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2.7 ASSESSMENTS

There are several components found on a bridge structure that are not primary structural members but are items that the department wants to track. As they were not structural members, these items did not need to be elements, as this would require the creation and tracking of element specific defects. On the WisDOT bridge inspection form, the inspector will find an area for assessments. Many of the elements from WisDOT's CoRe inspections (the previous version of element level inspection prior to 2014) are now identified as assessments. Assessments are not elements and do not have defects associated with them. Rather, similar to condition states, assessments have four levels of deterioration or Assessment States.

Bridge inspections will typically have several assessments that must be inspected and recorded. It is the inspector's responsibility to determine the assessments that are associated with each bridge and evaluate and record them. Assessments are not optional items. The inspector must capture all assessments during a bridge inspection.

2.7.1 Assessment Items

On the inspection report all assessments are recorded in units of "each". It is the inspector's task to examine each assessment and reasonably assign the most severe assessment condition to each assessment. Similar to elements and defects, the inspector has the ability to describe and elaborate on assessments on the inspection report in the associated box under each assessment. It is recommended the inspector treat assessments with the same attention to detail as he/she would elements/defects; incorporating sketches, photographs and detailed notes. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.

Each assessment will be coded on an assessment state scale: Good, Fair, Poor, and Severe. Each assessment is described below, along with a description of the coding criteria.

2.7.1.1 Drainage – Approach (Assessment 9001)

This assessment defines drainage systems for the approach sections of the bridge. It is present on all bridges regardless if drainage system is present with the exception of unit bridges. Unit bridges (larger bridges that are comprised of several adjacent bridges, each with a separate bridge number) will not have this assessment on any interior spans but will on the bridges with the end spans. This assessment is used to monitor the condition of any erosion off the ends of the structure or undermining of approach.

On the inspection report form approach drainage is recorded in units of "each". All quadrants of a bridge span will count as an individual "each". Therefore, smaller bridges will have a quantity of four. Split bridges with a grass median may have a quantity of eight. The inspector will capture this assessment even if the approach is on the high side of a super-elevated bridge, or a bridge with curb and gutter along the approaches.

The assessment Drainage - Approach is limited to 20 feet from the wingtip at each quadrant of a bridge. This may include storm sewer inlets. Degrading storm sewer systems in the vicinity of the structure may have an adverse impact on the structure capacity of the abutment or approach slabs.

It is the inspector's task to examine each approach drainage assessment and reasonably assign the most severe assessment state to the "each" quantity. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-1: Assessment 9001 – Approach Drainage. Note concrete flume.

Assessment Condition

- Good:** Drainage systems are functioning properly. No slope erosion is evident off the ends of the bridge or in the associated ditches.
- Fair:** Minor erosion of slopes around the bridge. Drainage systems are plugged or have minor deterioration.
- Poor:** Moderate erosion of slopes around the bridge. Drainage systems are plugged or have moderate deterioration.
- Severe:** Major erosion of bridge slopes not related to slope protection. Drainage systems are plugged and have major deterioration.

2.7.1.2 Drainage – Deck (Assessment 9004)

This assessment defines drainage systems on the deck of the bridge. This assessment includes any scuppers and inlets that are located on the deck. The inlets located within the approach roadway of the bridge are not included in this assessment.

On the inspection report form, deck drainage is recorded in units of “each”. Each scupper, inlet, or drain pipe counts as one “each” regardless if combined or not.

It is the inspector’s task to examine all deck drainage and reasonably assign the most severe assessment condition to each drain found within the limits of the bridge deck. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-2: Assessment 9004 – Deck Drainage.

Assessment Condition

- Good:** Drainage systems are functioning properly. No slope erosion is evident off the ends of the bridge or in the associated ditches.
- Fair:** Drainage systems are plugged or have minor deterioration.
- Poor:** Drainage systems are plugged or have moderate deterioration.
- Severe:** Drainage systems are plugged and have major deterioration.

2.7.1.3 Aesthetic Treatment (Assessment 9010)

This assessment evaluates the aesthetic coatings or treatments on a bridge structure. Examples of aesthetic treatments include concrete staining, form liners, obelisks, as well as many others. The inspector is to note the type of aesthetic treatment on the inspection report.

On the inspection report form aesthetic treatments are recorded in units of “each” for the entire bridge. That is, regardless of the number of aesthetic treatments found on a bridge, the quantity reported shall be 1 Each. The inspector must note the type(s) of aesthetic treatments used on the structure under the assessment notes for Aesthetic Treatment.

