PREFACE

Engineering Manual Preamble

This manual provides guidance to administrative, engineering, and technical staff. Engineering practice requires that professionals use a combination of technical skills and judgment in decision making. Engineering judgment is necessary to allow decisions to account for unique site-specific conditions and considerations to provide high quality products, within budget, and to protect the public health, safety, and welfare. This manual provides the general operational guidelines; however, it is understood that adaptation, adjustments, and deviations are sometimes necessary. Innovation is a key foundational element to advance the state of engineering practice and develop more effective and efficient engineering solutions and materials. As such, it is essential that our engineering manuals provide a vehicle to promote, pilot, or implement technologies or practices that provide efficiencies and quality products, while maintaining the safety, health, and welfare of the public. It is expected when making significant or impactful deviations from the technical information from these guidance materials, that reasonable consultations with experts, technical committees, and/or policy setting bodies occur prior to actions within the timeframes allowed. It is also expected that these consultations will eliminate any potential conflicts of interest, perceived or otherwise. MDOT Leadership is committed to a culture of innovation to optimize engineering solutions.

The National Society of Professional Engineers Code of Ethics for Engineering is founded on six fundamental canons. Those canons are provided below.
Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform Services only in areas of their competence.
3. Issue public statement only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, reasonably, ethically and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

BSIR #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 (BSIR) 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 guidelines. 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. Refer to Michigan Structure Inspection Manual (MiSIM) Section 5.05 for inspection procedures related to common surface materials.

BSIR #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. Rate and code the condition in accordance with the following guidelines. All joints which permit rotation and longitudinal translation of the superstructure, including those located off of the bridge shall be evaluated as expansion joints. Joints such as cold joints, construction joints, and other joints which are fixed for the purpose of rotation shall be coded in BSIR Item 3. Refer to MiSIM Section 5.06 for inspection procedures.

BSIR #3 OTHER JOINTS

This item includes all other joints NOT in BSIR Item 2. These are typically unsealed joints such as cold joints and construction joints. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.07 for inspection procedures.

BSIR #4 RAILING

This item is for the evaluation and rating of vehicular railing and pedestrian fencing on the supported spans of the bridge. Rate and code the condition in accordance with the following guidelines. 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 Items 36 A through 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. Refer to MiSIM Section 5.08 for inspection procedures.

BSIR #5 SIDEWALKS or CURBS

This item is for the evaluation and rating of the surface of sidewalks and curbs on the supported spans only. Rate and code the condition in accordance with the following guidelines. 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 BSIR Item 4. Refer to MiSIM Section 5.09 for inspection procedures.

BSIR #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 if the structural concrete of the deck bottom surface or stay-in-place forms are being rated. 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. The inspector must note in the comment field on the BSIR the factors and quantities that influenced the judgment for the rating. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.10 for inspection procedures.

BSIR #7 DECK (SI&A item 58)

This item is to evaluate and rate the overall condition of the deck. Code "N" for culverts and other structures without decks such as filled arch bridges. 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, 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.

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 BSIR the factors and quantities that influenced the judgment for the rating. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.11 for inspection procedures.

BSIR #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 the deck, surface, and/or bottom surface.

BSIR #9 SUPERSTRUCTURE (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), 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 BSIR Items 9, 10, and 11 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. For example, if the stringers are in poor condition at a rating of 4 the rating would not be increased to 5 because the bearings are rated an 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 the Bridge Management Unit when this is necessary.

The inspector must note in the comment field on the BSIR the factors and quantities that influenced the judgment for the rating. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.13 for inspection procedures.

BSIR #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 of the BSIR 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 also have influence on the rating of BSIR Item 8. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.14 for inspection procedures.

BSIR #11 SECTION LOSS UNDER JOINTS

This item is used for steel and concrete superstructures 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 BSIR Item 8, but all deterioration identified in this location must be also taken into account when rating item 8. Rate and code the condition in accordance with the following guidelines. Refer to MiSIM Section 5.15 for inspection procedures.

BSIR #12 BEARINGS

This item describes the physical condition of bearings. Rate and code the condition in accordance with the following guidelines. Code "N" for culverts, delta frame designs and bridges designed with the superstructure integral with the substructure.

This item is separate from BSIR Item 8, but all deterioration identified in this location may also be taken into account when rating Item 8. The inspector must note in the comment field on the BSIR the type of bearings on the bridge and the factors and quantities that influenced the judgment for the rating. Refer to MiSIM Section 5.16 for inspection procedures.

BSIR #13 ABUTMENTS (SI&A Item 60, Substructure)

This item describes the physical condition of the abutments, piles, fenders, footings or other substructure components in proximity of the abutments and below the bearings. The final rating for SI&A Item 60 will be the lesser of the values assigned to BSIR Items 13 and 14. Rate and code the condition in accordance with the following guidelines. The substructure rating is independent of the deck and superstructure. Code "N" for all culverts. Note for a Concrete Filled Arch please provide a condition rating for the footings.

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 SI&A Item 113 - Scour Critical Bridges, may have a significant effect 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. For structures where the substructure and superstructure are integral, the substructure shall be considered as the portion below the superstructure.

The inspector must note in the comment field on the BSIR the factors and quantities that influenced the judgment for the rating. Refer to MiSIM Section 5.17 for inspection procedures.

BSIR #14 PIERS (SI&A item 60, Substructure)

This item describes the physical condition of the 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 Item 60 will be the lesser of the values assigned to BSIR Items 13 and 14. Rate and code the condition in accordance with the following guidelines. 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 SI&A Item 113 - Scour Critical Bridges, may have a significant effect 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.

