FDOT BRIDGE INSPECTION FIELD GUIDE NATIONAL BRIDGE, BRIDGE MANAGEMENT AND AGENCY DEFINED ELEMENTS
June 5, 2019

Introduction

This guide provides a description of elements that are used in inspections conducted by or for the Florida Department of Transportation (FDOT). **This guide is not intended to serve as a complete reference for bridge inspections.** The intent is to provide guidance for inspectors in selecting elements and assigning quantities to condition states for these elements.

In general, all girders, trusses, arches, cables, floor beams, stringers, abutments, piers, pin and hangers, culverts, joints, bearings, railings, decks, and slabs are identified as elements. The element listing includes a description, a commentary, condition state language, and a unit of measurement for each element. The element descriptions consider material composition. Protective systems for these elements are generally separate elements, but are assigned to specific elements.

National Bridge Elements (NBEs)

The National Bridge Elements represent the primary structural components of bridges necessary to determine the overall safety of the primary load carrying members. The NBEs are a refinement of the deck, superstructure, substructure, and culvert condition ratings defined in the Federal Highway Administration's Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges. Additional NBEs are designed to remain consistent from agency to agency across the country in order to facilitate and standardize the capture of bridge elements at the national level. In order to capture the diversity of new element design many elements in this category have an 'Other' type element defined.

Child Elements

FDOT uses child elements to identify specific elements that it wishes to track because the performance differs from the parent element. For example, reinforced concrete decks on precast deck panels is a child of the reinforced concrete deck element. The problems FDOT has experienced with these justifies tracking these separately from reinforced concrete decks. However, decks with precast deck panels will be rolled up with the reinforced concrete decks when reporting to the FHWA.

Bridge Management Elements (BMEs)

Bridge Management Elements include components of bridges such as joints, wearing surfaces, protective coating systems and deck/slab protection systems that are used for bridge management purposes, and are not used for national policy making.

Agency Defined Elements (ADEs)

FDOT has defined certain elements to meet FDOT's needs. These have no ties to NBEs or BMEs.

Secondary Members

The condition states of elements should not be affected by deficiencies of secondary members however deficiencies to secondary members should be noted in the inspection notes section for those elements relating to the secondary members.

Numbering of Elements

The elements are grouped into a logical numbering system: 1 -99 are reserved for NBE deck elements, 100-199 for NBE superstructure elements, 200-299 for NBE substructure elements, 300-399 for miscellaneous elements and joints, 8001–8999 for FDOT defined elements and 501-599 for protective coatings and wearing surface elements. FDOT elements that were previously defined now are in the format 8XXX where XXX represents the old number. FDOT elements may be in any category. The movable bridge elements 8563 - Access Ladders & Platforms, 8572 - Conduit& Junction Boxes and 8580 - Navigational Light System may be used for non-movable bridges. These are listed in multiple places in this field guide.

Deck and Slab Inspection

The condition state inspection for decks and slabs is different from CoRe element inspection. Instead of placing the entire deck or slab in one condition state, now the deck and slab is broken down by unit of measure just like other elements.

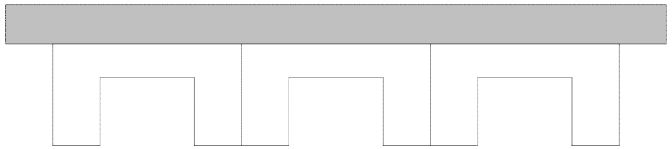
NBEs, MBEs and ADEs from an Inspector's Viewpoint

Whether an element is an NBE, MBE or ADE makes no difference from an inspector's viewpoint, these distinctions simply define how the results of a condition state inspection are used at a national level.

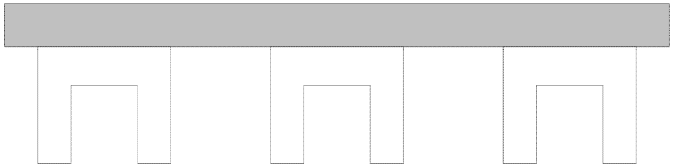
Conventions

Girder Quantities

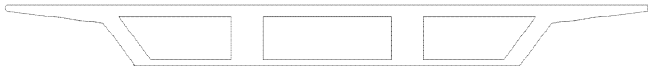
The following examples demonstrate the FDOT convention for numbering girders:



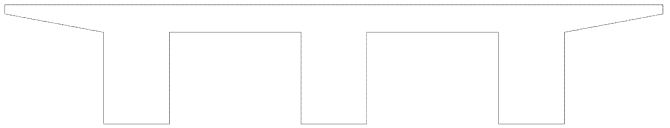
3 GIRDERS



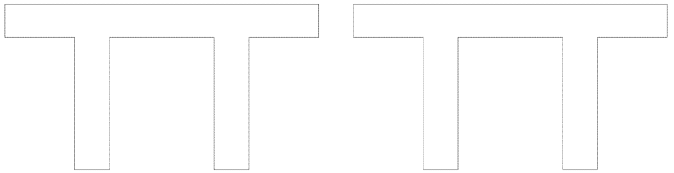
3 GIRDERS



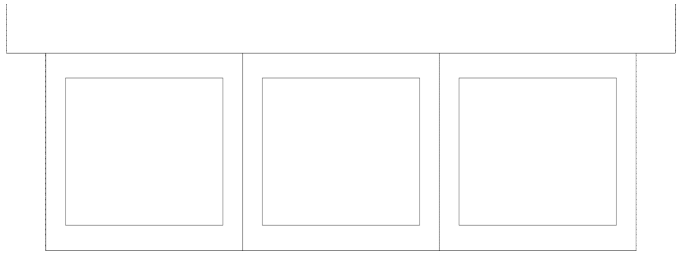
1 GIRDER

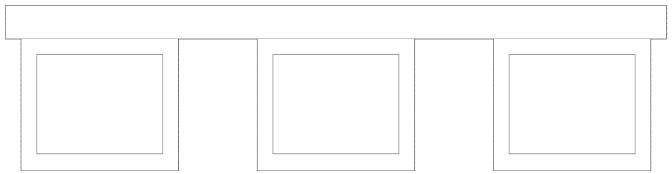


3 GIRDERS

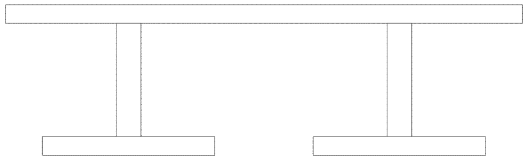


2 GIRDERS
3 GIRDERS

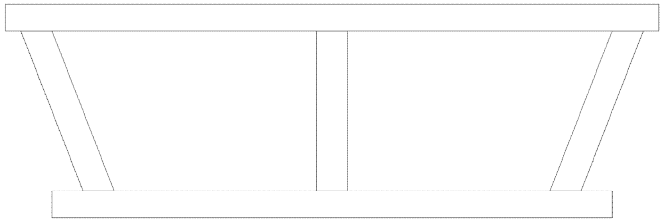




3 GIRDERS



2 GIRDERS

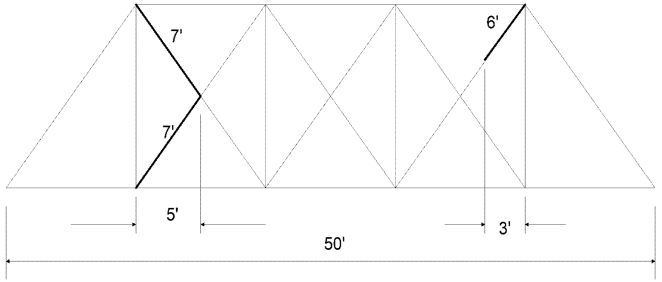


1 GIRDER

Truss and Open Spandrel Arch Quantities

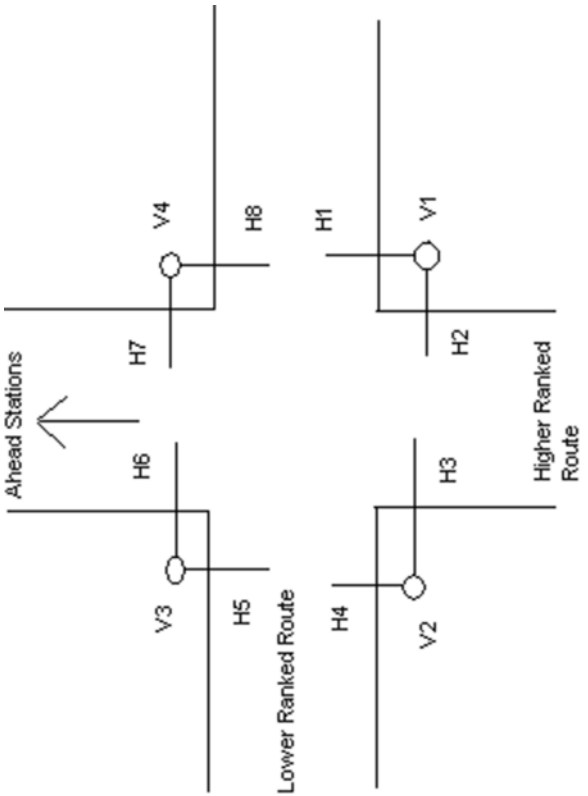
All measurements of a truss and an arch are along the horizontal projection. This convention includes the quantities for deterioration measurements. For the following example, the total length of the truss is 50’ and the total quantity of the condition state for the deterioration is 8’ (5’ + 3’):

Mast Arm Numbering

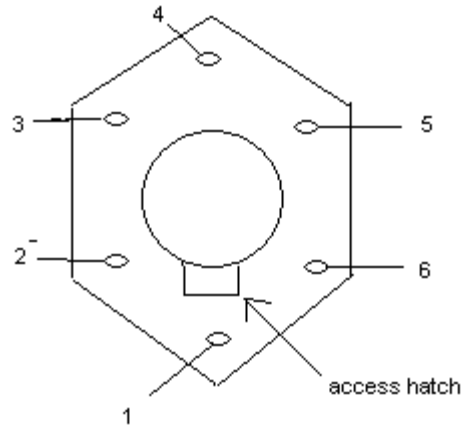


One structure number will be assigned to all mast arms at an intersection or location. The quantities for the vertical members, horizontal members and foundations will be the total number of each element at a particular intersection.

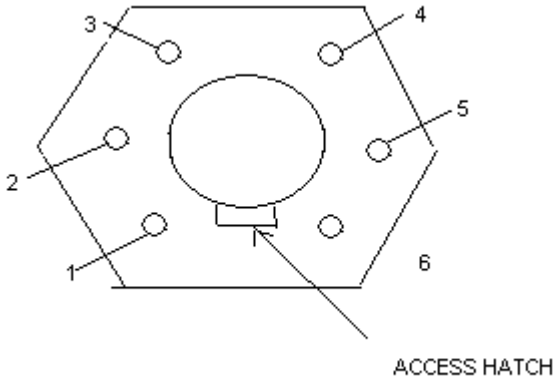
Mast Arm Component Numbering System - below is a guideline for assigning numbers to the vertical and horizontal mast arm members. Route hierarchy is as assigned for NBI Item 5B.



Anchor Bolt Numbering System - On the next two pages are guidelines for numbering anchor bolts for overhead sign structures, high mast light poles and mast arm traffic signals.



