



## ***PONTIS ELEMENT DATA COLLECTION MANUAL***



### ***OFFICE OF BRIDGE DEVELOPMENT***

For comments or questions regarding this coding guide contact the  
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## **NOTICE**

This inspection manual was written by personnel of the Bridge Inspection and Remedial Engineering Division of the Maryland State Highway Administration (SHA) for the inspection of SHA structures. This manual contains many feasible actions, comments, and remarks directed at and for the use of SHA inspectors.

Inspections done for counties, municipalities, and other agencies should follow the element and condition state language. However, there is no requirement to follow the feasible action language or the additional comments and remarks directed at the SHA inspectors.

## PONTIS BRIDGE ELEMENTS

DECKSLABS	UNITS	DECKS	SLABS	CULVERT RIDING SURFACE
Concrete (Bare)	EA	012/1	038/1	56/1
Concrete, Unprotected, with AC Overlay	EA	013/2	039/2	57/2
Concrete, Protected with Membrane and AC Overlay	EA	014/2	040/2	58/2
Concrete, Protected with Thin Overlay	EA	018/3	044/3	
Concrete, Protected with Rigid Overlay	EA	022/3	048/3	
Concrete, Protected with Coated Bars	EA	026/1	052/1	59/1
Concrete, Protected with Cathodic Protection	EA	027/1	053/1	
Open Grid Steel	EA	028/4		
Concrete Filled Grid Steel	EA	029/5		
Corrugated/Orthotropic	EA	030/6		
Timber (Bare)	EA	031/7	054/7	
Timber with AC Overlay	EA	032/8	055/8	

SUPERSTRUCTURE	UNITS	STEEL NO PAINT	STEEL PAINTED	PRESTRESSED CONCRETE	REINFORCED CONCRETE	TIMBER	OTHER
Closed Web/Box Girder	LF	101/10	102/11	104/12	105/13		
Open Girder	LF					111/14	178/18
Exterior Open Girder	LF	170/10	172/11	174/12	176/13		
Interior Open Girder	LF	171/10	173/11	175/12	177/13		
Stringer (stringer floor beam system)	LF	112/10	113/11	115/12	116/13	117/14	
Bottom Chord of Thru Truss	LF	120/10	121/11				
Thru Truss, Excluding Bottom Chord	LF	125/10	126/11				
Deck Truss	LF	130/10	131/11				
Truss/Arch	LF					135/14	
Arch	LF	140/10	141/11	143/12	144/13		145/15
Floor Beam	LF	151/10	152/11	154/12	155/13	156/14	
Pin and Hanger Assembly	EA	160/10	161/11				

## PONTIS BRIDGE ELEMENTS

SUBSTRUCTURE	UNITS	STEEL NO PAINT	STEEL PAINTED	PRESTRESSED CONCRETE	REINFORCED CONCRETE	TIMBER	OTHER
Column or Pile Extension	EA	201/10	202/11	204/12	205/13	206/14	
Pier Wall	LF				210/13		211/15
Abutment	LF				215/13	216/14	217/15
Abutment Backwall	LF				218/13		
Submerged Pile Cap/Footing	LF				220/13		
Submerged Pile	EA		225/11	226/12	227/13	228/14	
Pier Cap	LF	230/10	231/11	233/12	234/13	235/14	
Culvert	LF	240/19			241/20	242/21	243/21
Culvert Headwall	LF				246/13		247/15
Spandrel Wall	LF				255/13		256/15

OTHER ELEMENTS	UNITS	STEEL NO PAINT	STEEL PAINTED	PRESTRESSED CONCRETE	REINFORCED CONCRETE	TIMBER	OTHER
Sidewalk	LF		061/9		062/13	063/14	
Median	LF				070/13		
Steel Cable, Not Embedded in Concrete	EA	146/16	147/17				
Crossbracing	EA					207/14	
Crashwall	LF				213/13		
Wing Wall	LF			250/12	251/13	252/14	253/15
Protected Slope	EA						260/22
Unprotected Slope	EA						261/22
Dolphin	EA		271/11			270/14	
Fender	LF		272/11			274/14	
Strip Seal Expansion Joint	LF						300/23
Pourable Joint Seal	LF						301/24
Compression Joint Seal	LF						302/25
Assembly Joint Seal	LF						303/26
Open Expansion Joint	LF						304/27
Joint Trough	LF		306/28				307/28
Movable Bearing (Roller/Sliding, etc.)	EA	316/33	311/29				
Enclosed/Concealed Bearing	EA						312/30
Fixed Bearing	EA	317/34	313/31				
Pot Bearing	EA						314/32
Disk Bearing	EA						315/32
Approach Slab	EA			320/35	321/35		
Roadway Approach Transition	EA						322/36
Bridge Railing	LF	330/37			331/38	332/39	333/39

## PONTIS BRIDGE ELEMENTS

<b>OTHER ELEMENTS (Cont'd)</b>	<b>UNITS</b>	<b>STEEL NO PAINT</b>	<b>STEEL PAINTED</b>	<b>PRESTRESSED CONCRETE</b>	<b>REINFORCED CONCRETE</b>	<b>TIMBER</b>	<b>OTHER</b>
Utilities and Overhead Signs	EB						340/40
Fencing	LF						342/40
Railroad Shielding	LF						343/41
Drainage Devices	EB						344/41
Stream Channel	EB						345/41
Movable Bridge Machinery	EB						349/42
Retaining Wall	LF				350/49		
Bulkhead	LF		352/51			351/50	
Noise Wall	LF		355/51		353/52	354/53	
Gabion Wall	LF						346/48
Bridge Paint	EB		400/54				
Zone Paint	EB		401/55				

<b>SMART FLAGS</b>	<b>UNITS</b>	<b>FLAG #</b>
Steel Fatigue	EA	356/43
Pack Rust	EA	357/43
Soffit	EB	359/44
Settlement	EA	360/45
Scour	EA	361/45
Traffic Impact	EA	362/46
Erosion	EA	363/46
Pin and Hanger Deformation	EA	364/46

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022	Concrete Deck, Protected with Rigid Overlay (EA)	3
026	Concrete Deck, Protected with Coated Bars (EA)	1
027	Concrete Deck, Protected with Cathodic Protection (EA)	1
028	Open Grid Steel Deck (EA)	4
029	Concrete Filled Grid Steel Deck (EA)	5
030	Corrugated/Orthotropic Deck (EA)	6
031	Timber Deck (Bare) (EA)	7
032	Timber Deck (with AC Overlay) (EA)	8
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040	Concrete Slab, Protected, with AC Overlay (EA)	2
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052	Concrete Slab, Protected with Coated Bars (EA)	1
053	Concrete Slab, Protected with Cathodic Protection (EA)	1
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## DECK ELEMENTS

ELEM #	DESCRIPTION
012	Concrete Deck (Bare) (EA)
026	Concrete Deck, Protected with Coated Bars (EA)
027	Concrete Deck, Protected with Cathodic Protection (EA)
038	Concrete Slab (Bare) (EA)
052	Concrete Slab, Protected with Coated Bars (EA)
053	Concrete Slab, Protected with Cathodic Protection (EA)
056	Concrete Culvert at Grade Slab (Bare) (EA)
059	Concrete Culvert at Grade Slab, Protected with Coated Bars (EA)

**CONDITION STATE 1** The surface of the deck has no repaired areas and there are no spalls/delaminations in the deck surface. Any cracks present in the surface are only superficial.

**FEASIBLE ACTIONS:** 1) DN  
2) Add a protective system

**CONDITION STATE 2** Repaired areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area. The surface may also have cracks that are either filled/sealed or insignificant in size to warrant repair activities.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls and delaminations  
3) Add a protective system

**CONDITION STATE 3** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area. Cracks are of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls and delaminations and/or seal cracks  
3) Repair spalls, delaminations and add a protective system on entire deck

**CONDITION STATE 4** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area. Cracks are of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls and delaminations and/or seal cracks  
3) Repair spalls, delaminations and add protective system on entire deck

**CONDITION STATE 5** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck. The combined area of distress is more than 25% of the total deck area. Any cracks are of severe size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls, delaminations and/or add protective system on entire deck  
3) Replace deck

1. Elements 26, 27, 52, 53 and 59 CANNOT be changed even if an AC overlay has been applied.
2. The Soffit Smart Flag (359) must be coded for Elements 12, 26, 27, 38, 52 and 53.
3. Element 241- Concrete Culvert must be coded when Elements 56 and 59 are used.
4. If Element 12 is a composite timber and concrete structure, then the timber shall be coded under Element 117 - Timber Stringer. Only those timbers resting on the abutment and pier caps shall be included in the stringer quantity.

<b>ELEM #</b>	<b>DESCRIPTION</b>
013	Concrete Deck, Unprotected, with AC Overlay (EA)
014	Concrete Deck, Protected with membrane and AC Overlay (EA)
039	Concrete Slab, Unprotected, with AC Overlay (EA)
040	Concrete Slab, Protected with membrane and AC Overlay (EA)
057	Concrete Culvert at Grade Slab, Unprotected, with AC Overlay (EA)
058	Concrete Culvert at Grade Slab, Protected with membrane and AC Overlay (EA)

**CONDITION STATE 1** The surfacing on the deck has no repaired areas and there are no potholes in the surfacing. Any cracks present in the surface are only superficial.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Repaired areas and/or potholes or impending potholes exist. Their combined area is less than 2% of the deck area. The surface may also have cracks that are either filled/sealed or insignificant in size to warrant repair activities.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair potholes and substrate

**CONDITION STATE 3** Repaired areas and/or potholes or impending potholes exist. Their combined area is more than 2% but less than 10% or less of the total deck area. Surface may also have unsealed cracks of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair potholes & substrate/seal cracks  
3) Repair substrate & replace overlay

**CONDITION STATE 4** Repaired areas and/or potholes or impending potholes exist. Their combined area is more than 10% but less than 25% of the total deck area. Surface may also have unsealed cracks of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair potholes and substrate/seal cracks  
3) Repair substrate & replace overlay

**CONDITION STATE 5** Repaired areas and/or potholes or impending potholes exist. Their combined area is more than 25% of the total deck area. Surface may also have unsealed cracks of severe size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair substrate & replace overlay  
3) Replace deck

1. Code this element exactly as seen including overlays placed purely as a holding action.
2. The Soffit Smart Flag (359) must be coded for Elements 13, 14, 39 and 40.
3. Element 241 - Concrete Culvert must be coded when Element 57 and 58 are used.
4. If Element 13 or 14 is a composite timber and concrete structure, then the timber shall be coded under Element 117 -Timber Stringer. Only those timbers resting on the abutment and pier caps shall be included in the stringer quantity.

<b>ELEM #</b>	<b>DESCRIPTION</b>
018	Concrete Deck, Protected with Thin Overlay (EA)
022	Concrete Deck, Protected with Rigid Overlay (EA)
044	Concrete Slab, Protected with Thin Overlay (EA)
048	Concrete Slab, Protected with Rigid Overlay (EA)

**CONDITION STATE 1** The surface of the deck has no repaired areas and there are no spalls/delaminations in the deck surface. No wear-out is visible. Any cracks present in the surface are only superficial.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Repaired areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area. The deck also may have cracks that are either filled/sealed or insignificant in size to warrant repair activities.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls/delaminations

**CONDITION STATE 3** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck surface. The combined area of distress is more than 2% but less than 10% or less of the total deck area. Cracks are of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls/delaminations and/or seal cracks

**CONDITION STATE 4** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area. Cracks are of moderate size.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair spalls/delaminations and/or seal cracks  
3) Replace overlay

**CONDITION STATE 5** Repaired areas and/or spalls/delaminations and unsealed cracks exist in the deck. The combined area of distress is more than 25% of the total deck area. Any cracks are of severe size.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace overlay  
3) Replace deck

1. If Element 18 or 22 is a composite timber and concrete structure, then the timber shall be coded under Element 117 -Timber Stringer. Only those timbers resting on the abutment and pier caps shall be included in the stringer quantity.
2. Deck cracking should be recorded in deck element verbiage.