It is the inspector’s task to examine each aesthetic treatment assessment and reasonably assign the most severe assessment condition to the whole assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-3: Assessment 9010 – Aesthetic Treatment.

Assessment Condition

- Good: System is in good condition, with no notable issues.
- Fair: Aesthetic system is in fair condition, with some fading or discoloration. Minor issues.
- Poor: Aesthetic system is in poor condition, with fading or discoloration.
- Severe: Aesthetic system is in severe condition and is not functioning as intended.

2.7.1.4 Utilities (Assessment 9011)

This assessment evaluates utilities that are attached to bridge structures. This can include lighting, sewer lines, water mains, gas lines, electrical lines, as well as multiple others.

On the inspection report form, utilities are recorded in units of “each” per each conduit run. Therefore, if four conduits are hung in a bay between two beams, the quantity would be four. Similarly, three conduits hung from the exterior of a concrete parapet would have a quantity of three. It will be at the inspector’s discretion if several conduits are hung by one attachment point as whether the quantity will be one, or the number of conduits in that package. Clarification should be made in the notes.

It is the inspector’s task to examine each utility and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-4: Assessment 9011 – Utilities.

Assessment Condition

- Good: Utility is in excellent condition, no problems noted.
- Fair: Utility is in fair condition. Some minor problems are noted, but they do not affect the serviceability of the utility
- Poor: Utility is in poor condition and local failures are possible. Utility hangers may be disconnected from the bridge structure at various locations.
- Severe: Utility is in severe condition. Failures have occurred.

2.7.1.5 Movable Bridge – Counterweight (Assessment 9020)

This assessment evaluates the counterweight system used for movable bridges.

On the inspection report form, counterweights are recorded in units of “each” with each counterweight assessed separately.

It is the inspector’s task to examine each counterweight and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-5: Assessment 9020 – Movable Bridge Counterweight.

Assessment Condition

- Good: Counterweight is in good condition, no problems noted.
- Fair: Counterweight is in fair condition. Some minor problems are noted, but they do not affect the serviceability of the bridge.
- Poor: Counterweight is in poor condition and local failures are possible. Serviceability of the bridge could be affected by the item’s continued deterioration.
- Severe: Counterweight is in severe condition and is not functioning properly.

2.7.1.6 Movable Bridge Cables (Assessment 9021)

This assessment evaluates the cables on a movable bridge. These cables should not be captured under the National Bridge Elements 147 or 148, as these cables are used for suspension, cable-stayed, and tied arch bridges.

On the inspection report form, bridge cables are recorded in units of “each” where each grouping of cables is considered one assessment. The inspector should clarify quantities in the assessment notes. The inspector should include the condition of the cable attachments within the cable assessment. Sheave components which support the cables, will be evaluated in the Moveable Bridge Mechanical Inspection Report.

It is the inspector's task to examine each cable or cable group and reasonably assign the most severe assessment condition to the each assessment. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-6: Assessment 9021 – Movable Bridge Cables.

Assessment Condition

- Good: Cables are in good condition and are properly functioning
- Fair: Cables are in fair condition and are properly functioning.
- Poor: Cables are in poor condition.
- Severe: Cables are in severe condition, resulting in the lifting mechanism not working properly.

2.7.1.7 Signs – Object Markers (Assessment 9030)

This assessment evaluates the condition of bridge object markers at the location of the bridge structure. This assessment will also include the culvert delineators found at culverts.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment. Typically, bridges will have an object marker (tiger board) at each corner of the bridge. The quantity in this case would be four. In some instances, typically on shorter span structures, one sign post will be located on one side of a bridge approach and another post on the opposite side on the other approach. These posts may have an object marker on each side of the post. The quantity in this case would be four. Similarly, each culvert delineator will be an individual assessment.

It is the inspector's task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-7: Assessment 9030 – Signs – Object Markers.

Assessment Condition

- Good:** Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair:** Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor:** Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe:** Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.8 Signs – Narrow Bridge (Assessment 9031)

This assessment evaluates narrow bridge signs both at the bridge/culvert, as well as the advanced warning signs for the bridge/culvert.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment. Typically each direction will have one advanced warning sign leading up to the bridge, as well as at the bridge. Each one of these signs will be an assessment.

It is the inspector’s task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition



- Good: Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair: Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor: Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe: Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.9 Signs – One Lane Bridge (Assessment 9032)

This assessment defines the condition of the one lane bridge signs both at the bridge/culvert, as well as the advanced warning signs for the bridge/culvert.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment. Typically each direction will have one advanced warning sign leading up to the bridge, as well as a sign at the bridge. Each one of these signs will be an assessment.

