



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #1. SURFACE** (SI&A item 58A)

This item is to evaluate and rate the condition of the deck surface only. The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) if they are rating the structural deck surface or a protective wearing surface (i.e. thin epoxy, wood, bituminous or, latex overlay). Refer to SI&A item 108 “Wearing Surface / Protective System” for type of wearing surface. If there is no protective wearing surface, rate the condition of the surface of the structure deck.

A concrete or bituminous wearing surface should be inspected for spalling, cracking, scaling, and delamination. Timber wearing surfaces should be inspected for deterioration, splitting, and crushing. Rate and code the condition in accordance with the following ratings.

Concrete patches or concrete repaired areas that are sound and functioning properly should not be counted as deteriorated or deficient area. Concrete patches that are loose, delaminated, or generally in poor condition shall be counted as deteriorated or deficient area. Bituminous patches shall always be counted as deteriorated or deficient area.

Code	Description
N	NOT APPLICABLE. Code N for culverts and other structures without decks, e.g., filled arch bridge.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the surface.
8	GOOD CONDITION. Minor cracking less than 1/32" wide (0.8mm) with no spalling, scaling or delamination.
7	GOOD CONDITION. Open cracks less than 1/16" wide (1.6mm) at a spacing of 10 ft or more, light shallow scaling allowed.
6	FAIR CONDITION. Surface has considerable number of open cracks greater than 1/16" wide (1.6mm) at a spacing of 5 ft or less. Surface area exhibits 2% or less of spalled or delaminated areas, including repaired areas. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth.
5	FAIR CONDITION. Between 2% and 10% of the surface area is spalled or delaminated. There can be excessive cracking in the surface. Heavy scaling 1/2" to 1" in depth (13 mm to 26 mm) can be present.
4	POOR CONDITION. Large areas of the surface, 10 - 25% is spalled or delaminated.
3	SERIOUS CONDITION. More than 25% of the surface area is spalled.
2	CRITICAL CONDITION. Emergency surface repairs required by the crews.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.

## BIR #2 JOINTS

The joints to be rated in this item include expansion joint devices such as strip seals, compression seals, assembly joint seals, polymer block out joints, steel armor joints, pourable seals, and compression seals.

Joints such as cold joints, construction joints and other joints that do not have a seal will be coded in item #3 Other Joints. Code the joints for bridge decks that are continuous (“joint less bridges”) and have allowance for expansion in the approach slabs, in item #3 Other Joints.

Code	Description
N	NOT APPLICABLE. Code N for jointless bridges, and structures without decks, ie sand filled arches and culverts.
9	NEW CONDITION. No noticeable or noteworthy deficiencies that would affect the operation, movement, or water tightness of the joints.
8	GOOD CONDITION. Condition same as in 9 above with possible minor accumulation of non-compressible and debris in the expansion opening.
7	GOOD CONDITION. Minor deterioration with shallow hairline cracks less than 1/32" (0.8 mm) within 2 ft. of the joint. No noticeable water leakage.
6	FAIR CONDITION. Minor deterioration with shallow hairline cracks greater than 1/32" (0.8 mm) and shallow spalls within 2 ft. of the joint. Device components maybe uneven, misaligned or the joint opening is closed. No noticeable water leakage.
5	FAIR CONDITION. Moderate deterioration of surrounding concrete including cracking and shallow spalling. Minor leakage due to adhesion failures of the seal and/or anchorage device (less than 5% of the length).
4	POOR CONDITION. Major deterioration of surrounding concrete including cracking and spalling to steel. Leaking along more than 5% of the seal and/or anchorage device.
3	SERIOUS CONDITION. Surrounding concrete is spalled below steel on top or bottom of deck with possible full-depth failures. Most of device is leaking or loose. Ride quality may be impacted.
2	CRITICAL CONDITION. Device and surrounding concrete is seriously deteriorated. Emergency repairs may be required for lane to remain open. Temporary joint support from underneath may be necessary.
1	IMMINENT FAILURE CONDITION. Lane closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.

## BIR #3 OTHER JOINTS

This item includes all other joints NOT in item #2 Joints. These are typically unsealed joints such as cold joints, construction joints, and expansion joints off of the bridge (ie “jointless bridges”) in the approach slab.