The inspector must note in the comment field on the BSIR 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. Refer to MiSIM Section 5.18 for inspection procedures.

BSIR #15 SLOPE PROTECTION

This item describes the physical condition of the slope protection ahead of and on the sides of the abutments for bridges that do not cross water. This rating could have impact on the evaluation and the rating assigned to BSIR Item 13. Rate and code the condition in accordance with the following guidelines. The substructure rating is independent of the deck and superstructure. Code "N" for all culverts. Slope protection should be inspected for visible signs of distress which may include cracking, deterioration, settlement and misalignment.

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. Refer to MiSIM Section 5.19 for inspection procedures.

BSIR #16 / CSIR #2 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 may cause damage severe enough to affect the condition of the superstructure and substructure components. Refer to MiSIM Section 5.24 for inspection procedures.

BSIR #17 / CSIR #3 SCOUR INSPECTION

This item is to be used for evaluating the scour that represents the "observed" or measured scour condition from the inspection of all scour susceptible substructure units or culvert footings. The inspector should note the factors that influenced the rating, especially when the rating for this item is not in alignment with the coding definitions. Refer to MiSIM Section 6.04 for inspection procedures.

BSIR #18 APPROACH

This item is to evaluate and rate the overall condition of the 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 following guidelines. 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 BSIR the factors and quantities that influenced the judgment for the rating. Refer to MiSIM Section 5.20 for inspection procedures.

BSIR #19 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 that are carried across the structure on grade. Rate and code the condition in accordance with the following guidelines. 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 BSIR the factors and quantities that influenced the judgment for the rating. Refer to MiSIM Section 5.21 for inspection procedures.

BSIR #20 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 erosion of the slopes that affect the stability of the abutments should be reported in the condition rating of BSIR Item 12.

BSIR #21 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.

BSIR #22 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.

CSIR #1 CULVERT (SI&A Item 62)

This item evaluates the alignment, settlement, joints, structural condition, scour, and other items associated with culverts. The rating code is intended to be an overall condition evaluation of the culvert. Integral wingwalls to the first construction or expansion joint shall be included in the evaluation. Additional culvert condition information is required to be collected using the element level format.

BSIR #1 SURFACE (SI&A Item 58A)

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect the condition of the surface.
8	GOOD	Concrete	Cracking less than 1/32" wide with no spalling, scaling, or delamination.
		Thin Ovly	Surface wear with no other observed defects.
		HMA	No cracking, but minor deformations may be visible without spalling, segregation, or longitudinal joint failure.
		Timber	Minor surface abrasion with fasteners functioning as constructed.
7	GOOD	Concrete	Open cracks less than 1/16" wide or sealed cracks spaced at 10' or more. Light shallow scaling may be present.
		Thin Ovly	Minor surface wear and aggregate loss within 2' of expansion joints.
		HMA	Cracks spaced at 50' or more. Minor deformations with no spalling, segregation, or longitudinal joint failure.
		Timber	Minor surface abrasion with the majority of fasteners functioning as constructed.
6	FAIR	Concrete	Open cracks greater than 1/16" wide spaced at less than 10'. Spalling and delamination affecting 2% or less of the area. Surface scaling may be 1/4" to 1/2" deep.
		Thin Ovly	Hairline cracking spaced at 50' or more. Surface area exhibits 2% or less ineffectiveness.
		HMA	Cracks spaced at 50' or more. Limited rutting, shoving, or raveling with no affect on ride quality.
		Timber	Surface abrasion or decay that affects less than 5% of the thickness. Limited damage to the surface.
5	FAIR	Concrete	Delamination or spalling affecting between 2% and 10% of the area. Excessive cracking or heavy scaling up to 1" deep.
		Thin Ovly	Loss of aggregate or ineffectiveness affecting between 2% and 5% of the area.
		HMA	Spalling affecting 2% and 10% of the area. Moderate block cracking, raveling, and longitudinal joint failure.
		Timber	Abrasion or decay that affects 5% to 10% of the thickness. Fasteners may be loose but the surface functions adequately. Moderate damage to the surface.
4	POOR	Concrete	Delamination or spalling affecting between 10% and 25% of the area.
		Thin Ovly	Loss of aggregate or ineffectiveness affecting between 5% and 10% of the area.
		HMA	Spalling affecting 10% and 25% of the area. Block cracking, raveling, and longitudinal joint failure throughout.
		Timber	Abrasion or decay that affects 10% to 25% of the thickness. Substantial damage to the surface.
3	SERIOUS	Concrete	Spalling affecting more than 25% of the surface area.
		Thin Ovly	Loss of aggregate or ineffectiveness affecting more than 10% of the surface area. Condition of aggregate may affect skid resistance.
		HMA	Spalling affecting more than 25% of the surface area. Ride quality may be impacted.
		Timber	Abrasion or decay that affects more than 25% of the thickness. Fasteners or planks are missing.
2	CRITICAL	All	Emergency surface repairs are required for the bridge to remain open.
1	IMMINENT FAILURE	All	Bridge is closed to traffic due to the surface condition, but corrective action may allow the bridge to reopen.
0	FAILED	All	Bridge is closed to traffic due to the surface condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts, filled arch bridges, and other bridges without decks.

