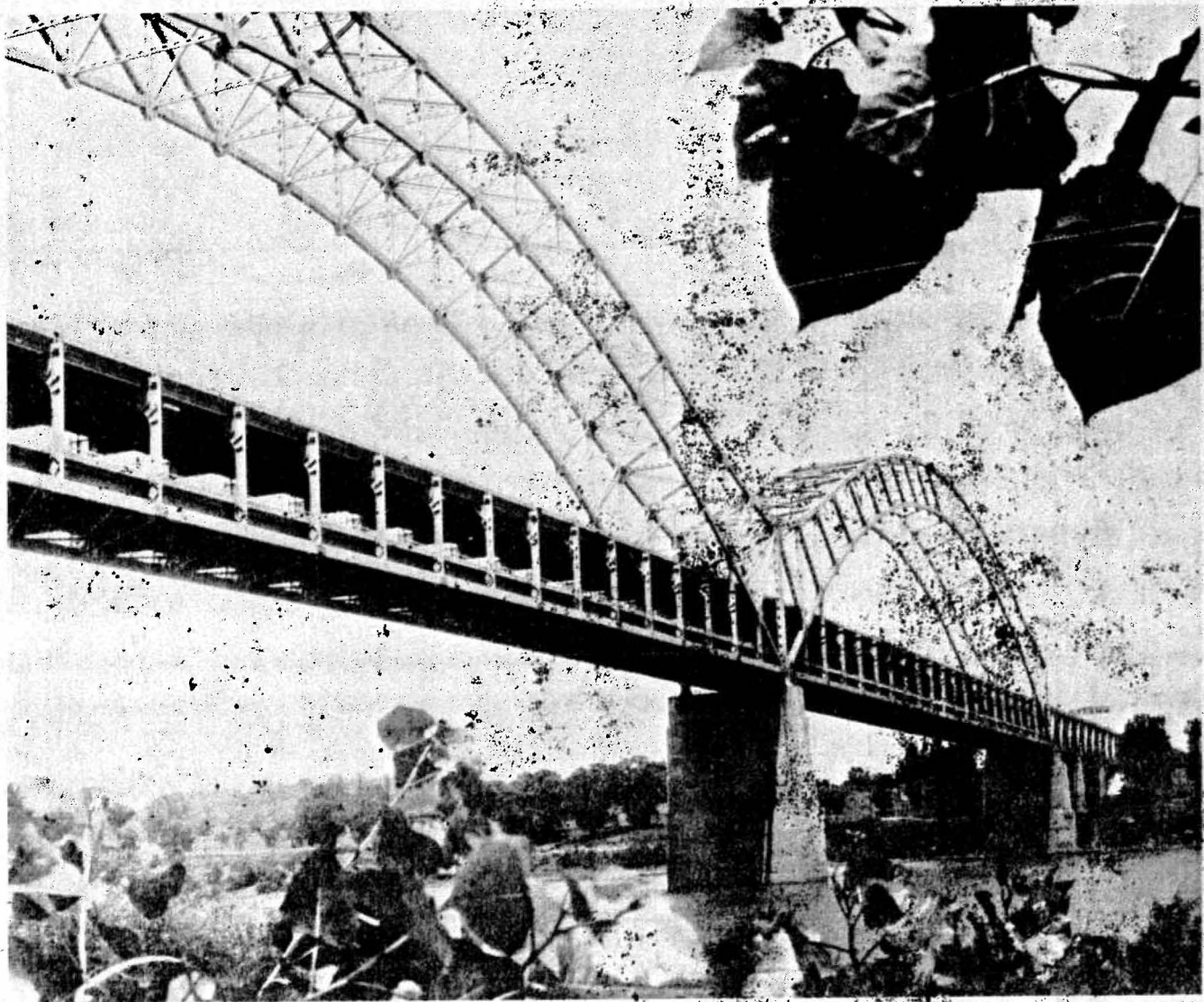


*John O'Halloran*  
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**RECORDING AND CODING GUIDE  
FOR THE STRUCTURE INVENTORY  
AND APPRAISAL  
OF THE NATION'S BRIDGES  
APRIL 1971**



U.S. DEPARTMENT OF TRANSPORTATION/FEDERAL HIGHWAY ADMINISTRATION



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WASHINGTON, D.C. 20591

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## INTRODUCTION

This Guide has been prepared for use by the States in recording and coding the data elements that will form a bridge inventory data base.

The data requested to be collected may appear to exceed that which is required to normally inventory the bridges on the Federal-Aid System; however, recent Legislation and anticipated Congressional inquiries render it mandatory that a thorough bridge inventory be maintained by the State.

It is only through having a complete and thorough inventory that an accurate report can be made to the Congress of the number and state of the Nation's bridges, arranged in a manner that would best suit needs for future Legislation.

Most of the identification and structural items should be available from the State highway departments, generally in the planning divisions. Several of the items are to be included in reports submitted to Federal government agencies. Two existing reports are the Highway Defense Requirements (Bridge Records) PPM 50-6.1 and Damage Assessment - Pre-attack Input, IM 50-10-68. Reports will be submitted in connection with the bridge replacement program and the bridge inspection program. Further, it is expected that the data items will be useful in planning activities such as the national highway needs study.

The AASHO Manual for Maintenance Inspection of Bridges (called AASHO Bridge Manual in this Guide) discusses the various items of information that are to be recorded as part of original bridge reports. That manual and the Bridge Inspector's Training Manual discuss inspection procedures and the preparation of detailed reports about the structure components. These reports will be the basis for recording values for many of the data elements shown in the Guide, particularly those having to do with the condition or the appraisal ratings.