Code	Description
N	NOT APPLICABLE. Code N for structures without decks, i.e. sand filled arches.
9	NEW CONDITION. No noticeable wear or leakage.
8	GOOD CONDITION. Condition same as in 9 above with possible minor accumulation of non-compressibles and debris in the tooled opening.
7	GOOD CONDITION. Minor deterioration with shallow hairline cracks less than 1/32" (0.8 mm) within 2 ft. of the joint. No noticeable water leakage.
6	FAIR CONDITION. Minor deterioration with shallow hairline cracks greater than 1/32" (0.8 mm) and shallow spalls within 2 ft. of the joint. No noticeable water leakage.
5	FAIR CONDITION. Moderate deterioration of surrounding concrete including cracking and shallow spalling. Minor leakage, along less than 5% of the length of the joint.
4	POOR CONDITION. Major deterioration of surrounding concrete including cracking and spalling to steel. Leaking along more than 5% of the length of the joint.
3	SERIOUS CONDITION. Surrounding concrete is spalled below steel on top or bottom of deck with possible full-depth failures. Most of joint is leaking. Ride quality may be impacted.
2	CRITICAL CONDITION. Joint and surrounding concrete is seriously deteriorated. Emergency repairs may be required for lane to remain open. Temporary joint support from underneath may be necessary.
1	IMMINENT FAILURE CONDITION. Lane closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



# Bridge Safety Inspection NBI RATING GUIDELINES

## BIR #4 RAILING

This item is for the evaluation and rating of vehicular railing and pedestrian fencing on the supported spans of the bridge. Report the type of railing in the comment section and if the railing is constructed on only one side of the bridge, or if the bridge has a thrie beam retrofit. Use SI&A item 36 A to D to report if the railing components meet the current standard. Report collision damage in the comment section and on the work recommendation list. Brush blocks are to be considered as part of the railing.

Code	Description
N	NOT APPLICABLE. Code N for structures that do not have railings such as buried bridges and culverts that have guardrail off the shoulders.
9	NEW CONDITION. No noticeable wear, deterioration or collision damage.
8	GOOD CONDITION. Small and superficial wear, deterioration, or collision damage.
7	GOOD CONDITION. Minor deterioration with shallow hairline cracks in concrete components less than 1/32" (0.8 mm) or shallow scaling. Failure of paint or galvanizing coated steel is very small and in scattered locations. Collision damage limited to minor scrapes.
6	FAIR CONDITION. Minor deterioration with shallow hairline cracks in concrete components greater than 1/32" (0.8 mm) and shallow spalls or scaling limited to less than 2 % of the surface area.. Failure of the coating on steel components is limited to less than 2% of the surface area with no loss of section. Collision damage limited to minor scrapes.
5	FAIR CONDITION. Moderate deterioration with cracks in concrete components and spalls or scaling limited to less than 5 % of the surface area.. Failure of the coating on steel components is limited to less than 5% of the surface area with minor loss of section. Collision damage limited to minor scrapes or temporary repairs in place.
4	POOR CONDITION. Major deterioration with cracks in concrete components and spalls or scaling greater than 5 % of the surface area.. Failure of coating on steel components is greater than 5% of the surface area with some loss of section. Some collision damage but not affecting the performance of the railing. Temporary repairs may be in place.
3	SERIOUS CONDITION. Most of the railing components exhibit deterioration and/or loss of section. Collision damage and deterioration has not progressed to the point where the railing will fail if impacted.
2	CRITICAL CONDITION. Most of the railing components exhibit deterioration and/or loss of section. Collision damage and deterioration has progressed to the point where the railing may fail if impacted. Immediate repairs are called for.
1	IMMINENT FAILURE CONDITION. Lane or shoulder closed to traffic and temporary concrete barricades or thrie beam in place to keep the bridge open. Corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



## Bridge Safety Inspection NBI RATING GUIDELINES

### BIR #5. SIDEWALKS or CURBS

This item is for the evaluation and rating of the surface of sidewalks and curbs on the supported spans only. The areas below the sidewalk are to be rated with the deck. The inspector must note in the comment field if the sidewalk is on only one side of the bridge. Brush blocks are to be rated as part of item #4, Railings.

Code	Description
N	NOT APPLICABLE. Code N for structures without sidewalks or curbs.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the surface.
8	GOOD CONDITION. Minor cracking less than 1/32" wide ( 0.8mm) with no spalling, scaling, or delamination.
7	GOOD CONDITION. Open cracks less than 1/16" wide (1.6mm) at a spacing of 10 ft or more, light shallow scaling allowed.
6	FAIR CONDITION. Surface has considerable number of open cracks greater than 1/16" wide (1.6mm) at a spacing of 5 ft or less. Surface area exhibits 2% or less of spalled or delaminated areas, including repaired areas. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth.
5	FAIR CONDITION. Between 2% and 10% of the surface area is spalled or delaminated. There can be excessive cracking in the surface. Heavy scaling 1/2" to 1" in depth (13 mm to 26 mm) can be present. This includes repaired areas and/or areas in need of corrective action.
4	POOR CONDITION. Large areas of the surface, 10 - 25% is spalled or delaminated. This includes repaired areas and/or areas in need of corrective action. Spalls and scaling are not deep enough to cause a trip hazard.
3	SERIOUS CONDITION. More than 25% of the surface area is spalled. This area includes repaired areas and/or areas in need of corrective action. Spalls and scaling are not deep enough to cause a trip hazard.
2	CRITICAL CONDITION. Emergency surface repairs required by the crews.
1	IMMINENT FAILURE CONDITION. Sidewalk is closed to pedestrians, but corrective action may put it back in service.
0	FAILED CONDITION. Bridge closed.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #6. DECK BOTTOM SURFACE** (SI&A item 58B)