SUGGESTED ANCHOR BOLT NUMBERING SYSTEM



SUGGESTED ANCHOR BOLT NUMBERING SYSTEM

Condition States and Defects

Element defects are used when the condition state leaves condition state 1 and essentially acts to breakdown the overall element condition into one or more specific observed problems. If two defects occur at the same location the defect in the worst condition state will be used. If the two defects are at the same location with the same condition state the refer to the Department's guide for guidance on selecting the appropriate defect.

Specific guidance is not provided for condition state 4 for most elements. Condition State 4 is for severe conditions that are beyond the specific defects defined for states 1 through 3. Elements with a portion o all of the quantity in state 4 may often have load capacity implications warranting a structural review. Structural reviews may include a review of the field inspection notes and photographs, review of as-built plans or analysis as deemed appropriate to evaluate the performance of the element.

Guidance on Cracking for Reinforced Concrete, Prestressed Concrete and Wearing Surfaces

The cracking defects for reinforced concrete, prestressed concrete and wearing surfaces categorize cracks as minor, moderate and wide. What constitutes a minor, moderate or a wide crack depends on whether the element is in an aggressive or non-aggressive environment.

An aggressive environment would be the portion of a structure in or near salt or brackish water, and the portions of the structure in the splash zone. This would include the undersides of decks or slabs with low clearances over salt or brackish water. There may be special cases where additional areas of the bridge may be considered to be in an aggressive environment similar to a marine environment.

Aggressive environments also include:

- Areas where people fishing from a bridge may dump containers with salt or brackish water
- Bridges near boat ramps where salt or brackish water draining from boats may fall on bridges after they have been removed from the water
- Areas subject to spray from jet skis.
- In northern Florida there has been a move to place salt after winter storms. If this becomes a more common occurrence, consideration may be given to including these with parts of the bridge in a marine environment.

Otherwise, the environment should be deemed non-aggressive.

Reinforced Concrete and Wearing Surface Cracks in a non-aggressive environment.

- Insignificant or narrow cracks – less than 1/16" (0.06)
- Moderate width cracks – 1/16" to 3/16" cracks (0.06 to 0.19)
- Wide cracks – greater than 3/16" cracks (0.19)

Reinforced Concrete and Wearing Surface Cracks in an aggressive environment would remain as recommended in the AASHTO National Bridge Element Manual.

- Insignificant or narrow cracks – less than 0.012 inches
- Moderate width cracks – 0.012 to 0.05 inches
- Wide cracks greater than 0.05 inches

Prestressed Concrete Cracks will remain as recommended in the AASHTO National Bridge Element Manual.

- Insignificant or narrow cracks – less than 0.004 inches
- Moderate width cracks – 0.004 to 0.010 inches
- Wide cracks greater than 0.010 inches

Pattern (Map) Cracking

The AASHTO Manual for Element Inspection gives no guidance on what constitutes moderate or heavy cracking. If the widths of the pattern cracks meet the definition of moderate or wide cracks, then the crack width shall be used to determine the condition state. When the crack width is smaller than moderate, then if the pattern spacing is greater than 12 inches, use condition state 1. If the pattern spacing is 6 to 12 inches, this is moderate and use condition state 2. If the spacing less than 6 inches this is heavy and use condition state 3.

Predominant Defect Guidance

When multiple defects in the same condition state exist at the same location, use the following for guidance in selecting the defect to code. Other defects should be mentioned in the inspection notes.

Steel Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 1010 Cracking
- 1020 Connection
- 1000 Corrosion

Prestressed Concrete Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 1100 Exposed Prestressing
- 1090 Exposed Rebar
- 1110 Cracking
- 1080 Delamination/Spall/Patched Area
- 1120 Efflorescence Rust Staining
- 1190 Abrasion/Wear

Reinforced Concrete Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 1090 Exposed Rebar
- 1130 Cracking
- 1080 Delamination/Spall/Patched Area
- 1120 Efflorescence Rust Staining
- 1190 Abrasion Wear

Timber Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 1150 Check/Shake
- 1140 Decay/Section Loss
- 1170 Split/Delamination
- 1160 Crack
- 1020 Connection
- 1180 Abrasion/Wear

Other Material Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 2240 Loss of Bearing Area
- 2230 Bulging, Splitting or Tearing
- 2220 Alignment
- 2210 Movement
- 1020 Connections
- 1010 Cracking
- 2330 Seal Damage
- 2360 Adjacent Deck or Header
- 1220 Deterioration
- 9160 Leakage and Blockage (drainage)
- 2310 Leakage (joints)
- 1080 Delamination/Spall/Patched Area
- 2320 Seal Adhesion
- 2340 Seal Cracking
- 2350 Debris Impaction
- 2370 Metal Deterioration or Damage
- 1000 Corrosion
- 1120 Efflorescence Rust Staining

Masonry Elements

- 6000 Scour
- 4000 Settlement
- 1900 Distortion
- 1640 Masonry Displacement
- 1620 Split/Spall
- 1610 Mortar Breakdown
- 1080 Delamination/Spall
- 1120 Efflorescence Rust Staining
- 1630 Patched Area

Wearing Surface Elements

- 3210 Spalls/Delamination/Patch Area/Potholes
- 3230 Effectiveness
- 3220 Cracks – Wearing Surfaces

Steel Protective Coating System Elements

- 3440 Effectiveness
- 3420 Peeling/Bubbling/Cracking
- 3410 Chalking
- 3430 Oxide Film Degradation

Concrete Protective Coating Systems

- 3540 Effectiveness
- 3510 Wear

Bearing Defects

- 2240 Loss of Bearing Area
- 1020 Connections
- 2220 Alignment
- 2230 Bulging, Splitting or Tearing
- 2210 Movement
- 1000 Corrosion

Deck Joint Elements

- 2330 Seal Damage
- 2320 Seal Adhesion
- 2310 Leakage
- 2350 Debris Impaction
- 2370 Metal Damage
- 2360 Adjacent Deck or Header
- 2340 Seal Cracking

Non Structural Movable Elements

- 9020 Operation
- 9010 Mechanical Alignment
- 9040 Mechanical Wear/Abrasion
- 9000 Lubrication
- 9030 Clearances
- 1000 Corrosion

Channel

- 9120 Degradation
- 9130 Aggradation
- 9110 Migration
- 9150 Bank Erosion
- 9100 Channel Alignment
- 9140 Debris

DECK/SLAB ELEMENT TABLE

ELEMENT	UNITS	ELEMENT NUMBER (Decks)	ELEMENT NUMBER (Slabs)
Concrete (Bare)	sq. ft.	12	38
Concrete on Precast Panels	sq. ft.	8098	
Prestressed Concrete	sq. ft.	13	8099
Prestressed Reinforced Conc. Hybrid Slab	sq. ft.		8097
Prestressed Concrete Top Flange	sq. ft.	15	
Reinforced Concrete Top Flange	sq. ft.	16	
Steel Deck – Open Grid	sq. ft.	28	
Steel Deck – Concrete Filled Grid	sq. ft	29	
Steel Deck—Corrugated./Orthotropic	sq. ft.	30	
Timber Deck/Slab	sq. ft.	31	54
Other Deck/Slab	sq. ft.	60	65
Wearing Surfaces	sq. ft.	510	

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DECK JOINTS ELEMENT TABLE		
ELEMENT NAME	**UNITS**	**ELEMENT NUMBER**
Strip Seal Expansion Joint	ft	300
Pourable Joint Seal	ft	301
Compression Joint Seal	ft	302
Assembly Joint/Seal (Modular)	ft	303
Open Expansion Joint	ft	304
Assembly Joint without Seal	ft	305
Other Expansion Joint	ft	306

APPROACH SLAB AND RAILING ELEMENTS TABLE							
ELEMENT	**UNITS**	**METAL**	**P/S CONC**	**REINF CONC**	**TIMBER**	**OTHER**	**Masonry**
Approach Slab with or without AC Overlay	sq. ft.		320	321			334
Bridge Railing	ft	330		331	332	333	

D E C K

D E C K

Reinforced Concrete Deck and Slab Elements

Element # 12 — Reinforced Concrete Deck

Description: This element defines all reinforced concrete bridge decks regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Measurement: sq. ft

Element # 16 — Reinforced Concrete Top Flange

Description: This element defines all reinforced concrete bridge girder top flanges where traffic rides directly on the structural element regardless of the wearing surface or protection systems used. These bridge types include tee-beams, box girders, and girders that require traffic to ride on the top flange.
Classification: NBE - National Bridge Element
Units of Measurement: sq. Ft

Element # 38 — Reinforced Concrete Slab

Description: This element defines all reinforced concrete bridge slabs regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Units of Measurement: sq. Ft

Element # 8098— Concrete on Precast Deck Panels

Description: This element defines all reinforced concrete bridge decks on precast deck panels.
Classification: ADE rolls up to Element 12
Units of Measurement: sq.ft

Element Commentary

DECK

Element # 12 — Reinforced Concrete Deck

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Deck top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces.

Element # 16 — Reinforced Concrete Top Flange

The flange evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, or both, and being captured using the defined condition states. Flange top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing, or indicators in the materials covering the surfaces.

Element # 38 — Reinforced Concrete Slab

The slab evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Slab top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces.

Element # 8098 — Concrete on Precast Deck Panels

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Deck top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/ Wear (PSC/ RC) (1190)	No abrasion or wearing.	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
The element has moderate damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has severe damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Prestressed Concrete Deck and Slab Elements

Element # 13 — Prestressed Concrete Deck

Description: This element defines all prestressed concrete bridge decks regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Measurement: sq. Ft

Element # 15 — Prestressed Concrete Top Flange

Description: This element defines all prestressed bridge girder top flanges where traffic rides directly on the structural element regardless of the wearing surface or protection systems used. These bridge types include bulb-tees, box girders and girders that require traffic to ride on the top flange.
Classification: NBE - National Bridge Element
Units of Measurement: sq. Ft

Element # 8099 — Prestressed Concrete Slab (Sonovoid)

Description: This element defines those prestressed concrete slab constructed of prestressed slab units generally with an asphaltic concrete overlay. The condition of the overlay shall be recorded in the wearing surface element.
Classification: ADE—Agency Defined Element
Units of Measurement: sq. Ft

Element 8097— Prestressed Reinforced Concrete (Hybrid) Slab

Description: This element defines those prestressed reinforced concrete slabs units with reinforced concrete on top of prestressed slab units.
Classification: Agency Defined Element
Units of Measurement: sq. ft.

Element Commentary

DECK

Element # 13 — Prestressed Concrete Deck

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Deck top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces. Defect 1900 Distortion shall not be used for this element.

Element # 15 — Prestressed Concrete Top Flange

The flange evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Flange top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing, or indicators in the materials covering the surfaces. Defect 1900 Distortion shall not be used for this element.

Element # 8099 — Prestressed Concrete Slab (Sonovoid)

The slab evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Slab top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces. Defect 1900 Distortion may be used for this element.

Element # 8097— Prestressed Reinforced Concrete (Hybrid) Slab

The slab evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Slab top or bottom surfaces that are not visible for inspection shall be assessed based on the available visible surface. If both top and bottom surfaces are not visible, the condition shall be assessed based on destructive and nondestructive testing or indicators in the materials covering the surfaces. Defect 1900 Distortion may be used for this element.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Pre-stressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wear-ing.	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Distortion (1900)	None	Distortion not requiring mitigation, or distortion mitigated.
Damage (7000)	Not applicable	The element has impact damage. The specific dam-age caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Distortion that requires mitigation, but does not warrant structural review.	
The element has moderate damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has severe damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

DECK

DECK

Steel Deck Elements

Element # 28 — Steel Deck with Open Grid

Description: This element defines all open grid steel bridge decks with no fill.
Classification: NBE - National Bridge Element
Measurement: sq. ft

Element # 29 — Steel Deck with Concrete Filled Grid

Description: This element defines steel bridge decks with concrete fill either in all of the openings or within the wheel tracks.
Classification: NBE - National Bridge Element
Units of Measurement: sq. ft

Element # 30 — Steel Deck Corrugated/Orthotropic/Etc.