<b>ELEM #</b>	<b>DESCRIPTION</b>
028	Open Grid Steel Deck (EA) (See Glossary)

**CONDITION STATE 1** There is no corrosion. The protective system, if any, is sound. The connectors (welds, rivets, etc.) are sound.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is little or no corrosion. The protective system, if any, may be showing early signs of distress (chalking, bubbling). The connectors are still sound.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean, spot paint

**CONDITION STATE 3** Surface or freckled rust has formed. The protective system, if any, is no longer fully effective. There is no loss of section. The connectors may be starting to show signs of distress - cracked welds or broken rivets.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean and restore top coat  
3) Rehab connectors

**CONDITION STATE 4** Corrosion is moderate. Surface pitting may be present but any section loss is incidental. Connectors may be failing. The strength or serviceability of the section is not yet affected.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint  
3) Rehab connectors

**CONDITION STATE 5** Corrosion is advanced. Numerous connectors have failed. Section loss and/or connectivity is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
029	Concrete Filled Grid Steel Deck (EA) (See Glossary)

**CONDITION STATE 1** There is no corrosion. The paint system, if any, is sound. The connectors ( welds, rivets, etc.) are sound. The concrete filler is sound.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is little or no corrosion. The paint system, if any, may be showing early signs of distress. The connectors are still sound. The concrete filler is sound.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean

**CONDITION STATE 3** Surface or freckled rust has formed. The paint system is no longer fully effective. There is no loss of section. The connectors may be starting to show signs of distress, cracked welds, or broken rivets. The concrete filler may have broken out at scattered locations.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean and restore top coat  
3) Rehab connectors and concrete filler

**CONDITION STATE 4** Surface or freckled rust has formed. The paint system is no longer fully effective. There is no loss of section. Numerous connectors are failing at scattered locations. Small areas of concrete are missing.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint.  
3) Rehab connectors and concrete filler

**CONDITION STATE 5** Corrosion is advanced. Numerous connectors have failed. Much of the concrete filler is missing. Section loss and/or connectivity is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab connectors & concrete filler & replace paint system  
3) Replace unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
030	Corrugated/Orthotropic Deck (EA)

**CONDITION STATE 1** There is no evidence of corrosion and any paint systems are sound and functioning as intended to protect the metal surface. The surfacing, if any, on the deck has no repaired areas and there are no potholes.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is little or no corrosion. Any paint systems may be showing early signs of distress. Minor cracking or potholes may exist in the surfacing.

**FEASIBLE ACTIONS:** 1) DN  
2) Seal cracks and/or repair potholes

**CONDITION STATE 3** The paint system is no longer functioning as intended. Surface or freckled rust has formed. There is no loss of section. Potholes exist in the surfacing and there may be significant cracking.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean & restore top coat of paint  
3) Repair potholes and cracks

**CONDITION STATE 4** The paint system has failed. Surface pitting may be present but any section loss is incidental. Potholes may be large and expose the metal decking.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint - repair potholes  
3) Replace paint system and/or replace surfacing

**CONDITION STATE 5** Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge. The surfacing has failed.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab, replace paint system, replace surfacing  
3) Replace unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
031	Timber Deck (Bare) (EA)
054	Timber Slab (Bare) (EA)

**CONDITION STATE 1** Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Decay, insect infestation, abrasion, splitting, cracking, loose planks, or crushing may exist but none is sufficiently advanced to affect serviceability or strength.

**FEASIBLE ACTIONS:** 1) DN  
2) Protect deck  
3) Rehab deck

**CONDITION STATE 3** Decay, insect infestation, abrasion, splitting, cracking, loose or broken planks, or crushing has produced loss of strength or deflection of the element but not of sufficient magnitude to affect the serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab deck  
3) Replace deck

**CONDITION STATE 4** Advanced deterioration. Decay, insect infestation, abrasion, splits, cracks, loose or broken planks, or crushing has produced loss of strength or deflection that affects the serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace deck

<b>ELEM #</b>	<b>DESCRIPTION</b>
032	Timber Deck (with AC Overlay) (EA)
055	Timber Slab (with AC Overlay) (EA)

**CONDITION STATE 1** Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability. There are no potholes in the surfacing.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Decay, insect infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect the strength or serviceability. There may be minor potholes or areas of delamination in the surfacing.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair potholes and/or protect unit  
3) Rehab unit

**CONDITION STATE 3** Decay, insect infestation, splitting cracking or crushing has produced loss of strength and/or deflection of the element but not of sufficient magnitude to affect the serviceability of the bridge. There may be major potholes or areas of delamination in the surfacing.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit and repair or replace surfacing  
3) Replace unit and surfacing

**CONDITION STATE 4** Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace unit and surfacing

1. Beyond CS2, the AC overlay shall not influence the rating regardless of its condition. If the condition of the AC overlay is poor, the inspector shall note in the verbiage and issue a defect sheet for this element.
2. There is no Smart Flag pertaining to the soffit for timber. Careful attention should be given to the ends and underside of the timber to rate this element.

<b>ELEM #</b>	<b>DESCRIPTION</b>
061	Steel Sidewalk, Open Grid (LF)

**CONDITION STATE 1** There is no corrosion. The protective system, if any, is sound . The connectors (welds, rivets, etc.) are sound.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is little or no corrosion. The protective system, if any, is showing early signs of distress (chalking, bubbling). The connectors are still sound.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean, spot paint

**CONDITION STATE 3** Surface or freckled rust has formed. The protective system, if any, is no longer fully effective. There is no loss of section. The connectors may be starting to show signs of distress - cracked welds or broken rivets.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean and restore top coat  
3) Rehab connectors

**CONDITION STATE 4** Corrosion is moderate. Surface pitting may be present but any section loss is incidental. Connectors may be failing. The strength or serviceability of the section is not yet affected.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint  
3) Rehab unit

**CONDITION STATE 5** Corrosion is advanced. Numerous connectors have failed. Section loss and /or connectivity is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

## UNPAINTED STEEL ELEMENTS

ELEM #	DESCRIPTION
101	Closed Web/Box Girder (LF)
112	Stringer (stringer - floor beam system) (LF) (See Glossary)
120	Bottom Chord of Through Truss (LF) (See Glossary)
125	Through Truss, Excluding Bottom Chord (LF) (See Glossary)
130	Deck Truss (LF)
140	Arch (LF) (See Glossary)
151	Floor Beam (LF)
160	Pin and Hanger Assembly (EA)
170	Exterior Open Girder (LF) (See Glossary)
171	Interior Open Girder (LF) (See Glossary)
201	Column or Pile Extension (EA)
230	Pier Cap (LF)

**CONDITION STATE 1** There is little or no corrosion of the unpainted steel. The oxide film is coating uniformly and remains in excellent condition and is tightly adhered.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Surface rust, surface pitting, has formed or is forming on the unpainted steel. The weathering steel has not corroded beyond design limits. Oxide film color is yellow orange to light brown and has a dusty to granular texture.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & paint

**CONDITION STATE 3** Steel has measurable section loss due to corrosion but does not warrant structural analysis. Oxide film is dark brown or black and is flaking (1/2" in diameter).

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & paint  
3) Rehab Unit

**CONDITION STATE 4** Corrosion is advanced. Oxide film has a laminar texture with thin sheets of rust. Section loss is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. Element 160 - Any deformation or restriction of the pin and hanger should be identified with the Pin and Hanger Deformation Smart Flag (364).

## PAINTED STEEL ELEMENTS

ELEM #	DESCRIPTION
102	Closed Web/Box Girder (LF)
113	Stringer (stringer - floor beam system) (LF) (See Glossary)
121	Bottom Chord of Through Truss (LF) (See Glossary)
126	Through Truss Excluding Bottom Chord (LF) (See Glossary)
131	Deck Truss (LF)
141	Arch (LF) (See Glossary)
152	Floor Beam (LF)
161	Pin and/or Pin and Hanger Assembly (EA)
172	Exterior Open Girder (LF) (See Glossary)
173	Interior Open Girder (LF) (See Glossary)
202	Column or Pile Extension (EA)
225	Submerged Pile
231	Pier Cap (LF)
271	Dolphin (EA)
272	Fender (LF)

**CONDITION STATE 1** The paint system is sound and functioning as intended to protect the steel surface.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean

**CONDITION STATE 2** The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of steel. There is little or no corrosion. Surface or freckled rust has formed or is forming.

**FEASIBLE ACTIONS:** 1) DN  
2) Surface clean  
3) Clean & paint

**CONDITION STATE 3** The paint system is no longer functioning as intended. Surface or freckled rust is prevalent. There may be exposed steel but there is no corrosion which is causing loss of section.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint

**CONDITION STATE 4** Corrosion is present but any section loss due to corrosion does not yet warrant structural analysis of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

**CONDITION STATE 5** Corrosion has caused section loss and is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. When major section loss (heavy pitting, holes, etc.) is present after the element has been recently painted, the inspector shall code solely based on the condition of the paint system. The major section loss shall be noted in the verbiage and "screamed" unless there is a note in the inspection file stating otherwise.
2. Element 161 - Any deformation or restriction of the pin and hanger should be identified with the Pin and Hanger Deformation Smart Flag (364).

## PRESTRESSED CONCRETE ELEMENTS

ELEM #	DESCRIPTION
104	Closed Web/Box Girder (LF)
115	Stringer (LF) (See Glossary)
143	Arch (LF) (See Glossary)
154	Floor Beam (LF)
174	Exterior Open Girder (LF) (See Glossary)
175	Interior Open Girder (LF) (See Glossary)
204	Column or Pile Extension (EA)
226	Submerged Pile (EA)
233	Pier Cap (LF)
250	Wing Walls (LF)

**CONDITION STATE 1** The element shows no deterioration. There may be discoloration, and/or superficial cracking.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracks, spalls and efflorescence may be present and there may be exposure of reinforcing with no evidence of corrosion. There is no exposure of the prestress system.

**FEASIBLE ACTIONS:** 1) DN  
2) Seal cracks minor patch

**CONDITION STATE 3** Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean steel and patch, (and/or seal)

**CONDITION STATE 4** Delaminations, spalls and corrosion of non-prestressed reinforcement are prevalent. There may also be exposure and deterioration of the prestress system (manifested by loss of bond, broken strands or wire, failed anchorages, etc.). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. Element 104 will be used for all box girders whether they are butted together or spread out.
2. When element 104 is used, an appropriate deck element shall also be used (12, 13, 14, 18, 22, 26 or 27)

## REINFORCED CONCRETE ELEMENTS

<b>ELEM #</b>	<b>DESCRIPTION</b>
062	Sidewalk (LF)
070	Median, (LF)
105	Closed Web/Box Girder (LF)
116	Stringer (stringer - floor beam system) (LF) (See Glossary)
144	Arch (LF) (See Glossary)
155	Floor Beam (LF)
176	Exterior Open Girder (LF) (See Glossary)
177	Interior Open Girder (LF) (See Glossary)
205	Column or Pile Extension (EA)
210	Pier Wall (LF)
213	Crash Wall (LF)
215	Abutment (LF)
218	Abutment Backwall (LF)
220	Submerged Pile Cap/Footing (EA)
227	Submerged Pile (EA)
234	Pier Cap (LF)
246	Culvert Headwall (LF)
251	Wing Walls (LF)
255	Spandrel Walls (LF)

**CONDITION STATE 1** The element shows no deterioration. There may be discoloration, and/or superficial cracking.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracks, spalls and efflorescence may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.

**FEASIBLE ACTIONS:** 1) DN  
2) Seal cracks minor patch

**CONDITION STATE 3** Some moderate cracking, delaminations and/or spalls may be present and with exposed reinforcing. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean rebar & patch (and/or seal)

**CONDITION STATE 4** Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. If an element is repaired with pneumatically applied mortar then the condition of the quantity repaired can be no higher than **CONDITION STATE 2**.
2. Use the pier wall element when the pier supporting member is 10' or greater in width. This is measured along the face of the pier.