This item is to evaluate and rate the condition of the deck bottom surface. The inspector must note in the comment field associated with this element (#6 on BSIR) if he/she is observing and rating the structural concrete of the deck bottom surface or the stay-in-place forms. The bottom surface of a concrete deck should be inspected for cracking, scaling, spalling, leaching, delamination, and full or partial depth failures. If the deck has stay-in-place forms, rate the condition of the forms. Steel grid decks should be inspected for broken welds, broken grids section loss, and growth of filled grids from corrosion. Timber decks should be inspected for splitting, crushing, fastener failure, and deterioration from rot.

If the bottom surface of the deck cannot be observed because the superstructure obscures it, such as with side by side box beams or earth filled arch structures, code "N" and note in the comments why this item is not being rated. Also, code "N" for slab bridges, culverts, and when the underside is obscured because of false-decking or maintenance sheeting.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BSIR) the factors and quantities that influenced the judgment for the rating.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #6. DECK BOTTOM SURFACE** (SI&A item 58B)

Code	Description
N	NOT APPLICABLE. Code N for culverts and other structures without decks, e.g., filled arch bridge, concrete slab, or when covered with false-decking or maintenance sheeting.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the bottom surface concrete or stay-in-place forms.
8	GOOD CONDITION. Minor cracking less than 1/32" wide (0.8mm) with no spalling, scaling, or delamination. No rust on stay-in-place forms.
7	GOOD CONDITION. Open cracks less than 1/16" wide (1.6mm) at a spacing of 10 ft or more, or light shallow scaling. No rust on stay-in-place forms.
6	FAIR CONDITION. The deck bottom surface has considerable number of open cracks greater than 1/16" wide (1.6mm) at a spacing of 5 ft or less. The bottom surface area exhibits 2% or less of spalled, delaminated, or heavily map cracked areas. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth. Stay-in place forms have light surface or freckled rust over less than 2% of the total surface area.
5	FAIR CONDITION. The deck bottom surface area exhibits between 2% and 10% spalled, delaminated, or heavily map cracked areas. There can be excessive cracking in the surface. Heavy scaling 1/2" to 1" in depth (13 mm to 26 mm) can be present. Stay-in place forms have light surface or freckled rust between 2% and 10% of the total surface area.
4	POOR CONDITION. The deck bottom surface area exhibits between 10% and 25% spalled, delaminated, or heavily map cracked areas. Stay-in place forms have light to moderate corrosion over between 10% and 25% of the total surface area. Some small areas may have pulled away exposing the deck concrete.
3	SERIOUS CONDITION. The deck bottom surface is showing advanced deterioration that has seriously affected the primary structural components. Local failures are possible. The bottom surface area exhibits more than 25% spalled, delaminated, or heavily map cracked areas. Structural evaluation and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading or structurally engineered temporary supports. There may be a need to increase the frequency of inspections. Stay-in place forms have moderate to severe corrosion over more than 25% of the total surface area. Some small areas may have pulled away exposing the deck concrete.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the deck will not support design loads and is therefore posted for reduced loads. Emergency deck repairs or shoring with structurally engineered temporary supports may be required by the crews. There may be a need to increase the frequency of inspections. Stay-in place forms have large areas of severe corrosion. Some areas may have pulled away exposing the deck concrete.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic due to the potential for deck failure, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed. Coordinate with S I & A item 41.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #7. DECK** (SI&A item 58)

This item is to evaluate and rate the overall condition of the deck. Rate and code the condition in accordance with the general condition ratings. Code “N” for culverts and other structures without decks, such as a filled arch bridge. Refer to SI&A item 108 “Wearing Surface / Protective System” for type of wearing surface.

A concrete deck should be inspected for cracking, scaling, spalling, leaching, potholing, delamination, and full or partial depth failures. Steel grid decks should be inspected for broken welds, broken grids section loss, and growth of filled grids from corrosion. Timber decks should be inspected for splitting, crushing, fastener failure, and deterioration from rot.

