

RECORDING AND CODING GUIDE FOR THE STRUCTURE INVENTORY AND APPRAISAL OF THE NATION'S BRIDGES

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INTRODUCTION

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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 States. 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 Division. The coded items in this Guide are considered to be an integral part of the data base that can be used to meet several Federal reporting requirements, as well as a large part of States' needs. Two such reports give information about bridges on designated defense highways. The instructions for preparing the reports are contained in a PPM that is closely tied to this Guide. Reports submitted in connection with the bridge replacement program and the bridge inspection program also are related to this Guide. Summary tabulations are to be developed and submitted according to the definitions and classifications contained in this Guide. Obviously, it is intended that present and future reports be developed using the bridge inventory data base.

The AASHTO Manual for Maintenance Inspection of Bridges (called AASHTO Bridge Manual in this Guide) discusses the various items of information that are to be recorded as part of original bridge report. That manual and the Bridge Inspector's Training Manual discuss inspection procedures and the preparation of detailed reports about the structural 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 Structure Inventory and Appraisal Sheet (SI & A Sheet), which is included as page 31. This form is intended to be a repository for the pertinent elements of information about an individual structure. Its use is optional, subject to the statements in the preceding paragraph of this Introduction. Any of the items shown may be requested from time to time and in a form similar to the SI&A Sheet.

An FHWA Notice dated March 30, 1972, subject "National Bridge Inspection Standards (NBIS)", states essentially that all bridges carrying and going over Federal-aid highways must be inventoried, even though inspection may not be mandatory.

It is recommended that a structure be located on the route it carries in all cases and that the computer records and SI&A Sheet contain all of the items for the structure in association with the route it carries. When the route beneath the structure is a Federal-aid highway (or a non-FA highway that is considered to be important), the structure should be located on that route, but the records and SI&A Sheet need contain only those items that pertain to the lower route. This would include the route-oriented items that have different values from the route above: Items 6, 10, 11, 12, 13, 14, 15, 19, 25, 26, 29, 30, and 47. It would not be necessary to repeat the other items (except Structure Number in Item 8) because the two sets of data can be related through the structure number identification.

Item 5 provides instructions for identifying either of the two routes at a structure and, thus, the means of identifying the two sets of records.

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 readable form, the format will be based on the codes in this Guide. A State choosing to use its own codes should provide for translation or conversion to those in the Guide. In other words, the States are responsible for having the capability to obtain, store, and report certain information about bridges whether or not this Guide or the SI&A Sheet is used. Any requests for submittals of these data by FHWA will be based on the definitions, explanations, and codes supplied in the Guide, the AASHTO 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. The first two digits are the Federal Information Processing Standards (FIPS) code for States and the third digit is the FHWA region code.

State Codes

<u>State</u>	<u>Code</u>	<u>State</u>	<u>Code</u>
014	Alabama	331	New Hampshire
049	Arizona	342	New Jersey
056	Arkansas	356	New Mexico
069	California	362	New York
088	Colorado	374	North Carolina
091	Connecticut	388	North Dakota
103	Delaware	395	Ohio
124	Florida	406	Oklahoma
134	Georgia	410	Oregon
160	Idaho	423	Pennsylvania
175	Illinois	441	Rhode Island
185	Indiana	454	South Carolina
197	Iowa	468	South Dakota
207	Kansas	474	Tennessee
214	Kentucky	486	Texas
226	Louisiana	498	Utah
231	Maine	501	Vermont
243	Maryland	513	Virginia
251	Massachusetts	530	Washington
265	Michigan	543	West Virginia
275	Minnesota	555	Wisconsin
284	Mississippi	568	Wyoming
297	Missouri	020	Alaska
308	Montana	159	Hawaii
317	Nebraska	113	Dist. of Columbia
329	Nevada	721	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 a report on highway defense bridges as contained in PPM 50-6.1. The source of the code scheme is the U. S. Censuses of Population and Housing--1970.

