

Updates to the Inventory Coding Guide

<i>Item No.</i>	<i>Description of Update</i>	<i>Date of Update</i>
F108A	Removed Virginia Code 'A' to be consistent with the Federal Coding Guide.	3-3-2010
F61	Removed Virginia Codes 'G', 'F', 'P', and 'C' to be consistent with the Federal Coding Guide	3-3-2010
F31	Added 3 new codes per revisions issued by the FHWA on 2-2-2011	7-10-13
S44	Added 3 new codes per revisions issued by the FHWA on 2-2-2011	7-10-13
F63	Added 1 new code and revised 1 existing code per revisions issued by the FHWA on 2-2-2011	7-10-13
F65	Added 1 new code and revised 1 existing code per revisions issued by the FHWA on 2-2-2011	7-10-13
S48	Notes have been removed to be consistent with IIM-S&B-86 and the current process in Pontis does not automatically update items F63 and F65.	7-10-13
F113	Entire section revised - notes and description of codes have updated to be consistent with FHWA's 4-27-2001 memo revising this item in their Coding Guide	10-9-13

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FEDERAL ITEM 2 - STATE HIGHWAY DEPARTMENT DISTRICT – X (1)

INVENTORY – ID/ADMIN

DISTRICT

TABLE - BRIDGE

The highway agency district (State or Federal) in which the bridge is located shall be represented by a 1-digit code. Existing district numbers shall be used where districts are identified by number. Where districts are identified by name, a code number shall be assigned based on an alphabetical or organizational listing of the districts.

- 1 Bristol District
- 2 Salem District
- 3 Lynchburg District
- 4 Richmond District
- 5 Hampton Roads District
- 6 Fredericksburg District
- 7 Culpeper District
- 8 Staunton District
- A Northern Virginia District

FEDERAL ITEM 3 - COUNTY (PARISH) CODE – XXX (3)

INVENTORY – ID/ADMIN

COUNTY

TABLE - BRIDGE

Counties shall be identified using the Federal Information Processing Standards (FIPS) codes given in the current version of the Census of Population and Housing - Geographic Identification Code Scheme. This information is available online at http://www.census.gov/geo/www/fips/fips55_2k.html

FEDERAL ITEM 4 - PLACE CODE – XXXXX (5)

INVENTORY – ID/ADMIN

PLACECODE

TABLE - BRIDGE

Cities, towns, townships, villages, and other census-designated places shall be identified using the Federal Information Processing Standards (FIPS) code given in the current version of the Census of Population and Housing - Geographic Identification Code Scheme. If there is no FIPS code, then code all zeros. This information is available online at http://www.census.gov/geo/www/fips/fips55_2k.html

(The Federal length of this field is 5 places XXXXX. When providing our annual report to the federal government we fill in the missing fields with zeros.)

FEDERAL ITEM 5 - INVENTORY ROUTE – XXXXXXXXX (9)

INVENTORY – ROADS

TABLE - ROADWAY

(See items 5A, 5B, 5C, 5D and 5E below)

The inventory route is a 9-digit code composed of 5 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
5A	Record Type	1 digit
5B	Route Signing Prefix	1 digit
5C	Designated Level of Service	1 digit
5D	Route Number	5 digits
5E	Directional Suffix	1 digit

FEDERAL ITEM 5A - RECORD TYPE – X (1)

INVENTORY – ROADS

ON_UNDER

TABLE - ROADWAY

There are two types of National Bridge Inventory records: "on" and "under." Code the first digit (leftmost) using one of the following codes:

<u>Code</u>	<u>Description</u>
1	Route carried "on" the structure
2	Single route goes "under" the structure
A through Z	Multiple routes go "under" the structure

A signifies the first of multiple routes under the structure.

B signifies the second of multiple routes under the structure.

Z signifies 26 routes under the structure.

"On" signifies that the inventory route is carried "on" the structure. Each bridge structure carrying highway traffic must have a record identified with a type code = 1 (numeric). All of the NBI data items must be coded, unless specifically excepted, with respect to the structure and the inventory route "on" it.

"Under" signifies that the inventory route goes "under" the structure. If an inventory route beneath the structure is on a Federal-aid highway, is a STRAHNET route or connector or is otherwise important, a record must be coded to identify it. The type code must be 2 or an alphabetic letter A through Z. Code 2 for a single route under the structure. If 2 or more routes go under a structure on separate roadways, the code of 2 shall not be used. Code A, B, C, D, etc. consecutively for multiple routes on separate roadways under the same structure. STRAHNET routes shall be listed first. When this Item is coded 2 or A through Z, only the following items must be coded: Items 1, 3-11, 16, 17, 19, 20, 26-30, 42, 43, 47-49, 100-104, 109 and 110. All other items are to remain blank.

Virginia Note: Overlapping under routes (single roadways carrying multiple routes) typically use only one under record. However, some districts have elected to use a different record for each route.

It cannot be overemphasized that all route-oriented data must agree with the coding as to whether the inventory route is "on" or "under" the structure.

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

There are situations of a route "under" a structure, where the structure does not carry a highway, but may carry a railroad, pedestrian traffic, or even a building. These are coded the same as any other "under" record and no "on" record shall be coded.

FEDERAL ITEM 5B - ROUTE SIGNING PREFIX - X (1)

INVENTORY – ROADS

KIND-HWY

TABLE - ROADWAY

In the second position, identify the route signing prefix for the inventory route using one of the following codes:

<u>Code</u>	<u>Description</u>
1	Interstate highway
2	U.S. numbered highway
3	State highway
4	County highway Virginia Note: This code shall be used for secondary routes in any county, including the counties of Arlington and Henrico.
5	City Street
6	Federal lands roads
7	State lands roads
8	Other (include toll roads not otherwise indicated or identified above)

When 2 or more routes are concurrent, the highest class of route will be used. The hierarchy is in the order listed above.

EDIT CHECK

Item 5B must not equal 1 if Item 104 does not equal 1

EDIT CHECK - Item 5B must not equal 1 if Item 104 does not equal 1.

FEDERAL ITEM 5C - DESIGNATED LEVEL OF SERVICE - X (1)

INVENTORY – ROADS

LEVL_SRVC

TABLE - ROADWAY

In the third position, identify the designated level of service for the inventory route using one of the following codes:

<u>Code</u>	<u>Description</u>
0	None of the below
1	Mainline Virginia Note: (HOV lanes shall be coded as Mainline)
2	Alternate
3	Bypass
4	Spur
6	Business
7	Ramp, Wye, Connector, etc.
8	Service and/or unclassified frontage road

FEDERAL ITEM 5D - ROUTE NUMBER – XXXXX (5)

INVENTORY – ROADS

ROUTENUM

TABLE - ROADWAY

Code the route number of the inventory route in the next 5 positions. This value shall be right justified in the field with leading zeros filled in. (See examples listed later.)

If concurrent routes are of the same hierarchy level, denoted by the route signing prefix, the lowest numbered route shall be coded. Code 00000 for bridges on roads without route numbers.

Virginia Note: Since "Non-Highway On" records have Item 5A coded 2, "Non-Highway On" records should have Item 5D "Route Number" coded as the route that passes under the structure.

Virginia Note: A Footbridge, a structure which carries pedestrian traffic over something other than a highway, will have Item 5A coded 1 and should have Item 5D "Route Number" coded as the route which passes adjacent to or nearest the structure.

FEDERAL ITEM 5E - DIRECTIONAL SUFFIX - X (1)

INVENTORY – ROADS

DIRSUFFIX

TABLE - ROADWAY

In the last position, code the directional suffix to the route number of the inventory route when it is part of the route number, using one of the following codes:

<u>Code</u>	<u>Description</u>
0	Not applicable
1	North
2	East
3	South
4	West

In some cases, letters may be used with route numbers and as part of the route numbers and not to indicate direction. In such cases, the letter should be included in the 5-position route number field.

<u>EXAMPLES:</u>	<u>Record</u>	<u>Code</u>
Interstate 95, on	1 1 1 00095 0	111000950
Interstate 70S, under	2 1 1 00070 3	211000703
State Highway 104, Spur, under	2 3 4 00104 0	234001040
U.S. 30E Bypass, on	1 2 3 00030 2	123000302
City street, on	1 5 0 00000 0	150000000
Ramp from I-81, under	2 1 7 00081 0	217000810
County Highway 173 on	1 4 1 00173 0	141001730
Interstate 84 under	2 1 1 00084 0	211000840
Interstate 495 on	1 1 1 00495 0	111004950
State Hwy 120 (STRAHNET Rte) under	A 3 1 00120 0	A31001200
Alternate State Hwy 130 under	B 3 2 00130 0	B32001300
Tunnel on Interstate 70	2 1 1 00070 0	211000700

EDIT CHECK

If Item 5A does not = 1 then Item 28B must be > 00.

If Item 5B = 1 then Item 26 must = 1 or 11 and Item 104 must = 1.

FEDERAL ITEM 6 - FEATURES INTERSECTED - XXXXXXXXXXXXXXXXXXXXXXXX X (25)

INVENTORY – ID/ADMIN

FEATINT

TABLE - BRIDGE

Virginia Note: When Item 5A indicates an “under” record, this item describes the inventory route and/or features “on” the structure.

This item contains a description of the features intersected by the structure and a critical facility indicator. ~~When Item 5A indicates an “under” record, this item describes the inventory route and/or features under the structure.~~ There are 25 digits divided into 2 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
6A	Feature Intersected	24 digits
6B	No Longer Coded (Blank)	1 digit

The information to be recorded for this item in the first 24 digits shall be the name or names of the features intersected by the structure. When one of the features intersected is another highway, the signed number or name of the highway shall appear first (leftmost) in the field. The names of any other features shall follow, separated by a semicolon or a comma. Parentheses shall be used to provide a second identification of the same feature (see third example). Abbreviations may be used where necessary, but an effort shall be made to keep them meaningful. The data in this segment shall be left justified in the first 24 positions without trailing zeros.

EXAMPLES:

I-81, US 51, MILL ROAD
MISSISSIPPI RIVER
SR 42 (POND ROAD)

FEDERAL ITEM 7 - FACILITY CARRIED BY STRUCTURE - XXXXXXXXXXXXXXXXXXXX (18)

INVENTORY – ID/ADMIN

FACILITY

TABLE - BRIDGE

Virginia Note: When Item 5A indicates an “under” record, this item describes the inventory route and/or features “under” the structure.

The facility being carried by the structure shall be recorded and coded. This item shall be left justified without trailing zeros.

EXAMPLES:

US 66
MAIN STREET
COUNTY ROAD 450
C & O RAILROAD (appropriate for "under" record only)
PEDESTRIAN BRIDGE (appropriate for "under" record only)

FEDERAL ITEM 8 – STRUCTURE NUMBER - XXXXXXXX (7) SAME AS STATE ITEM 3

INVENTORY – ID/ADMIN

STRUCT_NUM

TABLE - BRIDGE

Virginia Note: The Federal length of this field is XXXXXXXXXXXXXXXX (15). When providing our annual report to the federal government we fill in the missing fields. The first three digits are the state number 513 and the remaining digits are filled in with zeros.

It is required that the official structure number be recorded. It is not necessary to code this number according to an arbitrary national standard. Each agency should code the structure number according to its own internal processing procedures. When recording and coding for this item and following items, any structure or structures with a closed median should be considered as one structure, not two. Closed medians may have either mountable or non-mountable curbs or barriers.

The structure number must be unique for each bridge within the State, and once established should preferably never change for the life of the bridge. If it is essential that structure number(s) must be changed, all 15 digits are to be filled. For any structure number changes, a complete cross reference of corresponding "old" and "new" numbers must be provided to the FHWA Bridge Division. The cross reference shall include both a computer tape or diskette and a printed listing in the FHWA required format.

The identical structure number must appear on the "on" and all "under" records associated with a particular structure. (Refer to Item 5 - Inventory Route).

FEDERAL ITEM 9 - LOCATION - XXXXXXXXXXXXXXXXXXXXXXXXXXXX (25)

INVENTORY – ID/ADMIN

LOCATION

TABLE - BRIDGE

This item contains a narrative description of the bridge location. It is recommended that the location be keyed to a distinguishable feature on any official highway department map such as road junctions and topographical features. This item shall be left justified without trailing zeros.

EXAMPLES:

6 MI. SW. OF RICHMOND

3.5 I. S. OF JCT. SR 69

FEDERAL ITEM 10 - INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE – XX XX (4)

INVENTORY – ROADS

VCLRINV

TABLE - ROADWAY

See Virginia Note under Federal Item 54.

Code the minimum vertical clearance over the inventory route identified in Item 5, whether the route is "on" the structure or "under" the structure. The minimum clearance for a 10-foot width of the pavement or travel part (See Virginia Notes under Item 54 for definition of where to measure) below of the roadway where the clearance is the greatest shall be recorded and coded in feet and inches. For structures having multiple openings, clearances for each opening shall be recorded, but only the greatest of the "minimum clearances" for the two or more openings shall be coded regardless of the direction of travel. This would be the practical maximum clearance. When no restriction exists, code 9999. Coding of actual clearances between 100 feet and 300 feet to an exact measurement is optional.

EDIT CHECK

Last two columns of Item 10 (inches) must be 99 or < = 11.

A warning is issued if Item 10 is coded < 8 feet.

FEDERAL ITEM 11 – KILOMETER POINT(MILE POINT) (XXX.XXX MILES) (6)

INVENTORY – ROADS

KMPOST

TABLE - ROADWAY

Virginia Note: This is an automatic entry.

The linear referencing system (LRS) kilometer/mile point is used to establish the location of the bridge on the Base Highway Network (see Federal Item 12). It must be from the same LRS Inventory Route and kilometer/mile point system as reported in the Highway Performance Monitoring System (HPMS). The kilometer/mile point coded in this item directly relates to Item 13 – LRS Inventory Route, Subroute Number.

This item must be coded for all structures located on or overpassing the Base Highway Network. Code a 7-digit number to represent the LRS kilometer/mile point distance in kilometers/mile to the nearest thousandth. For structures carrying the LRS Inventory Route, code the kilometer/mile point at the beginning of the structure (i.e. the lowest kilometer/mile point on the bridge). When the LRS Inventory Route goes under the structure (Item 5A coded 2 or A-Z), then code the kilometer/mile point on the underpassing route where the structure id first encountered.

Code all zeros in this field for all records where kilometer/mile points are not provided. Kilometer/mile points may be coded for bridges that are not located on the Base Highway Network, however Item 12 – Base Highway Network shall be coded 0 for these records.

<u>EXAMPLES:</u>		<u>Code</u>
Kilometer/mile point is	130.34	0130340
Kilometer/mile point is	9.60	0009600

Virginia Note: The Traffic Engineering Division reports kilometer/mile points to the FHWA with the beginning kilometer/mile point (0000.000) at the beginning of a route and ignores county lines as the kilometer/mile points increase i.e. kilometer/mile points do **not** 'begin again' at each county line.

FEDERAL ITEM 12 – BASE HIGHWAY NETWORK - X (1)

INVENTORY – ROADS

ONBASENET

TABLE - ROADWAY

Virginia Note: This is an automatic entry.

This item is to be coded for all records in the inventory. The Base Highway Network includes the through lane (mainline) portions of the NHS, rural/urban principal arterial system and rural minor arterial system. Ramps, frontage roads and other roadways are not included in the Base Network. For the inventory route identified in Federal Item 5 – Inventory Route, indicate whether the inventory route is on the Base Highway Network or not on that network. Use one of the following codes:

<u>Code</u>	<u>Description</u>
0	Inventory Route <u>is not</u> on the Base Network
1	Inventory Route <u>is</u> on the Base Network

FEDERAL ITEM 13 – LRS INVENTORY RTE, SUBROUTE NUMBER – XXXXXXXXXXXX XX (10) (2)
INVENTORY – ROADS

LRSINVRT
SUBRTNUM
TABLE - ROADWAY

Virginia Note: This is an automatic entry.

If Item 12 - Base Highway Network has been coded 1, the information to be recorded for this item is inventory route for the State's linear referencing system (LRS). If Federal Item 12 has been coded 0, this entire item should be left blank. This item is a 12-digit code composed of 2 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
13A	LRS Inventory Route	10 digits
13B	Subroute Number	2 digits

The LRS inventory route and subroute numbers to be reported in this item must correspond to the LRS inventory route and subroute numbers reported by the State for the HPMS. The LRS inventory route number is coded in the ten positions of segment 13A, right justified and zero filled. The subroute number, if it exists, is coded in the two positions of segment 13B, right justified and zero filled.

The LRS inventory route number can be alphanumeric, but must not contain blanks. The LRS inventory route number is not necessarily the same as that posted along the roadway, but is a number used to uniquely identify a route within at least a county and perhaps throughout the State.

The subroute number is a number that uniquely identifies portions of an inventory route sections where duplicate kilometerpoints occur. These subroute numbers, if they exist, are identified in the State's HPMS-LRS records. If there is no subroute number, code 00 in this segment.

<u>EXAMPLES:</u>	<u>Code</u>
Inventory Route 2775, Subroute Number 0	000000277500
Inventory Route 2775, Subroute Number 3	000000277503

FEDERAL ITEM 16 - LATITUDE - XX XX XX.XX (8)

INVENTORY – ID/ADMIN
LATITUDE
TABLE - BRIDGE

The reason for the increased precision is to facilitate the use of Global Positioning System (GPS) data directly into this item. The increased precision is not currently mandatory and, if GPS readings are not available, the current measuring methods and level of precision may continue to be used. The minimum precision should be to the nearest minute, but the preferred precision is to the nearest hundredth of a second using GPS methods.

For bridges on STRAHNET and STRAHNET Connector highways and on the NHS, record and code the latitude of each in degrees, minutes and seconds to the nearest hundredth of a second. The point of the coordinate may be the beginning of the bridge in the direction of the inventory or any other consistent point of reference on the bridge that is compatible with the LRS. If the bridge is not on a STRAHNET highway or the NHS, a code of all zeros is acceptable, but it is preferable to code the latitude if available.

<u>EXAMPLE:</u>	<u>Code</u>
Latitude is 35 degrees 27.3	35273

EDIT CHECK

If Item 100 equals 1 or 2 then Item 16 must be > 00000.

FEDERAL ITEM 17 - LONGITUDE - XXX XX XX.XX (9)

INVENTORY – ID/ADMIN

LONGITUDE

TABLE - BRIDGE

The reason for the increased precision is to facilitate the use of Global Positioning System (GPS) data directly into this item. The increased precision is not currently mandatory and, if GPS readings are not available, the current measuring methods and level of precision may continue to be used. The minimum precision should be to the nearest minute, but the preferred precision is to the nearest hundredth of a second using GPS methods.

For bridges on STRAHNET and STRAHNET Connector highways and on the NHS, record and code the latitude of each in degrees, minutes and seconds to the nearest hundredth of a second. The point of the coordinate may be the beginning of the bridge in the direction of the inventory or any other consistent point of reference on the bridge that is compatible with the LRS. If the bridge is not on a STRAHNET highway or the NHS, a code of all zeros is acceptable, but it is preferable to code the latitude if available.

EXAMPLE:	<u>Code</u>
Longitude is 81 degrees 5.8	08105
	8

EDIT CHECK

If Item 100 equals 1 or 2 then Item 17 must be > 000000.

FEDERAL ITEM 19 - BYPASS, DETOUR LENGTH - XX (2) MILES

INVENTORY – ROADS

BYPASSLEN

TABLE - ROADWAY

If a ground level bypass is available at the structure site for the inventory route, record and code the detour length as 00.

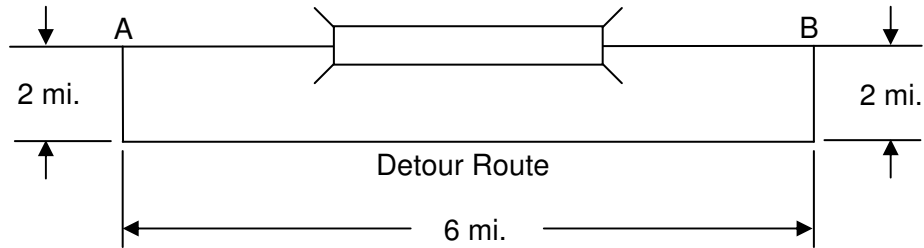
If the bridge is one of twin bridges and is not at an interchange, code 01 where the other twin bridge can be used as a temporary bypass with a reasonable amount of crossover grading. In other cases, indicate the actual length to the nearest mile of the detour length. The detour length should represent the total additional travel for a vehicle that would result from closing the bridge. The factor to consider when determining if a bypass is available at the site is the potential for moving vehicles, including military vehicles, around the structure. This is particularly true when the structure is in an interchange. For instance, a bypass likely would be available in the case of diamond interchanges, interchanges where there are service roads available, or other interchanges where the positioning and layout of the ramps is such that they could be used without difficulty to get around the structure. Code 99 for 99 mile or more.

The detour route will be established following allowable criteria determined by the governing authority. (Some authorities will not allow a designated detour over a road or bridge of lesser "quality.")

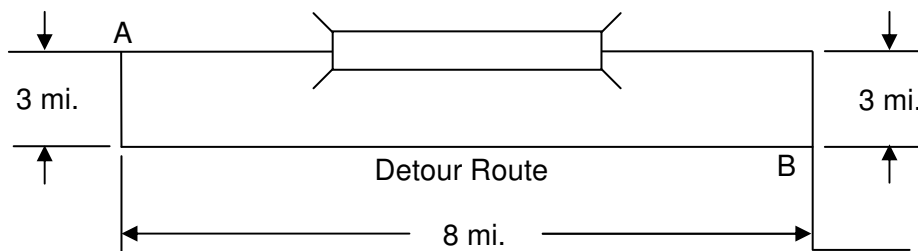
Virginia Note: The route must not contain structures with a lower posting than the subject bridge and must be a comparable type of road.

<u>EXAMPLES:</u>	<u>Code</u>
One of the bridges of twin bridges	01
A Ground level bypass is available	00
Diamond interchange, structure bypassable	00
Cloverleaf, not bypassable; 8-mile detour	08

Structure over river; 121-mile detour	99
Structure over highway, no interchange, bypassable at ground level	00
Structure on dead end road	99



Bypass Detour Length - Additional travel distance required to go from point A to point B is 4 miles.



Bypass Detour Length - Additional travel distance required to go from point A to point B is 0 miles.

FEDERAL ITEM 20 - TOLL - X (1)

INVENTORY - ROADS

TOLLFAC

TABLE - ROADWAY

This item indicates the toll status of the structure. Interstate toll segments under Secretarial Agreement (Title 23 - United States Code - Highways Section 129 as amended by 1991 ISTEA and prior legislation) shall be identified separately. Use one of the following codes:

<u>Code</u>	<u>Description</u>
1	Toll bridge. Tolls are paid specifically to use the structure.
2	On toll road. The structure carries a toll road, that is, tolls are paid to use the facility, which includes both the highway and the structure.
3	On free road. The structure is toll-free and carries a toll-free highway.
4	On Interstate toll segment under Secretarial Agreement. Structure functions as a part of the toll segment.
5	Toll bridge is a segment under Secretarial Agreement. Structure is separate agreement from highway segment.

FEDERAL ITEM 21 - MAINTENANCE RESPONSIBILITY - XX (2)

INVENTORY – ID/ADMIN

CUSTODIAN

TABLE - BRIDGE

The actual name(s) of the agency(s) responsible for the maintenance of the structure shall be recorded on the inspection form. The codes below shall be used to represent the type of agency that has primary responsibility for maintaining the structure. If more than one agency has equal maintenance responsibility, code one agency in the hierarchy of State, Federal, county, city, railroad, and other private.

<u>Code</u>	<u>Description</u>
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 **	Local Park, Forest, or Reservation Agency
21 *	Other State Agencies
25 **	Other Local Agencies
26	Private (other than railroad)
27	Railroad
31 *	State Toll Authority
32 **	Local 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
67 ***	Tennessee Valley Authority
68 ***	Bureau of Land Management
69 ***	Bureau of Reclamation
70 ***	Corps of Engineers (Civil)
71 ***	Corps of Engineers (Military)
72 ***	Air Force
73 ***	Navy/Marines
74 ***	Army
75 ***	NASA
76	Metropolitan Washington Airports Service
80	Unknown

Virginia Note: * Denotes codes which could indicate state responsibility
** Denotes codes which could indicate municipal responsibility
*** Codes 60 through 71 indicate federal responsibility

FEDERAL ITEM 22 - OWNER - XX (2)

INVENTORY – ID/ADMIN

OWNER

TABLE - BRIDGE

The actual name(s) of the owner(s) of the bridge shall be recorded on the inspection form. The codes used in Item 21 - Maintenance Responsibility shall be used to represent the type of agency that is the primary owner of the structure. If more than one agency has equal ownership, code one agency in hierarchy of State, Federal, county, city, railroad, and other private.

FEDERAL ITEM 26 - FUNCTIONAL CLASSIFICATION OF INVENTORY ROUTE - XX (2)

INVENTORY – ROADS

FUNCCLASS

TABLE - ROADWAY

Virginia Note: This is an automatic entry.

For the inventory route, code the functional classification using one of the following codes:

<u>Code</u>	<u>Description</u>	<u>Equivalent VDOT Traffic Engineering Codes</u>
<u>Rural</u>		
01	Principal Arterial - Interstate	1
02	Principal Arterial - Other	2
06	Minor Arterial	3
07	Major Collector	4
08	Minor Collector	5
09	Local	6
<u>Urban</u>		
11	Principal Arterial - Interstate	A
12	Principal Arterial - Other Freeways or Expressways	B
14	Other Principal Arterial	E
16	Minor Arterial	H
17	Collector	I
19	Local	J

The bridge shall be coded rural if not inside a designated urban area. The urban or rural designation shall be determined by the bridge location and not the character of the roadway.

Virginia Note: Codes of 08, 09 and 19 indicate non-federal aid (off-system) routes. All others are federal aid (on-system) routes.

EDIT CHECK

If Item 26 = 1 or 11 then Item 5B must = 1 and Item 104 must = 1.

ALSO:

<u>If Item 26 is:</u>	<u>Item 104 must be:</u>
01, 02, 11, 12 or 14	1 (NHS Route)
06, 07, 08, 09, 16, 17 or 19	0 (not on NHS Route)

FEDERAL ITEM 27 - YEAR BUILT - XXXX (4)

INVENTORY – ID/ADMIN

YEARBUILT

TABLE - BRIDGE

Record and code the year of construction of the structure. Code all 4 digits of the year in which construction of the structure was completed. If the year built is unknown, provide a best estimate. See Item 106 - Year Reconstructed.

<u>EXAMPLES:</u>	<u>Code</u>
Construction completed 1956	1956
1892	1892

EDIT CHECK

If Item 106 > 0 then Item 106 must be > Item 27.

First two digits of Item 27 must be 18, 19 or 20.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and the first digit of Item 64 or Item 66 = 1 through 9 and the last two digits of the corresponding Item are < 20.

FEDERAL ITEM 28 - LANES ON AND UNDER THE STRUCTURE - XX XX (4)

28A	28B
INVENTORY – ROADS	INVENTORY – ID/ADMIN
LANES	SUMLANES
TABLE - ROADWAY	TABLE - BRIDGE

Record and code the number of lanes being carried by the structure and being crossed over by the structure as a 4-digit number composed of 2 segments. The number of lanes should be right justified in each segment with leading zeros coded as required.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
28A	Lanes on the structure	2 digits
28B	Lanes under the structure	2 digits

Include all lanes carrying highway traffic (i.e., cars, trucks, buses) that are striped or otherwise operated as a full width traffic lane for the entire length of the structure or under the structure by the owning/maintaining authority. This shall include any full width merge lanes and ramp lanes, and shall be independent of directionality of usage (i.e., a 1-lane bridge carrying 2-directional traffic is still considered to carry only one lane on the structure). It should be noted here that for the purpose of evaluating the Deck Geometry - Item 68, any "1-lane" bridge, not coded as a ramp (Item 5C = 7), which has a Bridge Roadway Width, Curb-to-Curb - Item 51 coded 16 feet (4.9 meters) or greater shall be evaluated as 2 lanes.

When the inventory route is "on" the bridge (the first digit of Item 5 - Inventory Route is coded 1), the sum of the total number of lanes on all inventoried routes under the bridge shall be coded. When the inventory route is "under" the bridge (the first digit of Item 5 - Inventory Route is coded 2 or A through Z), the number of lanes being identified by that "under" record shall be coded in Item 28B.

When the inventory route is "under" the structure, the obstruction over the inventory route may be other than a highway bridge (railroad, pedestrian, pipeline, etc.). Code 00 for these cases if there are no highway lanes on the obstructing structure.

Double deck bridges may be coded as 1 or 2 structures as noted in the examples. Either method is acceptable, however, all related data must be compatible with the method selected.

<u>EXAMPLES *:</u>	<u>Code</u>
1 lane on, 0 lanes under	0100
3 lanes on, 1 lane under	0301
8 lanes on 2-way, 12 lanes under	0812 **
5 lanes on double deck each direction, - 2 lanes under	1002 ***
5 lanes on double deck each direction, - 2 lanes under	0502 ****
Railroad and pedestrian on, 4 lanes under	0004

* For the inventory route on the bridge, the first digit of Item - 5 Inventory Route is coded 1.