It is the inspector’s task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good: Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair: Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor: Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe: Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.10 Signs – Vertical Clearance (Assessment 9033)

This assessment evaluates the condition of the vertical clearance signs at the bridge. Typically, these signs will be attached to the bridge deck/girder to inform the travelling public under the bridge as to the clearance restrictions of the bridge under-clearance.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment. Most bridges with restricted clearances will have a sign on

both sides of the bridge to inform both directions of traffic. Each one of these signs will be an assessment.

It is the inspector's task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-8: Assessment 9033 – Signs – Vertical Clearance.

Assessment Condition

- Good:** Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair:** Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor:** Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe:** Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.11 Signs – Weight Limit Posting (Assessment 9034)

This assessment evaluates the weight limit posting signs both at the bridge/culvert, as well as the advanced warning signs further away from the bridge/culvert.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment. Typically each direction will have one advanced warning

sign leading up to the bridge, as well as at the bridge. Each one of these signs will be an assessment.

It is the inspector's task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-9: Assessment 9034 – Signs – Weight Limit Posting.

Assessment Condition

- Good:** Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair:** Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor:** Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe:** Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.12 Signs – Others (Assessment 9035)

This assessment evaluates any additional signs both at the bridge/culvert, as well as the advanced warning signs further away from the bridge/culvert that are not captured under Assessments 9030, 9031, 9032, 9033, and 9034.

On the inspection report form, signs are recorded in units of “each” where each individual sign is considered its own assessment.



It is the inspector's task to examine each sign and reasonably assign the most severe assessment condition. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good:** Sign is present and is in good condition (there may be superficial damage or deterioration).
- Fair:** Sign is present - sign may have some damage or deterioration (slightly bent or fading), but remains readable.
- Poor:** Sign is present, but is deteriorated to the point that replacement or repair should be considered in next inspection cycle.
- Severe:** Sign is absent, or incorrect, or existing sign is damaged or deteriorated to the extent that repair or replacement is required as soon as possible.

2.7.1.13 Slope Protection – Asphalt (Assessment 9040)

This assessment evaluates slopes protected by asphaltic systems, similar to asphalt roadway paving. This should not be confused with crushed aggregate sprayed with bituminous. This is a separate assessment and will be covered in Section 2.7.1.18.

On the inspection report form, slope protection systems are recorded in units of "each" where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector's task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good:** Slope protection is sound and protecting the embankments adjacent to the abutments.
- Fair:** Minor deterioration. Minor settlement, cracking or spalling may exist.
- Poor:** Moderate deterioration. Moderate settlement, cracking or spalling may exist.
- Severe:** Major deterioration of slope paving. Serious settlement, undermining, cracking, buckling or spalling may exist.

2.7.1.14 Bridge Closure System (Assessment 9036)

This assessment evaluates the signage, barricades, fencing, etc. that is associated with the closure or partial closure of a bridge. This assessment does not include the signage pertaining

to vertical clearance, advanced warning signs (unless explicitly noting a detour or lane closure), object markers, etc.

On the inspection report form, bridge closure systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Each unit will include the condition evaluation of all components.

It is the inspector’s task to examine each bridge closure system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-10: Assessment 9036 – Bridge Closure System. Note assessment used for sidewalk closure.

Assessment Condition

- Good:** All barricades, signs, fencing, etc. for the closure system are secured and installed properly to permit safe passage through or around the bridge.
- Fair:** Detour or passage at the bridge is safe. Barricades, signs, fencing, etc. are installed; however, slightly misaligned/spaced and/or reflective materials are fading or dull.
- Poor:** Bridge closure system is improperly installed and/or inadequate for safe passage through or around bridge.
- Severe:** Bridge closure system is missing or damaged. Traversing bridge without system in place poses eminent endanger travelling public.

**2.7.1.15 Slope Protection – Bare (Assessment 9041)**

This assessment evaluates slopes that have no protection systems. Care should be taken not to confuse this slope protection with overgrown slope protection of a different material, or a material that has washed away.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

Good: Bare Slope is sound with no erosion present.

Fair: Minor erosion present.

Poor: Moderate erosion present.

Severe: Severe erosion is present.

2.7.1.16 Slope Protection – Concrete (Assessment 9042)

This assessment evaluates slopes protected by concrete slope paving. Riprap infilled with concrete or grout will be captured under Assessment 9045 – Slope Protection - Riprap.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

Good: Concrete slope protection is sound and protecting the embankments adjacent to the abutments.

Fair: Minor deterioration. Minor settlement, cracking or spalling may exist.