Description: This element defines those bridge decks constructed of corrugated metal filled with portland cement, asphaltic concrete, or other riding surfaces. Orthotropic steel decks are also included.
Classification: NBE - National Bridge Element
Units of Measurement: sq. ft

Element Commentary

DECK

Element # 28 — Steel Deck with Open Grid

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states

Element # 29 — Steel Deck with Concrete Filled Grid

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states.

Element # 30 — Steel Deck Corrugated/Orthotropic/Etc.

The deck evaluation is three dimensional in nature with the defects observed on the top surface, bottom surface, edges or all, and being captured using the defined condition states. Materials added for riding surface is not part of the element condition.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
The element has moderate damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has severe damage caused by vehicular or vessel impact. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

D E C K

D E C K

Timber Deck and Slab Elements

Element # 31 — Timber Deck

Description: This element defines all timber bridge decks regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Measurement: sq. ft

Element # 54 — Timber Slab

Description: This element defines all timber bridge slabs regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Units of Measurement: sq. ft

Element Commentary

DECK

Element # 31 — Timber Deck

The deck evaluation is three dimensional in nature with the defects observed on the top and bottom surface, edges or all, and being captured using the defined condition states.

Timber running planks shall be included under the wearing surface assessment.

Element # 54 — Timber Slab

The slab evaluation is three dimensional in nature with the defects observed on the top and bottom surface, edges or all, and being captured using the defined condition states.

Timber running planks shall be included under the wearing surface assessment.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Checks/Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Cracks (Timber) (1160)	None.	Cracks that have been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified cracks exist that are not arrested and do not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	
Section loss 10% or more of the member thickness but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Other Material Deck and Slab Elements

Element # 60 — Other Deck

Description: This element defines all other material bridge decks regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Measurement: sq. ft

Element # 65 — Other Slab

Description: This element defines all slabs constructed of other materials regardless of the wearing surface or protection systems used.
Classification: NBE - National Bridge Element
Units of Measurement: sq. ft

Element Commentary

DECK

Element # 60 — Other Deck

The deck evaluation is three dimensional in nature with the defects observed on the top and bottom surface, edges or all, and being captured using the defined condition states.

The other material deck is intended for decks constructed of composite materials, or other materials that cannot be classified using any other defined deck element.

Element # 65 — Other Slab

The slab evaluation is three dimensional in nature with the defects observed on the top and bottom surface, edges or all, and being captured using the defined condition states.

The other material slab is intended for slabs constructed of composite materials, or other materials that cannot be classified using any other defined slab element.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry. .	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Deck Joint Elements

Element # 300 — Strip Seal Expansion Joint

Description: This element defines those expansion joint devices which utilize a neoprene type waterproof gland with some type of metal extrusion or other system to anchor the gland.
Classification: BME - Bridge Management Element
Measurement: ft

Element # 301 — Pourable Joint Seal

Description: This element defines those joints filled with a pourable seal with or without a backer.
Classification: BME - Bridge Management Element
Measurement: ft

Element # 302 — Compression Joint Seal

Description: This element defines only those joints filled with a preformed compression type seal. This joint does not have an anchor system to confine the seal.
Classification: BME - Bridge Management Element
Measurement: ft

Element # 303 — Assembly Joint With Seal

Description: This element defines only those joints filled with an assembly mechanism that have a seal.
Classification: BME - Bridge Management Element
Measurement: ft

Element # 305 — Assembly Joint Without Seal

D E C K

Description: This element defines only those assembly joints that are open and not sealed. These joint includes finger and sliding plate joints.

Classification: BME - Bridge Management Element

Measurement: ft

Element # 306 — Other Joint

Description: This element defines only those other joints that are not defined by any other joint element.

Classification: BME - Bridge Management Element

Measurement: ft

Element Commentary

Element # 305 — Assembly Joint Without Seal

This element shall include open joints with or without a drainage trough below the joint. **Do not use Defects 2310, 2320 or 2340 with this element.**

Element # 306 — Other Joint

The other material joint element is intended for joints constructed of materials that cannot be classified using any other defined joint element. **Do not use Defects 2320, 2330 or 2340 with this element.**

D E C K

Defect	Condition State 1	Condition State 2
	GOOD	**FAIR**
Leakage (2310)	None	Minimal. Minor dripping through the joint.
Seal Adhesion (2320)	Fully Adhered	Adhered for more than 50% of the joint height.
Seal Damage (2330)	None	Seal abrasion without punctures.
Seal Cracking (2340)	None	Surface crack
Debris Impaction (2350)	No debris to a shallow cover of loose debris may be evident but does not affect the performance of the joint.	Partially filled with hard-packed material, but still allowing free movement.
Adjacent Deck or Header (2360)	Sound. No spalls, delamination or unsound patches.	Edge delamination or spall less than 1 in. deep or less than 6 in. diameter. No exposed rebar. Patched area that is sound.
Metal Damage (2370)	None	Freckled rust, metal has no cracks, or impact damage. Connections may be loose but functioning as intended.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Moderate. More than a drip and less than free flow of water.	Free flow of water through the joint.
Adhered 50% or less of joint height but still some adhesion	Complete loss of adhesion
Punctured or ripped or partially pulled out.	Punctured completely through, pulled out, or missing.
Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Completely filled and impacts joint movement.	Completely filled and prevents joint movement.
Spall greater than 1 in. deep or 6 in. or greater in diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area or loose joint anchor that prevents the joint from functioning as intend-ed.
Section loss, missing or broken fasteners, cracking of the metal or impact damage but joint still functioning	Metal cracking, section loss, damage or connection failure that prevents the joint from functioning as intend-ed.
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 304 — Open Expansion Joint

Description: This element defines only those joints that are open and not sealed.

Classification: BME - Bridge Management Element

Measurement: ft

Element Commentary

DECK

Element # 304 — Open Expansion Joint

This element is intended for joints designed as open joints not those joints that were designed to have a seal that is currently missing.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Debris Impaction (2350)	No debris to a shallow cover of loose debris may be evident but does not affect the performance of the joint.	Partially filled with hard-packed material, but still allowing free movement.
Adjacent Deck or Header (2360)	Sound. No spalls, delamination or unsound patches.	Edge delamination or spall less than 1 in. deep or less than 6 in. diameter. No exposed rebar. Patched area that is sound.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Completely filled and impacts joint movement.	Completely filled and prevents joint movement.
Spall greater than 1 in. deep or 6 in. or greater in diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area or loose joint an-chor that prevents the joint from functioning as intend-ed.
The element has impact dam-age. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact dam-age. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Deck Approach Slab Elements

Element # 320 — Prestressed Concrete Approach Slab

Description: This element defines those structural sections, between the abutment and the approach pavement that are constructed of prestressed (post-tensioned) reinforced con-crete.

Classification: BME - Bridge Management Element

Measurement: sq. ft.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing.	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Exceeds tolerable limits but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 321 — Reinforced Concrete Approach Slab

Description: This element defines those structural sections, between the abutment and the approach pavement, that are constructed of mild steel reinforced concrete.

Classification: BME - Bridge Management Element

Measurement: sq ft

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing.	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Exceeds tolerable limits but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Bridge Railing Elements

Element # 330 — Metal Bridge Railing

Description: This element defines all types and shapes of metal bridge railing. Steel, aluminum, metal beam, rolled shapes, etc. will all be considered part of this element. Included in this element are the posts of metal, timber or concrete, blocking, and curb.

Classification: NBE - National Bridge Element

Measurement: ft

Element Commentary

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Element # 330 — Metal Bridge Railing

The number of rows of rail on a bridge is commonly two, one on each side of the traveled way. In some cases there may be more than two rows when the bridge has a center median or protected pedestrian/bicycle lanes. Refer to the other bridge rail material elements (concrete, timber, masonry, other) for specific defects for assessing the condition of posts, blocking and curbs that may be constructed of materials other than metal.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking/ Fatigue (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that are not arrested and does not require structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review	
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 331 — Reinforced Concrete Bridge Railing

Description: This element defines all types and shapes of reinforced concrete bridge railing. All elements of the railing must be concrete.

Classification: BME - Bridge Management Element

Measurement: ft

Element Commentary

Element # 331 — Reinforced Concrete Bridge Railing

The number of rows of rail on a bridge is commonly two, one on each side of the bridge. In some cases there may be more than two rows when you have a center median or protected pedestrian/ bicycle lanes.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without section loss.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or un-sealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggre-gate but the aggregate remains secure in the concrete.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been cap-tured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 332 — Timber Bridge Railing

Description: This element defines all types and shapes of timber bridge railing. Included in this element are the posts of timber, metal or concrete, blocking, and curb.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 332 — Timber Bridge Railing

The number of rows of rail on a bridge is commonly two, one on each side of the traveled way. In some cases there may be more than two rows when the bridge has a center median or protected pedestrian/bicycle lanes. Refer to the other bridge rail material elements (metal, concrete, masonry, other) for specific defects for assessing the condition of posts, blocking and curbs that may be constructed of materials other than timber.

DECK

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Checks/Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Cracks (Timber) (1160)	None.	Cracks that have been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified cracks exist that are not arrested and do not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	
Section loss 10% or more of the member thickness but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 333 — Other Bridge Railing

Description: This element defines all types and shapes of bridge railing except those defined as metal, concrete, timber, or masonry.

Classification: NBE - National Bridge Element

Measurement: ft

Element Commentary

Element # 333 — Other Bridge Railing

This element should be used for materials not otherwise defined. The number of rows of rail on a bridge is commonly two, one on each side of the traveled way. In some cases there may be more than two rows when the bridge has a center median or protected pedestrian/bicycle lanes.