BSIR #2 JOINTS

Code	Condition	Description
9	NEW	No noticeable or noteworthy deficiencies that would affect the operation, movement, or water tightness of the joint.
8	GOOD	No noticeable or noteworthy deficiencies that would affect the operation, movement, or water tightness of the joint. Minor accumulation of debris and non-compressible particles in the expansion joint opening.
7	GOOD	Minor deterioration with shallow hairline cracks less than 1/32" and shallow spalls within 2' of the joint. No noticeable water leakage on the surfaces below.
6	FAIR	Minor deterioration with shallow hairline cracks greater than 1/32" and shallow spalls within 2' of the joint. Device components may be uneven or misaligned. No noticeable water leakage on the surfaces below.
5	FAIR	Moderate deterioration of surrounding concrete including cracking and shallow spalling. Minor leakage along less than 5% of the joint length on redundant members due to loss of seal adhesion and/or failure of the device. Expansion may be limited due to inadequate opening at the bridge railing or fascia.
4	POOR	Major deterioration of surrounding concrete including cracking and spalling to steel. Minor leakage on non-redundant members, or along 5% or more of the joint length on redundant ones due to loss of seal adhesion and/or failure of the device. Expansion is obstructed due to bridge railing or fascia contact.
3	SERIOUS	Surrounding concrete is spalled below reinforcement on the top or bottom deck surface with possible full-depth failures. Majority of the device is leaking, loose, or not properly functioning. Settlement of the sleeper slab or joint condition is impacting ride quality.
2	CRITICAL	Device and surrounding concrete is seriously deteriorated. Emergency repairs may be required for all lanes to remain open. Temporary joint support from underneath may be necessary.
1	IMMINENT FAILURE	Lane closed to traffic due to joint condition, but corrective action may remove the restriction.
0	FAILED	Bridge is closed to traffic due to joint failure. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	Culverts, filled arch bridges, and other bridges without decks.

BSIR #3 OTHER JOINTS

Code	Condition	Description
9	NEW	No noticeable wear or leakage.
8	GOOD	No noticeable or noteworthy deficiencies except for possible minor accumulation of incompressible particles and debris in the joint opening.
7	GOOD	Minor deterioration with shallow hairline cracks less than 1/32" and shallow spalls within 2' of the joint. No noticeable water leakage on the surfaces below.
6	FAIR	Minor deterioration with shallow hairline cracks greater than 1/32" and shallow spalls within 2' of the joint. No noticeable water leakage on the surfaces below.
5	FAIR	Moderate deterioration of surrounding concrete including cracking and shallow spalling. Minor leakage along less than 5% of the joint length on redundant members.
4	POOR	Major deterioration of surrounding concrete including cracking and spalling to steel. Minor leakage on non-redundant members, or along 5% or more of the joint length on redundant ones.
3	SERIOUS	Surrounding concrete is spalled below reinforcement on the top or bottom deck surface with possible full-depth failures. Majority of the device is leaking. Ridge quality may be impacted.
2	CRITICAL	Joint and surrounding concrete is seriously deteriorated. Emergency repairs may be required for all lanes to remain open. Temporary joint support from underneath may be necessary.
1	IMMINENT FAILURE	Lane closed to traffic due to joint condition, but corrective action may remove the restriction.
0	FAILED	Bridge is closed to traffic due to the joint condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	Culverts, filled arch bridges, and other bridges without decks.

BSIR #4 RAILINGS

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect railing performance.
8	GOOD	All	Small superficial wear, deterioration, or collision damage.
7	GOOD	Concrete	Shallow hairline cracks less than 1/32" or shallow scaling.
		Steel	Protective coating failures in very small and scattered locations.
		Timber	Paint or other coating failures in very small and scattered locations. Minor weathering present.
		All	Minor deterioration or collision damage.
6	FAIR	Concrete	Minor deterioration with shallow cracking present greater than 1/32", shallow spalls, or scaling limited to less than 2% of the surface area.
		Steel	Protective coating failures is limited to less than 2% of the surface area with no loss of section.
		Timber	Minor checks, splitting, or decay that affects less than 5% of the member thickness.
		All	Minor collision damage with all connections are securely attached.
5	FAIR	Concrete	Moderate deterioration with cracks and spalls or scaling limited to less than 5% of the surface area.
		Steel	Protective coating failure is limited to less than 5% of the surface area with minor loss of section.
		Timber	Moderate checks, splitting, or decay that affects less than 10% of the member thickness.
		All	Minor collision damage with the majority of connections securely attached.
4	POOR	Concrete	Major deterioration with cracks and spalls or scaling greater affecting between 5% and 10% of the surface area.
		Steel	Protective coating failure affecting between 5% and 10% of the surface area with some loss of section.
		Timber	Major checks, splitting, or decay that affects more than 10% of the member thickness.
		All	Moderate collision damage or loose connections without substantial impact on railing performance.
3	SERIOUS	Concrete	Major deterioration with cracks and spalls or scaling greater affecting more than 10% of the surface area.
		Steel	Protective coating failure affecting more than 10% of the surface area with measurable loss of section.
		Timber	Decay that affects more than 15% of the member thickness.
		All	Collision damage or loose connections should be repaired prior to the next scheduled inspection.
2	CRITICAL	All	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 required for the structure to remain open.
1	IMMINENT FAILURE	All	Lane or shoulder closed to traffic and temporary concrete barricades or thrie beam guardrail in place to keep the bridge open. Corrective action may remove the restriction.
0	FAILED	All	Bridge is closed due to the condition of the railing. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Bridges that carry railway freight, culverts that do not have railing fastened to the structure because the amount of cover is sufficient for driven posts, or other culverts without railing that extend beyond the clear zone from the route shoulder.