Poor: Moderate deterioration. Moderate settlement, cracking or spalling may exist.

Severe: Major deterioration of slope paving. Serious settlement, undermining, cracking, buckling or spalling may exist.

2.7.1.17 Slope Protection – Crushed Aggregate Sprayed with Bituminous(Assessment 9043)

This assessment evaluates slopes protected by crushed aggregate sprayed w/ bituminous asphalt coating. This should not be confused with asphaltic slope paving. This is a separate assessment, refer to Section 2.7.1.15.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

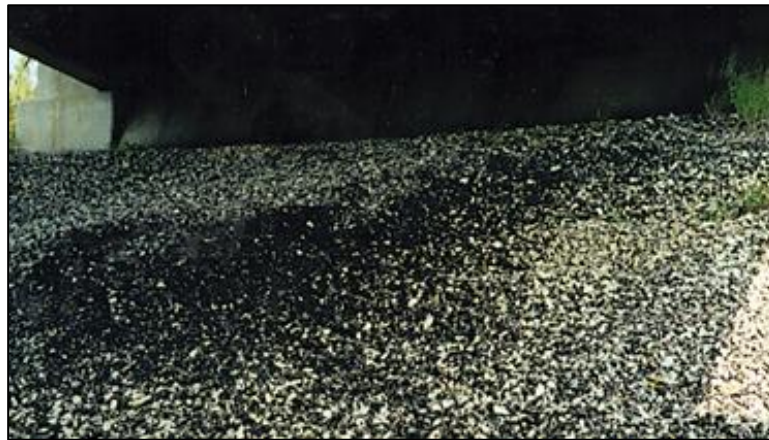


Figure 2.7.1-11: Assessment 9043 – Slope Protection – Crushed Aggregate Sprayed with Bituminous.

Assessment Condition

- Good:** Crushed aggregate is sound and protecting the embankment adjacent to the abutments.
- Fair:** Minor deterioration. Slope may have settled. Loose surface aggregate due to bleaching. Portions may be missing.
- Poor:** Moderate deterioration. Slope has settled. Loose surface aggregate due to bleaching. Portions may be missing.
- Severe:** Major deterioration. Major settlement and/or buckling are evident.

**2.7.1.18 Slope Protection – Epoxy Coated Crushed Aggregate (Assessment 9044)**

This assessment evaluates slopes that are protected by epoxy coated aggregate sloped paving.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good: Crushed stone is sound and protecting the embankment adjacent to the abutments.
- Fair: Minor deterioration. Slope may have settled. Loose surface stone due to bleaching. Portions may be missing.
- Poor: Moderate deterioration. Slope has settled. Loose surface stone due to bleaching. Portions may be missing.
- Severe: Major deterioration. Major settlement is evident.

2.7.1.19 Slope Protection – Riprap (Assessment 9045)

This assessment evaluates slopes protected by riprap. Riprap with concrete infill grouting would also be captured under this assessment.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to the whole assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-12: Assessment 9045 – Slope Protection – Riprap.

Assessment Condition

- Good:** Riprap is adequate, sound and protecting the embankments adjacent to the abutments.
- Fair:** Minor deterioration. Slope may have settled and portions may be missing. Riprap provides some embankment protection.
- Poor:** Moderate deterioration. Slope may have settled and portions may be missing. Riprap provides little embankment protection.
- Severe:** Major deterioration. Slope has settled and portions are missing. Riprap provides no embankment protection.

2.7.1.20 Slope Protection – Select Crushed Material (Assessment 9046)

This assessment evaluates slopes protected by select crushed material. This assessment will only capture slope protections without a stabilizer sprayed on top. If the crushed material/rock has a spray applied to it to stabilize the slope, then the inspector should use the appropriate assessment.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of a segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

**Assessment Condition**

- Good: Crushed aggregate is sound and protecting the embankment adjacent to the abutments.
- Fair: Minor deterioration. Slope may have settled. Portions may be missing.
- Poor: Moderate deterioration. Slope has settled. Portions may be missing.
- Severe: Major deterioration. Major settlement is evident.

2.7.1.21 Slope Protection – Other (Assessment 9047)

This assessment evaluates other slopes not included in the specific slope protection assessment definitions.

On the inspection report form, slope protection systems are recorded in units of “each” where each side of the bridge is considered its own assessment. Most bridges will have two assessments for slope protection, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number).

It is the inspector’s task to examine each slope protection system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good: Slope is sound with no erosion present.
- Fair: Minor deterioration, but functioning effectively.
- Poor: Moderate deterioration and/or erosion.
- Severe: Slope protection system has failed.