This Guide is based on the revised Inventory and Appraisal Sheet that is included in the appendix. This form is intended to be a repository for the pertinent elements of information about an individual structure. Its use by the States is optional. At this time, it is not expected that the completed forms will be requested by the Federal Highway Administration. Any of the items shown may be requested from time to time, however.

The table on page 31 of the appendix, shows the items that either are presently reported to, or are expected to be requested by FHWA. It is suggested that the coding scheme in this Guide be used for these items. The use of this Guide is optional; i.e., each State may use its own code scheme. However, when data are requested, whether in tabular or in computer record form, the format will be based on the codes in this Guide. If a State chooses to use its own codes, it should provide for translation or conversion to those in this Guide. Data in tabular form only are requested at present although future needs may alter submittal procedures.

The evaluation of the comments solicited in January 1971, resulted in dropping several items from the Inventory and Appraisal Sheet. The State may use the blank items for other data elements.

In summary, the States are responsible for having the capability to obtain, store, and report certain information about bridges whether or not this Guide or the Inventory Sheet are used. Any requests for submittals of these data by FHWA will be based on the definitions, explanations, and codes supplied in this Guide, the AASHO Bridge Manual, and the Bridge Inspector's Training Manual.

IDENTIFICATION CODE

Item 1 - State Code

3 digits

The codes given below are based on a code scheme presently being used with bridge data reported to NRAC. Use this three-digit code when submitting data for Pre-attack Input Damage Assessment (see IM 50-10-68). This is the only existing periodic submission involving bridge data that require a specific State code. The code has been adopted for use here, rather than establish a new code scheme or use one that has not heretofore been associated with bridge data. The three digits represent, left to right, the Office of Civil Defense region code, the State code within OCD region, and the code for FHWA region. If another code is preferred, it is suggested that the Interstate Cost Estimate code be used.

State Codes

<u>State</u>	<u>Code</u>	<u>State</u>	<u>Code</u>
313	Alabama	141	New Hampshire
717	Arizona	151	New Jersey
516	Arkansas	539	New Mexico
727	California	161	New York
619	Colorado	353	North Carolina
111	Connecticut	665	North Dakota
212	Delaware	252	Ohio
323	Florida	546	Oklahoma
333	Georgia	848	Oregon
828	Idaho	262	Pennsylvania
414	Illinois	171	Rhode Island
424	Indiana	363	South Carolina
625	Iowa	675	South Dakota
635	Kansas	373	Tennessee
234	Kentucky	556	Texas
526	Louisiana	759	Utah
121	Maine	181	Vermont
242	Maryland	272	Virginia
131	Massachusetts	858	Washington
434	Michigan	282	West Virginia
445	Minnesota	454	Wisconsin
343	Mississippi	689	Wyoming
645	Missouri	818	Alaska
838	Montana	737	Hawaii
655	Nebraska	222	Dist. of Columbia
747	Nevada	191	Puerto Rico

Item 2 - State Highway Department District

2 digits

The highway district in which the bridge is located should be represented by a two-digit code. Existing district numbers should be used where districts are identified by number. Where districts are identified by name, a code number should be assigned based on an alphabetical listing of the districts.

Item 3 - County (Parish)

3 digits

Counties should be identified with the code scheme specified by the instructions for preparing the Bridge Records for Defense Report. These instructions currently are contained in PPM 50-6.1 and IM 50-2-69.

Item 4 - City/Town Code

4 digits

Cities and towns should be identified according to the instructions noted above in item 3.

Item 5 - Inventory Route

9 digits

The principal route shall be the route at the structure, regardless of whether it is on or under the structure, that is considered to be the major route according to the system hierarchy shown below for the second code position. When two similar system routes intersect at the structure, the one with the lowest route number shall be the principal route. In some cases, concurrent routes, or the route on and the route under, have similar route numbers that are differentiated by a directional letter suffix (70, 70S, or 70N). In such cases, the lower route number should be decided based upon the order of the codes given for the last code position below. Route 70N, for example, would be a lower route number than Route 70S.

In the case of a multiple level interchange at which two or more routes intersect, the principal route for all structures in the interchange will be selected from the intersecting routes according to the hierarchy below.

Item 5 - Inventory Route (con.)

The structure must be located on the principal route at the structure. It also may be considered useful to locate the structure on other important routes that intersect the principal route. For a multilevel interchange, in effect, the interchange rather than an individual structure, would be located on the routes. This is because a central point of the interchange would have to be selected as the point for locating all the structures in the interchange.

The route number should be recorded in this item and the appropriate box should be checked to indicate if the route number given is the principal route or is another significant route. Note that a separate Inventory Sheet is required for each "other" route. However, only as many of the first 16 items as are applicable need be recorded for "other" route. All items will be recorded on the principal route sheet. These sheets may be correlated through the structure number.

The "other" route will be any route on which it is desirable to have the position of the structure recorded. This could range anywhere from a city street to an Interstate highway. Whether or not to record data for "other" routes will involve some judgment about how important the routes are to the structures and vice versa. When coding the data value for this item, a nine-digit number will be used for full identification.

The first position (leftmost) will indicate if the route is the principal or other route:

- 1 Principal Route
- 2 Other Route

The second position shall identify the kind of highway:

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

Item 5 - Inventory Route (con.)

The next position should identify highways that are designated as:

- 0 None of below
- 1 Mainline
- 2 Alternate
- 3 Bypass
- 4 Spur
- 5 Toll roads
- 6 Business
- 7 Ramp or Wye
- 8 Service and/or unclassified frontage road
- 9 Truck route

The route number should be right-justified in the next five positions (see example below).

