dir	WB74-99	110
Detour Length	WB74-103	119
Main Span Material	WB75-32	043A
Main Span Design	WB75-33	043B
Service On	WB75-44	042A
Service Under	WB75-45	042B

Tunnels shall be coded as an “under” record only; that is, they shall not be coded as a bridge carrying highway traffic.

hwy_class **Inventory Route Highway Class** *(Fatal)*
WB74-33
FHWA Item 005B

This code identifies what type of highway the inventoried route is on using the following:

1 Interstate highway
2 U.S. numbered highway
3 State highway
4 County road
5 City street
6 Federal lands road
7 State lands road
8 Other (include toll roads not otherwise identified.)

When two or more routes are concurrent, the highest class of route will be used. The hierarchy is in the order listed above.

serv_level_ **Inventory Route Service Level** *(Fatal)*
WB74-34
FHWA Item 005C

This code describes the designated level of service provided by the inventoried route:

1 Mainline (most local agency bridges)
2 Alternate
3 Bypass
4 Spur
6 Business
7 Ramp or "Y"
8 Service and/or unclassified Frontage Road
Ø None of the above

route **Route** *(Fatal)*
WB74-35
FHWA Item 005D

The number of the inventory route on (or under) the bridge must be entered in this field. County agencies should enter the County Road Log Number as the inventory route number. City agencies should enter a route number If one has been assigned. If not, the city can enter any unique number in this field; however, rather than arbitrarily assigning a random number, it is recommended that city agencies enter their city number code. This will ensure that two cities within the same county will not enter an identical route number.

Example:

If the bridge is located on highway 14, code **00014**.
If the bridge is located in Sprague, code **01225**.

traffic_flow
WB74-40
FHWA Item 01

Milepost *(Fatal)*

The Linear Referencing System (LRS) milepost is used to establish the location of the bridge on the Base Highway Network (see WB74-84). It must be from the same LRS Inventory Route and milepost system as reported in the Highway Performance Monitoring System (HPMS). The milepost coded in this item directly relates to WB74-67 and WB74-77, the LRS Inventory Route, and Subroute Number.

This item must be coded for all bridges reportable to the NBI. Code a five-digit number to represent the milepost distance in miles to the nearest hundredth (with an assumed decimal point). For bridges carrying the Inventory Route, code the milepost at the beginning of the bridge (i.e., the lowest milepost on the bridge). When the Inventory Route goes under the bridge (WB74-32 coded 2 or A-Z), then code the milepost on the underpassing route where the bridge is first encountered.

For records where mileposts are not provided, use a logical referencing system. Mileposts of zero are undesirable. Mileposts may be coded for bridges that are not located on the Base Highway Network; however, WB74-84, Base Highway Network shall be coded 0 for these records.

The milepost is coded aligned to the assumed decimal point and zero filled where needed to fill the five digits.

Examples	Code
milepost is 130.34	13034
milepost is 9.60	00960

adt
WB74-45
FHWA Item 029

ADT on the Inventory Route *(Required)*

This is the Average Daily Traffic (ADT) volume carried on the route being inventoried. If bridges on a divided highway are coded as parallel, then the ADT is the volume carried on the individual bridge, not the cumulative volume carried on the route. The determined ADT volume must be **no more than four (4) years old**. Add leading zeros to fill all spaces in the field.

adt_truck_pct
WB74-51
FHWA Item 109

Truck ADT Percentage *(Required)*

This is the percentage of the ADT volume that is truck traffic. It does not include vans, pickups, or other light delivery trucks. Code to the nearest whole percent.

adt_year
WB74-53
FHWA Item 030

ADT Year *(Required)*

This is the year in which the estimate of the ADT volume was determined. If the year entered in this field is more than four years in the past, a new ADT volume must be determined and entered in the **ADT (WB74-45)** and the year the ADT was determined in this field.

future_adt **Future ADT** *(Required)*
WB74-57
FHWA Item 114

This is the ADT volume that the inventory route is expected to carry 20 years in the future. This field may be updated whenever a new projection is made. The field must be updated any time the projected date of this forecast is less than 17 years, but not more than 22 years from the current year.

This volume is intended to provide a basis for forecasting future construction needs.

future_adt_year **Future ADT Year** *(Required)*
WB74-63
FHWA Item 115

This is the year for which WB74-57 has been projected.

This date must be at least 17, but no more than 22 years from the current year. If the date in this field is outside these limits, then a new value will be required for WB74-57 and a new year will need to be entered in this field.

lrs_route **Linear Referencing System Route** *(Required)*
WB74-67
FHWA Item 013A

If WB74-84, Base Highway Network, has been or is to be coded Ø, then this field should be left blank.

The LRS inventory route and subroute numbers are a 12-digit code composed of two segments. These items must correspond to the LRS inventory route and subroute numbers reported by Washington State for the Highway Performance Monitoring System (HPMS).

If WB74-84, Base Highway Network, has been coded 1, the LRS inventory route number is ten digits, right justified, and zero filled. The code can be alphanumeric but cannot contain blanks. The LRS inventory route number is not necessarily the same as the route number posted along the roadway, but is a number used to uniquely identify a route within at least a county and perhaps throughout the state.

George will identify where this can be located.

Example 1: WB74-84 has been coded zero, structure carries route 99
WB74-67 LRS code will be: blank

Example 2: WB74-84 has been coded one, structure carries route 99
WB74-67 LRS code will be: 0000000099

lrs_sub_route **LRS Sub Route** *(Required)*
WB74-77
FHWA Item 013B

If WB74-84, Base Highway Network, has been or is to be coded 0, then this two-digit field should be left blank.

This is the second segment of the LRS inventory route number. It is a number that uniquely identifies portions of an inventory route sections where duplicate mileposts occur or where a route passes through another agencies jurisdiction. If there is no sub route number, code 00 in this segment.

fed_aid_route **Federal Aid Route Number** *(Required)*
WB74-79
If the route being inventoried is a federal aid highway, enter its federal aid route number in this field.

Federal Aid Route Numbers are shown on the Statewide National Functional Classification System Maps. These maps are located at local agency planning departments or at WSDOT Service Center Planning.

If the bridge is not on a federal aid highway, the field should be filled with zeros.

fed_hwy_system_ **National Highway System** *(Required)*
WB74-83
FHWA Item 104
This item shall be coded for all records in the inventory. For the inventory route identified in WB74-35, indicate whether the inventory route is on the NHS or not on that system. This code shall reflect an inventory route on the NHS as described in the TRANSPORTATION EQUITY ACT FOR THE 21ST CENTURY (TEA21). State of Washington National Highway System Maps are located at local agency planning departments or at WSDOT Planning.

If more than one federal aid highway is carried on or under the bridge, indicate only the classification of the more primary route.

0 Inventory Route is not on the NHS.
1 Inventory Route is on the NHS.

base_hwy_net **Base Highway Network** *(Fatal)*
WB74-84
FHWA Item 012
This item shall be coded for all records in the inventory, both on and under records.

For the inventory route identified in WB74-35 (Route), indicate whether or not the inventory route is a part of the Base Highway Network.

The Base Highway Network includes the through lane (mainline) portions of the NHS system, rural and urban principal arterials, and rural minor arterials. Ramps, frontage roads, and other roadways are not included in the Base Highway Network. If WB74-87 (Federal Function Class) is coded one of the following: 01, 02, 06, 11, 12, 14, this field should be coded 1.

0 Inventory route is not on the Base Highway Network.
1 Inventory route is on the Base Highway Network.

strahnet_hwy **STRAHNET Highway** *(Required)*
WB74-85
FHWA Item 100

This item shall be coded for all records in the inventory.

For identification of STRAHNET routes, see the State of Washington National Highway System map. State of Washington Highway System maps are located at local agency planning departments or at WSDOT Service Center Planning.

For the inventory route identified in WB74-35, indicate STRAHNET highway status using one of the following codes:

0 The inventory route is not a STRAHNET highway.
1 The inventory route is an Interstate STRAHNET highway.
2 The inventory route is a non-Interstate STRAHNET highway.
3 The inventory route connects with a Department of Defense facility.

fed_lands_hwy_ **Federal Lands Highway** *(Required)*
WB74-86
FHWA Item 105

This code identifies bridges on roads which lead to and traverse through federal lands. These bridges may be eligible to receive funding from the Federal Lands Highway Program.

Washington State Forest Highways maps can be found in the Emergency Relief chapter of the *Local Agencies Guidelines* (LAG) manual.

As of January 1, 2000, there are three Land Management Systems. There are two in Douglas County and one in Lincoln County.

Use one of the following codes:

0 Not Applicable
1 Indian Reservation Road (IRR)
2 Forest Highway (FH)
3 Land Management Highway System (LMHS)
4 Both IRR and FH
5 Both IRR and LMHS
6 Both FH and LMHS
9 Combined IRR, FH, and LMHS

For definition of IRR (Indian Reservation Roads), see Title 23 USC Chapter 1, Part 973

fed_functional_class **Federal Functional Class** *(Required)*
WB74-87

FHWA Item 026

This code describes the Federal Functional classification of the inventory route as classified according to Statewide National Functional Classification System maps. Statewide National Functional Classification System maps are located at local agency planning departments or online at www.wsdot.wa.gov/mapsdata/travel/hpms/functionalclass.htm.

Separate codes are used to distinguish roadways located in rural or in urban areas. Routes shall be coded rural If they are not inside a designated urban area, Codes 08, 09, and 19 are for roads off the Federal Aid System. See WB74-79, Federal Aid Route Number to reference whether the bridge is on or off the Federal Aid Route system.

Rural Codes	Urban Codes
01 Principal Arterial-Interstate	11 Principal Arterial-Interstate
02 Principal Arterial-Other	12 Principal Arterial-Other Freeway or Expressway
06 Minor Arterial	14 Other Principal Arterial
07 Major Collector (Federal Aid Secondary)	16 Minor Arterial
08 Minor Collector	17 Collector
09 Local	19 Local

nat_truck_ntwrk_ **National Truck Network** *(Required)*
WB74-89

FHWA Item 110

A one letter code is entered in this field to indicate whether the inventory route carried on or under the bridge is part of the National Network for Trucks. This network includes the Interstate System and the Federal Aid Primary System. Routes considered to be a part of the Federal Aid Primary System are "rural arterials and their extensions into or through urban areas in existence on June 1, 1991" (as identified in the Code of Federal Regulations (23 CFR 658)). Roadways on this network are available for use by commercial motor vehicles of the dimensions and configurations described in the Code of Federal Regulations.

Y Inventory route is part of the National Truck Network.
N Inventory route is not part of the National Truck Network.

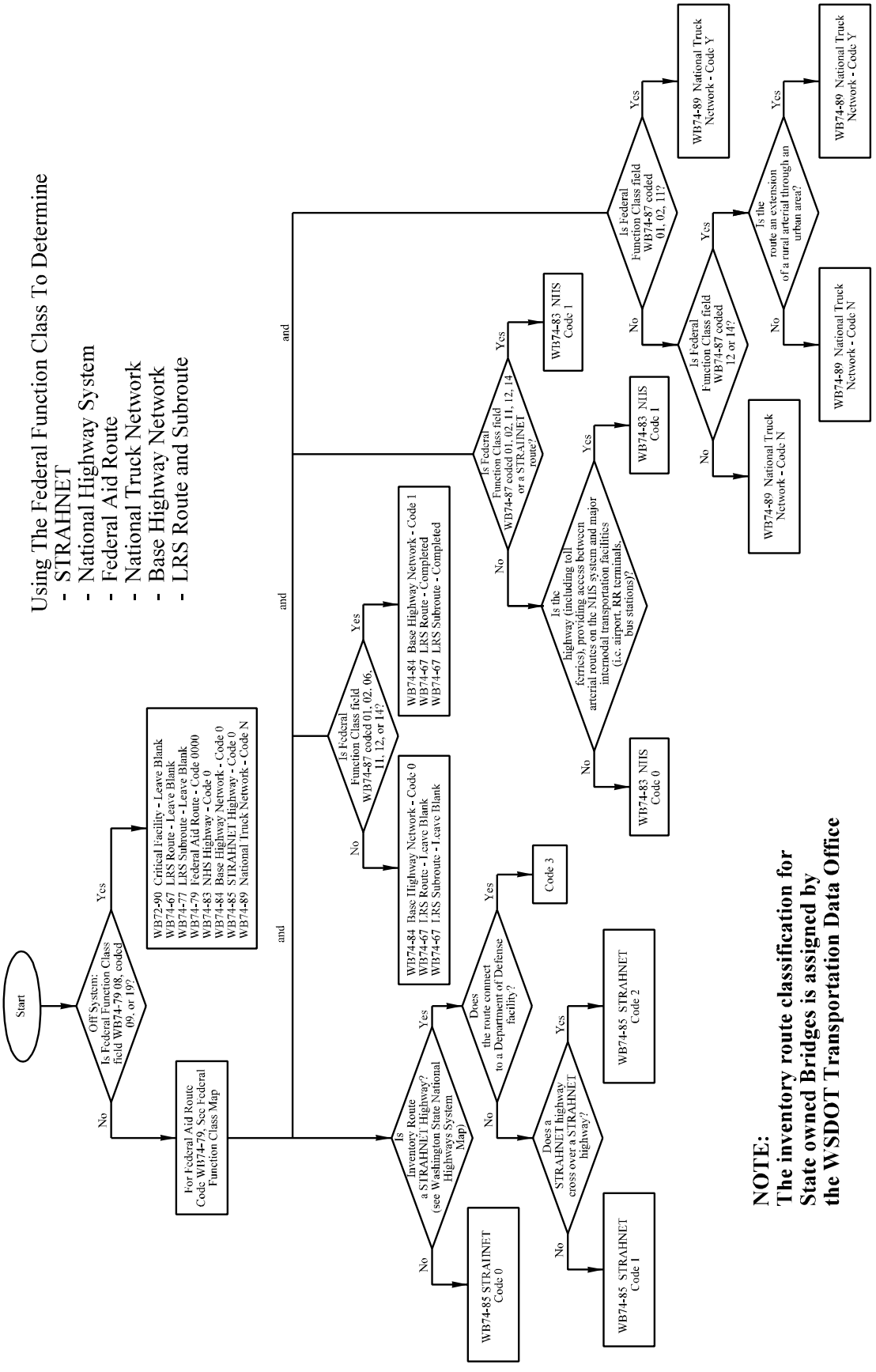


Figure WB74-67 through 89

lane_direction_ **Lane Use Direction** *(Required)*
WB74-90
FHWA Item 102

Code the direction of traffic on the inventory route identified in WB74-35 as a one-digit number using one of the codes below. This item must be compatible with other traffic-related items such as WB73-52, WB73-56, WB74-45, and WB74-91.

0 No highway traffic carried.
1 One-way traffic carried.
2 Two-way traffic carried.
3 Two-way and reversible traffic carried.
4 Reversible traffic only carried.
5 Two-way traffic carried on one-lane bridge (curb-to-curb distance must be < 16´).

horiz_clrnc_route **Horizontal Clearance, Route Direction** *(Required)*
WB74-91
FHWA Item 047

This clearance is the maximum horizontal distance available for wide loads moving across (or under) the bridge or culvert. This measurement shall be coded in feet and inches. See Figure WB74-91.

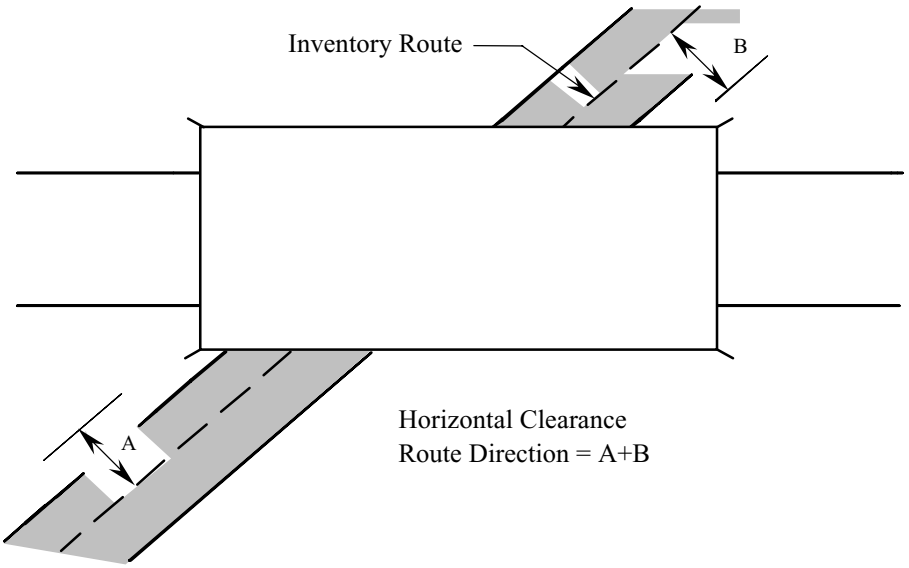
For undivided highways (or one-way ramps or streets), the measurement of horizontal clearance is taken from one side of the roadway to the other.

The measurement of horizontal clearance for divided highways is taken only for one side of the roadway, which carries traffic in the direction of increasing mileposts or, in the absence of mileposts, toward the east or north. The measurement of horizontal clearance for the lanes carrying traffic in the opposite direction, called the Reverse Direction, is entered in WB74-95 (Horizontal Clearance Reverse Direction).

If the inventory route is carried on the bridge, measure and code the smallest distance between the inside faces of the bridge rail, nonmountable curbs, or the truss members.

If the inventory route is carried under the bridge, measure and code the smallest distance between a substructure element and the median barrier. (If the horizontal clearance is restricted by an embankment, measure to the toe of the slope.)

UNDIVIDED HIGWAY



DIVIDED HIGHWAY

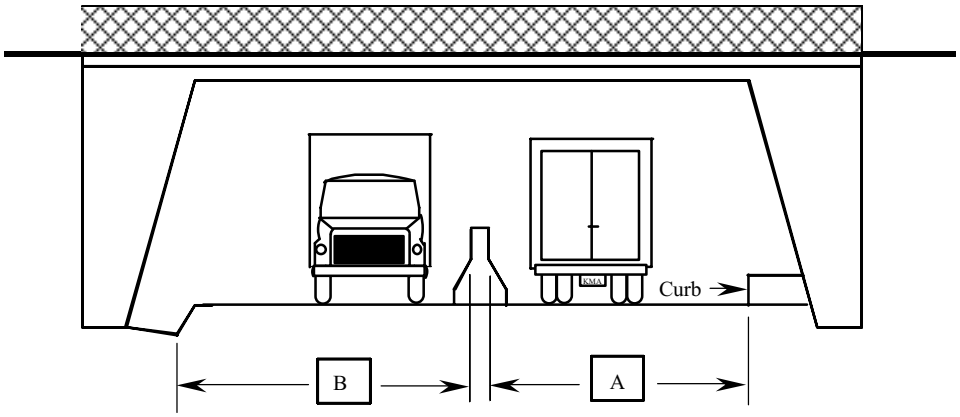


Figure WB74-91 through WB74-95

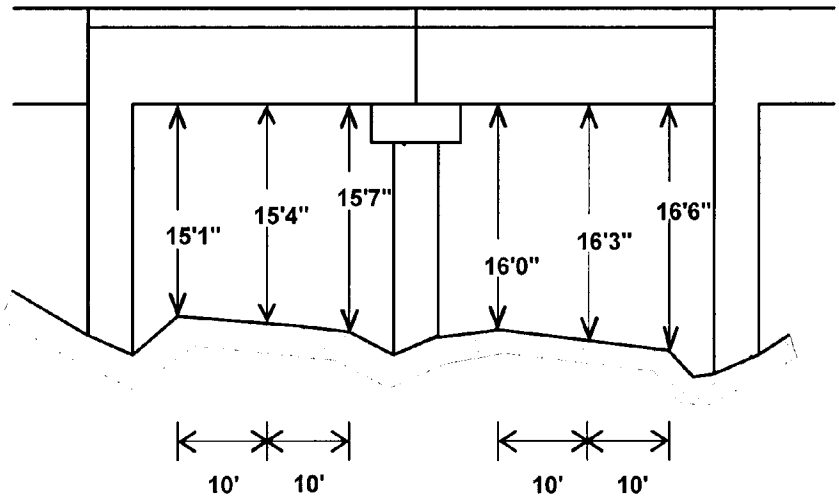
horiz_clrnc_rvrs **Horizontal Clearance, Reverse Direction** *(Required)*
WB74-95
FHWA Item 047

This is the minimum horizontal clearance for that side of the divided roadway which carries traffic in the direction of decreasing mileposts, or, in the absence of mileposts, to the south or west (see Figure WB74-91). This is called the reverse direction. The measurement shall be coded in feet and inches.

If the inventory route is not a divided highway, leave this field blank.

vert_clrnc_route_max **Maximum Vertical Clearance Route Direction**
WB74-99
FHWA Item 010

A value must be entered in this field to indicate If any height restrictions (imposed by a structural member such as sway bracing on trusses, a bridge passing over this route, the mouth of a tunnel) apply to loads carried **on the inventory** route. This measurement is coded in feet and inches. If the inventory route is carried **on or under the bridge**, code the vertical clearance for the 10-foot width of the traveled part of the roadway which will allow passage of the highest vehicle without striking the bridge. The maximum vertical height allowed in any 10 foot roadway width is the least vertical clearance in the 10 foot width of the roadway with the maximum vertical clearance. If there is no vertical restriction leave the field blank (see Figure WB74-99).



Code "1603": The maximum vertical height allowed in any 10 foot roadway width is the least vertical clearance in the 10 foot width of roadway with the maximum vertical clearance.

Figure WB74-99

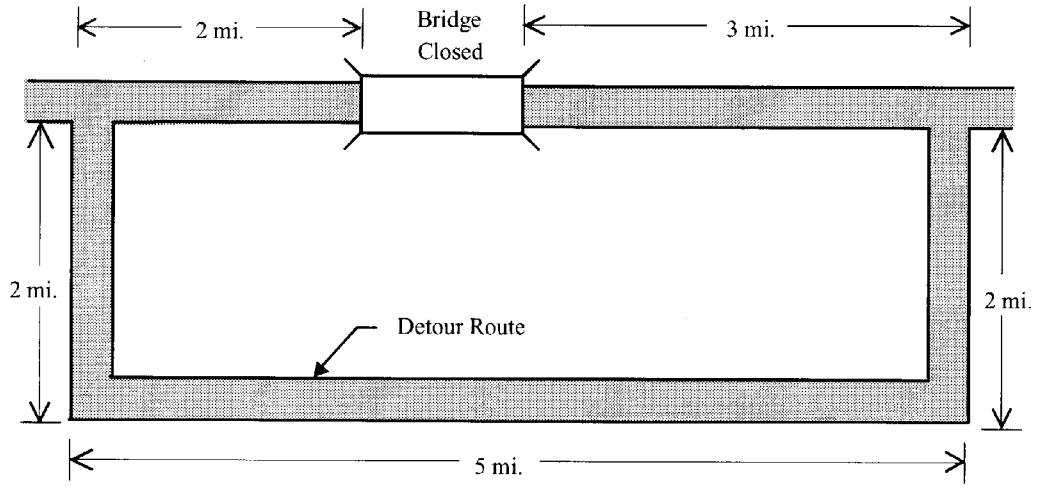
detour_length **Detour Length** *(Fatal)*
WB74-103
FHWA Item 019

The detour length is the distance a vehicle, when starting at one end of the bridge, must travel along the shortest alternate route to reach the opposite end of the bridge. The total detour length is coded to the nearest mile. To be an acceptable detour, an alternate route must be a public road and must be able to provide a similar level of load-carrying capacity as the inventory route (see Figure WB74-103).

If the bridge is at an interchange and a ground-level bypass or the other side of a parallel bridge can be used as the detour route, code Ø in this field.

If the bridge is not at an interchange and a ground level bypass or parallel bridge can be used as a detour route, code Ø1.

If the bridge is on a dead-end road where there is no alternate route, or if the distance that must be traveled is greater than 98 miles, code 99 in the field.



Detour Length = 2 + 2 + 5 + 2 + 3 = 14 miles

Figure WB74-103

WB75

fed_main_material_ **Main Span Material** *(Required)*
WB75-32
FHWA Item 043A

This code describes the kind of material and /or design used in the bridge's main span.

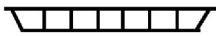
When coding this field, indicate the composition of the superstructure's main load carrying member. That is, if the bridge has a concrete deck carried on timber stringers, code 7 (for timber). Or, if the bridge has a concrete deck carried on steel beams, code 3 (for steel).

1 Concrete
2 Concrete continuous
3 Steel
4 Steel continuous
5 Prestressed concrete
6 Prestressed concrete continuous
7 Timber
8 Masonry
9 Aluminum, wrought iron, cast iron
0 Other

Both pre-tensioned concrete and post-tensioned concrete are considered prestressed concrete.

fed_main_design_ **Main Span Design** *(Required)*
WB75-33
FHWA Item 043B

This code describes the predominant type of design and/or type of construction used in the bridge's main span. This is a Fatal Field for WSDOT only.

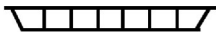
01 Slab
02 Stringer/multi-beam or girder
03 Girder and floorbeam system
04 Tee beam
05 Box beam/box girder-multiple 
06 Box beam/box girder-single or spread 
07 Rigid frame
08 Orthotropic
09 Truss-deck
10 Truss – through (Includes Pony Truss)
11 Arch-deck
12 Arch – through (With or without overhead lateral bracing)
13 Suspension
14 Stayed girder
15 Movable-lift
16 Movable-bascule
17 Movable-swing
18 Tunnel
19 Culvert
21 Segmental box girder
22 Channel beam (bathtub unit)
00 Other

fed_aprch_material_ Approach Span Material *(Required)*
WB75-35
FHWA Item 044A This code identifies the kind of material used in the bridge's approach spans.

1 Concrete
2 Concrete continuous
3 Steel
4 Steel continuous
5 Prestressed concrete
6 Prestressed concrete continuous
7 Timber
8 Masonry
9 Aluminum, wrought iron, cast iron
0 Other or Not Applicable

When coding this field, indicate the composition of the superstructure's main load carrying member. That is, If the bridge has a concrete deck carried on timber stringers, code 7 (for timber). Or, if the bridge has a concrete deck carried on steel beams, code 3 (for steel).

fed_aprch_design_ Approach Span Design *(Required)*
WB75-36
FHWA Item 044B This code identifies the predominant type of design and/or type of construction used in the bridge's approach spans. BMS element descriptions may differ from the following approach span design types.

01 Slab
02 Stringer/multi-beam or girder
03 Girder and floorbeam system
04 Tee beam
05 Box beam/box girder-multiple 
06 Box beam/box girder-single or spread 
07 Rigid frame
08 Orthotropic
09 Truss-deck
10 Truss-through
11 Arch-deck
12 Arch-through
13 Suspension
14 Stayed girder
15 Movable-lift
16 Movable-bascule
17 Movable-swing
18 Tunnel
19 Culvert
20 Mixed types
21 Segmental box girder
22 Channel beam (bathtub unit)
00 Other or Not Applicable

main_span_qty **Number of Main Spans** *(Required)*
WB75-38
FHWA Item 045

This is the number of spans in the main or major unit of the bridge. A bridge will contain at least one span. Most bridges will contain a main unit with no approach spans. In such cases, code the number of spans in this field and enter zero in WB75-41. If the bridge contains a main section and approach sections, code the number of spans in the main section only in this field, and code the number of spans in the approach section(s) in WB75-41.

aprch_span_qty **Number of Approach Spans** *(Required)*
WB75-41
FHWA Item 046

This is the number of spans in the approach(es) to the main section of the bridge.

If the bridge has no approach spans, enter zero.

serv_on_code **Service On** *(Fatal)*
WB75-44
FHWA Item 042A

This field describes the type of service carried on the bridge.

1 Highway
2 Railroad
3 Pedestrian exclusively
4 Highway and railroad
5 Highway and pedestrian
6 Overpass bridge at an interchange or second level of a multilevel interchange
7 Third level of a multilevel interchange
8 Fourth level of a multilevel interchange
9 Building or plaza
0 Other

serv_under_code **Service Under** *(Required)*
WB75-45
FHWA Item 042B

This field describes the type of service under the bridge.

1 Highway, with or without pedestrian traffic
2 Railroad
3 Pedestrians exclusively
4 Highway and railroad
5 Waterway
6 Highway and waterway
7 Railroad and waterway
8 Highway, waterway, and railroad
9 Relief for waterway
0 Other

fed_deck_type **Deck Type** *(Required)*
WB75-46
FHWA Item 107

This is the federal code for the type of deck system on the bridge.

If the deck is composed of more than one type of material, indicate what type of material is the most predominant.

If the bridge is a culvert and the roadway is carried on fill, code N to indicate that the deck type is not applicable. WB75-47, Wearing Surface, WB75-48, Membrane, and WB75-49, Deck Protection will also be coded N in this case.

1	Concrete cast-in-place
2	Concrete precast panels
3	Steel grating-open
4	Steel grating-filled with concrete
5	Steel plate (including orthotropic)
6	Corrugated steel
7	Aluminum
8	Treated timber
9	Untreated timber
Ø	Other
A	Filled arches
B	Precast integral with beam
N	Not applicable (bridge has no deck)

fed_wear_surf **Wearing Surface** *(Required)*
WB75-47
FHWA Item 108A

This is the federal code for the type of wearing surface on the bridge deck.

1	Concrete (also monolithic decks)
2	Integral concrete (non-modified concrete layer added)
3	Latex modified or other modified concrete
4	Low slump concrete
5	Protective overlays (epoxy, methyl methacrylate, polyester)
6	Bituminous (i.e., ACP or BST)
7	Timber
8	Gravel (ballast)
9	Other
Ø	None (traffic does not ride on wearing surface)
N	Not applicable (bridge has no deck)

fed_membrane **Membrane** *(Required)*
WB75-48
FHWA Item 108B

This is the federal code for the type of deck membrane used on the bridge.

1	Built-up (roofing tar or liquid asphalt)
2	Preformed fabric
3	Epoxy
8	Unknown
9	Other
Ø	None
N	Not applicable (bridge has no deck)

fed_deck_prot **Deck Protection** *(Required)*
WB75-49
FHWA Item 108C

This is the federal code for the type of deck-protective system on the bridge.

1	Epoxy coated reinforcing
2	Galvanized reinforcing
3	Other coated reinforcing bar
4	Cathodic protection
6	Polymer impregnated
7	Internally sealed
8	Unknown
9	Other
Ø	None
N	Not applicable (bridge has no deck)

design_load_ **Design Load** *(Required)*
WB75-50
FHWA Item 031

This code expresses the type and amount of live load the bridge has been designed to carry. Classify any other loading, when feasible, using the nearest equivalent valid code.

1	H 10
2	H 15
3	HS 15
4	H 20
5	HS 20
6	HS 20 + Military Mod
7	Pedestrian
8	Railroad
9	HS 25 or Greater
0	Unknown
A	HL-93
B	Greater than HL-93
C	Other

oper_rtng_meth **Operating Rating Method** *(Required)*
WB75-51
FHWA Item 063

Code this field with one of the following codes to indicate which load rating method was used to determine the Operating Rating for this bridge. FHWA has chosen the Load Factor Method as the standard for computing Operating and Inventory ratings reported to the NBI. For proper coding, see load rating section of Chapter 5.

F	Load Factor reported in tons
W	Working Stress reported in tons
L	Load and Resistance Factor reported in tons
T	Load Testing
N	No rating analysis was performed
A	Administrative
6	Load Factor Rating reported by Rating Factor using HS-20 loading
7	Working Stress Rating reported by Rating Factor using HS-20 loading
8	Load and Resistance Factor reported by Rating Factor using HL-93 loading

oper_rtng_tons **Operating Rating Tons** *(Required)*
WB75-52
FHWA Item 064

This field contains a value which indicates the absolute maximum gross weight (in tons) to which the bridge may be subjected for the type of vehicle used in the operating rating.

HS loading shall be used in the rating. The following conditions will apply:

- If the bridge will not carry a minimum of 3 tons of live load, code zero, and consistent with the direction of the AASHTO Manual for Bridge Evaluation, it shall be closed.
- If the bridge is a temporary bridge, code zero in this field (since there is no permanent bridge) even though the temporary bridge is rated for as much as a full legal load.
- If the bridge is shored up or repaired on a temporary basis, it is considered a temporary bridge and should be coded as If the shoring were not in place.
- Code 99 for a bridge under sufficient fill such that according to AASHTO design the live load is insignificant in the bridge load capacity.

invt_rtng_meth **Inventory Rating Method** *(Required)*
WB75-54
FHWA Item 065

Code this field with one of the codes listed below to indicate which load rating method was used to determine the Inventory Rating coded for this bridge. FHWA has chosen the Load Factor Method as the standard for computing Operating and Inventory rating reported to the NBI.

F Load Factor reported in tons
W Working Stress reported in tons
L Load and Resistance Factor reported in tons
T Load Testing
N No rating analysis was performed
A Administrative
6 Load Factor Rating reported by Rating Factor using HS-20 loading
7 Working Stress Rating reported by Rating Factor using HS-20 loading
8 Load and Resistance Factor reported by Rating Factor using HL-93 loading

invt_rtng_tons **Inventory Rating Tons** *(Required)*
WB75-55
FHWA Item 066

This is the capacity rating, in tons, which results in a load level which can safely utilize an existing bridge for an indefinite period of time. HS loading shall be used in the rating. The following conditions will apply:

- If the bridge is a temporary bridge, code zero in this field (since there is no permanent bridge) even though the temporary bridge is rated for as much as a full legal load.
- If the bridge is shored up or repaired on a temporary basis, it is considered a temporary bridge and should be coded as If the shoring were not in place.
- Code 99 for a bridge under sufficient fill such that according to AASHTO design the live load is insignificant in the bridge load capacity.

op_rating_factor **Operating Rating Factor**
If Item 551 is coded 6, 7, or 8, the operating rating factor is entered here as a 3-digit number without the decimal point.

inv_rating_factor **Inventory Rating Factor**
If Item 554 is coded 6, 7, or 8, the inventory rating factor is entered here as a 3-digit number without the decimal point.

design_exception_date **Design Exception Date** *(Optional)*
WB75-57
If a design exception has been granted by the FHWA to permit a deviation from required standards, this is the effective date of FHWA approval.

For example, if approval to build a one-lane bridge on a low volume road was granted, enter the date approval was given for this exception. Indicate the date in the MMDDYYYY format. If no design exception has been granted, leave the field blank.

fed_aid_project **Federal Aid Project** *(Optional)*
WB75-65
This is the most recent federal aid project number under which federal funds have been used for construction or reconstruction from the year 1970 forward.

Left justify and leave unused columns blank. If the construction work has been assigned more than one federal aid project number, enter the number for the most recently completed (or current) portion of the project. If federal funds have not been used, leave the field blank.

border_state_code **Border Bridge State Code** *(Required)*
WB75-85
FHWA Item 098A
For bridges which do not cross a Washington State border, leave this field blank.

This is the code of the neighboring state with which Washington State, or a Local Agency within Washington State, shares responsibility for improvements on the existing bridge which crosses state borders. Valid codes are:

160	Idaho
410	Oregon
CAN	Canada

border_pct **Border Bridge Percent** *(Required)*
WB75-88
FHWA Item 098B
For bridges which do not cross a Washington State border, leave the field blank.

This is the percentage of responsibility a neighboring state accepts for improvements on an existing bridge which crosses state borders.

Code the percentage of square footage of the existing bridge that the neighbor is responsible for funding.

border_structure_id Border Bridge Structure Identifier *(Required)*

WB75-90

FHWA Item 099

If the bridge does not cross a Washington State border, leave this field blank.

This is the neighboring state's 15 character National Bridge Inventory Structure Number.

The entire 15 character field must be filled in exactly, including any blank spaces and any leading, trailing, or imbedded zeros.

The Bridge Inspection Report (BIR) NBI section has numbers in parentheses that reflect the inventory form WB76. For example, WB76-57, Structural Adequacy Appraisal, is (657) on the BIR.

WB76

alphabetic_span **Alphabetic Span Type(s)** *(Optional)*

Use the table below to identify each group of span types that make up the entire bridge. Separate each span group by a space. List the Main Span first. The sequence for listing the Approach Spans should be longest to shortest but is somewhat arbitrary. The Alphabetic Span type for the Main and Approach spans must be compatible with Items 532, 533, 535 and 536 respectively.

As an example suppose you have a Steel Through Truss with a 140' Creosote Treated Timber approach at one end of the truss and a 30' Concrete t-beam at the other approach.

Items 532 would = 3 and 533 would = 10. Items 535 would = 1 or 7 and 536 would = 04 or 02 depending on which approach you choose to list.