2.7.1.22 Steel Diaphragm (Assessment 9167)

This assessment evaluates steel diaphragm members between girders. The steel protective coating is excluded from the assessment of this component and included in the primary painted superstructure element. The steel protective coating should not be included if the steel diaphragms are attached to concrete beams or are of a different protective coating than that of the superstructure. This assessment is not to be used on curved bridges as the diaphragms are primary load carrying members on those bridges. Steel diaphragms on curved bridges shall be coded under Other Primary Structural Members (Element 8170).

On the inspection report form, diaphragms are recorded in units of “each” for every individual diaphragm including connection points.

It is the inspector's task to examine each diaphragm and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-13: Assessment 9167 – Steel Diaphragm.

Assessment Condition

- Good:** Good condition. Connections are in place and functioning. No distortion.
- Fair:** Freckled Rust. Corrosion of the steel has initiated. Loose fasteners or pack rust without distortion is present but the connection is functioning.
- Poor:** Section loss is evident or pack rust is present. Missing bolts, rivets, broken welds, or fasteners.
- Severe:** The system no longer functions as intended.

2.7.1.23 Concrete Diaphragm (Assessment 9168)

This assessment evaluates concrete diaphragm members between girders that are above piers and at intermediate locations. To be considered a diaphragm, the concrete component must be greater than half the height of beam. Concrete that measures less than half the height of the beam will be considered extensions of the deck and evaluated as part of the deck element. In addition, diaphragms at abutments will be evaluated under this assessment if they do not retain fill (i.e. there is a backwall present behind the diaphragms). If the diaphragm retains fill, then the diaphragm will be considered part of the abutment and evaluated as part of the abutment element.

On the inspection report form, diaphragms are recorded in units of “each” for every applicable individual diaphragm throughout the superstructure.

It is the inspector’s task to examine each diaphragm and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-14: Assessment 9168 – Concrete Diaphragm.

Assessment Condition

- | | |
|-------|---|
| Good: | No deterioration. Possible discoloration, efflorescence, or superficial cracking but doesn't affect strength or serviceability. |
| Fair: | Minor cracks and spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion. |
| Poor: | Some delaminations &/or spalls may be present and some reinforcing may be exposed. Possible rebar corrosion but section loss is incidental and doesn't significantly affect strength or serviceability. |

Severe: Advanced deterioration. Corrosion of reinforcement &/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength &/or serviceability of either the element or the bridge.

2.7.1.24 Lateral Bracing (Assessment 9169)

This assessment evaluates lateral bracing systems below the decks of trusses and through arches, the horizontal bracing inside trapezoidal box girders, and horizontal/wind bracing between I-girders.

Bracing above the roadway in both trusses and arches are evaluated under assessment Truss or Tied Arch Portal Bracing (9170). The steel protective coating is excluded from this assessment and should be evaluated and quantified under the primary painted superstructure element.

For deck arch structures, the lateral bracing between the arch ribs is evaluated under the respective arch element.

On the inspection report form, lateral bracing systems are recorded in units of “each” per span of the bridge regardless of the number of trusses, bays, or girder lines. It is the inspector’s task to examine the lateral bracing system in each span and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-15: Assessment 9169 – Lateral Bracing.

Assessment Condition

Good: Good condition. Connections are in place and functioning. No distortion.

Fair: Freckled Rust. Corrosion of the steel has initiated. Loose fasteners or pack rust without distortion is present but the connection is functioning.



- Poor:** Section loss is evident or pack rust is present. Missing bolts, rivets, broken welds, or fasteners.
- Severe:** The system no longer functions as intended.

2.7.1.25 Truss or Tied Arch Portal Bracing (Assessment 9170)

This assessment evaluates all bracing above the roadway and includes all secondary gusset plates (i.e. those plates whose plane lies perpendicular to the centerline of the roadway or not in the plane of the truss/arch). Vertical and lateral bracing, regardless of plane, is included within this assessment. The steel protective coating is excluded from this assessment and should be evaluated and quantified under the primary painted superstructure element.

On the inspection report form, Truss or Tied Arch Portal Bracing is recorded in units of “each” for each span, i.e. from substructure unit to substructure unit.

It is the inspector’s task to examine each upper truss or arch bracing system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good:** Good condition. Connections are in place and functioning. No distortion.
- Fair:** Freckled Rust. Corrosion of the steel has initiated. Loose fasteners may be present but the connection is functioning. No impact damage noted.
- Poor:** Section loss is evident or pack rust is present. Missing bolts, rivets, broken welds, or fasteners. Impact damage may be present, but has not distorted primary truss members.
- Severe:** The system no longer functions as intended. Impact damage has distorted primary truss members.