The last position indicates the directional suffix to the route number when one is part of the route number. It should be coded:

- 0 Not applicable
- 1 North
- 2 East
- 3 South
- 4 West

Examples:

		Code
Principal Interstate 95	1 1 1 00095 0	111000950
Other Interstate 70S	2 1 1 00070 3	211000703
Other State Highway		
104 Spur	2 3 4 00104 0	234001040
Other City Street	2 5 0 00000 0	250000000
Principal U.S. 30E		
Bypass	1 2 3 00030 2	133000302



#### Item 6 - Features Intersected

The information to be recorded for this item will be the name or names of the features intersected by the structure whether the features are over or under structures. This information is required by the AASHO Bridge Manual to be a part of a bridge report. It is not considered necessary to code this information for machine processing. When "other" route is inventoried, Principal Route for the structure should be one of the features recorded in this item for the "other" route.

#### Item 7 - Facility Carried by Structure

The facility being carried by this structure should be recorded. For example, S to W Ramp, Ramp from I-495 to I-95, C & O Railroad, Great Eastern Pipeline and others. It is not necessary to code this information.

#### Item 8 - Structure Number

The AASHO Bridge Manual requires 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.

#### Item 9 - Location

This item will contain on the recording form a narrative description of the bridge location. It is recommended that the location be keyed to a distinguishable feature on an official highway department map. Examples are: road junctions and topographical features. It is not necessary to code the item.

#### Item 10 - Blank

Item 11 - Milepoint

5 digits

If a milepoint location reference system is being used in the State, the milepoint location of the structure should be recorded and coded. The milepoint will refer to the beginning (or other point the State uses) of the bridge in the direction of increasing mileage. Code a five-digit number to represent the milepoint to hundredths of a mile. Code all zeros if a milepoint location cannot be determined or is not appropriate.

Item 12 - Road Section Number

4 positions

If the bridge is on a designated defense highway, record and code the four-digit road section number that has been assigned according to the instructions in PPM 50-6.1, "Highway-Defense Requirements (Bridge Records)" and IM 50-10-68(2). The number should be right justified in the first three spaces as shown in the examples below. If the bridge is not on a defense highway, the item may be left blank or coded with zeros.

Example:

<u>Road Section Number</u>	<u>Code</u>
3	003
12	012
122 A	122 A

Item 13 - Defense Bridge Letter

3 positions

If the bridge is on a designated defense highway, record and code the bridge letter identification that has been assigned according to PPM 50-6.1. The coding should be left justified in the three position field. If the bridge is not on a defense highway, the item may be left blank or coded with zeros.

Item 14 - Defense Milepoint

5 digits

If the bridge is on a defense highway, record and code the number of miles to the nearest tenth that the bridge is from the beginning of the defense road section (Item 12). If the bridge is not on a defense highway, the item may be left blank or coded with zeros.

Item 15 - Defense Section Length

3 digits

If the bridge is on a defense highway, record and code the length of the Road Section (Item 12) to the nearest tenth of a mile. See IM 50-10-68, "Damage Assessment - Pre-attack Input," and IM 50-10-68(2), "Pre-attack Input," for additional instructions. The length should be coded as a three-digit number. If the bridge is not on a defense highway, the item may be left blank or coded with zeros.

Item 16 - Latitude

5 digits

For bridges on defense highways, record and code the latitude of each in degrees, minutes, and tenths of minutes. The point of the coordinate may be the beginning of the bridge in the direction of inventory or any other point the State has chosen to use. Coordinates must be provided for all bridges on designated defense highways. Refer to IM 50-10-68.

Example:

35° 27.3'

Code 35273

Item 17 - Longitude

6 digits

Longitude should be recorded and coded as instructed in Item 16 except that a six-digit code will be needed.

Example:

81° 5.8'

Code 081058

Item 18 - Physical Vulnerability

1 digit

If the bridge is on a designated defense highway, record and code the Physical Vulnerability of the bridge according to the instructions in IM 50-10-68. The code, which is based on the type of structure reported in the Bridge Records for Defense tables, is repeated below. If the bridge is not on a defense highway, the item may be left blank or coded with a zero.

Item 18 - Physical Vulnerability (con.)

- 1 Timber Trestle
- 2 Concrete girder
- 3 Steel girder
- 4 Cantilever and truss
- 5 Suspension
- 6 Reinforced concrete - massive arch
- 7 Dam bridge
- 8 Box culverts
- 9 Tunnels
- 0 No structure

Item 19 - Bypass, Detour Length

2 digits

If ground level bypass is available at structure site, record and code detour length as zero. Otherwise, indicate actual length of feasible detour to the nearest mile. Code "99" for 99 miles or more.

Item 20 - Toll

1 digit

The appropriate box on the Inventory Sheet should be checked. One of the codes given below should be used.

- 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.

Item 21 - Custodian

1 digit

The actual name of the custodian of the structure will be recorded. In the absence of a clear designation, the custodian will be the agency responsible for maintaining the structure. The codes below should be used to represent the type of agency that is the custodian.

- 1 State highway department
- 2 Other State agency
- 3 County agency
- 4 City or other local agency
- 5 Federal agency
- 6 Railroad
- 7 Other private
- 8 Combination
- 9 Unknown

Item 22 - Owner

1 digit

The actual name of the owner of the bridge should be recorded on the inventory sheet. The codes shown above in Item 21 should be used here to indicate the owner.

Item 23 - Federal-Aid Project Number

If Federal funds have been used for construction or reconstruction of this structure, the Federal-Aid project number of the most recent project should be recorded. It is not necessary to code the project number.

Item 24 - Federal-Aid System

2 digits

The information to be recorded and the codes to be used should be those shown below. These codes were taken from page C-4 of Appendix C of the Guide for Trucking Characteristics Study Manual, which was distributed to the States with FHWA Notice dated November 12, 1970. An addition for Federal-Aid Urban System has been added. The most applicable code should be used for any case that does not seem to have an appropriate code. A frontage road, for example, can be coded according to the system of the adjacent mainline roadway.