BSIR #5 SIDEWALKS OR CURBS

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect the condition of the surface.
8	GOOD	Concrete	Cracking less than 1/32" wide with no spalling, scaling, or delamination.
		Steel	Small areas of superficial wear on the surface.
		Timber	Minor surface abrasion with no measurable section loss.
7	GOOD	Concrete	Open cracks less than 1/16" wide or sealed cracks spaced at 10' or more. Light shallow scaling may be present.
		Steel	Protective coating failure in very small and scattered locations.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
6	FAIR	Concrete	Open cracks greater than 1/16" wide spaced at less than 10'. Spalling, delaminations, and unsound repairs affecting 2% or less of the area. Surface scaling may be 1/4" to 1/2" deep.
		Steel	Protective coating failures is limited to less than 2% of the surface area with no loss of section.
		Timber	Decay or section loss that affects less than 5% of the member section. Checks or shakes not in the tension zone that penetrate between 5% and 25% of the member thickness. Splits arrested and concerns mitigated.
5	FAIR	Concrete	Excessive surface cracking present. Spalling, delaminations, and unsound repairs affecting between 2% and 10% of the area. Surface scaling may be 1/2" to 1" deep.
		Steel	Protective coating failure is limited to less than 5% of the surface area with minor loss of section. Loose fasteners or broken welds present but the connection is in place and functioning as intended.
		Timber	Decay or section loss that affects between 5% and 10% of the member section. Checks or shakes not in the tension zone that penetrate between 25% and 50% of the member thickness. Split length less than the member depth.
4	POOR	Concrete	Delamination or spalling affecting between 10% and 25% of the area. Excessive cracking or scaling that does not present a hazard to pedestrians
		Steel	Protective coating failure affecting between 5% and 10% of the surface area with measurable loss of section. Cracks that have not been arrested. Structural review not required.
		Timber	Decay or section loss that affects more than 10% of the member section but does not warrant a structural review. Check or shakes that penetrate more than 50% of the member thickness.
3	SERIOUS	Concrete	Spalling affecting more than 25% of the surface area and does not present a trip hazard to pedestrians.
		Steel	Protective coating failure affecting more than 10% of the surface area with measurable loss of section. Missing fasteners or adjacent broken welds present that do not warrant a structural review.
		Timber	Checks or shakes that penetrate more than 5% of the member thickness in the tension zone. Cracking that has not been arrested and does not require structural review. Split length greater than the member depth.
2	CRITICAL	All	Emergency repairs required for the sidewalk to remain open.
1	IMMINENT FAILURE	All	Sidewalk is closed to pedestrians, but corrective action may put it back in service.
0	FAILED	All	Sidewalk is closed to pedestrians.
N	N/A	All	Bridges without sidewalks or curbs.

BSIR #6 DECK BOTTOM SURFACE

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect the condition of the bottom surface.
8	GOOD	Concrete	Cracking less than 1/32" wide with no spalling, scaling, or delamination. No rust on stay-in-place forms.
		Steel	Very limited partial protective coating failures that do not expose bare steel.
		Timber	Paint or other coating failures in very limited locations.
7	GOOD	Concrete	Open cracks less than 1/16" wide spaced at 10' or more. Light shallow scaling present. No rust on stay-in-place forms.
		Steel	Protective coating failures in very small and scattered locations.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
6	FAIR	Concrete	Open cracks greater than 1/16" wide spaced at less than 5'. Spalling, delaminations, map cracking, or freckled rust on stay-in-place forms affecting 2% or less of the area. Surface scaling may be 1/4" to 1/2" deep.
		Steel	Protective coating failures is limited to less than 2% of the surface area with no loss of section.
		Timber	Decay or section loss that affects less than 5% of the member section. Checks or shakes not in the tension zone that penetrate between 5% and 25% of the member thickness. Splits arrested and concerns mitigated.
5	FAIR	Concrete	Delamination, spalling, heavily map cracked areas, or freckled rust on stay-in-place forms affecting between 2% and 10% of the area. Excessive cracking or heavy scaling up to 1" deep.
		Steel	Protective coating failure is limited to less than 5% of the surface area with minor loss of section. Cracks that have self-arrested or have been arrested may be present. Loose fasteners present but the connection is functioning as intended.
		Timber	Decay or section loss that affects between 5% and 10% of the member section. Checks or shakes not in the tension zone that penetrate between 25% and 50% of the member thickness. Split length less than the member depth.
4	POOR	Concrete	Delamination, spalling, heavily map cracked areas, or light to moderate corrosion on stay-in-place forms affecting between 10% and 25% of the total surface area. Efflorescence with heavy rust staining.
		Steel	Protective coating failure affecting between 5% and 10% of the surface area with measurable loss of section. Cracks that have not been arrested or missing fasteners. Structural review not required.
		Timber	Decay or section loss that affects more than 10% of the member section. Check or shakes that penetrate more than 50% of the member thickness.
3	SERIOUS	Concrete	Delamination, spalling, heavily map cracked areas, or moderate to severe corrosion on stay-in-place forms affecting more than 25% of the total surface area. Local failures may be possible.
		Steel	Protective coating failure affecting more than 10% of the surface area with measurable loss of section. Cracks or missing fasteners that do warrant a structural review.
		Timber	Decay or section loss that affects more than 10% of the member section. Check or shakes that penetrate more than 50% of the member thickness. Split length greater than the member depth.
2	CRITICAL	All	The deck will not support design loads and is posted. Emergency repairs may be required.
1	IMMINENT FAILURE	All	Bridge is closed to traffic due to the potential for deck failure, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed due to deck condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts, filled arch bridges, and other bridges without decks.