The Alphabetic Span would be entered as follows:

STrus TTC CTB

Alphabetic Span	Definition	Alphabetic Span	Definition
Aculv	Aluminum Culvert	PRCB	Precast Reinforced Concrete Beam
BAS	Bascule Lift Span	SA	Steel Arch
CA	Concrete Arch	STA	Steel Tied Arch
CEFA	Concrete Earth Filled Arch	SRB	Steel Rolled Beam
CBox	Concrete Box Girder	SBG	Steel Box Girder
CCulv	Concrete Culvert	SCulv	Steel Culvert
CFP	Concrete Floating Pontoon	SFP	Steel Floating Pontoon
CG	Concrete Girder	SG	Steel Girder (weld or rivet)
CS	Concrete Slab	SLS	Steel Lift Span
CSS	Cable Stayed Span	SSCG	Steel Stayed Concrete Girder
CVS	Concrete Voided Slab	SSwS	Steel Swing Span
CSTP	Concrete Slab on Timber Piling	Strus	Steel Truss
CTB	Concrete T-Beam	SSusS	Steel Suspension Span
CTrus	Concrete Truss	TCulv	Timber Culvert
CTun	Concrete Lined Tunnel	TS	Timber Slab
CESB	Concrete Encased Steel Beam	TTLB	Treated Timber Laminated Beam
LIDTun	Cut and Cover (LID) Tunnel	TTTrus	Treated Timber Truss
MCulv	Masonry Culvert	TTS	Treated Timber (Salts) Bridge
PCG	Prestressed Concrete Girder	TTC	Treated Timber (Creosote) Bridge
PCS	Prestressed Concrete Slab	TLTun	Timber Lined Tunnel
PCBTG	Prestressed Concrete Bulb-T Girder	UTun	Unlined Tunnel
PCMWG	Prestressed Concrete Multi-Web Girder	Plaza	Park Plaza Structures
PCTG	Prestressed Concrete Trapezoidal Girder	UTTrus	Untreated Timber Truss
PTCTB	Post-Tensioned Concrete T-Beam	UT	Untreated Timber Bridge
PTCBox	Post-Tensioned Concrete Box Girder	UTLB	Untreated Timber Laminated Beam
PTCSeg	Post-Tensioned Segmental Box Girder	WSG	Weathering Steel Girder

Type	Field Name	WSBIS	FHWA
Item Inspection Elements			
Reqd.	Routine Inspection Frequency	WB76-32	091
Fatal	Date of Last Routine Inspection	WB76-34	090
Reqd..	Routine Inspection Hours on Site	WB76-42	
Reqd.	Inspector's Initials	WB76-46	
Fatal	Inspector's Certification Number	WB76-49	
Optl.	Co-Inspector's Initials	WB76-54	
Adequacy Appraisals			
Gen.	Structural	WB76-57	067
Gen.	Deck Geometry	WB76-58	068
Gen.	Underclearance	WB76-59	069
Reqd.	Operating Level	WB76-60	070
Reqd.	Alignment	WB76-61	072
Reqd.	Waterway	WB76-62	071
Inspection Conditions			
Reqd.	Overall Deck Condition	WB76-63	058
Optl.	Drain Condition	WB76-64	
Optl.	Drain Status	WB76-65	
Optl.	Deck Scaling Severity	WB76-66	
Optl.	Deck Scaling Percent	WB76-67	
Optl.	Deck Rutting	WB76-69	
Optl.	Deck Exposed Steel Code	WB76-70	
Reqd.	Superstructure Overall	WB76-71	059
Optl.	Curb Condition	WB76-72	
Optl	Sidewalk Condition	WB76-73	
Optl.	Paint Condition	WB76-74	
Optl	Number of Utilities	WB76-75	
Reqd.	Substructure Condition	WB76-76	060
Reqd.	Channel Protection	WB76-77	061
Reqd.	Culvert Condition	WB76-78	062
Reqd.	Pier / Abutment Protection	WB76-79	111
Reqd.	Scour	WB76-80	113
Reqd.	Approach Roadway Condition	WB76-81	
Optl.	Retaining Walls Condition	WB76-82	
Optl.	Pier Protection Condition	WB76-83	
Reqd.	Traffic Safety, Bridge Rails	WB76-840	36A
Reqd.	Traffic Safety, Bridge Rails	WB76-850	36B
Reqd.	Traffic Safety, Bridge Rails	WB76-860	36C
Reqd.	Traffic Safety, Bridge Rails	WB76-870	36D

Bridge Condition Inspection Fields

Table WB76-32

inspn_freq **Routine Inspection Frequency** *(Required)*
WB76-32
FHWA Item 091 This is the number of months between consecutive routine inspections.

The standard maximum frequency of NBI bridges for Routine Inspections is 24 months.

last_inspn_date **Date of Last Routine Inspection** *(Fatal)*
WB76-34
FHWA Item 090 This is the date the most recent routine inspection was performed on this bridge.

inspn_hours **Routine Inspection Hours on Site** *(Optional)*
WB76-42 This is the total number of inspection hours (to the tenth of an hour) that the inspection team spent on the bridge during a Routine Inspection.

inspr_initials **Inspector's Initials** *(Required)*
WB76-46 These are the initials of the inspector whose certification number appears in WB76-49.

cert_no **Inspector's Certification Number** *(Fatal)*
WB76-49 This is the certification number of the lead inspector at the bridge site performing the routine inspection.

co_inspr_initials **Co-Inspector's Initials** *(Optional)*
WB76-54 These are the initials of the individual who assisted the lead inspector in performing a routine inspection.

Adequacy Appraisal There are six fields used to appraise the adequacy of the bridge in relation to the level of service it provides on the highway system of which it is a part. To make this appraisal, the present condition of the bridge is compared to the condition of a new bridge built to current standards for that particular classification of road (with the exception of underclearance).

The appraisal codes for Structural Adequacy Appraisal, Deck Geometry Appraisal, and Underclearance Adequacy Appraisal are computed automatically by the WSBIS system.

The appraisal codes for Operating Level, Alignment Adequacy Appraisal, and Water Way Adequacy Appraisal are not computed automatically and must be entered by the bridge inspector. See the field descriptions that follow.

structure_adqcy **Structural Adequacy Appraisal** *(Generated)*
WB76-57
FHWA Item 067

The value in this field is generated by the WSBIS system and rates the adequacy of the structure's condition, taking into account any major structural deficiencies. This rating is based on the overall condition of the superstructure, substructure, the inventory rating, and the ADT.

Table WB76-57 explains how the inventory rating may further lower this code. The code for this item is no higher than the lowest of the condition codes for Superstructure Overall, Substructure Condition, or Culvert Condition.

ADT			Structural Adequacy Appraisal Rating Code
0-500	**501-5000**	**>5000**	
Inventory Rating HS Truck (Tons)			
	Not Applicable		**9**
36	36	36	8
31	31	31	7
23	25	27	6
18	20	22	5
12	14	18	4
Inventory rating less than value in rating code of 4 and requiring corrective action.			3
Inventory rating is less than above and bridge requires replacement, WB78-44 is coded 31 or 32.			2
Bridge is closed and requires replacement.			Ø

Structural Adequacy Appraisal Rating
Table WB76-57

deck_geometry_aprsl Deck Geometry Appraisal *(Generated)*

WB76-58

FHWA Item 068

The value in this field is generated by the WSBIS system. This is the adequacy appraisal rating of the bridge's deck geometry. The level of service provided by the bridge is evaluated with respect to the highway system of which it is a part. This appraisal is based on the number of traffic lanes, the curb-to-curb width, the minimum vertical clearance over the bridge deck, the ADT, and the federal functional classification.

The following Tables, WB76-58A through E, explain how the values are determined with respect to the highway system of which the bridge is a part. The lowest code determined from the tables is used.

Curb-to-Curb Bridge Roadway Width (In Feet)						Deck Geometry Appraisal Rating Code
Average Daily Traffic (ADT) (Both Directions)						
0-100	**101-400**	**401-1000**	**1001-2000**	**2001-5000**	**>5000**	
Not Applicable						**9**
≥ 32	≥ 36	≥ 40	≥ 44	> 44	> 44	8
28	32	36	40	44	44	7
24	28	30	34	40	44	6
20	24	26	28	34	38	5
18	20	22	24	28	32 (28)	4
16	18	20	22	26	30 (26)	3
Bridge is open and has a width less than required for a rating code of 3 and WB78-44 is coded 31.						2
Bridge is closed.						Ø

Notes:

1. For bridges longer than 200 feet, use the values shown in parentheses.
2. Use the lower rating code for roadway widths between those shown.
3. For bridges with three or more undivided lanes of two-way traffic, use Table WB76-58C under the column NUMBER of LANES (Other Roadways).
4. For bridges with one-lane and one-way traffic.

Deck Geometry Appraisal Rating Two-Lane Bridge With Two-Way Traffic or One-Lane With One-Way Traffic

Table WB76-58A

Curb-to-Curb Bridge Roadway Width (In Feet)		Deck Geometry Appraisal Rating Code
Average Daily Traffic (ADT) (Both Directions)		
0-100	>100	
Not Applicable		9
15′11″	–	8
15	–	7
14	–	6
13	–	5
12	–	4
11	15′11″	3
Bridge is open and has a width less than required for a rating code of 3 and WB78-44 is coded 31.		2
Bridge is closed.		Ø

Notes:
1. Use the lower rating code for a roadway widths between those shown.
2. All single lane bridges with a deck width less than 16 feet and an ADT > 100 should be rated at 3 or below.

Deck Geometry Appraisal Rating One-Lane Bridge With Two-Way Traffic
Table WB76-58B

Curb-to-Curb Bridge Roadway Width (In Feet) Two or More Lanes in Each Direction				Deck Geometry Appraisal Rating Code
Number of Lanes (Interstate)		Number of Lanes (Other Roadways)		
2 Lanes	> 2 Lanes	2 Lanes	> 2 Lanes	
Not Applicable				9
≥ 42	≥ 12N + 24	≥ 42	≥ 12N + 18	8
40	12N + 20	38	12N + 15	7
38	12N + 16	36	12N + 12	6
36	12N + 14	33	11N + 10	5
34 (29)	11N + 12 (11N + 7)	30	11N + 6	4
33 (28)	11N + 11 (11N + 6)	27	11N + 5	3
Bridge is open and has a width less than required for rating code of 3 and WB78-44 is coded 31.				2
Bridge is closed				Ø

Notes:
1. N = Number of traffic lanes.
2. Use the lower rating code for roadway widths between those shown.
3. For bridges longer than 200 feet, use the values shown in parentheses.

Deck Geometry Appraisal Rating Bridges With Two-Way Traffic
Table WB76-58C

Bridge/Ramp Width (In feet)		Deck Geometry Appraisal Rating Code
Number of Lanes		
1 Lane	> 1 Lane	
Not applicable		9
≥ 26	≥ 12N + 12	8
24	12N + 10	7
22	12N + 8	6
20	12N +6	5
18	12N +4	4
16	12N + 2	3
Bridge is open and has deck width less than required for a rating code of 3 and WB78-44 is coded 31.		2
Bridge is closed.		Ø

Notes:
1. N = Number of traffic lanes.
2. Use the lower rating code for a roadway width between those shown.

Deck Geometry Appraisal Rating for Ramps With One-Way Traffic (Service Level = 7)
Table WB76-58D

Functional Class				Deck Geometry Appraisal Rating Code
Interstate and Other Freeway		Other Principal and Minor Arterials	Major and Minor Collectors and Locals	
Designated Routes*	Undesignated Routes*			
Minimum Vertical Clearance				
Not Applicable				9
≥ 17′0″	≥ 16′0″	≥ 16′6″	≥ 16′6″	8
16′9″	15′6″	15′6″	15′6″	7
16′6″	14′6″	14′6″	14′6″	6
15′9″	14′3″	14′3″	14′3″	5
15′0″	14′0″	14′0″	14′0″	4
Vertical clearance is less than value for rating of 4; corrective action is required.				3
Vertical clearance is less than value for rating of 4 and WB78-44 is coded 31; replacement is required.				2
Bridge is closed.				Ø

Notes:
*Use the first column (Designated Routes) for all routes except designated routes in urban areas where there is an alternative interstate of freeway facility with a minimum clearance of at least 16′ 0″. Use the second column (Undesignated Routes) for all undesignated interstate or freeway facilities.
1. Use the lower rating code for any vertical clearance measurements between those shown.

Deck Geometry Appraisal Rating
Table WB76-58E

underclrnc_aprsl **Underclearance Adequacy Appraisal** *(Generated)*
WB76-59
FHWA Item 069

The code for this field is generated by the WSBIS system.

It rates the adequacy of the bridge's underclearance. This appraisal is based on the vertical and lateral underclearances beneath the bridge as related to the federal functional classification of the roadway carried beneath the bridge. If the bridge is not over a highway or a railroad, the field will be set to 9.

See Tables WB76-59A and B for an explanation of how the values are calculated.

Functional Class					Under-Clearance Adequacy Appraisal Rating Code
Interstate and Other Freeway		Other Principal and Minor Arterials	Major and Minor Collectors and Locals	Railroads	
Designated Routes*	Undesignated Routes*				
Minimum Vertical Underclearance					
Not Applicable					9
≥ 17′0″	≥ 16′0″	≥ 16’6″	≥ 16′6″	≥ 23′0″	8
16′9″	15′6″	15′6″	15′6″	22′6″	7
16′6″	14′6″	14′6″	14′6″	22′0″	6
15′9″	14′3″	14′3″	14′3″	21′0″	5
15′0″	14′0″	14′0″	14′0″	20′0″	4
Vertical clearance is less than value for rating of 4; corrective action is required.					3
Vertical clearance is less than value for rating of 4 and WB78-44 is coded 31; replacement is required.					2
Bridge is closed.					Ø

Notes:
*Use the first column (Designated Routes) for all routes except designated routes in urban areas where there is an alternative interstate of freeway facility with a minimum clearance of at least 16′ 0″. Use the second column (Undesignated Routes) for all undesignated interstate or freeway facilities.
1. Use the lower rating code for any vertical clearance measurements between those shown.

Underclearance Adequacy Appraisal Rating
Table WB76-59A

Functional Class							Under-clearance Adequacy Appraisal Rating Code
One-Way Traffic				Two-Way Traffic			
Principal Arterials (Interstate, etc.)				Other Principal and Minor Arterials	Major and Minor Collectors and Locals	Railroads	
Main Line		Ramp					
Lt.	Rt.	Lt.	Rt.				
Minimum Lateral Underclearance (Feet)							
Not Applicable							9
≥ 30	≥ 30	≥ 4	≥ 10	≥ 30	≥ 12	≥ 20	8
18	21	3	9	21	11	17	7
6	12	2	8	12	10	14	6
5	11	2	6	10	8	11	5
4	10	2	4	8	6	8	4
Underclearance is less than value for rating of 4; corrective action is required.							3
Underclearance is less than value for rating of 4 and WB78-44 is coded 31; replacement is required.							2
Bridge is closed.							Ø

Notes:
1. Use the lower rating code for any underclearance measurements between those shown.
2. Use the value from the Right Ramp column to determine the rating code when acceleration or deceleration lanes or ramps are provided under two-way traffic.

Underclearance Adequacy Rating
Table WB76-59B

safe_load_code **Operating Level** *(Required)*

WB76-60

FHWA Item 070

This appraisal is a consideration of the relationship between the load that may legally use the bridge and the desired load capacity for this type of bridge in the state of Washington. It is to be based on the bridge's operating rating.

When the maximum legal load allowed in the state exceeds the operating rating, the bridge must be posted. This is in accordance with the requirements of the NBIS. Agencies, however, may elect to post bridges at lower rating capacities. If this is done, WB72-93 may show that the bridge is posted while the field may show that posting is not required. Such coding information is not in conflict but is acceptable and correct.

If the bridge is a temporary bridge, the operating level appraisal rating must reflect its actual load-carrying capacity at the operating rating. The rating should be made based on the loads the bridge is actually carrying. This also applies to bridges which have been shored up or repaired on a temporary basis.

Refer to the Operating Rating Factors Table on page 2.06-C-21 to determine the proper code to enter in this field.

alignment_aprsl **Alignment Adequacy Appraisal** *(Required)*
WB76-61
FHWA Item 072

The evaluation of the approach roadway alignment is based on an assessment of how that alignment relates to the general alignment of the section of highway the bridge is on. The approach roadway alignment is not intended for comparison to current standards, but rather to the existing highway alignment. This field identifies bridges which do not function properly or safely due to the alignment of their approach roadways.

Speed reductions necessary because of the width of the bridge deck will not be considered.

The following codes are to be used:

9 Not applicable (non-vehicular traffic use).
8 No reduction in speed required for vehicle as it approaches the bridge.
6 Minor reduction in speed required for vehicle as it approaches the bridge.
3 Horizontal or vertical curvature of approach roadway requires substantial reduction in the speed of vehicle as it approaches the bridge.

waterway_aprsl **Waterway Adequacy Appraisal** *(Required)*
WB76-62
FHWA Item 071

This item appraises the waterway opening with respect to passage of flow beneath the bridge. The following codes shall be used in evaluating waterway adequacy (interpolate where appropriate). Site conditions may warrant somewhat higher or lower rating than indicated by Table WB76-62 (i.e., flooding of an urban area due to a restricted bridge opening).

The frequency of overtopping means the following:

Remote	greater than 100 years
Slight	11 to 100 years
Occasional	3 to 10 years
Frequent	less than 3 years

Adjectives describing traffic delays mean the following:

Insignificant	Minor inconvenience. Highway passable in a matter of hours.
Significant	Traffic delays of up to several days.
Severe	Long-term delays to traffic with resulting hardship.

Description	Functional Class*		
	1	2	3
	Code		
Bridge not over a waterway	9	9	9
Bridge deck and roadway approaches above flood (high) water elevations. Chance of overtopping remote.	8	8	8
Bridge deck above roadway approaches. Slight chance of over topping roadway approaches.	7	7	8
Slight chance of over topping bridge deck and roadway approaches.	6	6	7
Bridge deck is higher than approaches. Occasional over topping of roadway approaches with insignificant delays.	4	5	6
Bridge deck is higher than approaches. Occasional overtopping of roadway approaches with significant delays.	3	4	5
Occasional overtopping of both bridge deck and roadway approaches with significant delays.	2	3	4
Frequent overtopping of both bridge deck and roadway approaches with significant delays.	2	2	3
Occasional or frequent overtopping of both bridge deck and roadway approaches with severe delays.	2	2	2
Bridge closed – hydraulics problem	Ø	Ø	Ø

*Functional Class:
1 = Principal arterials, interstates, freeways, or expressways.
2 = Other principal arterials, minor arterials, and major collectors.
3 = Minor collectors and local roadways.

Waterway Adequacy Appraisal Rating
Table WB76-62

Condition Rating Codes

Codes are entered in WB76-63 to WB76-83 to describe (rate) the current condition of the existing, in-place bridge as compared to its as built condition. WB76-71 and WB76-76 are based on the overall condition of the bridge elements that comprise either the superstructure or substructure.

Condition codes are properly used when they provide an overall characterization of the general condition of the entire set of components being rated. They are improperly used If they attempt to describe localized or nominally occurring instances of deterioration or disrepair. In assigning condition codes, therefore, the engineer should consider both the severity of deterioration or disrepair and the extent to which it is widespread throughout the components being rated.

The existing condition of the bridge should be the only consideration in making these evaluations. The fact that a bridge may be posted or may have been designed for less than the current legal load should have no bearing on the evaluation of its present condition. Similarly, the fact that portions of a bridge are being supported or strengthened by temporary braces should not be considered. In such instances, the bridge is to be rated **as If the temporary braces were not in place**.

A completed bridge not yet open to traffic should be coded as If it were open to traffic.

Use Table WB76-63A to determine the proper code to enter for all primary load carrying bridge members (i.e., superstructure, substructure). Use Table WB76-64 to determine the proper code to enter for all secondary bridge members (i.e., curbs, sidewalks, rails). Where other coding values are appropriate, the field description will specify what codes to enter.

deck_overall_cond **Overall Deck Condition** *(Required)*

WB76-63

FHWA Item 058

This item describes the overall condition rating of the deck. BMS will address local conditions (see Chapter 4). Rate and code the deck condition in accordance with the general condition ratings by using Table WB76-63A Condition Codes for Primary Bridge Members (Deck) based on a visual inspection and/or Table WB76-63B Condition Rating Guide for Deck Conditions/Overall based on deck testing results (chloride, delamination, rebar cover).

Use a code of "9" for culverts and other bridges without a deck (i.e., filled arch bridge).

The condition of the wearing surface/protective system, joints, expansion devices, curbs, sidewalks, parapets, facias, bridge rail, and scuppers shall not be considered in the overall deck evaluation. However, their condition should be noted on the inspection form.

Decks integral with the superstructure will be rated as a deck only and may influence the superstructure rating (for example, rigid frame, slab, deck girder or T-beam, voided slab, box girder, etc.). The superstructure of an integral deck-type bridge will not influence the deck rating.

If deck testing has been completed then the deck condition rating will be determined from the lowest rating obtained from Tables WB76-63A and WB76-63B. If deck testing has not been completed, then the deck condition rating will be based only on Table WB76-63A.

If the bridge has a concrete deck that has been rehabilitated with a protective concrete overlay (such as Latex or Microsilica) then the deck shall be rated based on Table WB76-63A. The deck testing results and Table WB76-63B will no longer be used to determine the deck condition rating in this case.

For slab type bridges, deck condition codes shall match the superstructure condition code.

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.
3	Serious Condition. Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete maybe present.
2	Critical Condition. Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete maybe present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
1	Imminent Failure Condition. Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
Ø	Failed Condition. Out of service. Beyond corrective action.

Condition Rating for Primary Bridge Members (Deck)
Table WB76-63A

Rebar Cover	Visible Cracking	Visible Spalls and/or Delamination	Chloride Content at Rebar Level	Code
N/A	N/A	N/A	N/A	9
No exposed Rebar	Minor Shrinkage	None	None > 1# / C.Y.	8
No exposed Rebar	Minor – Medium Longitudinal/ Transverse	None	None > 2# / C.Y.	7
Random Exposed Rebar	Medium Map Cracking	< 1% (of deck area)	< 20% has > 2# / C.Y.	6
Exposed Rebar< 1% (of deck area)	Extensive Map Cracking	1% to 2% (of deck area)	21-40% has > 2# / C.Y.	5
Exposed Rebar > 1% (of deck area)	Extensive Cracking w/ Rebar Corrosion	2% to 5% (of deck area)	41-60% has > 2# / C.Y.	4
N/A	N/A>	5% (of deck area)	> 60% has > 2# / C.Y.	3

Condition Rating Guide for Deck Conditions/Overall
Table WB76-63B

drain_cond **Drains Condition** *(Optional)*
WB76-64 This is the condition rating of the drains in the bridge deck.

A rating of 5 should be used to indicate the drains are completely plugged with dirt and debris. Use Table WB76-64 Condition Rating for Secondary Bridge Members (Drains).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.

Condition Rating for Secondary Bridge Members (Drains)
Table WB76-64

drain_status_ **Drains Status** *(Optional)*
WB76-65 This code describes the present status of the drains on the bridge.

0 Drains do not exist
1 Drains exist as built
2 Drains have been permanently blocked
3 Drains have been replaced by another type
4 Drains have been disconnected
9 Drains status is unknown

deck_scaling_ **Deck Scaling Severity** *(Optional)*
WB76-66 This code describes the severity of any deck scaling present.

The amount and type of deterioration present in the top surface of concrete bridge decks is to be rated. If the bridge does not have a concrete deck (for example, it has an asphalt overlay or a steel or timber deck), code N.

N None
L Light (scaling up to ¼″ deep)
M Moderate (scaling up to ½″ deep)
H Heavy (scaling or spalls up to 1″ deep)
S Severe (over 1″ deep)

deck_scaling_pct **Deck Scaling Percent** *(Optional)*
WB76-67 This value is the percentage of the total deck area where scaling and/or spalling are present. It includes any areas which have been patched.

In scaled areas of more than 1 percent, estimate the percentage at 5 percent increments. The amount and type of deterioration present in the top surface of concrete bridge decks is to be calculated. If the bridge does not have a concrete deck (for example, it has an asphalt overlay or a steel or timber deck), code 00.

deck_rutting_ **Deck Rutting** *(Optional)*
WB76-69
The amount and type of deterioration present in the top surface of concrete bridge decks is to be rated using the following codes. If the bridge does not have a concrete deck (i.e., it has an asphalt overlay or a steel or timber deck), code Ø.

8	No wear
7	Exposed aggregate
5	Visible wheel track rutting
3	Wheel track rutting has exposed reinforcing steel
0	Not applicable

deck_exposed_steel_ Deck Exposed Steel *(Optional)*
WB76-70
This code describes the degree to which the deck area shows exposed reinforcing steel.

The amount and type of deterioration present in the top surface of concrete bridge decks is to be rated. If the bridge does not have a concrete deck (for example, it has an asphalt overlay or a steel or timber deck), code Ø.

8	None
7	Some cracking in deck over reinforcing steel
5	0 to 5 percent of deck area shows exposed reinforcing steel
3	More than 5 percent of deck area shows exposed reinforcing steel
0	Not applicable

superstructure_cond Superstructure Overall *(Required)*
WB76-71
FHWA Item 059
This item describes the physical condition of all structural members comprising the superstructure. Rate and code the condition in accordance with the previously described general condition ratings. BMS will address local conditions (see Chapter 4). Code 9 for all culverts.

The condition of secondary members such as bracing, diaphragms, bearings, joints, paint system, etc., shall not be included in this rating, except in extreme situations, but should be noted on the inspection form.

On bridges where the deck is integral with the superstructure, the superstructure condition rating may be affected by the deck condition. The resultant superstructure condition rating may be lower than the deck condition rating where the girders have deteriorated or been damaged.

Use Table WB76-71 Condition Rating for Primary Bridge Members (Superstructure).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.
3	Serious Condition. Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	Critical Condition. Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete maybe present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
1	Imminent Failure Condition. Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
Ø	Failed Condition. Out of service. Beyond corrective action.

Condition Rating for Primary Bridge Members (Superstructure)
Table WB76-71

curb_cond
WB76-72

Curb Condition *(Optional)*
This is the condition rating of any curbs located on the bridge. Use Table WB76-72 Condition Rating for Secondary Bridge Members (Curbs).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.

Condition Rating for Secondary Bridge Members (Curbs)
Table WB76-72

sdwk_cond
WB76-73

Sidewalk Condition *(Optional)*
This is the condition rating of any sidewalks which are an integral part of or are attached to the bridge. This rating considers the condition of any structural members (i.e., stringers) which may support the sidewalk.

To be considered a sidewalk, the member must be greater than or equal to three feet in width. Use Table WB76-73 Condition Rating for Secondary Bridge Members (Sidewalk).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking or spalling.

Condition Rating for Secondary Bridge Members (Sidewalk)
Table WB76-73

paint_cond
WB76-74

Paint Condition *(Optional)*
This field contains the condition rating of any paint applied to the bridge to protect the primary structural steel members.

If paint has been applied only on secondary members such as bridge rails or light posts, code 9 in this field.

9 Not applicable.
8 Bridge has recently been painted.
7 Paint is in good condition with only minor weathering.
6 Bridge needs to be painted within five years.
5 Bridge needs to be painted within three years.
4 Bridge needs to be painted within two years.

A paint code of '5' or '4' needs to have at least one paint inspection form completed as part of the inspection report in the bridge file. The bridge is also a candidate for paint testing.

utilities_qty
WB76-75

Number of Utilities *(Optional)*
This field indicates the number of franchise utilities attached to the bridge. Utilities include — but are not limited to — water pipes, sewer lines, telephone lines, power lines, and gas lines. Conduit for electricity used on the bridge is not considered a utility. A conduit cluster (i.e., a telephone cluster) is considered one utility.

This field is not used to evaluate the condition of utilities on the bridge, only the number of utilities present.

If more than nine utilities are attached to the bridge, code 9. If there are no utilities, code Ø. If the number of utilities is not known, leave this field blank.

substructure_cond **Substructure Condition** *(Required)*
WB76-76
FHWA Item 060

This item describes the overall physical condition of piers, abutments, piles, fenders, footings, or other components. Rate and code the condition in accordance with the previously described general condition ratings. Code 9 for all culverts. BMS will address local conditions (see Chapter 4).

The condition of secondary members such as bracing, diaphragms, bearings, joints, paint system, etc., shall not be included in this rating, except in extreme situations, but should be noted on the inspection form.

The Substructure Condition code should be consistent with Scour code WB76-80. A Scour code of 2 or below should result in a corresponding Substructure code of 2 or below.

The substructure condition rating shall be made independent of the deck and superstructure.

Integral-abutment wing walls to the first construction or expansion joint shall be included in the evaluation. For non-integral superstructure and substructure units, the substructure shall be considered as the portion below the bearings.

Use Table WB76-76 Condition Rating for Primary Bridge Members (Substructure).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.
3	Serious Condition. Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	Critical Condition. Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete maybe present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
1	Imminent Failure Condition. Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
Ø	Failed Condition. Out of service. Beyond corrective action.

Condition Rating for Primary Bridge Members (Substructure)
Table WB76-76

channel_prot **Channel Protection** *(Required)*
WB76-77
FHWA Item 061

This item describes the physical conditions associated with the flow of water beneath the bridge such as stream stability and the condition of the channel, riprap, slope protection, or stream control devices including spur dikes.
The inspector should be particularly concerned with visible signs of excessive water velocity which may affect undermining of slope protection, erosion of banks, and realignment of the stream which may result in immediate or potential problems. Accumulation of drift and debris on the superstructure and substructure should be noted on the inspection form but not included in the condition rating.

If more than one condition is present, enter the lowest of the codes that apply. Use Table WB76-77.

Code	Devices Description
9	Bridge is not over a waterway.
8	Protected, well vegetated banks. No river control devices required or they are in stable condition.
7	Bank protection needs minor repair. River control devices/slope protection show minor damage. Banks and/or channel show minor accumulation of drift.
6	Bank beginning to slump. River control devices/slope protection show wide spread damage. Minor movement of streambed. Debris restricts waterway.
5	Eroded bank protection. River control devices/slope protection have major damage. Trees and brush restrict waterway.
4	Banks severely undermined. River control devices/slope protection have severe damage. Large deposits of debris in waterway.
3	Failed bank protection. River control devices are destroyed. Waterway has changed course so it now threatens the bridge and/or approach roadway.
2	Waterway has changed course to extent that bridge is now near collapse.
1	Bridge closed – may be able to be repaired.
0	Bridge closed – beyond repair.

Rating for Channel and Channel Protection
Table WB76-77

culvert_cond **Culvert Condition** *(Required)*
WB76-78
FHWA Item 062

This is the general overall condition rating of any bridge which is a culvert.

A culvert is defined in the FHWA *Culvert Inspection Manual* as a drainage opening beneath an embankment, usually a pipe, which has been designed to allow the even flow of water beneath a roadway and designed to take advantage of submergence. This is a bridge with WB75-33 coded 19.

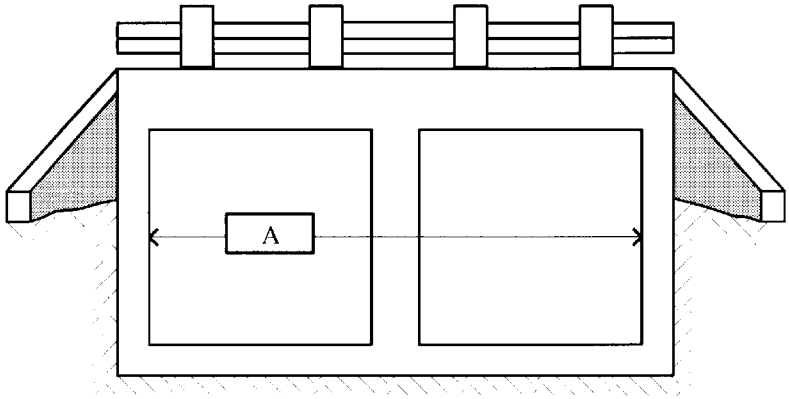
If the bridge is not a culvert, code 9 in this field.

Any culvert with a clear opening of more than 20 feet when measured along the center of the roadway, must be inventoried. In addition, any multiple pipes with a total span of more than 20 feet and a clear distance between openings of less than half of the smaller contiguous opening must also be inventoried. Culverts or multiple pipes which measure less than 20 feet may be inventoried at the agency's discretion.

When rating the general condition of the culvert, evaluate the alignment, degree of settlement, and structural integrity. Wingwalls which have been poured integral to the culvert's first construction or expansion joint should be included in this evaluation. Refer to the FHWA *Culvert Inspection Manual* for a detailed discussion regarding the inspection and rating of culverts. See Figure WB76-78 and Table WB76-78A Rating for Concrete Culverts or Table WB76-78B Rating for Metal Culverts.

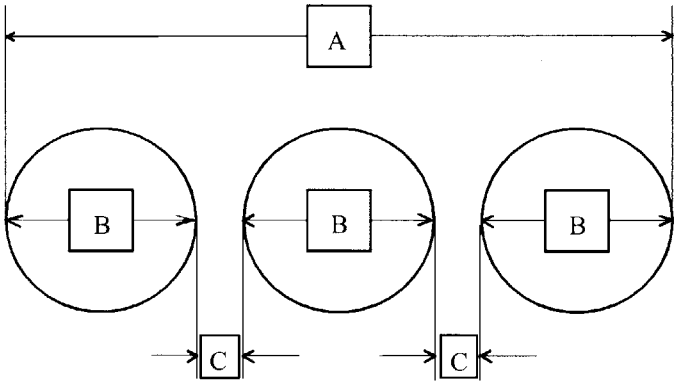
When culvert condition is coded (not including 9), code the following fields a 9.			
Type	**Field Name**	**WSBIS**	**FHWA Item**
Reqd.	Overall Deck Dondition	WB76-63	058
Reqd.	Superstructure Overall	WB76-71	059
Reqd.	Substructure Condition	WB76-76	060
	Table WB76-78		

BOX CULVERT



If A > 20'
then culvert's condition must be rated.

MULTIPLE PIPES



If A > 20' and B/2 > C
then culvert's condition must be rated.

Figure WB76-78

Code	Description
9	Bridge is not a culvert.
8	No noticeable or noteworthy defects.
7	Cracking, light scaling and spalling which does not expose reinforcing steel. Minor damage from drift. Insignificant scouring near wingwalls or pipes.
6	Minor deterioration, chloride contamination cracking, leaching, or spalling. Minor scouring near wingwalls or pipes.
5	Moderate to major deterioration, cracking, leaching or spalling. Minor settlement or misalignment. Moderate scouring or erosion at wingwalls or pipes.
4	Major deterioration (large spalls, heavy scaling, wide cracks, open construction joints, etc). Considerable settlement or misalignment. Considerable scouring or erosion at wingwalls or pipes.
3	Extensive deterioration. Severe movement, differential settlement of segments, loss of fill. Holes in walls or slab. Wingwalls nearly severed. Severe scouring or erosion at wingwalls or pipes.
2	Collapsed wingwalls, severe settlement of roadway due to loss of fill. Section failure of culvert. Complete undermining at wingwalls or pipes.
1	Bridge closed – culvert may be able to be repaired.
Ø	Bridge closed – culvert beyond repair.

Rating for Concrete Culverts
Table WB76-78A

Code	Description
9	Bridge is not a culvert
8	No noticeable or noteworthy defects. Bolts are in good condition, in place, and tight.
7	Smooth, symmetrical curvature with superficial corrosion and no pitting. Bolts may have superficial corrosion, are in place and tight.
6	Smooth curvature, non-symmetrical shape, and significant corrosion or moderate pitting. Bolts may have significant corrosion and 10 percent of the bolts in a panel seam maybe missing or loose.
5	Significant distortion and deflection in one section. Significant corrosion or deep pitting. Bolts may have significant corrosion and 20 percent of the bolts in a panel seam maybe missing or loose.
4	Significant distortion and deflection throughout. Extensive corrosion or deep pitting. Bolts may have extensive corrosion and 30 percent of the bolts in a panel seam maybe missing or loose.
3	Extreme distortion and deflection in one section. Extensive corrosion or deep pitting with scattered perforations. Bolts may have extensive corrosion and 40 percent of the bolts in a panel seam maybe missing or loose.
2	Extreme distortion and deflection in one section. Extensive perforations due to corrosion. Bolts may have extensive corrosion and 50 percent of the bolts in a panel seam maybe missing or loose.
1	Bridge closed – culvert may be able to be repaired.
Ø	Bridge closed – culvert beyond repair.