- ** This example has 3 inventory routes under the bridge of 6, 4, and 2 lanes of 2-way traffic respectively. When coding an "under" record for each of these inventory routes, the first digit of Item 5 - Inventory Route is coded A, B, and C, and Item 28 is coded 0806, 0804, and 0802 respectively for the 3 required records.
- *** Acceptable if coded as 1 bridge. However, other data such as ADT, curb-to-curb width, etc., must be for both decks.
- **** Acceptable if coded as 2 separate bridges. However, other data such as ADT, curb-to-curb width, etc., must be for a single deck.

EDIT CHECK

A warning is issued if Item 28A is > 14 feet.
 A warning is issued if Item 28A is > 3 and Item 32 is 1.5 times or more than Item 51.
 A warning is issued if Item 28A <= 3 and Item 32 is 2.0 times or more than Item 51.
 For an under record, If Item 5A does not = 1 then Item 28B must be > 00.
 For an under record, If the first two digits of Item 28 are > 00 then the first digit of Item 42 must be 1, 4, 5, 6, 7 or 8.
 For an under record, If the first two digits of Item 28 = 00 then the first digit of Item 42 must be 2, 3, 9 or 0.

FEDERAL ITEM 29 - AVERAGE DAILY TRAFFIC - XXXXXX (6)
INVENTORY – ROADS

ADTTOTAL
 TABLE - ROADWAY

Virginia Note: This is an automatic entry.

Code a 6-digit number that shows the average daily traffic volume for the inventory route identified in Item 5. Make certain the unit's position is coded even if estimates of ADT are determined to tens or hundreds of vehicles; that is, appropriate trailing zeros shall be coded. The ADT coded should be the most recent ADT counts available. Included in this item are the trucks referred to in item 109 - Average Daily Truck Traffic. If the bridge is closed, code the actual ADT from before the closure occurred.

The ADT must be compatible with the other items coded for the bridge. For example, parallel bridges with an open median are coded as follows: If Item 28 - Lanes On and Under the Structure and Item 51 - Bridge Roadway Width, Curb-to-Curb are coded for each bridge separately, then the ADT must be coded for each bridge separately (not the total ADT for the route).

<u>EXAMPLE:</u>		<u>Code</u>
Average Daily Traffic	540	000540
	15,600	015600
	24,000	024000

EDIT CHECK

If Item 29 is > 100 then Item 109 must NOT be blank.
 A warning is issued if Item 29 is coded > 200,000.

FEDERAL ITEM 30 - YEAR OF AVERAGE DAILY TRAFFIC - XX (2)

INVENTORY – ROADS

ADTYEAR

TABLE - ROADWAY

Record the year represented by the ADT in Item 29. Code all four digits of the year so recorded.

Virginia Note: This is an automatic entry.

EXAMPLE:

Year of ADT is 1994

Code

1994

EDIT CHECK

A warning is issued if Item 30 is greater than 4 years old.

FEDERAL ITEM 31 - DESIGN LOAD - X (1)

APPRAISAL – LOAD RATINGS

DESUGNLOAD

TABLE - BRIDGE

Use the codes below to indicate the live load for which the structure was designed. The numerical value of the railroad loading should be recorded on the form. Classify any other loading, when feasible, using the nearest equivalent of the loadings given below.

	<u>English Description</u>	<u>Metric Description</u>
0	Unknown (describe on recording form)	
1	H 10	M 9
2	H 15	M 13.5
3	HS 15	MS 13.5
4	H 20	M 18
5	HS 20	MS 18
6	HS 20+Mod	MS 18+Mod
7	Pedestrian	Pedestrian
8	Railroad	Railroad
9	HS 25	MS 22.5
A	HL 93	HL 93
B	Greater than HL 93	Greater than HL 93
C	Other (describe on recording form)	

FEDERAL ITEM 32 - APPROACH ROADWAY WIDTH - XXX (3)

INVENTORY – ROADS

AROADWIDTH

TABLE - ROADWAY

Code to the nearest foot a 3-digit number that represents the normal width of usable roadway approaching the structure. Usable roadway width will include the width of traffic lanes and the widths of shoulders where shoulders are defined as follows:

Shoulders must be constructed and normally maintained flush with the adjacent traffic lane, and must be structurally adequate for all weather and traffic conditions consistent with the facility carried.

Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder for this item.

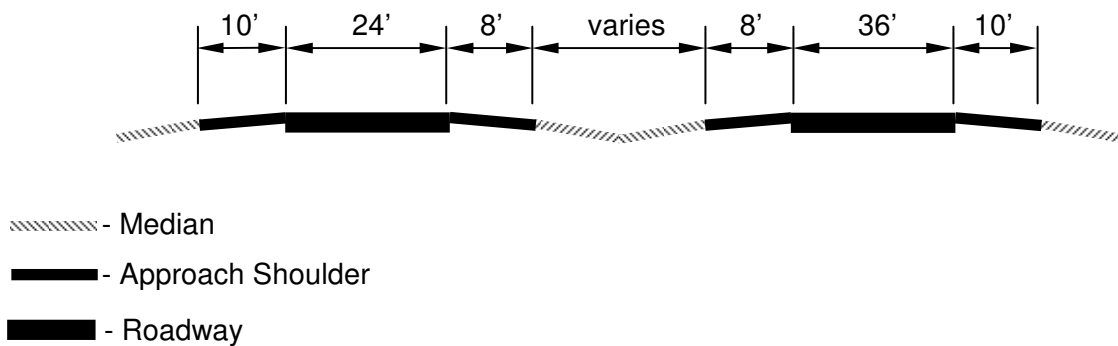
For structures with medians of any type and double-decked structures, this item should be coded as

the sum of the usable roadway widths for the approach roadways (i.e., all median widths which do not qualify as shoulders should not be included in this dimension). When there is a variation between the approaches at either end of the structure, record and code the most restrictive of the approach conditions.

EXAMPLES:

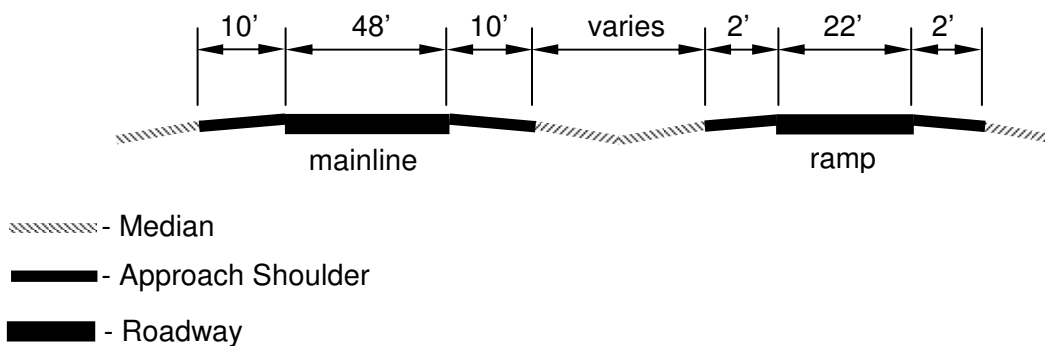
Left Shoulder	Left Roadway	Median Shoulders	Right Roadway	Right Shoulder	Code
4.0	-	-	16	6.0	026
6.0	-	-	36	12.0	054
12.0	48	30	48	12.0	150
10.0	24	16	36	10.0	096

The last example above represents the coding method for a structure in which the most restrictive approach has the cross-section shown below:



Regardless of whether the median is open or closed, the data coded must be compatible with the other related route and bridge data (i.e., if Item 51 - Bridge Roadway Width, Curb-to-Curb is for traffic in one direction only, then Items 28, 29, 32, etc. must be for traffic in one direction only).

If a ramp is adjacent to the through lanes approaching the structure, it shall be included in the approach roadway width. The total approach roadway width for the example below is 94 feet (a code of 094).



EDIT CHECK

- A warning is issued if Item 32 is < 8 feet.
- A warning is issued if Item 28A is > 3 and Item 32 is 1.5 times or more than Item 51.
- A warning is issued if Item 28A <= 3 and Item 32 is 2.0 times or more than Item 51.

FEDERAL ITEM 33 - BRIDGE MEDIAN - X (1)

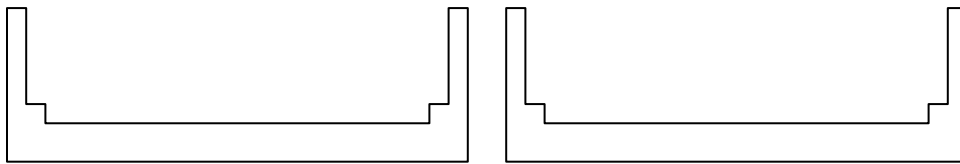
INVENTORY – DESIGN

BRIDGEMED

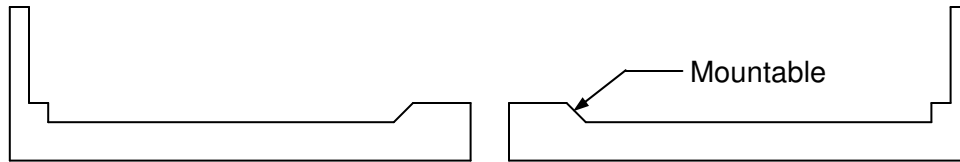
TABLE - BRIDGE

Indicate with a 1-digit code if the median is non-existent, open or closed. The median is closed when the area between the 2 roadways at the structure is bridged over and is capable of supporting traffic. All bridges that carry either 1-way traffic or 2-way traffic separated only by a centerline will be coded 0 for no median.

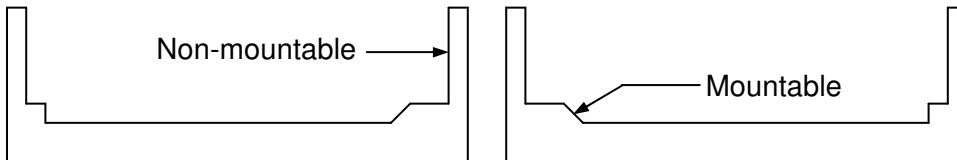
<u>Code</u>	<u>Description</u>
0	No median
1	Open median
2	Closed median (no barrier)
3	Closed median with non-mountable barrier



Open Median



Closed Median



Closed Median with Non-mountable Barrier

Virginia Note: Non-mountable curbs and/or medians will be defined as curbs being greater than 6” in height.

FEDERAL ITEM 34 - SKEW - XX (2)

INVENTORY – DESIGN

SKEW

TABLE - BRIDGE

The skew angle is the angle between the centerline of a pier and a line normal to the roadway centerline. When plans are available, the skew angle can be taken directly from the plans. If no plans are available, the angle is to be field measured if possible. Record the skew angle to the nearest degree. If the skew angle is 0 degrees, it should be so coded. When the structure is on a curve or if the skew varies for some other reason, the average skew should be recorded, if reasonable. Otherwise, record 99 to indicate a major variation in skews of substructure units. A 2-digit number should be coded.

EXAMPLES:		<u>Code</u>
Skew angle	0 degrees	00
	10 degrees	10
	8 degrees	08
	29 degrees	29

FEDERAL ITEM 35 - STRUCTURE FLARED - X (1)

INVENTORY – DESIGN

STRFLARED

TABLE - BRIDGE

Code this item to indicate if the structure is flared (i.e., the width of the structure varies). Generally, such variance will result from ramps converging with or diverging from the through lanes on the structure, but there may be other causes. Minor flares at ends of structures should be ignored.

<u>Code</u>	<u>Description</u>
1	Yes, flared
0	No flare

FEDERAL ITEM 36 - TRAFFIC SAFETY FEATURES - XXXX (4)

APPRAISAL – OTHER RATINGS

RAILRATING

TRANSRATING

ARAILRATING

AENDRATING

TABLE - INSPEVNT

Bridge inspection shall include the recording of information on the following traffic features so that the evaluation of their adequacy can be made.

(36A) Bridge railings:

Some factors that affect the proper functioning of bridge railing are height, material, strength, and geometric features. Railings must be capable of smoothly redirecting an impacting vehicle. Bridge railings should be evaluated using the current AASHTO Standard Specifications for Highway Bridges, which calls for railings to meet specific geometric criteria and to resist specified static loads without exceeding the allowable stresses in their elements. Bridge railing should be crash tested per FHWA policy. Railings that meet these criteria and loading conditions are considered acceptable. Other railings that have been successfully crash tested are considered acceptable even though they may not meet the static loading analysis and geometric requirements. Acceptable guidelines for bridge railing design and testing are also found in the AASHTO Guide Specifications for Bridge Railings 1989. Additional guidance for testing is found in National Cooperative Highway Research Program - Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features 1993.

(36B) Transitions:

The transition from approach guardrail to bridge railing requires that the approach guardrail be firmly attached to the bridge railing. It also requires that the approach guardrail be gradually stiffened as it comes closer to the bridge railing. The ends of curbs and safety walks need to be gradually tapered out or shielded.

(36C) Approach guardrail:

The structural adequacy and compatibility of approach guardrail with transition designs should be determined. Rarely does the need for a barrier stop at the end of a bridge. Thus, an approach guardrail with adequate length and structural qualities to shield motorists from the hazards at the bridge site needs to be installed. In addition to being capable of safely redirecting an impacting vehicle, the approach guardrail must also facilitate a transition to the bridge railing that will not cause snagging or pocketing of an impacting vehicle. Acceptable guardrail design suggestions are contained in the AASHTO Roadside Design Guide and subsequent FHWA or AASHTO guidelines.

(36D) Approach guardrail ends:

As with guardrail ends in general, the ends of approach guardrails to bridge should be flared, buried, made breakaway, or shielded. Design treatment of guardrail ends is given in the AASHTO Roadside Design Guide.

The data collected shall apply only to the route on the bridge. Collision damage or deterioration of the elements is not considered when coding this item. 'Traffic Safety Features' is a 4-digit code composed of 4 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
36A	Bridge railings	1 digit
36B	Transitions	1 digit
36C	Approach guardrail	1 digit
36D	Approach guardrail ends	1 digit

Virginia Note: The reporting of this feature shall be as follows:

<u>Code</u>	<u>Description</u>
0	Inspected feature is in place at all locations and DOES NOT meet currently acceptable standards at ONE OR MORE locations or inspected feature is not in place at one or more locations. (See Note Below)
1	Inspected feature is in place at ALL locations and meets currently acceptable standards at all locations. (See Note Below)
N	There is written notice from Traffic Engineering Division that guardrail is not required. (See Note Below)

NOTE: For structures on the NHS, national standards are set by regulation. For those not on the NHS, it shall be the responsibility of the highway agency to set standards.

CULVERTS

- If the guardrail extends across the fill and all parts of the guardrail are the same (post spacing, type of rail, etc.) the Bridge Railing and Transition are to be coded 'N' and the Approach Guardrail and End Treatment will be coded '1' or '0' using the criteria shown above.
- If the guardrail is physically attached to the culvert all items will be coded '1' or '0' using the criteria shown above.

EXAMPLE: Code
 All feature meet currently acceptable standards except transition 1011

FEDERAL ITEM 37 - HISTORICAL SIGNIFICANCE - X (1)

INVENTORY – CLASSIFICATION

HISTSIGN

TABLE - BRIDGE

The historical significance of a bridge involves a variety of characteristics: the bridge may be a particularly unique example of the history of engineering; the crossing itself might be significant; the bridge might be associated with a historical property or area; or historical significance could be derived from the fact the bridge was associated with significant events or circumstances. Use one of the following codes:

<u>Code</u>	<u>Description</u>
1	Bridge is on the National Register of Historic Places.
2	Bridge is eligible for the National Register of Historic Places.
3	Bridge is possibly eligible for the National Register of Historic Places (requires further investigation before determination can be made) or bridge is on a State or local historic register.
4	Historical Significance is not determinable at this time.
5	Bridge is not eligible for the National Register of Historic Places.

FEDERAL ITEM 38 - NAVIGATION CONTROL - X (1)

APPRAISAL – OTHER RATINGS

NAVCNTROL

TABLE - BRIDGE

Indicate for this item whether or not navigation control (a bridge permit for navigation) is required. Use one of the following codes:

<u>Code</u>	<u>Description</u>
N	Not applicable, no waterway
0	No navigation control on waterway (bridge permit not required)
1	Navigation control on waterway (bridge permit required)

EDIT CHECK

If Item 38 is = 1 then Item 111 must NOT be blank.

If Item 38 is = 1, then Item 39 must be > 000.

If Item 38 is = 0 or N, then Item 39 must be = 000.

If Item 38 is = 0 or N, then Item 40 must be = 000.

FEDERAL ITEM 39 - NAVIGATION VERTICAL CLEARANCE - XXX (3)

APPRAISAL – OTHER RATINGS

NAVVC

TABLE - BRIDGE

If Item 38 - Navigation Control has been coded 1, record in feet the minimum vertical clearance imposed at the site as measured above a datum that is specified on a navigation permit issued by a control agency. The measurement shall be coded as a 3-digit number rounded down to the nearest foot. This measurement will show the clearance that is allowable for navigational purposes. In the case of a swing or bascule bridge, the vertical clearance shall be measured with the bridge in the closed position (i.e., open to vehicular traffic). The vertical clearance of vertical lift bridge shall be measured with the bridge in the raised or open position. Also, Item 116 - Minimum Navigation Vertical Clearance Vertical Lift Bridge shall be coded to provide clearance in a closed position. If Item 38 - Navigation Control has been coded 0 or N, code 000 to indicate not applicable.

EXAMPLES:		<u>Code</u>
Measured Vertical Clearance	150.0	150
	20.6	020
	24.2	024

EDIT CHECK

If Item 38 is = 1, then Item 39 must be > 000.

If Item 38 is = 0 or N, then this Item 39 must be = 000.

A warning is issued if Item 39 is > 250 feet.

FEDERAL ITEM 40 - NAVIGATION HORIZONTAL CLEARANCE - XXXX (4)

APPRAISAL – OTHER RATINGS

NAVHC

TABLE - BRIDGE

If Item 38 - Navigation Control has been coded 1, record the horizontal clearance measurement imposed at the site that is shown on the navigation permit. This may be less than the structure geometry allows. If a navigation permit is required but not available, use the minimum horizontal clearance between fenders, if any, or the clear distance between piers or bents. Code the clearance as a 4-digit number. Code 0000 if Item 38 - Navigation Control is coded 0 or N.

EXAMPLES:		<u>Code</u>
Horizontal Clearance	95 feet	0095
	538 feet	0538
	1,200 feet	1200

EDIT CHECK

If Item 38 = 1, then this Item 40 must be > 0000.
 If Item 38 is = 0 or N, then this Item 40 must be = 000.
 A warning is issued if Item 40 is > 1000 feet.

FEDERAL ITEM 41 - OPEN, POSTED, OR CLOSED TO TRAFFIC - X (1)

APPRAISAL – OTHER RATINGS

OPPOSTCL

TABLE - INSPEVNT

This item provides information about the actual operational status of a structure. The field review could show that a structure is posted, but Item 70 - Bridge Posting may indicate that posting is not required. This is possible and acceptable coding since Item 70 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:

<u>Code</u>	<u>Description</u>
A	Open, no restriction
B	Open, posting recommended but not legally implemented (all signs not in place or in their correct location)
D	Open, would be posted or closed except for temporary shoring, etc. to allow for unrestricted traffic
E	Open, temporary structure in place to carry legal loads while original structure is closed and awaiting replacement or rehabilitation
G *	New structure not yet open to traffic
K *	Bridge closed to all traffic
P	Posted for load (may include other restrictions such as temporary bridges which are load posted)
R	Posted for other load-capacity restriction (speed, number of vehicles on bridge, etc.)

* Either of these will cause an '*' to appear in the 'S' column on an inquiry list.

EDIT CHECK

If Item 59 = 0 or 1 then Item 41 must = D, E or K.
 If Item 60 = 0 or 1 then Item 41 must = D, E or K.
 If Item 62 = 0 or 1 then Item 41 must = D, E or K.
 If Item 103 = T then Item 41 must = D, E or P.
 If Item 41 = E or K then last two digits of Item 64 must = 00.
 A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.
 A warning is issued if Item 64A = 1 - 6 or 9 and Item 64B = 00 and Item 41 = D or E then Item 103 must = T.
 A warning is issued if Item 41 = B, D, E, P, or R and Item 91 is not less than 24.

FEDERAL ITEM 42 - TYPE OF SERVICE - X X (2)

INVENTORY – ID/ADMIN

SERVYPON

SERVYPUND

TABLE - BRIDGE

The type of service on the bridge and under the bridge is indicated by a 2-digit code composed of 2 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
42A	Type of service on bridge	1 digit
42B	Type of service under bridge	1 digit

The first digit indicates the type of service "on" the bridge and shall be coded using one of the following codes:

<u>Code</u>	<u>Description</u>
1	Highway
2	Railroad
3	Pedestrian – bicycle
4	Highway-railroad
5	Highway-pedestrian
6	Overpass structure at an interchange or second level of multilevel interchange
7	Third level (Interchange)
8	Fourth level (Interchange)
9	Building or plaza
0	Other

The second digit indicates the type of service "under" the bridge and shall be coded using one of the following codes:

<u>Code</u>	<u>Description</u>
1	Highway, with or without pedestrian
2	Railroad
3	Pedestrian-bicycle
4	Highway-railroad
5	Waterway
6	Highway-waterway
7	Railroad-waterway
8	Highway-waterway-railroad
9	Relief for waterway
0	Other

EDIT CHECK

If Item 28B > 00 then Item 42 must = 1, 4, 6 or 8.

If Item 28B = 00 then Item 42 must = 0, 2, 3, 5, 7 or 9.

If Item 69 is numeric then Item 42 must be 1, 2, 4, 6, 7 or 8.

If Item 71 is numeric then Item 42 must be 5, 6, 7, 8, 9 or 0.

If Item 42B = 5, 6, 7, 8 or 9 then Item 113 must be numeric.

If Item 42B = 1, 2, 3 or 4 then Item 113 must be N.

For an under record, If the first two digits of Item 28 are > 00 then the first digit of Item 42 must be 1, 4, 5, 6, 7 or 8.

For an under record, If the first two digits of Item 28 = 00 then the first digit of Item 42 must be 2, 3, 9 or 0.

If this Item 28A is = 00 then Item 42A must = 0,2,3 or 9.

FEDERAL ITEM 43 - STRUCTURE TYPE, MAIN - XXX (3)

INVENTORY – DESIGN

MATERIALMAIN

DESIGNMAIN

TABLE - BRIDGE

Record the description on the inspection form and indicate the type of structure for the main span(s) with a 3-digit code composed of 2 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
43A	Kind of material and/or design	1 digit
43B	Type of design and/or construction	2 digits

The first digit indicates the kind of material and/or design and shall be coded using one of the following codes:

<u>Code</u>	<u>Description</u>
1	Concrete
2	Concrete continuous
3	Steel
4	Steel continuous
5	Prestressed concrete *
6	Prestressed concrete continuous *
7	Wood or Timber
8	Masonry
9	Aluminum, Wrought Iron, or Cast Iron
0	Other

* Post-tensioned concrete should be coded as prestressed concrete.

The second and third digits indicate the predominate type of design and/or type of construction and shall be coded using one of the following codes:

<u>Code</u>	<u>Description</u>
01	Slab
02	Stringer/Multi-beam or Girder
03	Girder and Floorbeam System
04	Tee Beam (See Virginia Note Below)
05	Box beam or Girders - Multiple
06	Box beam or Girders - Single or Spread
07	Frame (except frame culverts)
08	Orthotropic
09	Truss – Deck
10	Truss – Thru
11	Arch – Deck
12	Arch – Thru
13	Suspension
14	Stayed Girder
15	Movable – Lift
16	Movable – Bascule
17	Movable – Swing
18	Tunnel
19	Culvert (includes frame culverts)
20	Mixed types – <u>Applicable only to approach spans (Item 44)</u>
21	Segmental Box Girder
22	Channel Beam
00	Other

<u>EXAMPLE:</u>	<u>Code</u>
Timber Through Truss	710
Masonry Culvert	819
Steel Suspension	313
Continuous Concrete Multiple Box Girders	205
Simple Span Concrete Slab	101
Tunnel Rock	018

EDIT CHECK

- If Item 51 = 0000 then Item 43B must = 19
- If Item 52 = 0000 then Item 43B must = 19
- If Item 43B = 19 then Item 58 must = N.
- If Item 43B = 19 then Item 59 must = N.
- If Item 43B = 19 then Item 60 must = N.
- If Item 43B = 19 then Item 62 must be numeric.
- If Item 43B = 15 then Item 116 must NOT be blank.

Virginia Note: Not to be used for Prestressed Bulb-T girders. Code Prestressed Bulb-T girders as 502 or 602

FEDERAL ITEM 44 - STRUCTURE TYPE, APPROACH SPANS - XXX (3)

INVENTORY – DESIGN

MATERIALAPPR

DESIGNAAPPR

TABLE - BRIDGE

Indicate with a 3-digit code composed of 2 segments, the type of structure for the approach spans to a major bridge or for the spans where the structural material is different. The codes are the same as for Item 43 preceding. However, code 000 if this item is not applicable. Use code 20 (Item 44B) when no one type of design and/or construction is predominate for the approach units. If the kind of material (Item 44A) is varied, code the most predominant.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
44A	Kind of material and/or design	1 digit
44B	Type of design and/or construction	2 digits

EXAMPLES:

	<u>Code</u>
Simple prestressed concrete I-beam	502
Continuous concrete T-beam	204
Continuous steel deck truss	409

FEDERAL ITEM 45 - NUMBER OF SPANS IN MAIN UNIT - XXX (3)

INVENTORY – DESIGN

MAINS PANS

TABLE - BRIDGE

Record the number and indicate with a 3-digit number the number of spans in the main or major unit. This item will include all spans of most bridges, the major unit only of a sizable structure, or a unit of material or design different from that of the approach spans.

EDIT CHECK

A warning is issued if Item 45 is > 50 feet.

FEDERAL ITEM 46 - NUMBER OF APPROACH SPANS - XXXX (4)

INVENTORY – DESIGN

APPSPANS

TABLE - BRIDGE

Record the number and indicate with a 4-digit number the number of spans in the approach spans to the major bridge, or the number of spans of material different from that of the major bridge.

EDIT CHECK

A warning is issued if Item 46 is > 50 feet.

FEDERAL ITEM 47 - INVENTORY ROUTE, TOTAL HORIZONTAL CLEARANCE - XX.X (3)

INVENTORY – ROADS

HCLRINV

TABLE - ROADWAY

The total horizontal clearance for the inventory route identified in Item 5 should be measured and recorded. The clearance should be the available clearance measured between the restrictive features -- curbs, rails, walls, piers or other structural features limiting the roadway (surface and shoulders). The measurement should be recorded and coded to the nearest tenth of a foot. When the restriction is 100 feet or greater, code 999. Flush and mountable medians are not considered to be restrictions.

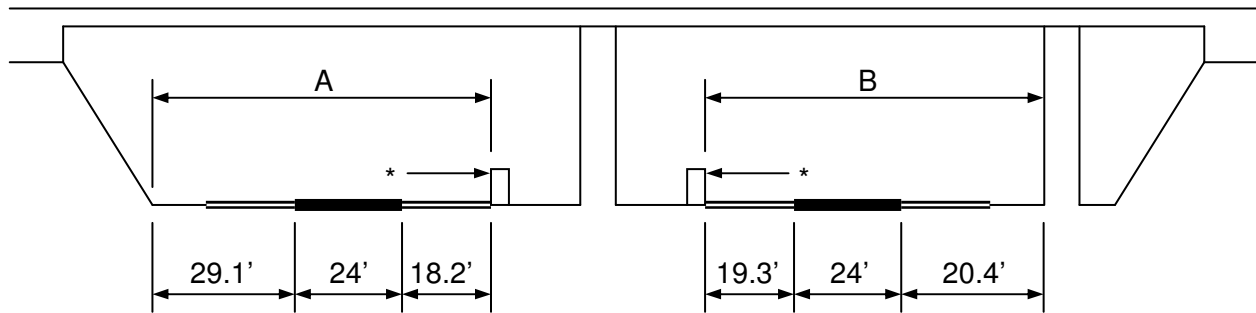
The purpose of this item is to give the largest available clearance for the movement of wide loads. This clearance has been identified in 2 ways; use the most applicable:

1. Clear distance between restrictions of the inventory route either “on” or “under” the structure.
2. Roadway surface and shoulders – when there are no restrictions.

For a divided facility with a raised or non-mountable median, or an “under” route divided by piers, record the greater of the restricted widths in either direction, not both directions.

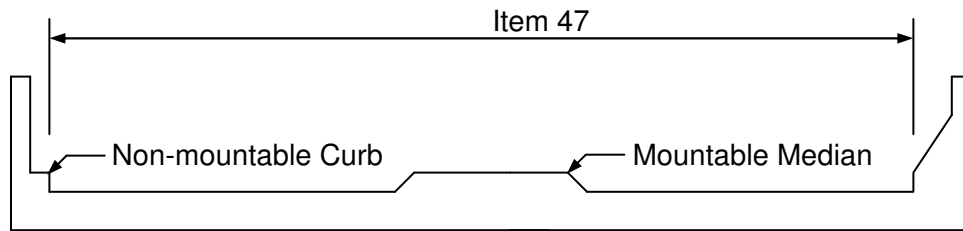
EXAMPLES:

NOTE: IGNORE GUARDRAILS FOR THIS ITEM.