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without section loss.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation, or distortion mitigated.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
Distortion that requires mitigation, but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Deck Joint Elements

Element # 334 — Masonry Bridge Railing

Description: This element defines all types and shapes of masonry block or stone bridge railing. All elements of the railing must be masonry block or stone.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 334 — Masonry Bridge Railing

The number of rows of rail on a bridge is commonly two, one on each side of the bridge. In some cases there may be more than two rows when you have a center median or protected pedestrian/ bicycle lanes.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Mortar Breakdown (Masonry) (1610)	None	Cracking or voids in less than 10% of joints.
Splits or Spalls (Masonry) (1620)	None	Block or stone has split or spalled with no shifting.
Patched Areas (Masonry) (1630)	None	Sound Patches
Masonry Displacement (1640)	None	Block or stone has shifted slightly out of alignment.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Heavy build-up with rust staining.	
Cracking or voids in 10% or more of the of joints	
Block or stone has split or spalled with shifting but does not warrant a structural review.	
Unsound Patches	
Block or stone has shifted significantly out of alignment or is missing but does not warrant structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

D E C K

D E C K

Wearing Surfaces Elements

Element # 510 — Wearing Surfaces

Description: This element is for all decks/slabs that have overlays made with flexible (asphaltic concrete), semi rigid (epoxy and polyester material), rigid (portland cement) materials and timber running planks.
Classification: BME - Bridge Management Element
Measurement: sq ft

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing.	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Spalls/ Delaminations/ Patch Areas/ Potholes - Wearing Surfaces (3210)	None	Delaminations. Spalls 1 in. or less deep or less than 6 in. in diameter. Patched areas that are sound. Partial depth pothole.
Cracks - Wearing Surfaces (3220)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Effectiveness - Wearing Surfaces (3230)	Fully effective. No evidence of leakage or further deterioration of the protected element.	Substantially effective. Deterioration of the protected element has slowed.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

DECK

Condition State 3	Condition State 4
POOR	SEVERE
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	The wearing surface is no longer effective.
Spalls greater than 1 in. deep or greater than 6 in. in diameter. Patched areas that are unsound or showing distress. Full depth pothole.	
Wide cracks or heavy pattern or map cracking.	
Limited effectiveness. Deterioration of the protected element has progressed.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUPERSTRUCTURE ELEMENT TABLE

CoRe ELEEMNT	UNITS	STEEL	P/S CONC	REINF CONC	TIMBER	OTHER
Closed Web/Box Girder	ft	102	104	105		106
Open Girder/Beam	ft	107	109	110	111	112
Stinger (Stringer Floor Beam system)	ft	113	115	116	117	118
Truss	ft	120			135	136
Masonry Arch	ft					145
Arch	ft	141	143	144	146	142
Main Cable	ft	147				
Secondary Cables	each	148				149
External Post Tensioning Duct	ft					8199
Floor Beam	ft	152	154	155	156	157
Pin & Hanger Assembly	each	161				
Gusset Plate	each	162				

BEARING AND OTHER SUPERSTRUCTURE ELEMENT TABLE		
CoRe ELEMENT	**UNITS**	**ELEMENT NUMBER**
Elastomeric Bearing	each	310
Movable Bearing (rolling, sliding, etc.)	each	311
Enclosed/Concealed Bearing	each	312
Fixed Bearing	each	313
Pot Bearing	each	314
Disk Bearing	each	315
Other Bering	each	316
Metal Drainage System	each	8397
Other Material Drainage System	each	8398
Conduit & Junction Boxes	each	8572

Steel Superstructure Elements

Element # 102 — Steel Closed Web/Box Girder

Description: This element defines all steel box girders or closed web girders, and is for all box girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 107 — Steel Open Girder/Beam

Description: This element defines all steel open girders, and is for all girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 113 — Steel Stringer

Description: This element defines steel members that support the deck in a stringer floor beam system, and is for all stringers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 120 — Steel Truss

Description: This element defines all steel trusses, and is for all steel trusses regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 102 — Steel Closed Web/Box Girder

The box girder evaluation is three dimensional in nature with the defects observed on exterior and interior surfaces being used to capture the condition states.

SUPER

Element # 107 — Steel Open Girder/Beam

Condition evaluation for this element includes the web face and the top and bottom faces of the flange.

Element # 113 — Steel Stringer

Condition evaluation for this element includes the web faces and the top and bottom faces of the flange.

Element # 120 — Steel Truss

Observed distress in truss vertical or diagonal members shall be reported as the length projected along the length of the truss.

Element # 141 — Steel Arch

Description: This element defines steel arches regardless of type, and is for all arches regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

SUPER

Element # 147 — Steel Main Cables

Description: This element defines all steel main suspension or cable stay cables not embedded in concrete. It is for all cable groups regardless of protective systems.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 148 — Secondary Steel Cables

Description: This element defines all steel suspender cables not embedded in concrete. It is for all individual or cable groups regardless of protective systems.
Classification: NBE - National Bridge Element
Measurement: each

Element Commentary

Element # 141 — Steel Arch

Observed distress in arch diagonals and vertical members (including spandrel columns) shall be reported as the projected length along the arch length.

Element # 147 — Steel Main Cables

This element is intended for use on main cables in suspension bridges or main cable stays in cable stayed bridges. Suspender cables or other smaller cables shall be captured using the secondary cable element.

Element # 148 — Secondary Steel Cables

This element is intended for use on suspender cables, other smaller cables or groups of cables in one location acting as a system to carry loads from the superstructure to the main cable/arch.

Suspension bridge main cables or cable stays shall be captured using the steel main cable element.

SUPER

Element# 152—Steel Floor Beam

Description: This element defines steel floor beams that typically support stringers, and is for all floor beams regardless of protective system.
Classification: NBE—National Bridge Element
Measurement: ft

SUPER

Element # 161 — Steel Pin and Pin & Hanger Assembly or Both

Description: This element defines steel pins and pin and hanger assemblies and is for all assemblies regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each

Element # 162 — Steel Gusset Plate

Description: This member defines only those steel gusset plate(s) connections that are on the main truss/arch panel(s). These connections can be constructed with one or more plates that may be bolted, riveted, or welded. This element is for all gusset plates regardless of protective systems.
Classification: NBE - National Bridge Element
Measurement: each

Element Commentary

Element# 152—Steel Floor Beam

Condition evaluation for this element includes the web faces and the top and bottom faces of the flange.

Element # 161 — Steel Pin and Pin & Hanger Assembly or Both

Distress observed on either hanger assembly plate should be considered in the condition assessment.

Element # 162 — Steel Gusset Plate

For built-up gusset plates, distress observed on any plate should be considered in the condition assessment. All plates at a connection (or panel) point are considered 1 gusset plate regardless of the number of plates present.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Prestressed Concrete Superstructure Elements

SUPER

Element # 104 — Prestressed Conc. Closed Web/Box Girder

Description: This element defines all pre-tensioned or post-tensioned concrete closed web girders or box girders, and is for all box girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 109 — Prestressed Concrete Open Girder/Beam

Description: This element defines pre-tensioned or post-tensioned concrete open web girders, and is for all girders regard-less of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 115 — Prestressed Concrete Stringer

Description: This element defines pre-tensioned or post-tensioned concrete members that support the deck in a stringer floor beam system, and is for all stringers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 154 — Prestressed Concrete Floor Beam

Description: This element defines prestressed concrete floor beams that typically support stringers, and is for all floor beams regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 104 — Prestressed Concrete Closed Web/Box Girder

The box girder evaluation is three dimensional in nature which includes defects observed on exterior and interior surfaces.

Where traffic rides directly on the structural element, regardless of the wearing surface, evaluation of the top flange above the fillet is considered with element 15.

Element # 109 — Prestressed Concrete Open Girder/ Beam

Where traffic rides directly on the structural element, regardless of the wearing surface, evaluation of the top flange above the fillet is considered with element 15.

Element # 115 — Prestressed Concrete Stringer

Condition evaluation for this element includes the web faces and the top and bottom flange surfaces.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 143 — Prestressed Concrete Arch

Description: This element defines only pre-tensioned or post-tensioned concrete arches, and is for all arches regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

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Element Commentary

Element # 143 — Prestressed Concrete Arch

Observed distress in arch diagonals and vertical members (including spandrel columns) shall be reported as the projected length along the arch length.

For filled arches, the arch quantity shall be measured from spring line to spring line. The length below the spring line is considered substructure.

SUPER

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

S U P E R

Reinforced Concrete Superstructure Elements

Element # 105 — Reinforced Concrete Closed Web/Box Girder

S U P E R

Description: This element defines all reinforced concrete box girders or closed web girders, and is for all box girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 110 — Reinforced Concrete Open Girder/ Beam

Description: This element defines mild steel reinforced concrete open web girders, and is for all girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 116 — Reinforced Concrete Stringer

Description: This element defines mild steel reinforced concrete members that support the deck in a stringer floor beam system, and is for all stringers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 155 — Reinforced Concrete Floor Beam

Description: This element defines mild steel reinforced concrete floor beams that typically support stringers, and is for all floor beams regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 105 — Reinforced Concrete Closed Web/Box Girder

Where traffic rides directly on the structural element, regardless of the wearing surface, evaluation of the top flange above the fillet is considered with element 16.

Element # 110 — Reinforced Concrete Open Girder/ Beam

Condition evaluation for this element includes the web faces and the top and bottom flange surfaces.

Where traffic rides directly on the structural element regardless of the wearing surface evaluation of the top flange above the fillet is considered with element 16.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Element # 144 — Reinforced Concrete Arch

Description: This element defines only mild steel reinforced concrete arches, and is for all arches regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

SUPER

Element Commentary

Element # 144 — Reinforced Concrete Arch

Observed distress in arch diagonals, vertical members (including spandrel columns) and spandrel walls shall be reported as the projected length along the arch length.

For filled arches, the arch quantity shall be measured from spring line to spring line. The length below the spring line is considered substructure.

SUPER

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Timber Superstructure Elements

Element # 111—Timber Open Girder/Beam

Description: This element defines all timber open girders, and is for all girders regardless of protection system.
Classification: NBE - National Bridge Element
Measurement: ft

SUPER

Element # 117 — Timber Stringer

Description: This element defines timber members that support the deck in a stringer floor beam system, and is for all stringers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 135 — Timber Truss

Description: This element defines all timber truss elements, including all tension and compression members for through and deck trusses. It is for all trusses regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 135 — Timber Truss

Observed distress in truss vertical or diagonal members shall be reported as the length projected along the length of the truss.

SUPER

Element # 146 — Timber Arch

Description: This element defines only timber arches, and is for all arches regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

SUPER

Element # 156 — Timber Floor Beam

Description: This element defines timber floor beams that typically support stringers, and is for all floor beams regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 146 — Timber Arch

Observed distress in arch diagonal and vertical members (including spandrel columns) shall be reported as the projected length along the arch.

SUPER

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Checks/Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Cracks (Timber) (1160)	None.	Cracks that have been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified cracks exist that are not arrested and do not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	
Section loss 10% or more of the member thickness but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUPER

Other Material Superstructure Elements

Element # 106 — Other Closed Web/Box Girder

Description: This element defines all other material box girders or closed web girders, and is for all other material box girders regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 112 — Other Open Girder/Beam

Description: This element defines all other material girders, and is for all girders regardless of protection system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 118 — Other Stringer

Description: This element defines all other material stringers, and is for all stringers regardless of protection system.
Classification: NBE - National Bridge Element
Measurement: ft

Element # 136 — Other Truss

Description: This element defines all other material truss elements, including all tension and compression members, and through and deck trusses. It is for all other material trusses regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 106 — Other Closed Web/Box Girder

The box girder evaluation is three dimensional in nature with the defects observed including exterior and interior surfaces being used to capture the condition states.

The other material box girder is intended for box girders constructed of composite materials, or other materials that can-not be classified using any other defined box girder element.

SUPER

Element # 112 — Other Open Girder/Beam

The other material open girder is intended for open girders constructed of composite materials, or other materials that cannot be classified using any other defined open girder element.

Element # 118 — Other Stringer

The other material stringer is intended for stringers constructed of composite materials, or other materials that cannot be classified using any other defined stringer element.

Element # 136 — Other Truss

Observed distress in truss diagonal and vertical members shall be reported as the projected length along the length of the truss.

The other material open truss is intended for trusses constructed of composite materials, or other materials that cannot be classified using any other defined truss element

Element # 142 — Other Arch

Description: This element defines other material arches regardless of type, and is for all other material arches regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

SUPER

Element # 149 — Other Secondary Cable

Description: This element defines all other material cables not embedded in concrete. It is for all individual other material cables or cable groups regardless of protective systems.
Classification: NBE - National Bridge Element
Measurement: each

Element# 157– Other Floor Beam

Description: This element defines other material floor beams that typically support stringers, and is for all floor beams regardless of protective system.
Classification: NBE—National Bridge Element
Measurement: ft

Element # 8199—External Post Tensioning Duct

Description: This element defines all external post tensioning ducts.
Classification: ADE—Agency Defined Element
Measurement: ft

Element Commentary

Element # 142 — Other Arch

Observed distress in arch diagonals and verticals (including spandrel columns) shall be reported as the projected length along the arch length.