Rating for Metal Culverts
Table WB76-78B

Code	Description
9	Bridge is not a culvert
8	No noticeable or noteworthy defects
7	Insignificant deterioration, decay or scour. No structural loss.
6	Minor deterioration, decay or scour. All primary structural elements are sound.
5	Moderate deterioration, decay or scour. All primary structural elements are sound but have some section loss.
4	Major deterioration, decay or scour. Advanced section loss or scour that affects the load capacity of the structure.
3	Extensive deterioration, decay or scour. Advanced section loss or scour that significantly affects the load capacity of the structure.
2	Severe deterioration, decay or scour. Critical structural members have obvious vertical or horizontal movement affecting structural stability.
1	Bridge closed – culvert may be able to be repaired.
Ø	Bridge closed – culvert beyond repair.

Rating for Timber Culverts
Table WB76-78C

pier_abutment_prot Pier / Abutment Protection *(Required)*
WB76-79
FHWA Item 111

This is only required If the bridge crosses a navigable channel (Item 386 = 1). This item contains a code which indicates the presence and adequacy of pier and/or abutment navigation protection features (i.e., fenders and dolphins).

WB76-79 evaluates the adequacy of the pier protection features and is **not** an evaluation of their general condition. WB76-83 is to be used for rating their general condition. However, the adequacy evaluation of these features should correspond to condition ratings entered in WB76-83 in the manner noted.

If WB73-86 has not been coded 1, code N in this field.

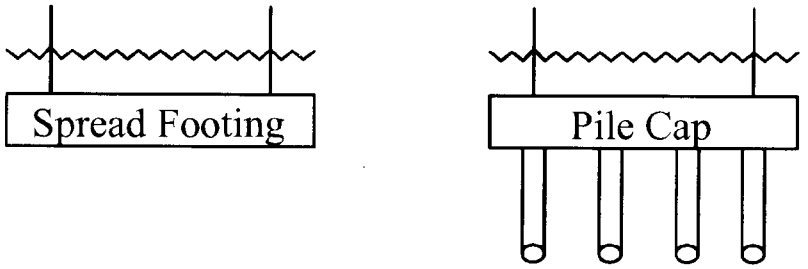
1 No pier protection is required.
2 Pier protection is in place and functioning properly (it has a condition rating of 6, 7, or 8).
3 Pier protection is in place but is in a deteriorating condition (it has a condition rating of 4 or 5),
4 Pier protection is in place but a reevaluation of its design is needed.
5 No pier protection is present but a reevaluation of the need for it should be made.
N Not applicable.

scour_ **Scour** *(Required)*
WB76-80
FHWA Item 113

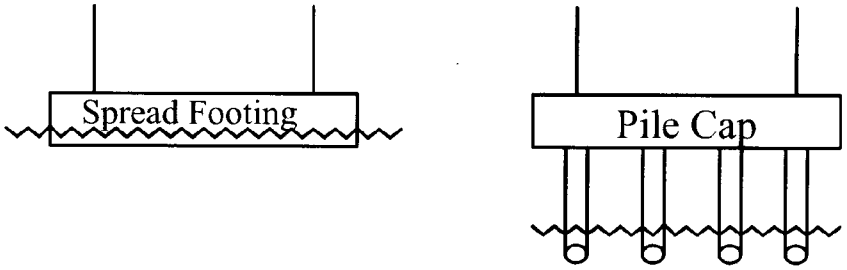
This rating is used to identify the current status of a bridge regarding its vulnerability to scour. Details on conducting a scour analysis are included in Chapter 5. Whenever a rating factor of 4 or below is determined for this item, the rating factor for WB76-76, Substructure may need to be revised to reflect the severity of actual scour and resultant damage to the bridge. A scour critical bridge is one with abutment or pier foundations which are rated as unstable due to (1) observed scour at the bridge site or (2) a scour potential as determined from a scour evaluation study.

When a bridge inspector identifies an actual or potential scour problem, the bridge must be further evaluated to determine whether or not it should be considered scour critical. This evaluation process includes field observations by an individual (or individuals) with a knowledge of foundation, hydraulic, and geotechnical engineering and may require that calculations of anticipated scour depths be made.

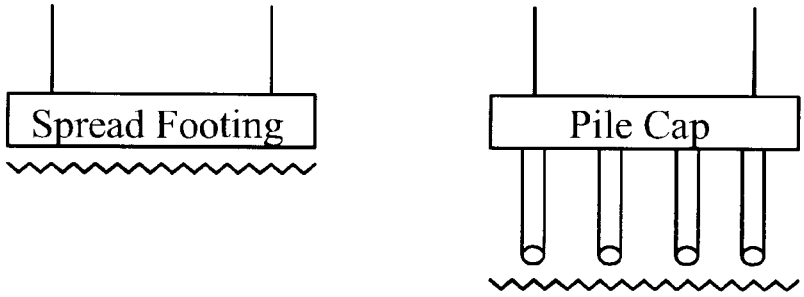
See Figure WB76-80 and Table WB76-80 Rating for Scour.



Example A: If calculated scour depth is above top of footing, code 8. (No action is required.)



Example B: If calculated scour depth is within limits of footing, code 5 or 3 and conduct foundation structural analysis.



Example C: If calculated scour depth is below pile tips or spread footing base, code 3 and provide for monitoring and scour countermeasures as needed.

= Calculated Scour Depth

Figure WB76-80

Code	Description
N	Bridge is not over a waterway.
U	Bridge with “unknown” foundation that has not been evaluated for scour. Until risk can be determined, a plan of action should be developed and implemented to reduce the risk to users from a bridge failure during and immediately after a flood event (see HEC 23).
T	Bridge over “tidal” waters that has not been evaluated for scour, but considered low risk. Bridge will be monitored with regular inspection cycle and with appropriate underwater inspections until an evaluation is performed (“Unknown” foundations in “tidal” waters should be coded U.)
9	Bridge foundations (including piles) well above flood water elevations.
8	Bridge foundations determined to be stable for the assessed or calculated scour condition. Scour is determined to be above top of footing (Example A) by assessment (i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge[4]), by calculation or by installation of properly designed countermeasures (see HEC 23).
7	Countermeasures have been installed to mitigate an existing problem with scour and to reduce the risk of bridge failure during a flood event. Instructions contained in a plan of action have been implemented to reduce the risk to users from a bridge failure during or immediately after a flood event.
6	Scour calculation/evaluation has not been made.
5	Bridge foundations determined to be stable for assessed or calculated scour condition. Scour is determined to be within the limits of footing or piles (Example B) by assessment (i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures (see HEC 23).
4	Bridge foundations determined to be stable for assessed or calculated scour conditions; field review indicates action is required to protect exposed foundations (see HEC 23).
3	Bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions: • Scour within limits of footing or piles (see Figure WB76-80B). • Scour below spread-footing base or pile tips (see Figure WB76-80C).
2	Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations, which are determined to be unstable by: • A comparison of calculated scour and observed scour during the bridge inspection, or • An engineering evaluation of the observed scour condition reported by the bridge inspector in WB76-76.
1	Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic. Failure is imminent based on: • A comparison of calculated and observed scour during the bridge inspection, or • An engineering evaluation of the observed scour condition reported by the bridge inspector in WB76-76.
Ø	Bridge is scour critical. Bridge has failed and is closed to traffic.

Rating for Scour
Table WB76-80

aprch_cond **Approach Roadway Condition** *(Optional)*

WB76-81 This is the general physical condition rating of the approach roadway. This evaluation takes into consideration visible signs of wear, cracking, spalling, etc., but does not consider the alignment or width of this roadway.

9 Not applicable.
8 Smooth approach onto the bridge structure.
6 Less than 1″ of settlement of the approach roadway causing minor bouncing and load impact onto the bridge. Monitor the settlement.
3 More than 1″ of settlement of the approach roadway causing bouncing and load impact onto the bridge. Needs to be ACP feather repaired to provide a smooth transition onto the bridge.

Note: Code 6 for well maintained gravel roads. Code 3 for gravel roads in rough condition.

retaining_wall_cond **Retaining Walls Condition** *(Optional)*

WB76-82 This field contains the general condition rating of any retaining walls associated with the bridge. This evaluation should take into consideration whether movement, cracking, or settling has occurred.

Wingwalls and curtain walls should not be considered under this code as they are considered part of the abutment. Use Table WB76-82 Condition Rating for Retaining Walls.

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.
3	Serious Condition. Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	Critical Condition. Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete maybe present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
1	Imminent Failure Condition. Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
Ø	Failed Condition. Out of service. Beyond corrective action.

Condition Rating for Retaining Walls
Table WB76-82

pier_prot **Pier Protection Condition** *(Optional)*
WB76-83
This rating describes the general condition rating of any pier and/or abutment protection features (i.e., fenders and dolphins) which have been put in place to protect the bridge against collisions from vessels or objects in tow.

This field is used for rating the general condition of the bridge's pier protection features and does not evaluate the adequacy of those features.

If no pier protection exists, code 9. Use Table WB76-83 Condition Rating for Secondary Bridge Members (Pier Protection).

9	Not Applicable.
8	Very Good Condition. No problems noted.
7	Good Condition. Some minor problems.
6	Satisfactory Condition. Structural elements show some minor deterioration.
5	Fair Condition. All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.
4	Poor Condition. Advanced deficiencies such as section loss, deterioration, cracking, spalling, or scour.

Condition Rating for Secondary Bridge Members (Pier Protection)
Table WB76-83

bridge_rail_adqcy **Traffic Safety, Bridge Rails** *(Required)*
WB76-84
FHWA Item 036A
This code indicates whether or not the bridge railings meet current design standards as established by the AASHTO Standards Specifications for Highway Bridges. To meet current design standards, bridge railings must be capable of smoothly redirecting an impacting vehicle and meet current crash test standards. Factors which may affect this capability are bridge rail height, strength, type of material, and geometric design. See Figure WB76-84.

0 Does not meet currently acceptable standards or a feature is required but not provided.
1 Meets currently acceptable standards.
N Not applicable, or not required, such as a non-vehicular bridge.

rail_trans_adqcy **Traffic Safety, Transitions** *(Required)*
WB76-85
FHWA Item 036B

This rating indicates whether or not the transition between the bridge rail and the approach guardrail meets current design standards. See Figure WB76-87. To meet design standards, the transition must provide for the following:

- A gradual stiffening of the approach guardrail in a manner that will not cause sagging or pocketing due to vehicle impact.
- A firm attachment between the approach guardrail and the bridge by a WSDOT Type F anchor, a WSDOT Type 3 beam guardrail anchor, or extension of the concrete barrier.
- A gradual tapering out of the curb ends.

0 Does not meet currently acceptable standards or a feature is required but not provided.
1 Meets currently acceptable standards.
N Not applicable, or not required, such as a non-vehicular bridge.

aprch_rail_adqcy **Traffic Safety, Guardrails** *(Required)*
WB76-86
FHWA Item 036C

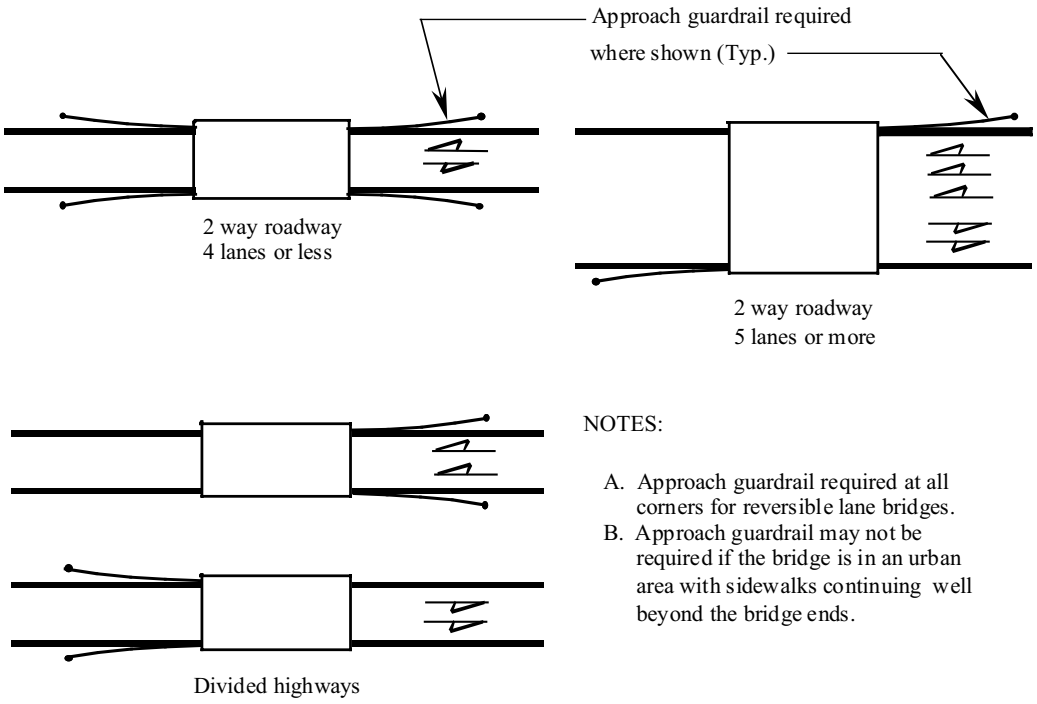
This rating indicates whether or not the approach guardrail meets current design standards. To meet standards, the approach guardrail should be of adequate length, height, and structural quality to shield motorists from bridge ends or from other hazards at the bridge site. Design standards are given in the *AASHTO Roadside Design Guide*. See Figure WB76-87.

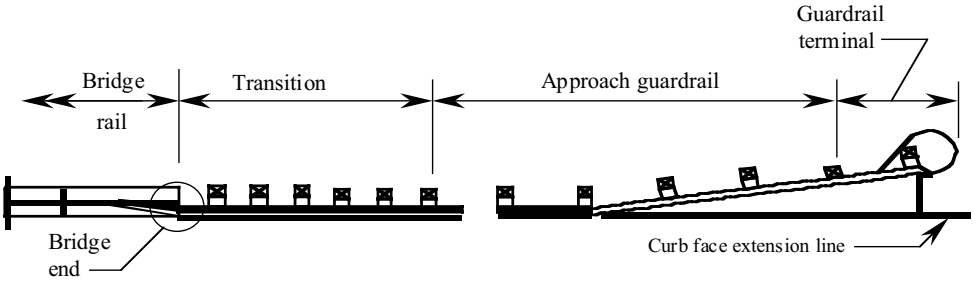
Ø Does not meet currently acceptable standards or a feature is required but not provided.
1 Meets currently acceptable standards.
N Not applicable, or not required, such as a non-vehicular bridge.

rail_end_adqcy **Traffic Safety, Terminals** *(Required)*
WB76-87
FHWA Item 036D

This code indicates whether or not the terminals (guardrail ends) meet current design standards. To meet standards, the terminals should either be flared, buried, shielded, or able to break away. Design standards for terminals are given in the *AASHTO Roadside Design Guide*. See Figure WB76-87.

Ø Does not meet currently acceptable standards or a feature is required but not provided.
1 Meets currently acceptable standards.
N Not applicable, or not required, such as a non-vehicular bridge.





Note: See Standard Plans Section C
for current standards.

Approach Rail Requirements
Figures WB76-84 through WB76-87

rating_calc_ **Rating** *(Optional)*
WB76-88 This code indicates whether or not the load ratings WB75-52 and WB75-55 need to be reviewed or calculated.

Y Yes, operating and/or inventory ratings need to be reviewed, or original ratings need to be established.
N No, operating and/or inventory ratings need not be reviewed.

repair_status_ **Repair Status** *(Optional)*
WB76-89 The inspector should code this field Y If there are recommended repairs.

- Y Recommended repair add to Bridge Repair List items.
- N No Recommended Repairs.

inspn_photo_ **Photographs** *(Optional)*
WB76-91 This code identifies the types of photographs to be taken during this inspection.

- D Take deck photographs.
- E Take elevation photographs.
- P Take both deck and elevation photographs.

Leave this field blank If photographs are not required. Use an asterisk to remove a code.

inspn_season_ **Season** *(Optional)*
WB76-92 This field specifies the time of year in which this bridge should be inspected, either summer, winter, or another seasonal inspection.

- L During low water
- S Summer
- W Winter
- B Outside bird nesting season
- F Outside fish windows
- K Call for utility

Use an asterisk to remove a code.

inspn_soundings_ **Soundings** *(Optional)*
WB76-93 This code indicates whether or not soundings of the streambed are required.

- Y Soundings should be taken.
- N Soundings need not be taken.

measure_clrnc_ **Clearances** *(Optional)*
WB76-94 This field identifies which clearances need to be checked on a bridge.

- C Measure both horizontal and vertical clearances.
- H Measure horizontal clearances.
- V Measure vertical clearances.

Leave this field blank If clearances are not required. Use an asterisk to remove a code.

monitor_structure_ **Monitor Structure** *(Optional)*
WB76-95 This field prompts the inspector to review comments from the previous inspection to identify what to monitor during an inspection.

- Y Yes
- N No

WB77

inspn_fracture_type Fracture Critical/UBIT Inspection, Type *(Required)*
WB77-32
FHWA Item 92A Code If a fracture critical inspection is required or whether an Under Bridge Inspection Truck (UBIT) is needed.

- U A Fracture Critical inspection is required (using a UBIT).
- Y A Fracture Critical inspection is required (without using a UBIT).
- I Requires UBIT for inspection, not Fracture Critical.
- N No Fracture Critical inspection is required.

fracture_inspn_freq Fracture Critical/UBIT Inspection, Frequency *(Required)*
WB77-33
FHWA Item 92A A two-digit code representing the number of months between consecutive fracture critical or UBIT inspections.

fracture_inspn_date Fracture Critical/UBIT Inspection Last Inspection Date *(Fatal)*
WB77-35
FHWA Item 93A The date on which the most recent fracture critical inspection was completed. Code this field in the mmddyyyy format.

fracture_inspn_hours Fracture Critical/UBIT Inspection Hours *(Required)*
WB77-43 The total number of inspection hours (to the nearest tenth of an hour) that the inspection team spent on the bridge during the most recent fracture critical/UBIT inspection. Use leading zeros.

fracture_inspr_initials Fracture Critical/UBIT Inspection Inspector (Optional)
WB77-47 The initials of the lead inspector of the inspection team who performed the most recent fracture critical/UBIT inspection.

fracture_cert_no Fracture Critical/UBIT Inspector Identification No *(Fatal)*
WB77-50 The certification number of the lead inspector at the bridge site during the most recent fracture critical /UBIT inspection.

fracture_co_inspr_initials Fracture Critical/UBIT Co-Inspector *(Optional)*
WB77-55 The initials of the individual who assisted the lead inspector in performing the most recent fracture critical /UBIT inspection.

inspn_underwater_type Underwater Inspection, Type *(Required)*
WB77-58
FHWA Item 92B The type of underwater inspection that is required for the bridge.

- D Underwater inspection with a diver (and fathometer, If necessary) is required.
- N No underwater inspection is required.
- O Other type of underwater inspection is required (submarine, ROV, etc.).
- W Underwater inspection w/o diver (wading) is required.

underwater_inspn_freq Underwater Inspection, Frequency *(Required)*
WB77-59
FHWA Item 92B A two-digit code representing the number of months between consecutive underwater inspections.

underwater_inspn_date Underwater Inspection Last Inspection Date *(Fatal)*
WB77-61
FHWA Item 93B The date on which the most recent underwater inspection was completed. Code this field in the mmddyyyy format.

underwater_inspn_hours Underwater Inspection Hours *(Optional)*
WB77-69 The total number of inspection hours (to the nearest tenth of an hour) that the inspection team spent at the bridge during the most recent underwater inspection. Use leading zeros.

underwater_inspr_initials Underwater Inspection Inspector *(Required)*
WB77-73 The initials of the lead inspector of the inspection team who performed the most recent underwater inspection.

underwater_cert_no Underwater Inspection Inspector Identification No *(Fatal)*
WB77-76 The certification number of the lead inspector at the bridge site during the most recent underwater inspection.

underwater_co_inspr_initials Underwater Inspection Co-Inspector *(Optional)*
WB77-81 The initials of the individual who assisted the lead inspector in performing the most recent underwater inspection.

inspn_special_type Other Special Inspections, Type *(Required)*
WB77-84
FHWA Item 92C This field identifies the type of special inspection that is required for the bridge.

1	Movable bridge.
2	Floating bridge.
3	Suspension bridge.
4	Redundant pin/hanger bridge.
5	Segmental.
6	Ferry terminal.
7	High strength steel bridge.
8	Bridges with temporary supports (require intermediate inspections).
9	Cable stayed.
Ø	Other special features.
N	No special inspection is required.

special_inspn_freq Special Inspection Frequency *(Required)*
WB77-85
FHWA Item 92C A two-digit code representing the number of months between consecutive special inspections.

special_inspn_date Special Inspection Date *(Fatal)*
WB77-87
FHWA Item 93C The date on which the most recent special inspection was completed. Code this field in the mmddyyyy format.

special_inspn_hours Special Inspection Hours *(Optional)*
WB77-95 The total number of inspection hours (to the nearest tenth of an hour) that the inspection team spent at the bridge during the most recent special inspection.

special_inspr_initials Other Special Inspector's Initials *(Required)*
WB77-99 The initials of the lead inspector of the inspection team who performed the most recent special inspection.

special_cert_no Other Special Inspector Certification No. *(Fatal)*
WB77-102 The certification number of the lead inspector at the bridge site during the most recent special inspection.

special_co_inspr_initials Other Special Co-Inspector's Initials *(Optional)*
WB77-107 The initials of the individual who assisted the lead inspector in performing the most recent special inspection.

WB78

water_type **Water Type** *(Required)*
WB78-32 This field describes the type of water the bridge crosses over.

- B Brackish (a mixture of fresh and salt water).
- F Fresh water.
- S Salt water.
- T Tidal.

Leave blank if not over water.

flood_plain_intrusion_ **Flood Plain Intrusion** *(Required)*
WB78-33 This code indicates whether or not the structure's approach roadway or abutment intrude into the flood plain of the waterway (i.e., whether or not previous or possible flooding could cause or has caused water to rise so it touches the structure's approach roadway embankment or abutment).

- A No intrusion into the flood plain.
- B Bridge or approaches intrude into the waterway causing minor backwater.
- C Overtopping of approach roadway has occurred.
- D A portion of the superstructure has been under water.
- U Flood plain intrusion is unknown.

Leave blank if not over water.

flood_control_ **Flood Control** *(Required)*
WB78-34 This field indicates If there is any existing type of flood control on the waterway the bridge crosses. To be considered, this flood control must be in place either upstream or downstream from the bridge and must be near enough to have an effect on the bridge. Flood control may be provided by dams, dikes, fill, or other means.

- B Both upstream and downstream.
- U Upstream.
- D Downstream.
- N No flood control.

Leave blank if not over water.

scour_history_ **Scour History** *(Required)*
WB78-35 This code describes scour conditions at the bridge site.

- C Current scour problems.
- H History of scour problems but scour conditions are now stable.
- N No history of scour.
- U Scour history is unknown.

Leave blank if not over water.

streambed_material_type Streambed Material Type *(Required)*

WB78-36 This code describes the composition of the streambed at the bridge site. Enter one of the following codes to indicate the predominant type of material that is evident.

1 Bedrock
2 Sediment
3 Gravel
4 Sand
5 Cobbles
6 Lined Canal
7 Vegetation
8 Alluvial Fan
9 Unknown

Leave blank if not over water.

substructure_stability_ Substructure Stability *(Required)*

WB78-37 This code describes the type of material upon which the bridge's substructure rests. This code is used to determine the degree of stability that can be expected in the bridge substructure.

Code the lower number value If different sections of a continuous span bridge are supported by different materials.

1 Spread footing, simple spans.
2 Spread footing, continuous spans.
3 Pile foundation, simple spans.
4 Pile foundation, continuous spans.
5 Bedrock, simple spans.
6 Bedrock, continuous spans.
7 Unknown, simple spans.
8 Unknown, continuous spans

Leave blank if not over water.

waterway_obstruction Waterway Obstruction *(Required)*

WB78-38 This code indicates any conditions in the waterway which affect the flow of water beneath the bridge.

A Debris accumulates at the bridge.
B Ice accumulates at the bridge.
C The waterway is overgrown with vegetation.
D A and C above.
E A and B above.
F B and C above.
G A, B, and C above.
N No obstruction to the flow of water beneath the bridge.

Leave blank if not over water.

streambed_stability_ Streambed Stability *(Required)*

WB78-39 This code describes any existing stream conditions which may influence scour at the bridge site.

- A Sharp bends.
- B Significant lateral shifts.
- C Steep slopes.
- D High water velocity.
- E Degradation.
- F Aggredation.
- G No conditions influencing scour exist.
- H Streambed conditions are unknown.

Leave blank if not over water.

streambed_anabranch_ Streambed Anabranch *(Required)*

WB78-40 This field indicates whether or not confluences or shifting anabranches are present in the waterway. A confluence is a flowing together of two or more streams. An anabranch is a river branch that re-enters the main stream, creating an island in the waterway.

Code only those conditions which exist near the bridge site.

- A Anabranches are present.
- B Both anabranches and confluences are present.
- C Confluences are present.
- N Neither anabranches nor confluences are present.
- U Waterway configuration is unknown.

Leave blank if not over water.

piers_in_waterway Piers in Water *(Required)*

WB78-41 This field contains the number of the structure's piers in the water at normal yearly high water.

If the bridge is inspected at low water, look for evidence that the piers or pile bents have been in the water.

- 0 No piers in the water.
- 1-9 Number of piers in the water.
- M More than nine piers in the water.

Leave blank if not over water.

prpsed_serv_on_code Proposed Improvement Service On *(Required)*

WB78-42 This field identifies the type of service to be carried on the proposed bridge.

1 Highway.
2 Railroad.
3 Pedestrian exclusively.
4 Highway and railroad.
5 Highway and pedestrian.
6 Overpass bridge at an interchange or second level of a multilevel interchange.
7 Third level of a multilevel interchange.
8 Fourth level of a multilevel interchange.
9 Building or plaza.
0 Other or Not Applicable.

The code Ø means "Other" only If there are proposed improvements. If there are no proposed improvements to the bridge, the code Ø means "not applicable."

prpsed_serv_under_code Proposed Improvement Service Under *(Required)*

WB78-43

This field identifies the type of service under the proposed bridge.

1 Highway, with or without pedestrian traffic.
2 Railroad.
3 Pedestrians exclusively.
4 Highway and railroad.
5 Waterway.
6 Highway and waterway.
7 Railroad and waterway.
8 Highway, waterway, and railroad.
9 Relief.
0 Other or Not Applicable

The code 0 means "Other" only If there are proposed improvements. If there are no proposed improvements to the bridge, the code 0 means "not applicable."

prpsed_work_type **Proposed Improvement Work Type** *(Required)*
WB78-44
FHWA Item 075A

This field identifies the type of work to be accomplished on the proposed improvement. The proposed work should improve the bridge to the degree that it can provide the type of service needed. This field must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. To be eligible, a bridge must carry highway traffic, be deficient and have a sufficiency rating of 80.0 or less.

- 31 Replacement of bridge because of substandard load-carrying capacity or substandard bridge roadway geometry.
- 32 Replacement of bridge because of relocation of road.
- 33 Widening of existing bridge without deck rehabilitation or replacement OR lengthening of a culvert.
- 34 Widening of existing bridge with deck rehabilitation or replacement.
- 35 Rehabilitation of bridge because of general structural deterioration or inadequate strength.
- 36 Rehabilitation of bridge deck with only incidental widening.
- 37 Replacement of bridge deck with only incidental widening.
- 38 Other structural work, includes hydraulic replacements.
- 00 If there are no proposed improvements to the bridge, the code 00 means "not applicable."

If there are no proposed improvements to the bridge, the code 00 means "not applicable."

prpsed_work_meth **Proposed Improvement Work Method** *(Required)*
WB78-46
FHWA Item 075B

This field indicates who will perform the work (as indicated in WB78-44) on the proposed improvement.

- 1 Work to be done by contract.
- 2 Work to be done by the agency which owns the bridge.

prpsed_length **Proposed Improvement Length** *(Required)*
WB78-47
FHWA Item 76

This field contains the length of the proposed improvement. The measurement is to the nearest foot. This should be a measurement of the proposed length of the bridge only, not the length of the project. (Do not include the length of approach guardrails.)

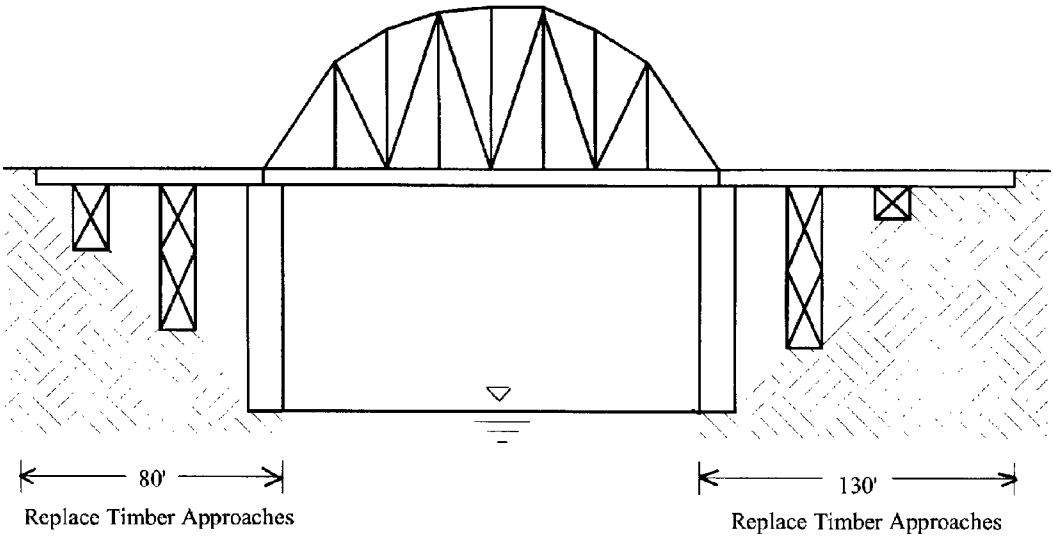
If only a portion of the bridge is to be rehabilitated or replaced, the improvement length is a measurement of the portion being improved only. If the entire bridge is being rehabilitated or replaced, the improvement length is measured from back to back of abutment backwalls or from pavement notch to pavement notch. See Figure WB78-47A.

If the bridge is a pipe or culvert, the improvement length is measured along the centerline of the barrel, regardless of pipe or culvert depth below grade. For pipes, code the total length of the pipe before ends have been mitered. This is not the length as is referenced in WB74-40. See Figure WB78-47B.

If the proposed improvement is to the substructure or channel beneath the bridge, code the length of the bridge directly over, or supported by, the substructure or channel.

This field must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program.

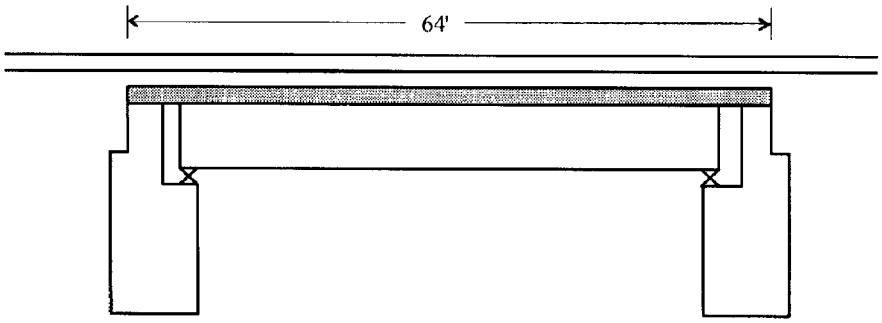
Example A



If the proposed improvement is to replace the timber approaches of both ends of the structure, the total length of improvement is:

80' + 130' = Code 000210

Example B

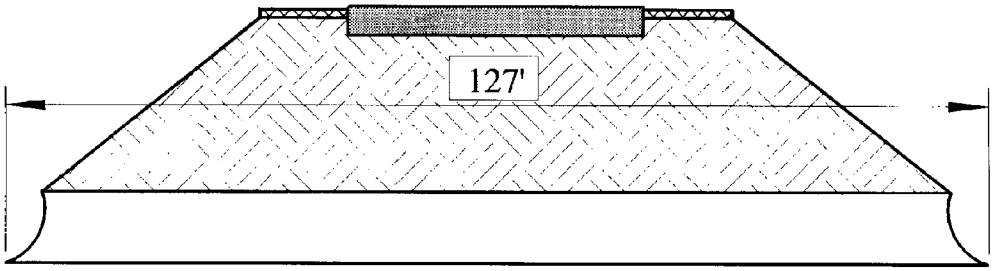


If the proposed improvement is to replace the entire structure, the total length of improvement is a measurement from paving notch to paving notch, or 64 feet , in the example above.

Code: 000064

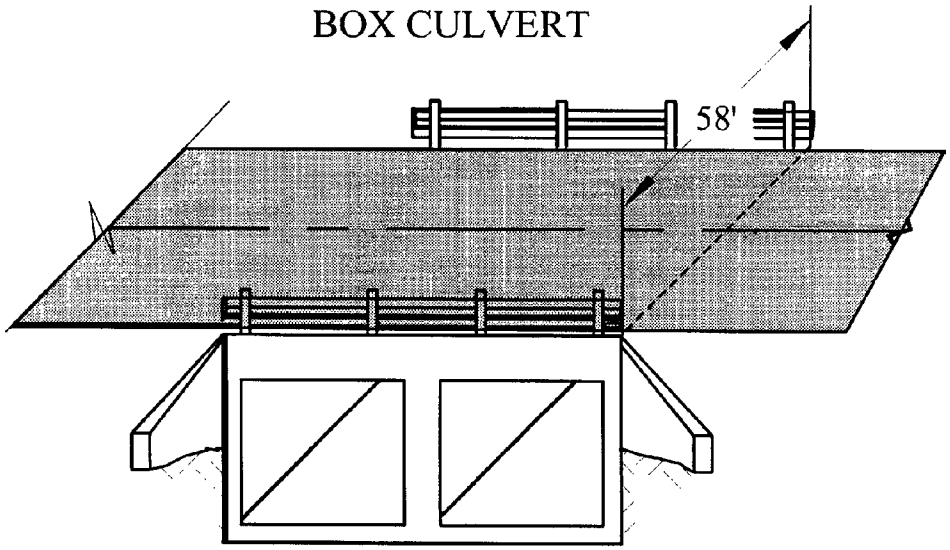
Figure WB78-47A

PIPE CULVERT
CROSS SECTION



If the proposed improvement is to replace a length of pipe, the total length of improvement is the length of the pipe (before ends have been mitered).
Code: 000127

BOX CULVERT



If the proposed improvement is to replace a box culvert, the total length of improvement is the length of the culvert between parapet walls.
Code: 000058

Figure WB78-47B

prpsed_roadway_width Proposed Improvement Roadway Width *(Required)*
WB78-53 This field contains the curb-to-curb width of the roadway on the proposed bridge. This measurement is coded to the nearest foot.

prpsed_lanes_on Proposed Improvement Lanes On *(Required)*
WB78-57 This field contains the number of through lanes the proposed bridge will carry.

prpsed_lanes_under Proposed Improvement Lanes Under *(Required)*
WB78-59 This field contains the number of lanes that will pass beneath the proposed bridge.

prpsed_total_cost Proposed Improvement Total Cost *(Required)*
WB78-61
FHWA Item 096 This field must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. This field contains the total cost of the proposed improvements in thousands of dollars. This value includes the bridge cost, the roadway cost, and all incidental costs normally associated with the proposed bridge improvement project. The total project cost will, therefore, usually be greater than the sum of the bridge and roadway costs.

If WB78-83 is coded N, the cost will not be automatically generated.

If no improvement is needed, code all zeroes.

Do not use this field to estimate maintenance costs.

prpsed_structure_cost Proposed Improvement Structure Cost *(Required)*
WB78-67
FHWA Item 094 This field must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. This field contains the estimated cost, in thousands of dollars, for the proposed bridge or major bridge improvements. This total should include only bridge construction costs.

It excludes any roadway, right of way, detour, demolition, preliminary engineering, maintenance, guardrail, or paving costs that are not part of the bridge cost.

If WB78-83 is coded N, the cost will not automatically be generated.

If no improvement is needed, code all zeroes.

prpsed_roadway_cost Proposed Improvement Roadway Cost *(Required)*
WB78-73
FHWA Item 095 This field contains the estimated cost, in thousands of dollars, for any proposed roadway improvements. This total includes all roadway construction costs, including guardrail and paving costs, but does not include bridge, right of way, detour, extensive roadway realignment, preliminary engineering, or maintenance costs.