Item 24 - Federal-Aid System (con.)

<u>Code</u>	<u>System</u>
01	Interstate, rural, open to traffic
02	Interstate, urban, open to traffic
03	Other FA primary, rural
04	Other FA primary, urban
05	FA secondary rural, State jurisdiction
06	FA secondary urban, State jurisdiction
07	FA secondary rural, local jurisdiction
08	FA secondary urban, local jurisdiction
09	Other State highways, rural (Non-FA)
10	Other State highways, urban (Non-FA)
11	Local rural roads
12	Local city streets
14	Federal-Aid Urban

The coding for toll roads is as follows: For toll roads on which trucks are permitted, add 20 to the appropriate system code above. For example, code 24 would be a toll facility on the Federal-aid primary urban system. For toll parkways on which trucks are not permitted, 60 should be added to the appropriate system code.

Item 25 - Administrative Jurisdiction

1 digit

Use the codes shown on the worksheets for the Needs Study:

- 1 State
- 2 Federal domain
- 3 Toll
- 4 Other existing (which includes county and local jurisdiction)
- 5 New

Item 26 - Functional Classification

2 digits

Use the functional classification code for the section as determined and assigned for the Functional Classification Study. It is suggested that the 1990 classification code be used. The codes given below are for that year.

Item 26 - Functional Classification (con.)

Population	<u>Urban Code</u>				<u>Functional System</u>	<u>Rural Code</u>
	5-10	10-25	25-50	50+		
	11	21	31	41	Interstate	01
	12	22	32	42	Other Freeway & Expressway	-
	13	23	33	43	Other Principal Arterial	02
	14	24	34	44	Minor Arterial	03
	15	25	35	45	Collector	-
	-	-	-	-	Major	04
	-	-	-	-	Minor	05

STRUCTURAL DATA

Item 27 - Year Built

4 digits

Record and code both the year of construction and latest year of major reconstruction of the structure. Code the last two digits of the years in which construction or reconstruction of the structure was completed. A code of "00" in the first two positions should be used for years 1900 and earlier.

Example:

Built 1928	No reconstruction	Code 2800
Built 1914	Reconstruction 1960	1460
Built 1898	Reconstruction 1948, 1964	0064

Item 28 - Lanes on Structure

4 digits

Code the number of through lanes being carried by the structure as a two-digit number. Also, code the total number of through lanes being crossed over by the structure as a two-digit number. This will be a four-digit field consisting of two subfields containing the two values. The codes should be right-justified in each of the subfields.

Example:

16 lanes on (double-level), 0 lanes under	Code 1600
8 lanes on, 12 lanes under (6 city streets)	0812

Item 29 - Average Daily Traffic

6 digits

Code a six-digit number that shows the average daily traffic volume being carried by the structure. Make certain the units position is coded even if estimates of ADT are determined to tens or hundreds of vehicles, that is, appropriate trailing zeros should be coded.

Volume	540	code	000540
	15600		015600
	24000		024000

Item 30 - Year of Average Daily Traffic

Record the year represented by the ADT above as specified in the AASHO Maintenance Inspection Manual. It is not necessary to code this item.

Item 31 - Design Load

1 digit

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 H loadings given below.

- 1 H 10
- 2 H 15
- 3 HS 15
- 4 H 20
- 5 HS 20
- 6 HS 20+Mod
- 7 Pedestrian
- 8 Railroad
- 9 Other (Describe on recording form)
- 0 Unknown

Item 32 - Approach Roadway Width

3 digits

Code, to the nearest foot, a three-digit number that represents the normal width of the roadway approaching the structure. This dimension will include the widths of the shoulders. For closed median structures, the approach median width at the normal point should be included in this dimension. When there is a variation between the approaches at either end of the structure, record and code the most representative.



Item 32 - Approach Roadway Width (con.)

Example:

<u>Left Shoulder</u>	<u>Left Roadway</u>	<u>Median</u>	<u>Right Roadway</u>	<u>Right Shoulder</u>	<u>Code</u>
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

Item 33 - Bridge Median

1 digit

Indicate with a one-digit code if the median is non-existent, opened or closed. The median is closed when the area between the two roadways at the structure is bridged over.

0	None
1	Open
2	Closed

Item 34 - Skew

2 digits

The AASHO Manual for Maintenance Inspection of Bridges (page 22) provides instructions for recording the skew angle of the structure. The skew should be recorded to the nearest degree. 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 a "99" to indicate a major variation in skews of sub-structure units. A two-digit number should be coded.

Example:

Skew	Code
10°	10
8°	08
29°	29

Item 35 - Structure Flared

1 digit

The appropriate box on the form should be checked to indicate whether or not 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. Code a "1" or "0" for Yes and No, respectively.

Item 36 - Blank

Item 37 - Blank

Item 38 - Navigation Control

1 digit

Indicate for this item whether or not navigation control exists. Code "1" or "0" for Yes and No, respectively.

Item 39 - Navigation Vertical Clearance

3 digits

If Item 38 has been coded "1," record in feet the minimum clearance imposed at the site as measured above a datum that is specified on a navigation permit issued by a control agency. This measurement will show the clearance that is allowable for navigation purposes. The measurement should be coded as a three-digit number as shown in the examples. If Item 38 has been coded "0," code all zeros for this item to indicate not applicable or leave blank.

Example:

Actual	Record	Code
75.0 ft.	75	075
150.0 ft.	150	150
20.6 ft.	21	021

Item 40 - Navigation Horizontal Clearance

4 digits

If Item 38 has been coded "1," record for this item the minimum horizontal clearance in feet. This measurement should be that shown on a navigation permit and may be less than the structure allows. Code the clearance as a four-digit number. Code all zeros if Item 38 is coded "0" or leave blank.