Bridge Safety Inspection NBI Rating Guidelines

BSIR #7 DECK (SI&A Item 58)

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect the condition of the bottom surface.
8	GOOD	Concrete	Cracking less than 1/32" wide with no spalling, scaling, or delamination.
		Steel	Very limited partial protective coating failures that do not expose bare steel.
		Timber	Minor surface abrasion with fasteners functioning as constructed.
		All	Small superficial wear or surface abrasion.
7	GOOD	Concrete	Open cracks less than 1/16" wide or sealed cracks spaced at 10' or more. Light shallow scaling present.
		Steel	Protective coating failures in very small and scattered locations.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
		All	Minor deterioration in intermittent locations that has no effect on structural capacity.
6	FAIR	Concrete	Delamination, spalling, and cracking greater than 1/16" wide spaced at less than 5'. Scaling may be 1/4" to 1/2" deep.
		Steel	Protective coating failures present with no loss of section.
		Timber	Decay or section loss affecting less than 5% of the member section. Checks or shakes not in the tension zone that penetrate between 5% and 25% of the member thickness. Splits arrested and concerns mitigated.
		All	Deterioration of the combined area of both deck surfaces is 2% or less of the total area.
5	FAIR	Concrete	Excessive cracking or heavy scaling up to 1" deep.
		Steel	Protective coating failures with minor loss of section. Cracks are arrested. All connections functioning as intended.
		Timber	Decay or section loss affecting 5% to 10% of the member section. Checks, shakes, and splits have no effect on capacity.
		All	Deterioration of the combined area of both deck surfaces is between 2% and 10% of the total area.
4	POOR	Concrete	Delamination, spalling, heavily map cracked areas, or efflorescence with heavy rust staining.
		Steel	Protective coating failure with measurable section loss. Cracks have not been arrested or missing fasteners are present.
		Timber	Decay, section loss, checks, shakes, or splits that do not warrant structural review.
		All	Deterioration of the combined area of both deck surfaces is between 10% and 25% of the total area. Structural review and/or load analysis is not required.
3	SERIOUS	Concrete	Excessive delamination, spalling, or cracking that may affect capacity.
		Steel	Protective coating failure with measurable loss of section. Cracks or missing fasteners may affect design capacity.
		Timber	Decay or section loss that affects more than 10% of the member section. Checks, shakes, splits may warrant structural review.
		All	Deterioration of the combined area of both deck surfaces is more than 25% of the total area. Structural review and/or load analysis may be necessary to determine if the structure can continue to function without restricted loading.
2	CRITICAL	All	The deck will not support design loads and is posted, emergency repairs or temporary shoring is required.
1	IMMINENT FAILURE	All	The bridge is closed to traffic due to the potential for deck failure, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed due to deck condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts, filled arch bridges, and other bridges without decks.

BSIR #9 SUPERSTRUCTURE (SI&A Item 59)

Code	Condition	Material	Description
9	NEW	All	No deficiencies in any of the structural components that will affect long term performance.
8	GOOD	All	All protective coatings are sound and functioning but with minor weathering of the coating.
7	GOOD	Concrete	Hairline cracks in C.I.P. concrete or sealed cracks spaced at more than 3' with no other defects present.
		Steel	Very limited partial protective coating failures that do not expose bare steel.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
		All	Members retain full section properties and function as designed with limited deterioration.
6	FAIR	Concrete	Cracks in C.I.P. concrete 1/16" wide or less or hairline cracks in P.S. concrete spaced at more than 3'. Minor delamination and spalling with exposed mild steel reinforcement without section loss or rust staining.
		Steel	Protective coating failures present with no loss of section.
		Timber	Decay or section loss affecting less than 5% of the member section. Splits arrested and concerns mitigated.
		All	Members retain full section properties and function as designed with minor deterioration. Superficial impact damage.
5	FAIR	Concrete	Cracks in C.I.P. concrete 1/16" wide or less or hairline cracks in P.S. concrete spaced at 1' to 3'. Moderate delamination, spalling, or exposed prestresseing reinforcement without section loss. Minor efflorescence present.
		Steel	Protective coating failures with minor loss of section. Cracks are arrested. All connections functioning as intended.
		Timber	Decay or section loss affecting 5% to 10% of the member section. Checks, shakes, and splits have no effect on capacity.
		All	Members continue to function as designed with moderate deterioration affecting structural members and minor section loss in low or no stress areas. Moderate impact damage that does not require mitigation.
4	POOR	Concrete	Cracks in C.I.P. 1/16" wide or greater or hairline cracks in P.S. concrete spaced at less than 1'. Moderate delam and spalling or exposed prestressing reinforcement without section loss.
		Steel	Significant protective coating failure and limited loss of section. Cracks not arrested or missing fasteners are present.
		Timber	Decay, section loss, checks, shakes, or splits that do not warrant structural review.
		All	All members continue to function as designed with considerable deterioration affecting structural members and up to 10% section loss in scattered and isolated areas. Substantial impact damage may be present.
3	SERIOUS	Concrete	Structural cracking or reinforcement section loss that may affect load capacity.
		Steel	Protective coating failed with measurable loss of section. Cracks or missing fasteners may affect design capacity.
		Timber	Decay or section loss that affects more than 10% of the member section. Checks, shakes, splits may warrant action.
		All	Considerable deterioration affecting structural members with section loss up to 25% in scattered and isolated areas. Structural evaluation or load analysis may be necessary to determine if the structure can continue to function without restricted loading.
2	CRITICAL	All	The superstructure will not support design loads. Posting, emergency repairs installed, or temporary shoring is required.
1	IMMINENT FAILURE	All	The bridge is closed to traffic due to the potential for superstructure failure, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed due to condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts.