* Item 4 - City/Town Code

4 digits

*

Cities and towns should be identified according to the instructions and sources noted above in Item 3. If the structure is not in a city or town, code all zeroes.

* Item 5 - Inventory Route

9 digits

*

As indicated in the Introduction, the complete data for the structure is to be recorded and coded, in all cases, with respect to the route carried by the structure, even if the route is not on a Federal-aid system.

In addition, if the route beneath the structure is on a Federal-aid system or is otherwise important, the route oriented items (6, 10, 11, 12, 13, 14, 15, 19, 24, 25, 26, 29, 30, 47) should be separately recorded and coded with respect to the route beneath. Item 8 should, of course, be recorded and coded for both routes to allow the two sets of data to be cross referenced.

When two or more routes are concurrent, the highest of the hierarchy of systems as shown in the second code position below will be used. If the concurrent routes are of the same hierarchy level, the lowest numbered route will be used. The same applies to any situation where a structure goes over two or more routes.

The first position (leftmost) will indicate if the route is carried by the structure or goes under it:

- 1 Route carried by structure
- 2 Route under structure

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)

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.

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

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

Examples:

Interstate 95, on	record	1 1 1 00095 0	code	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
Exit ramp from I-81, under		2 1 7 00081 0		217000000

* Item 6 - Features Intersected

25 positions

*

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 the structure. This information is required by the AASHO Bridge Manual to be a part of a bridge report. To meet several reporting requirements, one of which is the report on highway defense bridges, the information should be coded. When one of the features intersected is another highway, the signed number or name of the highway (e.g., I 81, US 51, SR 772, Mill Road) should appear first (leftmost) in the field. The names of any other features should follow, separated by a semi-colon or a comma. Abbreviations should be used where necessary, but an effort should be made to keep them meaningful.

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 - Inventory Route, Minimum Vertical Clearance

4 digits

*

The information to be recorded and coded for this item is the minimum vertical clearance over the roadway as required by PPM 50-6.1. To meet the requirements, vertical clearances should be reported in feet

* Item 10 - Inventory Route, Minimum Vertical Clearance (con.)

*

and inches. The minimum clearances for a 10-foot width of the pavement or traveled part of the roadway where the clearance is the greatest should be recorded. For structures having multiple openings, clearances for each opening should be recorded, but only the maximum of the clearances for the two or more openings should be coded. This would be the practical maximum clearance. Code feet and inches for the actual clearance. When no restriction exists, code "9999".

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 zeroes if a milepoint location cannot be determined or is not appropriate.

* Item 12 - Road Section Number

5 positions

*

If the bridge is on a designated defense highway, record and code the five character road section number that has been assigned according to the instructions in PPM 50-6.1, Attachment 2, Column A. The number should be right justified in the first four positions of the field as shown in the examples below. The fifth position should be left blank except when letter suffix is used. If the bridge is not on a defense highway, the item is coded with zeroes.

Example:

<u>Road Section Number</u>	<u>Code</u>
5	0005
15	0015
125 A	0125A
1245	1245

* Item 13 - Bridge Description

2 positions

*

This item should be coded for all structures included in the inventory data base, although it is intended primarily for defense highway bridges. The codes given below should be used to represent additional information describing the function of the bridge with respect to the route identified in Item 5. The order of the codes shown also is the hierarchy of their importance. This means that if two codes apply to a structure, the first of the codes (reading down the list) will be shown in the left position and the next one in the right position. If a second code does not apply, the right position should be left blank.

- (Blank) When none of the following codes apply for the first or second position or both, the first or second position or both will be blank.
- D where the structure carries a highway that is designated as a defense highway and goes over a defense highway.
- P for situations where separate structures carry two roadways in two directions of travel. (An Inventory Sheet and a data record should be prepared for each Structure, which may have the same or very close mile-point values in Items 11 and 14). The structure carrying the roadway in the direction of inventory (for defense highways, this is west to east and south to north) will be considered the first of the parallel bridges and the left position of the field for this structure will be left blank. The code "P" will be used for the structure carrying the opposite roadway.
- T for temporary structures erected for the purpose of carrying traffic pending or during the repair or replacement of an old structure.