## TIMBER ELEMENTS

ELEM #	DESCRIPTION
063	Sidewalk (LF)
111	Open Girder (LF)
117	Stringer (stringer - floor beam system) (LF)
135	Truss/Arch (LF)
156	Floor Beam (LF)
206	Column or Pile Extension (EA)
207	Crossbracing (EA) (see note below)
216	Abutment (LF)
228	Submerged Pile (EA)
235	Pier Cap (LF)
252	Wing Wall (LF)
270	Dolphin (EA)
274	Fender (LF)

**CONDITION STATE 1** Investigation indicates no decay. There may be superficial cracks, splits and checks having no affect on strength or serviceability.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Decay, insect/marine borer infestation, abrasion, splitting, cracking, checking or crushing may exist but none is sufficiently advanced to affect the strength or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab and/or protect unit

**CONDITION STATE 3** Decay, insect/marine borer infestation, abrasion, splitting, cracking or crushing has produced loss of strength or deflection of the element but not of a sufficient magnitude to affect the serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**CONDITION STATE 4** Advanced deterioration. Decay, insect/marine borer infestation, abrasion, splits, cracks or crushing has produced loss of strength or deflection that affects the serviceability of the element and warrants an analysis to ascertain the impact on the strength and/or serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. Element 207 - The crossbracing will be measured at each bent or between bents. The inspector shall apply the **CONDITION STATE** that applies best to the crossbracing on each bent or between bents.
2. All hardware problems particular to an element are to be included in the verbiage for that element.

## OTHER MATERIAL ELEMENTS

<b>ELEM #</b>	<b>DESCRIPTION</b>
145	Arch (LF)
211	Pier Wall (LF)
217	Abutment (LF)
247	Culvert Headwalls (LF)
253	Wing Wall (LF)
256	Spandrel Walls (LF)

**CONDITION STATE 1** There is little or no deterioration. Surface defects only are in evidence.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There may be minor deterioration, cracking and we athering. Mortar in joints may show minor deterioration.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Moderate to major deterioration and cracking. Major deterioration of joints. The deterioration is not of a sufficient magnitude to affect the serviceability of the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 4** Major deterioration, splitting, or cracking of materials may be affecting the structural capacity of the element which warrants a structural analysis to ascertain the impact on the strength and/or serviceability of the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**

146 Uncoated Steel Cable, Not Embedded in Concrete (EA)

**CONDITION STATE 1** There is no corrosion of steel. Strand and anchor sockets show no signs of distress.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Surface or freckled rust has formed or is forming. Strand and anchor sockets show no signs of distress.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & coat

**CONDITION STATE 3** Corrosion may be present but any section loss is incidental and does not affect the strength or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & coat  
3) Rehab unit

**CONDITION STATE 4** Corrosion is advanced. Cable banding, if any, may show some loosening, slipping and/or strands/wires may be broken or abraded. Cable anchor devices may be loosening or showing signs of slippage. Section loss or other deterioration is sufficient to warrant an analysis for strength and/or serviceability of both the element and the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit and coat  
3) Replace unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
147	Coated Steel Cable, Not Embedded in Concrete (EA)

**CONDITION STATE 1** Protective coating is sound and functioning as intended to protect the metal surface. There is no evidence of corrosion. Strand and anchor sockets show no signs of distress.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** The protective coating may be peeling, chalking, curling, or showing other early evidence of distress but there is no exposure of metal. There is no evidence of corrosion. Surface or freckled rust has formed or is forming. Strand and anchor sockets show no signs of distress.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & restore coating

**CONDITION STATE 3** Protective system is no longer effective. Surface or freckled rust is prevalent. Corrosion may be present but any section loss is incidental and does not affect the strength or serviceability of either the element or the bridge. Strand and anchor sockets show no signs of distress.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & restore coating

**CONDITION STATE 4** Corrosion is advanced. . Cable banding, if any, may show some loosening, slipping and/or strands/wires may be broken or abraded. Cable anchor devices may be loosening or showing signs of slippage. Section loss or other deterioration is sufficient to warrant analysis for strength and/or serviceability of both the element and the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit and replace coating system  
3) Replace unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
178	Steel Open Girder, Concrete Encased (LF)

**CONDITION STATE 1** The concrete system is sound and functioning as intended to protect the metal surface. There may be discoloration, and/or superficial cracking.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Surface clean

**CONDITION STATE 2** The concrete system has minor cracking, efflorescence and/or spalling showing other early evidence of distress but there is no exposure of metal or metal corrosion.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Seal cracks, patch minor spalls

**CONDITION STATE 3** Some spalling and cracking has occurred and some structural steel is exposed. Surface or freckled rust has formed with no loss of section.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Spot blast, clean & patch

**CONDITION STATE 4** Corrosion is present on exposed steel but any section loss due to corrosion does not yet warrant structural analysis of either the element or the bridge.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Spot blast, clean & patch
  - 3) Replace protective system

**CONDITION STATE 5** Corrosion has caused steel section loss and is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Rehab unit
  - 3) Replace unit

## CULVERTS

ELEM #	DESCRIPTION
240	Steel Culvert (LF along length of barrel)

**CONDITION STATE 1** The element shows little or no deterioration. Some discoloration or surface corrosion may exist but there is no metal pitting. The element shows no deterioration or separation of seams. *If a protective coating is present, it is functioning as intended.*

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is minor to moderate corrosion and pitting. Little or no distortion exists. There may be minor deterioration and/or separation of seams. *If a protective system is present, it may be peeling, chalking, curling, or showing other early evidence of distress but there is no exposure of metal. There is no evidence of corrosion. Surface or freckled rust has formed or is forming.*

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Clean and restore coating

**CONDITION STATE 3** Significant corrosion, deep pitting or some holes in the invert may exist. Minor to moderate distortion and deflection may exist. Minor cracking or abrasion of the metal may exist. There may be considerable deterioration and/or separation of seams. *If a protective coating is present, it is no longer effective. Surface or freckled rust is prevalent. Corrosion may be present but any section loss is incidental and does not affect the strength or serviceability of either the element or the bridge.*

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Clean and restore coating

**CONDITION STATE 4** Major corrosion, extreme pitting or holes in the barrel may exist. Major distortion, deflection, or settlement may be evident. Major cracking or abrasion of the metal may exist. Major separation of seams may have occurred. *If a protective coating is present, corrosion is advanced, and section loss is significant..* A structural analysis is warranted.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit and replace coating system  
3) Replace unit

**ELEM # DESCRIPTION**

241 Concrete Culvert (LF along length of barrel) (See Glossary)

**CONDITION STATE 1** Superficial cracks and spalls may be present, but there is no exposed reinforcing or evidence of rebar corrosion. There is little or no deterioration or separation of joints.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Deterioration, minor chloride contamination, minor abrasion, spalls, cracking and/or leaching may have begun but there is no exposed reinforcing or surface evidence of rebar corrosion. There may be deterioration and separation of joints.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** There may be moderate to major deterioration, extensive cracking and/or leaching and large areas of spalls. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of the element. Minor to moderate distortion, settlement, or misalignment may have occurred. There may be considerable deterioration and separation of joints.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 4** Major deterioration, abrasion, spalling, cracking, major distortion, deflection settlement, or misalignment of the barrel may be in evidence. Major separation of joints may have occurred. Holes may exist in floors and walls. Corrosion of reinforcement and/or loss of concrete section is significant. Structural analysis of the element is warranted.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**

242 Timber Culvert (LF along length of barrel) (See Glossary)

**CONDITION STATE 1** The timber and fasteners are in sound condition.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There may be minor decay and weathering. Corrosion at fasteners and connections may have begun. There is little or no distortion and/or deflection.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** There may be significant decay, weathering and warped or broken timbers. Significant decay and corrosion at fasteners and connections may be evident. Minor to moderate distortion of the culvert may exist.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 4** There may be major decay and many warped, broken or missing timbers. There is major decay and corrosion at fasteners and connections. Major distortion or deflection of the culvert may exist which warrants structural analysis.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**

243 Other Material Culvert (LF along length of barrel) (See Glossary)

**CONDITION STATE 1** There is little or no deterioration. Surface defects only are in evidence. There are no misalignment problems.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There may be minor deterioration, abrasion, cracking and misalignment. Mortar in joints may show minor deterioration. There is little or no distortion and/or deflection.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Moderate to major deterioration and cracking and/or minor to moderate distortion or deflection has occurred. Mortar in joints shows major deterioration.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 4** Major cracking, abrasion, distortion, deflection, settlement or misalignment and/or major deterioration affecting structural integrity may have occurred and warrants structural analysis.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

## SLOPES

**ELEM # DESCRIPTION**  
260 Protected Slope (EA)

**CONDITION STATE 1** The element shows little or no deterioration.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracks, spalls, splitting or joint deterioration may be present but there is no evidence of undermining of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair unit

**CONDITION STATE 3** Moderate deterioration of slope protection. Minor undermining may be present but erosion due to road run-off is still controlled by slope protection.

**FEASIBLE ACTIONS:** 1) DN  
2) Repair unit, replace fill

**CONDITION STATE 4** Advanced deterioration (misalignment, crushing) undermining of slope protection renders protection largely ineffective.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**  
261 Unprotected Slope (i.e., soil and vegetation) (EA)

**CONDITION STATE 1** The element shows little or no erosion.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor erosion present.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace fill

**CONDITION STATE 3** Moderate erosion of slope is present but is incidental and does not adversely affect the serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace fill

**CONDITION STATE 4** Advanced erosion of slope is present and/or the slope has failed. The slope is no longer functioning as intended.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace fill  
3) Rebuild slope

<b>ELEM #</b>	<b>DESCRIPTION</b>
300	Strip Seal Expansion Joint (LF) (See Glossary)

**CONDITION STATE 1** The element shows little or no deterioration. There is no leakage at any point along the joint. Gland is secure and has no defects. There may be some debris in the joint. The adjacent deck and/or header is sound.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Clean Joint

**CONDITION STATE 2** Signs of seepage along the joint may be present. The gland may have a minor rip or puncture. Debris in the joint is not causing any problems. The adjacent deck and/or header may have minor cracks and spalls but there is no exposed reinforcing or surface evidence of rebar corrosion.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit (patch/reset/clean joint)

**CONDITION STATE 3** Signs of seepage along the joint are present. The gland may be punctured, ripped or partially pulled out of the extrusion. Significant debris is in all or part of the joint. The adjacent deck and/or header may have some delaminations and/or spalls present and some reinforcing may be exposed. Corrosion of the rebar may be present. Deterioration of the deck and/or header does not significantly affect the strength and/or serviceability of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit (patch/reset or replace/clean joint)

**CONDITION STATE 4** The joint is leaking. The gland has failed, i.e., punctures, tears or has pulled out of the extrusion. Major delaminations and/or spalls are present in the deck and/or header adjacent to the joint with exposed rebar. Corrosion of the rebar is present. The deterioration of the deck and/or header is sufficient to warrant an analysis of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit
  - 3) Replace Unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
301	Pourable Joint Seal (LF) (See Glossary)

**CONDITION STATE 1** The element shows little or no deterioration. Adhesion is sound and there is no leakage at any point along the joint. There are no cohesion cracks. There may be some debris in the joint. The adjacent deck and/or header is sound.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Clean Joint

**CONDITION STATE 2** Signs of seepage along the joint may be present. Minor adhesion and/or cohesion failures may be present. Any debris in joint is not causing any problems. The adjacent deck and/or header may have minor cracks and spalls but there is no exposed reinforcing or surface evidence of rebar corrosion.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Clean Joint
  - 3) Rehab Unit (reseal joint)

**CONDITION STATE 3** Signs of seepage along the joint are present. Minor adhesion and/or cohesion failures are present. Joint may be slightly impacted with debris. The adjacent deck and/or header may have some delaminations and/or spalls present and some reinforcing may be exposed. Corrosion of the rebar may be present. Deterioration of the adjacent deck and/or header does not significantly affect the strength and/or serviceability of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit (clean joint, patch spalls, replace seal)

**CONDITION STATE 4** The joint is leaking. The seal has failed. There are major adhesion and/or cohesion failures. Joint is heavily impacted with debris and/or stones. Major delaminations and/or spalls are present in the deck and/or header adjacent to the joint with exposed rebar. Corrosion of the rebar is present. The deterioration of the deck and/or header is sufficient to warrant an analysis of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit
  - 3) Replace Unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
302	Compression Joint Seal (LF) (see glossary)

**CONDITION STATE 1** The element shows little or no deterioration. Adhesion is sound and there is no leakage at any point along the joint. There are no cohesion cracks. There may be some debris in the joint. The adjacent deck and/or header is sound. If joint is armored, there are no signs of anchorage looseness.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Clean Joint

**CONDITION STATE 2** Signs of seepage along the joint may be present. Minor adhesion failures may be present. Debris in joint is not causing any problems. The gland may show signs of abrasion or minor tearing. The adjacent deck and/or header may have minor cracks or spalls but there is no exposed reinforcing or surface evidence of rebar corrosion. If the joint is armored, there may be some minor signs of anchorage looseness.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Clean Joint
  - 3) Rehab Unit (reseal, replace gland, repair spalls)

**CONDITION STATE 3** Signs of seepage along the joint are present. Minor adhesion failures are present. The gland may be punctured, ripped or partially pulled out of the adjacent deck and/or header may have some delaminations and/or spalls present and some reinforcing may be exposed. Corrosion of the rebar may be present. If the joint is armored, there are signs of anchorage looseness. Deterioration of the adjacent deck and/or header or anchorage looseness does not significantly affect the strength and/or serviceability of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit

**CONDITION STATE 4** The joint is leaking. The gland has failed. Major delaminations and/or spalls are present in the deck and/or header adjacent to the joint with exposed rebar. Corrosion of the rebar is present. If the joint is armored, the anchorage has failed. The deterioration of the deck and/or header or failed anchorage is sufficient to warrant an analysis of the element.