BSIR #10 PAINT

Code	Condition	Description
9	NEW	No deficiencies in the coating which will affect its long term performance.
8	GOOD	Minor weathering of the coating and/or dirt contamination.
7	GOOD	Minor pinpoint rusting in scattered locations or on sharp edges.
6	FAIR	Minor corrosion or degradation of the coating in scattered locations with a total area of less than 1%.
5	FAIR	Moderate corrosion or degradation of the coating limited to 1% and 5% of the total surface area. If areas of paint failure are concentrated under open joints, consideration may be given to zone painting.
4	POOR	Large areas of corrosion or degradation of the coating occurring to 5% and 15% of the total surface area. 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	Significant areas of corrosion or degradation of the coating comprising between 15% and 50% of the total surface area. Structure should be scheduled for complete recoating.
2	CRITICAL	More than 50% of the coating has failed. Structure should be scheduled for complete recoating.
1	IMMINENT	Very limited effectiveness of the entire coating system remaining throughout.
0	FAILED	The entire coating system has failed or is no longer effective.
N	N/A	Concrete superstructures, unpainted A-588 weathering steel, and galvanized beams.

BSIR #11 SECTION LOSS UNDER JOINTS

Code	Condition	Material	Description
3	GOOD	Steel	No loss of paint protection, corrosion, or evidence of section loss due to corrosion.
		Concrete	Superficial surface scaling without reinforcement exposure or reduced bearing.
2	FAIR	Steel	Rusty beam ends or section loss less than 10%.
		Concrete	Distress limited to non-structural cracking or spalling without exposed reinforcement.
1	POOR	Steel	10% or greater section loss that does not require repair or action due to load capacity analysis or structural review.
		Concrete	Cracking, exposed reinforcement, or bearing surface reduction that does not require action due to load analysis or structural review.
0	FAILED	All:	Excessive deterioration requiring engineered repairs or temporary supports.
N	N/A	All:	Timber superstructures, slabs, culverts, etc.

BSIR #12 BEARINGS

Code	Condition	Description
9	NEW	No deficiencies in any bearing components that will affect long term performance.
8	GOOD	All protective coatings are sound and functioning but with minor weathering of the coating and/or dirt contamination on bearing components.
7	GOOD	Minor coating failures in scattered locations on steel bearing components. All bearing components function as designed.
6	FAIR	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	Moderate deterioration affecting bearing components. Minor misalignment, section loss, or loss of bearing in low or no stress areas.
4	POOR	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	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	Deterioration has progressed to the point where the structure will not support design loads and must be posted for reduced loads.
1	IMMINENT FAILURE	Bridge is closed to traffic due to condition of the bearings, but corrective action may put the bridge back in service.
0	FAILED	Bridge is closed due to bearing condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	Slab designs without bearings and culverts.

Bridge Safety Inspection NBI Rating Guidelines

BSIR #13 ABUTMENTS (SI&A Item 60)

Code	Condition	Material	Description
9	NEW	All	No deficiencies in any of the structural components that will affect long term performance.
8	GOOD	All	All structural components are sound and functioning as designed. There may be superficial cracking or weathering of protective components and/or dirt contamination of structural components.
7	GOOD	Concrete	Insignificant cracks or moderate cracks that are sealed.
		MSE	Structural cracking or staining of panels is minor and limited to a few locations.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
		All	All components retain full section properties and function as designed.
6	FAIR	Concrete	Unsealed moderate-width or map cracks. Minor delamination, spalling, or efflorescence without build-up or rust staining.
		MSE	Minor uniform tilting of walls that does not require structural review. Structural cracking limited to 5% or less of the area.
		Timber	Decay or section loss affecting less than 5% of the member section. Splits arrested and concerns mitigated.
		All	Minor deterioration affecting structural components. Scour effects have been arrested with countermeasures.
5	FAIR	Concrete	Moderate delamination, spalling, or efflorescence. Reinforcement exposure without section loss.
		MSE	Connections visible at isolated locations where panels are bowing. Joint width between panels is substantially uniform.
		Timber	Decay or section loss affecting 5% to 10% of the member section. Checks, shakes, and splits have no effect on capacity.
		All	Moderate deterioration affecting structural components including minor settlement, shallow scour, or impact damage. All members continue to function as designed.
4	POOR	Concrete	Considerable cracking, spalling, and efflorescence with heavy build-up or rust staining.
		MSE	Moderate uniform tilting of walls that does not require structural review. Structural cracking limited to between 10% and 25% of the area. Erosion has exposed the wall base without undermining.
		Timber	Extensive decay, section loss, checks, shakes, or splits that do not warrant structural review.
		All	Considerable deterioration affecting structural members including partial settlement or scour. All members continue to function as designed.
3	SERIOUS	Concrete	Considerable areas of spalling, exposed reinforcement with section loss, or heavy rust staining.
		MSE	Structural cracking occurring on greater than 25% of area. Exposed geotextile fabric or loss of backfill.
		Timber	Decay or section loss that affects more than 10% of the member section. Checks, shakes, splits may warrant action.
		All	Considerable deterioration or damage 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 or immediate repairs.
2	CRITICAL	All	Deterioration has progressed to the point where the structure will not support design loads and posting, emergency repairs, or shoring with structurally engineered temporary supports is required.
1	IMMINENT	All	Bridge is closed to traffic due to abutment failure, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed due to abutment condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts

BSIR #14 PIERS (SI&A Item 60)

Code	Condition	Material	Description
9	NEW	All	No deficiencies in any of the structural components that will affect long term performance.
8	GOOD	All	All structural components are sound and functioning as designed. There may be superficial cracking or weathering of protective components and/or dirt contamination of structural components.
7	GOOD	Concrete	Insignificant cracks or moderate cracks that are sealed.
		Steel	Protective coating failure in very small and scattered locations.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
		All	All members retain full section properties and function as designed.
6	FAIR	Concrete	Unsealed moderate-width or map cracks. Minor delamination, spalling, or efflorescence without build up or rust staining.
		Steel	Protective coating failures is limited to less than 2% of the surface area with no loss of section.
		Timber	Decay or section loss affecting less than 5% of the member section. Splits arrested and concerns mitigated.
		All	Minor deterioration affecting structural components. Scour effects have been arrested with countermeasures.
5	FAIR	Concrete	Moderate delamination, spalling, or efflorescence. Reinforcement exposure without section loss.
		Steel	Protective coating failure is limited to less than 5% of the surface area with minor loss of section. Loose fasteners or broken welds present but the connection is in place and functioning as intended.
		Timber	Decay or section loss affecting 5% to 10% of the member section. Checks, shakes, and splits have no effect on capacity.
		All	Moderate deterioration affecting structural components including minor settlement, shallow scour, or impact damage.
4	POOR	Concrete	Considerable cracking, spalling, and efflorescence with heavy build-up or rust staining.
		Steel	Protective coating failure affecting between 5% and 10% of the surface area with some loss of section. Cracks that have not been arrested but do not require structural review.
		Timber	Extensive decay, section loss, checks, shakes, or splits that do not warrant structural review.
		All	Considerable deterioration affecting structural members including partial settlement or scour. All members continue to function as designed.
3	SERIOUS	Concrete	Considerable areas of spalling, exposed reinforcement with section loss, or heavy rust staining.
		Steel	Protective coating failure affecting more than 10% of the surface area with measurable loss of section. Missing fasteners or adjacent broken welds present that do not warrant a structural review.
		Timber	Decay or section loss that affects more than 10% of the member section. Checks, shakes, splits may warrant action.
		All	Considerable deterioration or damage 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 or immediate repairs.
2	CRITICAL	All	Deterioration has progressed to the point where the structure will not support design loads and posting, emergency repairs, or shoring with structurally engineered temporary supports is required.
1	IMMINENT FAILURE	All	Bridge is closed to traffic due to pier failure, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed due to condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts

BSIR #15 SLOPE PROTECTION

Code	Condition	Description
9	NEW	No deficiencies in any of the primary components that will affect the long term performance.
8	GOOD	Superficial cracking and/or dirt contamination on primary components.
7	GOOD	Minor deterioration and/or cracking of the materials. Slope protection will function as designed.
6	FAIR	Minor cracking, shallow settlement, scaling, and small scattered spalls.
5	FAIR	Moderate cracking, scaling, scattered spalls, or minor settlement. Slope protection will function as designed.
4	POOR	Considerable cracking, scaling, scattered spalls, and partial settlement. Slope protection will continue to function as designed.
3	SERIOUS	Considerable deterioration affecting the primary materials. Slope protection repairs or other corrective action should be scheduled.
2	CRITICAL	Limited effectiveness due to undermining or deterioration of the materials.
1	IMMINENT FAILURE	Slope protection no longer functions as designed.
0	FAILED	Slope protection has failed.
N	N/A	All structures over water and culverts.

BSIR #16/CSIR #2 CHANNEL and CHANNEL PROTECTION (SI&A 61)

Code	Condition	Description
9	NEW	No noticeable or noteworthy deficiencies affect the condition of the channel.
8	GOOD	Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in stable condition.
7	GOOD	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	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	Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel.
4	POOR	Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the channel.
3	SERIOUS	Bank protection has failed. River control devices have been destroyed. Streambed, aggradation, degradation or lateral movement has changed to threaten the bridge and/or approach roadway now.
2	CRITICAL	The channel has changed to the extent the bridge is near a state of collapse.
1	IMMINENT FAILURE	The bridge is closed because of channel failure, but corrective action may put it back in service.
0	FAILED	Bridge closed because of channel failure. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	Bridges that are not over a waterway (channel).

BSIR #17 / CSIR #3 SCOUR INSPECTION

Code	Condition	Description
9	NEW	New scour protection, No Scour.
8	GOOD	No Scour noted. Scour Protection (if installed) is in good condition.
7	GOOD	Insignificant to minor scour along substructures. Scour Protection (if installed) is in good condition.
6	FAIR	Minor scour or erosion exsists in scattered areas along substructure. No exposure of the footing or piles. Scour Protection (if installed) is substantially effective with minor defects noted.
5	FAIR	Minor to Moderate Scour exists with no exposure of footings or piles. All substructures are structurally sound. Scour Protection (if installed) is substantially effective with minor defects noted.
4	POOR	Extensive advanced scour with or without isolated major scour. More frequent monitoring or corrective actions are typically needed to address scour conditions. Footings are exposed, Scour Protection (if installed) has limited effectiveness at protecting substructure for scour, significant defects noted.
3	SERIOUS	Major scour that typically requires more frequent monitoring or corrective actions. Few areas of undermining. Scour Protection (if installed) has limited effectiveness at protecting substructure for scour, significant defects noted.
2	CRITICAL	Field review indicates that extensive scour has occurred at bridge foundations, which are determined to be unstable by a comparison of calculated scour and observed scour during the bridge inspection, or an engineering evaluation of the observed scour condition.
1	IMMINENT	Field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic.
0	FAILED	Bridge is closed due to scour condition. Condition is beyond repair and replacement is needed to restore service.
N	N/A	NOT APPLICABLE.