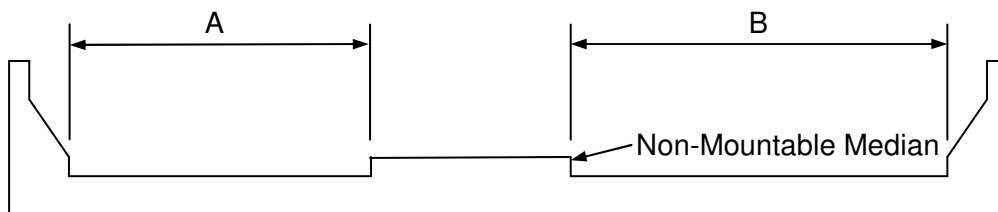


* - Face of a rigid barrier, not face of guardrail.

Clearance $A > B$ Item 47 = A



No Median or Flush or Mountable Median



Raised Median or Non-mountable Median

$B > A$ Item 47 = B

Virginia Note: Non-mountable curbs and/or medians will be defined as curbs being greater than 6" in height.

EDIT CHECK

If Item 100 = 1 or 2 then Item 47 must be > 000.
 A warning is issued if Item 47 is < 8 feet.

FEDERAL ITEM 48 - LENGTH OF MAXIMUM SPAN - XXXX (4) (FEET)**INVENTORY – DESIGN**

MAXSPAN

TABLE - BRIDGE

The length of the maximum span shall be recorded. It shall be noted whether the measurement is center-to-center of bearing points or clear open distance between piers, bents, or abutments. The measurement shall be along the centerline of the bridge. For this item, code a 4-digit number to represent the measurement to the nearest foot.

<u>EXAMPLES:</u>		<u>Code</u>
Length of Maximum	50 feet	0050
	117 feet	0117
	1,050 feet	1050

EDIT CHECK

Item 48 must be <= Item 49.
 A warning is issued if Item 48 is > 1000 feet.

FEDERAL ITEM 49 - STRUCTURE LENGTH - XXXXXX (6) (FEET)**INVENTORY – DESIGN**

LENGTH

TABLE - BRIDGE

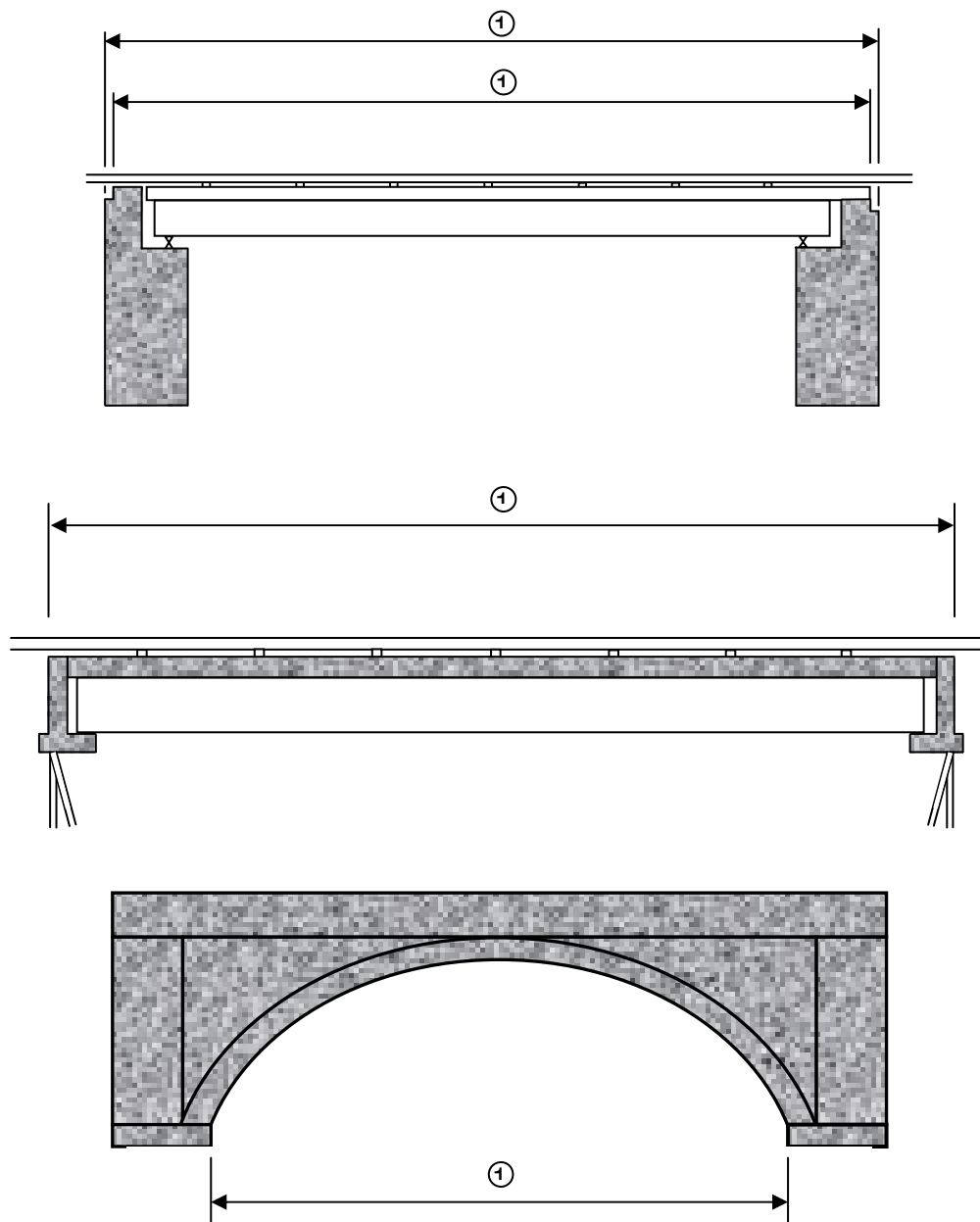
Record and code a 6-digit number to represent the length of the structure to the nearest foot. This shall be the length of roadway that is supported on the bridge structure. The length should be measured back to back of backwalls of abutments or from paving notch to paving notch.

Culvert length should be measured along the centerline of roadway regardless of their depth below grade. Measurement should be made between inside faces of exterior walls. Tunnel length should be measured along the centerline of the roadway. Be sure to code Item 5A = 2 for all tunnels.

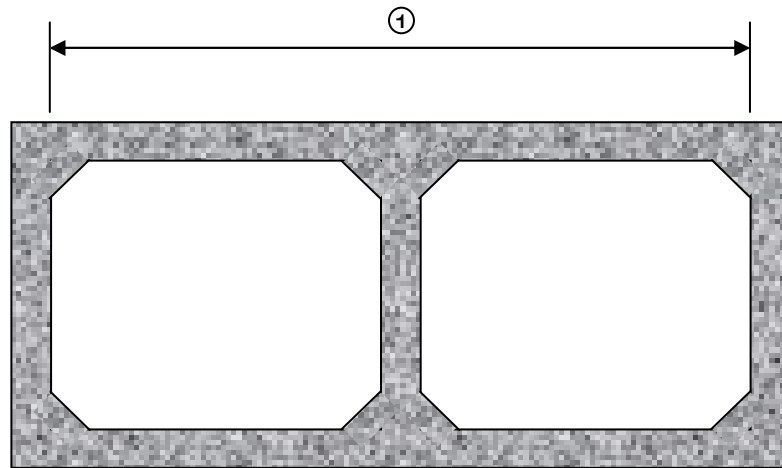
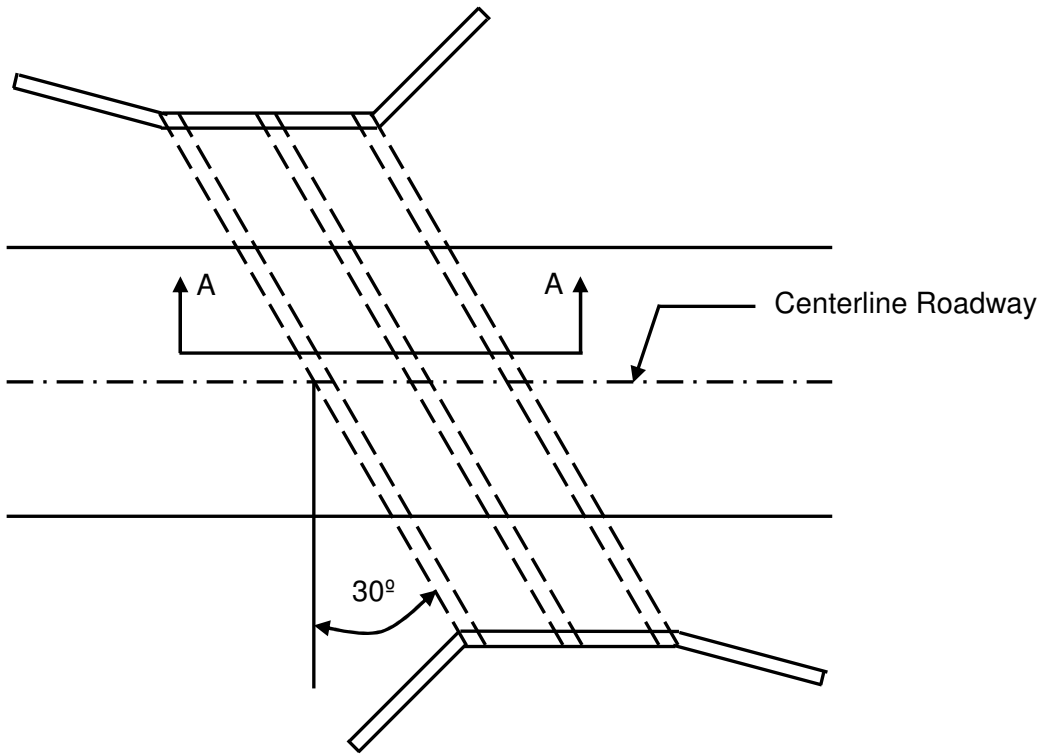
<u>EXAMPLES:</u>		<u>Code</u>
Structure Length	50 feet	000050
	5,421 feet	005421
	333 feet	000333
	101,235 feet	101235

EDIT CHECK

Item 48 must be <= Item 49.
 If Item 112 = Y then Item 49 must be >= 20
 A warning is issued if Item 49 is > 4000 feet.

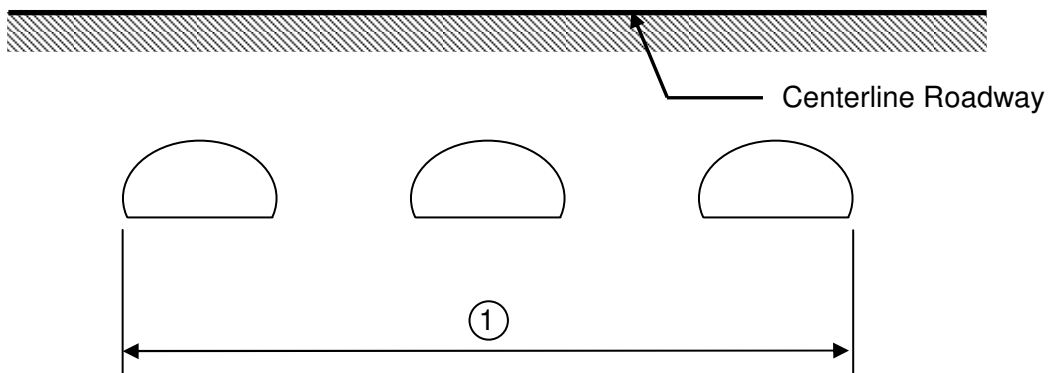
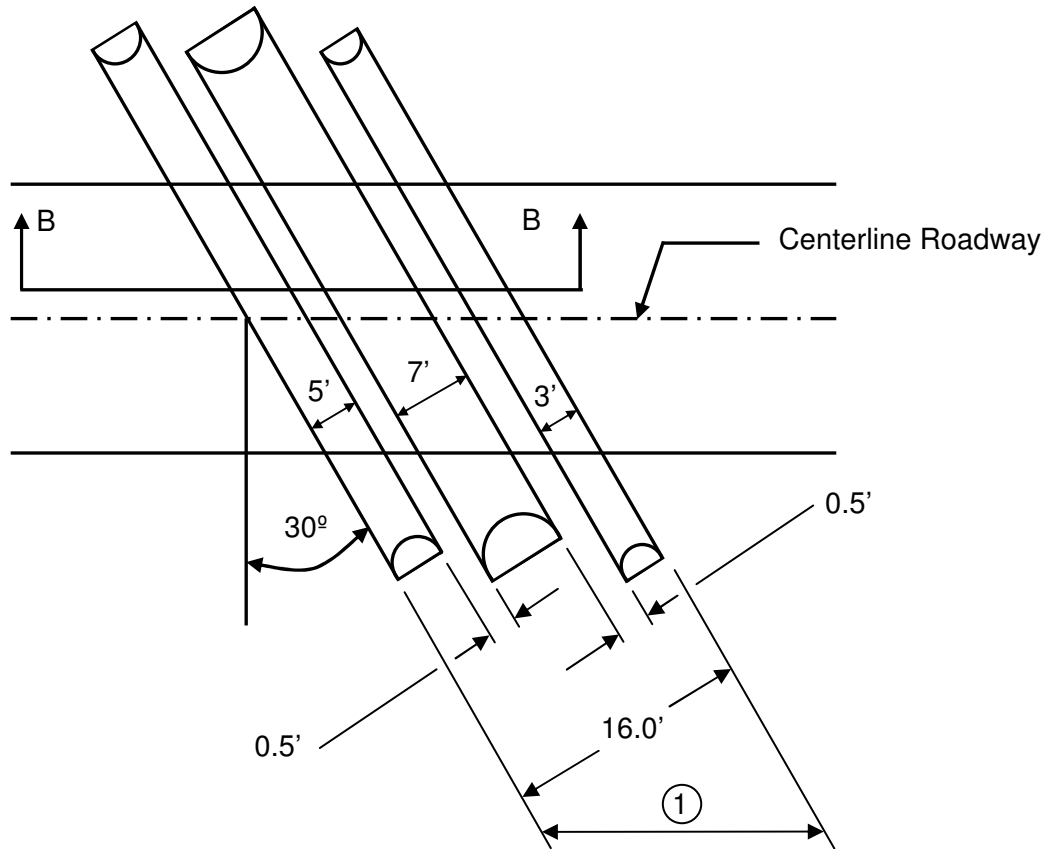


① Item 49 - Structure Length



SECTION A - A

① Item 49 Structure Length = $\frac{18'}{\cos 30^\circ} = 20.78'$ Code
000021



① Item 49 Structure Length = $\frac{18'}{\cos 30^\circ} = 20.78'$ Code
000021

FEDERAL ITEM 50 - CURB OR SIDEWALK WIDTHS - XX.X XX.X (6) (FEET)

INVENTORY – DESIGN

LFTCURBSW

RTCURBSW

TABLE - BRIDGE

Record and code two contiguous 3-digit numbers to represent the widths of the left and right curbs or sidewalks to nearest tenth of a foot. This is a 6-digit number composed of two segments, with the leftmost 3 digits representing the left curb or sidewalk and the rightmost 3 digits representing the right curb or sidewalk. "Left" and "Right" should be determined on the basis of direction of the inventory.

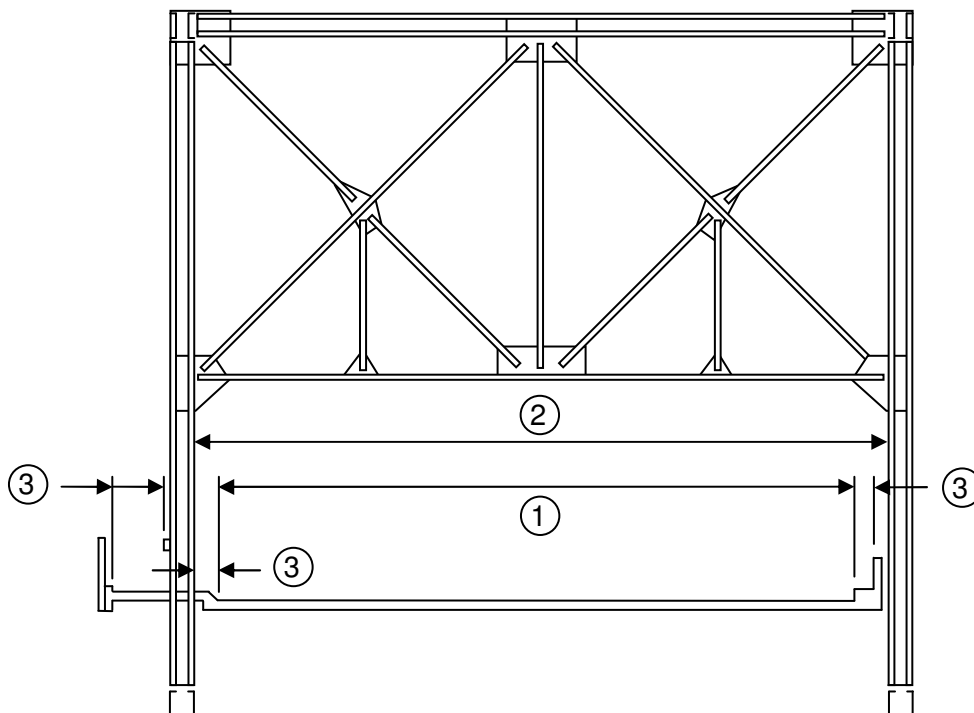
<u>Segment</u>	<u>Description</u>	<u>Length</u>
50A	Left curb or sidewalk width	3 digits
50B	Right curb or sidewalk width	3 digits

<u>EXAMPLES:</u>	<u>Left Side</u>	<u>Right Side</u>	<u>Code</u>
Curb or sidewalk	None	8.3'	000083
	10.0'	4.1'	100041
	8.3'	None	083000
	2.1'	11.5'	121115
	None	None	000000
	0.6'	1.5'	006015

EDIT CHECK

A warning is issued if Item 50A is > 12 feet.

A warning is issued if Item 50B is > 12 feet.



- ① Item 51 – Bridge Roadway Width, Curb to Curb
- ② Item 52 – Deck Width, Out-to-Out
- ③ Item 50, Curb or Sidewalk Width

FEDERAL ITEM 51 - BRIDGE ROADWAY WIDTH, CURB-TO-CURB - XXX.X (4)

INVENTORY – ROADS

ROADWIDTH

TABLE - ROADWAY

The information to be recorded is the most restrictive minimum distance between curbs or rails on the structure roadway. For structures with closed medians and usually for double decked structures, coded data will be the sum of the most restrictive minimum distances for all roadways carried by the structure except as noted below. The data recorded for this item must be compatible with other related route and bridge data (i.e. Items 28, 29, 32, etc.). The measurement should be exclusive of flared areas for ramps. A 4-digit number should be used to represent the distance to the nearest tenth of a foot.

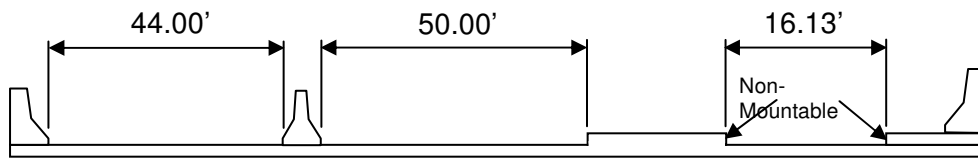
Where traffic runs directly on the top slab (or wearing surface) of a culvert-type structure, e.g. an R/C box without fill, code the actual roadway width (curb-to-curb or rail-to-rail). This will also apply where the fill is minimal and headwalls or parapets affect the flow of traffic.

Where the roadway is on fill carried across a structure and the headwalls or parapets do not affect the flow of traffic, code 0000. This is considered proper inasmuch as a filled section simply maintains the roadway cross-section. However, for sidehill viaduct structures code the actual full curb-to-curb roadway width. See figure in Federal Coding Guide Appendix D.

NOTE: Raised or non-mountable medians, open medians, and barrier widths are to be excluded from the summation along with barrier-protected bicycle and equestrian lanes.

EXAMPLES:		<u>Code</u>
Bridge Roadway Width	36.00' wide	0360
	66.37' wide	0664
	110.13' wide	1101

The last example above would be the coded value for the deck section shown below.



Virginia Note: Non-mountable curbs and/or medians will be defined as curbs being greater than 6” in height.

(For detail example refer to sketches throughout this section)

EDIT CHECK

Item 51 must be <= Item 52.

If Item 51 = 0000 then Item 43B must = 19

A warning is issued if Item 51 is > 150 feet or < 9 feet and not = 0000.

A warning is issued if Item 28A is > 3 and Item 32 is 1.5 times or more than Item 51.

A warning is issued if Item 28A <= 3 and Item 32 is 2.0 times or more than Item 51.

FEDERAL ITEM 52 - DECK WIDTH, OUT-TO-OUT - XXX.X (4)

INVENTORY – DESIGN

DECKWIDTH

TABLE - BRIDGE

Record and code a 4-digit number to show the out-to-out width to the nearest tenth of a foot. If the structure is a through structure, the number to be coded will represent the lateral clearance between superstructure members. The measurement should be exclusive of flared areas for ramps. (For detail examples refer to Federal Items 50, 51 and 52)

Where traffic runs directly on the top slab (or wearing surface) of the culvert (e.g., an R/C box without fill) coded the actual width (out-to-out). This will also apply where the fill is minimal and the culvert headwalls affect the flow of traffic. However, for sidehill viaduct structures code the actual out-to-out structure width. See figure in Federal Coding Guide Appendix D.

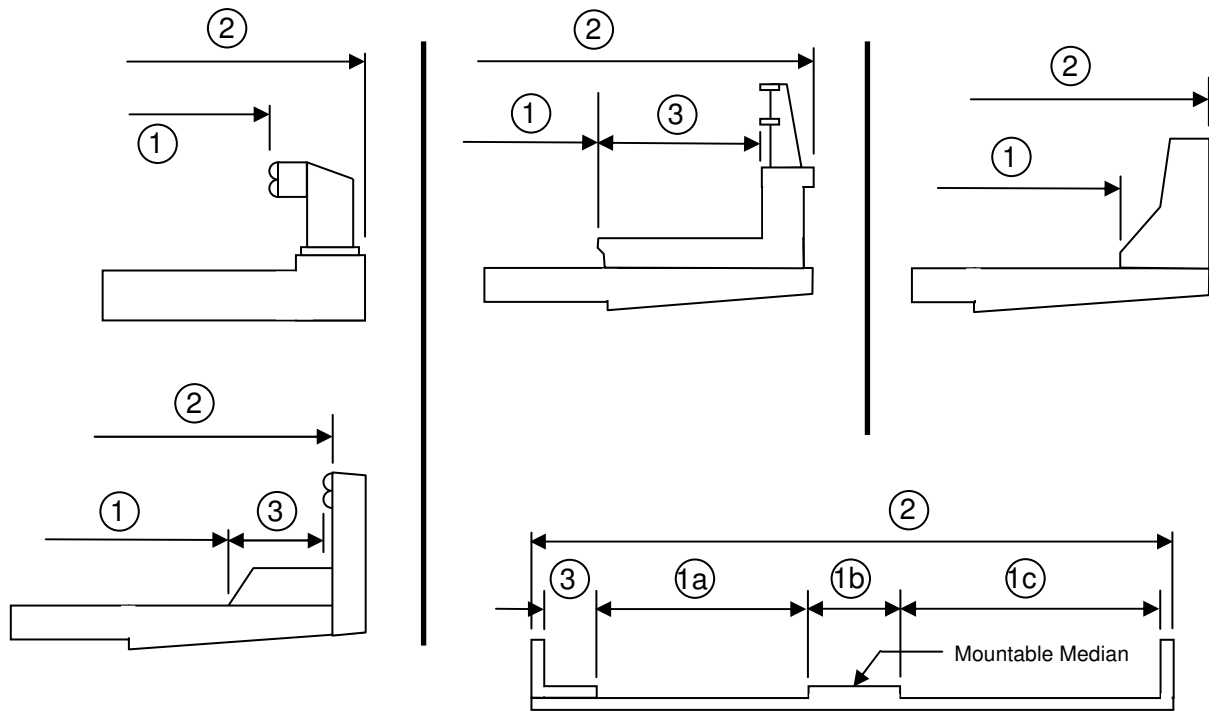
Where the roadway is on a fill carried across a pipe or box culvert and the culvert headwalls do not affect the flow of traffic, code 0000. This is considered proper inasmuch as a filled section over a culvert simply maintains the roadway cross-section.

EDIT CHECK

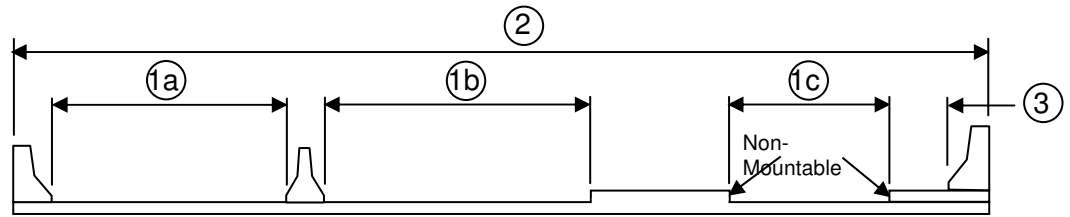
Item 51 must be \leq Item 52.

If Item 52 = 0000 then Item 43B must = 19

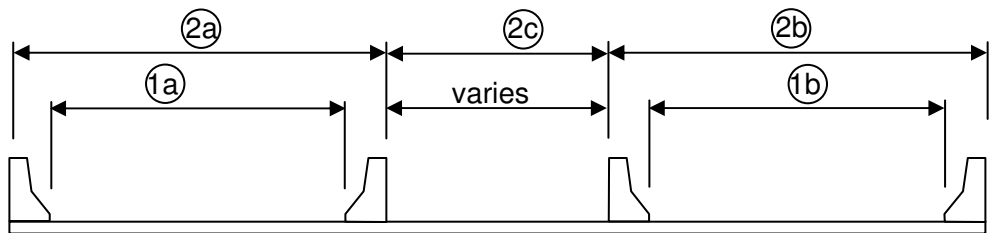
A warning is issued if Item 52 is > 150 feet or < 9 feet and not = 0000.



$$\textcircled{1} = \textcircled{1a} + \textcircled{1b} + \textcircled{1c}$$



$$\textcircled{1} = \textcircled{1a} + \textcircled{1b} + \textcircled{1c}$$



$$\textcircled{1} = \textcircled{1a} + \textcircled{1b}$$

$$\textcircled{2} = \textcircled{2a} + \textcircled{2b} + \textcircled{2c}$$

- ① Item 51 – Bridge Roadway Width, Curb-to-Curb
- ② Item 52 – Deck Width, Out-to-Out
- ③ Item 50 – Curb or Sidewalk Width

FEDERAL ITEM 53 - MINIMUM VERTICAL CLEARANCE OVER BRIDGE ROADWAY - XX XX (4)

APPRAISAL – OTHER RATINGS

VCLROVER

TABLE - BRIDGE

The information to be recorded for this item is the actual minimum vertical clearance over the bridge roadway, including shoulders, to any superstructure restriction, rounded down to the nearest inch. For double decked structures code the minimum, regardless whether it is pertaining to the top or bottom deck. Coding of actual clearances between 100 feet and 300 feet to an exact measurement is optional (see Virginia Note below). When no superstructure restriction exists above the bridge roadway, code 9999. A 4-digit number should be coded to represent feet and inches.

Virginia Note: When no restriction exists above the bridge roadway, or when a restriction is 100 feet or greater code 9999. The restriction should be measured to any item that creates a vertical clearance restriction including ancillary structures.

See Virginia Note under Federal Item 54.

EXAMPLES:		<u>Code</u>
Minimum Vertical Clearance	17'-3"	1703
	75'-11"	7511
	No restriction	9999
	115'-6"	9999

EDIT CHECK

A warning is issued if Item 53 is < 7 feet.

FEDERAL ITEM 54 - MINIMUM VERTICAL UNDERCLEARANCE - X XX(feet) XX(inches) (5)

APPRAISAL – OTHER RATINGS

REFVUC

VCLRUNDER

TABLE - BRIDGE

Using a 1-digit code and a 4-digit number, record and code the minimum vertical clearance from the roadway (travel lanes only – See Virginia Notes below) or railroad track beneath the structure to the underside of the superstructure. (When both a railroad and highway are under the structure, code the most critical dimension.)

<u>Segment</u>	<u>Description</u>	<u>Length</u>
54A	Reference feature	1 digit
54B	Minimum Vertical Underclearance	4 digit

Using one of the codes below, code in the first position, the reference feature from which the clearance measurement is taken:

<u>Code</u>	<u>Description</u>
H	Highway beneath structure
R	Railroad beneath structure
N	Feature not a highway or railroad

In the next 4 positions, code a 4-digit number to represent the minimum vertical clearance from that feature to the structure. Coding of actual clearances between 100 feet and 300 feet to an exact measurement is optional. If the feature is not a highway or railroad, code the minimum vertical clearance 0000.

