ITEMS INCLUDED IN STRUCTURAL DETAILS (RC02)

- General Type of Main Span
- General Type of Approach Span
- Number of Main Spans
- Number of Approach Spans
- Number of Ramps
- Design Load
- Length of Maximum Span
- Total Length of Bridge
- Roadway Approach Width
- Out to Out Width
- Out to Out Width Varies
- Curb-to-Curb Width
- Curb-to-Curb Width Varies
- Curb Type (Left & Right)
- Sidewalk Width (Left & Right)
- Sidewalk Type (Left & Right)
- Median Width
- Median Type
- Abutment Type (Beginning & End)
- Abutment Wingwall Type (Beginning & End)
- Abutment Footing Type (Beginning & End)
- Abutment Pile Type (Beginning & End)
- Abutment Height (Beginning & End)
- Abutment Skew Angle (Beginning & End)
- Abutment Joint Type (Beginning & End)
- Abutment Slope Protection (Beginning & End)
- Area of Bridge Deck
- Radius
- Temporary Structure Designation
ITEM: Material (Main Span)
FHWA 43A

PROCEDURE:
Record the type of material which was used to construct the General Type Main Span(s).

Main Span is the span or spans over the major feature crossed. There can be more than one Main Span. For example, a bridge with two equal spans crossing an interstate would have two Main Spans.

CODING:
1 - Concrete
2 - Concrete (Continuous)
3 - Steel
4 - Steel (Continuous)
5 - Prestressed Concrete
6 - Prestressed Concrete (Continuous)
7 - Timber
8 - Masonry
9 - Aluminum, Wrought Iron or Cast Iron
0 - Other
A - Unpainted Steel
B - Unpainted Steel (Continuous)
N - Not Applicable

ITEM: Superstructure Type (Main Span)
FHWA 43B

PROCEDURE:
Record the type of superstructure used to support the Main Span from the following table.

CODING:
01 - Slab

02 - Stringer/Multi-Beam or Girder
Multiple, longitudinal members which directly support the structural deck. Steel members may be either rolled beams or plate girders, depending on span. Prestressed I-girders with separate structural decks shall also coded this way.

03 - Girder and Floorbeam System
The structural deck is supported by floorbeams transverse to the main members, with smaller section stringers spanning between the floorbeams. Usually, there are only two main member sections, but three are sometimes seen on wide bridges. The main girders are almost always riveted or welded plate girders. Floorbeams may be plate girders or rolled sections, while stringers are almost always rolled sections.

04 - Tee Beam
Concrete monolithic deck and beam system formed in the shape of the letter “T”. Tee beams may have the shape of bulb tee, double tee, quad tee and rib tee. This code should only be used for precast sections where the top flanges are directly adjacent to one another. Otherwise, use the 02 code.
ITEM: **Superstructure Type (Main Span)** - continued

**05 - Box Beam or Box Girders - Multiple**
Multiple, longitudinal, voided, prestressed concrete longitudinal beams are placed directly adjacent to each other, and are then post-tensioned together with transverse tendons. Distinct joints separating members can be seen from below. A concrete wearing surface is applied. Note that there is no structural deck for this type, even though the wearing course may be designed to act compositely with the beams.

**06 - Box Beam or Box Girder - Single or Spread**
Prestressed concrete or steel sections with a trapezoidal or rectangular cross-section. Multiple units (spread boxes) will have a structural deck spanning between them.

**07 - Frame**
The horizontal and vertical/inclined units of a frame are a rigidly connected unit, which resists moment and shear. Frames may have either vertical or slanted legs. The top of a frame is parallel to the roadway surface and there will usually be no backfill over the structure. Concrete frames usually have approach fill placed against the vertical components.

**08 - Orthotropic**
Steel plate deck stiffened by longitudinal ribs and supported by floorbeams and main beams, generally with asphalt wearing surface.