2.7.1.26 Timber Diaphragms (Assessment 9171)

This assessment evaluates timber diaphragm members between girders that are above substructure and at intermediate locations. Note that this assessment will typically only be used on timber superstructures.

Timber diaphragms may be either in an X formation or solid dimensional lumber cut to fit between the girder. Diaphragms comprised of glue-laminated timber shall fall under this assessment. The inspector shall pay close attention to loose, corroded or missing fasteners. X blocking, typically observed in simple span timber structures, will commonly have the fasteners pulled through the toe of one of the legs limiting the effectiveness of the diaphragm.

On the inspection report form, diaphragms are recorded in units of “each” for every applicable individual diaphragm throughout the superstructure.



It is the inspector's task to examine each diaphragm and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.

Assessment Condition

- Good: Good condition. Connections are in place and functioning. No checking or splitting of the timber components.
- Fair: Minor checking or splitting present in timber components. Loose or corroded fasteners is present but the connection is functioning. Minor decay may be present however not yet effecting function.
- Poor: Missing fasteners. Timber components in place, however exhibiting full depth checking or splitting or moderate section loss due to decay.
- Severe: The diaphragm no longer functions as intended.

2.7.1.27 Culvert End Treatment (Assessment 9248)

This assessment applies to culverts that have end treatments that include headwalls and aprons. Depending on the configuration of the culvert, only certain items of this assessment may be found (i.e., headwall without an apron). As long as a culvert structure has some component of the culvert end treatment, this assessment shall be included on the inspection report. Steel pipe culverts protruding from an earth embankment without any components (headwall, wingwall, or apron) would not have an end treatment associated with it.

On the inspection report form, culvert end treatments are recorded in units of "each" where each end counts as its own assessment. On a typical culvert, the quantity will be two (one for each end).

Wingwalls at culvert ends are coded and their condition assessed under element 8400, regardless of whether a joint exists between the culvert and the wingwall or the culvert and wing are monolithic.

It is the inspector's task to examine each culvert end treatment and reasonably assign the most severe assessment condition to the each assessment. Quantifying these amounts helps to generate quantity/cost estimates for future remedial work.



Figure 2.7.1-16: Assessment 9248 – Culvert End Treatment.

Assessment Condition

- Good:** Culvert end treatment has little or no deterioration. Timber may have minor splitting. Steel may have minor surface corrosion. Masonry may have minor weathering (mortar joints are sound). Concrete may have minor cracking or scale.
- Fair:** Culvert end treatment has minor to moderate deterioration. Timber may have moderate splitting (minor decay or fire damage). Steel may have moderate surface corrosion (minor section loss). Masonry may have moderate weathering (mortar joints may have minor deterioration). Concrete may have moderate cracking or scaling (there may be minor delamination or spalling). End treatment may have slight undermining, settlement, misalignment, or separation.
- Poor:** Culvert end treatment has extensive deterioration. Timber may have extensive splitting - there may be significant decay or fire damage (slight sagging or crushing). Steel may have extensive corrosion (measurable section loss). Masonry may have extensive weathering (mortar joints may have significant deterioration). Concrete may have extensive cracking or scaling (delamination or spalling may be prevalent). End treatment may have significant undermining, settlement, misalignment, or separation.
- Severe:** Culvert end treatment has severe deterioration, the function or structural capacity of the culvert has been severely impacted - immediate repairs or structural analysis may be required. Timber may have severe splitting or advanced decay (severe sagging or crushing). Steel may have advanced corrosion (severe section loss). Masonry may have severe weathering (mortar joints may have failed). Concrete may have severe cracking, scaling, delamination, or spalling. End treatment may have severe undermining, settlement, misalignment, or separation.

2.7.1.28 Crash Walls/Web Walls/Cross Bracing or Struts (Assessment 9250)

This assessment evaluates all types of cross bracing systems not defined by other elements. This assessment can only be used on substructures. Examples of this assessment include cross bracing between columns, crash walls, and web walls.

On the inspection report form, crash walls/web walls/cross bracing or struts are recorded in units of “each” for each substructure unit. If a single substructure unit has several braces on it, the quantity will still be one each for the entire substructure unit. In addition, if bracing joins two adjacent substructure units, then this brace will be quantified under this assessment, one for each side of the substructure units.