The condition of the wearing surface / protective coating system (BIR item #1. Surface), joints, expansion devices, curbs, sidewalks, parapets, fascias, bridge railing, and scuppers shall not be considered in the overall deck evaluation. However, their condition will be noted on the form in their respective items. If the structural deck is visible (i.e. there is no wearing surface / protective coating system) then the surface must be considered in the overall evaluation of the deck.

If the underside of the deck cannot be observed due to an adjacent box beam superstructure or stay-in-place forms, the inspector is to evaluate and rate the deck from observations on the surface of the deck and note in the comment field any limitations this may cause.

Structurally engineered temporary supports may allow unrestricted loading of the bridge, however a load rating analysis must be completed without the addition of the supports and the coding of SI & A item 103 changed to a “T”. Contact Bridge Management Unit when this is necessary.

When determining the overall percent deterioration of the deck and both structural surfaces are visible, the quantity of deteriorated top surface area should be added to the quantity of deck bottom surface area and the summation is divided by the combined top and bottom surface areas.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.

## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #7. DECK** (SI&A item 58)

Code	Description
N	NOT APPLICABLE. Code N for culverts and other structures without decks, e.g., filled arch bridge.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the deck.
8	GOOD CONDITION. Minor cracking less than 1/32" wide (0.8mm) with no spalling, scaling or delamination on the deck surface or underneath.
7	GOOD CONDITION. Open cracks less than 1/16" wide (1.6mm) at a spacing of 10 ft or more, light shallow scaling allowed on the deck surface or underneath. Deck will function as designed.
6	FAIR CONDITION. Deterioration of the combined area of the top and bottom surface of the deck is 2% or less of the total area. There may be a considerable number of open cracks greater than 1/16" wide (1.6mm) at a spacing of 5 ft or less on the deck surface or underneath. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth. Deck will function as designed.
5	FAIR CONDITION. Deterioration of the combined area of the top and bottom surface of the deck is between 2% and 10% of the total area. There can be excessive cracking in the surface. Heavy scaling 1/2" to 1" in depth (13 mm to 26 mm) can be present. Deck will function as designed.
4	POOR CONDITION. Deterioration of the combined area of the top and bottom surface of the deck is between 10 - 25% of the total area. Deck will function as designed.
3	SERIOUS CONDITION. The deck is showing advanced deterioration that has seriously affected the primary structural components. Deterioration of the combined area of the top and bottom surface of the deck is more than 25% of the total area. Structural evaluation and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading or structurally engineered temporary supports. There may be a need to increase the frequency of inspections.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the deck will not support design loads and is therefore posted for reduced loads. Emergency deck repairs or shoring with structurally engineered temporary supports may be required by the crews. There may be a need to increase the frequency of inspections.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic due to the potential for deck failure, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed. Coordinate with SI&A item 41.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #8. DRAINAGE**

This item is for noting poor drainage characteristics on the bridge deck. There is no rating scale. The inspector can note in the comments if there is ponding of water on the surface or debris build up on the deck or in the drains that is preventing water from getting to the drains.

The deck drains and the area adjacent to the deck drains are to be considered in the evaluation of item 6 Deck (SI & A # 58).

### **BIR #9. STRINGER** (SI & A Item 59, Superstructure)

This item describes the physical condition of all structural members below the deck and above the pier cap, trusses (deck & through trusses) and, suspension cables and suspenders. Evaluate and rate the condition in accordance with the general condition ratings. Code N for all culverts.

All structural members should be inspected for visible signs of distress which may include cracking, deterioration, section loss, and malfunction and misalignment of bearings or pin and hanger assemblies. The condition of BIR Items 9, 10, and 11 (Paint, Section Loss and Bearings) may negatively influence the rating if they are in poor condition. However, they should not offset or improve the rating for stringers that are in poor condition. Such as a structure where the stringers are in poor condition at a rating of 4, would not be increased to 5 because the bearings are rated 8.

On bridges where the deck is integral with the superstructure, the superstructure condition rating may be affected by the deck condition. The resultant superstructure condition rating may be lower than the deck condition rating in the situation where the girders have deteriorated or been damaged.

Fracture critical components should receive careful attention because failure could lead to collapse of a span or the bridge. Fatigue prone details should receive close observation because they could lead to failure of a given element.