**Note for codes 09 and 10**
A truss is a main member consisting of two chords connected by diagonal and/or vertical members. The chords and diagonals are usually designed to withstand axial stresses only. Truss bridges have two main trusses with a stringer-floorbeam system supporting the deck.

**09 - Truss, Deck**
The deck is at the same level as the top chord.

**10 - Truss, Thru**
The deck level is between the trusses or at the lower chord level.

**Note for codes 11 and 12**
Concrete, steel or timber structural members supporting a structural deck via spandrel columns or walls (if the deck is above the arches), or through hangars (if the deck is between the arches). Shaped as a parabolic or circular curve. Primary stresses in arches are compression, with relatively low bending stresses.

**11 - Arch, Deck**
Deck is above the top of the arch..

**12 - Arch, Thru**
Structural deck placed between the arches.

**13 - Suspension**
Two cables on either side of the roadway provide the support system for suspension bridges. These cables are draped over towers and anchored into concrete blocks embedded into rock at each end. Suspension bridges are used to span wide openings.

The structural deck and floor system are supported by vertical cables which are fastened to the main cables. The deck is often provided with a stiffening truss to reduce the flexibility of the roadway.
ITEM: Superstructure Type (Main Span) - continued

14 - Stayed Girder
Also known as Cable-Stayed. The superstructure is directly supported by diagonal cables attached to towers at the main piers.

15 - Movable, Lift
One or more spans which are raised vertically while remaining parallel to the waterway to provide for passage of marine traffic beneath the bridge.

16 - Movable, Bascule
Span consists of one or two leaves which are rotated from a horizontal position to a near vertical position providing unlimited vertical clearance to marine traffic. A double-leaf bascule is counted as one span.

17 - Movable, Swing
One or more spans are rotated in a horizontal plane on a pivot pier to permit passage of marine traffic.

18 - Tunnel
An underground passage through natural material (mountain, river, etc.), conveying vehicular traffic.

19 - Culvert
A hydraulic structure passing through a railway or highway embankment to facilitate the flow of storm drainage, or cross over a small stream. Materials used can be steel (usually galvanized and corrugated), aluminum, or reinforced concrete (either cast-in-place or precast). Structure types may be circular or elliptical pipes, arches, or frames. What distinguishes culverts from other structure types are:

- Soil-structure interaction. The primary members are always covered with embankment material, which has a major influence on structural performance (critical in the case of metal culverts). Live loads will have a lower effect on culverts than other types.
- There will usually be highway guide rail on the structure rather than bridge rail.
- The structure will be partially submerged during peak flows, which also has the effect of constricting flow, making blockage with debris more likely.

21 - Segmental Box Girder
Transverse, Precast or Cast-in-Place concrete segments which are often the full width of the bridge and are connected longitudinally by post tensioning.

22 - Channel Beam
Channel beams are generally precast concrete sections 4’ to 6’ wide and consist of a thin slab cast monolithically with two legs about three to four feet apart. Adjacent beams are bolted together and can be differentiated from Tee beams by the seam running between sections.

00 - Other

ITEM: Material (Approach Span)
FHWA 44

PROCEDURE:
Record the type of material used to construct the Approach Span(s). An Approach Span is considered to be any span which is not the same type as a Main Span.
RC02: Structural Details

CODING:
Use same codes listed for “Material (Main Span)” to record this Item. If there are no Approach Spans, record this Item with “N”.

ITEM: Superstructure Type (Approach Span)
FHWA 44

PROCEDURE:
Record the type of superstructure used to support the Approach Spans.

CODING:
Use same codes listed for “Superstructure Type (Main Spans)” to record this Item. If there is more than one type of approach span use the following code:

20 – No type is dominant

If there are no Approach Spans, record this Item with “NN”.

ITEM: Number of Main Spans
FHWA 45

PROCEDURE:
Record the number of main spans on the bridge. Main spans are described in the Material (Main Span) Item.