The other material arch is intended for arches constructed of composite materials, or other materials that cannot be classified using any other defined arch element.

SUPER

Element # 149 — Other Secondary Cable

This element is intended for use on suspender cables, other smaller cables or groups of cables in one location acting as a system to carry loads from the superstructure to the main cable/arch.

Suspension bridge main cables or cable stays shall be captured using the steel main cable element.

The other material secondary cable is intended for cables constructed of composite materials, or other materials that can-not be classified using any other defined cable elements. **Do not use Defects 1080, 1120 or 1130 for this element.**

Element # 157 — Other Floor Beam

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state.

Element # 8199 — External Post Tensioning Duct

This element is intended for use on bridges with external tendons and includes deviators and anchorages.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Masonry Superstructure Elements

SUPER

Element # 145 — Masonry Arch

Description: This element defines masonry or stacked stone arches, and is for all arches regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 145 — Masonry Arch

SUPER

Observed distress in arch spandrel walls shall be reported as the projected length along the arch length.

For filled arches, the arch quantity shall be measured from spring line to spring line. The length below the spring line is considered substructure.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Mortar Breakdown (Masonry) (1610)	None	Cracking or voids in less than 10% of joints.
Splits or Spalls (Masonry) (1620)	None	Block or stone has split or spalled with no shifting.
Patched Areas (Masonry) (1630)	None	Sound Patch
Masonry Displacement (1640)	None	Block or stone has shifted slightly out of alignment.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Heavy build-up with rust staining	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Cracking or voids in 10% or more of the joints	
Block or stone has split or spalled with shifting but does not warrant a structural review.	
Unsound Patch	
Block or stone has shifted significantly out of alignment or is missing but does not warrant a structural review	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUPER

Miscellaneous Superstructure Elements

Element # 8397 — Metal Drainage Systems

Description: This element defines all visible parts of the drainage system that are constructed of metal.

Classification: ADE - Agency Defined Element

Measurement: each

Element Commentary

Element # 8397 — Metal Drainage Systems

This element consists of the entire drainage system from bridge deck to outlet. This element should not be used for deck scuppers or drainage holes in the parapets.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Blockage and Leakage (9160)	None	Showing minor signs of leaking or restricted flow due to blockage
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUPER

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Showing moderate signs of leakage or restricted flow due to blockage.	Drainage system is not functioning due to leakage or restricted flow due to blockage.
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUPER

Element # 8398 — Other Material Drainage Systems

Description: This element defines all visible parts of the drainage system that is constructed of material other than metal.

Classification: ADE - Agency Defined Element

Measurement: each

Element Commentary

Element # 8398 — Other Drainage Systems

This element consists of the entire drainage system from bridge deck to outlet. This element should not be used for deck scuppers or drainage holes in the parapets.

SUPER

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Blockage and Leakage (9160)	None	Showing minor signs of leaking or restricted flow due to blockage
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
Showing moderate signs of leakage or restricted flow due to blockage.	Drainage system is not functioning due to leakage or restricted flow due to blockage.
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Element # 8572—Conduit & Junction Boxes

This element defines those members which enclose, support and protect the power and control wiring. This element should also be used for the conduits for navigational light systems on non movable bridges but not for other conduit systems on non movable bridges.

SUPER

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Deterioration (1220)	None	Initiated deterioration.	Significant deterioration or breakdown that does not warrant structural review.	

SUPER

SUPER

Bearing Elements

Element # 310 — Elastomeric Bearing

Description: This element defines only those bridge bearings that are constructed primarily of elastomers, with or without fabric or metal reinforcement
Classification: NBE - National Bridge Element
Measurement: each

Element # 314 — Pot Bearing

Description: This element defines those high load bearings with confined elastomer. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction.
Classification: NBE - National Bridge Element
Measurement: each

Element Commentary

Element # 310 — Elastomeric Bearing

The quantity is the sum of each bearing of this type.

Element # 314 — Pot Bearing

The quantity is the sum of each bearing of this type.

SUPER

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Movement (2210)	Free to Move.	Minor Restriction
Alignment (2220)	Lateral and vertical alignment is as expected for the temperature conditions.	Tolerable lateral or vertical alignment that is inconsistent with the temperature conditions.
Bulging, Splitting or Tearing (2230)	None	Bulging less than 15% of the thickness.
Loss of Bearing Area (2240)	None	Less than 10%
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Restricted but not warranting structural review.	
Approaching the limits of lateral or vertical alignment for the bearing but does not warrant a structural review.	
Bulging 15% or more of the thickness. Splitting or tearing. Bearing's surfaces are not parallel. Does not warrant structural review.	
10% or more but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUPER

Element # 311 — Movable Bearing

Description: This element defines only those bridge bearings which provide for both rotation and longitudinal movement by means of roller, rocker, or sliding mechanisms.
Classification: NBE - National Bridge Element
Measurement: each

Element # 312 — Enclosed/Concealed Bearing

Description: This element defines only those bearings that are enclosed so that they are not open for detailed inspection.
Classification: NBE - National Bridge Element
Measurement: each

Element # 313 — Fixed Bearing

Description: This element defines only those bridge bearings that provide for rotation only (no longitudinal movement).
Classification: NBE - National Bridge Element
Measurement: each

Element # 315 — Disc Bearing

Description: This element defines only those high load bearings with a hard plate disc. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction.
Classification: NBE - National Bridge Element
Measurement: each

Element # 316 — Other Bearing

Description: This element defines all other material bearings regardless of translation or rotation constraints.
Classification: NBE - National Bridge Element
Measurement: each

Element Commentary

The quantity is the sum of each bearing of these types.

Element # 316 — Other Bearing

The other material bearing element is intended for bearings constructed of other materials that cannot be classified using any other defined bearing element.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Movement (2210)	Free to Move.	Minor Restriction
Alignment (2220)	Lateral and vertical alignment is as expected for the temperature conditions.	Tolerable lateral or vertical alignment that is inconsistent with the temperature conditions.
Loss of Bearing Area (2240)	None	Less than 10%
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUPER

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Restricted but not warranting structural review.	
Approaching the limits of lateral or vertical alignment for the bearing but does not warrant a structural review.	
10% or more but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

S U P E R

S U P E R

Protective Coatings and other Protective Systems

Element # 515 — Steel Protective Coating

Description: This element is for steel elements that have a protective coating such as paint, galvanization, weathering steel patina or other top coat steel corrosion inhibitor.
Classification: BME - Bridge Management Element
Measurement: sq ft

Element # 8516 — Paint on Steel

Description: This element is for steel elements that have a protective coating of paint.
Classification: ADE rolls up to Element 515
Measurement: sq ft

Element # 8517 — Weathering Steel Patina

Description: This element is for steel elements that have a protective coating of weathering steel.
Classification: ADE rolls up to Element 515
Measurement: sq ft

Element # 8518 — Galvanized or Metalized Steel

Description: This element is for steel elements that have a protective coating of galvanization or metalizing.
Classification: ADE rolls up to Element 515
Measurement: sq ft

Element # 8519 — Other Steel Protective Coatings

Description: This element is for steel elements that have a protective coating that is not covered by any of the other protective coatings.

Classification: ADE rolls up to Element 515

Measurement: sq ft

Element Commentary

The quantity for these elements should include the entire protected surface of the steel element. Element 515 shall not be used, it simply serves as a roll up element for reporting to FHWA.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Chalking - Steel Protective Coatings (3410)	None	Surface Dulling
Peeling/Bubbling/ Cracking - Steel Protective Coatings (3420)	None	Finish coats only.
Oxide Film Degradation Color/ Texture Adherence (3430)	Yellow-orange or light brown for early development. Chocolate-brown to purple-brown for fully developed. Tightly adhered, capable of withstanding hammering or vigorous wire brushing.	Granular texture.
Effectiveness - Steel Protective Coatings (3440)	Fully effective	Substantially effective
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUPER

Condition State 3	Condition State 4
POOR	SEVERE
Loss of Pigment	Not Applicable
Finish and primer coats	Exposure of bare metal
Small flakes, less than 1/2 in. diameter.	Dark black color. Large flakes, 1/2 in. diameter or greater or laminar sheets or nodules.
Limited effectiveness	Failed, no protection of the underlying metal
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Element # 521 — Concrete Protective Coating

SUPER

Description: This element is for concrete elements that have a protective coating applied to them. These coatings include silane/siloxane water proofers, crack sealers such as High Molecular Weight Methacrylate (HMWM), or any top coat barrier that protects concrete from deterioration and reinforcing steel from corrosion.

Classification: BME - Bridge Management Element

Measurement: sq ft

Element Commentary

The quantity for these elements should include the entire protected surface of the concrete element.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Wear - Concrete Protective Coatings (3510)	None	Underlying concrete not exposed, coating showing wear from UV exposure, friction course missing
Effectiveness - Concrete Protective Coatings (3540)	Good condition, fully effective	Substantially effective
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUPER

Condition State 3	Condition State 4
POOR	SEVERE
Underlying concrete is not exposed, thickness of the coating is reduced	Underlying concrete exposed. Protective coating no longer effective
Limited effectiveness	The protective system has failed or is no longer effective.
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

Element # 520 — Concrete Reinforcing Steel Protective System

Description: This element defines all types of protective systems used to protect reinforcing steel in concrete elements from corrosion.

SUPER

Classification: BME - Bridge Management Element

Measurement: sq ft

Element Commentary

The quantity for these elements should include the entire protected surface of the protected element. This element should include cathodic protection systems other similar protective systems. This element shall not be used for epoxy coated reinforcing steel. It may be used for non ferrous reinforcing steel or stainless steel reinforcing.

SUPER

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Effectiveness - Protective System (e.g. Cathodic) (3600)	Fully effective	Substantially effective
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUPER

Condition State 3	Condition State 4
POOR	SEVERE
Limited effectiveness	The protective system has failed or is no longer effective.
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUPER

SUB

SUBSTRUCTURE ELEMENT TABLE

ELEMENT	UNITS	STEEL	P/S CONC	REINF CONC	TIM-BER	OTHER	Masonry
Column	Each	202	204	205	206	203	
Pile	Each	225	226	227	228	229	
Hollow Core Pile	Each		8207				
Pier Wall	ft			210	212	211	213
Abutment	ft			215	216	218	217
Pile Cap/Footing	ft			220			
Tower or Trestle	ft	207			208		
Cap	ft	231	233	234	235	236	

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Steel Substructure Elements

Element # 202 — Steel Column

Description: This element is for all steel columns regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of columns.

Element # 207 — Steel Tower

Description: This element defines steel built up or framed tower supports, and is for all steel towers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the number of built up or framed tower supports.

Element # 219 — Steel Abutment

Description: This element defines steel abutments. This includes the sheet material retaining the embankment. This is for all steel abutments regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the width of the abutment with monolithic wingwalls and abutment extensions measured along the skew angle.

Element # 225 — Steel Pile

Description: This element defines steel piles that are visible for inspection. Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This element is for all steel piles regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of piles visible for inspection.