Structurally engineered temporary supports may allow unrestricted loading of the bridge, however a load rating analysis must be completed without the addition of the supports and the coding of SI & A item 103 changed to a "T". Contact Bridge Management Unit when this is necessary.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #9. STRINGER** (SI & A Item 59, Superstructure)

Code	Description
N	NOT APPLICABLE. Code N for culverts.
9	NEW CONDITION. No deficiencies in any of the structural components that will affect the long term performance.
8	GOOD CONDITION. All protective coatings are sound and functioning but with minor weathering of the coating and/or dirt contamination on structural components.
7	GOOD CONDITION. Minor coating failures on structural components. All members retain full section properties and function as designed.
6	FAIR CONDITION. Minor deterioration affecting non-structural members. Some protective coating failures. All members retain full section properties and function as designed.
5	FAIR CONDITION. Moderate deterioration affecting structural members. Minor section loss in low or no stress areas.
4	POOR CONDITION. Considerable deterioration affecting structural members with section loss up to 10% in scattered and isolated areas. All members continue to function as designed.
3	SERIOUS CONDITION. Considerable deterioration affecting structural members with section loss up to 25% in scattered and isolated areas. Structural evaluation and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading or structurally engineered temporary supports. There may be a need to increase the frequency of inspections.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the structure will not support design loads and therefore is posted for reduced loads. Emergency repairs or shoring with structurally engineered temporary supports may be required by the crews. There may be a need to increase the frequency of inspections.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic due to the potential for superstructure failure, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed. Coordinate with S I & A item 41.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #10. PAINT (SI & A item 59A)**

This item is to evaluate and rate the condition of the paint only. The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the type of paint or coating system (such as weathering steel or galvanized beams) and the year that the paint was applied.

The condition of the coating system may have influence on the rating of item # 8 Stringer (SI & A # 59) also.

Code	Description
N	NOT APPLICABLE. Code N for concrete super-structures, A-588 Weathering Steel super-structures, and galvanized beams.
9	NEW CONDITION. No deficiencies in the coating which will affect its long term performance.
8	GOOD CONDITION. Minor weathering of the coating and/or dirt contamination.
7	GOOD CONDITION. Minor pinhead size failures of the coating in scattered locations or on sharp edges.
6	FAIR CONDITION. Minor coating failures in scattered locations with a total area of less than 1%.
5	FAIR CONDITION. Moderate coating failures between 1% and 5% of the surface area. If areas of paint failure are concentrated under open joints, consideration may be given to zone painting.
4	POOR CONDITION. Large areas of coating failures, between 5% and 15% of the total surface. If areas of paint failure are concentrated under open joints, consideration may be given to zone painting. Otherwise, schedule for complete repainting when coating failure has progressed beyond 15%.
3	SERIOUS CONDITION. More than 15% of the coating has failed. Structure should be scheduled for complete repaint.
2	CRITICAL CONDITION. More than 50% of the coating has failed. Structure should be scheduled for complete repaint.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #11. SECTION LOSS UNDER JOINTS (SI&A Item 59B)**

This item is used only for steel structures and is intended to identify and track those structures with a tendency for deterioration under the joints. Evaluate and rate the area 5 ft. on each side of the joint. This item is separate from item # 8 Stringer (SIA-59) and all deterioration in this location must be also taken into account when rating item #8. Code N for all bridges with concrete superstructures.

Code	Description
N	Non-applicable (Concrete superstructure, etc.)
3	No loss of paint protection, corrosion, or evidence of loss of section due to corrosion.
2	Rusty beam ends or minor section loss. Less than 10% section loss.
1	10% or greater section loss.
0	Holes(s) in steel. May be temporarily supported.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #12. BEARINGS** (SI&A item 59C)

This item describes the physical condition of bearings. Evaluate and rate the condition in accordance with the general condition ratings. Code N for culverts, delta frame designs and bridges designed with the superstructure integral with the substructure.

This item is separate from BIR item # 8 Stringer (SIA-59), however deterioration in this location may be also taken into account when rating item #8. The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the type of bearings on the bridge and the factors and quantities that influenced the judgment for the rating.

Code	Description
N	NOT APPLICABLE. Code N for culverts.
9	NEW CONDITION. No deficiencies in any bearing components that will affect the long term performance.
8	GOOD CONDITION. All protective coatings are sound and functioning but with minor weathering of the coating and/or dirt contamination on bearing components.
7	GOOD CONDITION. Minor coating failures in scattered locations on steel bearing components. All bearing components function as designed.
6	FAIR CONDITION. Minor deterioration affecting non-structural components. Some protective coating failures. Minor misalignment or loss of bearing support. All bearing components function as designed.
5	FAIR CONDITION. Moderate deterioration affecting bearing components. Minor misalignment, section loss or, loss of bearing in low or no stress areas.
4	POOR CONDITION. Considerable deterioration affecting bearing components with section loss up to 10% in scattered and isolated areas, misalignment, and/or loss of bearing. All members continue to function as designed.
3	SERIOUS CONDITION. Considerable deterioration affecting bearing components with section loss up to 25% in scattered and isolated areas. Structural and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the structure will not support design loads and must be posted for reduced loads.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #13. ABUTMENTS** (SI&A Item 60, Substructure)