When inventorying ramp bridges, record the number of spans in the ramp.

CODING:
Numeric 000-999.

ITEM: Number of Approach Spans
FHWA 46

PROCEDURE:
Record the number of Approach Spans on the bridge. Approach Spans are described in the Material (Approach Span) Item.

When inventorying ramp bridges, record this Item with “000”. If there are no Approach Spans, record this item with “000”.

CODING:
Numeric 000 - 999
**ITEM: Number of Ramp Bridges**
NYSDOT

**PROCEDURE:**
Record the number of Ramp Bridges connected to the main bridge being inventoried. If there are none, code this Item with 0

**CODING:**
Numeric 00 - 99

**ITEM: Design Load**
FHWA 31 Translated

**PROCEDURE:**
Record the design load for which the bridge was originally designed or the design load for which it has been redesigned.

This information can be obtained from the Record Plans. Use one of the codes listed below.

**CODING:**
Record one of the following listed codes.
- 10 - H 15
- 20 - H 15
- 30 - HS 15
- 40 - H 20
- 50 - HS 20 or MS18
- 60 - HS 20 + Mod (2-24,000# Axles @ 4’ Ctrs., when they govern)
- 61 - Thruway (HS20-44 at 30 Ft. Centers)
- 70 - Less than 60 lb./sq.ft. (Pedestrian Loading)
- 71 - 60 Thru 70 lb./sq.ft. (Pedestrian Loading)
- 72 - 71 Thru 80 lb./sq.ft. (Pedestrian Loading)
- 73 - 81 Thru 90 lb./sq.ft. (Pedestrian Loading)
- 74 - 91 Thru 100 lb./sq. ft. (Pedestrian / Platform Loading)
- 75 - Over 100 lb./sq ft. (Pedestrian / Platform Loading)
- 80 - Less than E50 (RR)
- 81 - E50 (RR)
- 82 - E60 (RR)
- 83 - E72 (RR)
- 84 - E80 (RR)
- 85 - Greater than E80 (RR)
- 90 - HS 25 or MS23
- 91 - HL93
- 00 - Other NN- Unknown

**ITEM: Length of Longest Span**
FHWA 48

Do not code this item. Its value will be extracted from the span information in Record Code 15.
**ITEM: Total Length of the Bridge**  
FHWA 49

**PROCEDURE:**
Record the total length of the bridge along the centerline of the Feature Carried, to the nearest 100mm or to the nearest foot. This length is normally measured between the Bridge Begins and Bridge Ends Stations. These Stations indicate the points where the bridge deck ends and the approach slab or pavement begins.

If the structure is a culvert, record the maximum horizontal distance between the inside faces of the exterior walls, parallel to the centerline of the roadway.

If the structure is a tunnel, record the length of the roadway (portal-portal) that it conveys.

When the abutments are not parallel, or when they are curved, measure the length along both curb lines or both faces of railing. Record the bridge length as the average of one of these sets of measurements.

**CODING:**
Metric: 1 - 9999.9  
US Customary: 1 - 99999

**ITEM: Approach Roadway Width**  
FHWA 32

**PROCEDURE:**
Record the usable width of the Approach Roadway to the nearest 100mm or one foot. If the Approach Roadway Width is not the same at both ends of the bridge, record the smaller width. Include the shoulders in this measurement if they meet the following criteria:

- They are designed, constructed, and maintained flush with the adjacent lane.
- They are adequate for weather and traffic conditions, consistent with the facility carried.

The shoulders shall not be included in this measurement if they do not meet the above criteria. Raised medians should not be included in the Approach Roadway Width. For structures with raised medians, record the sum of the usable widths of the Approach Roadways.

If the bridge does not carry a highway, record this Item with "000".