Element Commentary

Element # 207 — Steel Tower

This element is intended to be used for truss framed tower supports or built up steel towers. This element is intended to capture large supports and towers associated with suspension bridges, cable stayed bridges, moveable bridges or similar structural configurations.

Element # 219 — Steel Abutment

Wingwalls and abutment extensions shall be considered as their own element.

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 231 — Steel Pier Cap

Description: This element defines those steel pier caps that support girders and transfer load into piles or columns, and is for all steel pier caps regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for the sum of the cap lengths measured along the skew angle.

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SUB

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUB

Prestressed Concrete Substructure Elements

Element # 204 — Prestressed Concrete Column

Description: This element is for all prestressed concrete columns regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of columns.

Element # 226 — Prestressed Concrete Piles

SUB

Description: This element defines prestressed concrete piles that are visible for inspection Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This element is for all prestressed concrete piles regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of piles visible for inspection.

Element # 8207 — Prestressed Concrete Hollow Core Piles

Description: This element defines prestressed concrete hollow core piles that are visible for inspection Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This element is for all prestressed concrete hollow core piles regardless of protective system.

Classification: ADE rolls up to Element 226

Measurement: each

Quantity: The quantity for this element is the sum of the number of piles visible for inspection.

SUB

Element Commentary

FDOT has decided to track hollow core piles separate from standard piles.

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or arrested with no observed structural distress
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exceeds tolerable limits but does not warrant structural review.	
Exceeds tolerable limits but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 233 — Prestressed Concrete Pier Cap

Description: This element is for all prestressed concrete pier caps that support girders and transfer load into piles or columns and is for all caps regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the cap lengths measured along the skew angle

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
Exceeds tolerable limits but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUB

SUB

Reinforced Concrete Substructure Elements

Element # 205 — Reinforced Concrete Column

Description: This element is for all reinforced concrete columns regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of columns.

Element # 210 — Reinforced Concrete Pier Wall

Description: This element defines reinforced concrete pier walls and is for all pier walls regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the lengths of the pier walls measured along the skew angle.

Element # 215 — Reinforced Concrete Abutment

Description: This element defines reinforced concrete abutments and is for all abutments regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the width of the abutment with monolithic wingwalls and abutment extensions measured along the skew angle.

Element # 220 — Reinforced Concrete Pile Cap/Footing

Description: This element is for all reinforced concrete pile caps/footings that are visible for inspection. Pile caps/footings exposed from erosion or scour or visible during an underwater inspection are included in this element. The exposure may be intentional or caused by erosion or scour..
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the length of the footings or pile caps measured along the skew angle.

Element # 227 — Reinforced Concrete Pile

Description: This element is for all reinforced concrete piles that are visible for inspection. Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This element is for all concrete piles regardless of protective system..
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of piles.

Element Commentary

Element # 215 — Reinforced Concrete Abutment

Wingwalls and abutment extensions shall be considered as their own element.

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Re-bar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/ Wear (PSC/ RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 234 — Reinforced Concrete Pier Cap

Description: This element is for all reinforced concrete pier caps that support girders and transfer load into piles or columns and is for all caps regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the cap lengths measured along the skew angle

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Timber Substructure Elements

Element # 206 — Timber Column

Description: This element is for all timber columns regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of columns.

Element # 208 — Timber Trestle

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Description: This element is for all framed timber supports, and is for all timber trestle/towers regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the heights of built up or framed tower supports.

Element # 212 — Timber Pier Wall

Description: This element defines timber pier walls that include pile, timber sheet material, and filler. This for all pier walls regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the length of the pier walls measured along the skew angle.

Element # 216 — Timber Abutment

Description: This element defines timber abutments. This includes the sheet material retaining the embankment, integral wingwalls and abutment extensions. This is for all abutments regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the width of the abutment with integral wingwalls and abutment extensions measured along the skew angle.

Element # 228 — Timber Pile

Description: This element defines other material piles that are visible for inspection. Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This is for all timber piles regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of piles.

Element Commentary

Element # 216 — Timber Abutment

Wingwalls and abutment extensions shall be considered as their own element.

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Check/Shake (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Crack (Timber) (1160)	None.	Crack that has been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.

SUB

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified crack exists that is not arrested and does not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Abrasion/Wear (Timber) (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUB

Condition State 3	Condition State 4
POOR	SEVERE
Section loss 10% or more of the member thickness but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 235 — Timber Pier Cap

Description: This element defines those timber pier caps that support girders that transfer load into piles, or columns and is for all timber pier caps regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

Quantity: The quantity for this element is the sum of the length of the pier walls measured along the skew angle.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Checks/ Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Cracks (Timber) (1160)	None.	Cracks that have been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified cracks exist that are not arrested and do not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	
Section loss 10% or more of the member thickness but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Other Material Substructure Elements

Element # 203 — Other Column

Description: This element is for all other material columns regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: each
Quantity: The quantity for this element is the sum of the number of columns.

Element # 211 — Other Pier Wall

S U B

Description: This element defines those pier walls constructed of other materials. This for all pier walls regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the length of the pier walls measured along the skew angle.

Element # 218 — Other Abutment

Description: This element is for all other material abutments. This includes the sheet material retaining the embankment, integral wingwalls and abutment extensions. This is for all abutments regardless of protective system.
Classification: NBE - National Bridge Element
Measurement: ft
Quantity: The quantity for this element is the sum of the width of the abutment with integral wingwalls and abutment extensions measured along the skew angle.

Element # 229 — Other Pile

Description: This element defines other material piles that are visible for inspection. Piles exposed from erosion or scour and piles visible during an underwater inspection are included in this element. This is for all piles regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: each

Quantity: The quantity for this element is the sum of the number of piles.

Element Commentary

Element # 218 — Other Abutment

SUB

Wingwalls and abutment extensions shall be considered as their own element.

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Delamination/ Spall/ Patched Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUB

Condition State 3	Condition State 4
POOR	SEVERE
Significant deterioration or breakdown that does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 236 — Other Pier Cap

Description: This element defines those other material pier caps that support girders that transfer load into piles, or columns and is for all other material pier caps regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

Quantity: The quantity for this element is the sum of the length of the pier walls measured along the skew angle.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

SUB

Condition State 3	Condition State 4
POOR	SEVERE
Heavy build-up with rust staining.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Masonry Substructure Elements

Element # 213 — Masonry Pier Wall

Description: This element defines those pier walls constructed of block or stone. The block or stone may be placed with or without mortar. This for all pier walls regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

Quantity: The quantity for this element is the sum of the length of the pier walls measured along the skew angle.

SUB

Element # 217 — Masonry Abutment

Description: This element defines those abutments constructed of block or stone. The block or stone may be placed with or without mortar. This is for all abutments regardless of protective system.

Classification: NBE - National Bridge Element

Measurement: ft

Quantity: The quantity for this element is the sum of the width of the abutment with integral wingwalls and abutment extensions measured along the skew angle.

Element Commentary

Element # 217 — Masonry Abutment

Wingwalls and abutment extensions shall be considered as their own element.

SUB

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Mortar Breakdown (Masonry) (1610)	None	Cracking or voids in less than 10% of joints.
Splits or Spalls (Masonry) (1620)	None	Block or stone has split or spalled with no shifting.
Patched Areas (Masonry) (1630)	None	Sound Patch
Masonry Displacement (1640)	None	Block or stone has shifted slightly out of alignment.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Heavy build-up with rust staining.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Cracking or voids in 10% or more of the of joints	
Block or stone has split or spalled with shifting but does not warrant a structural review.	
Unsound Patch	
Block or stone has shifted significantly out of alignment or is missing but does not warrant structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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OTHER SUBSTRUCTURE ELEMENT TABLE

ELEMENT	UNITS	METAL	P/S CONC	REINF CONC	TIMBER	OTHER
Abutment Slope Protection	sq ft			8394	8395	8396
Pile Jacket	each					8298
Bulkhead/Seawall	ft					8393
Fender/Dolphin System	ft	8386	8387	8388	8389	8390
Wingwall/Retaining Wall	ft	8474		8475	8476	8477
Mechanically Stabilized Earth Wall	ft					8478
Access Ladders & Platforms	each					8563
Navigational Light System	each					8580

Other Substructure Elements
Other Substructure Elements Metal

Element # 8386 - Fender/Dolphin System

Description: This element defines fender or dolphin systems made of uncoated metal. For fender system the material is based on the material of the piles.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8474—Wingwall/Retaining Wall

Description: This element defines wingwalls or retaining walls made of uncoated metal. Steel H pile retaining walls are in this element.
Classification: Agency Defined Element
Measurement: ft

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Other Substructure Elements Prestressed Concrete

Element # 8387 - Fender/Dolphin System

Description: This element defines the fender and dolphin systems constructed of prestressed concrete. For fender systems the material is based on the material of the piles.

Classification: ADE—Agency Defined Element

Measurement: ft

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Pre-stressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Other Substructure Elements Reinforced or Plain Concrete

Element # 8298 - Pile Jacket
Description: This element defines all pile jackets regardless of protective system.
Classification: ADE—Agency Defined Element
Measurement: each

Element # 8388 - Fender/Dolphin System
Description: This element defines the fender and dolphin systems constructed of reinforced concrete. For fender systems the material is based on the material of the piles.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8394 - Abutment Slope Protection
Description: This element defines the abutment slope protection constructed of concrete.
Classification: ADE—Agency Defined Element
Measurement: sq ft

Element # 8475 - Wingwall/Retaining Wall (ft)
Description: This element defines the wingwalls and retaining walls constructed of reinforced concrete.
Classification: ADE—Agency Defined Element
Measurement: ft

Note: Defect 2330 Seal Damage may be used for Element 8394—Abutment Slope Protection

Element Commentary

Element # 8298 — Pile Jackets

Add Element 520 reinforcing steel protective system for all pile jackets with cathodic protection.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.

Condition State 3	Condition State 4	
POOR	SEVERE	
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.	**SUB**
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.		
Present with measurable section loss that does not warrant structural review.		
Heavy build-up with rust staining.		
Wide cracks or heavy pattern or map cracking.		

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Other Substructure Elements Timber

Element # 8389 - Fender/Dolphin System
Description: This element defines the fender and dolphin systems constructed of timber. For fender systems the material is based on the pile material.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8395 - Abutment Slope Protection
Description: This element defines the abutment slope protection constructed of timber.
Classification: ADE—Agency Defined Element
Measurement: sq ft

SUB

Element # 8476 - Wingwall/Retaining Wall
Description: This element defines the wingwalls and retaining walls constructed of timber.
Classification: ADE—Agency Defined Element
Measurement: ft

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Checks/ Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Cracks (Timber) (1160)	None.	Cracks that have been arrested through effective measures.