Item 40 - Navigation Horizontal Clearance (con.)

Example:

95 ft.	code	0095
538 ft.	"	0538
1200 ft.	"	1200

Item 41 - Blank

Item 42 - Type Service

2 digits

This item is intended to show the type of service on the bridge and the type of service under the bridge. The person recording data on the form for this item will also record the proper code at that time. The service types for this item will be indicated by a two-digit code. The first digit is for the service on the bridge as follows:

- 1 Highway
- 2 Railroad
- 3 Pedestrian exclusively
- 4 Highway-railroad
- 5 Highway-Pedestrian
- 6 Second level (Interchange)
- 7 Third level (Interchange)
- 8 Fourth level (Interchange)
- 9 Building or plaza
- 0 Other

The second digit will indicate the type of service under the bridge:

- 1 Highway, with or without pedestrian
- 2 Railroad
- 3 Pedestrian exclusively
- 4 Highway-railroad
- 5 Waterway
- 6 Highway-waterway
- 7 Railroad-waterway
- 8 Highway-Railroad-waterway
- 9 Relief
- 0 Other

When recording the data the proper code should be entered at the same time. The code used will be for the main span. The first digit of the three-digit code will indicate type of design and kind of material and the second and third digits will indicate type design and/or of construction.

TYPE OF STRUCTURE

1st Digit		2nd and 3rd Digits	
1	Concrete	01	Slab
2	Concrete continuous	02	Stringer/Multi-beam or girder
3	Steel	03	Girder and Floorbeam System
4	Steel continuous	04	Tee Beam
5	Prestress concrete	05	Box Beam or Girders - Multiple
6	Prestress concrete continuous	06	Box Beam or Girders - Single or Spread
7	Timber	07	Frame
8	Masonry	08	Orthotropic
9	Aluminum, W.I. or C.I.	09	Truss - Deck
0	Other	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
		00	Other

Examples:

Timber Through Truss	Code	710
Masonry Culvert		819
Steel Suspension		313
Continuous Concrete Multiple Box Girders		205
Simple Span Concrete Slab		101
Tunnel in Rock		018

Item 44 - Structure Type, Approach Spans

3 digits

Indicate with a three-digit code the type of structure in the approach spans to a major bridge or in the spans where the structural material is different. The codes are the same as for Item 43 preceding. However, code zeros if this item is not applicable. Use code "20" when no one type of design and/or construction is predominate in the approach units. If design and/or material is varied, code the first digit as "0."

Examples:

Simple prestress concrete I-Beam	502
Continuous concrete T-Beam	204
Continuous deck truss	409

Item 45 - Number of spans in Main Unit

3 digits

Record the number and indicate with a three-digit code 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.

Item 46 - Number of Approach Spans

4 digits

Record the number and indicate with a four-digit code 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.

Item 47 - Blank

Item 48 - Length of Maximum Span

4 digits

The length of the maximum span should be recorded. The measurements should be as specified in Section 3.2.2 of the AASHO Bridge Maintenance Manual. The manual allows measurement to be made at two different points to the tenth of a foot. For this item, record and code a four-digit number to represent the measurement, however taken, to the nearest foot.

Example:

50 feet	code	0050
117 "	"	0117
1,050 "	"	1050

Item 49 - Structure Length

6 digits

Record and code a six-digit number to represent the length of the structure to the nearest foot. The length should be measured back to back of backwalls of abutments as specified in Section 3.2.2 of the AASHO Bridge Maintenance Manual.

Example:

50 feet	Code	000050
5421 "	"	005421
333 "	"	000333
101,235 "	"	101235

Item 50 - Sidewalk Widths

6 digits

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

Example:

Left side	Right side	Code
None	8.3'	000083
10.0	4.1'	100041
8.3	None	083000
12.1	11.5	121115

Item 51 - Bridge Roadway Width, Curb to Curb

4 digits

The information to be recorded is the distance between curbs on the structure roadway. If the median is covered at the structure, the distance will be between the outside curbs of the structure; i.e., the distance will include both roadways and the median widths. The measurement should be exclusive of flared areas for ramps; i.e., it should be the minimum or nominal width. When a brush curb (9" or less) is used, record and code the measurement to face of parapet, guardrail, or railing. A four-digit code should be used to represent the distance to the nearest tenth of a foot.

Example:

36.0' side	code	0360
110.13'		1101
66.37'		0664

Item 52 - Deck Width

4 digits

Record and code a four-digit number to show the out-to-out width of the deck 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 super-structure members. The measurement should be exclusive of flared areas for ramps, i.e., it should be the minimum or nominal width.

Item 53 - Minimum Vertical Clearance Over Bridge Roadway

4 digits

The information to be recorded for this item is the minimum vertical clearance over the bridge roadway as required in PPM 50-6.1, "Highway-Defense Requirements (Bridge Records)" with the measurement to be made to the nearest inch. The vertical clearance should be the maximum permissible for a selected 10 foot wide path of travel where the clearance is the greatest. Where no super-structure exists above the bridge a roadway and clearance is therefore unlimited, code 9999. A four-digit number should be coded to represent feet and inches.

Example:

Clearance 18'-3"	Code 1803
14'-4"	1404
150'-0"	9999
Unlimited	9999

Item 54 - Minimum Vertical Underclearance

4 digits

Record and code a four-digit number to represent in feet and inches, the minimum vertical clearance from the roadway or railroad track beneath the structure to the underside of the super-structure. Code zeros for structures over any other features.