**CODING:**
Metric - 0 - 99.9  
US Customary - 0 - 999

**ITEM: Out-to-Out Width**  
FHWA 52

**PROCEDURE:**
Record the Out-to-Out Width of the bridge, to the nearest 30mm or tenth of a foot. Out-to-Out Width is measured at the same point as Curb-to-Curb Width; the measurement should be exclusive of flared areas for ramps. If the superstructure is a deck girder, deck truss, or deck arch, the Out-to-Out Width should be...
measured between the fascias. If it is a thru girder, thru truss, or a thru arch, the Out-to-Out Width should be the lateral clearance between superstructure members.

For culverts, the Out-to-Out Width is coded 0 if there are no headwalls and if the filled section over the culvert maintains the roadway cross-section. For concrete box culvert where the traffic is carried directly by the top slab, record the actual out-to-out width.

For tunnels, record the maximum opening width.

**CODING:**
- Metric - 0 – 304.5
- US Customary - 0 - 999.9

**ITEM: Out-to-Out Width Varies**
FHWA 35

**PROCEDURE:**
Record whether the Out-to-Out Width of the bridge varies by at least 600mm or two feet.

**CODING:**
- 0 - Out-to-Out Width does not vary.
- 1 - Out-to-Out Width varies by 600mm (2 feet) or more.

**ITEM: Curb-to-Curb Width**
FHWA 51

**PROCEDURE:**
Record the minimum distance between the curbs or the bridge railings (if there are no curbs), to the nearest 30mm or tenth of a foot. For bridges with closed medians, record the sum of the minimum distances for all roadways carried by the bridge.

If there are no curbs or bridge railing, such as with pipe culverts or box culverts under fill, record this Item with “0”. Do not include the flared areas for ramps in the Curb-to-Curb Width.

**CODING:**
- Metric - 0 - 304.5
- US Customary - 0 - 999.9

**ITEM: Curb-to-Curb Width Varies**
FHWA 35

**PROCEDURE:**
Record whether the Curb-to-Curb Width varies by more than 300mm or one foot. Use the codes listed below.

**CODING:**
- 0 - Not applicable (no curb)
RC02: Structural Details

1 - Curb-to-Curb Width does not vary by more than 300mm or one foot.
2 - Curb-to-Curb Width varies by more than 300mm or one foot.

ITEM: Curb Type (Left and Right)
NYSDoT

PROCEDURE:
Record the type of curb on the bridge.
While looking in the “Direction of Orientation”, record the left curb first and then the right curb.

Jersey Barriers or Safety Shapes are not considered to be curbs. They should be recorded as “1 - No Curb.”

CODING:
1 - No Curb
2 - Concrete
3 – Granite
4 - Stone
5 - Steel Plate
6 - Molded - Asphalt
7 - Timber
0 - Other

ITEM: Sidewalk Width (Left and Right)
FHWA 50

PROCEDURE:
Record the minimum width of the sidewalk, carried by the bridge, which is usable for pedestrian traffic, to the nearest 300mm or tenth of a foot. Sidewalk Width is measured between any two of the following elements:
– Face of Railing
– Edge of Curb
– Inside face of the truss member of the inside edge of the flange plate for a thru girder
The minimum width of a sidewalk is 300mm or one foot. Safety walks are assumed to be sidewalks for this purpose. Record the Left Sidewalk Width in the first field, followed by the Right Sidewalk Width in the remaining field.

“Left” and “Right” are determined while facing in the Direction of Orientation.

CODING:
Metric - 0 - 9.9
US Customary - 0 - 99.9
ITEM: Sidewalk Type (Left and Right)

PROCEDURE:
Record the type of material used to construct the Left and Right Sidewalks on the bridge. Left and right are determined by looking in the Direction of Orientation.

If the Sidewalk Width is less than 1.0 foot, then code this Item "1 - No Sidewalk."