- FEASIBLE ACTIONS:**
- 1) Do Nothing
  - 2) Rehab Unit
  - 3) Replace Unit

**ELEM # DESCRIPTION**

303 Assembly Joint Seal (finger, sliding plates) (LF) (See Glossary)

**CONDITION STATE 1** The element shows little or no deterioration or damage. There may be some debris in the joint. The anchors are tight. There are no broken welds or fingers. The adjacent deck and/or header is sound. The paint system, if it is present, is sound and functioning as intended to protect the metal.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean Joint

**CONDITION STATE 2** The element may show some signs of minor deterioration or damage. Debris in the joint is not causing any problems. There may be some minor weld cracking. There are no broken fingers. There may be some minor signs of anchorage looseness. The adjacent deck and/or header may have minor cracks and/or spalls, but there is no exposed reinforcing or surface evidence of rebar corrosion. The paint system, if present, may be chalking, peeling, curling or showing other early evidence of paint system distress.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean Joint  
3) Rehab Joint

**CONDITION STATE 3** The element is showing signs of deterioration or damage. Joint may be slightly impacted with debris. There are signs of anchorage looseness. There may be some broken welds or fingers. The adjacent deck and/or header may have some delaminations and/or spalls present and some reinforcing may be exposed. Corrosion of the rebar may be present. The paint system, if present, is no longer effective. Surface or freckled rust has formed or is forming. Deterioration of the adjacent deck and/or header or loose anchorage does not significantly affect the strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit

**CONDITION STATE 4** The element shows major deterioration or damage. The anchorage has failed. There are broken welds or fingers. Major delamination and/or spalls are present in the deck and/or header adjacent to the joint with exposed rebar. Corrosion of the rebar is present. The paint system, if present, has failed. Corrosion is present and may have caused some section loss. The deterioration of the deck and/or header or failed anchorage is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Any vertical misalignment of the fingers should be noted in the verbiage.

<b>ELEM #</b>	<b>DESCRIPTION</b>
304	Open Expansion Joint (LF) (See Glossary)

**CONDITION STATE 1** The element shows little or no deterioration. If joint is armored the adjacent deck and/or header is sound.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** The adjacent deck and/or header may have minor cracks or spalls but there is no exposed reinforcing or surface evidence of rebar corrosion. If the joint is armored, there may be some minor signs of anchorage looseness.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit

**CONDITION STATE 3** The adjacent deck and/or header may have some delaminations and/or spalls present and some reinforcing may be exposed. Corrosion of the rebar may be present. If the joint is armored, there are signs of anchorage looseness. Deterioration of the adjacent deck and/or header or anchorage looseness does not significantly affect the strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit

**CONDITION STATE 4** Major delaminations and/or spalls are present in the deck and/or header adjacent to the joint with exposed rebar. Corrosion of the rebar is present. If the joint is armored, the anchorage has failed. The deterioration of the deck and/or header or failed anchorage is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

## JOINT TROUGHS

**ELEM # DESCRIPTION**  
306 Steel Joint Trough (LF)

**CONDITION STATE 1** The element and supporting hardware show little or no deterioration. The paint system if any is sound and functioning as intended to protect the metal surface.

**FEASIBLE ACTIONS** 1) DN

**CONDITION STATE 2** Surface pitting may be present but any section loss due to active corrosion does not significantly affect the serviceability of the element. Some supporting hardware may have failed but the trough is still intact.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Advanced corrosion and/or hardware failure. The element is no longer able to perform its function.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**  
307 Neoprene or Fiberglass Joint Trough (LF)

**CONDITION STATE 1** The element shows little or no deterioration.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracking, splitting or other deterioration may be present. Serviceability is not affected.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Advanced deterioration and/or hardware failure. The element is no longer able to perform its function.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**

311 Painted Movable Bearing (roller, sliding, etc.) (EA)

**CONDITION STATE 1** The element shows little or no deterioration. The bearing has minimal debris. The paint system is sound and functioning as intended to protect the metal surface. Vertical and/or horizontal alignments are within limits. Bearing support member is sound. Any lubrication system is functioning properly. *If an elastomeric pad is present, the shear deformations are correct for the existing temperatures.*

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** The paint system may be chalking, peeling, curling or showing other early evidence of paint distress but there is no exposure of metal. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Debris buildup may be affecting bearing movement. Bearing alignment is still tolerable. Any lubrication system is still functioning. *If an elastomeric pad is present, it may have minor cracking, splitting or other deterioration. Also, minor shear deformations may be present. The pad may have moved causing slight loss of bearing (5% or less).*

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Reset Bearings

**CONDITION STATE 3** The paint system is no longer effective. Surface or freckled rust is prevalent. The assemblies have moved causing cracking in the supporting concrete. Debris buildup is affecting bearing movement. Bearing alignment may be beyond tolerable limits. Lubrication system, if any, may have failed. *If an elastomeric pad is present, it is exhibiting cracking, splitting or other deterioration. Shear deformations may be excessive. The pad has moved causing loss of bearing (greater than 5% but less than or equal to 25%).* Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Rehab Unit

**CONDITION STATE 4** Corrosion is advanced with section loss. There may be section loss of the supporting member, i.e., bearing loss, sufficient to warrant supplemental supports or load restrictions. Bearing alignment is beyond tolerable limits. Shear keys may have failed. The lubrication system, if any, has failed. *If an elastomeric pad is present, it is in a state of advanced deterioration. Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel. The pad has moved causing significant loss of bearing (greater than 25%).* Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Bearing supports (i.e., concrete pedestals) are to be rated and included in the verbiage for this element.

<b>ELEM #</b>	<b>DESCRIPTION</b>
312	Enclosed/Concealed Bearing or Bearing System (EA)

**CONDITION STATE 1** The element shows little or no deterioration. There are no vertical or horizontal offsets. There is no cracking of the support members. The support member is stable under traffic.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Both vertical and/or horizontal offsets are within the capability of the bearing and are not yet significant. The support member may exhibit minimal vertical movement under traffic. There may be minor cracking of the support members. There may be an insignificant reduction of bearing due to superstructure shortening.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit

**CONDITION STATE 3** Both vertical and/or horizontal offsets may be beyond the capability of the bearing. The support member exhibits vertical movement under traffic. There is cracking of the support members. There is a reduction of bearing due to superstructure shortening. Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

**CONDITION STATE 4** Vertical and/or horizontal offsets are significant indicating bearing failures. There is significant vertical movement under traffic. Cracking of the supporting member is significant. There is a significant reduction of bearing due to superstructure shortening. Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Bearing supports (i.e., concrete pedestals) are to be rated and included in the verbiage for this element.

ELEM #	DESCRIPTION
313	Painted Fixed Bearing (EA)

**CONDITION STATE 1** The element shows little or no deterioration. The paint system is sound and functioning as intended to protect the metal surface. Vertical and/or horizontal alignments are within limits. Bearing support member is sound. *If an elastomeric pad is present, the shear deformations are correct for the existing temperatures.*

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** The paint system may be chalking, peeling, curling or showing other early evidence of paint distress but there is no exposure of metal. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Bearing alignment is still tolerable. *If an elastomeric pad is present, it may have minor cracking, splitting or other deterioration. Also, minor shear deformations may be present. The pad may have moved causing a slight loss of bearing (5% or less).*

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Reset Bearings

**CONDITION STATE 3** The paint system is no longer effective. Surface or freckled rust is prevalent. The assemblies have moved causing cracking in the supporting concrete. Bearing alignment may be beyond tolerable limits. *If an elastomeric pad is present, it is exhibiting cracking, splitting or other deterioration. Shear deformations may be excessive. The pad has moved causing loss of bearing (greater than 5% but less than or equal to 25%).* Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Rehab Unit

**CONDITION STATE 4** The paint system has failed. Corrosion is advanced with section loss. There may be section loss of the supporting member, i.e., bearing loss, sufficient to warrant supplemental supports or load restrictions. Bearing alignment is beyond tolerable limits. Shear keys may have failed. *If an elastomeric pad is present, it is in a state of advanced deterioration. Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel. The pad has moved causing significant loss of bearing (greater than 25%).* Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Bearing supports (i.e., concrete pedestals) are to be rated and included in the verbiage for this element.

<b>ELEM #</b>	<b>DESCRIPTION</b>
314	Pot Bearing (EA) (high load bearings with confined elastomer)
315	Disk Bearing (EA) (high load bearings with a hard plastic disk)

**CONDITION STATE 1** The element shows little or no deterioration. The paint or other anti-corrosion system is sound and functioning as intended to protect the metal. The bearing has minimal debris. Vertical and/or horizontal alignments are within limits. Bearing support member is sound. Any lubrication system is functioning properly.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** The paint system may be chalking, peeling, curling but there is no exposure of metal or other anti-corrosion system may be showing some signs of corrosion. Debris buildup may be affecting bearing movement. Bearing alignment and load carrying capacity is tolerable. There may be minor cracking in the supporting concrete. Any lubrication system is still functioning.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint

**CONDITION STATE 3** The paint system or other anti-corrosion system is no longer functioning. Surface or freckled rust or corrosion with minor pitting is prevalent. Debris buildup is affecting bearing movement. Bearing alignment and load carrying capacity may be beyond tolerable limits. There is cracking in the supporting concrete. Any lubrication system may have failed. Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Rehab Unit

**CONDITION STATE 4** The paint system has failed. Corrosion is advanced. Bearing alignment and load carrying capacity are beyond tolerable limits. Shear keys may have failed. The lubrication system, if any, has failed. There may be loss of section of the supporting concrete. (Elem. 314: Elastomer may be extruding from the device). Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

**ELEM # DESCRIPTION**

316 Unpainted Movable Bearing (Roller, sliding, etc.) (EA)

**CONDITION STATE 1** The element shows little or no deterioration. The bearing has minimal debris. The weathering steel is coated uniformly and remains in excellent condition. Oxide film is tightly adhered. Vertical and/or horizontal alignments are within limits. Bearing support member is sound. Any lubrication system is functioning properly. *If an elastomeric pad is present, the shear deformations are correct for the existing temperatures.*

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Surface rust or surface pitting has formed or is forming, but the element is still functioning as intended. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Debris buildup may be affecting bearing movement. Bearing alignment is still tolerable. Weathering steel color is yellow orange to light brown. Oxide has a dusty to granular texture. Any lubrication system is still functioning. *If an elastomeric pad is present, it may have minor cracking, splitting or other deterioration. Also, minor shear deformations may be present. The pad may have moved causing a slight loss of bearing (5% or less).*

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Reset Bearings

**CONDITION STATE 3** Steel has measurable section loss. The assemblies have moved causing cracking in the supporting concrete. Debris buildup is affecting bearing movement. Bearing alignment may be beyond tolerable limits. Weathering steel is dark brown or black. Oxide film is flaking. Lubrication system may have failed. *If an elastomeric pad is present, it is exhibiting cracking, splitting or other deterioration. Shear deformations may be excessive. The pad has moved causing loss of bearing (greater than 5% but less than or equal to 25%).* Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Rehab Unit

**CONDITION STATE 4** Corrosion is advanced. Oxide film has a laminar texture with thin sheets of rust. There may be section loss of the supporting member, i.e., bearing loss, sufficient to warrant supplemental supports or load restrictions. Bearing alignment is beyond tolerable limits. Shear keys may have failed. The lubrication system has failed. *If an elastomeric pad is present, it is in a state of advanced deterioration. Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel. The pad has moved causing significant loss of bearing (greater than 25%).* Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Bearing supports (i.e., concrete pedestals) are to be rated and included in the verbiage for this element.