Virginia Note: When a restriction is 100 feet or greater code 9912. For clearances less than or equal to 25 feet the clearance should be measured and recorded. For clearances between 25 feet and 100 feet the clearance should be measured directly or estimated from the plans and recorded.

Where to measure

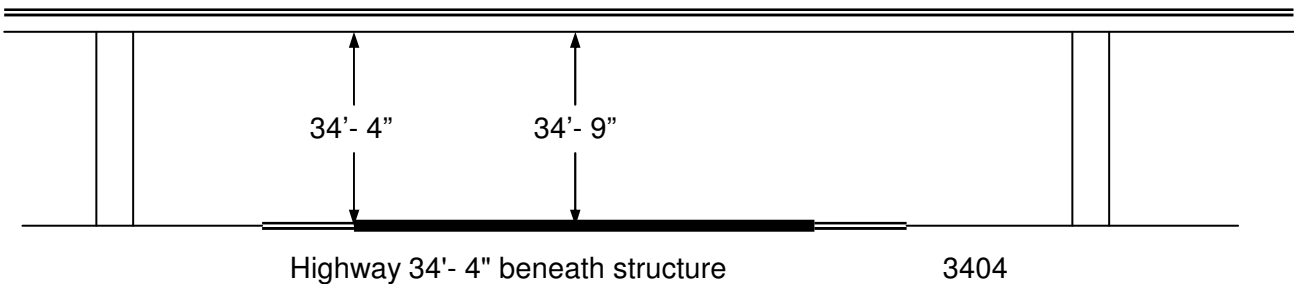
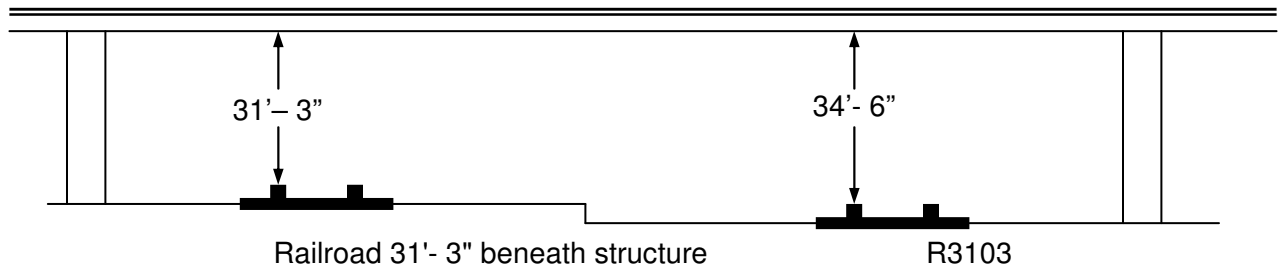
The traveled part of the roadway and/or the travel lane will include the width of traffic lanes and the widths of shoulders where shoulders are defined as follows:

Shoulders must be constructed and normally maintained flush with the adjacent traffic lane, and must be structurally adequate for all weather and traffic conditions consistent with the facility carried.

Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder.

Therefore, measurements for all vertical clearances should be checked across all portions of the 'traveled part of the roadway' and/or 'travel lane', as defined above, and the minimum clearance recorded for the item which is being checked (Federal Item 10, Federal Item 53, Federal Item 54, State Item 36 and State Item 37). Of course, if edge of pavement is behind the face of a guardrail then stop at the face of the guardrail. When on a bridge deck measurements will be checked from face of parapet/railing to face of parapet/railing. I have checked Manual 90, the 'Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges', the 'Manual for Condition Evaluation of Bridges' and I have checked with Claude Napier concerning this. He agrees with this definition and method.

EXAMPLES: Code
 River beneath structure N000



EDIT CHECK

A warning is issued if Item 54B is < 7 feet and not = 0000.

FEDERAL ITEM 55 - MINIMUM LATERAL UNDERCLEARANCE ON RIGHT - X XX.X (4)

APPRAISAL – OTHER RATINGS

REFHUC

HCLRURT

TABLE - BRIDGE

Using a 1-digit code and a 3-digit number, record and code the minimum lateral underclearance on the right to the nearest tenth of a foot. When both a railroad and highway are under the structure, code the most critical dimension (Refer to Item 69 – Underclearances, Horizontal – Table 3B).

<u>Segment</u>	<u>Description</u>	<u>Length</u>
55A	Reference feature	1 digit
55B	Minimum Lateral Underclearance	3 digit

Using one of the codes below, code in the first position the reference feature from which the clearance measurement is taken:

<u>Code</u>	<u>Description</u>
H	Highway beneath structure
R	Railroad beneath structure
N	Feature not a highway or railroad

In the next 3 positions, code a 3-digit number to represent the minimum lateral underclearance on the right. 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, or to the toe of slope steeper than 3 to 1 (e.g. 1 to 1 or 2 to 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 dual highway this would mean the outside clearances of both roadways should be measured and the smaller distance recorded and coded.

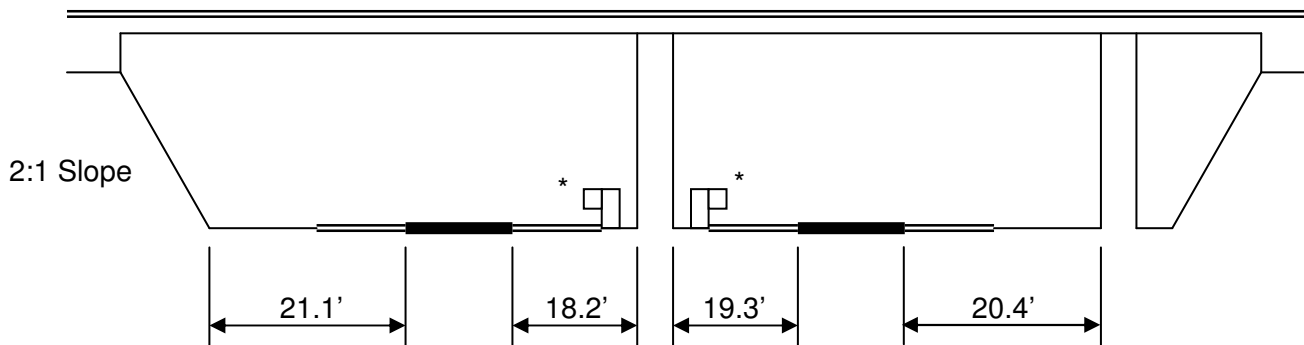
If two related features are below the bridge, measure both and record the lesser of the 2. An explanation should be written as to what was recorded. When the clearance is 99.9 feet or greater, code 999.

If the feature beneath the structure is not a railroad or highway, code 000 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.

<u>EXAMPLES:</u>	<u>Code</u>
Railroad 29.4' centerline to pier	R204
Highway 20.2' edge of pavement to pier	H202
Creek beneath structure	N000

EXAMPLES:

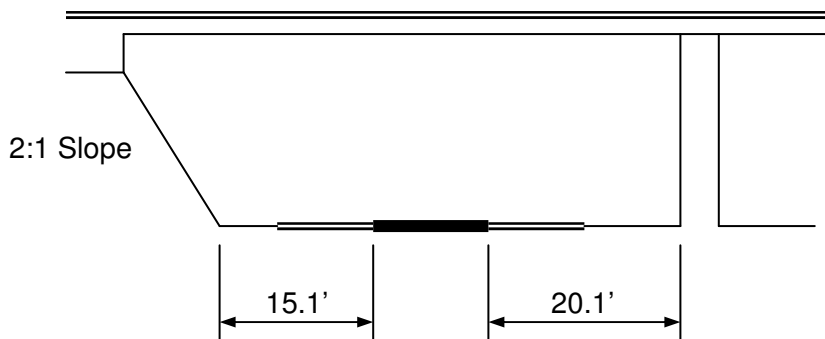


* - Non-rigid barrier (example - guardrail)

18.2' Left

20.4' Right

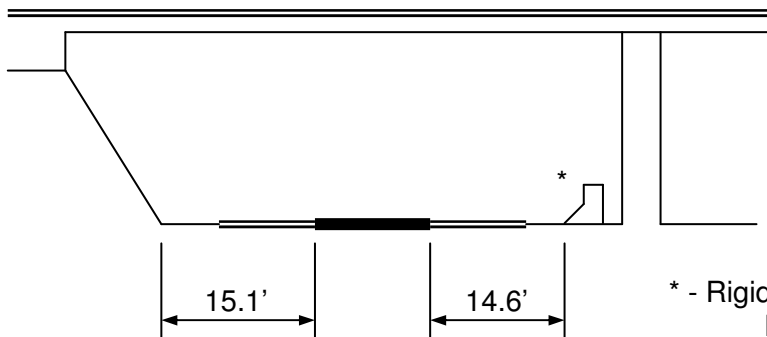
NOTE: IGNORE GUARDRAILS FOR THIS ITEM.



-- Left
15.1 Left

15.1 Right
20.1 Right

for 2-way traffic
for 1-way traffic

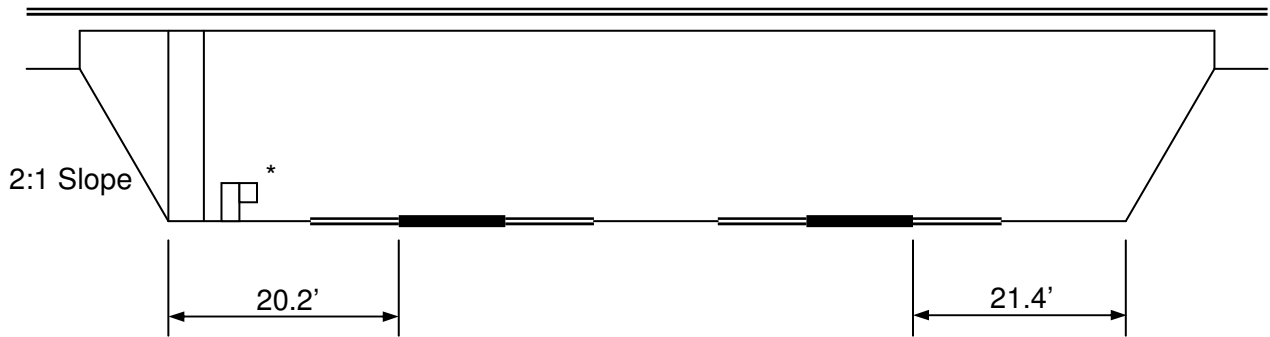


* - Rigid barrier
Not guardrail

-- Left
15.1 Left

14.6 Right
14.6 Right

for 2-way traffic
for 1-way traffic

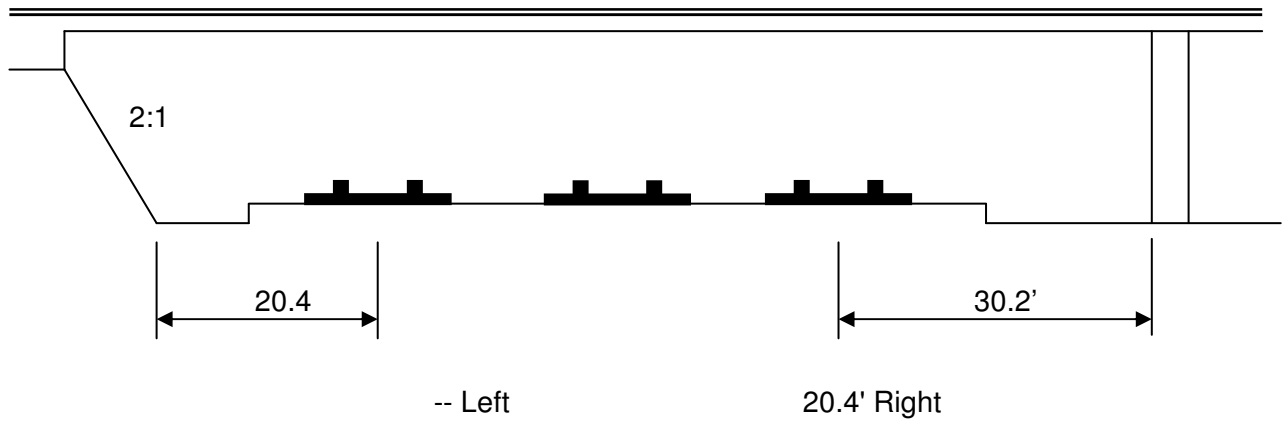
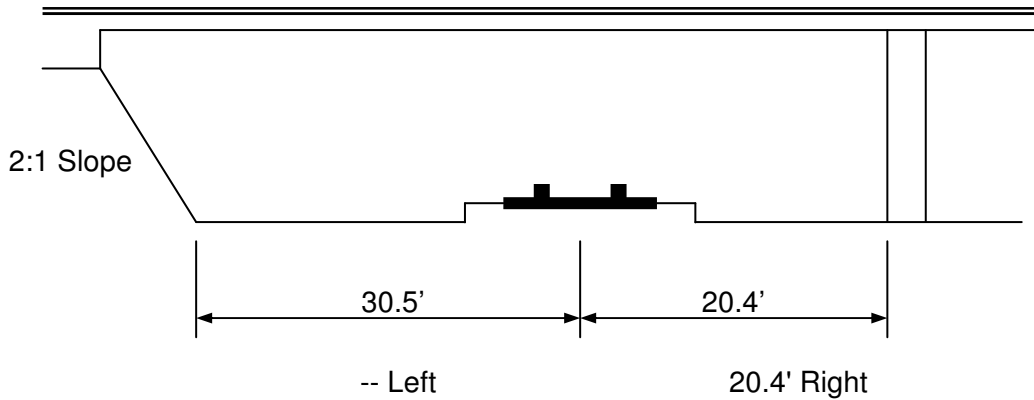


* - Non-rigid barrier (example - guardrail)

OPEN Left

20.2' Right

NOTE: Instructions state that left would be noted as "Open". Coding should be 99.9



FEDERAL ITEM 56 - MINIMUM LATERAL UNDERCLEARANCE ON LEFT - XX.X (3)

APPRAISAL – OTHER RATINGS

REFHUC

HCLRULT

TABLE - BRIDGE

(code only for divided highway, 1-way streets, and ramps; not applicable to railroads)

Using a 3-digit number, record and code the minimum lateral underclearance on the left (median side for divided highways) to the nearest tenth of a foot. 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 aid the toe of slope steeper than 3 to 1. Refer to examples on page 34 under Item 55 - Minimum Lateral Underclearance on Right.

In the case of a dual 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 clearance greater than 99.8 feet, code 998. Code 000 to indicate not applicable.

GENERAL CONDITION RATINGS

In order to promote uniformity between bridge inspectors, these guidelines will be used to rate and code items 58, 59, 60, 61 and 62.

Condition ratings are used to describe the existing, in-place bridge as compared to the as-built condition. Evaluation is for the materials related, physical condition of the deck, superstructure and substructure components of a bridge. The condition evaluation of channels and channel protection and culverts is also included. Condition codes are properly used when they provide an overall characterization of the general condition of the entire component being rated. Conversely, they are improperly used if they attempt to describe localized or nominally occurring instances of deterioration or disrepair. Correct assignment of a condition code must, therefore, consider both the severity of the deterioration or disrepair and the extent to which it is widespread throughout the component being rated.

The load carrying capacity will not be used in evaluating condition items. The fact that a bridge was designed for less than current legal loads and may be posted shall have no influence upon condition ratings.

Portions of bridges that are being supported or strengthened by temporary members will be rated based on their actual condition; that is, the temporary members are not considered in the rating of the item. (See Item 103 - Temporary Structure Designation for the definition of a temporary bridge.)

Completed bridges not yet opened to traffic, if rated, shall be coded as if open to traffic.

The following general condition ratings shall be used as a guide in evaluating Items 58, 59, 60, 61 and 62:

<u>Code</u>	<u>Description</u>
N	NOT APPLICABLE
9	EXCELLENT CONDITION
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 some minor section loss, cracking, spalling or scour
4	POOR CONDITION Advanced section loss, deterioration, spalling or scour.
3	SERIOUS CONDITION Loss of section, deterioration, spalling or scour has 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 may be 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.
0	FAILED CONDITION Out of service - beyond corrective action.

FEDERAL ITEM 58 - DECK - X (1)

CONDITION

DKRATING

TABLE - INSPEVNT

This item describes the overall condition rating of the deck. Rate and code the condition in accordance with the above general condition ratings. Code N for all culverts.

Concrete decks should be inspected for cracking, scaling, spalling, leaching, chloride contamination, potholing, delamination, and full or partial depth failures. Steel grid decks should be inspected for broken welds, broken grids, section loss, and growth of filled grids from corrosion. Timber decks should be inspected for splitting, crushing, fastener failure, and deterioration from rot.

The condition of the wearing surface/protective system, joints, expansion device, curbs, sidewalks, parapets, fascias, 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 not how they may influence the superstructure rating (for example, rigid frame, slab, deck girder or T-beam, void slab, box girder, etc.). Similarly, the superstructure of an integral deck-type bridge will not influence the deck rating.

EDIT CHECK

If Item 58 is ≤ 3 then Item 70 must be < 5 .

If Item 43B = 19 then Item 58 must = N.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded ≥ 2 and Item 42 is NOT = to D, E or K.

FEDERAL ITEM 59 - SUPERSTRUCTURE - X (1)

CONDITION

SUPRATING

TABLE - INSPEVNT

This item describes the physical condition of all structural members. Rate and code the condition in accordance with the described general condition ratings. Code N for all culverts.

The structural members should be inspected for signs of distress that may include cracking, deterioration, section loss, and malfunction and misalignment of bearings.

The condition of 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. Fracture critical components should receive careful attention because failure could lead to collapse of a span or the bridge.

EDIT CHECK

If Item 59 = 0 or 1 then Item 41 must = D, E or K.

If Item 59 is ≤ 3 then Item 70 must be < 5 .

If Item 43B = 19 then Item 59 must = N.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded ≥ 2 and Item 42 is NOT = to D, E or K.

A warning is issued if Item 70 = 5 and Item 59 = 0, 1, 2 or 3.

FEDERAL ITEM 60 - SUBSTRUCTURE - X (1)

CONDITION

SUBRATING

TABLE - INSPEVNT

This item describes the 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 N for all culverts.

All substructure elements should be inspected for visible signs of distress including evidence of cracking, section loss, settlement, misalignment, scour, collision damage, and corrosion. The rating given by Item 113 - Scour Critical Bridges, may have a significant effect on Item 60 if scour has substantially affected the overall condition of the substructure.

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

Integral-abutment wingwalls to the first construction or expansion joint shall be included in the evaluation (i.e. wings poured separately and falling away from the substructure unit will not affect the

condition rating of the substructure). For non-integral superstructure and substructure units, the substructure shall be considered as the portion below the bearings. For structures where the substructure and superstructure are integral, the substructure shall be considered as the portion below the superstructure.

EDIT CHECK

If Item 60 = 0 or 1 then Item 41 must = D, E or K.

If Item 60 is < = 3 then Item 70 must be < 5.

If Item 43B = 19 then Item 60 must = N.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

A warning is issued if Item 70 = 5 and Item 60 = 0, 1, 2 or 3.

FEDERAL ITEM 61 - CHANNEL AND CHANNEL PROTECTION - X (1)

CONDITION

CHANRATING

TABLE - INSPEVNT

This item describes the physical conditions associated with the flow of water through 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 that may affect undermining of slope protection or footings, erosion of banks, and realignment of the stream that 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.

Rate and code the condition in accordance with the previously described general condition ratings and the following descriptive codes:

<u>Code</u>	<u>Description</u>
N	Not applicable. Use only when the bridge is not over a waterway.
9	There are no noticeable or noteworthy deficiencies, which affect the condition of the channel.
8	Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in a stable condition.
7	Bank protection is in need for minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift.
6	Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor streambed movement evident. Debris is restricting the waterway slightly.
5	Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel.
4	Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the waterway.
3	Bank protection has failed. River control devices have been destroyed. Streambed aggravation, degradation or lateral movement has change the waterway to now threaten the bridge and/or approach roadway.
2	The waterway has changed to the extent the bridge is near a state of collapse.
1	Bridge closed because of channel failure. Corrective action may put back in light service.
0	Bridge closed because of channel failure. Replacement necessary.

EDIT CHECK

If Item 61 is ≤ 3 then Item 70 must be < 5 .

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

FEDERAL ITEM 62 - CULVERTS - X (1)

CONDITION

CULVRATING

TABLE - INSPEVNT

This item evaluates the alignment, settlement, joints, structural condition, scour, and other items associated with culverts. The rating code is intended to be an overall condition evaluation of the culvert. Integral wingwalls to the first construction or expansion joint shall be included in the evaluation. For a detailed discussion regarding the inspection and rating of culverts, consult Report No. FHWA-IP-2, Culvert Inspection Manual, July 1986.

Item 58 - Deck, Item 59 - Superstructure and Item 60 - Substructure shall be coded N for all culverts.

Rate and code the condition in accordance with the previously described general condition ratings and the following descriptive codes:

<u>Code</u>	<u>Description</u>
N	Not applicable. Use if structure is not a culvert.
9	No deficiencies.
8	No noticeable or noteworthy deficiencies that affect the condition of the culvert. Insignificant scrape marks caused by drift.
7	Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting.
6	Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting.
5	Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection in one section, significant corrosion or deep pitting.
4	Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joint permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls or pipes. Metal culverts have significant distortion and deflection throughout, extensive corrosion or deep pitting.
3	Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slabs. Integral wingwalls nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.
2	Integral wingwalls collapsed, severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at curtain walls and pipes. Corrective action is required to maintain traffic. Metal culverts have extreme distortion and deflection throughout with extensive perforations due to corrosion.
1	Bridge closed. Corrective action may put back in light service.
0	Bridge closed. Replacement necessary.

EDIT CHECK

If Item 62 = 0 or 1 then Item 41 must = D, E or K.

If Item 43B is = 19 then Item 62 must be numeric.

If Item 62 is < = 3 then Item 70 must be < 5.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

A warning is issued if Item 70 = 5 and Item 62 = 0, 1, 2 or 3.

FEDERAL ITEM 63 – METHOD USED TO DETERMINE OPERATING RATING - X (1)

APPRAISAL - LOADRATING

ORTYPE

TABLE - BRIDGE

~~(SEE 'MISC' FOR HANDLING OF PIPES AND CULVERTS.)~~

Virginia Note: ~~This is an automatic entry controlled by State Item 48.~~

Use one of the codes below to indicate which load rating method was used to determine the Operating Rating coded in Federal Item 64 for this structure.

<u>Code</u>	<u>Description</u>
0	Field evaluation and documented engineering judgment
1	Load Factor (LF)
2	Allowable Stress (AS)
3	Load and Resistance Factor (LRFR)
4	Load Testing
5	No rating analysis or evaluation performed

** Please note that the FHWA has added 3 additional codes (6, 7, 8); however, these all are for reporting using a rating factor and VDOT's inventory program, Pontis 4.4.4 hotfix, is not able to accept these values (July 10, 2013).

FEDERAL ITEM 64 - OPERATING RATING - XXX (3)

APPRAISAL - LOADRATING

ORLOAD

TABLE - BRIDGE

This capacity rating, referred to as the operating, will result in the absolute maximum permissible load level to which the structure may be subjected for the vehicle type used in the rating. Code the operating rating as a 3-digit code.

~~(SEE 'MISC' FOR HANDLING OF PIPES AND CULVERTS.)~~

Virginia Note: The newest Federal coding guide uses the only MS loading to determine operating rating. This is the metric equivalent of the HS loading. We will continue to use the HS loading to determine the operating rating and will convert these electronically to the MS equivalent when providing our annual report to the federal government. Since only one vehicle is now allowed to determine the operating rating we will report the loading as before and use a leading 0 where the type of vehicle would normally be coded. It should be emphasized that for HS loading, the total weight in tons of the entire vehicle should be coded; that is HS20 shall be coded 036 even though the HS20 lane loading

controls and is used to determine the rating. Likewise HS10 shall be coded 018. The requirement of only using an equivalent HS loading was phased in over a 5-year period. Therefore, all National Bridge Inventory updates in 1993 were to report the operating and inventory ratings in an equivalent HS loading regardless of the loading used to calculate the ratings.

The AASHTO Manual for Condition Evaluation of Bridges provides a choice of load rating methods, such as the new load and resistance factor (LRFR) rating method, in addition to the traditional allowable stress (AS) and load factor (LF) methods. Of the three rating methods, the LF method is the most suitable for use as a national standard, therefore the FHWA has chosen the LF method as the standard for computing inventory and operating ratings reported to the NBI. The highway agencies may, however, elect to use LF, AS or LRFD to establish load limits for purposes of load posting.

If the bridge will not carry a minimum of 3 tons of live load, the operating rating shall be coded '000'; and consistent with the direction of the AASHTO Manual, it shall be closed.

The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, Items 64 and 66 should be coded as 000 even though the temporary structure is rated for as much as full legal load.

A bridge shored up or repaired on a temporary basis is considered a temporary bridge and the inventory and operating rating should be coded as if the temporary shoring were not in place. See Item 103 - Temporary Structure Designation for definition of a temporary bridge.

EXAMPLES:	<u>Code</u>
HS30	054
Temporary bridge	000
Shored-up bridge	003
Structure under sufficient fill that live load is insignificant * (according to AASHTO design)	099

NOTE: Load capacity without shoring.

Virginia Note: For steel pipes/culverts code method of analysis as 'L'.

See Virginia charts for pipes/culverts under fill.

* - Insignificant is defined as fill depths greater than 15 feet.

EDIT CHECK

If Item 41 = E or K then last two digits of Item 64 must = 00.

Last two digits of Item 66 must be <= Item 64.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and the first digit of Item 64 = 1 through 9 and the last two digits are < 20.

A warning is issued if Item 64A = 1 through 6 or 9 and Item 64B = 00 and Item 41 = D or E then Item 103 must = T.

FEDERAL ITEM 65 – METHOD USED TO DETERMINE INVENTORY RATING - X (1)

APPRAISAL - LOADRATING

IRTYPE

TABLE - BRIDGE

Virginia Note: ~~This is an automatic entry controlled by State Item 48.~~

Use one of the codes below to indicate which load rating method was used to determine the Inventory Rating coded in Federal Item 66 for this structure.

<u>Code</u>	<u>Description</u>
0	Field evaluation and documented engineering judgment
1	Load Factor (LF)
2	Allowable Stress (AS)
3	Load and Resistance Factor (LRFR)
4	Load Testing
5	No rating analysis or evaluation performed

** Please note that the FHWA has added 3 additional codes (6, 7, 8); however, these all are for reporting using a rating factor and VDOT's inventory program, Pontis 4.4.4 hotfix, is not able to accept these values (July 10, 2013).

FEDERAL ITEM 66 - INVENTORY RATING - XXX (3)

APPRAISAL - LOADRATING

IRLOAD

TABLE - BRIDGE

This capacity rating, for the vehicle type used in the rating, will result in a load level that can safely utilize an existing structure for an indefinite period of time. Only the HS loading shall be used to determine the inventory rating. Code the Inventory Rating as a 3-digit code. The statements and codes in Item 64 - Operating Rating apply to this item also.

EDIT CHECK

If Item 41 = E or K then last two digits of Item 66 must = 00.

Last two digits of Item 66 must be <= Item 64.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and the first digit of Item 66 = 1 through 9 and the last two digits are < 20.

APPRAISAL RATINGS

The items in the Appraisal section are used to evaluate a bridge in relation to the level of service that it provides on the highway system of which it is a part. The structure will be compared to a new one that is built to current standards for that particular type of road as further defined in this section except for Item 72 – Approach Roadway Alignment. See Item 72 for special criteria for that item.

Items 67, 68, 69, 71 and 72 will be coded with a 1-digit code that indicates the appraisal rating for that item. The ratings and codes are as follows:

<u>Code</u>	<u>Description</u>
N	Not Applicable
9	Superior to present desirable criteria
8	Equal present desirable criteria
7	Better than present desirable criteria
6	Equal to present desirable criteria
5	Somewhat better than minimum adequacy to tolerate being left in place as is
4	Meets minimum tolerable limits to be left in place as is
3	Basically intolerable requiring high priority of corrective action
2	Basically intolerable requiring high priority of replacement
1	This value of rating code not used
0	Bridge Closed

Tables are provided to evaluate items 67, 68, 69 and 71 and shall be used by all evaluators to code these items. They have been developed to closely match the descriptions for the appraisal evaluation codes of 0 to 9. The tables shall be used in all instances to evaluate the item based on the designated

data in the inventory, even if a table does not appear to match the descriptive codes. For unusual cases where the site data does not exactly agree with the table criteria, use the most appropriate table to evaluate the item. The code of 'N' is not valid for use with Items 67 and 72.

Complete bridges not yet open to traffic, if rated, shall be appraised as if open to traffic. Design values, for example ADT, shall be used for the evaluation. The data provided will include a code of G for Item 41 – Structure Open, Posted or Closed to Traffic.