If WB78-83 is coded N, the cost will not automatically be generated.

This field must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program.

prpsed_estimate_year **Proposed Improvement Estimate Year** *(Required)*
WB78-79
FHWA Item 097

This field contains the year in which the project cost estimates have been made. If this date is more than eight years old, the cost estimates entered in WB78-61, WB78-67, and WB78-73 must be revised and a new estimate year must be entered in this field.

prpsed_cost_calc_ **Proposed Improvement Calculation** *(Required)*
WB78-83

This field directs the WSBIS system to compute costs for any proposed bridge improvements.

If no improvements are proposed for the bridge, this field should be left blank.

- Y Yes, compute the replacement costs automatically.
- N No, do not automatically compute the replacement costs.

inspn_agency_id **Inspecting Agency** *(Optional)*
WB78-84

If the agency which owns the bridge does not have primary responsibility for inspecting it, this field describes the type of agency inspecting the bridge.

If the owner agency has primary responsibility for inspecting the bridge, leave this field blank, otherwise enter a code to indicate the type of agency inspecting the bridge.

When the agency which owns the bridge performs routine inspections on it and uses other agencies to perform special inspections (for example, a consultant performs underwater inspections), the primary responsibility for inspecting the bridge is still considered to rest with the owner agency. The field should be left blank. Use the following codes.

- 01 State Highway Agency
- 02 County Highway Agency
- 03 Town or Township Highway Agency
- 04 City or Municipal Highway Agency
- 11 State Park, Forest, or Reservation Agency
- 12 County Park, Forest, or Reservation Agency
- 13 City/Other Park, Forest, or Reservation Agency
- 21 Other State Agencies
- 24 Other County Agencies
- 25 Other City or Local Agencies
- 26 Private (Consultant)
- 27 Railroad
- 31 State Toll Authority
- 32 County Toll Authority
- 33 City or Other Toll Authority
- 60 Other Federal Agencies (not listed below)
- 61 Indian Tribal Government
- 62 Bureau of Indian Affairs
- 63 Bureau of Fish and Wildlife
- 64 U.S. Forest Service
- 66 National Park Service
- 68 Bureau of Land Management

69 Bureau of Reclamation
70 Corps of Engineers (Civilian)
71 Corps of Engineers (Military)
72 Air Force
73 Navy/Marines
74 Army
75 NASA
76 Metroplitan Washington Airport Services
80 Unknown
91 Canada
92 Idaho
93 Oregon

city_inspn_no **Inspecting Agency Number** *(Optional)*
WB78-86 If the agency which owns the bridge does not have primary responsibility for inspecting it, this field contains a code which indicates the entity which is performing the inspections.

Use the following criteria for determining the proper code to enter:

1 If the inspecting entity is a county, code that county's number in the first two field positions and leave the last two field positions blank.

2 If the inspecting agency is a city, code that city's four-digit number in the field.

3 If the inspecting entity is WSDOT or an agency outside Washington State, code all zeroes in the field.

If the owner agency is inspecting the bridge, leave this field blank

seismic_superstrctr_main_b **Seismic Status Superstructure Main Biennium** *(Optional)*
WB78-90 This field contains the biennium in which the superstructure main span group was fitted with seismic restraining devices.

Enter the beginning and ending years of the biennium. For example, code the 1997-1999 biennium as 9799.

Leave this field blank If the superstructure of the main span group has not been fitted with seismic restraining devices.

seismic_superstrctr_aprch_b **Seismic Status Superstructure Approach Biennium** *(Optional)*
WB78-94 This field contains the biennium in which the superstructure approach span group was fitted with seismic restraining devices.

Enter the beginning and ending years of the biennium. For example, code the 1997-1999 biennium as 9799.

Leave this field blank If either there are no approach spans or If the superstructure of the approach span group has not been fitted with seismic restraining devices.

seismic_substrctr_main_b Seismic Status Substructure Main Biennium *(Optional)*

WB78-98 This field contains the biennium in which the substructure main span group was fitted with seismic restraining devices.

Enter the beginning and ending years of the biennium. For example, code the 1997-1999 biennium as 9799.

Leave this field blank If the substructure of the main span group has not been fitted with seismic restraining devices.

seismic_substrctr_aprch_b Seismic Status Substructure Approach Biennium *(Optional)*

WB78-102 This field contains the biennium in which the substructure approach span group was fitted with seismic restraining devices.

Enter the beginning and ending years of the biennium. For example, code the 1997–1999 biennium as 9799.

Leave this field blank If either there are no approach spans or If the substructure of the approach span group has not been fitted with seismic restraining devices.

Edit Process

The WSBIS system has been designed so that various checks of the coded values are made before the form is processed and the information stored in WSBIS. These edit checks are made each time information is added or updated. There are four different types of edit checks performed and each is described below.

A. Valid Range Edits

Each field is edited to see If a complete entry was made and whether the coded values fall within the acceptable range of values for that field. For example, acceptable values for SECTION (WB71-81) are the numbers Ø1 through 36. The number 42, therefore, is an invalid entry in this field.

When a valid range error is found during processing, the error is underlined in the field and asterisks are printed in the Card Indicator Box corresponding to that field. (Card WB71 in the example above). These errors should be corrected and the form resubmitted. Refer to the VALID RANGE EDITS table on the following pages for a listing of valid values for each field.

B. Fatal Field Edits

Certain fields are considered critical and must contain acceptable values for information to be added or updated on the form. These are called Fatal Fields. For example, COUNTY NUMBER is considered a Fatal Field. Therefore, an acceptable value (a number between Ø1 and 39) must be coded in the field.

If a Fatal Field error is found when data is first being added, the inventory record will not be created. When a Fatal Field error is found as the form is being updated, the original data will be left in the field and an error message will be displayed. Refer to the FATAL FIELD EDITS table on the following pages for a list of Fatal Fields, and the field descriptions.

C. Dependency Edits

Certain fields are cross-checked against each other to confirm compatibility of codes in related fields. For example, If the MAXIMUM SPAN LENGTH has been coded ØØ78, then the BRIDGE LENGTH (WB73-40) must be coded as greater than ØØ78 (since the total length of the structure is usually greater than the length of the maximum span). Similarly, If NAVIGATION CONTROL (WB73-86) has been coded 1 (to indicate that navigation control exists) then NAVIGATION VERTICAL CLEARANCE and NAVIGATION HORIZONTAL CLEARANCE must be coded with values greater than Ø (since a navigable channel must have some vertical and horizontal clearance).

When a dependency error is found during processing of the form, the problematic fields are marked and an error message code is printed at the top of the form. These messages are preceded by the letter E and indicate the source of the problem. For a listing of the error codes which may appear on the form and what each means, refer to the ERROR CODES table on the following pages.

D. Logical Edits

Values coded in certain fields are checked to see If they are reasonable. For example, for the MINIMUM VERTICAL CLEARANCE UNDER BRIDGE (WB73-74) to be coded at 8 feet, would be questionable. Values coded in certain fields are also checked against other values to see If a reasonable relationship exists between two fields. For example, If YEAR BUILT (WB73-32) has been coded to show that the bridge has been built in the past five years, it would be unreasonable for the DECK CONDITION OVERALL to be coded Ø through 4 (how could a five year old bridge deck be in such deteriorated condition?)

When logical coding errors are found during the processing of the form, the problematic fields are marked and an error message code is printed at the top of the form. These messages are preceded either by the letter R or the letter L and indicate the source of the problem. For a listing of error codes which may appear on the form and what each means, refer to the ERROR CODES table on the following pages.

Error Codes

E400 One of the following conditions is true:

- **National Highway System (WB74-83)** is coded "1" *and* **Highway Class (WB74-33)** is in the range "4" through "8"

  OR

- **National Highway System (WB74-83)** is not coded "1" *and* **Highway Class (WB74-33)** is coded "1"

E401 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* one of the following conditions is true:

- **Lanes On (WB73-52)** is greater than "/ØØ" *and* **Service On (WB75-44)** is coded "Ø", "2", "3", or "9"

  OR

- **Lanes On (WB73-52)** is coded "/ØØ" *and* **Service On (WB75-44)** code is coded "1" or is in the range "4" through "8"

E402 One of the following conditions is true:

- **Lanes Under (WB73-54)** is greater than "/ØØ" *and* **Service Under (WB75-45)** is not "1", "4", "6", or "8"

  OR

- **Lanes Under (WB73-54)** is coded "/ØØ" *and* **Service Under (WB75-45)** is not "2", "3", "5", "7", "9", or "Ø"

E403 One of the following conditions is true:

- **National Highway System (WB74-83)** is coded "Ø" *and* **Federal Functional Classification (WB74-87)** is coded "Ø1", "Ø2", "11", "12", or "14")

  OR

- **National Highway System (WB74-83)** is coded "1" *and* **Federal Functional Classification (WB74-87)** is coded "Ø6", "Ø7", "Ø8", "Ø9", "16", "17", or "19"

E404 **Deck Geometry (WB76-58)** is coded in the range "Ø" through "5" *and* one of the following conditions is true:

- **Year Built (WB73-32)** is within 10 years of current year

  OR

- **Year Rebuilt (WB73-36)** is within 10 years of current year

E405 If **Year Rebuilt (WB73-36)** > ' ØØØØ' *and* **Year Rebuilt (WB73-36)** is earlier than **Year Built (WB73-32)**

E406 **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "5" *and* one of the following conditions is true:

- **Year Built (WB73-32)** is within 10 years of current year

  OR

- **Year Rebuilt (WB73-36)** is within 10 years of current year

E407 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Lanes Under (WB73-54)** is coded "/ØØ"

E408 **On/Under (WB74-32)** is coded "1" *and* one of the following conditions is true:

- **Navigation Control (WB73-86)** is coded "1" *and* **Navigation Horizontal Clearance (WB73-90)** is coded " ØØØØ"

  OR

- **Navigation Control (WB73-86)** is coded "Ø" or "N" *and* **Navigation Horizontal Clearance (WB73-90)** is greater than " ØØØØ"

E409 **On/Under (WB74-32)** is coded "1" *and* one of the following conditions is true:

- **Navigation Control (WB73-86)** is coded "1" *and* **Navigation Vertical Clearance (WB73-87)** is coded " ØØØØ"

  OR

- **Navigation Control (WB73-86)** is coded "Ø" or "N" *and* **Navigation Vertical Clearance (WB73-87)** is greater than "ØØØØ"

E410 **Maximum Span Length (WB73-48)** is greater than **Bridge Length (WB73-40)**

E411 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "3" *and* none of the following are true:

- **Service Under (WB75-45)** is coded "1" or "6" *and* **Minimum Vertical Clearance Under Bridge (WB73-74)** is less than 15 feet *and* **STRAHNET (WB74-85)** is coded "2"

  OR

- **Service Under (WB75-45)** is coded "1" or "6" *and* **Minimum Vertical Clearance Under Bridge (WB73-74)** is less than 14 feet *and* **STRAHNET (WB74-85)** is coded "Ø" or "1"

  OR

- **Service Under (WB75-45)** is coded "2", "4", "7", or "8" *and* **Minimum Vertical Clearance Under Bridge (WB73-74)** is less than 20 feet

  OR

- **Service Under (WB75-45)** is coded "Ø", "3", "5", or "9"

E412 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "3" *and* **Service Under (WB75-45)** is coded "2", "4", "7", or "8" *and* the lesser of **Horizontal Clearance Route Direction (WB74-91)** *and* **Horizontal Clearance Reverse Direction (WB74-95)** is less than 8 feet.

E415 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "3" *and* **Service Under (WB75-45)** is coded "1", "4", "6", or "8" *and* **Median (WB72-91)** is greater than "Ø" *and* either of the following is false:

- **ADT (WB74-45)** is greater than 249 *and* less than 999999 *and* **Minimum Lateral Underclearance Left (WB73-83)** is less than 2 feet

  OR

- **ADT (WB74-45)** is less than 25Ø or equal to 999999 *and* **Minimum Lateral Underclearance Left (WB73-83)** is less than 1′Ø6″

E416 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "3" *and* **Minimum Lateral Underclearance Right Code (WB73-82)** is "H" *and* one of the following is false:

- **ADT (WB74-45)** is greater than 249 *and* less than 999999 *and* **Minimum Lateral Underclearance Right (WB73-79)** is less than 6 feet

  OR

- **ADT (WB74-45)** is less than 25Ø or equal to 999999 *and* **Minimum Lateral Underclearance Right (WB73-79)** is less than 4′ Ø6″

E417 **STRAHNET (WB74-85)** is coded "1" or "2" *and* **Horizontal Clearance Route Direction (WB74-91)** is zero *and* **Horizontal Clearance Reverse Direction (WB74-95)** is zero

E418 **STRAHNET (WB74-85)** is coded "1" or "2" and **Latitude (WB71-88)** is not within range

E419 **STRAHNET (WB74-85)** is coded "1" or "2" *and* **Longitude (WB71-96)** is not within range

E420 **Curb to Curb Width (WB73-56)** is coded "ØØØØ" *and* **Main Span Design (WB75-33)** does not equal "19"

E421 **Out to Out Deck Width (WB73-60)** is coded "ØØØØ" *and* **Main Span Design (WB75-33)** does not equal "19"

E422 One of the following conditions is true:

- **Main Span Design (WB75-33)** is coded "19" *and* **Deck Overall (WB76-63)** is in the range "Ø" through "8"

  OR

- **Main Span Design (WB75-33)** is not coded "19" *and* **Deck Overall (WB76-63)** is coded "9"

E423 One of the following conditions is true:

- **Main Span Design (WB75-33)** is coded "19" *and* **Superstructure Overall (WB76-71)** is in the range "Ø" through "8"

  OR

- **Main Span Design (WB75-33)** is not coded "19" *and* **Superstructure Overall (WB76-71)** is coded "9"

E424 One of the following conditions is true:

- **Main Span Design (WB75-33)** is coded "19" *and* **Substructure Overall (WB76-76)** is in the range "Ø" through "8"

  OR

- **Main Span Design (WB75-33)** is not coded "19" *and* **Substructure Overall (WB76-76)** is coded "9"

E425 One of the following conditions is true:

- **Main Span Design (WB75-33)** is coded "19" *and* **Culvert (WB76-78)** is coded "9"

  OR

- **Main Span Design (WB75-33)** is not coded "19" *and* **Culvert (WB76-78)** is in the range "Ø" through "8"

E426 **Open Closed (WB72-93)** is coded "E" or "K" *and* **Operating Rating Tons (WB75-52)** is greater than zero

E427 **Open Closed (WB72-93)** is coded "E" or "K" *and* **Inventory Rating Tons (WB75-55)** is greater than zero

E428 **Proposed Improvements Total Cost (WB78-61)** is less than the sum of **Proposed Improvements Structure Cost (WB78-67)** *plus* **Proposed Improvements Roadway Cost (WB78-73)**

E429 **Proposed Improvements Estimate Year (WB78-79)** is greater than "ØØØØ" *and* one of the following conditions is true:

- **Proposed Improvements Structure Cost (WB78-67)** is zero

  OR

- **Proposed Improvements Roadway Cost (WB78-73)** is zero

  OR

- **Proposed Improvements Total Cost (WB78-61)** is zero

E430 **Main Span Design (WB75-33)** is coded "15" *and* **Vertical Lift Minimum Clearance (WB73-94)** is blank

E431 **ADT (WB74-45)** is greater than 1ØØ *and* **Truck ADT Percent (WB74-51)** is blank

E432 **NBIS Length (WB73-46)** is greater than or equal to 2Ø feet *and* **Bridge Length (WB73-40)** is less than 2Ø feet

E433 One of the following conditions is not met:

- **Border State Code (WB75-85)** = spaces *and* **Border State Percent (WB75-88)** = spaces *and* **Border State Structure Identifier (WB75-90)** = spaces

  OR

- **Border State Code (WB75-85)** not = spaces *and* **Border State Percent (WB75-88)** not = spaces *and* **Border State Structure Identifier (WB75-90)** not = spaces

E437 Sufficiency Rating is less than or equal to 8 Ø. ØØ *and* the Deficient Obsolete Status is "1" (SD) or "2" (FO) *and* one or more of the following fields are coded zero:

- **Proposed Improvement Work Type (WB78-44)**
- **Proposed Improvement Work Method (WB78-46)**
- **Proposed Improvement Structure Improvement Length (WB78-47)**
- **Proposed Improvement Structure Cost (WB78-67)**
- **Proposed Improvement Roadway Cost (WB78-73)**
- **Proposed Improvement Total Cost (WB78-61)**

E450 **On/Under (WB74-32)** is coded "1" *and* **Lanes On (WB73-52)** is coded "/ØØ"

E451 **On/Under (WB74-32)** is coded "1" and **Service On (WB75-44)** is coded "Ø", "2", "3", or "9"

E452 **On/Under (WB74-32)** is coded "2" or is in the range "A" through "Z" *and* **Service Under (WB75-45)** is coded "Ø", "2", "3", "5", "7", or "9"

E453 **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "8" *and* **Service Under (WB75-45)** is coded "Ø", "3", "5", or "9"

E454 **Waterway Adequacy (WB76-62)** is in the range "Ø" through "8" *and* **Service Under (WB75-45)** is coded "1", "2", "3", or "4"

E455 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Substructure Stability (WB78-37)** is blank

E456 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Flood Control (WB78-34)** is blank

E457 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Flood Plain Intrusion (WB78-33)** is blank

E459 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Piers in Water (WB78-41)** is blank

E460 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Scour (WB76-80)** is "N" or blank

E461 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Waterway Obstruction (WB78-38)** is blank

E462 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Streambed Anabranch (WB78-40)** is blank

E463 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Streambed Material (WB78-36)** is blank

E464 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Scour History (WB78-35)** is blank

E465 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Streambed Stability (WB78-39)** is blank

E466 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Channel Protection (WB76-77)** is coded "9"

E467 **Service Under (WB75-45)** is in the range "5" through "9" *and* **Water Type (WB78-32)** is blank

E468 One of the following conditions is true:

- **Navigation Control (WB73-86)** is coded "1" *and* **Pier / Abutment (WB76-79)** is coded "N" or blank

  OR

- **Navigation Control (WB73-86)** is coded "N" *and* **Pier / Abutment (WB76-79)** is in the range "1" through "5"

E470 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Substructure Stability (WB78-37)** is not blank

E471 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Flood Control (WB78-34)** is not blank

E472 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Flood Plain Intrusion (WB78-33)** is not blank

E473 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Navigation Control (WB73-86)** is coded "Ø" or "1"

E474 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Navigation Horizontal Clearance** is greater than zero

E475 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Navigation Vertical Clearance** is greater than zero

E476 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Pier / Abutment (WB76-79)** is in the range "1" through "5"

E477 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Piers in Water (WB78-41)** is not blank

E478 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Channel Protection (WB76-77)** is in the range "Ø" through "8"

E479 One of the following conditions is true:

- **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Scour (WB76-80)** is coded "U" or "T" or in the range "Ø" through "9")

  OR

- **Service Under (WB75-45)** is in the range "5" through "9" *and* **Scour (WB76-80)** is coded "N"

E480 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Waterway Obstruction (WB78-38)** is not blank

E481 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Streambed Anabranch (WB78-40)** is not blank

E482 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Streambed Material (WB78-36)** is not blank

E483 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Scour History (WB78-35)** is not blank

E484 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Streambed Stability (WB78-39)** is not blank

E485 **Service Under (WB75-45)** is in the range "1" through "4" or "Ø" *and* **Water Type (WB78-32)** is not blank

E489 **Curb to Curb Width (WB73-56)** is greater than **Out to Out Deck Width (WB73-60)**

E490 **Inventory Rating Tons (WB75-55)** is greater than **Operating Rating Tons (WB75-52)**

E491 **Superstructure Overall (WB76-71)** is coded "Ø" or "1" *and* **Open Closed (WB72-93)** is not coded "D", "E", or "K"

E492 **Substructure Overall (WB76-76)** is coded "Ø" or "1" *and* **Open Closed (WB72-93)** is not coded "D", "E", or "K"

E493 **Culvert (WB76-78)** is coded "Ø" or "1" *and* **Open Closed (WB72-93)** is not coded "D", "E", or "K"

E494 One of the following conditions is true:

- **Temporary Structure (WB72-89)** is coded "T" *and* **Open Closed (WB72 93)** is not coded "D", "E", or "P"

  OR

- **Open Closed (WB72-93)** is coded "D" or "E" *and* **Temporary Structure (WB72-89)** is not coded "T"

E495 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Estimate Year (WB78-79)** is coded zero or is blank

E496 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Lanes On (WB73-52)** is coded zero or is blank

E497 **Proposed Improvements Work Type (WB78-44)** greater than "/ØØ" *and* **Proposed Improvements Structure Improvement Length (WB78-47)** is coded zero or is blank

E499 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Roadway Width (WB78-53)** is coded zero or is blank

E500 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Service On (WB75-44)** is coded zero or is blank

E501 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Structure Cost (WB78-67)** is coded zero or is blank

E502 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Total Cost (WB78-61)** is coded zero or blank

E504 **Proposed Improvements Work Type (WB78-44)** is greater than "/ØØ" *and* **Proposed Improvements Work Method (WB78-46)** is coded zero or is blank

E507 One of the following conditions is true:

- **Inspecting Agency Code (WB78-84)** is in the group ("Ø1", "11", "21", "26", "27", "31", "62", "63", "64", "66" thru "71", or "8Ø") *and* **Inspecting Agency Number (WB78-86)** does not = spaces

  OR

- **Inspecting Agency Code (WB78-84)** is in the group ("Ø2", "12", "24", or "32") *and* **Inspecting Agency Number (WB78-86)** is not in County Table

  OR

- **Inspecting Agency Code (WB78-84)** is in the group ("Ø3", "Ø4", "13", "25", or "33") *and* **Inspecting Agency Number (WB78-86)** is not in City Table

E511 One of the following conditions is true:

- **Base Highway Network (WB74-84)** = "1" *and* Linear **Referencing System Route (WB74-67)** *and* **Linear Referencing System Sub Route (WB74-77)** are not coded

  OR

- **Base Highway Network (WB74-84)** = "Ø" *and* Linear **Referencing System Route (WB74-67)** is coded or **Linear Referencing System Sub Route (WB74-77)** is coded

E512 **Base Highway Network (WB74-84)** is coded "1" *and* **Federal Functional Classification (WB74-87)** is not coded "Ø1", "Ø2", "Ø6", "11", "12", or "14"

E513 **Lanes On (WB73-52)** is coded "1" *and* **Lane Use Direction (WB74-90)** is not coded "1" or "5"

E515 **On/Under (WB74-32)** is coded "2" or in the range "A" through "Z" *and* **Lanes Under (WB73-54)** is coded "1" *and* **Lane Use Direction (WB74-90)** is not coded "1" or "5"

E516 One of the following conditions is true:

- **Lanes On (WB73-52)** is coded "/ØØ" *and* **Service On (WB75-44)** not = "Ø", "2", "3", or "9"

  OR

- **Lanes On (WB73-52)** is greater than "/ØØ" *and* **Service On (WB75-44)** is coded "Ø", "2", "3", or "9"

E603 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Curb Condition (WB76-72)** is blank

E605 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Sidewalk Condition (WB76-73)** is blank

E613 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Paint Condition (WB76-74)** is blank

E616 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Pier Protection (WB76-83)** is blank

E617 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Number of Utilities (WB76-75)** is blank

E618 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Scaling Severity (WB76-66)** is blank

E619 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Scaling Percent (WB76-67)** is blank

E620 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Deck Rutting (WB76-69)** is blank

E621 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Exposed Reinforcing Steel (WB76-70)** is blank

E622 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Drain Condition (WB76-64)** is blank

E623 **Owner (Control Field)** is coded "Ø1" *and* **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Retaining Walls (WB76-82)** is blank

E630 One of the following conditions is true

- **Lane Use Direction (WB74-90)** is coded "Ø" *and* **Lanes On (WB73-52)** is greater than zero

  OR

- **On/Under (WB74-32)** is coded "1" *and* **Lane Use Direction (WB74-90)** is in the range "1" through "5" *and* **Lanes On (WB73-52)** is equal to zero

L007 **Future ADT (WB74-57)** is greater than 2ØØ,ØØØ

L008 **Future ADT Year (WB74-63)** is not in the range of 17 to 23 years in the future

L009 **ADT (WB74-45)** is greater than 2ØØ,ØØØ

L010 **Truck ADT Percent (WB74-51)** is greater than 4Ø

L011 **ADT Year (WB74-53)** is more than 4 years old

L012 **Alignment Adequacy (WB76-61)** is coded "Ø" or "1"

L047 **Channel Protection (WB76-77)** is coded "Ø" or "1"

L085 **Deck Geometry (WB76-58)** is coded "Ø" or "1"

L092 **Deck Overall (WB76-63)** is coded "Ø" or "1"

L132 One of the following conditions is true:

- **Main Span Design (WB75-33)** is coded "/ØØ"

OR

- **Main Span Material (WB75-32)** is coded "Ø"

L158 **Horizontal Clearance Reverse Direction (WB74-95)** is less than 8 feet

L159 **Horizontal Clearance Route Direction (WB74-91)** is less than 8 feet

L163 **Routine Inspection Frequency (WB76-32)** is greater than 24 months

L183 **Lanes On (WB73-52)** is greater than 14

L184 **Lanes Under (WB73-54)** is greater than 2 Ø

L185 **Routine Inspection Last Inspection Date (WB76-34)** is more than three years old

L210 **Maximum Span Length (WB73-48)** is greater than 984 feet

L223 **Minimum Vertical Clearance Under Bridge (WB73-74)** is greater than zero *and* less than 7 feet

L228 **Navigation Horizontal Clearance (WB73-90)** is greater than 984 ft.

L229 **Navigation Vertical Clearance (WB73-87)** is greater than 25Ø feet.

L231 **Proposed Improvements Estimate Year (WB78-79)** is more than 8 years old

L232 **Number of Main Spans (WB75-38)** is greater than 5Ø

L233 **Number of Approach Spans (WB75-41)** is greater than 5Ø

L318 **Operating Level (WB76-60)** is coded "Ø" or "1"

L321 **Sidewalk Curb Left (WB73-64)** is greater than 12 feet

L322 **Sidewalk Curb Right (WB73-67)** is greater than 12 feet

L339 **Bridge Length (WB73-40)** is greater than 3937 feet

L341 **Structural Adequacy (WB76-57)** is coded "Ø" or "1"

L368 **Underclearance Adequacy (WB76-59)** is coded "Ø" or "1"

L378 **Maximum Vertical Clearance Route Direction (WB74-99)** is less than 8 feet

L382 **Waterway Adequacy (WB76-62)** is coded "Ø" or "1"

R700 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Deck Overall (WB76-63)** is less than 5

R701 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Superstructure Overall (WB76-71)** is less than 5

R702 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Substructure Overall (WB76-76)** is less than 5

R703 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Channel Protection (WB76-77)** is less than 5

R704 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Culvert (WB76-78)** is less than 5

R705 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Structural Adequacy (WB76-57)** is less than 5

R706 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Deck Geometry (WB76-58)** is less than 5

R707 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Underclearance Adequacy (WB76-59)** is less 5

R708 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Operating Level (WB76-60)** is less than 5

R709 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Waterway Adequacy (WB76-62)** is less than 5

R710 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Alignment Adequacy (WB76-61)** is less than 5

R711 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Inventory Rating Tons (WB75-55)** is less than 2Ø tons

R712 **On/Under (WB74-32)** is coded "1" *and* **Year Built (WB73-32)** is within the last 5 years *and* **Operating Rating Tons (WB75-52)** is less than 2Ø tons

R713 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Deck Overall (WB76-63)** is in the range "Ø" through "5"

R714 **On/Under (WB74-32)** is code d "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Superstructure Overall (WB76-71)** is in the range "Ø" through "4"

R715 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Substructure Overall (WB76-76)** is in the range "Ø" through "4"

R716 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Channel Protection (WB76-77)** is in the range "Ø" through "4"

R717 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Culvert (WB76-78)** is in the range "Ø" through "4"

R718 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Structural Adequacy (WB76-57)** is in the range "Ø" through "4"

R719 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Deck Geometry (WB76-58)** is in the range "Ø" through "4"

R720 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Underclearance Adequacy (WB76-59)** is in the range "Ø" through "4"

R721 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Operating Level (WB76-60)** is in the range "Ø" through "4"

R722 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Waterway Adequacy (WB76-62)** is in the range "Ø" through "4"

R723 **On/Under (WB74-32)** is coded "1" *and* **Year Rebuilt (WB73-36)** is within 5 years *and* **Alignment Adequacy (WB76-61)** is in the range "Ø" through "4"

R727 **Median (WB72-91)** is coded "Ø", or in the range "2" through "7", or "9" *and* **Minimum Lateral Underclearance Left (WB73-83)** is coded 99.9

R729 **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Approach Roadway Width (WB73-97)** is less than 8 feet

R730 **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Curb to Curb Width (WB73-56)** is less than 9 feet

R731 **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Out to Out Deck Width (WB73-60)** is less than 9 feet

R732 **Service On (WB75-44)** is coded "1" or is in the range "4" through "8" *and* **Minimum Vertical Clearance Over Deck (WB73-70)** is less than 7 feet

R733 **Service Under (WB75-45)** is coded "1", "2", "4", "6", "7" or "8" *and* **Minimum Vertical Clearance Under Bridge (WB73-74)** is zero

R736 **Main Span Design (WB75-33)** is in the range "/ØØ" through "18", or "21", or "22" *and* **Curb to Curb Width (WB73-56)** is between Ø *and* 9 feet or between 15Ø feet *and* 999 feet

R737 **Main Span Design (WB75-33)** is in the range "/ØØ" through "18", or "21", or "22" *and* **Out to Out Deck Width (WB73-60)** is between Ø *and* 9 feet or between 15Ø feet *and* 999 feet.

R738 **Bridge Length (WB73-40)** is between 19 feet *and* 23 feet *and* **NBIS Length (WB73-46)** is blank

R742 **Open Closed (WB72-93)** is coded "A" *and* **Superstructure Overall (WB76-71)** is in the range "Ø" through "4"

R743 **Open Closed (WB72-93)** is coded "A" *and* **Substructure Overall (WB76-76)** is in the range "Ø" through "4"

R744 **Open Closed (WB72-93)** is coded "A" *and* **Culvert (WB76-78)** is in the range "Ø" through "4"

R745 **Open Closed (WB72-93)** is coded "A" *and* **Superstructure Overall (WB76-71)** is greater than "4" *and* **Substructure Overall (WB76-76)** is greater than "4" *and* **Culvert (WB76-78)** is greater than "4" *and* **Operating Rating Tons (WB75-52)** is greater than 36 tons *and* **Structural Adequacy (WB76-57)** is in the range "Ø" through "3"

R746 **Open Closed (WB72-93)** is coded "A" *and* **Operating Level (WB76-60)** is in the range "Ø" through "4"

R747 **On/Under (WB74-32)** is coded "1" *and* **Operating Rating Tons (WB75-52)** is coded zero *and* **Open Closed (WB72-93)** is not coded "K" *and* **Temporary Structure (WB72-89)** is blank

R762 **Routine Inspection Last Inspection Date (WB76-34)** is less than the current date minus **Routine Inspection Frequency (WB76-32)**

R763 **Curb to Curb Width (WB73-56)** does not equal zero *and* **Lanes On (WB73-52)** is greater than 3 *and* **Approach Roadway Width (WB73-97)** is greater than 1.5 times **Curb to Curb Width (WB73-56)**

R764 **Curb to Curb Width (WB73-56)** does not equal zero *and* **Lanes On (WB73-52)** is less or equal to 3 *and* **Approach Roadway Width (WB73-97)** is greater than or equal to 2 times **Curb to Curb Width (WB73-56)**

R765 **Open Closed (WB72-93)** is coded "B", "D", "E", "P" or "R" *and* **Routine Inspection Frequency (WB76-32)** is not less than 24 months

R766 **Open Closed (WB72-93)** is not coded "D", "E", or "K" *and* any of the following fields is coded "Ø" *and* all others of this group are coded "2" or greater

- **Deck Overall (WB76-63)**
- **Superstructure Overall (WB76-71)**
- **Substructure Overall (WB76-76)**
- **Culvert (WB76-78)**
- **Structural Adequacy (WB76-57)**
- **Deck Geometry (WB76-58)**
- **Underclearance Adequacy (WB76-59)**
- **Waterway Adequacy (WB76-62)**

R767 **Operating Level (WB76-60)** is coded "5" *and* **Superstructure Overall (WB76-71)** is coded "Ø", "1", "2", or "3"

R768 **Operating Level (WB76-60)** is coded "5" *and* **Substructure Overall (WB76-76)** is coded "Ø", "1", "2", or "3"

R769 **Operating Level (WB76-60)** is coded "5" *and* **Culvert (WB76-78)** is coded "Ø", "1", "2", or "3"

R770 **Fracture Critical/UBIT Inspection Type (WB77-32)** is not coded "N" *and* Fracture **Critical/UBIT Inspection Frequency (WB77-33)** is greater than "/ØØ" *and* **Fracture Critical/UBIT Inspection Last Inspection Date (WB77-35)** is older than current date minus the Fracture **Critical/UBIT Inspection Frequency (WB77-33)**

R771 **Underwater Inspection Type (WB77-58)** is not coded "N" *and* **Underwater Inspection Frequency (WB77-59)** is greater than "/ØØ" *and* **Underwater Inspection Last Inspection Date (WB77-61)** is older than current date minus the **Underwater Inspection Frequency (WB77-59)**

R772 **Other Special Inspection Type (WB77-84)** is not coded "N" *and* **Other Special Inspection Frequency (WB77-85)** is greater than "/ØØ" *and* **Other Special Inspection Last Inspection Date (WB77-87)** is older than current date minus the **Other Special Inspection Frequency (WB77-85)**

R773 **Future ADT (WB74-57)** is less than four-tenths **ADT (WB74-45)**

R774 **Future ADT (WB74-57)** is greater than 4 times **ADT (WB74-45)**

R775 **Minimum Vertical Clearance Under Bridge (WB73-74)** is coded "R" *and* **Minimum Vertical Clearance Under Bridge (WB73-74)** is less than 15′ Ø9″

R776 **Minimum Lateral Underclearance Right (WB73-79)** is coded "R" *and* **Minimum Lateral Underclearance Right (WB73-79)** is less than 4¢11″

R777 **Curb to Curb Width (WB73-56)** is less than 16′ /ØØ″ *and* **Lanes On (WB73-52)** is greater than 1

R778 The following conditions are not met:

- **Curb to Curb Width (WB73-56)** is greater than 16′ /ØØ″ *and*
- **Lanes On (WB73-52)** is 2 or greater *and*
- **Service Level (WB74-34)** is not coded "7"

R779 **Curb to Curb Width (WB73-56)** is less than half of **Out to Out Deck Width (WB73-60)**

R780 One of the following conditions is true:

- **National Highway System (WB74-83)** is coded "1" *and* **Federal Functional Classification (WB74-87)** is not coded "Ø1", "Ø2", "11", "12", *and* "14"

  OR

- **National Highway System (WB74-83)** is coded "Ø" *and* **Federal Functional Classification (WB74-87)** is not coded "Ø6", "Ø7", "Ø8", "Ø9", "16", "17", and "19"

R781 **National Highway System (WB74-83)** is coded "1" *and* **Highway Class (WB74-33)** is coded "2" or "3"