This item describes the physical condition of abutments, piles, fenders, footings or other substructure components in proximity of the abutments and below the bearings. The final rating for SI & A #60 will be the lower of this rating and the rating for BIR #14. Piers. Evaluate and rate the condition in accordance with the general condition ratings. The substructure rating is independent of the deck and superstructure. Code N for all culverts.

All structural members should be inspected for visible signs of distress which may include cracking, deterioration, section loss, settlement, misalignment, scour, collision damage and corrosion. The rating given by Item 113 - Scour Critical Bridges, may have a significant affect on this item if scour has substantially affected the overall condition of the substructure. The location, size and, depth of any scour must be noted in the comments.

Integral - abutment wingwalls to the first construction or expansion joint shall be included in the evaluation. For non-integral superstructure and substructure units, the substructure shall be considered as the portion below the bearings. For structures where the substructure and superstructure are integral, the substructure shall be considered as the portion below the superstructure.

Structurally engineered temporary supports may allow unrestricted loading of the bridge, however a load rating analysis must be completed without the addition of the supports and the coding of SI & A item 103 changed to a "T". Contact Bridge Management Unit when this is necessary.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #13. ABUTMENTS** (SI&A Item 60, Substructure)

Code	Description
N	NOT APPLICABLE. Code N for culverts.
9	NEW CONDITION. No deficiencies in any of the structural components that will affect the long term performance.
8	GOOD CONDITION. All structural components are sound and functioning as designed. There may be superficial cracking or weathering of protective coatings and/or dirt contamination on structural components.
7	GOOD CONDITION. All members retain full section properties and function as designed. There may be minor cracking in structural components.
6	FAIR CONDITION. All members retain full section properties and function as designed. There may be some deterioration affecting structural members such as minor cracking, scaling, small scattered spalls, or shallow scour. Some protective coating failures.
5	FAIR CONDITION. Moderate deterioration affecting structural members such as cracking, scaling, scattered spalls, minor settlement or shallow scour. Minor section loss in low or no stress areas. All members continue to function as designed.
4	POOR CONDITION. Considerable deterioration affecting structural members such as cracking, scaling, scattered spalls, partial settlement or, scour. . All members continue to function as designed.
3	SERIOUS CONDITION. Considerable deterioration affecting structural members. Structural evaluation, hydraulic, and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading, structurally engineered supports, or immediate repairs. There may be a need to increase the frequency of inspections.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the structure will not support design loads and therefore is posted for reduced loads. Emergency repairs or shoring with structurally engineered temporary supports may be required by the crews. There may be a need to increase the frequency of inspections.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic due to abutment failure, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed. Coordinate with S I & A item 41



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #14. PIERS (SI&A item 60, Substructure)**

This item describes the physical condition of Piers, pier caps, crash walls, footings or other substructure components in proximity of the piers and below the bearings. The final rating for SI & A #60 will be the lower of this rating and the rating for BIR #13. Abutments. Evaluate and rate the condition in accordance with the general condition ratings. The substructure rating is independent of the deck and superstructure. Code N for all culverts.

All structural members should be inspected for visible signs of distress which may include cracking, deterioration, section loss, settlement, misalignment, scour, collision damage and corrosion. The rating given by Item 113 - Scour Critical Bridges, may have a significant affect on this item if scour has substantially affected the overall condition of the substructure.

For structures where the substructure and superstructure are integral, the substructure shall be considered as the portion below the superstructure.

Structurally engineered temporary supports may allow unrestricted loading of the bridge, however a load rating analysis must be completed without the addition of the supports and the coding of SI & A item 103 changed to a "T". Contact Bridge Management Unit when this is necessary.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating. The location, size and, depth of any scour must be noted in the comments.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #14. PIERS (SI&A item 60, Substructure)**