Item 55 - Minimum Lateral Underclearance on Right

3 digits

If the feature beneath the structure is either a railroad or highway, code a three-digit number to represent the minimum lateral clearance on the right. If the feature is not a railroad or highway, code "999" to indicate not applicable. The lateral clearance should be measured to the nearest tenth of a foot from the right edge of the roadway, or from the centerline (between the rails) of the right-hand track in the case of a railroad, to the substructure unit--pier, abutment, etc.-- or to the toe of slope steeper than three to one. The underclearance 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.

Item 56 - Minimum Lateral Underclearance on Left  
(for Divided Highways Only)

3 digits

The minimum clearance on the left (median side) of the roadway beneath the structure regardless of the direction of travel, is to be recorded. As was explained in Item 55, the clearance on the left in both directions of travel should be measured and the smaller distance recorded. The clearance is to be measured from the left edge of roadway to the nearest substructure unit or any median barrier. In the case of a dual highway where there is no obstruction in the median area, a notation of "open" should be recorded and "999" should be coded. A three-digit code to represent the distance to the nearest tenth of a foot should be used.

Item 57 - Wearing Surface

1 digit

The kind of wearing surface material on the structure should be recorded. One of the codes given below should be used to represent the wearing surface material.

- 1 Concrete
- 2 Asphalt
- 3 Block
- 4 Open grate
- 5 Wood planking
- 6 Asphalt with known membrane (This should be recorded and coded from office records only, not field determined.)

CONDITION

Items 58 through 65, with the exception of items 63 and 64 will be coded with a one-digit code that indicates the condition rating for the items. The ratings and codes are:

- 9 New condition
- 8 Good condition - no repair necessary
- 7 Minor items in need of repair by maintenance forces
- 6 Major items in need of repair by maintenance forces
- 5 Major repair contract needs to be let
- 4 Minimum adequacy to tolerate present traffic  
immediate rehabilitation necessary to keep open
- 3 Inadequacy to tolerate present heavy load - warrants  
closing bridge to trucks
- 2 Inadequacy to tolerate any live load - warrants  
closing bridge to all traffic
- 1 Bridge repairable, if desirable to reopen to traffic
- 0 Bridge conditions beyond repair - danger of immediate  
collapse



The determination of which of the above ratings apply to each of the items will be based on an evaluation of all the relevant factors and information that are included in the detailed inspection reports. The rating chosen for each of these items will, in effect, be a composite of all of the relevant factors. It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. It is recognized that there are unique situations, but, again, it is expected that some judgment will be used.

For additional explanations or definitions relating to these items, the AASHO Bridge Inspection Manual and Bridge Inspector's Training Manual should be used.

These statements apply equally to Items 67-72.

Item 58 - Deck 1 digit

This item refers to the riding surface, deck slab or plate, wearing surface, any fixed or expansion joint devices, and railings, parapets or other safety features.

Item 59 - Superstructure 1 digit

This item includes all structural members, bearing devices and any drainage system.

Item 60 - Substructure 1 digit

This item includes piers, abutments, piles, fenders, footing scour conditions, or other.

Item 61 - Channel and Channel Protection 1 digit

Stream stability and condition of riprap, spur, dike, etc., are included in this item.

Item 62 - Culvert and Retaining Walls 1 digit

This item includes culvert alignment or settlement problems, retaining wall stability and structural integrity.

Item 63 - Estimated Remaining Life

2 digits

The remaining life of the structure should be estimated based on all related and appropriate factors such as material, traffic volumes, age, and other. The estimate, which should be made using the best judgment of a knowledgeable individual, should reflect the remaining life without major reconstruction. Use a two-digit code to show the remaining life.

Example:

4 years remaining	code 04
15 years remaining	15

Item 64 - Operating Rating

3 digits

Record for the critical vehicle the operating rating as explained in Section 4.1 of the AASHO Manual for Maintenance Inspection of Bridges 1970. A three-digit code should be used. The first digit will show the type of loading:

1	H truck	6	3-3 trailer
2	HS truck	7	Railroad loading
3	Alternate Interstate loading	8	Pedestrian or special loading
4	3-axle truck (type 3)	9	Gross load only given
5	3-S semi-trailer		

The second and third digits will give the gross loading in tons, except pedestrian and railroad loading. For railroad loading only, the second and third digits will give Cooper Class or equivalent load. Code pedestrian loading as "800."

Example:

3-S semi-trailer, 72000 pounds code 536

Item 65 - Approach Roadway Alignment

1 digit

For this item, give the rating in relationship to the effect on the use of bridge.

Item 66 - Inventory Rating

3 digits

The inventory rating is referred to in Section 4.1 of the AASHO manual named in Item 64. Use the same code scheme given in Item 64.

## APPRAISAL

Items 67 through 72 will be coded with a one-digit code that indicates the condition rating for the item. The ratings and codes are:

- 9 Conditions superior to present desirable criteria
- 8 Condition equal to present desirable criteria
- 7 Condition better than present minimum criteria
- 6 Condition equal to present minimum criteria
- 5 Condition somewhat better than minimum adequacy to tolerate being left in place as is
- 4 Condition meeting minimum tolerable limits to be left in place as is
- 3 Basically intolerable condition requiring high priority of repair
- 2 Basically intolerable condition requiring high priority of replacement
- 1 Immediate repair necessary to put back in service
- 0 Immediate replacement necessary to put back in service

Refer to the statements following condition ratings for items 58-65.

Item 67 - Structural Condition 1 digit

Record major structural deficiencies and code the rating.

Item 68 - Deck Geometry 1 digit

This item refers to adequacy of roadway width, clearances above deck, and other.

Item 69 - Underclearances - Vertical and Lateral 1 digit

This item refers to the vertical and horizontal underclearances from the through roadway to the superstructure or substructure units, respectively.

Item 70 - Safe Load Capacity 1 digit

Record deficiencies and code rating in accordance with appropriate system criteria.