Appendix

2-A Half Bridges

Forms

WSBIS Inventory Coding Form

Washington State Legislative Districts Map

Appendix 2.06-E WSDOT BMS to NBE Translation

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
12	Concrete Deck (See Note 9)	SF			intentionally blank	
8217	Concrete Deck (See Note 9)	SF			intentionally blank	
14	Fully Supported Concrete Deck (See Note 9)	SF			intentionally blank	
20	Concrete Deck - Lightweight Aggregate (See Note 9)	SF		12	Reinforced Concrete Deck	SF
26	Concrete Deck w/Coated Bars (See Note 9)	SF			intentionally blank	
35	Concrete Deck Soffit (See Note 9)	SF			intentionally blank	
8216	Concrete Deck Soffit (See Note 9)	SF			intentionally blank	
	no state element equivalent			13	Prestressed Concrete Deck	SF
	no state element equivalent			15	Prestressed Concrete Top Flange	SF
13	Bridge Deck Surface	SF		16	Reinforced Concrete Top Flange	SF
8213	Bridge Deck Surface	SF			intentionally blank	
27	Steel Orthotropic Deck	SF			intentionally blank	
30	Deck-Corrugated or Other Steel System	SF		30	Steel Deck—Corrugated/Orthotropic/Etc.	SF
8222	Deck-Corrugated or Other Steel System	SF			intentionally blank	
28	Steel Deck Open Grid	SF		28	Steel Deck—Open Grid	SF
8218	Steel Deck Open Grid	SF			intentionally blank	
29	Steel Deck - Concrete Filled Grid	SF		29	Steel Deck—Concrete Filled Grid	SF
8219	Steel Deck - Concrete Filled Grid	SF			intentionally blank	
31	Timber Deck	SF		31	Timber Deck	SF
8221	Timber Deck	SF			intentionally blank	
32	Fiber Reinforced Polymer (FRP) Deck	SF		60	Other Deck	SF
36	Deck Rebar Cover Flag	SF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
38	Concrete Slab	SF			intentionally blank	
49	Concrete Hollow Slab	SF			intentionally blank	
50	Prestressed Concrete Slab	SF			intentionally blank	
8150	Prestressed Concrete Slab	SF		38	Reinforced Concrete Slab	SF
51	Prestressed Conc Slab w/Coated Bars	SF			intentionally blank	
8151	Prestressed Conc Slab w/Coated Bars	SF			intentionally blank	
52	Concrete Slab w/Coated Bars	SF			intentionally blank	
54	Timber Slab	SF		54	Timber Slab	SF
	no state element equivalent			65	Other Slab	SF
89	Prestressed Concrete Girder w/Coated Strands	LF			intentionally blank	
103	Prestressed Concrete Super Girder	LF			intentionally blank	
108	Prestressed Concrete Bulb-T Girder	LF			intentionally blank	
8108	Prestressed Concrete Bulb-T Girder	LF		109	Girder/Beam - Prestressed Concrete	LF
109	Prestressed Concrete Multiple Web Girder Units	LF			intentionally blank	
8109	Prestressed Concrete Multiple Web Girder Units	LF			intentionally blank	
115	Prestressed Concrete Girder	LF			intentionally blank	
8111	Prestressed Concrete Girder	LF			intentionally blank	
97	Prestressed Concrete Trapezoidal Girder	LF			intentionally blank	
100	Post-Tensioned Concrete Segmental Box Girder	LF		104	Closed Web/Box Girder - Prestressed Concrete	LF
104	Post-Tensioned Concrete Box Girder	LF			intentionally blank	
90	Steel Rolled Girder	LF			intentionally blank	
91	Steel Riveted Girder	LF			intentionally blank	
92	Steel Welded Girder	LF		107	Girder/Beam - Steel	LF
107	Steel Open Girder	LF			intentionally blank	
8201	Steel Open Girder	LF			intentionally blank	
96	Concrete Encased Steel Girder	LF			intentionally blank	
	no state element equivalent			112	Girder/Beam - Other	LF

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
102	Steel Box Girder	LF		102	Closed Web/Box Girder - Steel	LF
8200	Steel Box Girder	LF			intentionally blank	
105	Concrete Box Girder	LF		105	Closed Web/Box Girder - Reinforced Concrete	LF
	no state element equivalent			106	Closed Web/Box Girder - Other	LF
110	Concrete Girder	LF			intentionally blank	
8110	Concrete Girder	LF		110	Girder/Beam - Reinforced Concrete	LF
114	Concrete Multiple Web Girder Unit	LF			intentionally blank	
111	Timber Glue-Lam Girder	LF			intentionally blank	
117	Timber Sawn Girder	LF		111	Girder/Beam - Timber	LF
8112	Timber Sawn Girder	LF			intentionally blank	
113	Steel Stringer	LF		113	Stringer - Steel	LF
8209	Steel Stringer	LF			intentionally blank	
	no state element equivalent			115	Stringer - Prestressed Concrete	LF
116	Concrete Stringer	LF		116	Stringer - Reinforced Concrete	LF
118	Timber Stringer	LF		117	Stringer - Timber	LF
	no state element equivalent			118	Stringer - Other	LF
119	Concrete Truss	LF		136	Truss - Other	LF
126	Steel Thru Truss	LF			intentionally blank	
8204	Steel Thru Truss	LF		120	Truss - Steel	LF
131	Steel Deck Truss	LF			intentionally blank	
133	Truss Gusset Plates	EA		162	Gusset Plate	EA
135	Timber Truss	LF		135	Truss - Timber	LF
139	Timber Arch	LF		146	Arch - Timber	LF
141	Steel Arch	LF		141	Arch - Steel	LF
142	Steel Tied Arch	LF			intentionally blank	
	no state element equivalent			143	Arch - Prestressed Concrete	LF
	no state element equivalent			145	Arch - Masonry	LF

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
144	Concrete Arch	LF		144	Arch - Reinforced Concrete	LF
145	Earth Filled Concrete Arch	LF			intentionally blank	
	no state element equivalent			142	Arch - Other	LF
143	Steel Suspender - Rolled Shape (see note 7)	EA			intentionally blank	
147	Steel Suspender - Cable (see note 7)	EA		148	Cable - Steel Secondary	EA
146	Suspension - Main Cable (see note 8)	EA		147	Cable - Steel Main	LF
149	Cable Stayed Bridge - Cable (see note 8)	EA			intentionally blank	
150	Concrete Column on Spandrel Arch	EA			intentionally blank	
160	Steel Column on Spandrel Arch	EA			intentionally blank	
152	Steel Floor Beam	LF			intentionally blank	
8206	Steel Floor Beam	LF		152	Floor Beam - Steel	LF
8341	Lift Beam (FC)	LF			intentionally blank	
154	Prestressed Concrete Floorbeam	LF		154	Floor Beam - Prestressed Concrete	LF
155	Concrete Floor Beam	LF		155	Floor Beam - Reinforced Concrete	LF
156	Timber Floor Beam	LF		156	Floor Beam - Timber	LF
	no state element equivalent			157	Floor Beam - Other	LF
161	Steel Hanger (See Note 10)	EA			intentionally blank	
162	Steel Pin	EA		161	Pin, Pin & Hanger Assembly, or both	EA
8343	Apron Two Hinge Pin System/LL Hanger Pins (FC)	EA			intentionally blank	
8342	Live Load Hanger Bars (FC) (See Note 10)	EA			intentionally blank	
200	Abutment Fill	EA			intentionally blank	
202	Steel Pile/Column	EA		202	Column/Pile Extension - Steel	EA
204	Prestressed Concrete Pile/Column	EA		204	Column/Pile Extension - Prestressed Concrete	EA
205	Concrete Pile/Column	EA			intentionally blank	
207	Concrete Pile/Column - w/Steel Jacket	EA		205	Column/Pile Extension - Reinforced Concrete	EA
208	Concrete Pile/Column w/Composite Wrap	EA			intentionally blank	
206	Timber Pile/Column	EA		206	Column/Pile Extension - Timber	EA

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
	no state element equivalent			203	Column - Other	EA
	no state element equivalent			207	Column Tower (Trestle) - Steel	EA
	no state element equivalent			208	Column Tower (Trestle) - Timber	EA
209	Submerged Concrete Pile/Column w/Steel Jacket	EA			intentionally blank	
227	Concrete Submerged Pile/Column	EA		227	Submerged Pile - Reinforced Concrete	EA
8125	Concrete Submerged Pile/Column	EA			intentionally blank	
210	Concrete Pier Wall	LF		210	Pier Wall - Reinforced Concrete	LF
212	Concrete Submerged Pier Wall	LF			intentionally blank	
211	Other Pier Wall	LF		211	Pier Wall - Other	LF
213	Other Submerged Pier Wall	LF			intentionally blank	
214	Concrete Web Wall between Columns	LF			intentionally blank	
	no state element equivalent			212	Pier Wall - Timber	LF
	no state element equivalent			213	Pier Wall - Masonry	LF
215	Concrete Abutment	LF			intentionally blank	
8102	Concrete Abutment	LF		215	Abutment - Reinforced Concrete	LF
219	Concrete Cantilevered Span Abutment	LF			intentionally blank	
216	Timber Abutment	LF		216	Abutment - Timber	LF
8103	Timber Abutment	LF			intentionally blank	
217	Other Abutment	LF		218	Abutment - Other	LF
218	Steel Abutment	LF		219	Abutment - Steel	LF
8101	Steel Abutment				intentionally blank	
	no state element equivalent			217	Abutment - Masonry	LF
220	Concrete Submerged Foundation	EA			intentionally blank	
8136	Concrete Submerged Foundation	EA		220	Pile Cap/Footing - Reinforced Concrete	EA
221	Concrete Foundation	EA			intentionally blank	
222	Timber Foundation	LF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
225	Steel Submerged Pile/Column	EA			intentionally blank	
8129	Transfer Span/OHL Supercolumn	EA		225	Submerged Pile - Steel	EA
8128	Steel Submerged Pile/Column	EA			intentionally blank	
226	Prestressed Concrete Submerged Pile/Column	EA		226	Submerged Pile - Prestressed Concrete	EA
8127	Prestressed Concrete Submerged Pile/Column	EA			intentionally blank	
228	Timber Submerged Pile/Column	EA		228	Submerged Pile - Timber	EA
8124	Timber Submerged Pile/Column	EA			intentionally blank	
	no state element equivalent			229	Pile - Other	EA
229	Timber Cap Rehab with Steel	LF			intentionally blank	
231	Steel Pier Cap/Crossbeam	LF		231	Pier Cap - Steel	LF
8130	Steel Pier Cap/Crossbeam	LF			intentionally blank	
233	Prestressed Concrete Pier Cap/Crossbeam	LF		233	Pier Cap - Prestressed Concrete	LF
234	Concrete Pier Cap/Crossbeam	LF		234	Pier Cap - Reinforced Concrete	LF
8132	Concrete Pier Cap/Crossbeam	LF			intentionally blank	
235	Timber Pier Cap	LF		235	Pier Cap - Timber	LF
8131	Timber Pier Cap	LF			intentionally blank	
	no state element equivalent			236	Pier Cap - Other	LF
236	Concrete Floating Pontoon	Cell			intentionally blank	
237	Pontoon Hatch/Bulkhead	EA			intentionally blank	
238	Floating Bridge - Anchor Cable	EA		149	Cable - Other Secondary	EA
240	Metal Culvert	LF		240	Culvert - Steel	LF
241	Concrete Culvert	LF		241	Culvert - Reinforced Concrete	LF
242	Timber Culvert	LF		242	Culvert - Timber	LF
	no state element equivalent			244	Culvert - Masonry	LF
243	Other Culvert	LF		243	Culvert - Other	LF
	no state element equivalent			245	Culvert - Prestressed Concrete	LF
250	Tunnel - Concrete Lined	SF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
251	Tunnel - Timber Lined	SF			intentionally blank	
252	Tunnel - Unlined	SF			intentionally blank	
253	Tunnel Tile	SF			intentionally blank	
260	Steel Open Grid Sidewalk & Supports	SF			intentionally blank	
261	Steel Filled Grid Sidewalk & Supports	SF			intentionally blank	
8261	Steel Filled Grid Sidewalk & Supports	SF			intentionally blank	
262	Corrugated/Orthotropic Sidewalk & Supports	SF			intentionally blank	
8262	Corrugated/Orthotropic Sidewalk & Supports	SF			intentionally blank	
264	Timber Sidewalk & Supports	SF			intentionally blank	
8264	Timber Sidewalk & Supports	SF			intentionally blank	
266	Concrete Sidewalk & Supports	SF			intentionally blank	
8266	Concrete Sidewalk & Supports	SF			intentionally blank	
267	Fiber Reinforced Polymer(FRP) Sidewalk & Supports	SF			intentionally blank	
8265	Fiber Reinforced Polymer(FRP) Sidewalk & Supports	SF			intentionally blank	
310	Elastomeric Bearing	EA		310	Elastomeric Bearing	EA
311	Moveable Bearing (roller, sliding, etc)	EA		311	Moveable Bearing (roller, sliding, etc)	EA
8391	Moveable Bearing (roller, sliding, etc)	EA			intentionally blank	
312	Concealed Bearing or Bearing System	EA		312	Enclosed/Concealed Bearing	EA
313	Fixed Bearing	EA		313	Fixed Bearing	EA
8390	Fixed Bearing	EA			intentionally blank	
316	Isolation Bearing	EA		316	Bearing - Other	EA
314	Pot Bearing	EA		314	Pot Bearing	EA
315	Disc Bearing	EA		315	Disk Bearing	EA
321	Concrete Roadway Approach Slab	SF			intentionally blank	
322	Bridge Impact	EA			intentionally blank	
330	Metal Bridge Railing	LF		330	Metal Bridge Railing	LF
8810	Metal Bridge Railing	LF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
331	Concrete Bridge Railing	LF		331	Reinforced Concrete Bridge Railing	LF
8811	Concrete Bridge Railing	LF			intentionally blank	
332	Timber Bridge Railing	LF		332	Timber Bridge Railing	LF
8812	Timber Bridge Railing	LF			intentionally blank	
333	Other Bridge Railing	LF		333	Other Bridge Railing	LF
8813	Other Bridge Railing	LF			intentionally blank	
	no state element equivalent			334	Masonry Bridge Railing	LF
340	Metal Pedestrian Railing	LF			intentionally blank	
8815	Metal Pedestrian Railing	LF			intentionally blank	
341	Concrete Pedestrian Railing	LF			intentionally blank	
8816	Concrete Pedestrian Railing	LF			intentionally blank	
342	Timber Pedestrian Railing	LF			intentionally blank	
8817	Timber Pedestrian Railing	LF			intentionally blank	
343	Other Pedestrian Railing	LF			intentionally blank	
8818	Other Pedestrian Railing	LF			intentionally blank	
355	Damaged Bolts or Rivets	EA			intentionally blank	
8355	Damaged Bolts or Rivets	EA			intentionally blank	
356	Steel Cracking	EA			intentionally blank	
8356	Steel Cracking	EA			intentionally blank	
357	Pack Rust	EA			intentionally blank	
8357	Pack Rust	EA			intentionally blank	
360	Bridge Movement	EA			intentionally blank	
8360	Bridge Movement	EA			intentionally blank	
361	Scour	EA			intentionally blank	
8361	Scour	EA			intentionally blank	
362	Impact Damage	EA			intentionally blank	
8362	Impact Damage	EA			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
366	Undercrossing-Safety Inspection	EA			intentionally blank	
367	Movable Bridge	EA			intentionally blank	
368	Seismic Pier Crossbeam Bolster	EA			intentionally blank	
369	Seismic Pier Infill Wall	EA			intentionally blank	
370	Seismic - Longitudinal Restrainer	EA			intentionally blank	
8370	Seismic - Longitudinal Restrainer	EA			intentionally blank	
371	Seismic - Transverse Restrainer	EA			intentionally blank	
8371	Seismic - Transverse Restrainer	EA			intentionally blank	
372	Seismic - Link/Pin Restrainer	EA			intentionally blank	
373	Seismic - Catcher Block	EA			intentionally blank	
374	Seismic - Column Silo	EA			intentionally blank	
375	Cathodic Protection	EA			intentionally blank	
8375	Cathodic Protection	EA			intentionally blank	
376	Concrete Deck Delamination Testing	SF			intentionally blank	
8376	Concrete Deck Delamination Testing	SF			intentionally blank	
380	(DISCONTINUED) Unknown Pier Foundations	EA			intentionally blank	
400	Asphalt Butt Joint Seal (see note 11)	LF			intentionally blank	
403	Concrete Bulb-T (see note 11)	LF		301	Pourable Joint	LF
417	Silicone Rubber Joint Filler (see note 11)	LF			intentionally blank	
401	Asphalt Open Joint Seal (see note 11)	LF			intentionally blank	
402	Open Concrete Joint (see note 11)	LF			intentionally blank	
407	Steel Angle Header (see note 11)	LF		304	Open Joint	LF
8407	Steel Angle Header (see note 11)	LF			intentionally blank	
419	Steel Angle w/Raised Bars (see note 11)	LF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
408	Steel Sliding Plate (see note 11)	LF			intentionally blank	
8408	Steel Sliding Plate (see note 11)	LF			intentionally blank	
409	Steel Sliding Plate w/Raised Bars (see note 11)	LF		305	Assembly Joint without Seal	LF
414	Bolt Down - Sliding Plate w/Springs (see note 11)	LF			intentionally blank	
410	Steel Fingers (see note 11)	LF			intentionally blank	
411	Steel Fingers w/Raised Bars (see note 11)	LF			intentionally blank	
404	Compression Seal / Concrete Header (see note 11)	LF			intentionally blank	
8404	Compression Seal / Concrete Header (see note 11)	LF			intentionally blank	
405	Compression Seal / Polymer Header (see note 11)	LF		302	Compression Seal	LF
406	Compression Seal / Steel Header (see note 11)	LF			intentionally blank	
8406	Compression Seal / Steel Header (see note 11)	LF			intentionally blank	
412	Strip Seal - Anchored (see note 11)	LF		300	Strip Seal	LF
413	Strip Seal - Welded (see note 11)	LF			intentionally blank	
416	Assembly Joint Seal (Modular) (see note 11)	LF		303	Assembly Joint Seal (Modular)	LF
415	Bolt Down Panel - Molded Rubber (see note 11)	LF		306	Joint - Other	LF
418	Asphalt Plug (see note 11)	LF			intentionally blank	
420	Joint Paved Over Flag	LF			intentionally blank	
501	Movable Bridge Steel Tower	LF			intentionally blank	
705	Bridge Luminaire Pole and Base	EA			intentionally blank	
8705	Bridge Luminaire Pole and Base	EA			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
800	Asphaltic Concrete (AC) Overlay (see note 11)	SF			intentionally blank	
8223	Asphaltic Concrete (AC) Overlay (see note 11)	SF			intentionally blank	
801	AC Overlay with Waterproofing Membrane (see note 11)	SF			intentionally blank	
802	Thin Polymer Overlay (see note 11)	SF			intentionally blank	
8224	Thin Polymer Overlay (see note 11)	SF		510	Wearing Surfaces	SF
803	Modified Concrete Overlay (see note 11)	SF			intentionally blank	
804	Polyester Concrete Overlay (see note 11)	SF			intentionally blank	
805	AC Over a Polymer Overlay (see note 11)	SF			intentionally blank	
806	BST on Concrete (Chip Seal)	SF			intentionally blank	
901	Red Lead Alkyd Paint System (see note 12)	SF			intentionally blank	
8901	Red Lead Alkyd Paint System (see note 12)	SF			intentionally blank	
902	Inorganic-Zinc/Vinyl Paint System (see note 12)	SF			intentionally blank	
8902	Inorganic-Zinc/Vinyl Paint System (see note 12)	SF			intentionally blank	
903	Inorganic Zinc/Urethane Paint System (see note 12)	SF			intentionally blank	
8903	Inorganic Zinc/Urethane Paint System (see note 12)	SF			intentionally blank	
904	Organic Zinc/Urethane Paint System (see note 12)	SF			intentionally blank	
8904	Organic Zinc/Urethane Paint System (see note 12)	SF			intentionally blank	
905	Coal Tar Epoxy Paint System (see note 12)	SF		515	Steel Protective Coating	SF
8905	Coal Tar Epoxy Paint System (see note 12)	SF			intentionally blank	
906	Metallizing (see note 12)	SF			intentionally blank	
907	Galvanizing (see note 12)	SF			intentionally blank	
8907	Galvanizing (see note 12)	SF			intentionally blank	
908	Epoxy Paint for Weathering Steel (see note 12)	SF			intentionally blank	
909	Zinc Primer (see note 12)	SF			intentionally blank	
8909	Zinc Primer (see note 12)	SF			intentionally blank	
910	Weathering Steel Patina (see note 12)	SF			intentionally blank	
	no state element equivalent			521	Concrete Protective Coating	SF

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
8225	Non-skid Metal Surfacing	SF			intentionally blank	
8263	Steel Open Grid Sidewalk w/Cover Plate & Suppt.	SF			intentionally blank	
8301	Apron Steel Orthotropic Deck	SF			intentionally blank	
8305	Apron Hinge Multi-Pin & Plate	EA			intentionally blank	
8307	Apron Lips & Pins	EA			intentionally blank	
8309	Counterweight Cables for Vehicle Span or Apron	LF			intentionally blank	
8310	Apron Hoist/Cables/Spool/Platform/Supports/Rigging	EA			intentionally blank	
8312	Span Apron/Cab Gangplank Pivot/Raise/Rams/Fittings	EA			intentionally blank	
8348	Span Hoist/Cables/Spool/Platform/Supports/Rigging	EA			intentionally blank	
8413	Steel Tower	EA			intentionally blank	
8414	Timber Tower	EA			intentionally blank	
8415	Steel Headframe	LF			intentionally blank	
8416	Timber Headframe	LF			intentionally blank	
8418	Counterweight Guides	EA			intentionally blank	
8419	Concrete Counterweights	EA			intentionally blank	
8420	CTWT Sheaves/Shafts(FC)/Bearings/Anchor Blts.	EA			intentionally blank	
8421	Counterweight Cable Protective Systems	LF			intentionally blank	
8423	Steel Counterweights	EA			intentionally blank	
8450	Timber Wingwalls	LF			intentionally blank	
8451	Steel Pile Frame Wingwalls	LF			intentionally blank	
8460	Timber Pile Dolphins	EA			intentionally blank	
8462	Steel Pile Frame Dolphins	EA			intentionally blank	
8463	Timber Floating Dolphin	LF			intentionally blank	
8464	Concrete Pontoon Floating Dolphin	LF			intentionally blank	
8640	Moveable Pedestrian Gangplank	LF			intentionally blank	
8650	Overhead Passenger Loading Cab	SF			intentionally blank	
8653	Passenger Cab Floor System and Lift Beam(FC)	LF			intentionally blank	

STATE ELEMENTS			TRANSLATION	NATIONAL ELEMENTS		
element_id		unit		element_id	name	unit
8669	Tower Base Platform	SF			intentionally blank	
8701	Ferry Concrete Floating Pontoon	CELL			intentionally blank	
8702	Ferry Steel Floating Pontoon	CELL			intentionally blank	
8703	Spud Piling & Wells	EA			intentionally blank	
8704	Pontoon Anchors, Anchor Chain/Cables/Clamps	EA			intentionally blank	
8906	Epoxy Paint System	SF			intentionally blank	
8910	Safety Access Ladders	EA			intentionally blank	
8911	Safety Railing & Catwalks	LF			intentionally blank	

Translation Notes

1.	State elements highlighted in light blue are used for structures owned and maintained by the Washington State Ferry system.
2.	National bridge elements that do not have a state element equivalent are highlighted in orange.
3.	A green arrow:  indicates that the state element should be directly translated to the national element, including total quantities and each quantity for each condition state.
4.	A green bracket with a green arrow:  indicates that all state elements on a given bridge need total quantity and the quantity in each condition state to be summed prior to translation to the indicated national element.
5.	A green drop arrow:  indicates the state element is not translated to a national element.
6.	A red arrow:  indicates special treatment is required for the translation. See associated note for details.
7.	Element 143 and 147 have been re-named to more clearly describe the existing intent of these elements. WSDOT owned bridges have 12 bridges with element 143 (for example 5/140E&W) and 3 bridges with element 147 (for example TNB 16/110E).
8.	State Elements 146 and 149 will remain EA units. Quantities in each condition state and the total will be summed and reported in NBI element 147 as LF units without alteration.
9	Deck Translation Specifications - see separate worksheet
10	Pin and Pin & Hanger Translation Specifications - see separate worksheet.
11	Joint and Wearing Surface Specifications - see separate worksheet.
12	Paint System Specifications - see separate worksheet.

Note 9 - Deck Translation Specifications

For WSDOT elements 12, 14, 20, 26, and 8217, perform the following steps towards translation to NBE element 12:

Step	Description
1	Sum total quantities and all quantities in each condition state into an NBE Temp element 12.
2	Move all quantities in WSDOT CS4 into NBE Temp CS2, adding to the quantity of NBE Temp CS2 added in Step 1. NBE Temp CS4 will have zero quantity at this point.
3	Move all quantities in WSDOT CS3 into NBE Temp CS4.
4	Add WSDOT elements 35 and 8216 CS2 to NBE Temp CS2.
5	Add WSDOT elements 35 and 8216 CS3 to NBE Temp CS4.
6	If NBE Temp total quantity = NBE Temp CS1 + CS2 + CS3 + CS4, go to Step 11.
7	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS1 to zero limit, then go to Step 6.
8	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS2 to zero limit, then go to Step 6.
9	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS3 to zero limit, then go to Step 6. THIS STEP SEEMS REDUNDANT - GFC 7/31/14
10	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, set NBE Temp CS4 = NBE Temp total quantity, then go to Step 11.
11	Move NBE Temp total quantity and all Temp CS1 through CS4 quantities to final NBE element 12. ***Note:*** CS3 will have zero quantity in the final translation.

For WSDOT elements 13 and 8413, perform the following steps towards translation to NBE element 16:

Step	Description
1	Sum total quantities and all quantities in each condition state into NBE element 16.
2	Move all quantities in WSDOT CS4 into NBE CS2, adding to the quantity of NBE CS2 added in Step 1. NBE CS4 will have zero quantity at this point.
3	Move all quantities in WSDOT CS3 into NBE CS4. ***Note:*** NBE CS3 will have zero quantity in the final translation.

Note 10 - Pin, Pin & Hanger Translation Specifications

For WSDOT elements 162 and 8343, perform the following steps towards translation to NBE element 161:

Step	Description
1	Sum the WSDOT elements 162 and 8243 total quantities and all condition state quantiies into NBE Temp element 161.
2	Add the WSDOT element 161 and 8342 CS1 through CS4 to corresponding NBE Temp element 161 CS1 through CS4.
3	If NBE Temp total quantity = NBE Temp CS1 + CS2 + CS3 + CS4, go to Step 8.
4	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS1 to zero limit, then go to Step 3.
5	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS2 to zero limit, then go to Step 3.
6	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, deduct difference from NBE Temp CS3 to zero limit, then go to Step 3.
7	If NBE Temp total quantity > NBE Temp CS1 + CS2 + CS3 + CS4, set NBE Temp CS4 = NBE Temp total quantity, then go to Step 8.
8	Move NBE Temp total quantity and all Temp CS1 through CS4 quantities to final NBE element 161.

Note 11 - Joint and Wearing Surface Translation Specifications

For WSDOT elements 400, 403 and 417, perform the following steps towards translation to NBE element 301:

Step	Description
1	Sum the WSDOT element total quantities and into NBE element total quantities.
2	Sum the WSDOT element CS1 quantities into NBE element CS2 quantities. Note that NBE will have zero quantities in CS1.
3	Sum the WSDOT element CS2 quantities into NBE element CS3 quantities.
4	Sum the WSDOT element CS3 quantities into NBE element CS4 quantities.

Perform these same steps listed above for the following translations:

- WSDOT elements 401, 402, 407 8407, and 419 translated into NBE element 304
- WSDOT elements 408, 8408, 409, 414, 410 and 411 translated into NBE element 305
- WSDOT elements 404, 8404, 405, 406 and 8406 translated into NBE element 302
- WSDOT elements 412 and 413 translated into NBE element 300
- WSDOT element 416 translated into NBE element 303
- WSDOT elements 415 and 418 translated into NBE element 306
- WSDOT elements 800, 8223, 801, 802, 8224, 803, 804, and 805 translated into NBE element 510

Note 12 - Paint/Coating Translation Specifications

For WSDOT elements 901, 8901, 902, 8902, 903, 8903, 904, 8904, 905, 8905, 906, 907, 8907, 908, 909, 8909, and 910, perform the following steps towards translation to NBE element 515:

Step	Description
1	Sum the WSDOT element total quantities and into NBE element total quantities.
2	Sum the WSDOT element CS1 quantities into NBE element CS1 quantities.
3	Sum the WSDOT element CS2 quantities into NBE element CS2 quantities.
4	Sum the WSDOT element CS3 quantities into NBE element CS4 quantities. Note that NBE CS3 will always have zero quantities.

E. Revise Rating Flag (2688)

- For State owned bridges, any load rating issues should be addressed within the body of the BIR in the (2688) note. Delete any notes that don't have relevance to the existing condition of the bridge.

F. Scour Code (1680)

- The Scour Engineer maintains the Scour code (1680) field and notes. Any scour comments by the Team Leader should be placed in BMS Element (#361) Scour Flag or Channel Protection (1677), depending upon which is most appropriate.

G. Soundings Flag (2693)

- When preparing for an inspection that requires soundings, print any existing stream profile file to include in your inspection field packet. The Scour Engineer determines which State bridges need stream cross sections (soundings) by placing a "Y" in the Soundings Flag (2693). When this is required as part of the inspection, perform the following:

  1. Enter data into the Scour Field Evaluation Form, see Section 3.05.
     a. If you could not take soundings on the initial inspection trip, plan on getting them on another trip, either by coordinating with another Team Leader or by doing it yourself.
     b. If there is a reason soundings should be taken at a different time of the year (e.g. low water, low tide, or fish windows), add a resource with an explanation under the Report Types Tab.
  2. Save the file under the bridge number (e.g., 5_24S.xls) in the appropriate year "Soundings" folder found on the W drive at W:\Data\Bridge\RegionalInsp\Common\Soundings.
  3. Attach the completed form to the appropriate bridge inspection report File Tab, replacing any already existing form and remove the old one.
  4. Change the Soundings Flag (2693) from "Y" to "*" for State bridges only.
  5. Place the date soundings were taken in the (2693) note (e.g., 'Soundings taken 2/1/2004').
  6. When you return to the office submit an email to the Scour Engineer stating that the soundings have been completed and that the findings are in the soundings folder for his review.
  7. The Scour Engineer will email an electronic stream profile file that you will attach to the report Files tab.
     a. Replace any existing stream profile file with the updated one and remove the old one.
     b. Print the new stream profile file and include it with your inspection review packet.

H. Timber Structures

- Yellow Tagged (YT) members have rot and a shell greater than or equal to 1-½". A YT member requires a Monitor repair. The need for Interim Inspections is determined by the lead.
- Red Tagged (RT) members have rot and a shell less than 1-½". A RT member requires a Priority 1 repair. Schedule an Interim Inspection. Determine the extent, location and significance of decay. Provide details for the Load Rating Engineer.

I. Culverts

- Structure Length, NBI Length and Maximum Span are determined in accordance with (1340), (2346), and (1348).
- The BMS quantity is determined by measuring from inlet to outlet of one barrel/ pipe and is not dependent upon the number of barrels or pipes.

J. Vertical Clearances (1370 and 1374)

When to Collect or Verify Vertical Clearances

- Whenever a clearance card is missing, incomplete or inaccurate. High traffic volumes may prevent the ability to acquire this information without traffic control.
- At bridges with vertical clearances under or over that are equal to or less than 15′3″.
- At bridges where the clearances box has been populated with a "V".
- When Team Leader feels that over height hit damage is occurring significantly enough to check the existing clearance information.
- As a part of over height load damage inspections.

Where to Collect or Verify Vertical Clearances

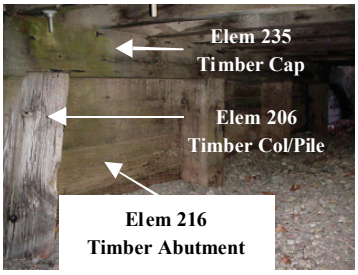
- Minimum clearances along all lane stripes, edges of pavement/curb or controlling grade breaks between these points.
- Appurtenances (lights, signs, utilities) that control minimum vertical clearances should be documented as well, but in most circumstances will be used only to create a repair recommendation to relocate appurtenance. Provide vertical clearance information to the Sign Bridge Engineer.
- For existing postings verify lowest accessible clearance location first and verify other locations as required.
- For Damage Inspections, measure all accessible lane stripe locations in the area of the damage and at the point of impact.

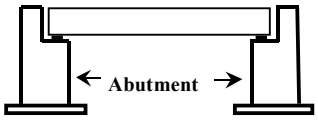
4.3 Substructure

The evaluation of the substructure elements are based on those portions of the member that are exposed for visual inspection and included in the element quantity. If an element is added to a bridge or quantities are changed due to exposure or discovery by other means, do not delete the historical information in subsequent inspections. Simply note the prior exposure or those members not visible and document the current condition.

Abutments

An abutment is a substructure unit located at the end of a bridge that is designed to retain the fill supporting the roadway, and support the bridge superstructure. Bridges that terminate in mid-span or at a pier that is not at grade do not have an abutment substructure unit and do not have abutment elements. These cases will use other appropriate structural elements to evaluate condition.



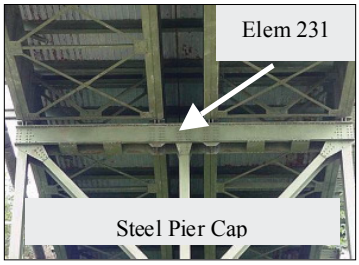


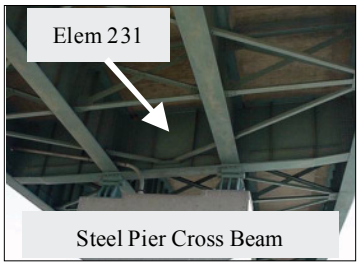
All abutments shall be evaluated for the capacity to transfer design loads to a foundation thru structural elements. The roadway embankment with non-monolithic concrete wingwalls, timber planking, or other abutment retaining systems are included in the evaluation of the WSDOT Abutment Fill element 200 (EA) where the evaluation is limited to no more than 25 feet from the abutment. Timber Abutment element 216 (LF) and Cantilever Abutment element 219 (EA) are elements equivalent to element 200.

Pier Cap/Cross Beam

A pier cap is an element that is attached to the top of a pier and is used to support the superstructure of a bridge. A pier cross beam is generally attached to the girders and is used to distribute the loads from the girders to the pier.

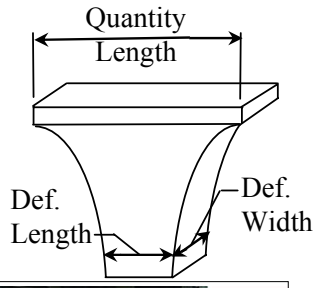
One WSDOT element is used to define either a cap or cross beam constructed of the same material.

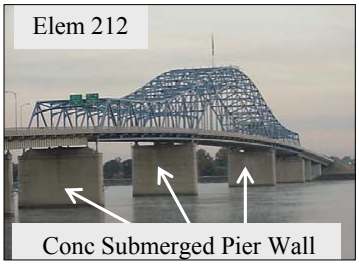


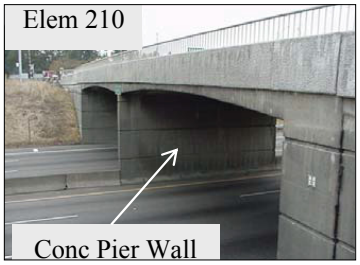


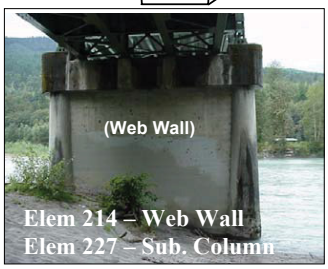
Pier Wall Definition

A pier wall is a substructure pier element. For WSDOT elements, a pier wall is defined using two criteria: if the length (transverse direction) is 3 times greater than the width (longitudinal direction) at the bottom; and the wall extends full height from the foundation to the superstructure. If the pier does not meet these two criteria, then the element would be coded as a column or other pier.









Pile/Column Elements

These long slender members transfer load normally as a part of the bridge substructure. The bottom of a column element may be visible or supported on unknown foundations. For element and inspection purposes, a pile is inspected as a designed column for the visible portion above ground or if visible in the past. Single columns supported on a single shaft are to be considered the same as one column or column length even though a part of the shaft is visible.

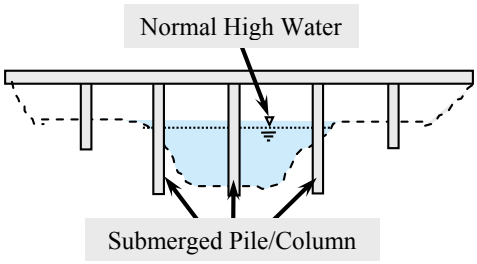
Foundation Elements

WSDOT elements have a Timber Foundation or a Concrete Foundation element to document any visible structural conditions not related to scour. The foundation may be a spread footing or a footing supported by piles or drilled shafts. The foundation element is based on the footing material and the piles may be of any material. The condition of the foundation is the focus of these elements, not the design or pile materials at this time.

These elements document that a foundation is visible and structural conditions. As with Pile/column elements, if an element is added due to exposure, do not delete the element in subsequent inspections. When scour threatens or reduces the condition, the scour documentation and condition is recorded separately in WSDOT element 361 and not recorded in the foundation element.