SUB

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified cracks exist that are not arrested and do not require structural review	

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Length equal to or greater than the member depth, but does not require structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Section loss 10% or more of the member thickness but does not warrant structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

SUB

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Other Substructure Elements Other Material

Element # 8390 - Fender/Dolphin System

Description: This element defines the fender and dolphin systems constructed of other materials. For fender systems the material is based on the pile material.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8393 - Bulkhead/Seawall

Description: This element defines abutment slope protection made of any material.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8396 - Abutment Slope Protection

Description: This element defines the abutment slope protection constructed of other material.
Classification: ADE—Agency Defined Element
Measurement: **sq** ft

Element # 8477 - Wingwall/Retaining Wall

Description: This element defines the wingwalls and retaining walls constructed of other material.
Classification: ADE—Agency Defined Element
Measurement: ft

Element # 8478 - Mechanically Stabilized Earth Wall

Description: This element defines those walls where the structure interacts with the soil for support.
Classification: ADE—Agency Defined Element
Measurement: ft

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)Use for Element 8393 only	None	Present without measurable section loss.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	

SUB

SUB

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Significant deterioration or breakdown that does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 8563 - Access Ladder & Platforms

Description: This elements defines the members that make up the Access Ladder & Platforms. Each access ladder or platform is counted for the quantity for this item. Lighting of machinery area is incidental to this element. This item may also be used for non movable bridges.
Classification: ADE—Agency Defined Element
Measurement: each

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 8580 - Navigational Light System (ea)

Description: This element defines the lights used for navigation, mounted on the bridge or fender system and is not limited to lights on movable bridges. This element includes clearance gauge lights and power system. Inspection should include the back up power system. This element may also be used on non movable bridges. *(Should this be separate and have an operational defect?)*

Classification: ADE—Agency Defined Element

Measurement: each

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Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Operation (1000)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Corrosion (9020)	No corrosion, no problems with paint system.	No corrosion, minor paint chalking.	Some corrosion, paint system failure.	Major section loss.

CULVERT ELEMENT TABLE		
ELEMENT NAME	**UNITS**	**ELEMENT NUMBER**
Steel	ft	240
Prestressed Concrete	ft	245
Reinforced Concrete	ft	241
Timber	ft	242
Masonry	ft	244
Other	ft	243

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Culvert Elements

Element # 240 — Steel Culvert

Description: This element defines steel culverts, including arched, round, or elliptical pipes.
Classification: NBE - National Bridge Element
Measurement: ft

Element Commentary

Element # 240 — Steel Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of barrels.

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

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Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review.	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 241 — Reinforced Concrete Culvert

Description: This element defines reinforced concrete culverts, including box, arched, round, or elliptical shapes.
Classification: NBE - National Bridge Element
Measurement: ft

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Element Commentary

Element # 241 — Reinforced Concrete Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of the barrels.

CULV

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No Abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Distortion that requires mitigation that has not been addressed but does not require structural review	

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

CULV

Condition State 3	Condition State 4
POOR	SEVERE
Exceeds tolerable limits but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 242 — Timber Culvert

Description: This element defines all timber culverts.
Classification: NBE - National Bridge Element
Measurement: ft

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Element Commentary

Element # 242 — Timber Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of the barrels.

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Decay/ Section Loss (1140)	None	Affects less than 10% of the member section
Check/Shakes (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.
Crack (Timber) (1160)	None.	Cracks that have been arrested through effective measures.
Splits/ Delamination (Timber) (1170)	None	Length less than the member depth or arrested with effective actions taken to mitigate.

Condition State 3	Condition State 4
POOR	SEVERE
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Affects 10% or more of the member but does not warrant structural review.	
Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural analysis.	
Identified crack exists that is not arrested and do not require structural review	
Length equal to or greater than the member depth, but does not require structural review.	

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Abrasion (1180)	None or no measurable section loss	Section loss less than 10% of the member thickness
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

CULV

Condition State 3	Condition State 4
POOR	SEVERE
Section loss 10% or more of the member thickness but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 243 — Other Culvert

Description: This element defines all other material type culverts, including arches, round or elliptical pipes. These culverts are not included in steel, concrete, or timber material types.

Classification: NBE - National Bridge Element

Measurement: ft

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Element Commentary

Element # 243 — Other Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of the barrels.

CULV

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Deterioration (Other) (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

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Condition State 3	Condition State 4
POOR	SEVERE
Significant deterioration or breakdown that does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

C U L V

Element # 244 — Masonry Culvert

Description: This element defines masonry block or stone culverts.
Classification: NBE - National Bridge Element
Measurement: ft

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Element Commentary

Element # 244 — Masonry Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of the barrels.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Efflorescence/Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Mortar Breakdown (Masonry) (1610)	None	Cracking or voids in less than 10% of joints.
Split/Spall (Masonry) (1620)	None	Block or stone has split or spalled with no shifting.
Patched Area (Masonry) (1630)	None	Sound Patch
Masonry Displace-ment (1640)	None	Block or stone has shifted slightly out of alignment.

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Condition State 3	Condition State 4
POOR	SEVERE
Heavy build-up with rust staining.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Cracking or voids in 10% or more of the of joints	
Block or stone has split or spalled with shifting but does not warrant a structural review.	
Unsound Patch	
Block or stone has shifted significantly out of alignment or is missing but does not warrant structural review.	

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

CULV

Condition State 3	Condition State 4
POOR	SEVERE
Distortion that requires mitigation that has not been addressed but does not require structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 245 — Prestressed Concrete Culvert

Description: This element defines all prestressed concrete culverts.
Classification: NBE - National Bridge Element
Measurement: ft

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Element Commentary

Element # 245 — Prestressed Concrete Culvert

The distortion defect is contingent on a number of factors such as site, wall thickness, fill depth, etc. The inspector shall use such factors to assess the proper condition state. The quantity for this element is the flow line length of the barrel times the number of the barrels.

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Exposed Prestressing (1100)	None	Present without section loss
Cracking (PSC) (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Abrasion/Wear (PSC/RC) 1190	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but aggregate remains secure in concrete.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Present with section loss that does not warrant structural review.	
Wide cracks or heavy pattern or map cracking.	
Heavy build-up with rust staining.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	

CULV

Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

CULV

Condition State 3	Condition State 4
POOR	SEVERE
Distortion that requires mitigation that has not been addressed but does not require structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exceeds tolerable limits but does not warrant structural review.	
Exists that exceeds tolerable limits but is less than the critical limits determined by scour evaluation but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

C U L V

C H A N

Channel

Element # 8290 — Channel

Description: This element defines the channel, including riprap, slope protection, culvert toe walls, or stream control devices. The purpose of this element is to allow the recommendation of corrective actions. No modeling is done on this element. The entire element is to be placed in one condition state

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is 1 each

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Channel Alignment (9100)	Flow angle of attack less than 15 degrees with respect to the bridge substructure.	Flow angle of attack less than 30 degrees with respect to the bridge sub-structure.
Migration (9110)	None.	Thalweg has moved from its baseline location, but movement has arrested.
Degrada-tion (9120)	None.	Exists within tolerable limits or arrested.
Aggrada-tion (9130)	None.	Exists within tolerable limits or arrested.
Debris (9140)	None and not prone to build-up.	Exists and restricts the channel slightly, or prone to build-up.
Bank Ero-sion (9150)	None.	Erosion that does not threaten the bridge or approach roadway.

Condition State 3	Condition State 4
POOR	SEVERE
Flow angle of attack 30 degrees or more with respect to the bridge substructure and the structure is stable.	Structural and/or Hydraulic review has been completed and the defects impact stability of the bridge.
Thalweg movement has not arrested and threatens the bridge or approach roadway.	
Exceeds tolerable limits, but is less than the critical limits established by scour evaluation and does not warrant structural and/or hydraulic review.	
Exceeds tolerable limits. Hydraulic opening no longer adequate.	
Large deposits exist and restrict the channel.	
Erosion that begins to threaten the bridge or approach roadway.	

CHAN

MISC

MISCELLANEOUS STRUCTURE ELEMENT TABLE			
ELEMENT	**UNITS**	**METAL**	**OTHER OR CONCRETE**
High Mast Light Pole Foundation	each		8499
High Mast Light Poles	each	8496	
Overlane Sign Structure Foundation	each		8489
Overlane Sign Structure Vertical Member	ft	8488	8491
Overlane Sign Structure Horizontal Member	ft	8487	
Mast Arm Vertical Member	each	8481	8483
Mast Arm Horizontal Member	each	8484	
Mast Arm Foundation	each		8480

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Miscellaneous Structures Metal Elements

Element # 8481 — Vertical Mast Arm Member

Description: This element defines the metal vertical mast arms present regardless of protective system.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the vertical mast arms present at the intersection.

Element # 8484 — Horizontal Mast Arm Member

Description: This element defines the metal horizontal mast arms present regardless of protective system.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the horizontal mast arms present at the intersection.

Element # 8487 — Horizontal Overlane Sign Structure Member

Description: This element defines the metal horizontal overlane sign members present regardless of protective system.
Classification: ADE - Agency Defined Element
Measurement: ft
Quantity: The quantity for this element is the sum of the lengths of the horizontal sign structure horizontal members present. Where the horizontal member is a truss type structure this will be the length of the truss. For monotube type of structures, this will be the length of the monotube.

Element # 8488 — Vertical Overlane Sign Structure Member

Description: This element defines the metal vertical overlane sign members present regardless of protective system.

Classification: ADE - Agency Defined Element

Measurement: ft

Quantity: The quantity for this element is the sum of the lengths of the vertical overlane sign members present.

Element # 8496 — High Mast Light Poles

Description: This element defines the metal high mast light pole present regardless of protective system.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the light poles.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

MISC

Miscellaneous Structures Concrete Elements

Element # 8483 — Vertical Mast Arm Member

Description: This element defines the concrete vertical mast arms present.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the vertical mast arms present at the intersection.

Element # 8491 — Vertical Overlane Sign Member

Description: This element defines the concrete vertical overlane sign members.

Classification: ADE - Agency Defined Element

Measurement: ft

Quantity: The quantity for this element is the sum of the length of the vertical overlane sign members present.

Element Commentary

Element # 8483—Vertical Mast Arm

This element should also be used for Prestressed Concrete Mast Arms, and for these Defects 1100 Exposed Prestressing and 1110 Cracking (PSC) may be used.

Element # 8491—Vertical Mast Arm

This element should also be used for Prestressed Concrete Mast Arms, and for these Defects 1100 Exposed Prestressing and 1110 Cracking (PSC) may be used.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Delamination/Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Exposed Rebar (1090)	None	Present without measurable section loss.
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moder-ate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Abrasion/Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Damage (7000)	Not applicable	The element has impact damage. The specific dam-age caused by the impact has been captured in condi-tion state 2 under the appro-priate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Present with measurable section loss that does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Miscellaneous Structures Other Material Elements

Element # 8480 — Mast Arm Foundation

Description: This element defines the mast arm foundations present.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the mast arms foundations present at the intersection.

Element # 8489 — Overlane Sign Structure Foundation

Description: This element defines the overlane sign structure foundations present.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the overlane foundations present.

Element # 8499 — High Mast Light Pole Foundation

Description: This element defines the high mast light pole foundations present.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the high mast light pole foundations present.