BSIR #18 APPROACH

Code	Condition	Material	Description
9	NEW	All	No noticeable or noteworthy deficiencies which affect the condition of the surface.
8	GOOD	Concrete	Cracking less than 1/32" wide with no spalling, scaling, or delamination.
		HMA	No cracking, but minor deformations may be visible without spalling, segregation, or longitudinal joint failure.
		All	No spalling, scaling, or delamination of the surface.
7	GOOD	Concrete	Open cracks less than 1/16" or sealed cracks spaced at 10' or more.
		HMA	Cracks at spacing of 50' or more. Minor deformations with no spalling, segregation, or longitudinal joint failure.
		All	Light shallow scaling or raveling allowed on the surface. Approach pavement will function as designed.
6	FAIR	Concrete	Open cracks greater than 1/16" wide spaced at less than 10'. Spalling, delamination, or unsound repairs affecting 2% or less of the area. Surface scaling may be 1/4" to 1/2" deep.
		HMA	Cracks spaced at of 50' or more. Rutting, shoving, or raveling in limited locations with no affect on ride quality.
		All	Minor settlement of the slab or pavement.
5	FAIR	Concrete	Excessive cracking or heavy scaling up to 1" deep. Spalling, delamination, or unsound repairs affecting between 2% and 10% of the area.
		HMA	Block cracking, raveling, and other deterioration present throughout affecting between 2% and 10% of the area.
		All	Settlement of the slab or pavement is less than 3/4" at the bridge seat or sleeper slab.
4	POOR	Concrete	Spalling, delamination, or unsound repairs affecting between 10% and 25% of the area.
		HMA	Block cracking, raveling, other deterioration present throughout affecting between 10% and 25% of the area.
		All	Settlement of the slab or pavement is more than 3/4" at the bridge seat or sleeper slab.
3	SERIOUS	Concrete	Spalling affecting more than 25% of the surface area.
		HMA	Spalling affecting more than 25% of the surface area. Ride quality may be impacted.
		All	Settlement of the slab or pavement impacts ride quality. Emergency repairs may be required.
2	CRITICAL	All	Emergency approach repairs required for the bridge to remain open.
1	IMMINENT FAILURE	All	The bridge is closed due to the approach condition, but corrective action may put it back in service.
0	FAILED	All	Bridge is closed to traffic due to the approach condition. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Culverts, filled arch bridges, and other bridges without decks.

BSIR #19 APPROACH SHOULDERS and SIDEWALKS

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

Bridge Safety Inspection NBI Rating Guidelines

CSIR #1 CULVERT (SI&A #62)

Code	Condition	Material	Description
9	NEW	All	New Condition
8	GOOD	All	No Settlement or misalinment. Members retain full section properties and function as designed with limited deterioration.
7	GOOD	Concrete	Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel.
		Steel	Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting. No problems with joints or seams.
		Timber	Checks or shakes penetrate less than 5% of the member thickness.
		All	No Settlement or misalinment. Members retain full section properties and function as designed with limited deterioration.
6	FAIR	Concrete	Minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs
		Steel	Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting.
		Timber	Decay or section loss affecting less than 5% of the member section. Splits arrested and concerns mitigated.
		All	Local minor scouring at curtain walls, wingwalls, or pipes.
5	FAIR	Concrete	Extensive cracking and leaching, or spalls on concrete or masonry walls and slabs.
		Steel	Metal culverts have significant distortion and deflection in one section, significant corrosion or deep pitting.
		Timber	Decay or section loss affecting 5% to 10% of the member section. Checks, shakes, and splits have no effect on capacity.
		All	Moderate to major deterioration or disintegration. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes.
4	POOR	Concrete	Large spalls, heavy scaling, wide cracks, considerable efflorescence.
		Steel	Metalculverts have significant distortion and deflection throughout, extensive corrosion or deep pitting.
		Timber	Extensive decay, section loss, checks, shakes, or splits that do not warrant structural review.
		All	Opened joint or seam permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls or pipes.
3	SERIOUS	Concrete	Considerable areas of spalling, exposed reinforcement with section loss, or heavy rust staining.
		Steel	Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.
		Timber	Decay or section loss that affects more than 10% of the member section. Checks, shakes, splits may warrant action.
		All	Severe movement or differential settlement of the segments, or loss of fill. Severe scour or erosion at curtain walls, wingwalls or pipes.
2	CRITICAL	All	Integral wingwalls have collapsed, severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at walls & pipes. Corrective action required to maintain traffic. Metal culverts have extreme distortion/deflection throughout with extensive perforations due to corrosion.
1	IMMINENT FAILURE	All	Culvert is closed, but corrective action may put it back in service.
0	FAILED	All	Culvert is closed and replacement is necessary. Coordinate with SI&A Item 41 and notify Bridge Field Services.
N	N/A	All	Not applicable. Use if structure is not a culvert.