FEDERAL ITEM 67 - STRUCTURAL EVALUATION - X (1) (CALCULATED)

APPRAISAL – OTHER RATINGS

STRRATING

TABLE - INSPEVNT

This item is calculated by the program and need not be coded by the bridge inspector.

The following specifications are used by the program:

For structures other than culverts, the lowest of the codes obtained from Item 59 - Superstructure, Item 60 - Substructure, or Table 1 is used.

For culverts, the lowest of the codes obtained from Item 62 - Culverts, or Table 1 should generally be used.

If Item 59, Item 60 or Item 62 is coded 1, then Item 67 is equal to zero (0), regardless of whether the structure is actually closed. However, if the structure is closed, it does not mean that this value is zero (0) unless the overall condition and appraisal ratings indicate that a code of 0 is appropriate.

Table 1. Rating by Comparison of ADT - Item 29
and Inventory Rating - Item 66

Structural Evaluation Rating Code	Inventory Rating		
	Average Daily Traffic (ADT)		
	0-500	501-5000	>5000
9	>236* (HS20)**	>236 (HS20)	>236 (HS20)
8	236 (HS20)	236 (HS20)	236 (HS20)
7	231 (HS17)	231 (HS17)	231 (HS17)
6	223 (HS13)	225 (HS14)	227 (HS15)
5	218 (HS10)	220 (HS11)	222 (HS12)
4	212 (HS7)	214 (HS8)	218 (HS10)
3	Inventory rating less than value in rating code of 4 and requiring corrective action.		
2	Inventory rating less than value in rating code of 4 and requiring replacement.		
0	Bridge Closed.		

* Coded HS rating load (typical)

** HS Designation (typical)

Table 1 Notes:

- 1 Use the lower rating code for values between those listed in the table.
- 2 The live load used in establishing the Inventory Rating shall be the HS loading.
- 3 To use Table 1, the Inventory Rating must be the coded HS rating or its equivalent. If the comparable HS equivalent is not calculated for the controlling rating, using a factor to determine the HS equivalent is acceptable even though converting other rating loads to an HS equivalent is not a constant.
- 4 All bridges with Item 26 - Functional Class coded Interstate, Freeway or Expressway shall be evaluated using the ADT column of >5000 regardless of the actual ADT on the bridge.

EDIT CHECK

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N. A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

FEDERAL ITEM 68 - DECK GEOMETRY - X (1) (CALCULATED)

APPRAISAL – OTHER RATINGS

DECKGEOM

TABLE - INSPEVNT

This item is calculated by the Program and need not be coded by the bridge inspector.

The overall rating for deck geometry includes two evaluations:

- The curb-to-curb or face-to-face of rail bridge width using Table 2A, B, C, or D and
- The minimum vertical clearance over the bridge roadway using Table 2E.

The lower of the codes obtained from these tables shall be used. When an individual table lists several deck geometry rating codes for the same roadway width under a specific ADT, use the lower code. (For example, Table 2A lists deck geometry rating codes 6, 7 and 8 for a 44-foot roadway width and an ADT of >5000. Use the code of 6.) For values between those listed in the tables, the lower code is used.

The curb-to-curb or face-to-face of rail dimension shall be taken from Item 51 - Bridge Roadway Width, Curb-to-Curb. Item 53 - Minimum Vertical Clearance Over Bridge Roadway shall be used to evaluate the vertical clearance.

The values provide in the tables are for rating purposes only. Current design standards must be used for structure design or rehabilitation.

Table 2A & 2B. Rating by Comparison of ADT - Item 29 and
Bridge Roadway Width, Curb-to-Curb - Item 51

Deck Geometry Rating Code	TABLE 2A Bridge Roadway Width 2 Lanes; 2 Way Traffic						TABLE 2B Bridge Roadway Width 1 Lane; 2-Way Traffic	
	ADT (Both Directions)						ADT (Both Directions)	
	0-100	101- 400	401- 1000	1001- 2000	2001- 5000	>5000	0-100	>100
9	>32	>36	>40	>44	>44	>44	-	-
8	32	36	40	44	44	44	15'-11"	-
7	28	32	36	40	44	44	15	-
6	24	28	30	34	40	44	14	-
5	20	24	26	28	34	38	13	-
4	18	20	22	24	28	32 (28*)	12	-
3	16	18	20	22	26	30 (26*)	11	15'-11"
2	Any width less than required for a code of 3 & structure open.							
0	Bridge closed.							

* Use value in parentheses for bridges longer than 200 feet.

Notes:

1. Use the lower rating code for values between those listed in the table.
2. Dimensions are in feet.
3. For 1 lane of one-way traffic Table 2A is used.
4. For 3 or more undivided lanes of 2-way traffic, use Table 2C, "Other Multilane Div. Facilities."
5. Do not use Table 2B for code 9 or codes 8 through 4 inclusive when ADT >100. Single lane bridges less than 16 feet wide carrying 2-way traffic are always appraised at 3 or below if they have ADT >100.
6. One-lane bridges 16 feet and greater in roadway width, which are not ramps, are evaluated as a 2-lane bridge using Table 2A.

Table 2C & 2D. Rating by Comparison of Number of Lanes - Item 28
and Bridge Roadway Width, Curb-to-Curb - Item 51

TABLE 2C					TABLE 2D	
Deck Geometry Rating Code	Bridge Roadway Width 2 or More Lanes Each Direction				Bridge Roadway Width 1-Way Traffic	
	Interstate and Other Divided Freeways		Other Multilane Divided Facilities		Ramps Only	
	2 Lanes	3 or more	2 Lanes	3 or more	1 Lane	2 or more
9	>42	>12N+24	>42	>12N+18	>26	>12N+12
8	42	12N+24	42	12N+18	26	12N+12
7	40	12N+20	38	12N+15	24	12N+10
6	38	12N+16	36	12N+12	22	12N+8
5	36	12N+14	33	11N+10	20	12N+6
4	34(29)*	11N+12 (11N+7)*	30	11N+6	18	12N+4
3	33(28)*	11N+11 (11N+6)*	27	11N+5	16	12N+2
2	Any width less than required for a code of 3 & structure open.					
0	Bridge closed.					

* Use value in parentheses for bridges longer than 200 feet.
N = number of lanes of traffic.

Notes

1. Use the lower rating code for values between those listed in the tables.
2. Dimensions in feet.
3. Use Table 2C, Other Multilane Divided Facilities, for 3 or more undivided lanes of 2-way traffic.

Table 2E. Rating by Comparison of Minimum Vertical Clearance over Bridge Roadway - Item 53 and Functional Classification - Item 26

Deck Geometry Rating Code	Minimum Vertical Clearance			
	Functional Class			
	Interstate and Other Freeway		Other Principal and Minor Arterials	Major and Minor Collectors and Locals
All Routes Except as noted for Urban Areas	Undesignated Routes, Urban Areas*			
9	>17'-0"	>16'-6"	>16'-6"	>16'-6"
8	17'-0"	16'-6"	16'-6"	16'-6"
7	16'-9"	15'-6"	15'-6"	15'-6"
6	16'-6"	14'-6"	14'-6"	14'-6"
5	15'-9"	14'-3"	14'-3"	14'-3"
4	15'-0"	14'-0"	14'-0"	14'-0"
3	Vertical clearance less than value in code 4 and requiring corrective action.			
2	Vertical clearance less than value in code 4 and requiring replacement.			
0	Bridge Closed			

* Use for routes in highly developed urban areas only when there is an alternative Interstate, freeway or expressway facility with a minimum of 16'- 0" clearance.

NOTES

1. Use the lower rating code for values between those listed in the table.
2. Dimensions are in feet.

EDIT CHECK

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N. A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

FEDERAL ITEM 69 - UNDERCLEARANCE, VERTICAL & HORIZONTAL - X (1) (CALCULATED)

APPRAISAL – OTHER RATINGS

UNDERCLR

TABLE - INSPEVNT

This item is calculated by the Program and need not be coded by the bridge inspector.

Vertical and horizontal underclearances are measured from the through roadway to the superstructure or substructure units, respectively. Code "N" is used unless the bridge is over a highway or railroad.

The vertical underclearance is evaluated using Table 3A. The horizontal underclearance is evaluated using Table 3B. The lower of the codes obtained from Table 3A and Table 3B is used by the Edit/Update Program.

Bridges seldom are closed due to deficient underclearances; however, these bridges may be good candidates for rehabilitation or replacement.

Item 54 - Minimum Vertical Underclearance, Item 55 - Minimum Lateral Underclearance on Right, and Item 56 - Minimum Lateral Underclearance on Left are used to evaluate this item.

The functional classification used in the table is for the underpassing route. Therefore, the functional classification is obtained from the record for the route "under" the bridge (see Item 5 - Inventory Route).

If the underpassing route is not on a Federal-aid system, is not a defense route, or is not otherwise important, an "under" record may not be available. If no "under" record exists, it is assumed that the route under the bridge is a major or minor collector or a local road for the purpose of using Tables 3A and 3B.

Table 3A. Rating by Comparison of Minimum Vertical Underclearance - Item 54 and Functional Classification of Underpassing Route

Underclearance Rating Code	Minimum Vertical Clearance				
	Functional Class				Railroad
	Interstate and Other Freeway		Other Principal and Minor Arterials	Major and Minor Collectors and Locals	
	All Routes Except as noted for Urban Areas	Undesignated Routes, Urban Areas			
9	>17'-0"	>16'-6"	>16'-6"	>16'-6"	>23'-0"
8	17'-0"	16'-6"	16'-6"	16'-6"	23'-0"
7	16'-9"	15'-6"	15'-6"	15'-6"	22'-6"
6	16'-6"	14'-6"	14'-6"	14'-6"	22'-0"
5	15'-9"	14'-3"	14'-3"	14'-3"	21'-0"
4	15'-0"	14'-0"	14'-0"	14'-0"	20'-0"
3	Vertical clearance less than value in code 4 and requiring corrective action.				
2	Vertical clearance less than value in code 4 and requiring replacement.				
0	Bridge Closed.				

* Use for routes in highly developed urban areas only when there is an alternative Interstate, freeway or expressway facility with a minimum of 16'- 0" clearance.

NOTES

1. Use the lower rating code for values between those listed in the table.
2. Dimensions are in feet.
3. The functional classification of the underpassing route shall be used in the evaluation. If an "under" record is not coded, the underpassing route shall be considered a major or minor collector or a local road.

Table 3B. Rating by Comparison of Minimum Lateral Underclearances Right & Left - Items 55 & 56 and Functional Classification of Underpassing Route

Under-clearance Rating Code	Minimum Lateral Underclearance						
	Functional Class						Railroad
	1 – Way Traffic				2 – Way Traffic		
	Principal Arterials Interstate, Freeways or Expressways				Other Principal and Minor Arterials	Major and Minor Collectors and Locals	
	Main Line		Ramp				
Left	Right	Left	Right				
9	>30	>30	>4	>10	>30	>12	>20
8	30	30	4	10	30	12	20
7	18	21	3	9	21	11	17
6	6	12	2	8	12	10	14
5	5	11	2	6	10	8	11
4	4	10	2	4	8	6	8
3	Vertical clearance less than value in code 4 and requiring corrective action.						
2	Vertical clearance less than value in code 4 and requiring replacement.						
0	Bridge Closed.						

NOTES

1. Use the lower rating code for values between those listed in the table.
2. Dimensions are in feet.
3. When acceleration or deceleration lanes or ramps are provided under 2-Way traffic, use the value from the right ramp column to determine code.
4. The functional classification of the underpassing route shall be used in the evaluation. If an "under" record is not coded, the underpassing route shall be considered a major or minor collector or a local road.

EDIT CHECK

If Item 69 is numeric then Item 42 must be 1, 2, 4, 6, 7 or 8.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

FEDERAL ITEM 70 - BRIDGE POSTING - X (1)

APPRAISAL – LOAD RATINGS

POSTING

TABLE - BRIDGE

The National Bridge Inspection Standards require the posting of load limits only if the maximum legal load configurations in the State exceed the load permitted under the operating rating. If the load capacity at the operating rating is such that posting is required, this item shall be coded 4 or less. If no posting is required at the operating rating, this item shall be coded 5.

This item evaluates the load capacity of a bridge in comparison to the State legal load. It differs from Item 67 - Structural Evaluation in that Item 67 uses Item 66 - Inventory Rating, while the bridge posting requirement is based on Item 64 - Operating Rating.

Although posting a bridge for load-carrying capacity is required only when the maximum legal load exceeds the operating rating, highway agencies may choose to post at a lower level. This posting practice may appear to produce conflicting coding when Item 41 - Structure Open, Posted or Closed to Traffic is coded to show the bridge as actually posted at the site and Item 70 - Bridge Posting is coded

as bridge posting is not required. Since different criteria are used for coding these 2 items, this coding is acceptable and correct when the highway agency elects to post at less than the operating rating. Item 70 shall be coded 4 or less only if the legal load of the State exceeds that permitted under the operating rating.

The use or presence of a temporary bridge affects the coding. The actual operating rating of the temporary bridge should be used to determine this item. However the highway agency may choose to post at a lower level. This also applies to bridges shored up or repaired on a temporary basis.

<u>Code</u>	<u>Description</u>
0, 1, 2, 3 or 4	Posting required
5	No posting required

The degree that the operating rating is less than the maximum legal load level may be used to differentiate between codes. As a guide and for coding purposes only, the following values may be used to code this item:

<u>Code</u>	<u>Relationship of Operating Stress to Legal Load Stress</u>
5	Equal to or above legal loads
4	0.1 - 9.9% below
3	10.0 - 19.9% below
2	20.0 - 29.9% below
1	30.0 - 39.9% below
0	> 39.9% below

Virginia Note: Virginia has elected to post its structures using the loads produced by the Virginia legal vehicles. These are the three axle - 27-ton vehicle and the 5 axle - 40-ton vehicle. Therefore, for Item 70, we must figure the capacity of the Virginia legal vehicles at the operating stress level and compare whether the structure would be posted at that level.

Example 1:

The 27-ton Virginia legal vehicle produces a capacity of 23 tons at the operating stress level. Since this Virginia legal vehicle is a 27-ton vehicle, we compare the 23-ton capacity at the operating stress level to the 27-ton vehicle, the difference is 4 tons. $4/27 = .148$ which is 14.8%, then Item 70 would be coded a 3, since a code of 3 is from 10.0 - 19.9% below legal loads.

Example 2:

The 27-ton Virginia legal vehicle produces a capacity of 28 tons at operating stress level. Since this Virginia legal vehicle is a 27 ton vehicle, we compare the 28 ton capacity at the operating stress level to the 27 ton vehicle, the capacity is above the legal load of 27 tons, then Item 70 would be coded a 5, since a code of 5 is for capacities at the operating stress level equal to or above legal loads.

NOTE: The structure used in Example 2 may be posted since Virginia figures the posting capacity at a stress level below operating stress level for other than concrete spans. The posting capacity (whatever the posting level) that Virginia uses is not considered in the coding of Item 70. Therefore, the structure used in Example 2 would still have a coding of 5 for Item 70. In the examples only the 27-ton vehicle was cited, it could be that the 40-ton vehicle would be below legal limit even though the 27-ton vehicle was above legal limit. Therefore, both vehicles must be checked.

EDIT CHECK

If Item 70 is coded < 5 then one of items 58 - 62 must be coded 3 or less. However, keep in mind that this item uses OPERATING stress to determine posting. That means that some structures may be posted and yet be coded 5 (since we use a stress less than operating to determine posting). A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N. A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded ≥ 2 and Item 42 is NOT = to D, E or K. A warning is issued if Item 70 = 5 and Item 59 = 0, 1, 2 or 3. A warning is issued if Item 70 = 5 and Item 60 = 0, 1, 2 or 3. A warning is issued if Item 70 = 5 and Item 62 = 0, 1, 2 or 3.

FEDERAL ITEM 71 - WATERWAY ADEQUACY - X (1)

CONDITION

WATERADEQ

TABLE - INSPEVNT

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

Where overtopping frequency information is available, the descriptions give in the table for chance of overtopping mean 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 delay mean the following:

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

Functional Classification			Description
Principal Arterials Interstates, Freeways, or Expressways	Other Principal and Minor Arterials and Major Collector	Minor Collector s Local	
Code			
N	N	N	Bridge not over a waterway.
9	9	9	Bridge deck and roadway approaches above floodwater elevations (high water). Chance of overtopping is remote.
8	8	8	Bridge deck above roadway approaches. Slight chance of overtopping roadway approaches.
6	6	7	Slight chance of overtopping bridge deck and roadway approaches.
4	5	6	Bridge deck above roadway approaches. Occasional overtopping of roadway approaches with insignificant traffic delays.
3	4	5	Bridge deck above roadway approaches. Occasional overtopping of roadway approaches with significant traffic delays.
2	3	4	Occasional overtopping of bridge deck and roadway approaches with significant traffic delays.
2	2	3	Frequent overtopping of bridge deck and roadway approaches with significant traffic delays.
2	2	2	Occasional or frequent overtopping of bridge deck and roadway approaches with severe traffic delays.
0	0	0	Bridge closed.

EDIT CHECK

If Item 71 is numeric then Item 42 must be 5, 6, 7, 8, 9 or 0.

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

FEDERAL ITEM 72 - APPROACH ROADWAY ALIGNMENT - X (1)

APPRAISAL – OTHER RATINGS

APPRALIGN

TABLE - INSPEVNT

Code the rating based on the adequacy of the approach roadway alignment. This item identifies those bridges that do not function properly or adequately due to the alignment of the approaches. It is not intended that the approach roadway alignment be compared to current standards but rather to the existing highway alignment. This concept differs from other appraisal evaluations. The establishment of set criteria to be used at all bridge sites is not appropriate for this item. The basic criteria is how the alignment of the roadway approaches to the bridge relate to the general highway alignment for the section of highway the bridge is on.

The individual structure shall be rated in accordance with the general appraisal rating guide in lieu of specific design values. Approach roadway alignment will be rated intolerable (a code of 3 or less) only if the horizontal or vertical curvature requires a substantial reduction in the vehicle operating speed from that on the highway section. A very minor speed reduction will be rated a 6, and when a speed reduction is not required, the appraisal code will be an 8. Additional codes may be selected between these general values.

For examples, if the highway section requires a substantial speed reduction due to vertical or horizontal alignment, and the roadway approach to the bridge requires only a very minor additional speed reduction at the bridge, the appropriate code would be a 6. This concept shall be used at each bridge site.

Speed reductions necessary because of structure width and not alignment shall not be considered in evaluating this item.

EDIT CHECK

A review flag occurs if Item 27 is younger than 4 years old or equal to current year and any one Item 58 through Item 62 or any one Item 67 through Item 72 is < 5 and not N.

A warning is issued if any one of Items 41, 58, 59, 60, 62, 67, 68, 69, 70 or 72 is coded 0 and all others are coded >= 2 and Item 42 is NOT = to D, E or K.

FEDERAL ITEM 75 - TYPE OF WORK - XXX (3)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

PROPWORK

WORKBY

TABLE - BRIDGE

The information to be recorded for this item will be the type of work proposed to be accomplished on the structure to improve it to the point that it will provide the type of service needed and whether the proposed work is to be done by contract or force account. Code a 3-digit number composed of 2 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
75A	Type of Work Proposed	2 digit
75B	Work Done by	1 digit

This item 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. This item may be coded for other bridges at the option of the highway agency. Use one of the following codes to represent the proposed work type, otherwise leave blank:

<u>Code</u>	<u>Description</u>
31	Replacement of bridge or other structure because of substandard load carrying capacity or substandard bridge roadway geometry.
32	Replacement of bridge or other structure because of relocation of road.
33	Widening of existing bridge or other major structure without deck rehabilitation or replacement; includes culvert lengthening.
34	Widening of existing bridge with deck rehabilitation or replacement.
35	Bridge rehabilitation because of general structure deterioration or inadequate strength.
36	Bridge deck rehabilitation with only incidental widening.
37	Bridge deck replacement with only incidental widening.
38	Other structural work, including hydraulic replacements.

If segment A is blank, leave segment B blank. Otherwise, the third digit shall be coded using one of the following codes to indicate whether the proposed work is to be done by contract or by force account:

<u>Code</u>	<u>Description</u>
1	Work to be done by contract
2	Work to be done by owner's forces

EXAMPLES:

<u>Code</u>	<u>Description</u>
311	A bridge is to be replaced by contract because it has deteriorated to the point that it can no longer carry legal loads. The same code should be used if the bridge is replaced because it is now too narrow or the original design was too light to accommodate today's legal loads.
321	A bridge is to be replaced because the roadway must be straightened to eliminate a dangerous curve. The work will be done by contract.
331	A bridge is to be widened to increase shoulder width or the number of traffic lanes. Existing deck is in good condition and will be incorporated as is into the new structure. The work is to be done by contract.
331	A culvert is to be extended by contract to accommodate additional roadway width as part of a reconstruction contract to improve the safety of the adjacent slopes.
341	A deck is to be rehabilitated and the bridge widened to provide a full 12-foot shoulder. The existing shoulder is only 7.87 inches wide and an extra line of girders with appropriate substructure widening must be added. The work will be done by contract.
352	A bridge superstructure and substructure are to be rehabilitated by State forces to increase the bridge's load capacity.
361	A bridge deck is to be rehabilitated by contract and a safety curb to be removed which results in incidental widening of 2 feet.
371	A bridge deck is to be replaced by contract and the deck cantilever overhang extended 2 feet, which is the maximum that can be done without adding another line of stringers or girders to the superstructure.
382	A bridge that is no longer needed is to be demolished and an at-grade crossing built by State forces. (This code could also be used to designate incidental safety work on a bridge such as bridge-rail upgrading or replacement.)

EDIT CHECK

If Item 75A is > 00 then Item 96 must be > 00000.

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

FEDERAL ITEM 76 - LENGTH OF STRUCTURE IMPROVEMENT - XXXXXX (6)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

IMPLEN

TABLE - BRIDGE

Code a 6-digit number that represents the length of the proposed bridge improvement to the nearest foot. For replacement or rehabilitation of the entire bridge, the length should be back to back of backwalls of abutments or from pavement notch to pavement notch. For replacement or rehabilitation of only part of the structure, use the length of the portion to be improved.

This item must be coded for bridges eligible for the Highway Bridge Replacement And Rehabilitation Program. It may be coded for other bridges at the option of the highway agency.

For culvert improvements, use the proposed length measured along the centerline of the barrel regardless of the depth below grade. The measurement should be made between the inside faces of the top parapet or edge-stiffening beam of the top slab.

EXAMPLES:		
Length of Structure Improvement	250 feet	<u>Code</u> 000250
	1,200 feet	001200
	12,345 feet	012345

For substructure or channel work only, code the length of superstructure over or supported by, the substructure or channel.

Typically, a replacement bridge is longer than the existing bridge. Nationwide averages for the increase in bridge length with replacement as a function of the existing length are given in the following figures. The length-expansion factors represent data for the years 1981 to 1985. Where site-specific data is lacking, these factors are suggested for estimating the length of replacement bridges. For exceedingly long bridges (i.e., 1000 feet or more) the length-expansion factor approaches 1.0.

(For a detail example of Item 75 refer to the Federal Coding Guide)

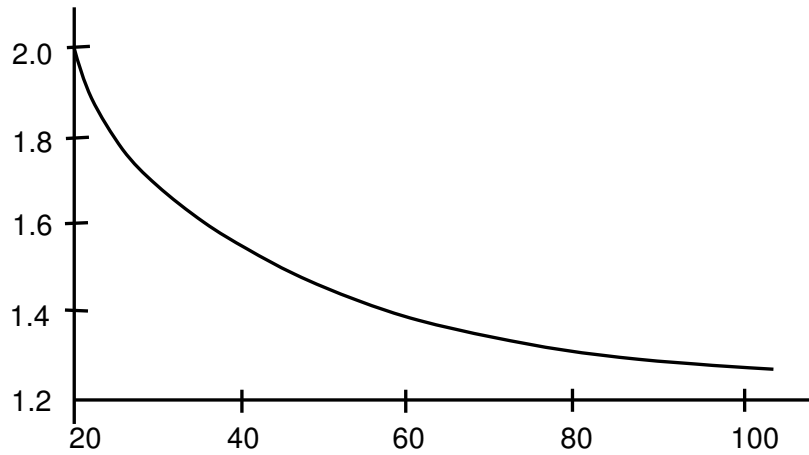
EDIT CHECK

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

INCREASED LENGTH OF REPLACEMENT BRIDGES

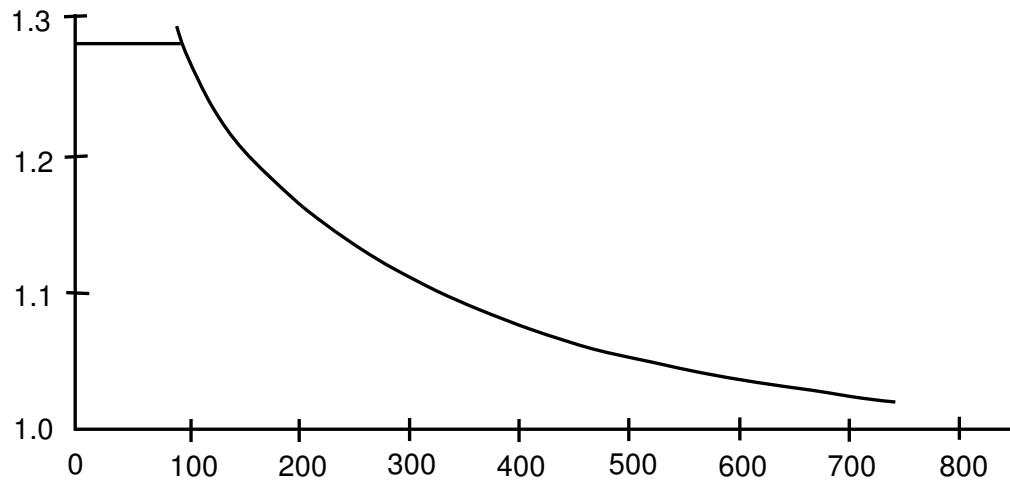
X = EXISTING BRIDGE LENGTH
Y = LENGTH EXPANSION FACTOR

LENGTH EXPANSION FACTOR



EXISTING BRIDGE LENGTH (FEET)

LENGTH EXPANSION FACTOR



EXISTING BRIDGE LENGTH (FEET)

REPLACEMENT BRIDGE LENGTH = EXISTING BRIDGE LENGTH X LENGTH EXPANSION FACTOR

FEDERAL ITEM 90 - INSPECTION DATE - AUTOMATIC ENTRY (8)

SCHEDULE

INSPDATE

TABLE - INSPEVNT

Record the month and year that the last routine inspection of the structure was performed (note that this is the way the Feds want us to report this data, it is NOT the way we collect our data). This inspection date may be different from those recorded in Item 93 - Critical Feature Inspection Date. Code a 4-digit number to represent the month and year. The number of the month should be coded in the first 2 digits with leading zeros as required and the last 2 digits of the year coded as the third and fourth digits of the field.

EXAMPLE:		<u>Code</u>
Inspection date November 1986		1186
March 1987		0387

EDIT CHECK

A warning is issued if Item 90 is older than the current date less 36 months.

FEDERAL ITEM 91 - DESIGNATED INSPECTION FREQUENCY - XX (2)

SCHEDULE

BRINSPFREQ

TABLE - INSPEVNT

Code 2 digits to represent the number of months between designated inspections of the structure. Leading zeros shall be coded. The individual in charge of the inspection program is responsible for determining the inspection interval. For posted, understrength bridges, this interval should be substantially less than the 24-month standard. The designated inspection interval could vary from inspection to inspection depending on the condition of the bridge at the time of inspection.

EXAMPLES:

<u>Code</u>	
01	Posted bridge with heavy truck traffic and questionable structural details which is designated to be inspected each month
24	Bridge is scheduled to be inspected every 24 months

Only the following frequencies are allowed: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 24, 48 and 60.

It should be noted that bridges require special non-scheduled inspections after unusual physical traumas such as floods, earthquakes, fires or collisions. These special inspections may range from a very brief visual examination to a detailed in-depth evaluation depending upon the nature of the trauma. For example, when an errant vehicle strikes a substructure unit (pier or abutment), in most cases only a visual examination of the bridge is necessary. After major collisions or earthquakes, in-depth inspections may be warranted as directed by the engineer in overall charge of the program. After and during severe floods, the stability of the substructure of bridges may have to be determined by probing, underwater sensors or other appropriate measures. Underwater inspection by divers may be required for some scour critical bridges immediately after floods. See Item 113 - Scour Critical Bridges.

EDIT CHECK

Item 91 must be between 00 and 48 inclusive.

A warning is issued if Item 91 is > 24 months.

A warning is issued if Item 41 = B, D, E, P, or R and Item 91 is not less than 24.

FEDERAL ITEM 92 - CRITICAL FEATURE INSPECTION - XXX (3)

SCHEDULE

FCINSPFREQ
FCINSPREQ
UWINSPFREQ
UWINSPREQ
OSINSPFREQ
OSINSPREQ
TABLE - INSPEVNT

Virginia Note: The inspection interval for 92C – Other Special Inspections may be as great as 60 months.