It is the inspector’s task to examine each system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-17: Assessment 9250 – Crash Walls/Web Walls/Cross Bracing or Struts.

Assessment Condition

- Good: No deterioration.
- Fair: Minor deterioration is present but does not affect serviceability of the element.
- Poor: Moderate deterioration is present but not of sufficient magnitude to affect serviceability of the bridge.
- Severe: The system no longer functions as intended.

2.7.1.29 Dolphin or Fender System (Assessment 9290)

This assessment evaluates systems used to protect bridge substructure units from vessel collisions. These systems can be either free standing or attached to the substructure.

On the inspection report form, dolphin or fender systems are recorded in units of “each” for each system. If there are several free standing dolphins in the vicinity of the bridge structure, each one of these dolphins will be captured as an individual assessment. Similarly, each substructure unit found in the water with a fender system associated with it will be captured as an individual assessment.

It is the inspector’s task to examine each system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-18: Assessment 9290 – Dolphin or Fender System.

Assessment Condition

- | | |
|---------|--|
| Good: | The dolphin or fender system has little to no deterioration. Minor wear and deterioration may be present but the system is functioning as intended. |
| Fair: | The dolphin or fender system shows signs of deterioration or minor collision damage but the protection of the bridge has not been compromised. |
| Poor: | The dolphin or fender system has advanced deterioration or significant collision damage that compromises its effectiveness in protecting the bridge. |
| Severe: | The dolphin or fender system has failed and provides little to no protection for the bridge. |

2.7.1.30 Approach Roadway – Concrete (non-structural) (Assessment 9322)

This assessment evaluates approach roadway sections that are concrete but are not designed as a structural approach roadway. Structural approaches are elements and shall be coded under Elements 320 and 321.

On the inspection report form, non-structural approach roadways are recorded in units of “each” where each approach counts as its own assessment. Most bridges will have two assessments for approach roadway, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number). In addition, bridges with a grass median may have four approach roadway assessments. If a known approach has been recently paved over, the inspector should keep the existing assessment and make note of the change in the assessment note. If the approach has been replaced with a different type of approach, the inspection report should reflect the change by the removal of the old assessment and addition of the new approach type.

It is the inspector’s task to examine each system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-19: Assessment 9322 – Concrete Approach Roadway.

Assessment Condition

- | | |
|-------|--|
| Good: | No deterioration or horizontal or vertical movement other than superficial surface cracks. |
| Fair: | Minor cracks & spalls. There may be some settlement or heaving which increases traffic impact on bridge. <1/2” settlement. |
| Poor: | Cracks may extend through slab, but doesn’t act as if it is broken. Major spalls, but they do not affect the structural integrity of the slab. <1” settlement. |

Severe: Slab is broken or rocks under traffic loads. Settlement >1 " and cannot be corrected without increasing the size of the slab. Deterioration is excessive which no longer allows for mudjacking.

2.7.1.31 Approach Roadway – Asphalt (Assessment 9323)

This assessment evaluates approach roadway sections that are composed of asphalt.

On the inspection report form, approach roadways are recorded in units of "each" where each approach counts as its own assessment. On the inspection report form, approach roadways are recorded in units of "each" where each approach counts as its own assessment. Most bridges will have two assessments for approach roadway, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number). In addition, bridges with a grass median may have four approach roadway assessments. If a known approach has been recently paved over, the inspector should keep the existing assessment and make note of the change in the assessment note. If the approach has been replaced with a different type of approach, the inspection report should reflect the change by the removal of the old assessment and addition of the new approach type.

It is the inspector's task to examine each system and reasonably assign the most severe assessment condition to each assessment. Quantifying these amounts helps to generate quantity/cost estimates for future remedial work.



Figure 2.7.1-20: Assessment 9323 – Asphalt Approach Roadway.

Assessment Condition

Good: No deterioration or settlement other than superficial cracks.

Fair: Minor cracks. May be minor settlement which increases traffic impact on bridge. $<1/2$ " settlement.

- Poor: Alligator cracks and possible rutting is evident. Settlement may be occurring which increases traffic impact on bridge. <1" settlement.
- Severe: Major rutting and cracks are evident. >1" settlement which increases traffic impact on the bridge.

2.7.1.32 Approach Roadway – Gravel (Assessment 9324)

This assessment evaluates approach roadway sections that are composed of gravel.