<b>ELEM #</b>	<b>DESCRIPTION</b>
317	Unpainted Fixed Bearing (EA)

**CONDITION STATE 1** The element shows little or no deterioration. The weathering steel is coated uniformly and remains in excellent condition. Oxide film is tightly adhered. Vertical and/or horizontal alignment are within limits. Bearing support member is sound. *If an elastomeric pad is present, the shear deformations are correct for the existing temperatures.*

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Surface rust, surface pitting, has formed or is forming, but is still functioning as intended. The assembly may have moved enough to cause minor cracking in the supporting concrete. Bearing alignment is still tolerable. Weathering steel color is yellow orange to light brown. Oxide has a dusty to granular texture. *If an elastomeric pad is present, it may have minor cracking, splitting or other deterioration. Also, minor shear deformations may be present. The pad may have moved causing a slight loss of bearing (5% or less).*

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint

**CONDITION STATE 3** Steel has measurable section loss. The assemblies have moved causing cracking in the supporting concrete. Bearing alignment may be beyond tolerable limits. Weathering steel is dark brown or black. Oxide film is flaking. *If an elastomeric pad is present, it is exhibiting cracking, splitting or other deterioration. Shear deformations may be excessive. The pad has moved causing loss of bearing (greater than 5% but less than or equal to 25%).* Deterioration of the bearing does not yet warrant a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean and Paint  
3) Rehab Unit

**CONDITION STATE 4** Corrosion is advanced. Oxide film has a laminar texture with thin sheets of rust. There may be section loss of the supporting member, i.e., bearing loss, sufficient to warrant supplemental supports or load restrictions. Bearing alignment is beyond tolerable limits. Shear keys may have failed. *If an elastomeric pad is present, it is in a state of advanced deterioration. Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel. The pad has moved causing significant loss of bearing (greater than 25%).* Deterioration is sufficient to warrant an analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. Bearing supports (i.e., concrete pedestals) are to be rated and included in the verbiage for this element.

## BRIDGE ROADWAY APPROACHES

<b>ELEM #</b>	<b>DESCRIPTION</b>
320	Prestressed Concrete Approach Slab (EA)
321	Reinforced Concrete Approach Slab (EA)

**CONDITION STATE 1** The slab has not settled and shows no sign of deterioration other than superficial surface cracks.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracking, spalls may be present but they do not affect the ability of the slab to carry traffic. Settlement may be occurring which increases the traffic impact on the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Perform mudjacking operations

**CONDITION STATE 3** Cracks may extend completely through the slab cross-section, but the slab does not act as if it is broken. Spalls may be heavy but they do not affect the structural integrity of the slab. Settlement may be occurring which increases the traffic impact on the bridge.

**FEASIBLE ACTIONS:** 1) DN  
2) Place overlay  
3) Replace unit

**CONDITION STATE 4** The slab is broken or rocks under traffic loads. Settlement is excessive and cannot be corrected without increasing the size of the slab.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace unit

1. Element 322 must be coded whenever Element 320 or 321 is used.

<b>ELEM #</b>	<b>DESCRIPTION</b>
322	Roadway Approach Transition (EA) (Non-CoRe)

**CONDITION STATE 1** The approach roadway transition to the bridge is smooth. There is no settlement or heaving.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is minor settlement or heaving (< 0.5") of the approach roadway. Minor potholes/delaminations may be occurring.

**FEASIBLE ACTIONS:** 1) DN  
2) Patch  
3) Mill and/or overlay

**CONDITION STATE 3** There is moderate settlement or heaving (0.5" to 1") of the approach roadway. Potholes/delaminations may be present. Traffic impact on bridge is increased.

**FEASIBLE ACTIONS:** 1) DN  
2) Mill and/or overlay  
3) Replace unit

**CONDITION STATE 4** There is major settlement or heaving (> 1") of the approach roadway. Large potholes/delaminations may be present.

**FEASIBLE ACTIONS:** 1) DN  
2) Mill and/or overlay  
3) Replace unit

1. This element is to describe the general condition of the transition. Isolated potholes should be noted in the verbiage.
2. Element 322 must be coded for all structures which are not under fill.

## BRIDGE RAILING

**ELEM # DESCRIPTION**  
330 Metal Bridge Railing (EA)

**CONDITION STATE 1** There is little or no evidence of corrosion. Protective coating is sound and functioning as intended to protect the element. Anchorage is tight and shows no signs of distress.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There is little or no evidence of corrosion. Surface or freckled rust has formed or is forming. Protective coating may have minor areas of deterioration. Anchorage is tight and shows no signs of distress.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & restore coating

**CONDITION STATE 3** Surface or freckled rust is prevalent. Protective coating is no longer effective. Surface pitting may be present but there is no loss of section. Anchors may be loosening.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & restore coating  
3) Rehab unit

**CONDITION STATE 4** Corrosion is present but any section loss is incidental and does not affect the strength or serviceability of the element. Some anchors are loose.

**FEASIBLE ACTIONS:** 1) DN  
2) Clean & restore coating  
3) Rehab unit

**CONDITION STATE 5** Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**  
331 Reinforced Concrete Bridge Railing (EA)

**CONDITION STATE 1** The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracks, surface scaling or spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion. Strength and/or serviceability are not affected.

**FEASIBLE ACTIONS:** 1) DN  
2) Seal cracks, minor patching

**CONDITION STATE 3** Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Seal cracks, minor patching  
3) Rehab unit

**CONDITION STATE 4** Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**  
332 Timber Bridge Railing (EA)

**CONDITION STATE 1** There is no decay. There may be minor cracks, splits and/or checks.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** There may be decay with or without splitting, cracking, checking or crushing but none is sufficiently advanced to affect serviceability.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab and/or apply surface treatment

**CONDITION STATE 3** Advanced deterioration. Decay, splits, cracks or crushing has produced loss of strength that may affect the serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Replace unit

**ELEM # DESCRIPTION**  
333 Miscellaneous Bridge Railing (EA)

**CONDITION STATE 1** The element shows little or no signs of deterioration. There may be minor cracking, corrosion and/or other minor deterioration having no effect on strength or serviceability.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Minor cracking, spalls, decay of timber portions or corrosion of metal may be present. Mortar in joints may show minor deterioration.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Advanced deterioration. Corrosion, decay or loss of section is sufficient to warrant analysis to ascertain the impact on the serviceability or strength of the element. Major deterioration of joints.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

## MISCELLANEOUS OTHER ELEMENTS

### ELEM # DESCRIPTION

340 Utilities and Overhead Signs (ENTIRE BRIDGE)

Make comments in verbiage under this number. Comments should pertain to condition of lamp posts, wiring, and electrical boxes.

### ELEM # DESCRIPTION

342 Fencing (LF) (Note: This is fencing on the bridge including anti-climb shield. Make comments concerning the hardware in the verbiage.)

**CONDITION STATE 1** No deficiencies. The protective coating (if any) is functioning as intended to protect the metal surface.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** The protective coating (if any) is no longer effective but corrosion has not affected the serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Fencing may be loose. Some posts may be loose but are still in place. The protective coating (if any) has failed there is corrosion throughout but has not affected the serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 4** Fencing is torn or missing. Fence posts are loose and ineffective. Anti-climb shield is not functioning. Corrosion has caused section loss which has affected the serviceability of the element.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

1. This is on the bridge including anti-climb shield. Make comments concerning the hardware in the verbiage.

**ELEM # DESCRIPTION**

343 Railroad Shielding (LF) (This element includes both fiberglass and aluminum protective walls)

**CONDITION STATE 1** No deficiencies.

**FEASIBLE ACTIONS:** 1) DN

**CONDITION STATE 2** Shielding may be loose. Some posts may be loose but are still in place.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit

**CONDITION STATE 3** Shielding is torn, missing, or has accident damage. Posts are loose and ineffective.

**FEASIBLE ACTIONS:** 1) DN  
2) Rehab unit  
3) Replace unit

**ELEM # DESCRIPTION**

344 Drainage Devices (ENTIRE BRIDGE) (Non-CoRe)

Make comments in verbiage under this number. Comments should pertain to condition of drain devices, grating, drain elbows, etc.

**ELEM # DESCRIPTION**

345 Stream Channel (ENTIRE BRIDGE) (Note: Code Item 61 on Cover Sheet screen).

Make comments in verbiage under this number.

<b>ELEM #</b>	<b>DESCRIPTION</b>
349	Moveable Bridge Machinery (ENTIRE BRIDGE) (Non-CoRe)

**CONDITION STATE 1** Machinery is in good condition.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Service machinery

**CONDITION STATE 2** Machinery is fair condition.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Clean & service machinery

**CONDITION STATE 3** Machinery is in poor condition.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Repair machinery
  - 3) Replace machinery

**CONDITION STATE 4** Machinery is non-operational.

- FEASIBLE ACTIONS:**
- 1) DN
  - 2) Repair machinery
  - 3) Replace machinery

Make comments in the verbiage under the appropriate element number/letter combination:

1. 34a - Trunnion Bearings
2. 34b - Gears
3. 34c - Couplings
4. 34d - Motors
5. 34e - Brakes
6. 34f - Auxiliary Brakes
7. 34g - Hand Crank
8. 34h - Speed Reducers
9. 34i - Differential
10. 34j - Bearings
11. 34k - Central Locks
12. 34l - Load supports
13. 34m - Console
14. 34n - Machinery Room
15. 34o - Tenders House
16. 34p - Electrical System
17. 34q - Counterweight
18. 34r - Pits
19. 34s - Shaft Alignment
20. 34t - Cleanliness

## SMART FLAGS

The following **DESCRIPTIONS** describe conditions for smart flags.

<b>SMART FLAG #</b>	<b>DESCRIPTION</b>
356	Steel-Fatigue (EA, Location)

This flag exists only on those bridges with steel elements which are already showing fatigue damage. It should not be applied to steel bridges prior to fatigue damage becoming apparent. Once established, deterioration modeling can be used to obtain transition probabilities.

**CONDITION STATE 1** Fatigue damage to the bridge has been repaired or arrested. The bridge may still be fatigue prone.

**CONDITION STATE 2** Fatigue damage exists which is not arrested (normally, this condition state would be used the first time the element is identified and at any other time when additional fatigue damage occurs).

**CONDITION STATE 3** Fatigue damage exists which warrants analysis of the element to ascertain the serviceability of the element or the bridge.

<b>SMART FLAG #</b>	<b>DESCRIPTION</b>
357	Pack Rust (EA Connection)

This flag defines only those connections (including shapes in contact in built-up members) of steel bridges which are already showing signs of rust packing between steel plates.

**CONDITION STATE 1.** The connection is showing signs of rusting between plates. Seams of the connections exhibit rust staining.

**CONDITION STATE 2.** Rusting between plates is beginning to distress the connection. Minor swelling exists.

**CONDITION STATE 3.** Rusting between plates has caused serious distress to the connection. The plates may be badly distorted, however all connectors (rivets/bolts) are still functioning.

**CONDITION STATE 4.** Rusting between plates has caused serious distress to the connection which warrants analysis of the bridge to ascertain the impact on the serviceability of the bridge. Some rivets or other connectors may have popped or are no longer effective.

1. This element does not apply to bearing plates.

SMART FLAG #	DESCRIPTION
359	Soffit (underside) of concrete decks and slabs (EB)

This condition state language addresses deck and slab distresses through visual inspection of the soffit (underside). It is extremely valuable when the top surface of the deck is covered with an overlay.

**CONDITION STATE 1.** Any cracking that is present is only superficial and there is no efflorescence. There are no repaired areas and there are no spalls or areas of delamination.

**CONDITION STATE 2.** a) There is no evidence that corrosion is occurring (no rust staining). Cracking and/or efflorescence is light.

AND/OR

b) Repaired areas or spalls or areas of delamination exist. Their combined area is 2% or less of the total under-surface area.

**CONDITION STATE 3.** a) There is no evidence that corrosion is occurring (no rust staining). Cracking and/or efflorescence is moderate.