Using a series of 3-digits segments, denote critical features that need special inspection or special emphasis during inspections and the designated in inspection interval in months as determined by the individual in charge of the inspection program. The designated inspection interval could vary from inspection to inspection depending on the condition of the bridge at the time of inspection.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
92A	Fracture Critical Details	3 digits
92B	Underwater Inspection	3 digits
92C	Other Special Inspection	3 digits

For each of 92A, B, and C, code the first digit Y for special inspection or emphasis needed and code N for not needed. The first digit of 92 A, B, and C must be coded for all structures to designated either a yes or no answer. Those bridges coded with a Y in Item 92A or B should be the same bridges contained in the Master Lists of fracture critical and special underwater inspection bridges. In the second and third digits of each segment, code a 2-digit number to indicate the number of months between inspections only if the first digit is coded Y. If the first digit is code N, the second and third digits are left blank.

EXAMPLES:

A structure with a 2-girder system being inspected yearly and no other special inspections are required.	<u>Item</u>	<u>Code</u>
	92A	Y12
	92B	N
A structure where both fracture critical and an underwater inspection are being performed on a 1-year interval. Other special inspections are not required.	92C	N
	92A	Y12
	92B	Y12
A structure has been temporarily shored and is being inspected on a 6-month interval. Other special inspections are not required.	92C	N
	92A	N
	92B	N
	92C	Y06

EDIT CHECK

If Item 92 A, B or C = Y then Item 91 must be < 25.

A warning is issued if the first digit of Item 92A = Y and Item 93A is older than the current date minus the last two digits of Item 92A in months.

A warning is issued if the first digit of Item 92B = Y and Item 93B is older than the current date minus the last two digits of Item 92B in months.

A warning is issued if the first digit of Item 92C = Y and Item 93C is older than the current date minus the last two digits of Item 92C in months.

FEDERAL ITEM 93 - CRITICAL FEATURE INSPECTION DATE - XXXXXXXXXXXX (12)

SCHEDULE

FCLASTINSP

UWLASTINSP

OSLASTINSP

TABLE - INSPEVNT

Code only if the first digit of Item 92A, 92B or 92C is coded Y for yes. Record as a series of 4-digit code segments, the month and year that the last inspection of the denoted critical feature was performed.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
93A	Fracture Critical Details	4 digits
93B	Underwater Inspection	4 digits
93C	Other Special Inspection	4 digits

For each segment of this item, when applicable, code a 4-digit number to represent the month and year. The number of the month should be coded in the first 2 digits with leading zeros as required and the last 2 digits of the year coded as the third and fourth digits of the field. If the first digit of any part of Item 92 is coded N, then the corresponding part of this item shall be blank.

EXAMPLES:

A structure has fracture critical members that were last inspected in March 1986. It does not require underwater or other special feature inspections.	<u>Item</u>	<u>Code</u>
	93A	0386
	93B	(blank)
	93C	(blank)

A structure has no fracture critical details, but requires underwater inspection and has other special features (for example, a temporary support) for which the State requires special inspection. The last underwater inspection was done in April 1986 and the last special feature inspection was done in November 1985.	93A	(blank)
	93B	0486
	93C	1185

EDIT CHECK

A warning is issued if the first digit of Item 92A = Y and Item 93A is older than the current date minus the last two digits of Item 92A in months.

A warning is issued if the first digit of Item 92B = Y and Item 93B is older than the current date minus the last two digits of Item 92B in months.

A warning is issued if the first digit of Item 92C = Y and Item 93C is older than the current date minus the last two digits of Item 92C in months.

FEDERAL ITEM 93 (SUPPLEMENTAL) - CRITICAL FEATURE INSPECTOR'S CODE - XXX (3)

THIS HAS BEEN REPLACED BY THE WAY EACH INSPECTION IS ASSOCIATED WITH THE INSPECTOR SHOWN ON THE 'SCHEDULE' SCREEN

This is the number of the person, county, city or agency performing the Critical Feature Inspection for this structure. For State Inspectors, this will be the code for the team leader. This is a user-defined table and will be maintained by Central Office.

FEDERAL ITEM 93 (SUPPLEMENTAL) - CRITICAL FEATURE INSPECT - NEXT XXXXXXXX (8)

THIS HAS BEEN REPLACED BY 'NEXT DATE' ON THE 'SCHEDULE' SCREEN

This is the date that will be calculated by a program at the time of changes to the inspection data. The value is determined by adding the frequency to the actual inspection date or by adding the frequency to the last scheduled date. Format is MM/DD/YYYY.

FEDERAL ITEM 94 - BRIDGE IMPROVEMENT COST – XXXXXX (6)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

NBIIMPCOST

TABLE - BRIDGE

Code a 6-digit number to represent the cost of the proposed bridge or major structure improvements in thousands of dollars. This cost shall include only bridge construction costs, excluding roadway, right of way, detour, demolitions, preliminary engineering, etc. Code the base year for the cost in Item 97 - Year of Improvement Cost Estimate. Do not use this item for estimating maintenance costs.

This item must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. It may be coded for other bridges at the option of the highway agency.

EXAMPLES:

		<u>Code</u>
Bridge Improvement Cost	\$55,850	000056
	250,000	000250
	7,451,233	007451

Nationally, the deck area of replaced bridges is averaging 2.2 times the deck area before replacement. The deck area of rehabilitated bridges is averaging 1.5 times the deck area before rehabilitation. Widening square foot costs are typically 1.8 times the square foot cost of new bridges with similar spans. For example, if the average cost of a new bridge were \$50 per square foot, the average cost of the widening area would be \$90 per square foot.

Each highway agency is encouraged to use it best available information and established procedures to determine bridge improvement costs. In the absence of these procedures, the highway agency may wish to use the following procedure as a guide in preparing bridge improvement cost estimates.

Apply a construction unit cost to the proposed bridge area developed by using (1) current State deck geometry design standards and (2) proposed bridge length from Item 76 - Length of Structure Improvement.

EDIT CHECK

Item 96 must be > the sum of Item 94 and Item 95.

If Item 97 is not blank then Items 94, 95 and 96 cannot be blank.

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

FEDERAL ITEM 95 - ROADWAY IMPROVEMENT COST – XXXXXX (6)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

NBIRWPCOST

TABLE - BRIDGE

Code a 6-digit number to represent the cost of the proposed roadway improvement in thousands of dollars. This shall include only roadway construction costs, excluding bridge, right-of way, detours, extensive roadway realignment costs, preliminary engineering, etc. Code the base year for the cost in Item 97 - Year of Improvement Cost Estimate. Do not use this item for estimating maintenance costs.

This item must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. It may be coded for other bridges at the option of the highway agency.

In the absence of a procedure for estimating roadway improvement costs, a guide of 10 percent of the bridge costs is suggested.

EDIT CHECK

Item 96 must be > the sum of Item 94 and Item 95.

If Item 97 is not blank then Items 94, 95 and 96 cannot be blank.

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

FEDERAL ITEM 96 - TOTAL PROJECT COST – XXXXXX (6)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

NBITOTPCOST

TABLE - BRIDGE

Code a 6-digit number to represent the total project cost in thousands of dollars, including incidental costs not included in Items 94 and 95. This item should include all costs normally associated with the proposed bridge improvement project. The Total Project Cost will therefore usually be greater than the sum of Items 94 and 95. Code the base year for the cost in Item 97 - Year of Improvement Cost Estimate. Do not use this item for coding maintenance costs.

This item must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. It may be coded for other bridges at the option of the highway agency.

In the absence of a procedure for estimating the total project cost, a guide of 150 percent of the bridge cost is suggested.

EDIT CHECK

If Item 75A is > 00 then Item 96 must be > 00000.

Item 96 must be > the sum of Item 94 and Item 95.

If Item 97 is not blank then Items 94, 95 and 96 cannot be blank.

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

FEDERAL ITEM 97 - YEAR OF IMPROVEMENT COST ESTIMATE – XXXX (4)

IN THE UPPER LEFT BESIDE 'INVENTORY' USE THE DROP DOWN AND SELECT 'PROJECT PLAN'

CLICK THE RADIO BUTTON FOR 'BRIDGES'

CLICK ON THE RADIO BUTTON FOR 'BRIDGES'

SELECT A STRUCTURE BY SINGLE CLICKING ON THE STRUCTURE

ON THE LEFT CLICK ON 'NBI PROJECT INFO'

THIS ITEM WILL SHOW IN A POP-UP WINDOW

NBIYRCOST

TABLE - BRIDGE

Record and code the year that the costs of work estimated in Item 94 - Bridge Improvement Cost, Item 95 - Roadway Improvement Cost, and Item 96 - Total Project Cost were based upon. This date and the data provided for Item 94 through Item 96 must be current; that is, Item 97 shall be no more than 8 years old.

EXAMPLES:		<u>Code</u>
Year of Cost Estimate	1994 costs	1994
	2000 costs	2000

EDIT CHECK

Item 97 must be no more than eight years old.

If Item 97 is not blank then Items 94, 95 and 96 cannot be blank.

If the bridge is structurally deficient and/or functionally obsolete (see appendix for definitions) and the sufficiency rating is < 80 and Item 5A = 1 then the structure is eligible for HBRRP funds and Items 75, 76, 94, 95, 96 and 97 must be numeric and > 0.

FEDERAL ITEM 98 - BORDER BRIDGE - XXX XX (5)

INVENTORY – ID/ADMIN

NSTATECODE

BB_PCT

TABLE - BRIDGE

Use this item to indicate structures crossing borders of States. Code a 5-digit number composed of 2 segments specifying the percent responsibility for improvements to the existing structure when it is on a border with a neighboring State. Code the first 3 digits with the neighboring State code using State codes listed in Item 1 - State Code. Code the fourth and fifth digits with the percentage of total deck area of the existing bridge that the neighboring State is responsible for funding.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
98A	Neighboring State Code	3 digits
98B	Percent Responsibility	2 digits

If a neighboring State codes the structure and accepts 100% of the responsibility, but your State still codes a record for the structure, then Item 98B in your State's record should be coded 99 to represent that your State has no responsibility for the structure.

For the special case of a structure on the border with Canada or Mexico, code the State code value = CAN or MEX respectively. If structure is not on a border, leave blank.

EXAMPLES:

<u>Code</u>	<u>Description</u>
34245	A structure connects your State with New Jersey and New Jersey is responsible for funding 45 percent of future improvement costs.
MEX00	A structure connects your State with Mexico and Mexico is not responsible for any funding of future improvement costs.

FEDERAL ITEM 99 - BORDER BRIDGE STRUCTURE NUMBER - XXXXXXXXXXXXXXXX (15)

INVENTORY – ID/ADMIN

BB_BRIDGEID

TABLE - BRIDGE

Code the neighboring State's 15 digit National Bridge Inventory structure number for any structure noted in Item 98 - Border Bridge. This number must match exactly the neighboring State's submitted NBI structure number. The entire 15-digit field must be accounted for including zeros and blank spaces whether they are leading, trailing, or embedded in the 15-digit field. If Item 98 is blank, this item is blank.

In the above example where Mexico (or a neighboring State) has 00% responsibility, and, if there is no NBI Structure Number in that State's inventory file, then the entire 15-digit field shall be coded zeroes.

FEDERAL ITEM 100 - STRAHNET HIGHWAY DESIGNATION – X (1)

INVENTORY – ROADS

DEFHWY

TABLE - ROADWAY

This item shall be coded for all records in the inventory. For the purposes of this item, STRAHNET Connectors are considered included in the term STRAHNET. For the inventory route identified in Item 5, indicate STRAHNET highway conditions using one of the following codes:

<u>Codes</u>	<u>Description</u>
0	The inventory route is not a STRAHNET route.
1	The inventory route is on a STRAHNET route.
2	The inventory route is on a Non-Interstate STRAHNET route.
3	The inventory route is on a STRAHNET connector route.

EDIT CHECK

If Item 100 = 1 or 2 then Item 47 must be > 000

If Item 100 equals 1 or 2 then Item 16 must be > 00000.

If Item 100 equals 1 or 2 then Item 17 must be > 00000.

FEDERAL ITEM 101 - PARALLEL STRUCTURE DESIGNATION – X (1)

INVENTORY – CLASSIFICATION

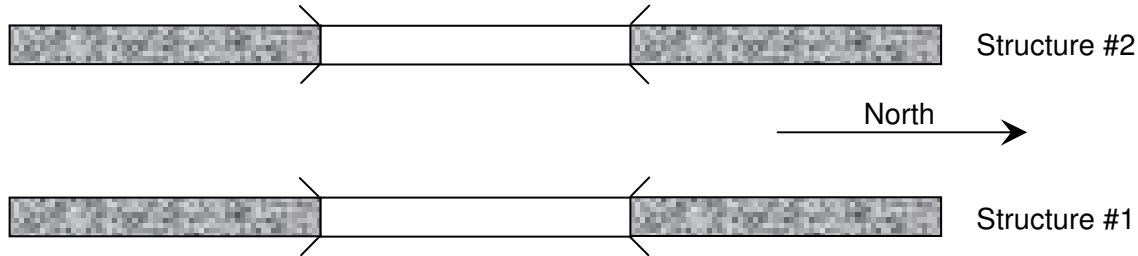
PARALSTRUC

TABLE - BRIDGE

Code this item to indicate situations where separate structures carry the inventory route in opposite directions of travel over the same features. The lateral distance between structures has no bearing on the coding of this item.

One of the following codes shall be used:

<u>Code</u>	<u>Description</u>
EBL	The right structure of parallel bridges carrying the roadway in the direction of the inventory. (For a STRAHNET highway, this is west to east and south to north.)
NBL	
WBL	The left structure of parallel bridges. This structure carries traffic in the opposite direction.
SBL	
N	No parallel structure.
EXAMPLE:	<u>Code</u>
Structure #1	R
Structure #2	L



FEDERAL ITEM 102 - DIRECTION OF TRAFFIC – X (1)

INVENTORY – ROADS

TRAFFICDIR

TABLE - ROADWAY

Code the direction of traffic of the inventory route identified in Item 5 as a 1-digit number using one of the codes below. This item must be compatible with other traffic-related items such as Item 28A Lanes on the Structure, Item 29 - Average Daily Traffic, Item 47 - Total Horizontal Clearance and Item 51 - Bridge Roadway Width, Curb-to-Curb.

<u>Code</u>	<u>Description</u>
0	Highway traffic not carried
1	1-way traffic
2	2-way traffic
3	One lane bridge for 2-way traffic

EDIT CHECK

If this Item 28A is = 01 then Item 102 must = 1 or 3.

FEDERAL ITEM 103 - TEMPORARY STRUCTURE DESIGNATION – X (1)

INVENTORY – CLASSIFICATION

TEMPSTRUC

TABLE - BRIDGE

Code this item to indicate situations where temporary structures or conditions exist. This item should be blank if not applicable.

<u>Code</u>	<u>Description</u>
T	Temporary structure(s) or conditions exist.

Temporary structure(s) or conditions are those that are required to facilitate traffic flow. This may occur either before or during the modification or replacement of a structure found to be deficient. Such conditions include the following:

1. Bridges shored up, including additional temporary supports.
2. Temporary repairs made to keep a bridge open.
3. Temporary structures, temporary runarounds or bypasses.
4. Other temporary measures, such as barricaded traffic lanes to keep the bridge open.

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

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

<u>Item</u>	<u>Description</u>
10	Inventory Route, Minimum Vertical Clearance
41	Structure Open, Posted, or Closed Traffic
47	Inventory Route, Total Horizontal Clearance
53	Minimum Vertical Clearance Over Bridge Roadway
54	Minimum Vertical Underclearance
55	Minimum Lateral Underclearance on Right
56	Minimum Lateral Underclearance on Left
70	Bridge Posting

EDIT CHECK

If Item 103 = T then Item 41 must = D, E or P.

A warning is issued if Item 64A = 1 through 6 or 9 and Item 64B = 00 and Item 41 = D or E then Item 103 must = T.

FEDERAL ITEM 104 - HIGHWAY SYSTEM OF THE INVENTORY ROUTE – X (1)

INVENTORY – ROADS

NHS_IND

TABLE - ROADWAY

Virginia Note: THIS DOES NOT DENOTE FEDERAL AID AND NON-FEDERAL AID ROUTES.

This item is to be coded for all records in the inventory. For the inventory route identified in Item 5, indicate whether the inventory route is on the National Highway System (NHS) or not on that system. Initially, this code shall reflect an inventory route on the NHS "Interim System" description in Section 1006(a) of the 1991 ISTEA. Upon approval of the NHS by Congress, the coding is to reflect the approved NHS. Use one of the following codes:

<u>Code</u>	<u>Description</u>
0	Inventory Route <u>is not</u> on the NHS
1	Inventory Route <u>is</u> on the NHS

EDIT CHECK

If Item 26 = 1 or 11 then Item 5B must = 1 and Item 104 must = 1.

Item 5B must not equal 1 if Item 104 does not equal 1.

ALSO:

<u>If Item 104 is:</u>	<u>Item 26 must be:</u>
1	01, 02, 11, 12 or 14
0	06, 07, 08, 09, 16, 17 or 19

FEDERAL ITEM 105 – FEDERAL LANDS HIGHWAY – X (1)

INVENTORY – ROADS

FEDLANDHWY

TABLE - ROADWAY

Structures owned by State and local jurisdictions on roads that lead to and traverse through federal lands sometimes require special coded unique identification because they are eligible to receive funding from the Federal Lands Highway Program. One of the following codes shall be used:

<u>Code</u>	<u>Description</u>
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

FEDERAL ITEM 106 - YEAR RECONSTRUCTED – XXXX (4)

INVENTORY – ID/ADMIN

YEARRECON

TABLE - BRIDGE

Record and code the year of the most recent reconstruction of the structure. Code all 4 digits of the latest year in which reconstruction of the structure was completed. If there has been no reconstruction code 0000.

For a bridge to be defined as reconstructed, 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 reconstruction 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 that 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).

<u>EXAMPLE:</u>	<u>Code</u>
Reconstruction completed 1970	1970

EDIT CHECK

If Item 106 > 0 then Item 106 must be > Item 27.
A warning is issued if Item 106 is not = 19 or 20.

FEDERAL ITEM 107 - DECK STRUCTURE TYPE – X (1)

INVENTORY – DESIGN

DKDTRUCTYP

TABLE - BRIDGE

Record the type of deck system on the bridge. If more than one type of deck system is on the bridge, code the most predominate. Code N for a filled culvert or arch with the approach roadway section carried across the structure. Use one of the following codes:

Virginia Note: Where prestressed box beams have a no overlay or a non-rigid overlay such as asphalt code this item 9 - Other.

<u>Code</u>	<u>Description</u>
1	Concrete Cast-in-Place
2	Concrete Pre-cast Panels
3	Open Grating
4	Close Grating
5	Steel Plate (includes orthotropic)
6	Corrugated Steel
7	Aluminum
8	Wood or Timber
9	Other (FRP, etc.
N	Not Applicable

FEDERAL ITEM 108 - WEARING SURFACE/PROTECTIVE SYSTEM – X (1)

INVENTORY – DESIGN

DKSURFTYPE

DKMEMBTYPE

DKPROTECT

TABLE - BRIDGE

Information on the wearing surface and protective system of the bridge deck shall be coded using a 3-digit code composed of 3 segments.

<u>Segment</u>	<u>Description</u>	<u>Length</u>
108A	Type of Wearing Surface	1 digit
108B	Type of Membrane	1 digit
108C	Deck Protection	1 digit

1st Digit - Type of Wearing Surface (Item 108A):

<u>Code</u>	<u>Description</u>
1	Monolithic Concrete - (concurrently placed with structural deck)
2	Integral Concrete - (separate non-modified layer of concrete added to structural deck) Virginia Note: Not latex modified, low slump, etc.
3	Latex Concrete or similar additive
4	Low Slump Concrete
5	Epoxy Overlay
6	Bituminous (Asphalt/Surface Treatment)
7	Wood or Timber
8	Gravel
9	Other
0	None (no additional concrete thickness or wearing surface included in bridge deck)
N	Not Applicable (applies only to structures with no deck)

2nd Digit - Type of Membrane (Item 108B)

<u>Code</u>	<u>Description</u>
1	Built-up
2	Preformed Fabric
3	Epoxy
8	Unknown
9	Other
0	None
N	Not Applicable (applies only to structures with no deck)

3rd Digit - Deck Protection (Item 108C):

<u>Code</u>	<u>Description</u>
1	Epoxy Coated Reinforcing
2	Galvanized Reinforcing
3	Other Coated Reinforcing
4	Cathodic Protection
6	Polymer Impregnated
7	Internally Sealed
8	Unknown
9	Other
0	None
N	Not Applicable (applies only to structure with no deck)

Virginia Note: For something to be called a wearing surface, it must be placed separately from the time the deck is placed. This is the first and most important test. Therefore, monolithically place concrete (the 1/2" that designers call a wearing surface) is not a wearing surface. The following are wearing surfaces: asphaltic concrete overlays, latex overlays, epoxy overlays or overlays of A-4 concretes. There are others not mentioned.

Now for some exceptions, remember, for something to be called a wearing surface, it must be placed separately from the time the deck is placed. However, if an application is placed separately from the time the deck is placed and if the designer and the analyzer consider it in the capacity of the structure, it will not be considered an overlay. Therefore, reinforced A-4 overlays (the concrete placed over prestressed deck panels, etc.) are not wearing surfaces. They are part of the deck. While this is in conflict with some of the wording of Manual 90, I believe the above definitions best suit Virginia's need for this information and will reduce or eliminate coding disparities. Mr. Claude Napier of the FHWA approves of this definition.

FEDERAL ITEM 109 - AVERAGE DAILY TRUCK TRAFFIC – XX (2) (PERCENT)

(AUTO ENTRY)

INVENTORY – ROADS

TRUCKPCT

TABLE - ROADWAY

Code a 2-digit percentage that shows the percentage of Item 29 - Average Daily Traffic that is truck traffic. Do not include vans, pickup trucks and other light delivery trucks in this percentage.

If this information is not available, an estimate that represents the average percentage for the category of road carried by the bridge may be used. Leave blank if Item 29 - Average Daily Traffic is not greater than 100.

<u>EXAMPLES:</u>		<u>Code</u>
Average Daily Traffic	7% trucks	07
	12% trucks	12

EDIT CHECK

If Item 29 is > 100 then Item 109 must NOT be blank.

A warning is issued if Item 109 is > 40.

FEDERAL ITEM 110 - DESIGNATED NATIONAL NETWORK – X (1)

INVENTORY – ROADS

TRUCKNET

TABLE - ROADWAY

The national network for truck includes most of the Interstate System and those portions of the Federal-Aid Primary System identified in the Code of Federal Regulations (23 CFR 658). The National network for trucks is available for use by commercial motor vehicles of the dimensions and configurations described in these regulations. For the Inventory route identified in Item 5, indicate conditions using one of the following codes:

<u>Code</u>	<u>Description</u>
0	The inventory route is not part of the national network for trucks.
1	The inventory route is part of the national network for trucks.

FEDERAL ITEM 111 - PIER OR ABUTMENT PROTECTION (FOR NAVIGATION) – X (1)

APPRAISAL – OTHER RATINGS

PIERPROT

TABLE - INSPEVNT

If Item 38 - Navigation Control has been coded 1 use the codes below to indicate the presence and adequacy of pier or abutment protection features such as fenders, dolphins, etc. The condition of the protection devices may be a factor in the overall evaluation of Item 60 - Substructure. If Item 38 - Navigation Control has been coded 0 or N, leave blank to indicate not applicable.

<u>Code</u>	<u>Description</u>
1	Navigation protection not required
2	In place and functioning
3	In place but in a deteriorated condition
4	In place but reevaluation of design suggested
5	None present but reevaluation suggested
Blank	Not Applicable

EDIT CHECK

If Item 38 is = 1 then Item 111 must NOT be blank.

FEDERAL ITEM 112 - NBIS LENGTH – X (1)

INVENTORY – CLASSIFICATION

NBISLEN

TABLE - BRIDGE

Does this structure meet or exceed the minimum length specified to be designated as a bridge for National Bridge Inspection Standards purposes? The following definition of a bridge is to be used:

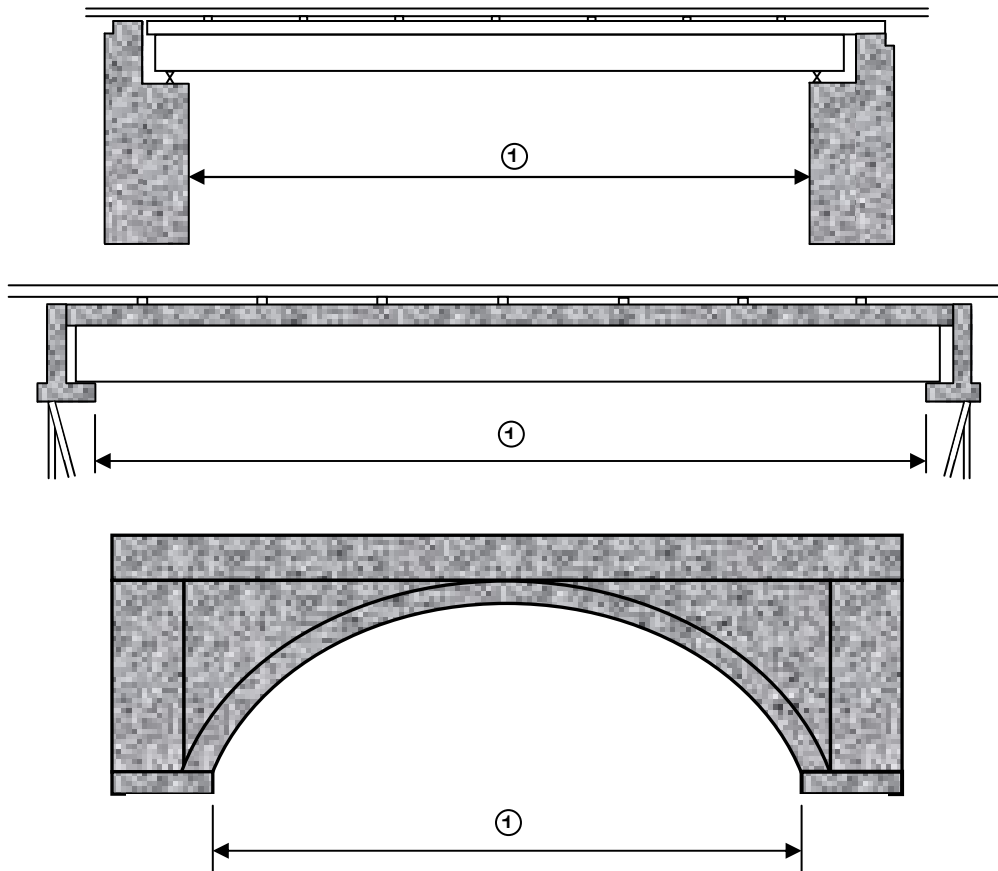
A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments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

In addition to the above, the structure must carry a highway.