Code	Description
N	NOT APPLICABLE. Code N for culverts.
9	NEW CONDITION. No deficiencies in any of the structural components that will affect the long term performance.
8	GOOD CONDITION. All structural components are sound and functioning as designed. There may be superficial cracking or weathering of protective coatings and/or dirt contamination on structural components.
7	GOOD CONDITION. All members retain full section properties and function as designed. There may be minor cracking in structural components.
6	FAIR CONDITION. All members retain full section properties and function as designed. There may be some deterioration affecting structural members such as minor cracking, scaling, small scattered spalls, or shallow scour. Some protective coating failures.
5	FAIR CONDITION. Moderate deterioration affecting structural members such as cracking, scaling, scattered spalls, minor settlement or shallow scour. Minor section loss in low or no stress areas. All members continue to function as designed.
4	POOR CONDITION. Considerable deterioration affecting structural members such as cracking, scaling, scattered spalls, partial settlement or, scour. . All members continue to function as designed.
3	SERIOUS CONDITION. Considerable deterioration affecting structural members. Structural evaluation, hydraulic, and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading, immediate repairs, or structurally engineered temporary supports. There may be a need to increase the frequency of inspections.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the structure will not support design loads and is therefore posted for reduced loads. Emergency repairs or shoring with structurally engineered temporary supports may be required by the crews. There may be a need to increase the frequency of inspections.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic due to pier failure, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed. Coordinate with S I & A item 41

## BIR #15. SLOPE PROTECTION

This item describes the physical condition of the slope protection ahead of and on the sides of the abutments. This rating could have impact on the evaluation and the rating assigned to BIR #13. Abutments. Evaluate and rate the condition in accordance with the general condition ratings. The substructure rating is independent of the deck and superstructure. Code N for all culverts.

All structural members should be inspected for visible signs of distress which may include cracking, deterioration, settlement, misalignment, and scour. Report the location, size and, depth of any scour at the toe of the slope in the comments.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.

Code	Description
N	NOT APPLICABLE. Code N for culverts.
9	NEW CONDITION. No deficiencies in any of the primary components that will affect the long term performance.
8	GOOD CONDITION. All primary components are sound and functioning as designed. There may be superficial cracking and/or dirt contamination on primary components.
7	GOOD CONDITION. All members retain full section properties and function as designed. There may be minor deterioration and/or cracking of primary components.
6	FAIR CONDITION. All members retain full section properties and function as designed. There may be some deterioration affecting primary members such as minor cracking, shallow settlement, scaling, small scattered spalls, or shallow scour.
5	FAIR CONDITION. Moderate deterioration affecting primary members such as cracking, scaling, scattered spalls, minor settlement or shallow scour. All members continue to function as designed.
4	POOR CONDITION. Considerable deterioration affecting primary members such as cracking, scaling, scattered spalls, partial settlement or, scour. All members continue to function as designed.
3	SERIOUS CONDITION. Considerable deterioration affecting primary members. Structural or hydraulic analysis may be necessary to determine if the structure can continue to function without restricted loading or immediate repairs.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the structure will not support design loads and must be posted for reduced loads.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #16. APPROACH**

This item is to evaluate and rate the overall condition of the road approach pavement. It includes the roadway area from the bridge seat at the abutments to 40 feet away from the bridge or to the first joint. Rate and code the condition in accordance with the general condition ratings. Code N for culverts and other structures without decks, such as a filled arch bridge where the pavement is carried across the structure on grade.

The concrete or asphalt pavement should be inspected and evaluated for settlement, cracking, scaling, spalling, potholing, and delamination. The approach should allow for a smooth transition to the bridge deck.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.

Code	Description
N	NOT APPLICABLE. Code N for culverts and other structures without decks, e.g., filled arch bridge.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the approach pavement.
8	GOOD CONDITION. Minor cracking less than 1/32" wide (0.8mm) with no spalling, scaling or delamination on the approach pavement.
7	GOOD CONDITION. Open cracks less than 1/16" wide (1.6mm) at a spacing of 10 ft or more, light shallow scaling allowed in the surface. Approach pavement will function as designed.
6	FAIR CONDITION. Deterioration of the approach pavement, including repaired areas, is 2% or less of the total area. There may be a considerable number of open cracks greater than 1/16" wide (1.6mm) at a spacing of 5 ft or less in the approach pavement. Medium scaling on the surface is 1/4" to 1/2" (6.4 mm to 13 mm) in depth. Settlement is minor. Approach pavement will function as designed.
5	FAIR CONDITION. Deterioration of the approach pavement, including repaired areas, is between 2% and 10% of the surface area. There can be excessive cracking in the surface. Heavy scaling 1/2" to 1" in depth (13 mm to 26 mm) can be present. Settlement is less than 3/4 inches at the bridge seat. Approach pavement will function as designed.
4	POOR CONDITION. Deterioration on the approach pavement, including repaired areas, is between 10 - 25% . Settlement is more than 3/4 inches at the bridge seat. Approach pavement will function as designed.
3	SERIOUS CONDITION. Deterioration in the approach pavement, including repaired areas, is more than 25% of the surface area. Urgent surface repairs may be required by the crews.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the approach pavement will not function as designed. Emergency surface repairs may be required by the crews.
1	IMMINENT FAILURE CONDITION. Bridge is closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



# Bridge Safety Inspection NBI RATING GUIDELINES

## **BIR #17. APPROACH SHOULDERS AND SIDEWALKS**

This item is to evaluate and rate the overall condition of the approach shoulders, sidewalks, and curbs and gutter. It includes those shoulders etcetera, that are carried across the structure on grade. Rate and code the condition in accordance with the general condition ratings.