AND/OR

b) Repaired areas or spalls or areas of delamination exist. Their combined area is more than 2% but less than or equal to 5% of the total under-surface area.

**CONDITION STATE 4.** a) There is evidence that corrosion is occurring (light to moderate rust staining). Cracking and/or efflorescence is heavy.

AND/OR

b) Repaired areas or spalls or areas of delamination exist. Their combined area is more than 5% but less than or equal to 10% of the total under-surface area.

**CONDITION STATE 5.** a) There is evidence that corrosion is occurring (heavy to severe rust staining). Cracking and/or efflorescence is severe.

AND/OR

b) Repaired areas or spalls or areas of delamination exist. Their combined area is more than 10% of the total under-surface area.

1. Repaired areas should be considered as deck punctures.
2. If the deck is planked the soffit will be placed, at a minimum, in **CONDITION STATE 4**. The inspector will determine if the soffit should be placed in **CONDITION STATE 5**.

<b>SMART FLAG #</b>	<b>DESCRIPTION</b>
360	Settlement (EA)

This condition state language addresses substructure settlement distresses which are evident during visual inspections. Its primary purpose is to identify bridges that are experiencing settlement and to provide some measure of the magnitude of that settlement. The normal condition state language for substructure elements does not address settlement.

**CONDITION STATE 1.** Some of the bridge supporting elements are showing signs of visible settlement or rotation but due to earlier repairs or other signs, the settlement appears to have stabilized.

**CONDITION STATE 2.** Settlement or rotation of the bridge supporting elements show signs of continuing and if left un-arrested could cause adverse impacts to the bridge.

**CONDITION STATE 3.** Settlement or rotation of the bridge supporting elements is significant enough to warrant analysis of the bridge.

<b>SMART FLAG #</b>	<b>DESCRIPTION</b>
361	Scour (EA)

This condition state language addresses scour distresses which are evident during visual inspections. Its primary purpose is to identify bridges that are experiencing scour and to provide some measure of the magnitude of scour. This flag is only to be used for scour resulting from stream channel.

**CONDITION STATE 1.** Scour exists at the bridge site but is of little concern to the structural integrity of the bridge.

**CONDITION STATE 2.** Scour exists at the bridge site and if left unchecked could adversely impact the structural integrity of the bridge.

**CONDITION STATE 3.** Scour is significant enough to warrant analysis of the bridge.

SMART FLAG #	DESCRIPTION
362	Traffic Impact (EA)

This condition state language addresses distress of any elements due to traffic impact.

**CONDITION STATE 1.** Impact damage has occurred and has been repaired. Prestressing system is covered by patch concrete. Steel has been straightened or repaired.

**CONDITION STATE 2.** Impact damage has occurred. Prestressing system is exposed, but is not impaired. Steel strength does not threaten the serviceability of the bridge.

**CONDITION STATE 3.** Impact damage has occurred and strength of the member is impaired. Analysis is warranted to ascertain the serviceability of the bridge.

SMART FLAG #	DESCRIPTION
363	Erosion (EA)

This condition state language addresses bridge element erosion distresses which are evident during inspection. Its primary purpose is to identify bridges which are suffering from abutment or wing wall bearing loss and to provide some measure of the magnitude of the bearing loss. It is not to be used to describe erosion distress to slopes (see elements 260 and 261).

**CONDITION STATE 1** Erosion exists but is of little concern to the bearing ability of the abutment.

**CONDITION STATE 2** Erosion exists and if left unchecked could adversely affect the structural integrity of the bridge.

**CONDITION STATE 3** Erosion is sufficient to warrant structural analysis of the bridge.

SMART FLAG #	DESCRIPTION
364	Pin and Hanger Deformation (EA Location)

This condition state language addresses any deformation on the pin and hanger element.

It is to be used to identify the deformation's existence. **Inspectors may only use CONDITION STATE 2.** An engineer may change this to **CONDITION STATE 1**.

**CONDITION STATE 1** Deformation exists but has been inspected and/or a structural analysis has been performed by an engineer and found to be acceptable.

**CONDITION STATE 2** Deformation exists and is sufficient to warrant a structural analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

**The following elements are designed for use by State Highway Administration Bridge Inspection and Remedial Engineering Division forces for SHA small structures. If a non-SHA bridge agency inspects these types of structures, that agency may, at their own discretion, use these elements and incorporate their inspections into the bridge management system.**

**ELEM # DESCRIPTION**  
346 Gabion Wall (LF)

**CONDITION STATE 1** The element shows little or no deterioration. If the wall is along a stream, there are no signs of undermining or settlement. There are no signs of misalignment along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Minor rust may be forming on the wire mesh but there are no broken wires and/or or missing stone. There may be some minor undermining, but there are no signs of settlement. There may be some minor misalignment along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Repair wire mesh

**CONDITION STATE 3** Rust is prevalent on the wire mesh with some broken wires and/or missing stones, but the deterioration is incidental and does not significantly affect the strength and/or serviceability of either the element or the wall. There may be some signs of undermining and/or settlement. There may be some misalignment along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Replace stones and repair wire mesh  
3) Rehab Unit

**CONDITION STATE 4** Advanced deterioration. Rusting of the wire mesh is severe with many broken wires and missing stones. The deterioration is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the wall. There is probably some undermining and/or settlement. There may be some misalignment along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

**ELEM # DESCRIPTION**  
350 Retaining Wall (LF)

**CONDITION STATE 1** The element shows little or no deterioration. There may be discoloration efflorescence, and/or superficial cracking, but without effect on strength and/or serviceability. If the wall is along a stream, there are no signs of undermining or settlement. There are no signs of misalignment along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Minor cracks and spalls may be present, but there is no exposed reinforcing or surface evidence of rebar corrosion. There may be some minor undermining, but there are no signs of settlement. There may be some minor misalignment (<0.5") along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Seal Cracks, minor patch

**CONDITION STATE 3** Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present, but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the wall. There may be some signs of undermining and/or settlement. There may be some misalignment (0.5" to 1") along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Clean rebar & patch, (and/or seal)  
3) Rehab Unit

**CONDITION STATE 4** Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the wall. There is probably some undermining and/or settlement. There may be some misalignment (>1") along the wall.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
351	Timber Bulkhead (LF)

**CONDITION STATE 1**            The bulkhead is plumb. Investigation indicates no decay. There may be superficial cracks, splits, and checks having no effect on strength or serviceability.

**FEASIBLE ACTIONS:**    1) Do Nothing

**CONDITION STATE 2**            The bulkhead is slightly out of plumb (<0,5") and/or decay, insect/marine borer infestation, abrasion, splitting, cracking, checking or crushing may exist but none is sufficiently advanced to affect strength or serviceability of the element.

**FEASIBLE ACTIONS:**    1) Do Nothing  
2) Rehab and/or protect unit

**CONDITION STATE 3**            The bulkhead is moderately out of plumb (0.5" to 1") and/or decay, insect/marine borer infestation, abrasion, splitting, cracking or crushing has produced loss of strength or deflection of the element but not of a sufficient magnitude to affect the serviceability of the element.

**FEASIBLE ACTIONS:**    1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

**CONDITION STATE 4**            The bulkhead is leaning (>1") and/or advanced deterioration. Decay, insect/marine borer infestation, abrasion, splits, cracks or crushing has produced loss of strength or deflection that affects the serviceability and warrants a structural analysis of the element.

**FEASIBLE ACTIONS:**    1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. All hardware problems should be included in the verbiage.

<b>ELEM #</b>	<b>DESCRIPTION</b>
352	Steel Bulkhead (LF)
355	Steel Noise Wall (LF)

**CONDITION STATE 1**            The bulkhead/noise wall is plumb. There is no evidence of active corrosion, and the coating system is sound and functioning as intended to protect the metal surface.

**FEASIBLE ACTIONS:**    1) Do Nothing

**CONDITION STATE 2**            The bulkhead/noise wall is plumb. There is little or no active corrosion. Surfaced or freckled rust has formed or is forming. The coating may be chalking, peeling, curling or showing other early evidence of distress, but there is no exposure of metal.

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Clean and restore coating

**CONDITION STATE 3**            The bulkhead/noise wall is slightly out of plumb (<0.5”) and/or surface or freckled rust is prevalent. The coating is no longer effective. There may be exposed metal, but there is no active corrosion, which is causing loss of section.

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Spot blast, clean and coat

**CONDITION STATE 4**            The bulkhead/noise wall is moderately out of plumb (0.5” to 1”) and/or the coating has failed. Corrosion may be present, but any section loss due to active corrosion does not warrant a structural analysis of the element.

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Sand blast, clean and coat  
    3) Replace coating system

**CONDITION STATE 5**            The bulkhead/noise wall is leaning (>1”) and/or corrosion has caused section loss and is sufficient to warrant a structural analysis to ascertain the impact on the ultimate strength and/or serviceability of the element.

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Rehab Unit  
    3) Replace Unit

1. When major section loss (heavy pitting, holes, etc.) is present after the element has been recently painted, the inspector shall code solely based on the condition of the paint system. The major section loss shall be noted in the verbiage and “screamed” unless there is a note in the inspection file stating otherwise.

<b>ELEM #</b>	<b>DESCRIPTION</b>
353	Concrete Noise Wall

**CONDITION STATE 1**            The wall is plumb. The element shows little or no deterioration. There may be discoloration, efflorescence and/or cracking, but without effect on the strength and/or serviceability. If steel posts are present, there is no evidence of corrosion and the paint system is sound and functioning as intended to protect the metal surface. Post/panel engagement is minimum of 3".

**FEASIBLE ACTIONS:**    1) Do Nothing

**CONDITION STATE 2**            The wall is slightly out of plumb (<0.5") and/or minor cracks and spalls may be present, but there is no exposed reinforcing or surface evidence of rebar corrosion. If steel posts are present, surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling, or showing other early evidence of paint system distress, but there is no exposure of metal. Post/panel engagement is 2" or <3".

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Clean and Paint  
    3) Seal cracks; minor patch

**CONDITION STATE 3**            The wall is moderately out of plumb (0.5" to 1") and/or some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present, but loss of section is incidental. If steel posts are present, surface or freckled rust is prevalent. The paint system is no longer effective. There may be exposed metal. Deterioration does not significantly effect the strength and/or serviceability of the element. Post/panel engagement is 1" to <2".

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Clean and paint  
    3) Clean rebar and patch

**CONDITION STATE 4**            The wall is leaning (>1") and/or advanced deterioration, corrosion of reinforcement and/or loss of concrete section. If posts are present, the paint system has failed. Corrosion is present and may have caused some section loss. Deterioration is sufficient to warrant a structural analysis to ascertain the impact on the strength and/or serviceability of the element. Post/panel engagement is <1". Fill differential is >2".

**FEASIBLE ACTIONS:**    1) Do Nothing  
    2) Rehab Unit  
    3) Replace Unit

**ELEM # DESCRIPTION**  
354 Timber Noise Wall

**CONDITION STATE 1** The wall is plumb. Investigation indicates no decay. There may be superficial cracks, splits and checks having no effect on strength or serviceability.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** The noise wall is slightly out of plumb (<0.5") and/or insect infestation, splitting, cracking or checking may exist, but none is sufficiently advanced to effect strength or serviceability of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab and/or protect unit

**CONDITION STATE 3** The noise wall is moderately out of plumb (0.5" to 1") and/or decay, insect infestation, splitting or cracking has produced loss of strength or deflection of the element but not of a sufficient magnitude to effect the serviceability of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

**CONDITION STATE 4** The noise wall is leaning (>1") and/or advanced deterioration. Decay, insect infestation, splits or cracks has produced loss of strength or deflection that effects the serviceability and warrants a structural analysis of the element.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

1. All hardware problems should be included in the verbiage

**ELEM # DESCRIPTION**  
400 Bridge Paint (Entire Bridge)

**CONDITION STATE 1** The paint system is sound and functioning as intended to protect the metal surface.

**FEASIBLE ACTIONS:** 1) Do Nothing

**CONDITION STATE 2** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Surface clean  
3) Clean and paint

**CONDITION STATE 3** The paint system is no longer functioning as intended. Surface or freckled rust is prevalent. There may be exposed metal but there is no corrosion, which is causing loss of section.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Spot blast, clean and paint

**CONDITION STATE 4** Corrosion is present but any section loss due to corrosion does not yet warrant structural analysis of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Spot blast, clean and paint  
3) Replace paint system

**CONDITION STATE 5** Corrosion has caused section loss and is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

**FEASIBLE ACTIONS:** 1) Do Nothing  
2) Rehab Unit  
3) Replace Unit

<b>ELEM #</b>	<b>DESCRIPTION</b>
401	Zone Paint (Entire Bridge)

**CONDITION STATE 1**            There is little or no corrosion. Surface or freckled rust has formed or is forming on the beam ends. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.