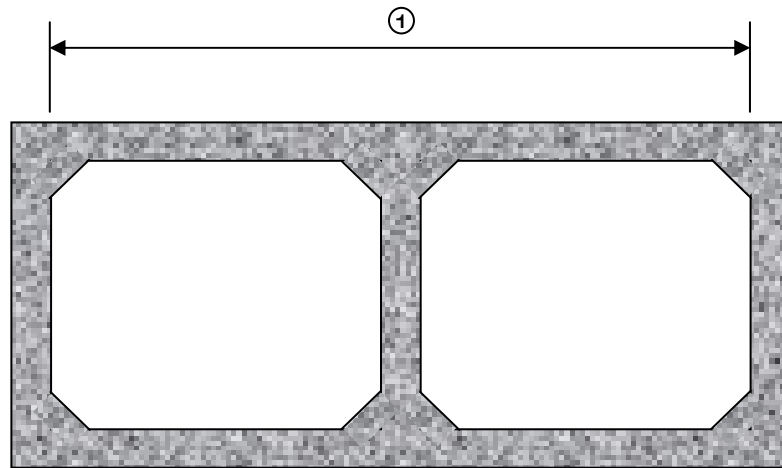
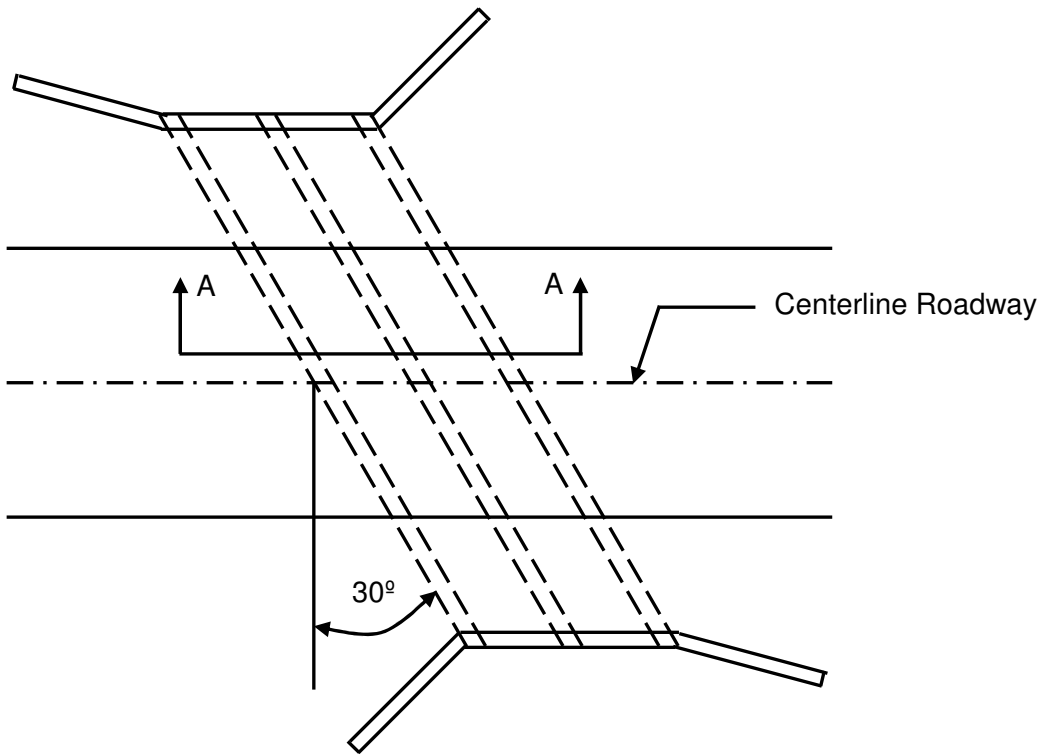
<u>Code</u>	<u>Description</u>
Y	Yes
N	No

EDIT CHECK

If Item 112 = Y then Item 49 must be ≥ 20

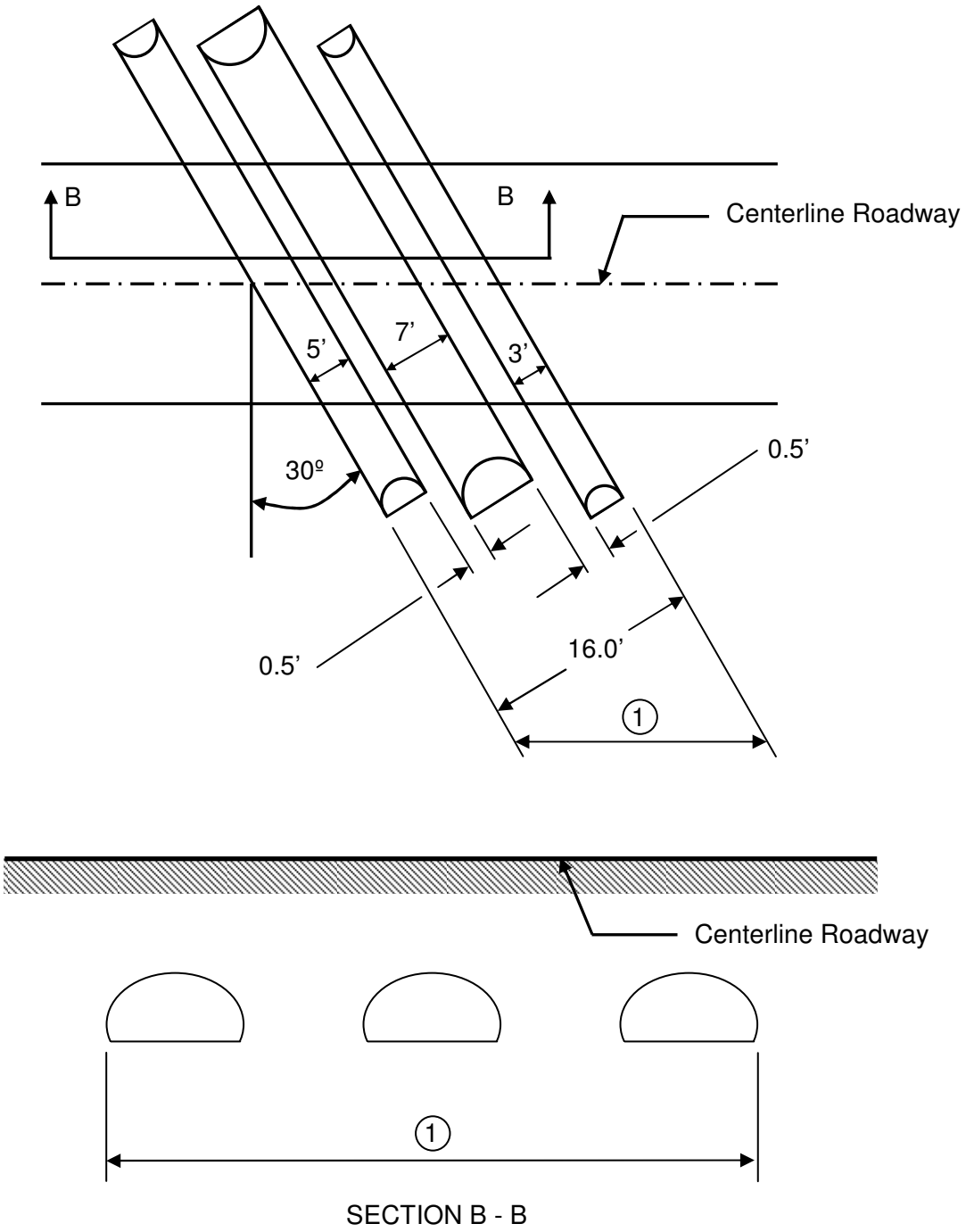


① Item 112 – NBIS Bridge Length



SECTION A - A

① Item 112 – NBIS Bridge Length



① Item 112 – NBIS Bridge Length

FEDERAL ITEM 113 - SCOUR CRITICAL BRIDGES – X (1)

APPRAISAL – OTHER RATINGS

SCOURCRIT

TABLE - INSPEVNT

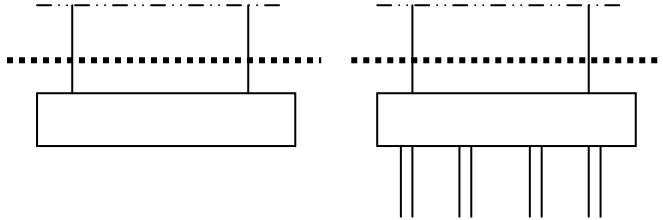
Use a single-digit code as indicated below to identify the current status of the bridge regarding its vulnerability to scour. Evaluations shall be made by hydraulic/geotechnical/structural engineers. Guidance on conducting a scour evaluation is included in the FHWA Technical Advisory T 5140.23 titled, "Evaluating Scour at Bridges." Detailed engineering guidance is provided in the Hydraulic Engineering Circular 18 titled "Evaluating Scour at Bridges." Whenever a rating factor of 2 or below is determined for this item, the rating factor for Item 60 -- Substructure and other affected items (i.e., load ratings, superstructure rating) should be revised to be consistent with the severity of observed scour and resultant damage to the bridge. A plan of action will be developed for each scour critical bridge (see FHWA Technical Advisory T 5140.23, HEC 18 and HEC 23). A scour critical bridge is one with abutment or pier foundation rated as unstable due to (1) observed scour at the bridge site (rating factor of 2, 1, or 0) or (2) a scour potential as determined from a scour evaluation study (rating factor of 3). It is assumed that the coding of this item has been based on an engineering evaluation, which includes consultation of the NBIS field inspection findings.

<u>Code</u>	<u>Description</u>
N	Bridge not over 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 flood events.
T	Bridge over 'tidal' water 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) on dry land 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), by calculation or by installation of properly designed countermeasures (see HEC 23).
7	Countermeasures have been installed to mitigate an existing problem with scour at an existing bridge 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. (<u>Use only to describe case where bridge has not yet been evaluated for scour potential.</u>)
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: <ul style="list-style-type: none"> - Scour within limits of footing or piles. (Example B) - Scour below spread-footing base or pile tips. (Example C)
2	Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations, which are determined to be unstable by: <ul style="list-style-type: none"> - 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 Item 60.
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: <ul style="list-style-type: none"> - 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 Item 60.
0	Bridge is scour critical. Bridge has failed and is closed to traffic.

EXAMPLES:

CALCULATED SCOUR DEPTH

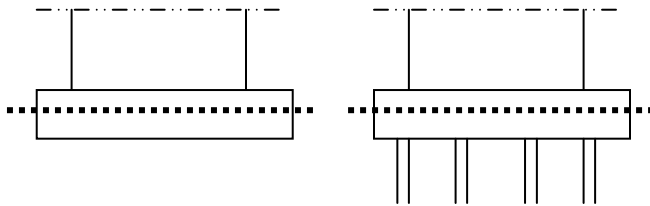
A. Above top of Footing.



ACTION NEEDED

None

B. Within limits of footing or piles

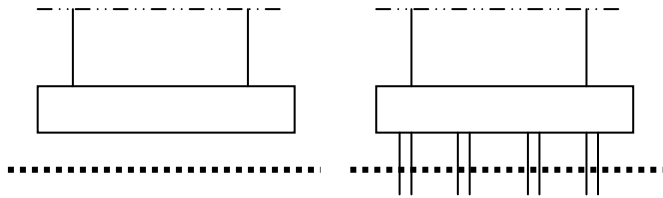


ACTION NEEDED

None if scour code = 5

Conduct foundation structural analysis if scour code = 3 and foundation has an assessed scour condition

C. Below pile tips or spread footing base



ACTION NEEDED

Provide for monitoring and scour countermeasures as necessary

SPREAD FOOTING
(NOT FOUNDED IN ROCK)

PILE FOOTING

..... = Calculated Scour Depth

EDIT CHECK

If Item 42B = 5, 6, 7, 8, or 9 then Item 113 must be numeric.

If Item 42B = 1, 2, 3, or 4 then Item 113 must be N.

FEDERAL ITEM 114 - FUTURE AVERAGE DAILY TRAFFIC - XXXXXX (6)

INVENTORY – ROADS

ADTFUTURE

TABLE - ROADWAY

Code for all bridges the forecasted average daily traffic (ADT) for the inventory route identified in Item 5. This shall be projected at least 17 years but no more than 22 years from the year data is submitted to the NBI. The intent is to provide a basis for a 20-year forecast. This item may be updated anytime, but must be updated when the forecast falls below the 17-year limit. If planning data is not available, use the best estimate based on site familiarity.

The future ADT must be compatible with the other items coded for the bridge. For example, parallel bridges with an open median are coded as follows: if Item 28 - Lanes On and Under the Structure and Item 51 - Bridge Roadway Width, Curb-to-Curb are coded for each bridge separately, then the future ADT must be coded for each bridge separately (not the total for the route).

EXAMPLES:		<u>Code</u>
Future ADT	540	000540
	15,600	015600
	240,000	240000

EDIT CHECK

Item 114 must be < or = 4.0 times Item 29 and Item 114 must be > or = 0.4 times Item 29. A warning is issued if Item 114 is > 200,000.

FEDERAL ITEM 115 - YEAR OF FUTURE AVERAGE DAILY TRAFFIC - XXXX (4)

INVENTORY – ROADS

ADTFUTYEAR

TABLE - ROADWAY

Record and code the year represented by the future ADT in Item 114. The projected year of future ADT shall be at least 17 years but no more than 22 years from the year of inspection.

EXAMPLE:		<u>Code</u>
Year of Future ADT is	2008	08

EDIT CHECK - Item 115 must be >= 17 years and <= 22 years since date of last inspection.

FEDERAL ITEM 116 - MINIMUM NAVIGATION VERTICAL CLEARANCE,

APPRAISAL – OTHER RATINGS

VERTICAL LIFT BRIDGE - XXX (3)

LFTBRNAVCL

TABLE - BRIDGE

Record to the nearest foot (rounding down) the minimum vertical clearance imposed at the site as measured above a datum that is specified on a navigation permit issued by a control agency. Code this item only for vertical lift bridges in the dropped or closed position, otherwise leave blank.

EXAMPLES:		<u>Code</u>
Vertical Clearance	20.6	020
	24.2	024

EDIT CHECK - If Item 43B = 15 then Item 116 must NOT be blank.

STATE ITEM 1 - RESIDENCY CODE - XX

AGENCY – BRIDGE
RESID_CODE
TABLE - USERBRDG

This is the number of the Residency in which the structure is geographically located.

STATE ITEM 2 - COUNTY OR CITY - XXX

AGENCY – BRIDGE
CITY_CNTY_CODE
TABLE - USERBRDG

The structures are ordinarily inventoried under the county/city where that structure is geographically located. (See the County or City Code Tables in the Appendix.)

Structures located in towns or cities with a population over 3,500 are inventoried in that city or town regardless of the maintenance responsibility.

Structures located in towns with a population under 3,500 which have chosen to maintain their own street are inventoried in the county in which the town is located and the maintenance responsibility field should reflect the town code.

If the structure is on a county-county line, county-city line or city-city line, and the maintenance county/city is on the line, the structure is inventoried under the maintenance county/city.

If the structure is maintained jointly, inventory the structure under the lowest numbered county or city.

If the structure is within a county or city but is maintained by another county or city, inventory the structure under the county or city where it is geographically located.

STATE ITEM 3 - HTRIS STRUCTURE ID - Automatic Entry

INVENTORY – ID/ADMIN
STRUCT_NUM
TABLE - BRIDGE

SAME AS FEDERAL ITEM 8

This is a unique number assigned when a structure is added to the system. Its purpose is to allow a structure record to be maintained without limitation of county or structure number. A replacement structure will be assigned a new Structure ID but may carry the old county and structure number. History and inspection Data records are linked by the structure ID.

STATE ITEM 4 - VA STRUCTURE NUMBER - XXXX

AGENCY – BRIDGE
VA_STRUC_NO
TABLE - USERBRDG

This is the structure number assigned by the State of Virginia.

STATE ITEM 5 - LANE ON INVENTORY ROUTE - X

AGENCY – ROADWAYS

LANE_ON_RTE

TABLE - USERRWAY

The direction of traffic on the structure according to the Straight Line Diagram shall be used for all routes including ramps.

<u>Code</u>	<u>Description</u>
Blank	Not Applicable
N	Northbound
E	Eastbound
S	Southbound
W	Westbound
R	Reversible
P	Parallel Route
1	Express Northbound
2	Express Eastbound
3	Express Southbound
4	Express Westbound
5	Express Reversible

STATE ITEM 6 – NAME (Previously - BRIDGE NAME) - XXXXXXXXXXXXXXXXXXXXXXXXXXXX (25)

INVENTORY – ID/ADMIN

ROADWAY_NAME

TABLE - ROADWAY

This is the given or assumed name of a bridge. When available this item should be the official name of a bridge. The unofficial local name of a bridge can also be used. Bridges with “official” names are those named by the General Assembly or the Commonwealth Transportation Board and can be found in the booklet titled “Virginia Route Index”. The Traffic Engineering Division prepares this booklet.

STATE ITEM 7 - HTRIS ROUTE ID - XXXXXXXXXXXXXXXX (14)

AGENCY – ROADWAY

HTRIS_ROUTE_ID

TABLE - USERRWAY

Virginia Note: This is an automatic entry.

This is a unique identification for all roads in the Link/Node Inventory System. It can be sub-defined as follows:

ROUTE PREFIX (Positions 1 -4)

ROUTE TYPE

Position 1

A	Alternate
B	Bypass
C	Commercial (Business)
E	Extension/Connector
T	Truck Route
Y	Wye
Blank	Not Applicable

CO/CITY/SIGNING

Position 2

- O Old
- T Temporary
- C Under Construction
- N First digit of City Code for City Street
- N Digit identifying distinct route for Alternate, Bypass, Commercial, or Parallel

Position 3 & 4

- IS Interstate
- US U. S. Route
- SR State Route
- FR Frontage Road
- Nn Two digits of County (Use maintenance county for secondary roads and Code use jurisdiction county for county roads)
- Nn Second and third digits of City Code for City Street

ROUTE NUMBER

- Nnnnn State-assigned number (Positions 5-9)
- Nnnnn Off-system Federal Aid No. (requires Co/City Code)

ROUTE SUFFIX (Positions 10-14)

ROUTE DIRECTION

Position 10

- P Parallel Route
- N Northbound
- E Eastbound
- S Southbound
- W Westbound
- R Reversible
- 1 Express Northbound
- 2 Express Eastbound
- 3 Express Southbound
- 4 Express Westbound
- 5 Express Reversible
- Blank Not Applicable

SPECIAL FEATURES TYPE

Position 11

- D Distributor/Collector
- C Channelized Turn Lane
- T On-Ramp (To)
- F Off-Ramp (From)
- I Intersectional Cross-over
- R Rest Area
- W Weigh Station
- Blank Not Applicable

SPECIAL FEATURE NUMBER

Positions 12-14

- Nnn State-assigned number (e.g., ramp number)
- Blank Not Applicable

STATE ITEM 8 - NODE NUMBER - XXXXXX

AGENCY – ROADWAY
START_NODE_NO
TABLE - USERRWAY

Virginia Note: This is an automatic entry.

This is the node number that begins this link for this route. As a link record is built, the beginning and ending nodes for the link are identified. A record for each of these nodes must be created at the same time into this file store.

STATE ITEM 9 - NODE OFFSET - XXX.XXX

AGENCY – ROADWAY
START_NODE_OFFSET
TABLE - USERRWAY

Virginia Note: This is an automatic entry.

This is the distance that the data element is from the begin node.

STATE ITEM 10 - ADJACENT COUNTY, CITY - XXX

AGENCY – BRIDGE
ADJ_CITY_CNTY
TABLE - USERBRDG

If the structure is on a county or city line the code for the county or city adjacent to the structure that is being inventoried.

STATE ITEM 11 - NATIONAL PARK SERVICE STRUCTURE NUMBER - XXXXXXXX

SINCE THE FHWA INSPECTS THESE BRIDGES AND VDOT HAS NO REPORTING RESPONSIBILITIES, THIS ITEM IS OBSOLETE.

STATE ITEM 12 - SPECIAL USE CODE - XX

AGENCY – BRIDGE
SPEC_USAGE
TABLE - USERBRDG

This two-digit code is used to supplement the inventory for the special use of a structure. An example is the structure on coal hauling highways. This is to be a user-defined table controlled by the Districts.

- PE FATIGUE PRONE & ELECTROSLAG WELDS
- ES Electroslag welds (OBSOLETE)
- H Pin & Link Hangers (OBSOLETE)
- L Low Water structures (OBSOLETE)
- F FORESTRY ROUTES
- P FATIGUE PRONE
- U ULTRASONIC INSPECTION REQUIRED
- B CONTRACT TO BE LET FOR BRUSH REMOVAL (NOVA)
- C BARS CHECKED (SALEM)
- V ANALYZED WITH VA LEGAL LOADS (SALEM)

STATE ITEM 13 - ORIGINAL PLAN NUMBER - XXX-XXX

AGENCY – BRIDGE
ORIG_PLAN
TABLE - USERBRDG

Code the original special design plan number for the structure in place. When a structure is built with multiple standard plans and has a plan number, this field should be coded.

STATE ITEM 13 - ORIGINAL STANDARD PLAN NUMBER - XXXXXXXXXXXXXXXX (16)

AGENCY – BRIDGE
ORIG_STD_PLAN
TABLE - USERBRDG

Code the original standard plan number for the structure in place.

STATE ITEM 14 - RECONSTRUCTION PLAN NUMBER - XXX-XXX

AGENCY – BRIDGE
RECON_PLAN
TABLE - USERBRDG

Code the reconstruction special design plan number for the structure in place. When a structure is built with multiple standard plans and has a plan number, this field should be coded.

STATE ITEM 14 - RECONSTRUCTION STANDARD PLAN NO. - XXXXXXXXXXXXXXXX (16)

AGENCY – BRIDGE
RECON_STD_PLAN
TABLE - USERBRDG

Code the reconstruction standard plan number for the structure in place. This should be coded when there is no regular construction plan number.

STATE ITEM 15 - MAINTENANCE RESPONSIBILITY - STATE - XXX

AGENCY – BRIDGE
MAINT_RESP_STATE
TABLE - USERBRDG

This indicates the agency having responsibility for the maintenance of structures in the state. For state or city maintenance, code the county or city number indicating the maintenance of the structure. For other state facilities, railroads, Arlington and Henrico counties or other agency maintenance, code alphabetically according the Agency Responsibility Tables (see rear of this manual).

For an interstate route within a city, code the number of the county that maintains the structure.

Where there is joint maintenance between a city and county, code the county number.

Where there is joint maintenance with and outside agency, code the proper county or city number.

STATE ITEM 18 - EXPANSION JOINTS OR DEVICES - XX

THIS ITEM WAS REPLACED BY PONTIS ELEMENTS

STATE ITEM 19 - ABUTMENT/CULVERT MATERIAL & TYPE, FOUNDATION OR PILES - X XX

AGENCY – BRIDGE
ABUT_A_MATER
ABUT_A_TYPE
ABUT_A_PMATER
ABUT_A_PTYPE
ABUT_B_MATER
ABUT_B_TYPE
ABUT_B_PMATER
ABUT_B_PTYPE
TABLE - USERBRDG

Code for Abutments A & B and Culverts.
(Code culvert foundation material in abutment A.)

Abutment Material and Type

Leave blank for Culverts.

The first position indicates **kind of MATERIAL**.

<u>CODE</u>	<u>DESCRIPTION</u>
1	Concrete
2	Steel
3	Timber
4	Masonry
0	Other

The second and third positions indicate **TYPE of design and/or construction**.

<u>CODE</u>	<u>DESCRIPTION</u>
01	Shelf or stub
02	Solid or Gravity
03	Column or Open
04	Curtain Wall
05	Cantilever
06	Bent
07	Cribwall
08	Integral
09	Reinforced Earth, etc.
00	Other

Foundation/Piles Material and Type

The first position indicates the **type of/or kind of MATERIAL** used for the foundation or piles.

<u>CODE</u>	<u>DESCRIPTION</u>
1	Solid Rock
2	Improved Foundation (Select Aggregate, geo-grid)
3	Firm Material
4	Pre-consolidated Fill
5	Steel
6	Concrete
7	Prestressed Concrete
8	Timber
0	Other

The second and third position indicated **spread footing or pile design TYPE**.

<u>CODE</u>	<u>DESCRIPTION</u>
01	Spread Footing
02	Piles, Precast or Prefabricated
03	Piles, C-I-P
04	Drilled Shaft
00	Other (used for culverts not on piles.)

3 00 - Unknown

0 00 - Unknown, but likely something other than firm material

STATE ITEM 20 - PIERS TYPE - MAIN - SEE BELOW

AGENCY – BRIDGE

MAIN_PIER_A_NO

MAIN_PIER_B_NO

MAIN_PIER_C_NO

MAIN_PIER_D_NO

MAIN_PIER_E_NO

MAIN_PIER_A_MATER

MAIN_PIER_B_MATER

MAIN_PIER_C_MATER

MAIN_PIER_D_MATER

MAIN_PIER_E_MATER

MAIN_PIER_A_TYPE

MAIN_PIER_B_TYPE

MAIN_PIER_C_TYPE

MAIN_PIER_D_TYPE

MAIN_PIER_E_TYPE

MAIN_PIER_A_PMATER

MAIN_PIER_B_PMATER

MAIN_PIER_C_PMATER

MAIN_PIER_D_PMATER

MAIN_PIER_E_PMATER

MAIN_PIER_A_PTYPE

MAIN_PIER_B_PTYPE

MAIN_PIER_C_PTYPE

MAIN_PIER_D_PTYPE

MAIN_PIER_E_PTYPE

TABLE - USERBRDG

Number - XX

Material and Type - X XX

Foundation/Piles Material and Type - X XX

Pier - Number of

The number of any one type of pier and foundation combination (i.e. one type of pier may be used in combination with two or more foundations.)

Pier - Material and Type

The first position of this code will indicate **kind of MATERIAL**.

<u>CODE</u>	<u>DESCRIPTION</u>
1	Concrete
2	Steel
3	Timber
4	Masonry
0	Other

The second and third positions will indicate **TYPE** of design and/or construction.

<u>CODE</u>	<u>DESCRIPTION</u>
01	Solid
02	Column - single
03	Column - webwall
04	Drilled-In-Caisson
05	Bent - column
06	Bent - pile
07	Single Stem - hammerhead
08	Collision Wall
09	Pivot
10	Bascule
11	Rest Bent
00	Other

Pier Foundation or Piles

The first position indicates the **kind of MATERIAL** used for piles or for bearing for spread footing.

<u>CODE</u>	<u>DESCRIPTION</u>
1	Solid Rock
2	Improve Foundation (select aggregate, geo-grid)
3	Firm Material
4	Preconsolidated Fill
5	Steel
6	Concrete
7	Prestressed Concrete
8	Timber
0	Other

The second and third positions will indicate the **spread footing or piles design TYPE**.

<u>CODE</u>	<u>DESCRIPTION</u>
01	Spread Footing
02	Piles, Precast or Prefabricated
03	Piles, C-I-P
04	Drilled Shaft
00	Other

STATE ITEM 21 - PIERS TYPE - APPROACH

AGENCY – BRIDGE

APPR_PIER_A_NO
APPR_PIER_B_NO
APPR_PIER_C_NO
APPR_PIER_D_NO
APPR_PIER_E_NO
APPR_PIER_A_MATER
APPR_PIER_B_MATER
APPR_PIER_C_MATER
APPR_PIER_D_MATER
APPR_PIER_E_MATER
APPR_PIER_A_TYPE
APPR_PIER_B_TYPE
APPR_PIER_C_TYPE
APPR_PIER_D_TYPE
APPR_PIER_E_TYPE
APPR_PIER_A_PMATER
APPR_PIER_B_PMATER
APPR_PIER_C_PMATER
APPR_PIER_D_PMATER
APPR_PIER_E_PMATER
APPR_PIER_A_PTYPE
APPR_PIER_B_PTYPE
APPR_PIER_C_PTYPE
APPR_PIER_D_PTYPE
APPR_PIER_E_PTYPE
TABLE - USERBRDG

- Number = (Code as shown above for Main)
- Material & Type = (Code as shown above for Main)
- Fnd/Piles = (Code as shown above for Main)

STATE ITEM 22 - OPENINGS, NUMBER OF - XX

AGENCY – BRIDGE

DRAIN_OPEN
TABLE - USERBRDG

The number of opening in the given drainage structure or the number of tubes of a tunnel

STATE ITEM 23 - WIDTH OR DIAMETER - XX.X

AGENCY – BRIDGE

DRAIN_WIDTH
TABLE - USERBRDG

Code width or diameter or an opening to the nearest tenth of a foot. For multiple culverts or pipes having unequal openings, this shall be the width or diameter of the SMALLEST opening.

STATE ITEM 24 - HEIGHT - XX.X

AGENCY – BRIDGE

DRAIN_HT
TABLE - USERBRDG

Design height of an opening to the nearest tenth of a foot. For multiple culverts or non-circular pipes, this shall be the height of the SMALLEST multiple opening.
For circular openings leave this item blank

STATE ITEM 25 - BARREL LENGTH - XXXX

AGENCY – BRIDGE
DRAIN_BARL LENG
TABLE - USERBRDG

Code total barrel length along the flowline to the nearest foot. When the extension of an existing structure is of a different size, code the data for the entire portion (all sizes) and note the differences in the report.

STATE ITEM 26 - DEPTH OF FILL - XX

AGENCY – BRIDGE
DRAIN_DEPTH_FILL
TABLE - USERBRDG

This is the maximum amount of fill above the culvert. Code to the nearest foot.

STATE ITEM 27 - YEAR RECONSTRUCTED - XXXX

AGENCY – BRIDGE
YR_RECON
TABLE - USERBRDG

Code the last year reconstructed for any reconstruction where a plan is involved and the entire structure is **not** replaced. This field would be coded whether or not Item 106 is coded.

<u>CODE</u>	<u>DESCRIPTION</u>
1961	Reconstructed in 1961

STATE ITEM 28 - HORIZONTAL CLEARANCE UNDER ROUTE - LEFT - XX.X

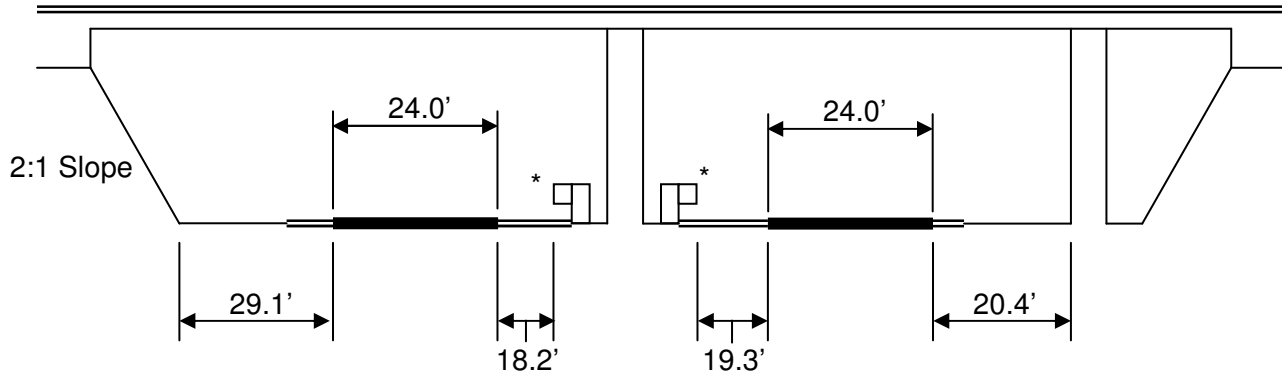
STATE ITEM 29 - HORIZONTAL CLEARANCE UNDER ROUTE – RIGHT (SINGLE) - XX.X

AGENCY – ROADWAYS
THEN CLICK ON NEXT ROW AT BOTTOM
HORIZ_UNDER_LEFT
HORIZ_UNDER_RIGHT
TABLE - USERRWAY

The minimum horizontal clearance for passing under the structure should be measured and recorded. The clearance should be the least available clearance measured between the most restrictive features -- curbs, rails, walls, or other structural features limiting the roadway (surface and shoulders). The measurement should be recorded and coded to the nearest tenth of a foot.