Submerged Element Definition (Column, Pier Wall, Foundation)

A Submerged element in BMS is defined as a substructure element located within the normal high water banks of a waterway channel. Repair or replacement of these elements may have special construction requirements as outlined in the environmental permits.



200 Abutment Fill — Units – EA

This element is defined as the soil retained behind a concrete or steel abutment and includes the materials retaining the embankment such as non-monolithic concrete wing walls or other retaining wall system. The evaluation of the fill or retaining systems should not extend beyond 25 feet or the approach slab, whichever is greater.

Normally bridges have two abutments at grade. When bridges terminate at intermediate piers or in mid-span (not on the ground), then this element does not apply. In addition, WSDOT Element 200 is equivalent to and does not apply to bridges with WSDOT Timber Abutment 216 (LF) or Cantilever Abutment Element 219 (EA).

Erosion outside of the abutment/wingwalls can be documented in the notes, but is not included in the evaluation or condition of the element or the condition of the element.

1. Defects are superficial and have no effect on the structural capacity or performance of the fill.
2. Number of abutments that have been repaired.
3. Number of abutments with a fill problem which does not significantly affect the support of the traveled lanes. Deficiencies do not warrant analysis, but may require repairs.
4. Number of abutments with a fill problem in locations or quantity and has reduced the structural capacity of the soil to support the approach or roadway. It is a threat to traffic. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

202 Steel Pile/Column Units – EA

This element defines a column or column portion of a pile constructed of structural steel visible for inspection.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Number of pile/columns with repairs such as: bolts or rivets have been replaced; cracks that have been drilled or plated.
3. Number of pile/columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to impact damage, corrosion, a crack in primary load path member or in the attachment welded to primary member. Retain the quantity of the element reported in CS4 if the element is repainted but not repaired.

204 Prestressed Concrete Pile/Column Units – EA

This element defines a column or column portion of a pile constructed of prestressed concrete visible for inspection.

205 Concrete Pile/Column Units – EA

This element defines a column or column portion of a pile constructed of reinforced concrete visible for inspection. Usually, WSDOT concrete piles are designed and constructed inside a sacrificial steel pipe.

Condition States for WSDOT Elements 204 and 205

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Number of pile/columns that has been repaired or patched.
3. Number of pile/columns has structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to delaminations, spalls, structural cracking, exposed or corroded reinforcing or strands.
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

206 Timber Pile/Column Units – EA

This element defines a column or column portion of a pile constructed of timber visible for inspection.

1. Defects are superficial and have no effect on the structural capacity of the element. Decay, insect infestation, cracks, splits, or checks may exist.
2. Number of pile/columns with repairs, plates, or splices.
3. Number of pile/columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Typically, locations in a load path with a 1½″ to 3″ shell thickness are marked with a YELLOW TAG.
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Typically, locations in a load path with less than a 1½″ shell thickness are marked with a RED TAG.

207 Concrete Pile/Column w/Steel Jacket Units – EA

This element defines a column or column portion of a pile constructed of reinforced concrete and has been seismically retrofitted with a steel jacket visible for inspection.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Number of pile/columns with repairs.
3. Number of pile/columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to impact damage, corrosion, a crack in primary load path member or in the attachment welded to primary member.

208 Concrete Pile/Column w/Composite Wrap Units – EA

This element defines a column or column portion of a pile constructed of reinforced concrete and has been seismically retrofitted with composite wrap visible for inspection.

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, superficial cracking or debonding.
2. Number of composite wrapped Pile/Columns with repairs.
3. Number of composite wrapped Pile/Columns with structural defects. The defects do not significantly affect structural capacity of the wrap or pile/column. Deficiencies do not warrant analysis, but may require repairs.
4. Number of composite wrapped Pile /Columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

209 Submerged Concrete Pile/Column w/Steel Jacket Units – EA

This element defines a submerged column or column portion of a pile that is constructed of reinforced concrete and has been seismically retrofitted with a steel jacket visible for inspection.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Number of steel jacketed Pile/Columns with repairs.
3. Number of steel jacketed Pile/Columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Number of steel jacketed Pile/Columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

210 Concrete Pier Wall Units – LF

This element defines a pier wall constructed of reinforced concrete. The total quantity for this element is the length at the top of the wall.

211 Other Pier Wall — Units – LF

This element defines a pier wall that is constructed of a non-standard material (rock and mortar) or non-standard construction. The total quantity for this element is the length at the top of the wall.

212 Concrete Submerged Pier Wall — Units – LF

This element defines a submerged pier wall constructed of reinforced concrete. The total quantity for this element is the length at the top of the wall.

213 Other Submerged Pier Wall — Units – LF

This element defines a submerged pier wall that is constructed of a non-standard material (rock and mortar) or non-standard construction. The total quantity for this element is the length at the top of the wall.

Condition States for WSDOT Elements 210, 211, 212, and 213

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Length of pier wall with repairs.
3. Length of pier wall with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Entire length of pier wall with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

214 Concrete Web Wall between Columns — Units – LF

This element defines a secondary concrete wall constructed between pier columns. This element includes railroad crash barriers. The total quantity for this element is the length at the top of the wall.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Affected length of Web wall with repairs.
3. Length of Web wall with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Entire length of Web wall with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

215 Concrete Abutment — Units – LF

This element is defined as a concrete abutment or a concrete cap at the abutment which are designed to carry design loads to a foundation. A concrete abutment is a short or tall wall supporting the superstructure. An abutment cap is generally a rectangular beam supporting the superstructure. An abutment cap is included in this element and excluded from the quantity of element 234, Concrete Caps, elsewhere in the bridge. An abutment cap may be supported with concrete, steel, or timber columns or piles and the columns are coded separately and not included in this element, but are included with

the quantity and evaluation of the other the similar columns in the bridge. The columns are only coded if they are visible or have been visible in the past.

The element quantity is measured along the skew and includes concrete monolithic wingwalls up to the first open joint or expansion joint. Wingwalls monolithic with the abutment shall be included evaluation of the abutment. The length of monolithic wingwall shall not exceed 20 feet per corner,

The embankment and retaining system, or retaining system beyond a monolithic wingwall, are documented in WSDOT element 200.

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Affected length of abutment with repairs.
3. Length of abutment with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Entire length of abutment when damage exists in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

216 Timber Abutment Units – LF

This element defines the roadway embankment fill behind a timber cap includes the sheet materials retaining the embankment. The total quantity is the length of the timber cap. Timber caps at the abutment and the piles supporting the caps are not included in this element. The caps are included in the element 235 with other timber caps and the piles are included with the other pile elements in the bridge.

Erosion outside of the abutment/wingwalls can be documented in the notes, but is not included in the evaluation of the element condition states.

1. Defects are superficial and have no effect on the structural capacity or performance of the fill.
2. Number of abutments that have been repaired.
3. Number of abutments with a fill problem which does not significantly affect the support of the traveled lanes. Deficiencies do not warrant analysis, but may require repairs.
4. Number of abutments with a fill problem in locations or quantity and has reduced the structural capacity of the soil to support the approach or roadway. It is a threat to traffic. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

217 Other Abutment Units – LF

This element defines an abutment not constructed of steel,timber, or concrete such as rock/mortar. The element quantity is the length of abutment measured along the skew. The element quantity includes monolithic wing walls but not to exceed 20 feet per corner.

Document the condition of the embankment and the embankment retaining system conditions in WSDOT element 200.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Affected length of abutment with repairs
3. Affected length of abutment with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Entire length of abutment when damage exists in locations or quantity and has reduced the structural capacity of the abutment. Structural analysis is warranted or has determined repairs are essential to restore the full abutment capacity.

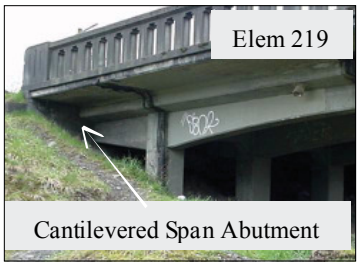
218 Steel Abutment Units – LF

This element defines an abutment constructed of structural steel which is usually a steel cap at the abutment. Similar to concrete abutment caps, steel abutment caps are included in this element and are not included in the quantity of element 233, steel cap/crossbeam. The columns supporting the steel cap are coded separately or included with other similar columns in the bridge. The element quantity is the length of steel abutment cap measured along the skew.

Document the embankment conditions and the embankment retaining system conditions in WSDOT element 200.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Length of abutment with repairs such as: bolts or rivets have been replaced; cracks that have been drilled or plated.
3. Length of abutment with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Entire length of abutment affected when damage exists in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

219 Concrete Cantilevered Span Abutment Units – EA



The WSDOT Cantilever Span Abutment element was created to keep this abutment type separate from the typical abutment elements. This element defines an abutment for the end of a bridge span that is cantilevered from the first or last pier at grade. The default notation assumes the pavement seat (abutment 1) is Pier 1; the cantilever span is Span 1; the first pier is Pier 2. These abutments do not carry load but do retain fill where the defects of structural members are evaluated as part of the superstructure elements.

The definition, condition evaluation, and units are the same as for the WSDOT element 200 where this element is defined as the soil retained behind the abutment and wing walls or retaining walls that support an asphalt roadway or approach slab. The fill evaluation should not extend beyond 25 feet or the approach slab, whichever is greater. Erosion outside of the abutment/wingwalls can be documented in the notes, but is not included in the evaluation of the element condition states.

1. Defects are superficial and have no effect on the structural capacity or performance of the fill.
2. Number of abutments that have been repaired.
3. Number of abutments with a fill problem does not significantly affect the support of the traveled lanes. Deficiencies do not warrant analysis, but may require repairs.
4. Number of abutments with a fill problem in locations or quantity and has reduced the structural capacity of the soil to support the approach or roadway. It is a threat to traffic. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

220 Concrete Submerged Foundation Units – EA

This element defines a reinforced concrete foundation footing supported by shafts, piles, or soil (spread footing) that is visible for inspection and may be always or seasonably covered by water. Do not delete the element from the bridge because the foundation is no longer visible. The piles may be timber, concrete or steel. The foundation may be always or seasonally covered by water. Scour deficiencies at a concrete abutment are included in WSDOT element 361 and are not included in this element.

221 Concrete Foundation Units – EA

This element defines a reinforced concrete foundation footing supported by shafts, piles, or soil (spread footing) that is visible for inspection. The piles may be timber, concrete or steel. Scour deficiencies at a concrete foundation are included in WSDOT element 361 and are not included in this element. Plinths are a form of spread footing and included in this element which are a small concrete base that supports a column.

Condition States for WSDOT Elements 220 and 221

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Number of foundations with repairs.
3. Number of foundations with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Number of foundations with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

222 Timber Foundation Units – LF

This element defines a timber foundation element that includes a mud sill which is a spread footing and the rare case of a pile supported footing. A timber pile supported footing is a where timber horizontal footing member is a support for columns and the timber member is supported by piles. The total quantity for this element is the length of timber foundation.

1. Defects are superficial and have no effect on the structural capacity of the element. Decay, insect infestation, cracks, splits, or checks may exist.
2. Total length of foundation if repairs exist.
3. Total length of foundation if structural defects exist, but the defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Typically, locations in a load path with a 1½″ to 3″ shell thickness are marked with a YELLOW TAG.
4. Total length of foundation where damage exists in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Typically, locations in a load path with less than a 1½ shell thickness are marked with a RED TAG.

225 Steel Submerged Pile/Column Units – EA

This element defines a column or column portion of a pile constructed of steel and is visible for inspection and may be always or seasonably covered by water. Do not delete the element from the bridge because the element is no longer visible. The exposure may be intentional or caused by scour.

226 Prestressed Concrete Submerged Pile/Column Units – EA

This element defines a submerged column or column portion of a pile constructed of prestressed concrete and is visible for inspection and may be always or seasonably covered by water. Do not delete the element from the bridge because the element is no longer visible. The exposure may be intentional or caused by scour.

227 Concrete Submerged Pile/Column Units – EA

This element defines a submerged column or column portion of a pile constructed of reinforced concrete and is visible for inspection and may be always or seasonably covered by water. Do not delete the element from the bridge because the element is no longer visible. The exposure may be intentional or caused by scour.

Condition States for WSDOT Elements 225, 226, and 227

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Number of pile/columns with repairs.
3. Number of pile/columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

228 Timber Submerged Pile/Column Units – EA

This element defines a submerged column or column portion of a pile constructed of reinforced timber and is visible for inspection and may be always or seasonably covered by water. Do not delete the element from the bridge because the element is no longer visible. The exposure may be intentional or caused by scour.

1. Defects are superficial and have no effect on the structural capacity of the element. Decay, insect infestation, cracks, splits, or checks may exist.
2. Number of pile/columns with repairs, plates, or splices.
3. Number of pile/columns with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Typically, locations in a load path with a 1½″ to 3″ shell thickness are marked with a YELLOW TAG.
4. Number of pile/columns with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Typically, locations in a load path with less than a 1½″ shell thickness are marked with a RED TAG.

229 Timber Cap Rehab with Steel Units – LF

This element consists of a timber cap rehabilitation where alternate load paths to piling are provided by steel members on the exterior of the cap and the timber cap remains in place. The timber conditions are excluded from the condition evaluation. The total quantity for this element is the length at the top of the wall.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Steel span length of pier cap rehabilitation with repairs.
3. Steel length of pier cap rehabilitation with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Steel span length of pier cap rehabilitation with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to impact damage, corrosion, a crack in primary load path member or in the attachment welded to primary member. Retain the quantity of the element reported in CS4 if the element is repainted but not repaired.

231 Steel Pier Cap/Crossbeam Units – LF

This element defines a steel pier cap or crossbeam. The total quantity for this element is the length at the top of the crossbeam.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Steel span length of pier cap/crossbeam with repairs.
3. Steel span length of pier cap/crossbeam with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth).
4. Steel span length of pier cap/crossbeam with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to impact damage, corrosion, a crack in primary load path member or in the attachment welded to primary member. Retain the quantity of the element reported in CS4 if the element is repainted but not repaired.

233 Prestressed Concrete Pier Cap/Crossbeam Units – LF

This element defines a prestressed concrete pier cap or crossbeam. The total quantity for this element is the length at the top of the crossbeam.

234 Concrete Pier Cap/Crossbeam Units – LF

This element defines a reinforced concrete pier cap or crossbeam. Integral pier caps with girders framed directly into the crossbeam are also included in this element. The total quantity for this element is the length at the top of the crossbeam.

Condition States for WSDOT Elements 233 and 234

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Length of pier cap/crossbeam affected by repair or patch. Capacity repairs such as a strand splicing should record girder span length.
3. Length of pier cap/crossbeam affected by defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to delaminations, spalls, structural cracking, exposed or corroded reinforcing or strands.
4. Concrete span length of pier cap/crossbeam affected by damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

235 Timber Pier Cap Units – LF

This element defines a timber pier cap that directly supports the superstructure. The total quantity for this element is the length at the top of the crossbeam.

1. Defects are superficial and have no effect on the structural capacity of the element. Decay, insect infestation, cracks, splits, or checks may exist.
2. Length of pier cap with repairs, plates, or splices.
3. Length of pier cap with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Typically, locations in a load path with a 1½″ to 3″ shell thickness are marked with a YELLOW TAG.
4. Timber span length of pier cap with damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Typically, locations in a load path with less than a 1 ½ shell thickness are marked with a RED TAG.

236 Concrete Floating Pontoon Units – Cell

A concrete floating bridge is a series of post-tensioned floating pontoons which are subdivided into internal compartments called cells. Traffic may ride directly on the top of the pontoon or the roadway may be elevated above the pontoon and supported by columns. This element includes all pontoons regardless of size or configuration and all cells shall be evaluated at the same risk to the bridge condition. Deck elements will apply for the entire length of the pontoon structure. Pontoon condition will include the top slab where the deck /soffit elements exist on the pontoon. The deck/soffit elements are not included where the deck is elevated above the pontoon. The total quantity for the Concrete Floating Pontoon element is the total number of pontoon cells for the bridge.

Concrete pontoons are specially designed to be water tight and dry while in service. The concrete is specifically designed to be visually crack free and have low permeability with water tight construction joints. Water tight design is the basis for condition evaluation of the pontoon below water line and is to include, but is not limited to the assessment of post-tensioned concrete, connections between pontoons, WSDOT element 237-Pontoon Hatch/Bulkheads, and the risk to buoyancy. Water tight criteria shall not apply to the evaluations of conventionally designed concrete conditions above the waterline.

Concrete cracking shall be assessed on the location:

- Above or below the waterline;
- Whether it is in an exterior or interior wall;
- Whether it is active or in-active;
- And based on the design criteria that visible cracking should not exist on submerged surfaces.

An active crack is defined for this element as a crack that allows water to pass into or through a concrete section which is a risk for transporting fine materials out of the section or a source of contaminates into the section. Active cracks may be visible under normal bridge loading or only visible under storm conditions.

Seepage is defined as a cell with a water accumulation of less than 1” per year. Ballasted cells shall establish a void ratio of the ballast to calculate a volume of water in a cell.

This Concrete Floating Pontoon element also defines the relationship between the bridge element condition and the corresponding NBI Substructure Condition rating or NBI Item 060.

1. Number of pontoon cells with defects that are superficial and are insignificant to structural capacity or buoyancy of the cell, pontoon or bridge. The cell is dry. A cell may have water present due to condensation caused when a deck hatch is opened.
   - If the total quantity is in CS1, then NBI Item 060 shall be an 8.

2. Number of pontoon cells with a repair such as, but not limited to a concrete patch or a sealed crack.
   - If repairs are above water level, then NBI Item 060 shall be a 7.
   - If repairs below water level, then NBI Item 060 shall be a 6.
   - If 20 percent of the cells in one pontoon, or a total of 10 percent of the cells in adjoining pontoons, or 5 percent of the total element quantity are in CS2, then NBI Item 060 shall be a 5.
3. Number of pontoon cells with significant defects. Conventional concrete defects above the waterline which does not affect structural capacity of the concrete. Water tight defects below the waterline which may affect buoyancy of the cell, pontoon or the bridge. Typical CS3 submerged defects include, but are not limited to: Seepage of less than 1" of water accumulation in a year; Cracks that are stable or inactive for several storm events; Areas of concrete that are moist or have leachate present; Any cells that are consistently in a damp or "trace condition."
   - If cells are in CS3 due to seepage, then NBI Item 060 shall be a 6.
   - If eight or more adjacent or contiguous cells in a single pontoon are in CS3, then NBI Item 060 shall be a 5.
   - If 20 percent of the cells in one pontoon, or a total of 10 percent of the cells in adjoining pontoons or 5 percent of the total element quantity are in CS3, then NBI Item 060 shall be a 4.
4. Number of pontoon cells with damage in locations or quantity which has reduced the structural capacity of the pontoon or threatens the buoyancy of a cell, the pontoon or the bridge. Wet conditions that indicate a threat to a cell's buoyancy include, but not limited to: Water leaks 1 inch or more per year in three consecutive years; Water leaks 2 inches or more in a year; Any cell visually leaking water. Any cell with a pontoon hatch or bulkhead in CS4, see WSDOT element 237.
   - If cells are in CS4, then NBI Item 060 shall be a 4.
   - If eight or more non-adjacent cells in a single pontoon are in CS4 or one cell leaks ½ inch per month, then NBI Item 060 shall be a 3.
   - If eight or more adjacent cells in a single pontoon are in CS4, or one cell leaks 1 inch of water per month, then NBI Item 060 shall be a 2.
   - If 20 percent of the cells in one pontoon, or a total of 10 percent of the cells in adjoining pontoons or 5 percent of the total element quantity are in CS4, then NBI Item 060 shall be a 2.
   - If one cell leaks 1 inch of water per month, for three consecutive months, then the NBI Item 060 shall be a 1 and the bridge shall be closed to traffic.
   - If there is a measurable or visual change in the alignment or the free board distance at any location on the pontoon, then the NBI Item 060 shall be a 1 and the bridge shall be closed to traffic.

237 Pontoon Hatch/Bulkhead Units – EA

This element defines a steel deck or bulkhead hatch access. Deck hatches are accessed from the exterior of a pontoon and bulkhead hatches provide access between cells. The condition evaluation of a hatch includes, but is not limited to the ability of a hatch to provide a watertight structural seal. The performance of the hatches is critical to the design buoyancy of the pontoon structure during extreme events. The total element quantity is the total number of hatch and bulkheads on a bridge.

1. Defects are superficial and are insignificant to performance of the hatch. Insignificant amounts of water enter a cell when a deck hatch is opened.
2. Number of hatch/bulkheads with repairs such as: replaced seals, repaired hold-down dogs or locks.
3. Number of hatch/bulkheads with structural defects. The defects do not threaten performance of the hatch. Number of hatches which allow water accumulation into a cell of less than 1” per year.
4. Number of hatch/bulkheads with damage that threatens performance during an extreme event. Number of hatches which allow water accumulation into a cell of 1” or more per year. All pontoon cells in WSDOT element 236 shall be coded CS4 that have a deck hatch or bulkhead hatch coded CS4.

238 Floating Bridge – Anchor Cable Units – EA

This element defines a steel anchor cable used in a floating bridge. The condition of a floating pontoon anchor cable is evaluated during underwater inspections performed by divers and remotely operated vehicles. Condition evaluation is based on cable protection system, breakage of wires within the cable and the condition of the cable anchor. The total element quantity should equal the number of floating pontoon anchor cables attached to the bridge.

1. Number of cables or anchors with no defects in the cable or anchor and the galvanized protection system is functioning properly. New replacement cables are coded in this condition state. (Corresponds to NBI substructure rating of 7 or 8.)
2. Number of cables or anchors with defects that are insignificant and do not affect the capacity of the cable. The galvanized protection system is showing signs of failure, and surface or freckled rust may exist with no significant loss of section. If any portion of the cable or anchor is CS2, then the NBI Substructure Condition rating (NBI Item 060) shall be a maximum of 6.
3. Number of cables or anchors with defects that are beginning to affect the capacity of the cable, but are within acceptable design limits. Corrosion section loss is present. Single wire failures of the cable may exist due to corrosion or hydrogen embrittlement, but no closer than 30 feet apart.
4. Number of cables or anchors with defects that have significantly affected the capacity. Two or more broken wires, or equivalent section loss due to other defects, are within 30 feet. If any portion of the cable or anchor is CS4, then the NBI Substructure Condition rating (NBI Item 060) shall be a maximum of 4. If two or more adjacent cables (on the same side or opposite sides of the pontoon) or more than four cables on the structure are CS4, then the NBI Substructure Condition rating (NBI Item 060) shall be 3.

4.4 Culverts

240 Metal Culvert Units – LF

This element defines a metal (steel, aluminum, etc.) culvert including arches, round or elliptical pipes, etc. The total quantity is the length of culvert from inlet to outlet along the bottom of the culvert and does not include the apron.

1. Defects are superficial and have no effect on the structural capacity of the element. There may be corrosion, erosion, scour, distortion, or roadway settlement.
2. Length of culvert with repairs.
3. Length of culvert with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Length of culvert affected by damage in locations or quantity and has reduced the structural capacity of the culvert. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to: distortion, deflection, roadway settlement, or misalignment of the barrel.

241 Concrete Culvert Units – LF

This element defines all precast and cast-in-place (conventional or prestressed) concrete arch, pipe and box culverts. The total quantity is the length of culvert from inlet to outlet along the bottom of the culvert and does not include the apron.

1. Defects are superficial and have no effect on the structural capacity of the element. There may be discoloration, efflorescence, and/or superficial cracking, spalls, or delaminations.
2. Length of culvert with repair or patch.
3. Length of culvert affected by defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to delaminations, spalls, structural cracking, exposed or corroded reinforcing or strands.
4. Length of culvert affected by damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the culvert. Structural deficiencies are not limited to: distortion, deflection, roadway settlement, or misalignment of the.

242 Timber Culvert Units – LF

This element defines all timber box culverts. The total quantity is the length of culvert from inlet to outlet along the bottom of the culvert and does not include the apron.

1. Defects are superficial and have no effect on the structural capacity of the element. Decay, insect infestation, cracks, splits, or checks may exist.
2. Length of culvert that has been replaced, repaired, patched, or plated.
3. Length of culvert with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Typically, locations in a load path with a 1½″ to 3″ shell thickness are marked with a YELLOW TAG.
4. Length of culvert affected by damage in locations or quantity and has reduced the structural capacity of the element or the bridge. Structural analysis is warranted or has determined repairs are essential to restore the structural capacity of the culvert. Structural deficiencies are not limited to: distortion, deflection, roadway settlement, or misalignment of the barrel. Typically, locations in a load path with less than a 1½″ shell thickness are marked with a RED TAG.

243 Other Culvert Units – LF

This element defines all culverts not included under steel, concrete, or timber culvert elements. It may include masonry or combinations of other materials. The total quantity is the length of culvert from inlet to outlet along the bottom of the culvert and does not include the apron.

1. Defects are superficial and have no effect on the structural capacity of the culvert.
2. Length of culvert with repairs.
3. Length of culvert with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Length of culvert affected by damage in locations or quantity and has reduced the structural capacity of the culvert. Structural analysis is warranted or has determined repairs are essential to restore the structural capacity of the culvert. Structural deficiencies are not limited to: distortion, deflection, roadway settlement, or misalignment of the barrel.

4.5 Tunnels

250 Tunnel – Concrete Lined Units – SF

This WSDOT element identifies concrete lined tunnels. In addition, other WSDOT elements are used to record the existence and condition of those portions of a tunnel that are defined as tunnel superstructure. Tunnel superstructure exists when elevated members directly support live load on or inside the tunnel. The total quantity is the tunnel perimeter exposed to traffic minus the roadway surface multiplied by the length of tunnel.

251 Tunnel – Timber Lined Units – SF

This is an element used to identify timber-lined tunnels. In addition, other WSDOT elements are used to record the existence and condition of those portions of a tunnel that are defined as tunnel superstructure. Tunnel superstructure exists when elevated members directly support live load on or inside the tunnel. The total quantity is the tunnel perimeter exposed to traffic minus the roadway surface multiplied by the length of tunnel.

252 Tunnel – Unlined Units – SF

This is an element to identify unlined tunnels. In addition, other WSDOT elements are used to record the existence and condition of those portions of a tunnel that are defined as tunnel superstructure. Tunnel superstructure exists when elevated members directly support live load on or inside the tunnel. The total quantity is the tunnel perimeter exposed to traffic minus the roadway surface multiplied by the length of tunnel.

Condition States for WSDOT Elements 250, 251, and 252

1. Defects are superficial and have no effect on the structural capacity of the tunnel.
2. Tunnel area with repairs or patches.
3. Tunnel area with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Tunnel area affected by damage in locations or quantity and has reduced the structural capacity of the tunnel (or tunnel liner). Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

253 Tunnel Tile Units – SF

This is an element to identify tunnel tile. The total quantity is the area of tile visible for inspection.

1. Tile is bonded with no cracks, chips, or blemishes. Tile may be dirty but reflectivity is enhanced during regular tunnel washing operations.
2. Tile area that has been repaired.
3. Tile area that is bonded, but cracked and may have efflorescence or small amounts of section loss. Tile may be blemished from impact or other causes resulting in major loss of reflectivity.
4. Tile area with delaminations based on soundings, is completely missing, or has major section loss warranting replacement.

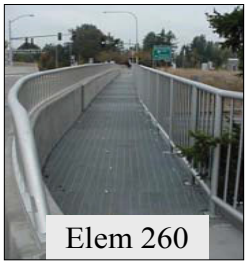
4.6 Sidewalk and Supports

A sidewalk is an element that provides pedestrian access across a bridge. A sidewalk is supported by a bridge deck and/or by sidewalk brackets that consist of several types of materials. The purpose of the sidewalk BMS is to record the structural integrity of the support system and sidewalk. Identify these elements in BMS if the sidewalk width is greater than or equal to 3 feet.

However, there are exceptions that must be accommodated. When there is a true sidewalk on a bridge as determined by the design, approach sidewalks, and location, it is appropriate to enter a sidewalk element in the BMS. Timber sidewalks, for example, may be narrow and have a support system. These exceptions should include a sidewalk WSDOT element. A specific note explaining the reasoning for including the sidewalk element should be provided.

If a rail retrofit or a wide curb has been determined to NOT be a sidewalk, then Bridge Rail elements will be used to document defects.


Elem 264


Elem 260


Elem 260

260 Steel Open Grid Sidewalk and Supports Units – SF

This element defines a sidewalk constructed of steel grids that are open and unfilled. This element also includes the members used to provide support like stringers and braces. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.

261 Steel Concrete Filled Grid Sidewalk and Supports Units – SF

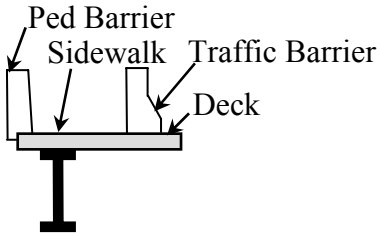
This element defines a sidewalk constructed of steel grids that have been filled with concrete. This element also includes the members used to provide support like stringers and braces. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.

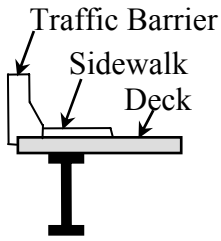
262 Corrugated/Orthotropic Sidewalk and Supports Units – SF

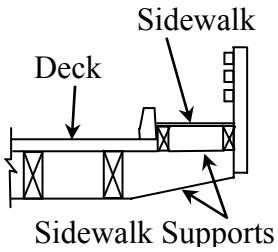
This element defines a sidewalk constructed of corrugated metal filled with Portland cement concrete or asphaltic concrete or an orthotropic steel deck. This element also includes the members used to provide support like stringers and braces. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.

264 Timber Sidewalk and Supports Units – SF

This element defines a sidewalk constructed of timber. This element also includes the members used to provide support like stringers and braces. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.







266 Concrete Sidewalk and Supports Units – SF

This element defines a sidewalk constructed of reinforced concrete. The concrete sidewalk may be supported by the roadway deck, bracing, diaphragms, or sidewalk stringers. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.

267 Fiber Reinforced Polymer (FRP) Sidewalk and Supports Units – SF

This element defines a sidewalk constructed of fiber-reinforced polymer. This element also includes the members used to provide support like stringers and braces. The total quantity should equal the width of the sidewalk times its length which includes sidewalk supported by structural bridge members such as a wing wall or approach slab.

Condition States for WSDOT Elements 260, 261, 262, 264, 266, and 267

1. Defects are superficial and have no effect on the structural capacity of the sidewalk or supports.
2. Sidewalk area (or support projected area) with repairs or patches
3. Sidewalk area (or support projected area) with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Sidewalk area (or support projected area) affected by damage in locations or quantity and has reduced the structural capacity of the sidewalk support. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

4.7 Bearings

When an in-span hinge separates two structures, the joint, bearing, and seismic restrainers at the hinge will be documented in the dependent (or supported) structure only.

310 Elastomeric Bearing Units – EA

This element defines a bridge bearing that is constructed primarily of elastomers, with or without fabric or metal reinforcement.

311 Moveable Bearing (Roller, Sliding, etc.) Units – EA

This element defines those bridge bearings that provide for both deflection and longitudinal movement by means of roller, rocker or sliding mechanisms.

312 Concealed Bearing or Bearing System Units – EA

This element defines those bridge bearings and/or bearing seats that are not accessible with tools or equipment and therefore are not open for detailed inspection.

313 Fixed Bearing Units – EA

This element defines those bridge bearings that provide for rotation only.

314 Pot Bearing Units – EA

This element defines those high load bearings with a confined elastomer. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction.

314 – Pot Bearing

315 Disc Bearing Units – EA

This element defines a high load bearing with a hard plastic disc. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction.

316 Isolation Bearing Units – EA

This element defines a bearing that is laminated and is a sandwich of neoprene and steel plates. The bearing contains a lead core that is primarily used for seismic loads. The isolation bearing is used to protect structures against earthquake damage.

Condition States for WSDOT Elements 310, 311, 312, 313, 314, 315, and 316

1. Defects are superficial and have no effect on the superstructure movements or safe transfer of load to the substructure. Shear deformation, displacement, or cracking of grout pad may be present. Top and bottom surfaces may not be parallel.
2. Number of bearings with a repair.
3. Number of bearings with structural defects. The defects are not detrimental to the superstructure or the safe transfer of load to the substructure. Deficiencies do not warrant analysis, but may require repairs.
4. Number of bearings with defects that are detrimental to the superstructure or the safe transfer of load to the substructure. Loss of minimum bearing area may be imminent. Structural analysis is warranted or has determined bearing repairs are essential to restore the safe movement or transfer of load to the substructure.

4.8 Bridge Approach

321 Concrete Roadway Approach Slab Units – SF

This element defines a structural concrete slab supported at the bridge abutment and the roadway pavement. This element is essentially a concrete deck element that documents the surface conditions of the approach slab. The element quantity is the total area of both concrete approach slabs attached to the bridge. Do not include asphalt shoulder if present. Whether surface of approach slab is visible or covered by an asphalt overlay, a WSDOT element shall exist.

1. Defects are superficial. The slab surface do not have spalls/delaminations or previous repairs. The deck surfaces may have cracks or rock pockets. Wear and rutting may expose aggregate or reinforcing.
2. Slab area with repairs or patches. Do not include the rare case rutting filled with patching material.
3. Slab area with spalling. Do not add delaminations found in the field.
4. This condition state documents when an approach slab has failed and needs to be replaced. Failure is normally due to the slab falling off the bridge seat with a visible grade separation and/or excessive gap at the pavement seat. Code the total SF of approach slab in condition state 4.

322 Bridge Impact Units – EA

This documents an increase to the bridge live load, or impact, due to hammering or dynamic response of the bridge from trucks passing on to the bridge. Truck speed may be considered when slower speeds reduce the impact. Total quantity is based on the direction of trucks on to the bridge. Head to head traffic has two and bridges with a single direction of traffic will have one, such as ramps or main line divided structures (N&S or E&W). Code the approach roadway in the condition state that best indicates the severity of the problem. For the roadway where trucks are leaving the structure, deficiencies can be described and repairs may be called out. However, approach roadway will not be quantified.

1. The number of approach roadways that are smooth. Hammer or dynamic response to the structure is not significant. There may be small bumps or minor raveling of the pavement in the approach roadway.
2. The number of approach roadways (not approach slab) that have been repaired or feather patched to correct an approach problem. If a paving project has removed the repairs, then the flag may be deleted.
3. The number of approach roadways that are rough, but the increase in live load to the structure is minor. Hammering impact is minor due to the wheels passing over surface discontinuities such as joints, cracks, or potholes. Dynamic response is minor due to a dip or rise in the approach roadway alignment.
4. The number of approach roadways that are causing significant increase in live load to the structure. Hammering impact is significant due to the wheels passing over surface discontinuities such as joints, cracks, or potholes. Dynamic response is significant due to a dip or rise in the approach roadway alignment.

4.9 Bridge Rail

WSDOT element for bridge railing are to be entered for each type of rail. For example, if there is W-beam or Thrie beam guardrail mounted on the concrete bridge rail, then the length of each metal and concrete element should be entered. If the original concrete bridge rail has aluminum rail installed on top (with or without a rail retrofit), enter that quantity into the appropriate WSDOT element as well. In the element notes, describe what type of metal bridge or pedestrian rail has been entered.

330 Metal Bridge Railing Units – LF

This element defines all types and shapes of metal bridge railing aluminum, metal beam, rolled shapes, etc. The quantity should equal the total length measured along each bridge rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

331 Concrete Bridge Railing Units – LF

This element defines all types and shapes of reinforced concrete bridge railing. The quantity should equal the total length measured along each bridge rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

332 Timber Bridge Railing Units – LF

This element defines all types and shapes of timber railing. All elements of this rail (except connectors) must be timber. The quantity should equal the total length measured along each bridge rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

333 Other Bridge Railing Units – LF

This element defines all types and shapes of bridge railing except those defined as METAL, CONCRETE or TIMBER. This element will include cable rails, and combinations of materials. The quantity should equal the total length measured along each bridge rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

Condition States for WSDOT Elements 330, 331, 332, and 333

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Bridge rail length with a repair.
3. Bridge rail length with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth), decay, or spalling.
4. Bridge rail length with damage in locations or quantity and has reduced the structural capacity of the rail. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

4.10 Pedestrian Rail

A pedestrian rail will typically be on the outside of a sidewalk and protected from traffic by a Bridge Rail.