CODING:
1 - No Sidewalk  5 - Asphalt Concrete
2 - Concrete    6 - Wood
3 - Steel Plate 0 - Other
4 - Steel Grating  

ITEM: Median Width

PROCEDURE:
Record the median width to the nearest 30mm or tenth of a foot. If it varies, record the average width. The width of flush medians (See the Medium Type item) shall also be recorded. For pipe culverts or box culverts which are continuous under a divided highway, record the mall width between directions of travel as the Median Width.

If there is no median, record the Median Width as "0".

CODING:
Metric - 0.0 - 9.9
US Customary - 0.0 - 99.9

ITEM: Median Type

PROCEDURE:
Record the Type of Median on the bridge using one of the following codes.

Safety shapes should be coded with "8 - Barrier".

CODING:
1 - Open  6 - Striped
2 - Closed  7 - Flush
3 - Other  8 - Barrier
4 - Raised  9 - Post
5 - Curbed 0 – None
ITEM: Abutment Type (Begin and End)

PROCEDURE:
Record the type of abutment used at each end of the structure.

Record the Beginning Abutment Type first and then Ending Abutment Type as defined by the Direction of Orientation. Note: Bridge Ramps do not have Beginning Abutments as they attach directly to the main bridge. Codes 5 (Jointless) and 8 (Abutmentless) are no longer used.

CODING:

1 - None
2 – Stub
3 – Integral
4 – Cantilever
6 - Gravity
7 – Counterfort
9 – Stub Abutment on Mechanically Stabilized Earth Retaining Wall
A - Masonry

1 - None

2 – Stub

A Stub Abutment has a backwall with a maximum height of approx. 3m (10'). The superstructure members are supported on individual pedestals.

3 – Integral

An Integral Abutment is composed of a concrete cap beam which is supported by a single row of steel bearing piles or Cast in Place concrete piles.
RC02: Structural Details

4 – Cantilever

A Cantilever Abutment is used when the height of the backwall required exceeds the limits of a Stub Abutment. The superstructure is supported on a continuous bridge seat.

6 - Gravity

A Gravity Abutment derives its ability to resist applied loads primarily from its size and weight.

7 – Counterfort

Counterfort Abutments have bracket-like elements which project from the fill side of the backwalls. They provide additional resistance against overturning. The backwall is designed as a horizontal beam between Counterforts.
9 – Stub Abutment on Mechanically Stabilized Earth Retaining Wall

Mechanically Stabilized Earth Retaining Walls are sometimes used instead of conventional embankments to support a stub abutment and the approach roadways.

A - Masonry
This includes all abutments constructed of plain concrete, Stonework or Brickwork. This does not include aesthetic treatments of these materials on reinforced concrete abutments.

ITEM: Abutment Wingwall Type (Begin and End)
NYSDoT

PROCEDURE:
Record the type of Wingwall used for each Abutment.

CODING:
1 - None
2 - “U” Type
3 - “Splayed”
4 - One Wall “U” Type, the other wall connected to the adjacent abutment
5 - One Wall “U” type, the other wall “Splayed”
6 - Cribbing
7 - One wall “Splayed”, the other wall connected to the adjacent abutment.
8 - Reinforced Earth
0 - Other

ITEM: Abutment Footing Type (Begin and End)
NYSDoT

PROCEDURE:
Record the type of Footing used for each Abutment. If there is no abutment, leave this item blank.
RC02: Structural Details

CODING:
1 - None, Doweled to Rock
2 - Individual, Spread-on-Rock
3 - Continuous, Spread-on-Rock
4 - Individual, Spread-on-Earth Fill
5 - Continuous, Spread-on-Earth Fill
6 - Individual, Spread-on-Earth Cut
7 - Continuous, Spread-on-Earth Cut
8 - Individual Pile
9 - Continuous Pile
0 - Other
* - Unknown
Blank - No Footing

ITEM: Abutment Pile Type (Begin and End)
NYSDoT

PROCEDURE:
Record the pile Type for each Abutment. If there is no Abutment, leave this Item blank.