Example:

Parallel bridge in direction of	
inventory	code (blank)
Parallel bridge carrying opposite	
roadway	P
Temporary structure, also defense	
highway over defense highway	TD

* Item 14 - Defense Milepoint 4 digits *

If the bridge is on a defense highway, record and code the number of miles to the nearest hundredth 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 zeroes.

* Item 15 - Defense Section Length 3 digits *

Record and code the length of the road section identified in Item 12 to the nearest tenth of a mile. See PPM 50-6.1, Attachment 2, Column F, 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 zeroes.

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. Refer to PPM 50-6.1.

Example: 35° 27.3' code 35273

Item 17 - Longitude 6 digits

Longitude should be recorded and coded as instructed in Item 16. Leading zeroes should be coded where 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. The code is based on the type of structure. The item may be left blank if it is not applicable.

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

* Item 19 - Bypass, Detour Length

2 digits

*

If a ground level bypass is available at the structure site for the route given in Item 5, record and code the detour length as zero. Otherwise, indicate the actual length to the nearest mile of the feasible detour to the nearest comparable structure. If the bridge is one of twin bridges and is not at an interchange, code 01 to indicate that the other twin bridge can be used as a temporary bypass. In other cases, indicate that actual length to the nearest mile of the detour length. The detour length should represent the total additional travel for a vehicle which would result from closing of 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 miles or more.

Examples:

diamond interchange, structure bypassable	code 00
cloverleaf, not bypassable; 8 mile detour	08
structure over river, 121 mile detour	99
structure over highway, no interchange, bypassable	00

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.)

*

<u>Urban Code</u>					<u>Functional System</u>	<u>Rural Code</u>
Population	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
	16	26	36	46	Local	06

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 for the route identified in Item 5. Make certain the units position is coded even if estimates of ADT are determined to tens or hundreds of vehicles, that is, appropriate trailing zeroes should be coded.

Examples:	Volume	540	code	000540
		15600		015600
		24000		024000

* Item 30 - Year of Average Daily Traffic 2 digits *

Record the year represented by the ADT above as specified in the AASHO Maintenance Inspection Manual. Code the last two digits of the year so recorded.

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. The determination of whether or not a water course is navigable is made by the U. S. Coast Guard or the U. S. Army Corps of Engineers, whichever is applicable. 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. In the case of a bascule bridge, the vertical clearance should be measured with the bridge in the closed position (i.e., open to vehicular traffic). The measurement should be coded as a three-digit number. If Item 38 has been coded "0" code all zeroes to indicate not applicable.

Examples:	Actual	150.0	Record	150	Code	150
		20.6		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 zeroes 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 Overpass structure at an interchange or
second level of a multilevel 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-waterway-railroad
- 9 Relief
- 0 Other

Item 43 - Structure Type, Main

3 digits

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 zeroes 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 - Total Horizontal Clearance

3 digits *

The total horizontal clearance for the route identified in Item 5 should be measured and recorded to supply information that meets reporting requirements of PPM 50-6.1. The clearance should be the 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.

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 to the nearest foot.

Examples:	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 actual minimum vertical clearance over the bridge roadway, to any superstructure restriction, to the nearest inch. When no superstructure restriction exists above the bridge roadway, the clearance is therefore unlimited and should be coded "9999". A four-digit number should be coded to represent feet and inches.

Examples:	17'-3"	code 1703
	75'-11"	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 superstructure. Code zeroes for structures over any other feature.

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 and not field determined.)
- 7 Other

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.

- N Not applicable
- 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 adequate 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 AASHTO 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 - Estimate 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.

Examples: 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. If a rating is determined for more than one type of live load, the rating for each should be recorded and the one with the largest gross weight should be coded. For HS loading the total weight in tons of the entire vehicle should be coded, i.e., HS 20 should be coded "236" even though the HS 20 lane loading controls and is used to determine the rating. A three-digit code will 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 |
| 4 3-axle truck (type 3) | special loading |
| 5 3-S semi-trailer | 9 Gross load only |
| | given |

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. 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 relation to the effect on the use of the bridge.