Element Commentary

Defect 1190 Abrasion may be used for all Miscellaneous Structure Foundation Elements

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Spalls/ Delaminations/ Patch Areas (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.
Efflorescence (1120)	None	Surface white without build-up or leaching without rust staining.
Cracking (RC and Other) (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern or map cracking.
Deterioration (1220)	None	Initiated breakdown or deterioration.
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.
Settlement (4000)	None	Exists within tolerable limits with effective actions taken to mitigate.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Heavy build-up with rust staining.	
Wide cracks or heavy pattern or map cracking.	
Significant deterioration or breakdown that does not warrant structural review.	
Distortion that requires mitigation that has not been addressed but does not require structural review.	
Exceeds tolerable limits but does not warrant structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

MISC

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MOVABLE BRIDGE DRIVE SYSTEM ELEMENT TABLE

ELEMENT	UNITS	ELEMENT
Open Gearing	each	8540
Speed Reducers	each	8541
Shafts	each	8542
Shaft Bearings/Shaft Couplings	each	8543
Brakes	each	8544
Emergency Drive and Back Up Power Systems	each	8545
Span Drive Motors/Span Lock Motors	each	8546
Hydraulic Power Units	each	8547
Hydraulic Piping System	each	8548
Hydraulic Cylinder/Motors	each	8549
Hopkins Frame	each	8550

MOVABLE BRIDGE SUPPORT SYSTEM ELEMENT TABLE		
ELEMENT	**UNITS**	**ELEMENT**
Span Locks/Toe Locks/Heel Stops/Tail Locks	each	8560
Live Load Shoes/Strike Plates/Buffer Cylinders	each	8561
Counterweight Support	each	8562
Access Ladders & Platforms	each	8563
Counterweight	each	8564
Trunnion/Straight and Curved Track	each	8565

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MOVABLE BRIDE CONTROL SYSTEM AND INTERFACE SYSTEM ELEMENT TABLE		
ELEMENT	**UNITS**	**ELEMENT NUMBER**
Transformers/Thyristors	each	8570
Submarine Cable	each	8571
Conduit & Junction Boxes	each	8572
Programmable Logic Controllers	each	8573
Control Console	each	8574

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MOVABLE BRIDGE MISCELLANEOUS ELEMENT TABLE		
ELEMENT	**UNITS**	**ELEMENT NUMBER**
Navigational Light System	each	8580
Operator Facilities	each	8581
Lift Bridge Specific Equipment	each	8582
Swing Bridge Specific Equipment	each	8583

MOVABLE BRIDGE TRAFFIC CONTROL ELEMENT TABLE		
ELEMENT	**UNITS**	**ELEMENT NUMBER**
Resistance Gates	each	8590
Warning Gates	each	8591
Traffic Signals	each	8592

Movable Bridge Drive System Elements

Element # 8540 — Open Gearing

Description: This element defines all gears that are not enclosed in an oil tight, dust tight housing. This element includes the rack or rack pinion.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the gear and pinion sets.

Element # 8541 — Speed Reducers

Description: This element defines gear sets that are mounted with shafts and bearings in dust proof, oil tight housings.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the speed reducers present.

Element # 8542 — Shafts

Description: This element defines the shafts that serve to transmit torque from one part to another
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the shafts present.

Element # 8543 — Shafts Bearings and Couplings

Description: This element defines the members that support the shafts or join the shafts together.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the shafts bearings and couplings present.

Element # 8544 — Brakes

Description: This element defines the members including limit switches that are used to stop the span and hold the span in open position.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the brakes present.

Element # 8545 — Emergency Drive and Back Up Power System

Description: This element defines the members that function as a back up drive and power system in case of failure of the main drive and/or power system.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the one for a bridge with an emergency drive.

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Element # 8546 — Span Drive Motors

Description: This element defines the members that are used to drive the span, and includes limit switches that control the span drive motors.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the span drive motors present.

Element # 8547 — Hydraulic Power Units

Description: This element defines the pump, electric motor, valves, filters, oil reservoir, limit switches and accessories that make up the Hydraulic Power Unit.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the hydraulic power units present.

Element # 8548— Hydraulic Piping System

Description: This element defines the pipe, tubing and flexible hose including fittings, manifolds and piping supports which conduct fluids for a fluid power system.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is one for a bridge with a hydraulic piping system.

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Element # 8549 — Hydraulic Cylinders/Motors/Rotary Actuators

Description: This element defines those components which convert fluid pressure into mechanical force and motion.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the hydraulic cylinders/motors/rotary actuators present.

	Defect	Condition State 1	Condition State 2
		GOOD	FAIR
	Lubrication (9000)	Well lubricated, oil reservoirs at proper level and oil does not require changing.	Well lubricated or oil reservoirs not full.
	Mechanical Alignment (9010)	In proper alignment.	Minor misalignment.
	Operation (9020)	Operating properly.	Minor operation problems.
	Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
	Clearances (9030)	Clearances appropriate.	Clearance not uniform.
MOV	Mechanical Wear/ Abrasion (9040)	No Wear.	Measurable wear but not impacting operation.

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Condition State 3	Condition State 4
POOR	SEVERE
Requires lubrication or oil requires changing.	Lack of lubrication or oil threatens operation.
Major misalignment.	Misalignment threatens operation.
Operation affected.	Not operating.
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge
Clearance out of specification.	Poor clearance threatens operation of bridge.
Major wear, operation may be affected.	Major wear threatening operation.

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Element # 8550 — Hopkins Frame

Description: This element defines the vertical frame pinned to the floor and holds all machinery except for the rack.

Classification: AE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is sum of the Hopkins frames present.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

Movable Bridge Support System Elements

Element # 8560— Span Locks/Toe Locks/Heel Stops/Tail Locks

Description: This item defines all locks and motors used to drive the locks present on the structure.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the locks present.

Element # 8561— Live Load Shoes/Strike Plates/Buffer Cylinders

Description: This item defines those elements used to transmit live load from the movable span to the substructure, or to cushion the span while it is being closed.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the live load shoes/strike plates/buffer cylinders present.

Element # 8565— Trunnion/Straight and Curved Track

Description: This element defines the trunnions about which the leaf of a bascule bridge rotates, the curved track mounted on the leaf and the straight track mounted on the pier for a rolling bascule. Trunnion journals and bearings are incidental.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the trunnion/straight and curved track present.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Lubrication (9000)	Well lubricated, oil reservoirs at proper level and oil does not require changing.	Well lubricated or oil reservoirs not full.
Mechanical Alignment (9010)	In proper alignment.	Minor misalignment.
Operation (9020)	Operating properly.	Minor operation problems.
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Clearances (9030)	Clearances appropriate.	Clearance not uniform.
Mechanical Wear/ Abrasion (9040)	No Wear.	Measurable wear but not impacting operation.

Condition State 3	Condition State 4
POOR	SEVERE
Requires lubrication or oil requires changing.	Lack of lubrication or oil threatens operation.
Major misalignment.	Misalignment threatens operation.
Operation affected.	Not operating.
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge
Clearance out of specification.	Poor clearance threatens operation of bridge.
Major wear, operation may be affected.	Major wear threatening operation.

Element # 8562— Counterweight Support

Description: This element defines the structural steel elements used to support the counterweight and attach it to the movable span.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of the counterweight support system present.

Element # 8563— Access Ladder & Platforms

Description: This elements defines the members that make up the Access Ladder & Platforms. Lighting of machinery area is incidental to this element. This item may also be used for non movable bridges.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: Each access ladder or platform is counted for the quantity for this item.

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Defect	Condition State 1	Condition State 2
	GOOD	FAIR
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.
Cracking (1010)	None	Crack that has self arrested or has been arrested with effective arrest holes, doubling plates, or similar.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.
Damage (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.

Condition State 3	Condition State 4
POOR	SEVERE
Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Identified crack exists that is not arrested but does not warrant structural review	
Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 4 under the appropriate material defect entry.

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Element # 8564—Counterweight

Description: This element defines the counterweight and includes any balance blocks.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the counterweights present.

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Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Delamination/ Spall/ Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or less than 6 in. diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Exposed Rebar (1090)	None	Present without measurable section loss.	Present with measurable section loss that does not warrant structural review.	
Efflorescence/ Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC and Other) (1130)	Minor cracks not requiring sealing or cracks that have been sealed	Unsealed cracks of moderate width or unsealed moderate pattern or map cracking	Wide cracks or heavy pattern or map cracking	

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Movable Bridge Control System and Interlock System Elements

Element # 8570—Transformers and thyrsitors

Description: This element defines the members that step down the voltage of the incoming power to a level compatible with the bridge equipment.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the transformers and thyrsitors present.

Element # 8573—Programmable Logic Controllers

Description: This element defines the general purpose industrial microprocessor based control system.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the programmable logic controllers present.

Element # 8574—Control Console

Description: This element defines the console which controls the operation of the movable bridge. This element includes interlocks, span limit switches and span position indicator devices.

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Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the control consoles present.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Lubrication (9000)	Well lubricated, oil reservoirs at proper level and oil does not require changing.	Well lubricated or oil reservoirs not full.	Requires lubrication or oil requires changing.	Lack of lubrication or oil threatens operation.
Mechanical Alignment (9010)	In proper alignment.	Minor misalignment.	Major misalignment.	Misalignment threatens operation.
Operation (9020)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Clearances (9030)	Clearances appropriate.	Clearance not uniform.	Clearance out of specification.	Poor clearance threatens operation of bridge.
Mechanical Wear/ Abrasion (9040)	No Wear.	Measurable wear but not impacting operation.	Major wear, operation may be affected.	Major wear threatening operation.

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Element # 8571—Submarine Cable

Description: This element defines the cable that is used to carry power and control signals from one pier to the other pier on a bascule bridge.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is the sum of the submarine cables present.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Operation (9020)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Outer Insulation (9050)	No problems	Minor chafing.	Significant deterioration to outer coating	Outer coating not protecting cable
Cable Geometry (9060)	Properly buried and fully attached to pier wall.	Not properly buried or not properly attached.	Cable vulnerable to ship traffic.	Cable is broken.
Mechanical Wear/ Abrasion (9040)	No Wear.	Measurable wear but not impacting operation.	Major wear, operation may be affected.	Major wear threatening operation.

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Element # 8572—Conduit & Junction Boxes

Description: This element defines those members which enclose, support and protect the power and control wiring. This element should also be used for the conduits for navigational light systems on non movable bridges but not for other conduit systems on non movable bridges.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

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Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Connections (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Deterioration (1220)	None	Initiated deterioration.	Significant deterioration or breakdown that does not warrant structural review.	

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Movable Bridge Miscellaneous Elements

Element # 8580—Navigational Light System

Description: This element defines the lights used for navigation, mounted on the bridge or fender system and is not limited to lights on movable bridges. This element includes clearance gauge lights and power system. Inspection should include the back up power system. This element may also be used on non movable bridges.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Operation (9020)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.

Element # 8581—Operator Facilities

Description: This element defines the Bridge Tenders House. The inspection of the bridge tender house includes the internal and external communication devices.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

Element # 8582—Lift Bridge Specific Equipment

Description: This element defines those components found on Lift Bridges not found on other types of movable bridges, such as wire rope, sheaves, span guides, counterbalance chains, etc.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

Element # 8583—Swing Bridge Specific Equipment

Description: This element defines those components found on Swing Bridges not found on other types of movable bridges, such as balance wheels and tracks, wedges, etc.

Classification: ADE - Agency Defined Element

Measurement: each

Quantity: The quantity for this element is one each for bridge.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Operation (9020)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.

Movable Bridge Traffic Control Elements

Element # 8590— Resistance Barriers

Description: This element defines the component that provides a physical barrier to vehicles while the bridge is in the open position and all equipment required to operate the barrier. All limit switches required to operate the barrier are incidental to this element.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of resistance barriers for the bridge.

Element # 8591— Warning Gates

Description: This element defines the component that alerts vehicular traffic to impending bridge operation. This element includes all equipment required to operate the warning gate including the warning bells. Limit switches that control the operation of the warning gates are incidental to this item.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of warning gates for the bridge.

Element # 8592— Traffic Signals

Description: This element defines the component that signals vehicular traffic when to stop and start.
Classification: ADE - Agency Defined Element
Measurement: each
Quantity: The quantity for this element is the sum of warning gates for the bridge.

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	GOOD	FAIR	POOR	SEVERE
Operation (9020)	Operating properly.	Minor operation problems.	Operation affected.	Not operating.
Corrosion (1000)	None	Freckled Rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.

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