Item 71 - Waterway Adequacy 1 digit

This item describes the waterway adequacies and all scour erosion, condition of slope protection, stream capacity, etc., should be recorded.

Item 72 - Approach Roadway Alignment 1 digit

Code the rating based on the adequacy of the approach roadway alignment.

PROPOSED IMPROVEMENTS

Item 73 - Year Needed 2 digits

The information to be recorded for this item will be the year improvements are estimated to be needed. The determination of the year can be made through the State's normal highway planning procedures. A two-digit number will be coded to represent this information. Use zeros to indicate "no answer" or "improvement not needed."

Example

Improvement Needed	Code
1970	70
1975	75
Not given	00
None needed	00

Item 74 - Type of Service 1 digit

Use the codes as shown in Item 42 to represent the type of service to be provided.

Item 75 - Type of Work 3 digits

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 specified in Item 74. A two-digit number should be coded to represent the proposed work type. The codes below are similar to those used in preparing Form PR-37 for highway safety improvements:

Item 75 - Type of Work (con.)

- 30 Widening existing bridge or other major structure
- 31 Replacement of bridge or other structure because of condition
- 32 Replacement of bridge or other structure because of relocation of road
- 33 Construction of new bridge or major structure (except to eliminate a railroad grade crossing or one for pedestrians only)
- 34 Construction of pedestrian over - or under - crossing
- 35 Other structure work
- 36 Strengthening
- 37 Rehabilitation

In addition, a one-digit suffix code should be used to indicate whether the proposed work is to be done by force account or by contract.

Contract	code 1
State forces	2

Code all zeros if not applicable.

Example:

Strengthen existing structure by contract 361

Item 76 - Length of Improvement

6 digits

Code a six-digit number that represents the length of the proposed improvement to the nearest foot. This length will not necessarily be the full length of the structure. Code zeros if not applicable.

Example:

Length of Improvement	Code
250 feet	000250
1200 "	001200
12345 "	012345

Item 77 - Proposed Design Loading of Improvement

1 digit

Use the codes as specified in Item 31 to show the design loading proposed for the improvement. Code zeros if not applicable.

Item 78 - Proposed Roadway Width 4 digits

Code a four-digit number to represent the width of the proposed reconstruction roadway to the nearest foot. The width will be from curb to curb or from face to face of rails if the curbs are 9 inches or less in width. Code zeros if not applicable.

Item 79 - Proposed Number of Lanes 2 digits

Code a two-digit number to indicate the number of lanes proposed as part of the improvement. Code zeros if not applicable.

Item 80 - Design ADT 6 digits

Code a six-digit number to represent the ADT which controls the design of the new improvement. The ADT should be to the nearest ten and coded as shown in Item 29. Code zeros if not applicable.

Item 81 - Year of Estimated ADT 2 digits

Code a two-digit number to represent the last two digits of the year of the stimated ADT given in Item 80. Code zeros if not applicable.

Item 82 - Year of Proposed Adjacent Roadway Improvements 2 digits

Code a two-digit number to represent the last two digits of the year in which it is expected that improvements to the roadway approaches to the bridge will take place. Code zeros if not applicable.

Item 83 - Type of Proposed Adjacent Roadway Improvements 1 digit

Code a one-digit number to represent the type of improvement proposed for approaches to the bridge. Use the following codes:

- 0 Not applicable
- 1 Resurface
- 2 Reconstruction
- 3 Widening
- 4 Shoulder improvements
- 5 Other (Explain in remarks)

Item 84 - Cost of Improvements

5 digits

Code a five-digit number to represent the total cost of the proposed improvements to thousands of dollars.

Example:

Cost of improvement	Code
\$ 55,850	00056
250,000	00250
7,451,233	07451

REMARKS

In addition to any other applicable statements, remarks must include a statement of action taken, if any, pursuant to findings of inspection.





Appendix

CHECK LIST OF REPORTABLE ITEMS

At this time, it is anticipated that only those items with an "x" will be submitted in either raw data or tabular form to any of the organizations shown in the column headings. Raw data submittals will require using the codes and requests for tabular submittals will be based on the codes given in the Guide.

<u>Item</u>	<u>Title</u>	<u>Defense</u>	<u>Pre-attack</u>	<u>Bridge</u>	<u>Plannin</u>
		<u>Record</u> FHWA	<u>Record</u> NRAC	<u>Division</u>	<u>Divisio</u>
1	State Code		x		
2	Highway District				
3	County	x	x	x	
4	City/Town	x	x	x	
5	Inventory Route	x	x	x	x
<hr/>					
6	Features intersected				
7	Facility carried by structure				
8	Structure Number				
9	Location				
10	Blank				
<hr/>					
11	Milepoint				x
12	Road Section Number	x	x		
13	Bridge Letter	x	x		
14	Defense Milepoint	x			
15	Defense Section Length		x		
<hr/>					
16	Latitude		x		
17	Longitude		x		
18	Physical Vulnerability		x		
19	Bypass, Detour Length			x	x
20	Toll			x	
<hr/>					
21	Custodian			x	
22	Owner			x	
23	Federal-Aid Project No.				
24	Federal-Aid System			x	x
25	Administrative				x
<hr/>					
26	Functional Classification				x
27	Year Built	x		x	x
28	Lanes On/Under Structure			x	
29	ADT	x		x	x
30	Year of ADT				