* Item 66 - Inventory Rating

3 digits

This rating is explained in Section 4.1 of the AASHO manual named in Item 64. The statements and codes in that item apply to this one, also.

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:

- N Not applicable
- 9 Conditions superior to present desirable criteria
- 8 Conditions 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 refers to adequacy of roadway width, clearances above deck, and other.

Item 69 - Underclearances, Vertical and Horizontal

1 digit

This refers to 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. It should be noted that the National Bridge Inspection Standards require the posting of load limits only if the maximum legal loads in the State produce stresses in excess of the operating rating stress level. However, a State may elect to use a lesser stress level, as low as the inventory rating level, to determine a safe load capacity for any or all of its bridges. This safe load capacity should be entered as Item 70. If the safe load capacity is such that posting is required, Item 70 shall be coded as 4 or less. If no posting is required, Item 70 shall be coded as 5 or greater.

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 zeroes 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 code shown in Item 42 to represent the type of service to be provided on the bridge.

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 estimated 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.

STRUCTURE INVENTORY & APPRAISAL SHEET

Revised 6-72 

IDENTIFICATION		CLASSIFICATION		By	Date
1 State		24 Fed. Aid System		Transfer of Data	
2 Hwy District				Maintenance Insp.	
3 County		25 Administrative		Condition Analysis	
4 City/Town				Appraisal	
5 Inventory Route		26 Functional		Cost Estimate	
6 Features Intersected				General Review	
7 Facility Carried by Structure					
8 Structure No. 1 of		STRUCTURE DATA			
9 Location		27 Year Built		28 Type Service	code
10 Min. Vert. Clearance, Inv. Rte.		29 Lanes on Str. under		29 Structure Type - Main	
11 Milepoint		30 ADT		30 - Approach	
12 Road Section No.		31 Design Load		31 No. of Spans - Main	
13 Defense Bridge Description		32 Appr. Rdwy. Width %/sh'd		32 - Approach	
14 Defense Milepoint		33 Br Median <input type="checkbox"/> None <input type="checkbox"/> Open <input type="checkbox"/> Closed		33 Total Horiz. Clearance	ft
15 Defense Section Length		34 Skew		34 Max. Span Length	ft
16 Latitude		35 Structure Flared <input type="checkbox"/> Yes <input type="checkbox"/> No		35 Structure Length	ft
17 Longitude		36 Navigation Control <input type="checkbox"/> Yes <input type="checkbox"/> No		36 Sidewalk Rt. ft, Lt. ft	
18 Physical Vulnerability		37 - Vertical		37 Br. Roadway Width (curb-curb)	ft
19 By-pass, Detour Length		38 - Horizontal		38 Deck Width (out-out)	ft
20 Toll Bridge <input type="checkbox"/> On Toll Road <input type="checkbox"/> On Free Road <input type="checkbox"/>		39 Wearing Surface		39 Vert. Clearance over Deck	' "
21 Custodian				40 Underclearance - Vertical	' "
22 Owner				41 - Lateral - Right	ft
23 F.A.P. No.				42 - Left	ft
CONDITION					
Material		Condition Analysis			Rating (9-0)
43 Deck					
44 Superstructure					
45 Substructure					
46 Channel & Channel Protection					
47 Culvert & Retaining Walls					
48 Estimated Remaining Life		49 Approach Roadway Alignment			
49 Operating Rating		50 Inventory Rating			
APPRAISAL					
Deficiencies					Rating (9-0)
51 Structural Condition					
52 Deck Geometry					
53 Underclearances - Vertical & Lateral					
54 Safe Load Capacity					
55 Waterway Adequacy					
56 Approach Roadway Alignment					
PROPOSED IMPROVEMENTS					
57 Year Needed		Completed		Describe (items)	
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 Type	
COST OF IMPROVEMENTS					
					\$, , 000.
Remarks					



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