**CONDITION STATE 2**            The paint system on the beam ends is no longer functioning as intended. Surface or freckled rust is prevalent. There may be exposed metal but there is no corrosion, which is causing loss of section.

**CONDITION STATE 3**            Corrosion is present but any section loss, on the beam ends, due to corrosion does not yet warrant structural analysis of either the element or the bridge.

**CONDITION STATE 4**            Corrosion has caused section loss on the beam ends and is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

## GLOSSARY

- 012 Concrete Deck (Bare) (EA)  
This element defines only those concrete bridge decks with no surface protection of any type and constructed with uncoated reinforcement.
- 013 Concrete Deck, Unprotected, with AC Overlay (EA)  
This element defines those concrete bridge decks with no surface protection membrane of any type. The deck is covered with an asphaltic concrete overlay and constructed with uncoated reinforcement.
- 014 Concrete Deck, Protected with Membrane and AC Overlay (EA)  
This element defines those concrete bridge decks protected with a membrane. The membrane is covered with an asphaltic concrete overlay and constructed with uncoated reinforcement.
- 018 Concrete Deck, Protected with Thin Overlay (EA)  
This element defines those concrete bridge decks protected with a thin (< or = 1") overlay (portland cement, epoxy, resin, etc.) and constructed with uncoated reinforcement.
- 022 Concrete Deck, Protected with Rigid Overlay (EA)  
This element defines those concrete bridge decks protected with a rigid (>1") overlay (low slump portland cement, epoxy, resin, etc.) and constructed with uncoated reinforcement.
- 026 Concrete Deck, Protected with Coated Bars (EA)  
This element defines those concrete bridge decks constructed with coated (epoxy, galvanized, stainless steel, etc.) reinforcement bars.
- 027 Concrete Deck, Protected with Cathodic Protection (EA)  
This element defines those concrete bridge decks protected with a cathodic system and constructed with coated or uncoated reinforcement.
- 028 Open Grid Steel Decks (EA)  
This element defines those bridge decks that are constructed of steel grids that are open and unfilled.
- 029 Concrete Filled Grid Steel Deck (EA)  
This element defines those bridge decks that are constructed of steel grids with either all of the openings or just those in the wheel tracks filled with concrete.
- 030 Corrugated/Orthotropic Deck (EA)  
This element defines those bridges that are constructed of corrugated metal filled with Portland Cement Concrete or asphaltic concrete or an orthotropic steel deck.
- 031 Timber Deck (Bare) (EA)  
This element defines those bridge decks that are constructed of timber and are not overlaid.
- 032 Timber Deck (with AC Overlay) (EA)  
This element defines only those bridges that are constructed of timber and are overlaid with asphaltic concrete.

- 038 Concrete Slab (Bare) (EA)  
This element defines those concrete slab bridges with no surface protection of any type and constructed with uncoated reinforcement.
- 039 Concrete Slab, Unprotected, with AC Overlay (EA)  
This element defines those concrete slab bridges with no surface protection of any type. The deck is covered with an asphaltic concrete overlay and constructed with uncoated reinforcement.
- 040 Concrete Slab, Protected with Membrane and AC Overlay (EA)  
This element defines those concrete slab bridges protected with a membrane. The membrane is covered with an asphaltic concrete overlay and constructed with uncoated reinforcement.
- 044 Concrete Slab, Protected with Thin Overlay (EA)  
This element defines those concrete slab bridges protected with a thin (< or = 1") overlay (portland cement, epoxy, resin, etc.) and constructed with uncoated reinforcement.
- 048 Concrete Slab, Protected with Rigid Overlay (EA)  
This element defines those concrete slab bridges protected with a rigid (>1") overlay (low slump portland cement, epoxy, resin, etc.) and constructed with uncoated reinforcement.
- 052 Concrete Slab, Protected with Coated Bars (EA)  
This element defines those concrete slab bridges constructed with coated (epoxy, galvanized, stainless steel, etc.) reinforcement bars.
- 053 Concrete Slab, Protected with Cathodic Protection (EA)  
This element defines those concrete slab bridges protected with a cathodic system and constructed with coated or uncoated reinforcement.
- 054 Timber Slab (Bare) (EA)  
This element defines those slab span bridges that are constructed of timber and are not overlaid.
- 055 Timber Slab (with AC overlay) (EA)  
This element defines those slab span bridges that are constructed of timber and are overlaid with asphaltic concrete.

\* FRP Fiber Reinforced Polymer deck;

**NOTE: Elements 56 - 59 describe the riding surface of a concrete culvert bridge where the top slab of the culvert is used as a roadway. These elements cannot stand alone but must be used in conjunction with element 241.**

- 056 Concrete Culvert at Grade, Slab (Bare) (EA)  
This element describes the riding surface of those concrete culverts with no fill with the top slab used as the roadway. There is no surface protection of any type and the culvert is constructed with uncoated reinforcement.
- 057 Concrete Culvert at Grade, Slab - Unprotected, with AC Overlay (EA)  
This element describes the riding surface of those concrete culverts with no fill with the top slab used as the roadway. There is no surface protection of any type and the culvert is constructed with uncoated reinforcement. The deck is covered with an asphaltic concrete overlay.

- 058 Concrete Culvert at Grade, Slab - Protected with Membrane and AC Overlay (EA)  
This element describes the riding surface of those membrane protected concrete culverts with no fill and with the top slab used as the roadway. The membrane is covered with an asphaltic concrete overlay.
- 059 Concrete Culvert at Grade, Slab - Protected with Coated Bars (EA)  
This element describes the riding surface of those concrete culverts with no fill and with the top slab used as the roadway which are constructed with coated (epoxy, galvanized, stainless steel, etc.) reinforcement bars.
- 061 Steel Sidewalk, Open Grid (LF)  
This element defines all those open grid steel sidewalks protected with paint, galvanizing, etc., which are 3' wide or greater. This 3' dimension distinguishes the sidewalk from the safety curb.
- 062 Reinforced Concrete Sidewalk (LF)  
This element defines all those reinforced concrete sidewalks which are 3' wide or greater. This 3' dimension distinguishes the sidewalk from the safety curb.
- 063 Timber Sidewalk (LF)  
This element defines all those timber sidewalks which are 3' wide or greater. This 3' dimension distinguishes the sidewalk from the curb.
- 070 Reinforced Concrete Median (LF)  
This element defines all raised concrete medians.
- 101 Steel Closed Web/Box Girder, Unpainted (LF)  
This element defines only those steel closed web/box girder units that are not painted or are constructed of weathering steel.
- 102 Steel Closed Web/Box Girder, Painted (LF)  
This element defines only those steel closed web/box girder units that are painted.
- 104 Prestressed Concrete Closed Web/Box Girder (LF)  
This element defines only those closed web/box girder units constructed of prestressed concrete.
- 105 Reinforced Concrete Closed Web/Box Girder (LF)  
This element defines only those closed web/box girder units constructed of reinforced concrete.
- 111 Timber Open Girder (LF)  
This element defines only those open girders of timber construction. This can include either solid timbers or glue-lam girders.

**NOTE: For Elements 112 - 117, "Stringers" are members used in a stringer-floor beam system exclusively. "Girders" applies to other longitudinal members; see elements 170 - 178.**

- 112 Steel Stringer (stringer - floor beam system), Unpainted (LF)  
This element defines only those steel stringers that are not painted or are constructed of weathering steel which support the deck in a stringer-floor beam system.

- 113 Steel Stringer (stringer - floor beam system), Painted (LF)  
This element defines only those steel stringers that support the deck in a stringer-floor beam system that are painted.
- 115 Prestressed Concrete Stringer (stringer - floor beam system), (LF)  
This element defines only those prestressed concrete stringers that support the deck in a stringer-floor beam system.
- 116 Reinforced Concrete Stringer (stringer - floor beam system), (LF)  
This element defines only those reinforced concrete stringers that support the deck in a stringer-floor beam system.
- 117 Timber Stringer (stringer - floor beam system), (LF)  
This element defines only those timber stringers that support the deck in a stringer-floor beam system.
- 120 Steel Bottom Chord of Through Truss, Unpainted (LF)  
This element defines the bottom chord of unpainted steel trusses or those constructed of weathering steel. This element includes Through trusses and Pony trusses.
- 121 Steel Bottom Chord of Through Truss, Painted (LF)  
This element defines the bottom chord of steel trusses that are painted. This element includes through trusses and Pony trusses.
- 125 Steel Through Truss excluding bottom chord, Unpainted (LF)  
This element defines all truss elements except the bottom chord of unpainted steel trusses or those constructed of weathering steel. This element includes through trusses and Pony trusses. The quantity for this element should be twice the length of the truss span(s).
- 126 Steel Through Truss excluding bottom chord, Painted (LF)  
This element defines all truss elements except the bottom chord of steel trusses that are painted. This element includes through trusses and Pony trusses. The quantity for this element should be twice the length of the truss span(s).
- 130 Steel Deck Truss, Unpainted (LF)  
This element defines all members of unpainted steel deck trusses or those constructed of weathering steel. The quantity for this element should be twice the length of the truss span(s).
- 131 Steel Deck Truss, Painted (LF)  
This element defines all members of steel deck trusses that are painted. The quantity for this element should be twice the length of the truss span(s).
- 135 Timber Truss/Arch (LF)  
This element defines all members of trusses and arches that are constructed of timber. The quantity for this element should be twice the length of the truss span(s).
- 140 Steel Arch, Unpainted (LF)  
This element defines all members of only those steel arches that are not painted or are constructed of weathering steel. The quantity for this element should be twice the length of the arch span(s).

- 141 Steel Arch, Painted (LF)  
This element defines all members of only those steel arches that are painted. The quantity for this element should be twice the length of the arch span(s).
- 143 Prestressed Concrete Arch (LF)  
This element defines only those arches constructed of prestressed concrete.
- 144 Reinforced Concrete Arch (LF)  
This element defines only those arches (open/closed spandrel, earth filled, bowstring, etc.) constructed of reinforced concrete. There are two distinct ways to measure the quantity for this element:  
1) The quantity for this element is measured along the barrel length if the arch ring is solid across the roadway. It is not measured along the span length from spring line to spring line.  
2) If the arch is an open type consisting of two or more arch rings, e.g., open spandrel arch, then the quantity shall be the sum of the lengths of the arch rings as measured from spring line to spring line.
- 145 Other Material Arch (LF)  
This element defines only those arches (open/closed spandrel, earth filled, bowstring, etc.) constructed of other material types (i.e., brick, stone). The quantity for this element is measured along the barrel length. It is not measured along the span length from spring line to spring line.
- 146 Uncoated Steel Cable, Not Embedded in Concrete (EA)  
This element defines only those steel cables not embedded in concrete.
- 147 Coated Steel Cable, Not Embedded in Concrete (EA)  
This element defines only those painted steel cables not embedded in concrete.
- 151 Steel Floor Beam, Unpainted (LF)  
This element defines only those steel floor beams that are not painted or are constructed of weathering steel.
- 152 Steel Floor Beam, Painted (LF)  
This element defines only those steel floor beams that are painted.
- 154 Prestressed Concrete Floor Beam (LF)  
This element defines only those floor beams constructed of prestressed concrete.
- 155 Reinforced Concrete Floor Beam (LF)  
This element defines only those floor beams constructed of reinforced concrete.
- 156 Timber Floor Beam (LF)  
This element defines only those floor beams constructed of timber.
- 160 Steel Pin and Hanger Assembly, Unpainted (EA)  
This element defines only those steel pin and hanger assemblies that are not painted or are constructed of weathering steel.
- 161 Steel Pin and Hanger Assembly, Painted (EA)  
This element defines only those steel pin and hanger assemblies that are painted.