340 Metal Pedestrian Rail Units – LF

This element defines all types and shapes of metal pedestrian bridge railing including steel (excluding weathering steel), aluminum, metal beam, rolled shapes, etc.
The quantity should equal the total length measured along each pedestrian rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

341 Concrete Pedestrian Rail Units – LF

This element defines all types and shapes of reinforced concrete pedestrian bridge railing. The quantity should equal the total length measured along each pedestrian rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

342 Timber Pedestrian Rail Units – LF

This element defines all types and shapes of timber pedestrian bridge railing.
All elements of this rail (except connectors) must be timber. The quantity should equal the total length measured along each pedestrian rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

343 Other Pedestrian Rail Units – LF

This element defines all types and shapes of pedestrian bridge railing except those defined as METAL, CONCRETE or TIMBER. This element will include cable rails, and combinations of materials. The quantity should equal the total length measured along each pedestrian rail within the limits of the bridge which includes rail attached to structural bridge members such as a wing wall or approach slab.

Condition States for WSDOT Elements 340, 341, 342, and 343

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Pedestrian rail length with a repair.
3. Pedestrian rail length with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs. Structural deficiencies are not limited to impact damage, cracks, broken bolts, or measurable section loss due to corrosion (note the location and depth), decay, or spalling.
4. Pedestrian rail length with damage in locations or quantity and has reduced the structural capacity of the rail. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element.

4.11 Smart Flags

355 Damaged Bolts or Rivets Units – EA

This smart flag is used to identify superstructure steel elements that have broken or missing bolts and/or rivets. Report one unit for each occurrence in the corresponding condition state.

1. Number of damaged, missing, or loose bolts or rivets in secondary member(s).
2. Number of damaged, missing, or loose bolts or rivets has been replaced.
3. Number of damaged, missing, or loose bolts or rivets in a primary member(s).

356 Steel Cracking Units – EA

This smart flag is used to identify superstructure steel elements with cracks. Report one unit for each occurrence (or crack) in the corresponding condition state. If fatigue damage exists, which may warrant analysis of the element or the serviceability of the element is uncertain, contact a supervisor immediately.

1. Number of steel cracks, of any length, in a secondary member(s).
2. Number of steel cracks within a load path that have been repaired or arrested. The bridge may still be prone to fatigue.
3. Number of steel cracks within a load path that are not arrested and less than 1 inch. Any cracks (typically cope cracks) on WSDOT bridges must be repaired accordance with WSDOT Bridge Preservation Office procedures.
4. Number of steel cracks within a load path that are not arrested and 1 inch or greater in length. Any cracks (typically cope cracks) on WSDOT bridges must be repaired accordance with WSDOT Bridge Preservation Office procedures.

357 Pack Rust Units – EA

The primary purpose of this smart flag is to quantify steel connections where rust expansion is visually deflecting steel plates and should be addressed when the bridge is painted. Structural impacts to pack rust overstressing are recorded in the steel elements. The total quantity is the number of existing pack rust locations identified by the inspector.

1. Number of locations where visible pack rust exists and is less than ¼ inch thick.
2. Number of locations where pack rust is more than ¼ inch thick.

360 Bridge Movement Units – EA

The primary purpose of this smart flag is to identify structural movement that is causing significant distress to the bridge. Movements may be horizontal, vertical, or rotational. Evidence of movement should be documented (photo) in such a way that future measurements can determine if the structure is still moving or has stabilized.

1. The entire bridge appears to have stabilized due to repairs or recent history of measurements. Tilt meters, piezometer tubes, or monitoring system show no movement in the past two years.

2. Bridge elements are moving but do not cause a significant problem for the bridge. Bearings may be approaching design limits. Substructure elements may be moving.
3. Bridge movement is at or beyond design limits. Investigation and repair analysis of the bridge is warranted.

361 Scour Units – EA

This element is used to identify foundation scour for bridges crossing waterways as observed during inspections. Its primary purpose is to identify bridge piers or abutments that are subject to scour and to provide some measure of the magnitude of that scour. Piers in normal high water are typically considered for this element but there are instances where piers above high water may be subject to scour. Maintain historical information related to scour documented in previous inspections such as measurements and/or comments of exposed footings.

1. Number of pier/abutment foundations where no Scour exists, or where scour is superficial and has no effect on the foundations structural capacity.
2. Number of pier/abutment foundations where scour has been mitigated and the repair is functioning and in place as designed. Evaluate and comment on any riprap or other scour countermeasures that are in place.
3. Number of pier/abutment foundations where scour exists. The scour does not significantly affect the foundations structural capacity. Scour does not warrant analysis, but may require repairs. If left unchecked, could adversely impact the foundations structural capacity.

   Scour at this level should not impact the NBI Substructure Overall rating code, item 060 (WSBIS Item 1676).

   Examples:
   - Top of spread footings are exposed due to scour.
   - Bottom of pile caps are exposed due to scour.
   - Minimum known pile embedment is between 5’ and 10’.
4. Number of pier/abutment foundations with scour damage in significant locations or quantity and has reduced the foundations structural capacity. Structural analysis is warranted. Repair and or action are required to protect exposed foundation and to restore capacity to the pier.

   Scour at this level may impact the NBI Substructure Overall rating code, item 060 (WSBIS Item 1676). A comment is necessary if the NBI Substructure Overall rating code is lowered.

   Examples:
   - Undermining of spread footings or foundation material is occurring.
   - Minimum pile embedment is less than 5’. Make a recommendation to evaluate the exposed pile for lateral stability.
   - Pile cap is undermined and piles are exposed due to scour.

362 Impact Damage Units – EA

This is a smart flag used to identify damage caused by impact from traffic or other causes such as flood debris. A maximum of 1 unit can be coded in each condition state.

1. Impact damage has occurred. None of the prestressed system is exposed. Repair, patching, or heat straightening is not required.
2. Impact damage has been repaired or patched. Any damage to a prestressed system has been repaired and patched. Steel elements have been repaired and painted.
3. Impact damage has occurred. Any prestressed system exposure is due to a traffic impact, but is not impaired. Patching concrete or heat straightening of steel is needed.
4. Impact damage has occurred and strength of the member is impaired. Analysis is warranted to ascertain if the member can be repaired or needs to be replaced.

366 Undercrossing – Safety Inspection Units – EA

This is a smart flag for safety checks of structures where Washington is not the Custodian (NBI Item 21) such as Railroad and other non-vehicular undercrossings. No other core elements are needed.

1. Report the entire bridge in condition state one (EA).

367 Movable Bridge Units – EA

This is a smart flag to identify movable bridges. WSDOT elements will be used in addition to this smart flag.

1. A Movable bridge with elements that do not require repair (EA).
2. A Movable bridge with elements that require repair (EA).

368 Seismic Pier Crossbeam Bolster Units – EA

This element identifies concrete piers with seismic structural improvements.

1. Number of piers with a crossbeam bolster.

369 Seismic Pier Infill Wall Units – EA

This element identifies concrete piers with seismic structural improvements.

1. Number of piers with a seismic pier infill wall.

4.12 Seismic Restrainers

Earthquake restrainers have been installed on WSDOT bridges since the 1980s. The typical longitudinal restrainer uses epoxy coated Dywidag bars with a designed gap maintained by double nuts. An earlier system using springs to maintain the required restrainer gap was used until the early 1990s when it was discontinued as being ineffective. Gap measurements are required during an inspection if visual inspection or loose double nuts indicate the gaps are not uniform.

370 Seismic – Longitudinal Restrainer Units – EA

This element is used to identify longitudinal seismic restrainers. When an in-span hinge separates two structures, the joint, bearing, and seismic restrainers at the hinge will be documented in the dependent (or supported) structure only. The quantity should equal the total number of longitudinal restrainers on the bridge.

371 Seismic – Transverse Restrainer Units – EA

This element identifies existing bridges that have been retrofitted or newer structures that have been equipped with transverse restrainers designed to restrain transverse movement during a seismic event. The quantity should equal the total number of transverse restrainers on the bridge. When an in-span hinge separates two structures, the joint, bearing, and seismic restrainers at the hinge will be documented in the dependent (or supported) structure only. Concrete girder stops located at the ends of girders attached to the abutment or intermediate pier caps/crossbeams provide lateral restraint however it is not the intention to include these in with this element.

372 Seismic – Link/Pin Restrainer Units – EA

This element is used to identify link/pin seismic restrainers. When an in-span hinge separates two structures, the joint, bearing, and seismic restrainers at the hinge will be documented in the dependent (or supported) structure only. The quantity should equal the total number of link/pin restrainers on the bridge.

Condition States for WSDOT Elements 370, 371, and 372

1. Restrainer is in good condition and will function as designed. Anchor plate nuts have been checked and are in good condition.
2. Number of restrainers with misaligned seismic-longitudinal restrainer rods. Anchor plate nuts that are tight, but that have epoxy running down their bolts or are of varying lengths. The gap between adjacent longitudinal restrainers varies between ¼ inch and ¾ inch. Short transverse pipe restrainer length. Measure the depth of the diaphragm hole to the restrainer. Take a picture of the hole and tape measure.
3. Number of restrainers with improper anchor plate installation. Loose or inadequately bonded anchor nuts. A repair is warranted if over 25 percent of the anchor nuts have more than 2 inches of bolt thread exposed below the nut. Restrainer gap variation in a series of longitudinal seismic restrainers is greater than ¾ inches (measure and add the two gap distances on both sides of each restrainer in making your comparisons). Loose double nuts. Specify the replacement of the double nuts with (new) nuts having (with) setscrews and the resetting of the restrainer gaps according to the design tables. The inspector shall specify the required gaps, according to the bridge plans, in the repair.

373 Seismic – Catcher Block Units – EA

This element is used to identify a catcher block attached to a pier or abutment installed as part of a seismic retrofit. The quantity should equal the total number of catcher blocks on the bridge.

1. Number of catcher blocks in good condition.
2. Number of catcher blocks with deficiencies that need correction.

374 Seismic - Column Silo Units – EA

This element is used to identify when a column has been designed to be isolated from the surrounding soil during a seismic event. This will usually consist of a corrugated metal pipe buried in the ground with a cap at the base of a column. The inspection note needs to identify the individual columns that are siloed along with the planned depth (relative to an identifiable elevation) at each one. In cases with small numbers of siloed columns, that could be done in the note. In other situations, a spreadsheet attached as a file or something similar may be useful. In-depth inspections at 12-year intervals are required to confirm the system condition and functionality. In-depth inspection may require means (equipment and manpower) to open and then reclose/reseal the capping system along with tools to measure the silo depth and to roughly assess column and silo condition below the capping system. Each bridge with siloed columns may require an individual in-depth inspection procedure.

1. Silo capping system is intact as designed and is accessible with no visible deterioration.
2. Minor deterioration of silo capping system elements such as hardware corrosion, visible seal deterioration, access hardware broken/missing.
3. Capping system has been buried and is not visible for inspection. (write repair – priority 2 or higher)
4. Capping system has failed allowing solid foreign material to enter the intended gap and potentially restrict column movement. (write repair – priority 1)

375 Cathodic Protection Units – EA

This is a smart flag used to identify a cathodic protection system used on a bridge. The quantity should equal the total number of cathodic protection systems on the bridge.

1. Code 1 if the cathodic protection system is functioning as designed.
2. Code 1 if the cathodic system is no longer functioning as designed.

376 Concrete Deck Delamination Testing Units – SF

This is a smart flag used to identify the results of concrete deck delamination testing. For Washington State bridges, the BMS engineer will provide the area of condition states and 376 notes for this element.

1. Deck area with no delaminations
2. For bridges with an ACP overlay, this is the area of concrete patching before an overlay was constructed. No action required by the inspector.
3. Deck area with concrete spalling measured in the Materials Lab Deck Delamination Test.
4. Deck area with concrete delamination measured in a Materials Lab Deck Delamination Test. This area should be recorded in the Concrete Deck CS4 (or Deck and Concrete Overlay CS4).

380 Unknown Foundation Units Units – EA

This element has been discontinued and is no longer available for use. Migrate any notes that pertain to this element to an appropriate alternative element.

4.13 Expansion Joint Elements

The expansion joint condition states are designed to track the criteria associated with joint structural failure such as spalling, patches, and other structural problems. A spall within 1′-0″ of a joint system should be considered a joint spall and not included with the deck spalling. Spalls next to the joint are a joint deficiency rather than deck deterioration.

Missing or defective joint glands are not considered structural joint failures in the joint condition states. Some joints are designed to pass water and many joints leak within days of installation. If the joint seal leakage is causing structural problems with elements below the joint, this should be noted in the report and a repair should be recommended. A smart flag or element may be used to track this deterioration in the future, but it is not included in the joint condition states at this time.

If any portion of a joint falls into a lower condition state, code the entire length of the joint in the lower condition state. Joints with structural defects are coded in CS2. Joints that require replacement are tracked in CS3. In general, joints in Condition State 3 will be programmed for rehabilitation or replacement.

When the entire joint is replaced with a new joint system, change the WSDOT element to the new joint type. Do not use more than one WSDOT element for a joint location, unless the structure has been widened and there are two joint systems present. Joint notes should reference specific joints by pier or span number.

When an in-span hinge separates two structures, the joint, bearing, and seismic restrainers at the hinge will be documented in the dependent (or supported) structure only.

400 Asphalt Butt Joint Seal — Units – LF

This element defines a butt joint between concrete and asphalt pavement that is an asphalt sawcut filled with hot poured rubber. This joint is shown in WSDOT Standard Plan A-40.20, Bridge Paving Joint Seals, Detail 3 or 4. This element shall also be apply for a butt joint at the end of the approach slab to extend the life of the asphalt. The quantity should equal the length measured along the joint.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent concrete or asphalt is sound.
2. Skewed joint length at each location. “D” spalls or patches are present in the header or in the concrete within one foot of either side of the joint but no more than 10 percent of the length.
3. Skewed joint length at each location with the following typical criteria: When the concrete or asphalt must be rebuilt to maintain a reliable roadway surface; More than 10 percent of the joint length has spalls or patches adjacent to the seal; Asphalt was placed without a sawcut or the sawcut was not in the proper location.

401 Asphalt Open Joint Seal Units – LF

This element represents a sealed and sawcut contraction joint or a asphalt joint in bridge paving over an open concrete joint in a bridge deck or truss panel joint, as shown in WSDOT Standard Plan A-40.20, Bridge Paving Joint Seals, Detail 1, 2, 5, or 6 . The joint consists of hot poured rubber placed in an open concrete joint and a membrane may or may not exist. After the asphalt is placed, a sawcut is placed over the concrete joint and the gap filled with hot poured rubber. WSDOT Elements 402 - Open Concrete Joint and 420 - Joint Paved Over flag do not apply at these locations. The quantity should equal the length measured along the joint.

WSDOT Element 420 - the Joint Paved Over flag does apply for all locations of a buried steel joint due to the risk of planing equipment damaging the bridge deck.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent concrete or asphalt is sound.
2. Skewed joint length at each location. “D” spalls or patches are present in the header or in the concrete within one foot of either side of the joint but no more than 10 percent of the length.
3. Skewed joint length at each location with the following typical criteria: When the concrete or asphalt must be rebuilt to maintain a reliable roadway surface; More than 10 percent of the joint length has spalls or patches adjacent to the seal; Asphalt was placed without a sawcut or the sawcut was not in the proper location.

402 Open Concrete Joint Units – LF

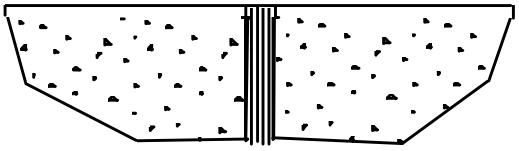
This element defines a joint designed to have concrete edges at the joint opening in a concrete wearing surface. The original design is usually filled with hot poured rubber or pre-molded joint filler and the design materials may or may not be present. This joint is typical for panel joints at a truss floorbeam and interior joints on older bridges. The quantity should equal the length measured along the expansion joint.

This is not to be confused with: WSDOT Element 403 - Concrete Bulb-T joint, WSDOT Elements 405 to 406 Compression Seals with the seal missing, or WSDOT Element 417 - Rapid Cure Silicone (RCS) joint.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound.
2. Skewed joint length at each location with “D” spalls or patches are present in the header or in the deck within one foot of either side of the joint.
3. Skewed joint length at each location where the deck or headers must be rebuilt to maintain a reliable roadway surface. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal.

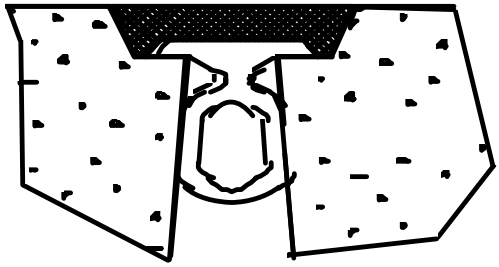
   

   A repair to reseal the joints is required for bridges at each steel floorbeam where water is corroding the top flange and/or connections.



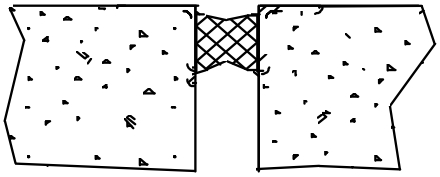
403 Concrete Bulb-T Units – LF

This element defines a joint formed to accept a Bulb-T preformed seal. The seal may be missing or other materials present to provide a seal. The quantity should equal the length measured along the expansion joint.



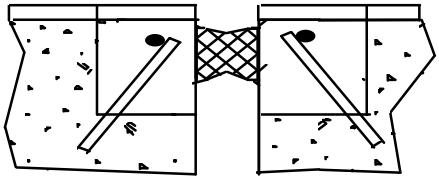
404 Compression Seal/Concrete Header Units – LF

This element defines a joint with concrete headers formed during the original construction of the bridge. The joint is filled with a pre-formed compression type seal. The quantity should equal the length measured along the expansion joint.



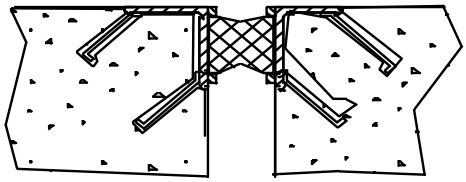
405 Compression Seal/Polymer Header Units – LF

This element defines those joints that have been rehabilitated with a polymer header and filled with a pre-formed compression type seal. The quantity should equal the length measured along the expansion joint.



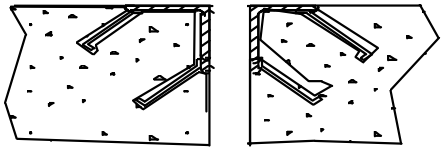
406 Compression Seal/Steel Header Units – LF

This element defines a joint with steel angle plate headers that have a pre-formed compression type seal. The quantity should equal the length measured along the expansion joint.



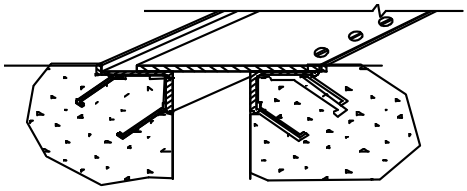
407 Steel Angle Header Units – LF

This element defines an open joint with steel angle plate headers. The quantity should equal the length measured along the expansion joint.



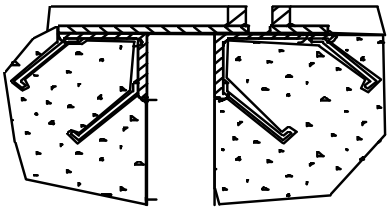
408 Steel Sliding Plate Units – LF

This element defines a joint with steel sliding plates. The quantity should equal the length measured along the expansion joint.



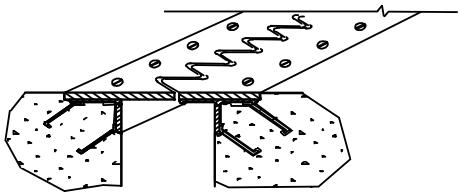
409 Steel Sliding Plate w/Raised Bars Units – LF

This element defines a joint with steel sliding plates and steel raised bars welded to the plates to accommodate an overlay. The quantity should equal the length measured along the expansion joint.



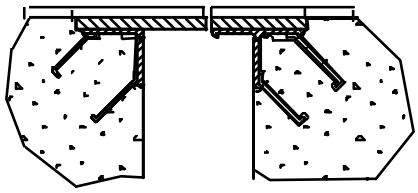
410 Steel Fingers Units – LF

This element defines a joint with open steel fingers. The quantity should equal the length measured along the expansion joint.



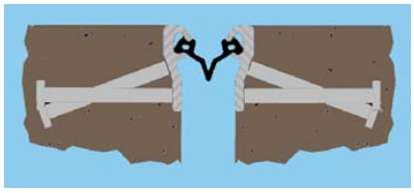
411 Steel Fingers w/Raised Bars Units – LF

This element defines a joint with bars or plates welded to the steel finger plates to accommodate an overlay. The quantity should equal the length measured along the expansion joint.



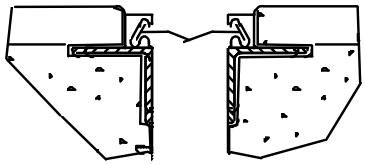
412 Strip Seal – Anchored Units – LF

This element defines an expansion joint that uses a neoprene type waterproof gland with steel extrusion or other system to anchor the gland. The steel extrusion is anchored into the concrete deck or header. The quantity should equal the length measured along the expansion joint.



413 Strip Seal – Welded Units – LF

This element defines an expansion joint that uses a neoprene type waterproof gland with steel extrusion or other system to anchor the gland. The steel extrusion is welded to a pre existing steel expansion joint. The quantity should equal the length measured along the expansion joint.



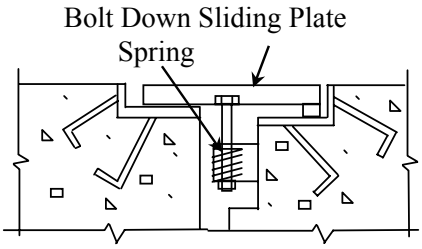
414 Bolt Down – Sliding Plate w/springs Units – LF

This element defines a bolted sliding plate expansion joint that uses steel springs. The quantity should equal the length measured along the expansion joint.

Condition States for WSDOT Elements 403,404, 405, 406, 407, 408, 409, 410, 411, 412, 413, and 414

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound.
2. Skewed joint length at each location with “D” spalls or patches present in the header or in the deck within one foot either side of the joint.
3. Skewed joint length at each location where the deck or headers must be rebuilt to maintain a reliable roadway surface or to maintain seal placement. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal.

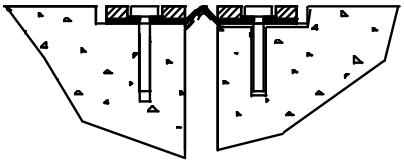
   Steel Materials: Steel components are banging, cracked, loose, broken, or missing. Steel sections that have been removed and/or replaced with something else (usually concrete patching) should be CS3.



415 Bolt Down Panel – Molded Rubber Units – LF

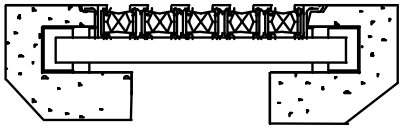
This element defines an expansion joint that uses a waterproof gland that is held in place by molded rubber panels that are attached with bolts. The quantity should equal the length measured along the expansion joint.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound. Molded Rubber panels are secure and have no defects.
2. Skewed joint length at each location with "D" spalls or patches present in the header or in the deck within one foot either side of the joint. Some of the bolts may be broken but they represent less than 10 percent of the total for that panel.
3. Skewed joint length at each location where more than 10 percent of the bolts in a panel are missing, loose, or broken. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal



416 Assembly Joint Seal (Modular) Units – LF

This element defines a large movement joint that has an assembly mechanism with multiple neoprene type waterproof glands. The quantity should equal the length measured along the expansion joint.



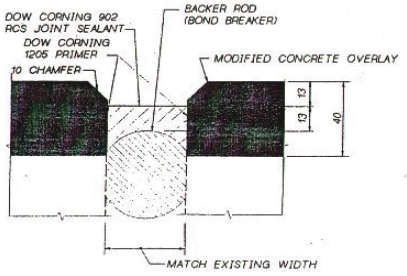
417 Silicone Rubber Joint Filler Units – LF

This element defines an expansion joint that has been repaired with a single or two component rubber joint filler. The quantity should equal the length measured along the expansion joint.

Condition States for WSDOT Elements 416 and 417

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound.
2. Skewed joint length at each location with "D" spalls or patches present in the header or in the deck within one foot either side of the joint.
3. Skewed joint length at each location where the deck or headers must be rebuilt to maintain a reliable roadway surface or to maintain seal placement. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal.

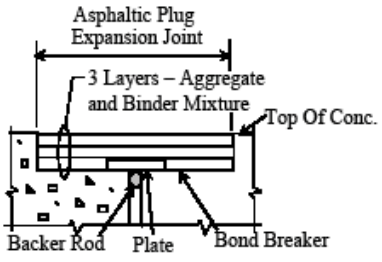
   Steel Materials: Steel components are banging, cracked, loose, broken, or missing. Steel sections that have been removed and/or replaced with something else (usually concrete patching) should be CS3.



418 Asphalt Plug Units – LF

This element defines an expansion joint that has been replaced with an asphalt plug system. The quantity should equal the length measured along the expansion joint.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound.
2. Skewed joint length at each location with rutting in the joint is minor. "D" spalls or patches are present in the joint, or in deck adjacent to joint.
3. Skewed joint length at each location where the asphalt material in the joint has significant rutting, bulging or is missing. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal.

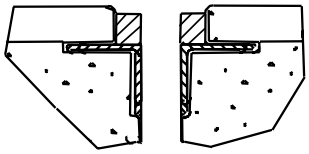


419 Steel Angle w/Raised Bars Units – LF

This element defines a joint with steel angles and steel raised bars welded to the angles to accommodate an overlay. The quantity should equal the length measured along the expansion joint.

1. The expansion joint is functioning as designed. Joint may not be perfect with signs of leakage. The adjacent deck or header is sound.
2. Skewed joint length at each location with “D” spalls or patches present in the header or in the deck within one foot either side of the joint.
3. Skewed joint length at each location where the deck or headers must be rebuilt to maintain a reliable roadway surface or to maintain seal placement. As a guideline, more than 25 percent of the joint length has spalls or patches in the deck or headers adjacent to the seal.

   Steel Materials: Steel components are banging, cracked, loose, broken, or missing. Steel sections that have been removed and/or replaced with something else (usually concrete patching) should be CS3.



420 Joint Paved Over Flag Units – LF

This element identifies when a steel joint system that has been paved over with asphalt. This is a high risk to damaging the steel joint or bridge deck by the paving operations. When this flag is used, a cost for joint work will be included in the next paving contract to correct the problem. Since the joint cannot be inspected, the joint element condition states should remain unchanged (and so noted). Some steel joints may have more than 2.5” of asphalt may not require rehabilitation. The Total quantity will be the sum total length of all joint systems on the bridge.

1. Skewed joint length at each location that is paved over, but rehabilitation is not required.
2. Skewed joint length at each location that requires rehabilitation. A photo is helpful to determine the type of rehabilitation.

4.14 Movable Bridges

501 Movable Bridge Steel Tower Units – LF

This element defines the structural steel columns and members used to support a counter weight of a vertical lift span. The total quantity is the total of the supporting column lengths.

1. Defects are superficial and have no effect on the structural capacity of the element.
2. Tower column length with repairs such as: bolts or rivets have been replaced; cracks that have been drilled or plated.
3. Tower column length with structural defects. The defects do not significantly affect structural capacity. Deficiencies do not warrant analysis, but may require repairs.
4. Tower column length affected by damage in locations or quantity and has reduced the structural capacity of the column or the tower. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Structural deficiencies are not limited to impact damage, corrosion, a crack in primary load path member or in the attachment welded to primary member. Retain the quantity of the element reported in CS4 if the element is repainted but not repaired.

4.15 Other Bridge Elements

705 Bridge Luminaire Pole and Base Units – EA

This element is defined by a light pole and anchor system attached to a bridge. It does not include the mast arm or other types of lights that may be attached to the bridge. The condition states describe the structural condition of the pole, anchor bolts, and support. WSDOT Region maintenance may need to be contacted prior to inspection in order to remove bolt covers or otherwise provide access for inspection. The total element quantity should equal the number of luminaire poles attached to the bridge.

1. There are no significant structural defects in the pole or support, and the grout pad is solid. Poles or supports that have been replaced are coded in this condition state.
2. Number of poles where structural inspection requires special equipment to access.
3. Number of poles with structural defects. The defects do not significantly affect the structural capacity.
4. Number of poles affected by damage in locations or quantity and has reduced structural capacity. Structural analysis is warranted or has determined repairs are essential to restore the full capacity of the element. Visual inspection indicates a base plate that is not supported by leveling nuts.

4.16 WSDOT Bridge Deck Overlay Elements

WSDOT categorizes overlays in to two different types. The first type consists of Asphalt Concrete Pavement (ACP) and Thin Overlays, are a deck protection systems intended to prolong the life of the deck by removing the traffic wear from the surface of the concrete deck. The second type is a Concrete Overlay which is intended to rehabilitate the deck and provide a new concrete wearing surface.

ACP Overlays are represented by the WSDOT element 800 can generally be identified in the field where as WSDOT element 801 represents asphalt with a membrane that is not visible. Thin overlays may be identified in the field if the system has failed and chunks are missing. Deterioration of the ACP and thin overlays is not generally associated with the deterioration of the deck. The ACP may be replaced several times without exposing the concrete deck and the condition states for the deck and overlay elements are independent and DIFFERENT. Paving contracts attempt to repair all concrete spalls and delaminations on WSDOT bridges before placing the overlay. If the area of patching/spalls/delams is known, then the quantity should be noted and recorded in the WSDOT concrete deck element as CS2, CS3 or CS4 respectively; while the Overlay quantities of CS2 and CS3 are based on the visible inspection of the surface. In a similar fashion, if a new Bituminous Surface Treatment (BST) has been applied to an asphalt surface, then the overlay element CS2 and CS3 are equal to zero.

800 Asphalt Concrete (AC) Overlay Units – SF

This element defines an Asphalt Concrete (AC) bridge deck overlay, with or without a Bituminous Surface Treatment (BST). The quantity should equal the overlay's width times the length.

801 Asphalt Concrete (AC) Overlay With Waterproofing Membrane Units – SF

This element defines an asphaltic concrete with waterproofing membrane bridge deck overlay. The quantity should equal the overlay's width times the length.

802 Thin Polymer Overlay Units – SF

This defines a thin polymer bridge deck overlay that is less than or equal to 0.5 inches in thickness (i.e., epoxy, methyl-methacrylate). The quantity should equal the overlay's width times the length.

Condition States for WSDOT Elements 800, 801, and 802

1. Defects are superficial. The deck surfaces have no spalls/delaminations or previous repairs. The deck surfaces may have cracking.
2. Total area of overlay patches.
3. Total area of overlay spalls or potholes. Thin Polymer Overlays (802) may have visible delaminations and should be considered as spalls and coded in CS3.

Concrete Overlay elements are difficult to discern in the field and are identified in special provisions or Plans. When constructing modified concrete overlays, the material removed by the deck preparation (spalls and delams) is replaced with the overlay material. WSDOT considers this construction deck rehabilitation; or in other words, the concrete overlay and deck are monolithic. Therefore, CS2 and CS3 for the

deck and concrete overlay will be the SAME. All defects noted in the concrete overlay (SF) apply to the deck. It is not uncommon to have the overlay break up when there is a problem in the deck below it.

803 Modified Concrete Overlay Units – SF

This defines a rigid modified concrete bridge deck overlay that is normally 1.5 inches or greater in thickness (i.e., Latex (LMC), Microsilica (MMC), Fly Ash (FMC)). The quantity should equal the overlay's width times the length.

804 Polyester Concrete Overlay Units – SF

This defines a rigid polyester concrete bridge deck overlay that is normally 0.75 inches in thickness. The quantity should equal the overlay's width times the length.

Condition States for WSDOT Elements 803 and 804

1. Defects are superficial. The deck surfaces have no spalls/delaminations or previous repairs. The deck surfaces may have hairline cracks or rock pockets.
2. Concrete overlay area with repairs or patches. Do not include the rare cases of rutting that has been filled with patching material.
3. Concrete overlay area with spalling.
4. If the results of deck delamination testing are available from Element 376, include the delaminated area in this CS4.

805 AC Over a Polymer Overlay Units – SF

This defines an asphaltic concrete applied over a thin polymer bridge deck overlay (i.e., epoxy, methyl-methacyrlate). The quantity should equal the overlay's width times the length.

1. Defects are superficial. The deck surfaces have no spalls/delaminations or previous repairs. The deck surfaces may have cracking.
2. ACP overlay area with patches.
3. ACP overlay area with spalls or potholes.

806 BST on Concrete (Chip Seal) Units – SF

This defines a Bituminous Surface Treatment (BST), or commonly known as a chip seal, mistakenly applied directly on a concrete deck. This severely limits the inspection of the deck. Code the area of BST covering the concrete deck in CS1.

4.17 Protective Coatings

901 Red Lead Alkyd Paint System — Units – SF

This paint protection system is a 3-coat alkyd system incorporating lead based paint. Use this paint element as a default if the paint was installed prior to 1991.

902 Inorganic Zinc/Vinyl Paint System — Units – SF

This paint protection system consists of an inorganic zinc silicate shop applied primer system and a vinyl is paint applied after erection, cleaning, and spot priming.

903 Inorganic Zinc/Urethane Paint System — Units – SF

This paint protection system consists of a inorganic zinc silicate shop applied primer system and an epoxy, aliphatic urethane paint system applied after erection, cleaning, and spot priming. This paint system is used on new WSDOT steel bridges.

904 Organic Zinc/Urethane Paint System — Units – SF

This paint protection system is a 3-coat system incorporating an organic zinc primer, an epoxy second coat and a moisture cured urethane topcoat. Use this paint element as a default if the paint was installed after 1991.

905 Coal Tar Epoxy Paint System — Units – SF

This paint protection system incorporates a coal tar epoxy based product.

Condition States for WSDOT Elements 901, 902, 903, 904, and 905

1. The paint system is sound and functioning as intended to protect the metal surface.
2. Paint system area with chalking, peeling, curling or showing other early evidence of paint system distress, but there is no exposure of metal.
3. Paint system area that is no longer effective. The metal substrate is exposed.

906 Metalizing — Units – SF

This protection system consists of a sprayed coating of zinc or zinc/aluminum.

907 Galvanizing — Units – SF

This protection system consists of zinc applied to steel in a variety of spray-on methods.

908 Epoxy Paint for Weathering Steel — Units – SF

This protection system consists of a clear epoxy coating applied to weathering steel to prevent excessive corrosion.

Condition States for WSDOT Elements 906, 907, and 908

1. Protection system area that is sound and functioning as intended to protect the metal surface.
2. Protection system area with corrosion of the substrate metal.

909 Zinc Primer Units – SF

This paint protection system consists of a zinc silicate shop applied primer system.

1. The paint system is sound and functioning as intended to protect the metal surface.
2. Protection system area with chalking, peeling, curling or showing other early evidence of paint system distress, but there is no exposure of metal.

3. Protection system area that is no longer effective. The metal substrate is exposed.

910 Weathering Steel Patina Units – SF

This protection system consists of a chemical compound formed on the surface of weathering steel elements and is called the patina. When exposed to the atmosphere, weathering steel develops a patina, which seals and protects the steel from further corrosion. This oxide film is actually an intended layer of surface rust, which protects the member from further corrosion and loss of material thickness. The patina acts like a paint system to protect the steel. The color is an indicator of the condition of the patina may vary from orange to dark brown or purple-brown.

1. Weathering steel area that is chocolate brown or purple brown in color (boldly exposed) and in good condition. The patina is tightly adhered, capable of withstanding hammering or vigorous wire brushing. The patina system is sound and functioning to protect the metal surface.

2. Weathering steel color is yellow orange to light brown. Some areas may not have rust. Patina has a dusty to granular texture.

3. Weathering steel area that is black in color indicating non-protective patina. Area that remains damp for long periods of time due to rain, condensation, leaky joints, traffic spray or other source of moisture. Area where debris has accumulated on a horizontal surface and the steel is continuously wet. Area with a texture of large granules (greater than ⅛″ diameter); flaking (greater than ¼″ diameter) or laminar rusting in thin sheets.

Chapter 5 Load Rating and Scour

5.01 General

The National Bridge Inspection Standards (NBIS) requires a load rating be calculated for each reportable bridge as well as a scour evaluation for any reportable structure over water. Temporary structures that will be in service for more than 90 days shall be load rated as well as assessed for scour.

The load rating calculations and scour evaluations are a permanent part of the bridge file and are to be updated when the condition of the bridge changes. All load rating calculations and new and updated Scour analysis shall be stamped, signed, and dated by a registered professional engineer.