CODING:
1 - No Piles
2 - Steel, "H" or "I" Section
3 - Steel Pipe
4 - Concrete, Cast-in-Place
5 - Concrete, Cast-in-Place, Tapered
6 - Concrete, Precast
7 - Concrete, Prestressed, Precast
8 - Timber
0 - Other
* - Unknown

ITEM: Abutment Height (Begin and End)
NYSDoT

PROCEDURE:
Record the height of each Abutment. The height of an abutment is the distance from the bottom of the footing to the top of the backwall. The Record Plans are usually required to determine this distance. If there is no Abutment, leave this Item blank. Abutment heights greater than 9.9 meters will need to be input in US Customary units.

CODING:
Metric - 0.0 - 9.9
US Customary - 0.0 – 99
Blank

ITEM: Abutment Skew Angle (Begin and End)
FHWA 34

PROCEDURE:
Record the skew angle at each Abutment to the nearest degree. The Skew Angle is defined as the angle
RC02: Structural Details

between a line perpendicular to the centerline of the Feature Carried and a line parallel to the centerline of bearings at the Abutment. If there is no Abutment, leave this Item blank.

CODING:
Numeric 0-89 or blank

**ITEM: Abutment Joint Type (Begin and End)**

**NYSDoT**

**PROCEDURE:**
Record the type of joint at each Abutment. If there is no Abutment, leave this Item blank.

<table>
<thead>
<tr>
<th>CODING</th>
<th>ABUTMENT JOINT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
ITEM: Abutment Slope Protection (Begin and End)  
NYSDoT

PROCEDURE:  
Record the type of slope protection used at each abutment.  
If there is no abutment, leave this Item blank.

CODING:  
1 - None Used - Rip-Rap  
3 - Concrete Block Paving  
4 - Timber  
5 - Cribbing, Steel  
6 - Cribbing, Concrete  
7 - Stone Bank Protection  
8 - Sod  
9 - Dry Stone Paving  
0 - Other  
Blank - No Abutment

ITEM: Area of Bridge Deck  
NYSDoT

PROCEDURE:  
The area of a Bridge Deck is determined by multiplying its total length by its Out-to-Out Width. This information is usually available on the Contract Plans. For Tunnels, the number to be recorded is the product of the length of the Tunnel and its Out-to-Out Width. If there is no Bridge Deck, record the plan view area of the structure. Record the area in square meters or square feet.

This item shall be coded 0 for culverts where the recorded out-to-out dimension is 0.

CODING:  
Metric - 0 - 999999.9  
US Customary - 0 - 999999.9

ITEM: Radius  
NYSDoT

PROCEDURE:  
Record the horizontal radius of the bridge to the nearest 300mm or 1 foot. The radius shall be measured from the center of curvature to the centerline of the bridge. If the curve is a spiral, record the minimum radius. Use 0 for straight bridges.

CODING:  
Metric - 0 - 999.9, US Customary - 0 - 9999.9
ITEM: Temporary Bridge Designation
FHWA 103

PROCEDURE:
Record whether temporary measures have been taken to keep this bridge open to traffic. Temporary measures may be required to keep a bridge open to traffic while it is being reconstructed on new or existing alignment, or while it is being rehabilitated. Temporary measures may also be required if the bridge is to be used as a detour.
Some examples of temporary measures are:

- Adding temporary supports
- Strengthening various members
- Performing temporary repairs
- Reducing the speed and volume of bridge traffic

If this item is coded “T”, all data recorded shall be for the structure without temporary measures except for the following Items:
Rec. Code 06, Posted Load
Rec. Code 12, Maximum Vertical Clearance
Rec. Code 12, Total Horizontal Clearance
Rec. Code 12, Minimum Vertical Clearance
Rec. Code 13, Maximum Vertical Clearance
Rec. Code 13, Minimum Horizontal Clearance (Left/Right)

CODING:
T - Temporary structures or conditions exist
Blank - No temporary structures or conditions exist