The purpose of this item is to determine the width available for the movement of wide loads. This item will include the roadway surface and shoulders, distance from face of pier or toe of slope or to the face of guardrail or non-mountable medians (Item 33 - Bridge Median coded 2) whichever is the most restrictive. See sketch below for further details

EXAMPLE: (Looking in the direction of increasing milepost)



* - Face of a rigid barrier or face of raised median or face of non-mountable curb or face of guardrail

State Item 28 = 71.3 State Item 29 = 63.7

STATE ITEM 30 - SCOUR CRITICAL EVALUATION - X

AGENCY – BRIDGE

SCOUR_CRIT_IND

TABLE - USERBRDG

This is a single-digit code indicating the need for a Scour Critical Study.

<u>Code</u>	<u>Description</u>
Y	Study Required
N	No Study Required
C	Study Complete

STATE ITEM 31 - SCOUR CRITICAL REMARKS CODE - XX

AGENCY – BRIDGE

SCOUR_CRIT_REMRK

TABLE - USERBRDG

The following is the anticipated coding for this item as discussed at a February 1995 bridge scour workshop. These codes may be used at this time.

This is used to indicate the results/status of the scour study.

EF	Indicates that a study by a consultant is required.
ET	A full hydraulic and hydrologic analysis has <u>not</u> been completed and temporary monitoring is being utilized until the study is complete.
FM	A full hydraulic and hydrologic analysis has been completed and permanent monitoring is being utilized as part of the recommendations.
FT	A full hydraulic and hydrologic analysis has been completed and temporary monitoring is being utilized until recommended remedial measures are completed.
Blank	Indicates that a study and all remedial measures are completed or if Item 113 is coded a 6, that the district will complete the analysis.

STATE ITEM 32 - DATE DELETED - XX/XX/XX

OBSOLETE FIELD

STATE ITEM 33 - BRIDGE ROADWAY WIDTH - LEFT SIDE - XX.X

MINIMUM CURB-TO-CURB OF MAINLINE ROUTE (FT)

AGENCY – ROADWAYS

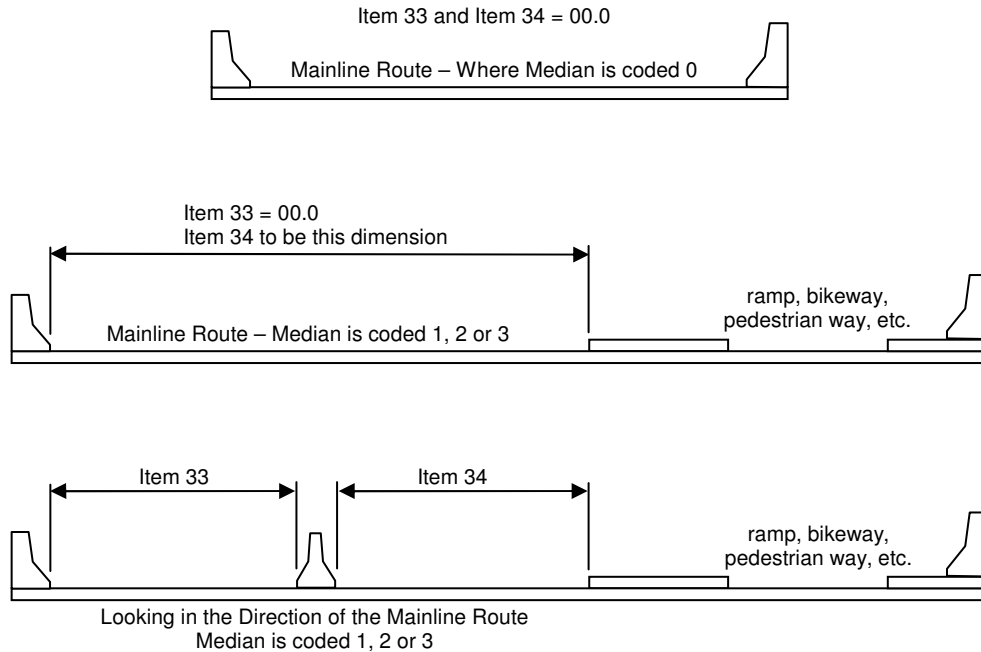
WIDTH_ROAD_LEFT

TABLE - USERRWAY

If Federal Item 33 is coded 0 then this item should be 00.0.

If Federal Item 33 is coded 1, 2 or 3 and the median that exists separates a mainline road from a ramp, bikeway, pedestrian way, etc. **only** Item 34 will be coded and the measurement will be from curb-to-curb of the mainline route.

See sketches below.



STATE ITEM 34 - BRIDGE ROADWAY WIDTH - RIGHT SIDE - XX.X

MINIMUM CURB-TO-CURB OF MAINLINE ROUTE (FT)

AGENCY – ROADWAYS

WIDTH_ROAD_RIGHT

TABLE - USERRWAY

If Federal Item 33 is coded 0 then this item should be 00.0. If Federal Item 33 is coded 1, 2 or 3 then this item must be coded.

If Federal Item 33 is coded 1, 2 or 3 and the median that exists separates a mainline road from a ramp, bikeway, pedestrian way, etc. **only** this item will be coded and the measurement will be from curb-to-curb of the mainline route.

See sketches above.

STATE ITEM 35 - WIDTH OF MEDIAN (FT) - XXX

AGENCY – ROADWAYS

WIDTH_MEDIAN
TABLE - USERRWAY

Record the measurement in feet. If Federal Item 33 is coded 1, 2 or 3 then this item must be coded. If Federal Item 33 is coded 0 then this item should be blank.

STATE ITEM 36 - MIN. VERT. UNDERCLEARANCE-RIGHT OR SINGLE- X XX(feet) XX(inches)

AGENCY – ROADWAYS

THEN CLICK ON NEXT ROW AT BOTTOM

VERT_UNDER_RIGHT_CODE
VERT_UNDER_RIGHT
TABLE - USERRWAY

See Virginia Note under Federal Item 54.

Using a 1-digit code and a 4-digit number, record and code the minimum vertical clearance from the right/single roadway or right/single railroad track beneath the structure to the underside of the superstructure. (When both a railroad and highway are under the structure, code the most restrictive dimension.)

<u>Segment</u>	<u>Description</u>	<u>Length</u>
36A	Reference feature	1 digit
36B	Minimum Vertical Underclearance	4 digit

Using one of the codes below, code in the first position, the reference feature from which the clearance measurement is taken:

<u>Code</u>	<u>Description</u>
H	Highway beneath structure
R	Railroad beneath structure
N	Feature not a highway or railroad

In the next 4 positions, code a 4-digit number to represent the minimum vertical clearance from that feature to the structure. If the feature is not a highway or railroad, code the minimum vertical clearance 0000.

STATE ITEM 37 - MINIMUM VERTICAL UNDERCLEARANCE - LEFT - X XX(feet) XX(inches)

AGENCY – ROADWAYS

THEN CLICK ON NEXT ROW AT BOTTOM

VERT_UNDER_LEFT_CODE
VERT_UNDER_LEFT
TABLE - USERRWAY

See Virginia Note under Federal Item 54.

If the feature beneath the structure has more than a single roadway or single railroad then using a 1-digit code and a 4-digit number, record and code the minimum vertical clearance from the left roadway or left railroad track beneath the structure to the underside of the superstructure. (When both a railroad and highway are under the structure, code the most restrictive dimension.)

<u>Segment</u>	<u>Description</u>	<u>Length</u>
37A	Reference feature	1 digit
37B	Minimum Vertical Underclearance	4 digit

Using one of the codes below, code in the first position, the reference feature from which the clearance measurement is taken:

<u>Code</u>	<u>Description</u>
H	Highway beneath structure
R	Railroad beneath structure
N	Feature not a highway or railroad

In the next 4 positions, code a 4-digit number to represent the minimum vertical clearance from that feature to the structure. If the feature is not a highway or railroad, code the minimum vertical clearance 0000.

STATE ITEM 38 - TOTAL REPLACEMENT INDICATOR - X

AGENCY – BRIDGE

REPL_STRUC

TABLE - USERBRDG

Indicates that this structure is a replacement structure. **NO PORTION OF THE PREVIOUS STRUCTURE EXISTS**. This field must be coded when a structure is replaced.

<u>Code</u>	<u>Description</u>
Y	New structure totally replaces an existing structure.
N	New structure does not totally replace an existing structure.

STATE ITEM 39 - TYPE OF CONSTRUCTION - X

AGENCY – BRIDGE

TYPE_CONSTR

TABLE - USERBRDG

Indicates the construction type of the given structure.

<u>Code</u>	<u>Description</u>
B	Precast Concrete Box Culvert.
C	Culvert or Drainage structure.
D	Parking Deck.
F	Footbridge (structure which carries <u>only</u> pedestrians over a non-highway)
L	Landing Dock or Wharf.
N	Any bridge carrying a highway or highway/railroad not covered by another coding.
P	Pedestrian Overpass (structure which carries <u>only</u> pedestrians over a highway)
R	Railroad
S	Scales
T	Tunnel (Tunnels shall be coded as under records)
Z	Plaza

STATE ITEM 40 - TYPE OF MODIFICATION - X

AGENCY – BRIDGE

TYPE_RECONST

TABLE - USERBRDG

Indicates the last type of modification to the structure.

<u>Code</u>	<u>Description</u>
A	Altered or remodeled (includes any change to the structure which increases the original design load capacity or otherwise alters the functional use except for widening of the bridge roadway deck, also includes all modifications made to existing culverts or pipes).
D	Deck Replacement.
M	New Superstructure on existing substructure.
R	Repaired Bridge (does not include culverts or pipes).
W	Widened Bridge (does not include culverts or pipes).
Blank	No modification has been made to structure.

STATE ITEM 41 - HBRRP INDICATOR - X

(HIGHWAY BRIDGE REPLACEMENT/REHABILITATION PROGRAM)

AGENCY – BRIDGE

BRBH_IND

TABLE - USERBRDG

CODE	DESCRIPTION
Y	Code a 'Y' in this field to remove a structure from the HBRRP lists once the project has been let to contract or started by State Forces.
	Code an 'N' in this field to denote 'Not Applicable'. Also, once work has been completed, this field should be changed to 'N'.
N	When this field is changed from a 'Y' to an 'N' Item 106 - YEAR RECONSTRUCTED (FED. FUNDS) and/or Item S27 YEAR RECONSTRUCTED (STATE FUNDS) must be coded.

When the state spends money on repairing or rehabilitating a structure, it is not eligible for HBRRP funds for ten years. However, there is a length of time where a contract is 'let' or work has begun and the 'Year Reconstructed' date has not been coded because the work has not been completed.

This field is used to remove from lists of eligible HBRRP structures those structures that are not eligible for HBRRP money because of ongoing or impending work, but the 'Year Reconstructed' date has not been coded because the work has not been completed. This field must be updated once the work has been completed.

The date built or the date of reconstruction does NOT cause the '*** HBRRP CANDIDATE ***' indicator to be removed automatically.

STATE ITEM 42 - TIDAL INDICATOR - X

AGENCY – BRIDGE

TIDAL_IND

TABLE - USERBRDG

This is a single-digit code indicating whether the structure crosses tidal water.

<u>Code</u>	<u>Description</u>
Y	Yes, this is tidal water.
N	No, this is not tidal water.
*	Does not cross water (May be added when the PDA is placed into service)

STATE ITEM 44 - DESIGN LOAD - HIGH (STATE) - X

AGENCY – BRIDGE

DESIGN_LOAD_HIGH

TABLE - USERBRDG

Code the highest design capacity for a structure that has been widened or otherwise altered so that different portions have different live-load designs. Use the same codes as Federal Item 31.

STATE ITEM 45 - RATED CAPACITY, SINGLE UNIT - XX

AGENCY – BRIDGE

RATG_CAPAC_SINGLE

TABLE - USERBRDG

Code the rated capacity in gross tons for the Virginia Legal 27 Ton vehicle.

<u>Code</u>	<u>Description</u>
07	7 tons
20	20 tons
99	Greater than 100 tons

STATE ITEM 46 - RATED CAPACITY, SEMI - XX

AGENCY – BRIDGE

RATG_CAPAC_SEMI

TABLE - USERBRDG

Code the rated capacity in gross tons for the Virginia Legal 40 Ton Vehicle. See example above.

STATE ITEM 47 - STRESS LEVEL - X

AGENCY – BRIDGE

STRESS_LEVEL

TABLE - USERBRDG

(Inventory, Operating, or Mid-Range). The Stress Level used to determine the rated capacity of the structure.

<u>Code</u>	<u>Description</u>
I	Inventory
O	Operating
M	Mid-Range

STATE ITEM 48 - METHOD OF ANALYSIS - X

AGENCY – BRIDGE

STRESS_METHOD

TABLE - USERBRDG

The Methodology used to calculate the capacity/capacities.

<u>Code</u>	If Federal Item 64 & 66 <u>Figured by</u>	AND	If State Item 45 & 46 <u>Figured by</u>
W	Working Stress		Working Stress
X	Working Stress		Load Factor
Y	Working Stress		Load Resistance Factor
L	Load Factor		Load Factor
M	Load Factor		Working Stress
N	Load Factor		Load Resistance Factor
R	Load Resistance Factor		Load Resistance Factor
S	Load Resistance Factor		Working Stress
T	Load Resistance Factor		Load Factor
A	Assumed		Assumed
-	No Analysis		No Analysis

NOTE: ~~Working Stress can still be used for non-NBI structures for Federal Item 64 and Federal Item 66. Culverts with fill greater than 15 feet (i.e. liveload is not a factor and Federal Item 64 and Federal Item 66 is coded 299) should be coded L. This item controls the coding of Federal Items 63 and 65.~~

STATE ITEM 49A – ANALYSIS PROGRAM NUMBER - XXXXXXXX

AGENCY – BRIDGE

BARS_PROG_NO

TABLE - USERBRDG

The 'Analysis Program Number' is comprised of the following designator of analysis type, county number and structure number.

Code the First digit for **Analysis Type** material:

<u>Code</u>	<u>Description</u>
A	Structural Steel - OBSOLETE
B	Reinforced Concrete – OBSOLETE
C	Composite Steel and Concrete – OBSOLETE
D	Prestressed Concrete – OBSOLETE
E	Composite Prestressed Concrete – OBSOLETE
F	Timber – OBSOLETE
G	Composite Reinforced Concrete – OBSOLETE
H	Truss - OBSOLETE
J	STAAD
K	Descus
L	Brass
M	Hand Calculations
N	Not enough information known for analysis
P	Conspan
R	BARS
V	Analysis performed by Virtis
X	Analysis performed by other method – Check Virtis for more information on the method used.
Z	Analysis performed but deck or substructure controls – Check Virtis for more information on the method used.

Code Positions 2 - 4 with the county or city number.

Code Positions 5 - 8 with the structure number.

EXAMPLE: The run for a structure number 1009 on Route 60 over Buffalo River in Amherst County that had been analyzed by Virtis would be coded as: V0051009

Note: While this varies greatly from the previous coding of this item, no changes are necessary on a particular structure until such time a new analysis is complete for that structure.

STATE ITEM 49B - ANALYSIS RUN DATE - XX/XX/XX

AGENCY – BRIDGE

BARS_RUN_DATE

TABLE - USERBRDG

This is the last date the structure was analyzed by any method.

STATE ITEM 50 - POSTED STATUS (POSTED OR CLOSED BRIDGE - X

AGENCY – BRIDGE

POSTED_STAT

TABLE - USERBRDG

This item provides information about the operational status of a structure.

<u>Code</u>	<u>Description</u>
P	Permanent Posting but not reported on the M-50 (For structures whose posting is not the responsibility of the state - i.e. structures inspected and owned by a municipality)
T	45T structures. Vehicles grossing more than 90 ^k may not use the structure.
M	Posted Structure reported on the M-50
Blank	Not Posted

STATE ITEM 51 - POSTED DATE - XX/XX/XX

AGENCY – BRIDGE

POSTED_DATE

TABLE - USERBRDG

Record the month, day and year that the load posting sign, indicating the most current designated load capacity, was placed. Code an 8-digit number to represent the month, day and year.

The date should change each time a reevaluation of load capacity requires changing the restriction signs on a bridge. To the extent possible, this data should represent the actual date that a bridge is posted or that the posting is removed.

EXAMPLE:

<u>Code</u>	<u>Description</u>
11/05/1985	Bridge Posted November 5, 1985
05/16/1986	Bridge Posting removed May 16, 1986

STATE ITEM 52 - POSTED CAPACITY - R12-1 - XX

AGENCY – INSPECTIONS

POST_CAPAC_STD

TABLE - USERINSP

The limiting weight loading for a given structure. This is the gross tonnage posted on a R12-1 Sign for a standard vehicle.

STATE ITEM 53 - POSTED CAPACITY - R12-5 SINGLE UNIT - XX

AGENCY – INSPECTIONS

POST_CAPAC_SINGLE

TABLE - USERINSP

The limiting weight loading for a given structure. This is the gross tonnage posted on a R12 - 5 Sign for the 27-ton Virginia vehicle.

STATE ITEM 54 - POSTED CAPACITY - R12-5 SEMI - XX

AGENCY – INSPECTIONS

POST_CAPAC_SEMI

TABLE - USERINSP

The limiting weight loading for a given structure. This is the gross tonnage posted on a R12-5 Sign for the 40 ton Virginia vehicle.

STATE ITEM 55 - POSTED SIGN MAINTENANCE REQUIRED - X

AGENCY – BRIDGE

POST_REQ

TABLE - USERBRDG

This is a flag indicating that a change has been made in the weight limit and sign maintenance is needed but has not been done. This will be set to "Y" at the time the M108 is produced. When the sign maintenance has been performed, the code will change to "C". Otherwise the code will be "N".

<u>Code</u>	<u>Description</u>
Y	Sign Maintenance Needed
C	Sign Maintenance Complete
N	No Sign Maintenance Required

STATE ITEM 56 - MAINTENANCE REPLACE COST - XXXXXX

AGENCY – INSPECTIONS

MAINT_REPAIR_COST

TABLE - USERINSP

Code a six-digit number to nearest thousand to represent the maintenance replacement cost required to satisfy the level of service established by the Maintenance Division. This cost is not included for structure in the six year improvement program unless the work is required to safely maintain traffic before the scheduled improvement can be made.

If no repairs are necessary, this field should be filled with zeroes.

STATE ITEM 57 - MAINTENANCE REPLACEMENT FUNDING CODE - X

AGENCY – INSPECTIONS

MAINT_FUND_CODE

TABLE - USERINSP

This is a single-digit code indicating the highway system that **funds/maintains** the structure.

NOTE: This item should be coded exclusive of State Item 185 Virginia Highway System. For example, it is possible for a structure to receive Interstate funding and be located on the Secondary System.

The coding description below will be true for the majority of the structures. A special agreement between a municipality and the State could affect the source of funding. If you are not aware of a special agreement, use the codes below.

<u>Code</u>		<u>Description</u>
I	Interstate Funding	Structures on an Interstate, crossing an Interstate or on a frontage road of an Interstate, regardless of the jurisdiction in which they reside.
P	Primary Funding	Structures on a Primary or a frontage road of a Primary that do not cross an Interstate and are not maintained by a municipality.
S	Secondary Funding	Structures on a Secondary that do not cross an Interstate, are not on the frontage road of an Interstate, are not on the frontage road of a Primary and are not maintained by a municipality. In the counties of Arlington and Henrico, all structures that are NOT part of an Interstate or Primary system receive secondary funding.
U	Urban Funding	Structures maintained by a municipality and are on a Primary or on a city street (non-numbered highway) and not crossing an Interstate. (See 'Secondary Funding' for coding of structures in the counties of Arlington and Henrico.)
O	Other	Structures that do not receive any of the above funding. For example, structures where maintenance is coded (DGT), (MWA), (PVT), (TJF), etc.

STATE ITEM 58 – PPMS PROJECT ID NUMBER - XXXXXXXXXXXXXXXX

AGENCY – BRIDGE

UPC

TABLE - USERBRDG

This is the identification number the FMSII system assigns to projects. This number is used across the enterprise to identify projects. It is unique to the project and will never be assigned to any other project.

STATE ITEM 59 - MAINTENANCE REPLACEMENT REMARKS CODE - XX

OBSOLETE

STATE ITEM 60 - REGULAR INSPECTOR'S CODE - XXX

SCHEDULE

INSPNAME

TABLE - USERINSP

This is the inspector number of the person, county, city or agency performing the bridge the regular inspection for this structure. For State Inspectors, this will be the code for the team leader. This is a user-defined table and will be maintained by Central Office.

STATE ITEM 61 - REGULAR INSPECTION - NEXT - CALCULATED

SCHEDULE

NEXTINSPEC

TABLE - INSPEVNT

This is the date will be calculated by a program at the time of changes to the inspection data. The value is determined by adding the frequency to the actual inspection date or by adding the frequency to the last scheduled date. Format is YY/MM/DD.

STATE ITEM 62 - SPECIAL INSPECTION CLASSIFICATION - X

AGENCY – INSPECTIONS

CRIT_FEAT_CLASS

TABLE - USERINSP

A one-digit code indicating the class of the Interim Inspections required. This user defined table and will be maintained by the Central Office.

<u>Code</u>	<u>Description</u>
1	Pin and Hanger (Redundant) (Obsolete)
2	Scour Monitor or Undermining
3	Vehicular or Drift damage
4	Posted Structure (Obsolete)
5	Concrete Structure (no plans)
6	Temporary Support (Obsolete)
7	Insect Infestation
8	Seam Cracks in Culverts

STATE ITEM 63 - SPECIAL EQUIPMENT INDICATOR - X

AGENCY – BRIDGE

SPEC_EQUIP_LADDER

SPEC_EQUIP_SNOOPER

SPEC_EQUIP_BOAT

SPEC_EQUIP_MANLIFT

SPEC_EQUIP_BUCKET_TRUCK

SPEC_EQUIP_PONTOON

SPEC_EQUIP_SCAFFOLD

SPEC_EQUIP_RIGGIN

SPEC_EQUIP_PLATFORM_TRUCK

TABLE - USERBRDG

This is a flag indicating the need of special equipment to perform the inspection. Value is a "Y" or blank.

STATE ITEM 64 - SPEC. EQUIPMENT COMMENTS - XXXXXXXXXXXXXXXXXXXXXXXXXXXX (25)

OBSOLETE

STATE ITEM 65 - SUFFICIENCY RATING - CALCULATED

APPRAISAL – OTHER RATINGS

SUFFIC_RATE

TABLE - INSPEVNT

The sufficiency rating is a programmed item as computed by the FHWA formula.

STATE ITEM 66 - DEFICIENCY POINT - CALCULATED

OBSOLETE

STATE ITEM 94 - LAST PAINTED DATE - XXXX

AGENCY - BRIDGE

YR-PAINTED

TABLE - USERBRDG

The year the structure was last painted.

STATE ITEM 170 - POSTING SIGN VISIBILITY - X

AGENCY - INSPECTIONS

POST_SIGN_VIS

TABLE - USERINSP

This field identifies the visibility of the posting sign using G (Good), F (Fair), P (Poor) or C (Critical).

STATE ITEM 171 – POSTING SIGN LEGIBILITY - X

AGENCY - INSPECTIONS

POST_SIGN_LEG

TABLE - USERINSP

This field identifies the legibility of the posting sign using G (Good), F (Fair), P (Poor) or C (Critical).

STATE ITEM 172 - INTERCHANGE SKETCH NUMBER - XXX

AGENCY - BRIDGE

SKETCH_NO

TABLE - USERBRDG

This field identifies the page number of the appropriate schematic sketch of an interchange in which the structure is located.

STATE ITEM 173 - SPECIAL STRUCTURE CODE - XX

AGENCY - BRIDGE

SPEC_STRUC_CODE

TABLE - INSPEVNT

This code is used to supplement the Federal Structure Types. This code will indicate a special type of design and/or construction. This is a user define table and will be maintained by the Central Office.

<u>CODE</u>	<u>DESCRIPTION</u>
01	Low water
02	Bailey Bridge
03	Covered bridge
04	Army H 10
05	Stabilized Fill
06	Pin and Hanger (Non Redundant)
07	Pin and Hanger (Redundant)
08	Curved Girder
09	Bebo Arch (NOVA District request)
10	Combination Pin & Hanger and Curved Bridge (NOVA District request)
11	Integral Backwalls (Integral Abutments are coded in State Item 19)
12	Metal culvert with concrete placed in the flowline (Lynchburg District request)
13	Hinge Pin (no link) (Richmond District request)
14	Modified Stabilized Earth (MSE) Walls present
15	Metal Culverts – Asphalt coated
16	Encroachment present
17	Pre-Cast Concrete Slab Span (Staunton District request)

STATE ITEM 176 - CRITICAL RECOMMENDATION INDICATOR - X

OBSOLETE

STATE ITEM 177 - CRITICAL RECOMMENDATION NOTICE DATE - XX/XX/XX

OBSOLETE

STATE ITEM 178 - CRITICAL RECOMMENDATION ACTION - X

OBSOLETE

STATE ITEM 179 - CRITICAL RECOMMENDATION STATUS CODE - X

OBSOLETE

STATE ITEM 180 - CRITICAL RECOMMENDATION ACTION DATE - XX/XX/XX

OBSOLETE

STATE ITEM 181 - CRITICAL RECOMMENDATION FOLLOW-UP INSPECTION - XX/XX/XX
OBSOLETE

STATE ITEM 182 - CRITICAL RECOMMENDATION REVIEW - DIV - XX/XX/XX
OBSOLETE

STATE ITEM 183 - CRITICAL RECOMMENDATION REVIEW - FHWA - XX/XX/XX
OBSOLETE

STATE ITEM 184 - PREVENTIVE MAINTENANCE CODE - X
OBSOLETE

STATE ITEM 185 - VIRGINIA HIGHWAY SYSTEM - X

AGENCY - ROADWAYS

VA_HWY_SYS

TABLE - USERRWAY

This is a single-digit code indicating the highway road system for this structure.

NOTE: This item should be coded exclusive of State Item 57 Maintenance Replacement Funding Code. It is possible for a structure to be located on the Secondary System and receive Interstate funding. For example, Route 600 over the interstate will receive interstate funding even though it carries a secondary system road.

<u>Code</u>		<u>Description</u>
I	Interstate Road System	Structures on an Interstate or on the frontage road of an Interstate, regardless of the jurisdiction in which they reside.
P	Primary Road System	Structures on a Primary or on the frontage road of a Primary, regardless of the jurisdiction in which they reside.
S	Secondary Road System	Structures on a Secondary and may cross an Interstate, may be on the frontage road of an Interstate or may be on the frontage road of a Primary. The structure is not within the limits of a municipality.
U	Urban Road System	Structures located within the limits of a municipality and not on an Interstate or a Primary or on the frontage road of an Interstate or a Primary. Structures can cross an Interstate or a Primary and still be part of the Urban Road System. (Structures not on an Interstate or Primary and located in and maintained by the counties of Arlington and Henrico are considered to be on the urban road system.)
O	Other	Structures not on one of the above systems.

STATE ITEM 186 - PAINT CLASSIFICATION - XX

AGENCY - BRIDGE

PAINT_SYS

TABLE - USERBRDG

This item is to be used for coding the type of paint system on the structure.

<u>Code</u>	<u>Description</u>
A	Aluminum topcoat with lead primer (old system #1, #2 and #3).
B	Color topcoat with lead primer (old system #2, #7, #8 and #50+).
C	Mastic topcoat with lead primer (old system #1, #2 and #14).
D	Various top coats with zinc rich primer or uncoated zinc rich primer (old system #4, #6 and system B).
E	A588 Steel - not painted (includes those structures where only the bearing assemblies were painted or galvanized)
F	A588 Steel - partially painted (system #4, #6 and systems B, B1 and B2).
G	A588 Steel - totally painted (system #4, #6 and systems B, B1 and B2).
H	* Galvanized or Metallized.
I	Other or several systems present.
X	Non-steel structure (not typically used for concrete structures).

* Galvanized and metallized structures are handled on the B-7 just like any other coating would be handled.

STATE ITEM 189 - PPMS PROJECT STATUS CODE - XX

AGENCY - BRIDGE

PROJECT_STATUS_CODE

TABLE - USERBRDG

This is a code that indicates the current status of a project as a whole. See PPMS table 109.

Examples: active, temporarily deferred, indefinitely deferred, advertised, awarded.