5.02 Bridge Load Rating

Load rating of bridges shall be completed per Chapter 13 of the *Bridge Design Manual* (BDM) M 23-50 and the AASHTO *Manual for Bridge Evaluation* (MBE). See Chapter 13 of the BDM, Section 13.4 for summary sheets and information included in the Load Rating Report. See the appendix in the MBE for examples of load rating different types of structures. Newly discovered or transfer of ownership of bridges shall have load ratings completed and data entered into the inventory within 90 days.

A. General Load Rating and Re-Rating Guidelines

- The Load rating of new bridges shall be completed within 90 days of opening the structure to the traveling public in the anticipated final configuration.
- The ratings of existing bridges shall be re-examined when the "Revise Rating Flag" is turned on. The condition of identified bridge elements shall be reviewed and the load ratings shall be updated if needed. In cases where the capacity of a member is reduced significantly, such as impact damage to a girder with loss of reinforcing or damage to steel members, ratings shall be updated within 30 days. In other cases such as increase in dead load, a preliminary assessment can be made based on the increase in dead load, condition of the structure and existing ratings. If in the engineer's judgment, the ratings will not be affected significantly, and will not require a need to post or lower the load restriction on the bridge, ratings should be updated within 12 months, however, the decision and findings shall still be documented in the Load Rating File.

  Load ratings of structures shall be reviewed and updated if necessary every 12 years. Factors to be reviewed to assess the need for updating the rating should be changes in the design code or changes in the load rating criteria as well as the criteria listed in Section B, below. For State bridges, a field in the load rating database with the initials of the reviewer and the date of the review shall be filled out.

  For State owned bridges, the Risk Reduction Engineer shall provide a list of outstanding load ratings to the Bridge Preservation Engineer on a monthly basis. The list can be generated thru a query in the Load Rating database.

B. Bridge Load Rating Revision Criteria

WSBIS Item 2688, Revise Rating should be coded as "Y" when one or more of the following items apply:

1. The Superstructure or Cross-beams/ Floor-beams Elements' State condition changes from either Condition State 1, 2 or 3 to Condition State 4, or Superstructure or Substructure NBI code changed to 4 or less.
2. If the approach condition to the structure causes severe impact to the bridge, call for a high priority repair to fix the approaches so the transition onto the structure is smooth.
3. If the deck has potholes on the surface or at the joints, call for a high priority repair to patch the potholes in the deck at the joints.
4. The thickness of the overlay has increased.
5. The railing is replaced with a heavier traffic barrier.
6. New utilities such as water main or sewer line have been installed on the structure.
7. The number of striped lanes has increased on 2 line superstructure members such as trusses or 2-line girder bridge, and box girder bridges.
8. Damaged or deficient structural elements have been repaired/ replaced, such as replacement of timber caps or girders or replacement or repair of damaged girders due to high load hits or other deterioration.

When a deficiency is observed in the field such as rot pockets in timber or section loss in a steel member, the inspector should provide the following items to assist in providing accurate rating factors:

1. The description "shell thickness" shall state whether the thickness is all around the member or on one side and whether it is full depth and location.
2. Section loss in steel members shall include, if possible, the remaining section thickness, location of the section loss and required dimensions.

Provide a sketch of the deficient member and show deterioration as stated above and provide the dimensions of the deteriorated area. It is of great importance to provide as accurate information as possible instead of estimates. Posting or restricting a bridge is greatly dependent on this information.

C. Bridges With Unknown Structural Components

For concrete and masonry bridges with no design plans, and when the necessary reinforcing details are unknown and cannot be measured, load capacity ratings may be determined based on field inspection by a qualified bridge inspector followed by evaluation by a qualified engineer. Such a bridge does not need to be posted for load restrictions if it has been carrying normal traffic for an appreciable period of time and shows no sign of distress; Reference the AASHTO Manual for Bridge Evaluation (MBE) second edition, Sections 6.1.4 and 6A.8.1. General rating guidelines for these structures are:

- Inventory rating shall be equal to the design truck at the time the bridge was constructed. Operating rating shall be equal to the inventory rating multiplied by 1.667.
- Legal trucks rating factors shall be equal to 1 when the Superstructure or Substructure NBI code is equal or greater than 5. Restriction of permit loads shall be assessed.
- Posting or restricting of a bridge shall be assessed when NBI condition rating of the superstructure or substructure is 4 or less or when there are signs of structural distress.

The Load Rating Methods WB1551 and WB1554 shall be coded as " 0", Administrative.

Full documentation for an administrative rating shall be placed in the bridge load rating file.

The table below shows typical design loads and the era they were utilized. The information in the table is based on State bridge inventory and it is dependent on the class of highway.

	Design Load in Tons	Design Era
H-10	10	Early 1900- mid 20's
H-15	15	Mid 1910's-Mid 1960's
H-20	20	Mid 1910's-1920's
HS-15	27	Mid 1940's-Late 60's
HS-20	36	Mid-1940's- Early 2000's

*Administrative ratings imply ratings based on Field evaluation and Documented Engineering Judgment.

E. Data Management

The WSBIS database shall be updated within 30 days from the completion and approval of a load rating of a structure.

F. Posting Requirements

Posting of a structure shall occur when the Operating rating factor for any of the legal loads is less than 1 based on the Load Factor or Allowable Stress Methods or the rating factor for any of the legal loads is less than 1 based on the Load and Resistance Factor Method.

Agencies generally post a bridge between the Inventory Rating and the Operating Rating using the Load Factor Method and Allowable Stress Methods. The minimum permissible posting value is three tons at inventory or operating levels. Bridges not capable of carrying a minimum gross live load of three tons shall be closed. The posted tonnage shall be the smaller of the rating factor for the specific truck times its weight or the gross vehicle weight of the truck.

In general, posting of a structure, when warranted, shall occur as soon as possible but not to exceed 90 days from the time posting requirements have been verified and within 60 days from the date of the posting letter is sent to the region by the Statewide Program Manager. In instances where the load carrying capacity of a bridge is significantly reduced, such as by impact to the structure, posting or closing of the bridge shall occur as soon as it is determined it is not safe to carry legal vehicular loads.

When possible, additional tests such as concrete strength or steel yield strength shall be performed to validate the assumption in the load rating analysis, hence mitigate the need for posting or restriction of the bridge. Strengthening or repair of an element should also be considered to eliminate the need for posting or restriction.

Load Posting Signs for structures where needed, shall follow the Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT *Sign Fabrication Manual* M 55-05.

In general, when a bridge requires posting for the three AASHTO legal trucks, Type 3 (Single Unit), Type 3S2 (Truck-Semi Trailer) and Type 3-3 (Truck Trailer), it will also require the posting for the SUV's (SU4, SU5, SU6 and SU7). In this instance two posting signs will be required as shown in Fig 5.02-F-1. Note that posting limit for the 3 or less axles shall match the Type 3 Truck.

In cases where the structure is required to be posted for only the SUV trucks, the posting shall follow the sign shown in Figure 5.02-F-2. The sign shall reflect only the vehicles that need be posted. For example if the bridge requires posting for the SU5, SU6 and SU7, there is no need to show the posting limit for the SU4.

In cases where the required posting for the different trucks falls within 5 tons, provide one posting sign limiting the structure to the most restrictive posting.

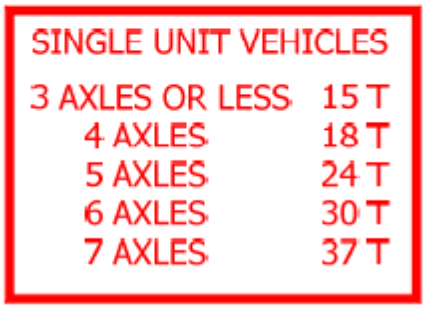


Fig 5.02-F-1

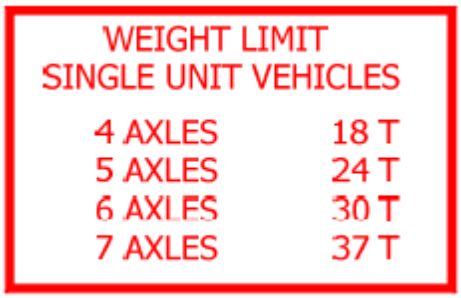


Fig 5.02-F-2

G. Overload Permits

Overweight loads traveling over state or local agency roads are required to obtain permits/approval from the state, county, or city maintaining those roadways. No permit loads shall be allowed over posted bridges. The first step in evaluating a permit is to determine if the configuration meets RCW 46.44 for maximum gross weight, load per axle, or axle group (E-Snoopi) is a tool on WSDOT Commercial Vehicle website is used to calculate axle weight per RCW). The second step is to evaluate the structures on the traveled route. This can be accomplished in two methods.

The first method, which is more precise for a specific structure, is to model the permit load moving on the bridge and calculating its load rating factor. A single lane distribution factor can be used in the model, which means that no other trucks are permitted in the adjacent lanes. A rating factor equal to or above 1 means the permit truck can safely travel over the particular structure. Permit loads that have unusual configuration or have more than 8 tires per axles shall be evaluated using this method.

The second method is more general and the engineer shall be extremely cautious when applying it to ensure that the permit load is enveloped by one of the typical rated trucks. The method calculates the maximum weight per axle allowed over a bridge and is dependent on the load rating factors for the particular structure, as follows:

- **Truck Type SA**

  Definition: Construction Equipment Tires (a.k.a., Super Single Axle) (RCW 46.44.091(3))

  Range: Up to 45,000 lbs. per axle.

  Criteria: Using the Load Rating Factor for the Overload 1 Truck (a.k.a., OL1), which has a dual axle weighing 43,000 lbs., the equation is 45,000 lbs. * Rating Factor * *43/45 rounded to the nearest 500 lbs.

- **Collection Truck (RCW 46.44.041) Restriction List**
  Truck Type S/A

  Definition: Two-axle trucks where the rear drive axle is the item in question on non-interstate routes only.

  Range: Up to 26,000 lbs. on rear axle.

  Criteria: Using the Load Rating Factor for the AASHTO1 Truck (a.k.a., Type 3), which has a dual axle weighing 34,000 lbs., the equation is **26,000 lbs. * Rating Factor * 26/34** rounded to the nearest 500 lbs.

- **Truck Type T/D**

  Definition: Three-axle trucks where the rear tandem drive axles are the item in question on non-interstate routes only.

  Range: Up to 42,000 lbs. on rear dual.

  Criteria: Using the Load Rating Factor for the AASHTO1 Truck (a.k.a., Type 3), which has a dual axle weighing 34,000 lbs., the equation is **42,000 lbs. * Rating Factor * 34/42** rounded to the nearest 500 lbs.

- **Tow Truck (RCW 46.44.015) Restriction List**

  Truck Type: Tow truck with tandem (dual) drive axles.

  Definition: Three axle tow truck with tandem drive axles towing a variety of vehicles.

  Range: Up to 48,000 lbs. on drive dual axles.

  Criteria: Using the Load Rating Factor for the AASHTO2 Truck (a.k.a., Type 3S2), which has dual weighing 31,000 lbs., the equation is **48,000 lbs. * Rating Factor * 31/48** rounded to the nearest 500 lbs.

- **Truck Type CL8**

  Definition: Class 8 Short Hitch five-axle combination (three-axle tractor with a two-axle trailer).

  Range: Up to 21,500 lbs. per axle in dual group and 20,000 to 22,000 for a single axle.

  Criteria: Use the Load Rating Factor for the OL1 Truck based on single lane distribution factor. The equation is **22,000 lbs.* Rating Factor** rounded to the nearest 500 lbs.

- **Truck Type BL**

  Definition: Big load six plus axle combination and three to four axle single units.

  Range: Up to 22,000 lbs. per axle in dual and tridem groups and up to 22,000 lbs. for a single axle.

  Criteria: Use the Load Rating Factor for the OL2 Truck based on a single lane distribution factor. The equation is **22,000 lbs.* Rating Factor*** Modifying Factor (MF)**** rounded to the nearest 500 lbs. In some instances engineering judgment may be used in establishing restrictions on a structure.

  *Modifying Factor (MF) is 1.15 if Superstructure or Substructure Condition is 6 or above; 1.10 for Condition of 5 and 1 for 4 or less. The MF is applicable to concrete and steel members. For timber members the MF is 1.

For permits traveling over State routes, WSDOT can request the weighing of a permit load at any time, however, here are typical triggers:

- Analysis shows that the load is close to overstressing one or more bridges.
- Multiple load requests: 10 or more loads in the 200-300 thousand pound range.
- 5 or more loads over 300 thousand pounds.
- Any load over 500,000 pounds.

Commentary: *The SA load is assumed to act as a tandem axle due to the size of the tire. The occurrence of these permitted loads are occasional, hence, the OL1 was used to envelope these vehicles due to the lower Live Load Factor instead of the Type 3S2 which was previously used.*

The MF multiplier applied to the BL is used since the OL2 is an envelope truck and is not permitted in the State. The Engineer shall use the MF with extreme caution and it shall not be applied to every permit load. The previous methodology which applied a Multiplier Factor based on the number of lanes is not valid any longer.

5.03 Scour Evaluation

All bridges spanning waterways are required by the NBIS to have a scour evaluation. A scour evaluation is done to identify the susceptibility to erosion of streambed material and the degree of foundation element stability. The evaluation should include as-built foundation details, current condition of the foundation, a stream bed cross section profile, and stream flow rates. The initial evaluation is a screening tool to evaluate the susceptibility of a structure to scour. If a structure is found to be vulnerable to scour, an analysis shall be performed by a professional engineer with hydraulics expertise to assess the scour issues or identify the proper repairs/countermeasures.

As the bridge foundation condition changes and/or the stream bed characteristics change, the scour criticality may have to be reanalyzed. Scour evaluations shall be reviewed and updated every 12 years, if necessary.

Upon determining that a bridge is scour critical, the agency needs to develop a written plan of action (POA) to monitor, mitigate, or close the bridge. `Monitoring the structural performance of the bridge during and after flood events is particularly important. For additional information, see FHWA HEC 18 Evaluating Scour at Bridges.

New bridges shall have the scour evaluation completed during the design phase and results shall be entered into the data inventory within 30 days of the structure being open to traffic. Newly discovered or transfer of ownership of bridges shall have scour evaluation completed and entered into inventory within 12 months.

A. Determining Susceptibility to Scour

Each bridge's susceptibility to scour damage must be determined to be either:

1. Stable for calculated scour conditions (scour code 8, 7, 5, 4).
2. Scour critical (scour code 3, 2, 1, 0).
3. Scour risk cannot be determined due to unknown foundations (scour code U)
4. Tidal water that has not been evaluated for scour, but considered low risk (appropriate scour code of 3 if foundations are unknown).

See FHWA coding guide revision at www.fhwa.dot.gov/engineering/hydraulics/policymemo/revguide.cfm.

The results of the scour evaluation are to be recorded by the scour engineer in the Scour Summary Sheet (See Section 5.04) and to be placed in the scour files. Upon completion of all scour evaluations, there should not be any bridges with a code "6." The completed scour evaluations, information required to do the evaluation, and the best mitigation option for the bridge in question are to be incorporated into the permanent bridge file.

Scour Code	Soundings Flag Max. Frequency (months)
2	12
3	24
U	24
4	24
5	72
7	72
8	72

The soundings frequency for State bridges can be changed by the Scour Engineer as needed based on field observations. The list of bridges that require soundings for State bridges is created by the Scour Engineer and provided to the Information Group within BPO no later than December 31st of each year to be added to Bridge Works.

B. Action Plans for Scour Critical Bridges

For each bridge that has been determined to be scour critical, a POA shall be developed to identify the appropriate measures necessary to make the bridge less vulnerable to damage or failure due to scour. The POA is to provide specific direction as to essential actions required at the site for region field staff to observe and take the appropriate action without further communication. It should have details of who to contact after a bridge has been closed due to the specified event. Whatever action is to be taken it must be documented in the POA no matter how trivial the direction is (or no direction).

Region field staff inspecting the condition of susceptible elements must have authority to close the bridge and know how to conduct an emergency closure. They must have the necessary equipment with them to take this action at the time of the determination without leaving the bridge or calling for assistance.

The two primary components of the POA are instructions regarding the triggering event and frequency of inspections to be made at the bridge, and a schedule for the timely design and construction of scour countermeasures (see Section 5.04 for WSDOT and FHWA POA templates). The POA's for WSDOT are updated by the Scour Engineer after each inspection, if needed, and they are stored on BEISt.

The POA should include:

- Physical site identification (bridge, route, stream, etc.) features that are vulnerable (approach roadway, pier/s, pier orientation/beginning of bridge)
- Hydrologic and Hydraulic Characteristics (water surface elevation needed if appropriate to the event type and characteristics.)
- Party responsible for decision on closure/reopen.
- Responsible party contact information after taking the specified action.
- Trigger mechanisms for closure and opening on-site water surface elevation located such that field crews can observe them from river bank.
- Detour routes
- Communication to public (detour signage, law enforcement, press, etc.)
- Records of mitigation in place (quarry spall, weirs, mats, barbs, etc.) with photo and original dimensions for future examination and reference. This information to be made available to inspectors and region field staff to utilize during inspections and flood events.

When monitoring is deemed appropriate there are basic components that should be incorporated as listed above. Depending on the risk or consequence of failure, greater detail may be warranted.

Monitoring – It is important that all scour critical bridges be monitored during and after flood events. The POA should include specific instructions to bridge inspectors or maintenance workers on what to look for, at what locations, and methods of inspection to use. Guidance should also be included as to when a bridge should be closed to traffic. Agencies should also develop and inform appropriate personnel of bridge closure procedures. The intensity of the monitoring effort is related to the risk of the scour hazard, as determined from the scour evaluation. Some of the items to consider when developing the monitoring plan include:

- Amount of existing rotational movement or settlement of substructure units
- Degree of streambed degradation, aggradation, or lateral movement
- Recommended procedures and equipment for taking measurements of streambed elevations (rods, probes, weights, portable sonic equipment, etc.)
- Instructions for inspecting existing countermeasures such as riprap, dikes, barbs, mats, etc.
- Guidance on maximum permissible scour depths, flood flows, water surface elevations, etc. beyond which the bridge should be closed to traffic
- Instructions for checking the operation of fixed scour monitoring devices
- Reporting procedures for conditions that warrant bridge closure. Establish the chain of command with authority to close bridges.
- Forms and procedures for documenting inspection results and instructions regarding follow-up actions when necessary

Temporary Countermeasures – Temporary countermeasures provide a degree of protection for scour critical bridges. They may prevent damage for most flows, but are sacrificial, low-cost treatments that help insure the safety of a bridge during flood events. Use of such measures may postpone the need to close a bridge during high flows. Temporary countermeasures, such as riprap, should not be viewed as an alternative to monitoring, but rather as a supplement.

Permanent Countermeasures – Permanent countermeasures are engineered to make a bridge safe from damage due to scour. A variety of methods exist including channel improvements, structural strengthening or underpinning, drop structures, relief bridges or constructing additional spans. These types of fixes would eliminate the bridge from being "scour critical," but are more costly. Agencies prioritize permanent countermeasures to address the most critical needs as funds permit.

C. Recording Bridge Scour Information

The completed bridge scour evaluation shall include the resulting WSBIS 1680 scour code, the information required to do the evaluations, and the written action plan to mitigate scour risk. The evaluation is to be incorporated into the permanent bridge file for the bridge. Any changes to bridge inventory data should be accomplished within 30 days after the evaluation or field review are complete. The scour monitoring information or schedule should be communicated to all affected parties.

Fields that relate to bridge hydraulics and/or scour are:

- Waterway Adequacy Appraisal- WSBIS 1662 [NBI Item 71]
- Substructure Condition - WSBIS 1676 [NBI Item 60]
- Channel Protection - WSBIS 1677 [NBI Item 61]
- Pier/Abutment Protection – WSBIS 1679 [NBI Item 111]
- Scour – WSBIS 1680 [NBI Item 113]

D. Scour Analysis

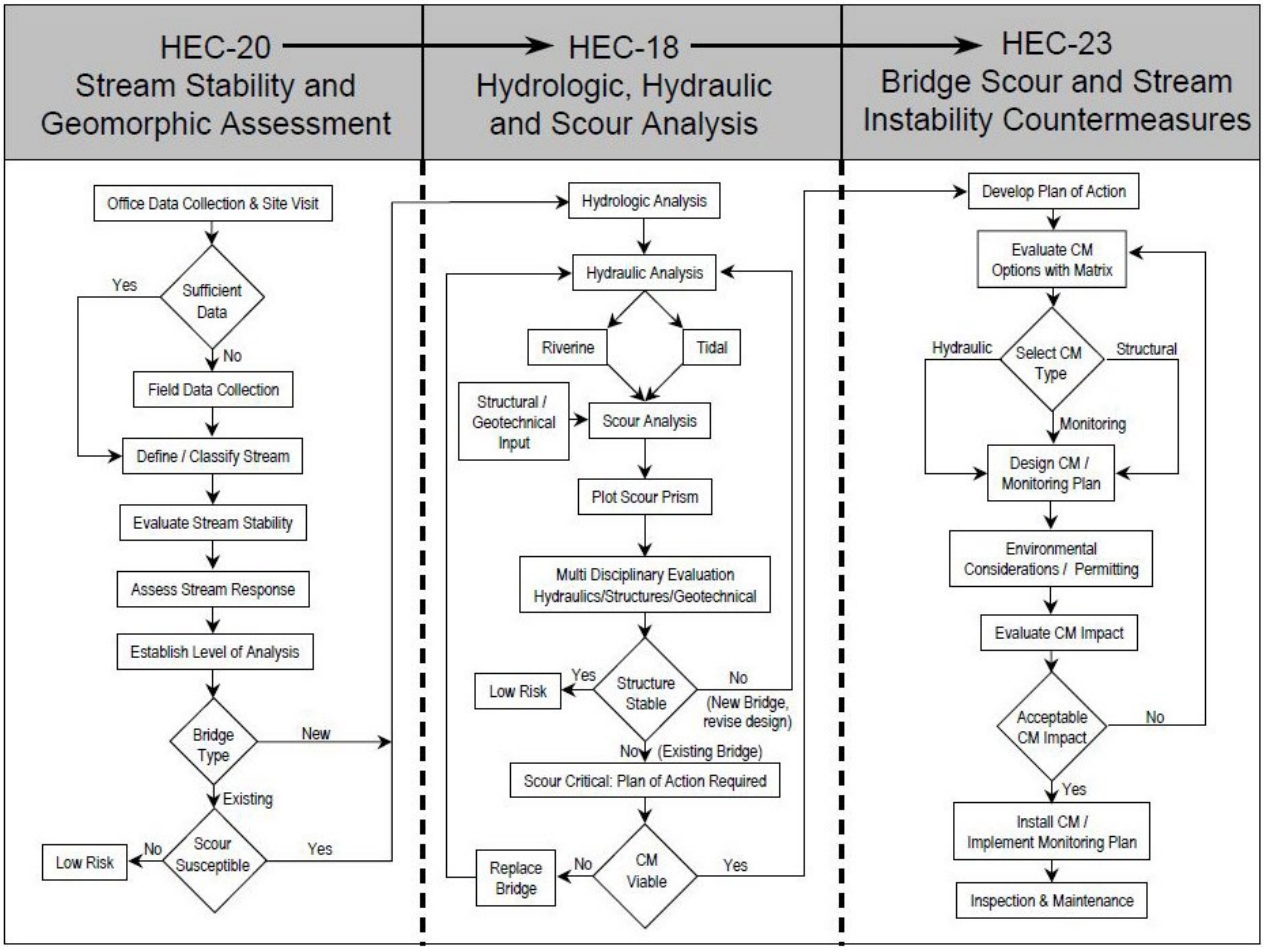
The procedure for analyzing stream stability and scour shall be per HEC Publications (see Figure 5-0) which could involve the following three levels of analysis:

- **Level 1** – Application of simple geomorphic concepts and other qualitative analyses
- **Level 2** – Application of basic hydrologic, hydraulic and sediment transport engineering concepts.
- **Level 3** – Application of mathematical or physical modeling studies

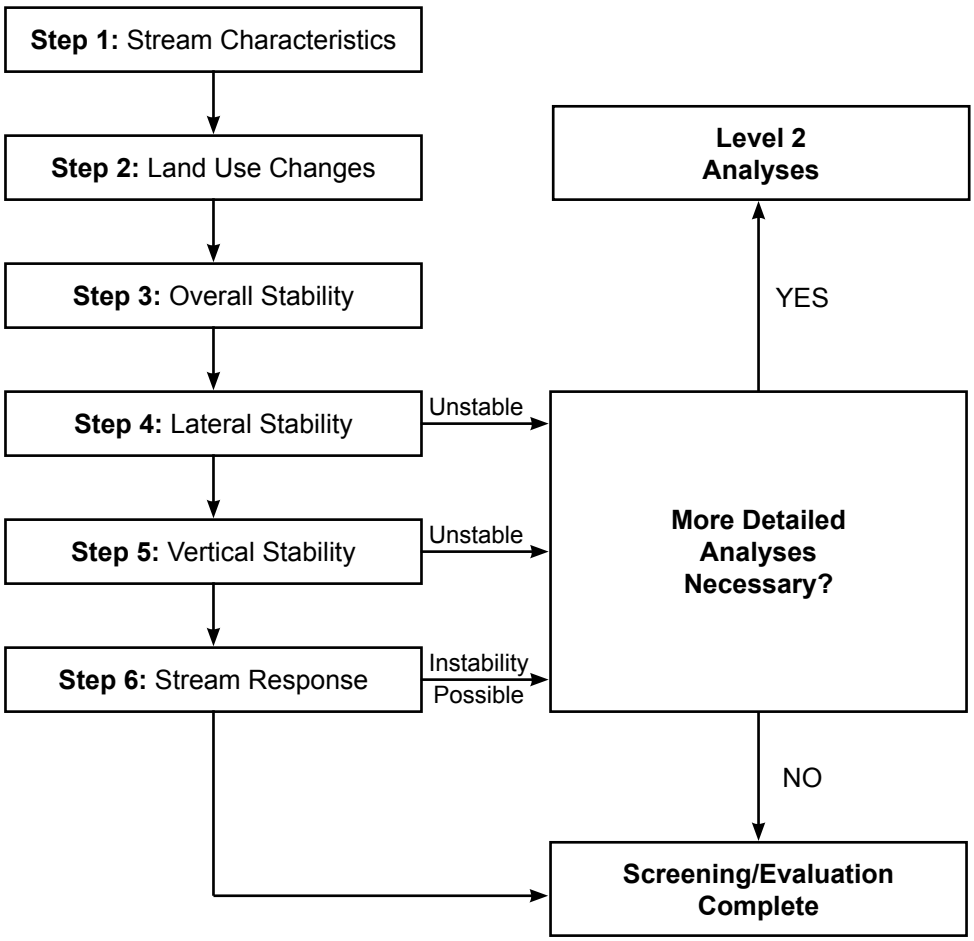
Data Needs for Level 1 Qualitative and Other Geomorphic Analyses – The data required for preliminary stability analyses include maps, aerial photographs, notes, and photographs from field inspections, historic channel profile data, information on human activities, and changes in stream hydrology and hydraulics over time.

A flowchart of the typical steps in qualitative geomorphic analyses is provided in Figure 5-1.

The six steps are generally applicable to most stream stability problems. As shown in the figure, the qualitative evaluation leads to a conclusion regarding the need for more detailed (Level 2) analysis or a decision to complete a screening or evaluation based on the Level 1 analysis. A Level 1 qualitative analysis is a prerequisite for a Level 2 engineering analysis for bridge design or rehabilitation.



Scour and Stream Stability Analysis
Figure 5-0

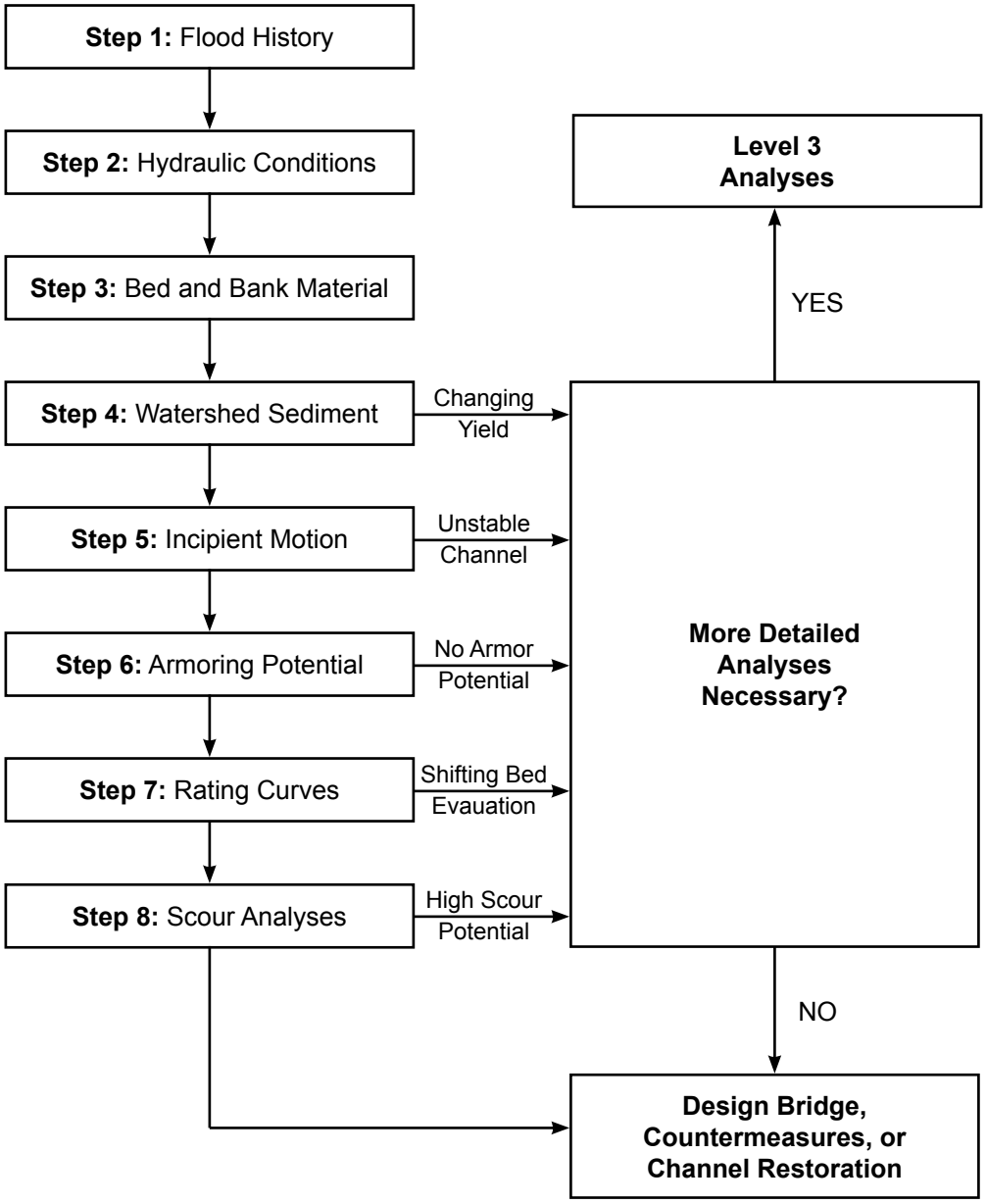


Level 1 Analysis
Figure 5-1

Data Needs for Level 2 Basic Engineering Analyses – Data requirements for basic hydrologic, hydraulic and sediment transport engineering analyses are dependent on the types of analyses that must be completed. Hydrologic data needs include dominant discharge (or bankfull flow), flow duration curves, and flow frequency curves. Hydraulic data needs include cross sections, channel and bank roughness estimates, channel alignment, and other data for computing channel hydraulics, up to and including water surface profile calculations. Analysis of basic sediment transport conditions requires information on land use, soils, geologic conditions, watershed and channel conditions, and available measured sediment transport rates (e.g., from USGS gauging stations).

More detailed quantitative analyses require data on the properties of bed and bank materials and field data on bed-load and suspended-load transport rates. Properties of bed and bank materials that are important to a study of sediment transport include size, shape, fall velocity, cohesion, density, and angle of repose.

Level 3 analyses are performed by a professional engineer with hydraulic expertise (see Figure 5-2).



Level 2 Analysis
Figure 5-2

5.04 Appendices

Appendix 5.04-A	WSDOT Scour Summary Sheet Instructions
Appendix 5.04-B	WSDOT Plan of Action Template
Appendix 5.04-C	Instructions for Completing WSDOT Plan of Action
Appendix 5.04-D	FHWA Plan of Action Template
Appendix 5.04-E	Instructions for Completing FHWA Plan of Action

The Bridge Preservation Engineer (for State bridges) or the WSDOT Local Programs Bridge Engineer (for Local Agency bridges) is to be notified by phone or email within one working day of identifying structural deficiencies to a structure that will likely require a CDBRR.

The CDBRR must be filled in as completely as possible immediately after the post-incident inspection. See Section 6.02.B for CDBRR submittal requirements.

CDBRR incidents are to be registered in the systemwide database by completing a Damage Inspection Report (DIR) within BridgeWorks (BW). The DIR is discussed further in Chapter 3. The CDBRR and all supporting materials (photos, sketches, etc.) are completed and attached to the Files Tab in BW. All repair recommendations arising from the CDBRR incident are to be identified in the CDBRR and also entered as specific repairs in BW. The specific repairs in BW shall be tagged as "CDBRR" within the repair description.

Any time the recommended repairs cannot be accomplished immediately, the applicable NBI and BMS condition codes should be updated to ensure that the data accurately reflects the bridge's current condition and status.

The following procedure describes how to fill out the CDBRR.

A. Completing the CDBRR

A dynamic CDBRR form (developed using InfoPath) may be copied from:

W:\Data\Bridge\BridgeDamage\CDBRR Form(For Inspectors Use). See Section 6.06 for a copy of the CDBRR form.

When filling out the CDBRR form, team leaders shall check the appropriate boxes in the upper right corner of the form. Check the CDBRR box when initially creating the form. The Update box should be checked and remain checked for all subsequent changes to the originally submitted CDBRR.

After the CDBRR type has been selected, the team leader may now fill in the applicable fields of the form. The form is organized into three distinct sections:

1. the bridge and inspection team information,
2. the description of the incident that caused the damage,
3. the follow-up or post repair activities on the structure.

Team leaders should fill out the form as thoroughly as possible although some information may be unknown and left blank.

1. **Bridge and Inspection Team Information** – This portion of the CDBRR briefly describes the basic information of the structure that has been damaged along with the inspection team information. The items within this section of the CDBRR are described below.
   - **Agency Name** – The name of the owner agency of the damaged structure.
   - **Structure ID** – The unique federal structure identification number associated with the particular structure in the NBI assigned by WSDOT.
   - **Bridge Number** – The bridge number given by the owner agency that is associated with the particular structure.

- **Milepost** – The structure's milepost location on the inventory route.
- **Incident Date** – The date of the incident that caused damage to the structure, if the information is available.
- **Bridge Name** – The name given by the owner agency that is associated with the particular structure.
- **CDBRR Date** – The date the CDBRR is filled out by the inspector.
- **Operational Status Check Boxes** – Check the appropriate box(es) to describe the type(s) of restriction imposed immediately after initial incident clean-up and inspection:
  - **Bridge Closure** – A complete closure to traffic as a result of structural damage to critical components.
  - **Lane Closure** – The inspection results in the closure of one or more lanes due to structural problems.
  - **Temporary Load Posting** – The inspection results in the temporary load posting of the bridge until repairs can be accomplished.

If limits are placed on a bridge for some other reason than the three listed above, the Other Restriction option may be selected. (Example: sidewalk closure due to structural defect.) This item may be used to further explain any closures, postings, restrictions or other actions taken with the damaged structure. This explanation shall be documented within the Mitigation Measures Taken section of the CDBRR as described below.

- **Lead Inspector's Name/CDBRR Author** – The team leader that performed the inspection or the person completing the CDBRR. (These are usually one and the same. On infrequent occasions, the CDBRR may be completed without there having been an inspection by BPO.)
- **Lead Inspector Cert#** – The team leader's certification number. (Leave blank if there was no inspection by BPO.)
- **Co-Inspector's Name** – The assistant inspector to the team leader. (Leave blank if there was no inspection by BPO.)
- **Inspection Date** – The date when the inspection of structural deficiencies took place. (Leave blank if there was no inspection by BPO.)
- **Incident Reported to the owner agency by** – The individual that reported the damage to the owner agency. (Leave blank when not applicable.)
- **Date Reported** – actual date when the incident was reported to the owner agency. (Leave blank when not applicable.)
- **Phone Number** – Contact number for the individual that reported the incident. (Leave blank when not applicable or unknown.)