**NOTE: For Elements 170 - 178, "Girder" defines a longitudinal member that transfers its load directly to a column or pile via a bearing device and pile cap.**

- 170 Exterior Steel Open Girder, Unpainted (LF)  
This element defines only those steel open girder units that are not painted or are constructed of weathering steel **and are the exterior girders on a set.** This element includes two girder systems as well as rolled beams on multiple beam spans.
- 171 Interior Steel Open Girder, Unpainted (LF)  
This element defines only those steel open girder units that are not painted or are constructed of weathering steel and **are the interior girders on a set.** This element includes built-up girder systems as well as rolled beams on multiple beam spans.
- 172 Exterior Steel Open Girder, Painted (LF)  
This element defines only those steel open girder units that are painted **and are the exterior girders on a set.** This element includes two girder systems as well as rolled beams on multiple beam spans.
- 173 Interior Steel Open Girder, Painted (LF)  
This element defines only those steel open girder units that are painted **and are the interior girders on a set.** This element includes built-up girder systems as well as rolled beams on multiple beam spans.
- 174 Exterior Prestressed Concrete Open Girder (LF)  
This element defines only those prestressed concrete open girder units constructed of prestressed concrete **and are the exterior girders on a set.**
- 175 Interior Prestressed Concrete Open Girder (LF)  
This element defines only those prestressed concrete open girder units constructed of prestressed concrete **and are the interior girders on a set.**
- 176 Exterior Reinforced Concrete Open Girder (LF)  
This element defines only those reinforced concrete open girder units constructed of reinforced concrete **and are the exterior girders on a set.**
- 177 Interior Reinforced Concrete Open Girder (LF)  
This element defines only those reinforced concrete open girder units constructed of reinforced concrete **and are the interior girders on a set.**
- 178 Steel Open Girder, Concrete Encased (LF)  
This element defines only those steel open girders that are concrete encased. A common use for this element is in the center span of a bridge over a railroad track.
- 201 Steel Column or Pile Extension, Unpainted (EA)  
This element defines only those columns or pile extensions that are unpainted or constructed of weathering steel.
- 202 Steel Column or Pile extension, Painted (EA)  
This element defines only those columns or pile extensions that are painted. This can include monotube and pipe piles.

- 204 Prestressed Concrete Column or Pile Extension (EA)  
This element defines only those columns or pile extensions that are constructed of prestressed concrete.
- 205 Reinforced Concrete Column or Pile Extension (EA)  
This element defines only those columns or pile extensions that are constructed of reinforced concrete.
- 206 Timber Column or Pile Extension (EA)  
This element defines only those columns or pile extensions that are constructed of timber.
- 207 Timber Crossbracing (EACH BENT OR BETWEEN BENTS)  
This element defines those timber members used as crossbracing on timber pile bents or crossbracing which runs between timber pile bents.
- 210 Reinforced Concrete Pier Wall (LF)  
This element defines only those pier walls (shafts) constructed of reinforced concrete.
- 211 Other Material Pier Wall (LF)  
This element defines only those pier walls (shafts) constructed of material other than reinforced concrete which are contiguous with the columns. This includes masonry pier walls.
- 213 Reinforced Concrete Crashwall (LF)  
This element describes those crash walls whose function is to protect columns. The traffic (vehicular or rail) side of the crashwall must be flush with or in front of the faces of the columns.
- 215 Reinforced Concrete Abutment (LF)  
This element defines only those abutments constructed of reinforced concrete. This element does not include the backwall (see element 218).
- 216 Timber Abutment (LF)  
This element defines only those abutments constructed of timber.
- 217 Other Material Abutment (LF)  
This element defines abutments made of masonry or any other material except concrete or timber.
- 218 Reinforced Concrete Abutment Backwall (LF)  
This element defines only those abutment backwalls constructed of reinforced concrete.

**NOTE: For Elements 220 - 228, a "Submerged" element is any element that is continuously submerged in water for any part of its length.**

- 220 Reinforced Concrete Submerged Pile Cap/Footing (EA)  
This element defines only those reinforced concrete pile caps and/or footings that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour.
- 225 Steel Submerged Pile (EA)  
This element defines only those steel piles that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour. This can include monotube and pipe piles.

- 226 Prestressed Concrete Submerged Pile (EA)  
This element defines only those prestressed concrete piles that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour.
- 227 Reinforced Concrete Submerged Pile (EA)  
This element defines only those reinforced concrete piles that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour.
- 228 Timber Submerged Pile (EA)  
This element defines only those timber piles that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour.
- 230 Steel Pier Cap, Unpainted (LF)  
This element defines only those steel pier caps that are not painted or are constructed of weathering steel.
- 231 Steel Pier Cap, Painted (LF)  
This element defines only those steel pier caps that are painted.
- 233 Prestressed Concrete Pier Cap (LF)  
This element defines only those pier caps that are constructed of prestressed concrete.
- 234 Reinforced Concrete Pier Cap (LF)  
This element defines only those pier caps that are constructed of reinforced concrete.
- 235 Timber Pier Cap (LF)  
This element defines only those pier caps that are constructed of timber.

**NOTES:**

- 1) **For Elements 240 - 243, "Culvert" length shall be the sum of the lengths of the pipe/cell opening(s).**
- 2) **For Element 241, if the riding surface is the top slab of the culvert, use Elements 56 - 59, "Concrete Culverts at Grade". If the riding surface is sitting on fill material, then include comments on the riding surface in the verbiage under Element 241.**

- 240 Steel Culvert (LF)  
This element defines all metal (steel, aluminum, galvanized, cast iron and asphalt coated) culverts, round or elliptical pipes, etc.
- 241 Concrete Culvert (LF)  
This element defines all pre-cast and cast-in-place (conventional or prestressed) concrete pipe and box culverts.
- 242 Timber Culvert (LF)  
This element defines all timber box culverts.
- 243 Other Material Culvert (LF)  
This element defines all culverts not included under steel, concrete or timber culverts. It includes masonry, plastic and/or combinations of other materials.

- 246 Concrete Culvert Headwall (LF)  
This element defines all pre-cast and cast-in-place (reinforced and prestressed) concrete culvert headwalls.
- 247 Other Material Culvert Headwall (LF)  
This element defines all culvert headwalls constructed of masonry and/or combinations of other materials.
- 250 Prestressed Concrete Wing Walls (LF)  
This element defines only those wing walls constructed of prestressed concrete.
- 251 Reinforced Concrete Wing Walls (LF)  
This element defines only those wing walls constructed of reinforced concrete.
- 252 Timber Wing Walls (LF)  
This element defines only those wing walls constructed of timber.
- 253 Other Material Wing Walls (LF)  
This element defines all wing walls not included under steel, concrete or timber. It includes masonry and/or combinations of other materials.
- 255 Reinforced Concrete Spandrel Wall (LF)  
This element describes those reinforced concrete walls built upon an arch to function as a retaining wall for the fill and the roadway on a filled arch bridge.
- 256 Other Material Spandrel Wall (LF)  
This element describes those walls constructed of other material (i.e., brick, stone) built upon an arch to function as a retaining wall for the fill and the roadway on a filled arch bridge.
- 260 Protected Slope (EA)  
This element describes those slopes under a bridge which are protected by concrete, masonry, timber, gabion baskets or some combination.
- 261 Unprotected Slope (EA)  
This element describes those slopes under a bridge which are unprotected. The slopes are composed of soil.
- 270 Timber Dolphin (EA)  
This element describes those protective timber pile clusters used with bridges over navigable water.
- 272 Steel Fender (LF)  
This element describes only those fenders made of steel.
- 274 Timber Fender (LF)  
This element describes only those fenders made of timber.
- \* FRP Fiber Reinforced Polymer fender on the Woodrow Wilson Bridge.

**NOTE: For Elements 300 - 304, if the "Joint(s)" have been paved over, then the inspector shall change the quantity to zero (0) and make comments in the verbiage under the appropriate element number.**

- 300 Strip Seal Expansion Joint (LF)  
This element defines only those expansion joint devices which utilize a neoprene type waterproof gland with steel extrusions to anchor the gland.
- 301 Pourable Joint Seal (LF)  
This element defines only those joints filled with a pourable seal.
- 302 Compression Joint Seal (LF)  
This element defines only those joints with a pre-formed compression type seal.
- 303 Assembly Joint/Seal (finger, sliding plates) (LF)  
This element defines only those joints filled with an assembly mechanism that may or may not have a seal.
- 304 Open Expansion Joint (LF)  
This element defines only those joints that are open and not sealed.
- 306 Steel Joint Trough (LF)  
This element defines those steel troughs (painted or unpainted) placed under joints in order to prevent road water from contacting bearing devices.
- 307 Neoprene Joint Trough (LF)  
This element defines those neoprene troughs placed under joints in order to prevent road water from contacting bearing devices.
- 311 Movable Bearing (Roller, sliding. etc.) (EA)  
This element defines only those bridge bearings which provide for both deflection and longitudinal movement by means of roller, rocker, or sliding mechanisms.
- 312 Enclosed/Concealed Bearing (EA)  
This element defines only those bridge bearings that are enclosed so that they are not open for detailed inspection.
- 313 Painted Fixed Bearing (EA)  
This element defines only those bridge bearings that provide for deflection only.
- 314 Pot Bearing (EA)  
This element defines those high load bearings with confined elastomer. The bearing may be fixed against horizontal movement, guided to allow movement in one direction, or floating to allow sliding in any direction.
- 315 Disk Bearing (EA)  
This element defines those high load bearings with a hard plastic disk. The bearing may be fixed against horizontal movement, guided to allow movement in one direction, or floating to allow sliding in any direction.
- 316 Unpainted Movable Bearing (EA)  
This element defines only those unpainted bridge bearings which provide for both deflection and longitudinal movement by means of roller, rocker or sliding mechanisms.
- 317 Unpainted Fixed Bearing (EA)  
This element defines only those bridge bearings that provide for deflection only.

- 320 Prestressed Concrete Approach Slab (EA)  
This element defines those structural sections between the abutment and the approach pavement that are constructed of prestressed concrete.
- 321 Concrete Approach Slab (EA)  
This element defines those structural sections between the abutment and the approach pavement that are constructed of reinforced concrete.
- 322 Roadway Approach Transition (EA)  
This element describes all bridge approaches for structures which are not under fill.
- 330 Metal Bridge Railing (LF)  
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. The element may be either painted, galvanized, or unpainted.
- 331 Reinforced Concrete Bridge Railing (LF)  
This element defines all types and shapes of reinforced concrete bridge railing.
- 332 Timber Bridge Railing (LF)  
This element defines all types and shapes of timber bridge railing.
- 333 Miscellaneous Bridge Railing (LF)  
This element defines all types and shapes of bridge railing except those defined as metal, concrete, or timber. This element includes masonry and/or combinations of materials.
- 340 Utilities and Overhead Signs (ENTIRE BRIDGE)  
This element receives no numerical rating but verbiage should be included under this number.
- 342 Fencing (LF)  
This element defines the fencing on including the pedestrian anti-climb shield on a bridge.
- 343 Railroad Shielding (LF)  
This element defines all barriers for use on bridges passing over electrified rail lines including pedestrian anti-climb shield. This element may be aluminum or fiberglass. This element should not be confused with fencing or bridge railing.
- 344 Drainage Devices (ENTIRE BRIDGE)  
This element receives no numerical rating but verbiage should be included under this number.
- 345 Stream Channel (ENTIRE BRIDGE)  
Code Item 61 on the cover sheet screen. Include in the verbiage comments directed at conditions associated with the flow of water through the bridge.
- 346 Gabion Wall (LF)  
This element defines all gabion walls.
- 349 Movable Bridge Machinery (ENTIRE BRIDGE)  
This element includes all movable bridge machinery.
- 350 Concrete Retaining Wall (LF)  
This element defines all concrete retaining walls.

- 351 Timber Bulkhead (LF)  
This element defines all timber bulkheads.
- 352 Steel Bulkhead (LF)  
This element defines all steel bulkheads.
- 353 Concrete Noise Wall (LF)  
This element defines all concrete noise walls.
- 354 Timber Noise Wall (LF)  
This element defines all timber noise walls.
- 355 Steel Noise Wall (LF)  
This element defines all steel noise walls.
- 400 Bridge Paint (Entire Bridge)  
This element defines all bridges with steel elements that require painting.
- 401 Zone Paint (Entire Bridge)  
This element defines all bridges with steel elements that require zone painting.