Appendix

<u>Item</u>	<u>Title</u>	<u>Defense</u>	<u>Pre-attack</u>	<u>Bridge</u>	<u>Planning</u>
		<u>Record</u>	<u>Record</u>	<u>Division</u>	<u>Division</u>
		FHWA	NRAC		
31	Design Load	x		x	x
32	Appr. Roadway Width			x	
33	Bridge Median			x	
34	Skew			x	
35	Structure Flared			x	
<hr/>					
36	Blank				
37	Blank				
38	Navigation Control				
39	Nav. Vertical Clearance				
40	Nav. Horizontal Clearance				
<hr/>					
41	Blank				
42	Type Service	x		x	x
43	Structure Type, Main			x	x
44	Structure Type, Approach			x	x
45	No. Spans, Main			x	
<hr/>					
46	No. Approach Spans			x	
47	Blank				
48	Maximum Span Length	x		x	
49	Structure Length	x			x
50	Sidewalk Widths				
<hr/>					
51	Bridge Roadway Width			x	
52	Deck Width				
53	Vert. Clearance Over Deck	x			
54	Underclearance-Vertical	x			
55	Underclearance-Right				
<hr/>					
56	Underclearance-Left			x	
57	Wearing Surface Material			x	x
<hr/>					
CONDITION RATED ITEMS					
58	Deck			x	
59	Superstructure			x	
60	Substructure			x	
<hr/>					
61	Channel & Channel Protection			x	
62	Culvert and Retaining Walls			x	
63	Estimated Remaining Life			x	
64	Operating Rating	x		x	
65	Approach Roadway			x	
66	Inventory Rating	x		x	

Appendix

<u>Item</u>	<u>Title</u>	<u>Defense Record</u> FHWA	<u>Pre-attack Record</u> NRAC	<u>Bridge Division</u>	<u>Planni Divisi</u>
APPRAISAL RATED ITEMS					
67	Structural Condition			x	
68	Deck Geometry			x	
69	Underclearances			x	
70	Safe Load Capacity			x	
<hr/>					
71	Waterway Adequacy			x	
72	Approach Alignment			x	
PROPOSED IMPROVEMENTS					
73	Year Needed			x	
74	Type of Service			x	
75	Type of Work			x	
<hr/>					
76	Length				
77	Design Loading				
78	Roadway Width				
79	Number of Lanes				
80	ADT, Design			x	
<hr/>					
81	Year of Estimated ADT			x	
82	Year Adjacent Roadway Improvements				
83	Type Adjacent Roadway Improvements				
84	Cost			x	



# STRUCTURE INVENTORY & APPRAISAL SHEET

Revised 4-77

IDENTIFICATION		CLASSIFICATION		By
1 State _____		24 Fed Aid System _____		Transfer of Data _____
2 Hwy District _____				Maintenance Insp. _____
3 County _____	<input checked="" type="checkbox"/> City/Town _____	25 Administrative _____		Condition Analysis _____
5 Inventory Route _____	Principal <input type="checkbox"/> Other <input type="checkbox"/>			Appraisal _____
6 Features Intersected _____		26 Functional _____		Cost Estimate _____
				General Review _____
7 Facility Carried by Structure _____				
8 Structure No. _____ of _____	<b>STRUCTURE DATA</b>		27 Type Service _____	
9 Location _____	27 Year Built _____		28 Structure Type - Main _____	
10 VC - defense _____	28 Lanes on Str. _____ under _____		29 - Approach _____	
11 Milepoint _____	29 ADT on Str. _____	33 Year _____	30 No of Spans - Main _____	
12 Road Section No _____	31 Design Load _____		31 - Approach _____	
13 Defense Bridge Letter _____	32 Appr Rdwy Width %Shld _____			
14 Defense Milepoint _____	33 Br Median <input type="checkbox"/> None <input type="checkbox"/> Open <input type="checkbox"/> Closed		32 Max Span Length _____	
15 Defense Section Length _____	34 Skew _____		33 Structure Length _____	
16 Latitude _____	35 Structure Flared <input type="checkbox"/> Yes <input type="checkbox"/> No		34 Sidewalk _____ Rt _____ ft, Lt _____	
17 Longitude _____	36 _____		35 Br Roadway Width (curb-curb) _____	
18 Physical Vulnerability _____	37 _____		36 Deck Width (out-out) _____	
19 Bypass, Detour Length _____	38 Navigation Control <input type="checkbox"/> Yes <input type="checkbox"/> No		37 Vert Clearance over Deck _____	
20 Toll Bridge <input type="checkbox"/> On Toll Road <input type="checkbox"/> On Free Road <input type="checkbox"/>	39 - Vertical _____ ft		38 Underclearance - Vertical _____	
21 Custodian _____	40 - Horizontal _____ ft		39 - Lateral - Right _____	
22 Owner _____	41 _____		40 - Left _____	
23 F A P No. _____			41 Wearing Surface _____	
<b>CONDITION</b>		Material	Condition Analysis	By
42 Deck _____				19
43 Superstructure _____				
44 Substructure _____				
45 Channel & Channel Protection _____				
46 Culvert & Retaining Walls _____				
47 Estimated Remaining Life _____	48 Approach Roadway Alignment _____			
49 Operating Rating _____	50 Inventory Rating _____			
<b>APPRAISAL</b>		Deficiencies		By
51 Structural Condition _____				19
52 Deck Geometry _____				
53 Underclearances - Vertical & Lateral _____				
54 Safe Load Capacity _____				
55 Waterway Adequacy _____				
56 Approach Roadway Alignment _____				
<b>PROPOSED IMPROVEMENTS</b>				
57 Year Needed _____	Completed _____	Describe (Item 75) _____		
58 Type of Service _____				
59 Type of Work _____				
60 Improvement Length _____	ft			
61 Design Loading _____				
62 Roadway Width _____	ft			
63 Number of Lanes _____		64 Prop Rdwy Improvement - Year _____		
65 ADT _____	66 Year _____	67 _____	68 Type _____	
<b>COST OF IMPROVEMENTS</b>				
				69 \$ _____
Remarks <u>VC - defense</u>				