The concrete or asphalt pavement should be inspected and evaluated for settlement, cracking, scaling, spalling, potholing, and delamination. Gravel shoulders should have adequate slope and drainage.

The inspector must note in the comment field on the Bridge Safety Inspection Report (BIR) the factors and quantities that influenced the judgment for the rating.

Code	Description
N	NOT APPLICABLE. Code N if the bridge has no approach shoulders or sidewalks.
9	NEW CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the approach shoulders or sidewalks.
8	GOOD CONDITION. Small and superficial deterioration or wear on the approach shoulders or sidewalks.
7	GOOD CONDITION. Minor deterioration or wear on the approach shoulders or sidewalks. All components will function as designed.
6	FAIR CONDITION. Some deterioration or wear on the approach shoulders or sidewalks. Settlement is minor. All components will function as designed.
5	FAIR CONDITION. Moderate deterioration or wear on the approach shoulders or sidewalks. Settlement is less than 3/4 inches at the bridge seat. All components will function as designed.
4	POOR CONDITION. Considerable deterioration or wear on the approach shoulders or sidewalks. Settlement is more than 3/4 inches at the bridge seat. All components will function as designed.
3	SERIOUS CONDITION. Serious deterioration or wear on the approach shoulders or sidewalks. Urgent surface repairs may be required by the crews.
2	CRITICAL CONDITION. Deterioration has progressed to the point where the approach shoulders and sidewalks will not function as designed. Emergency repairs may be required by the crews.
1	IMMINENT FAILURE CONDITION. Shoulder or sidewalks are closed to traffic, but corrective action may put the bridge back in service.
0	FAILED CONDITION. Bridge closed.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #18. APPROACH SLOPES**

This item is for noting poor characteristics or situations associated with the road approach slopes. There is no rating scale. The inspector can note in the comments if there are washouts, erosion that can affect the guardrail supports or the road shoulders. Evidence of scour of the slopes should be reported on the BIR under item 12 ABUTMENTS.

### **BIR #19. UTILITIES**

This item is for noting poor characteristics of utilities attached to and affecting the bridge. There is no rating scale. The inspector can note in the comment field the situations observed.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #20. CHANNEL (SI&A item 61 - Channel and Channel Protection)**

This item describes the physical conditions associated with the flow of water through a bridge such as stream stability and the condition of the channel, riprap, slope protection or stream control devices including spur dikes. The inspector should be particularly concerned with visible signs of excessive water velocity which may affect undermining of slope protection, erosion of banks, and realignment of the stream which may result in immediate or potential problems. Scour, accumulation of drift and debris on the superstructure and substructure should be noted on the inspection form (in BIR items 12 “Abutment” and /or BIR item 13 “Pier”) but not included in the condition rating of this element.

Code	Description
N	NOT APPLICABLE. Code N when the bridge is not over a waterway (channel).
9	NEW CONDITION. No noticeable or noteworthy deficiencies affect the condition of the channel.
8	GOOD CONDITION. Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in a stable condition.
7	GOOD CONDITION. Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel, have minor amounts of drift.
6	FAIR CONDITION. Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. Minor stream bed movement is evident. Debris is restricting the channel slightly.
5	FAIR CONDITION. Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel.
4	POOR CONDITION. Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the channel.
3	SERIOUS CONDITION. Bank protection has failed. River control devices have been destroyed. Streambed, aggradation, degradation or lateral movement has changed the channel to threaten the bridge and/or approach roadway now.
2	CRITICAL CONDITION. The channel has changed to the extent the bridge is near a state of collapse.
1	IMMINENT FAILURE CONDITION. Bridge closed because of channel failure. Corrective action may put back in service.
0	FAILED CONDITION. Bridge closed because of channel failure. Replacement necessary.



## Bridge Safety Inspection NBI RATING GUIDELINES

### **BIR #21. DRAINAGE CULVERTS**

This item is for noting damage or poor drainage characteristics in the approach drains. There is no rating scale. The inspector can note in the comments if there is ponding of water at the casting due to build up of debris or erosion of approach fill into the manhole.