On the inspection report form, approach roadways are recorded in units of "each" where each approach counts as its own assessment. On the inspection report form, approach roadways are recorded in units of "each" where each approach counts as its own assessment. Most bridges will have two assessments for approach roadway, with the exception of the spans of unit bridges (larger bridges that are comprised of adjacent bridge segments, each with a separate bridge number). In addition, bridges with a grass median may have four approach roadway assessments. If a known approach has been recently paved over, the inspector should keep the existing assessment and make note of the change in the assessment note. If the approach has been replaced with a different type of approach, the inspection report should reflect the change by the removal of the old assessment and addition of the new approach type.

It is the inspector's task to examine each system and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment's state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-21: Assessment 9324 – Gravel Approach Roadway.

Assessment Condition

- Good: No potholes or depressions near edge of bridge deck. Minimal gravel may have been pushed onto deck. Approaches provide smooth transition to bridge.

- Fair:** Minor potholes or depressions near edge of bridge deck or minor amounts of gravel pushed up on deck. Minor problems that are sufficient to create a noticeable traffic bump.
- Poor:** Moderate potholes or depressions less than 1 inch deep near edge of bridge deck or moderate amounts of gravel pushed up on deck. Minor problems that are sufficient to create a noticeable traffic bump.
- Severe:** Significant potholes or depressions greater than 1 inch deep near edge of bridge deck or significant amounts of gravel pushed onto deck. Problems that are substantial enough to launch vehicular traffic so that vehicles bounce on the bridge creating possible impact damage.

2.7.1.33 Roadway Over Structure (Assessment 9325)

This assessment evaluates the roadway over a buried bridge/culvert where there is more than 9" of fill at any point above the structure.

On the inspection report form, roadways over structures are recorded in units of “each” where a bridge/culvert will have one roadway over structure assessment. For roadways on fill over structures, when medians or sidewalks are observed on the roadway, these components shall be evaluated under the Roadway Over Structure assessment.

It is the inspector’s task to examine each roadway and reasonably assign the most severe assessment condition to each assessment. Quantifying these amounts helps to generate quantity/cost estimates for future remedial work.



Figure 2.7.1-22: Assessment 9325 – Roadway over Structure.

Assessment Condition

- Good:** The roadway over structure is smooth and shows no sign of settlement.
- Fair:** The roadway over structure has minor settlement and roadway may be cracked and deteriorated.

- Poor: The roadway over structure has moderate settlement and roadway may be cracked and deteriorated.
- Severe: Roadway over structure has significant deterioration and settlement.

2.7.1.34 Decorative Rail (Assessment 9335)

This assessment includes railing on top of concrete parapet, chain link fence stub between a sidewalk and a travelled way, and other non-screening rail on the exterior of the bridge fascia. These rails can be on the outside fascia of the bridge, or between the roadway and a sidewalk. Also included will be the aluminum/steel tube railing attached to a concrete railing to bring the height of the railing up to standard.

On the inspection report form decorative rail is recorded in units of “each” for one continuous span along a bridge. Therefore, each side of the bridge would be considered two rails if present. Additional railings may be added if barriers are present between sidewalks and traffic.

It is the inspector’s task to examine each decorative rail assessment and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-23: Assessment 9335 – Decorative Rail.

Assessment Condition

- Good: Rail has little or no deterioration. Galvanizing or protective coating is sound.
- Fair: Rail has minor deterioration. Coating may have minor failures and surface corrosion may be present.
- Poor: Rail has moderate deterioration. Coatings may have moderate failure and surface corrosion may be prevalent. Components may be bent or misaligned and connections may be loose.

Severe: Rail has extensive deterioration. Coating may have extensive failure and there may be section loss in exposed areas. Components may be bent or misaligned and connections may be loose.

2.7.1.35 Luminaire Bases (Assessment 9336)

This assessment evaluates the concrete base unit of luminaire supports typically located on the bridge railing along the side of the bridge. This does not take into account the condition of the actual light pole associated with the concrete base. This assessment does not include the base of sign structures, which will be evaluated as the foundation during sign structure inspections.

On the inspection report form, luminaire bases are recorded in units of “each” for every bump out.

It is the inspector’s task to examine each luminaire base and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-24: Assessment 9336 – Luminaire Bases.

Assessment Condition

Good: Good condition, with no problems noted.

Fair: Fair condition, with superficial spalls, small areas of delamination, and/or hairline cracking. No steel reinforcement is exposed.

Poor: Moderate deterioration, with cracking and spalls. Steel reinforcement may be exposed with surface corrosion present.

Severe: Base has failed. Major deterioration noted. Major spalls exist and steel reinforcement is exposed with section loss.

2.7.1.36 Protective Screening (Assessment 9337)

This assessment evaluates protective screening or fencing on the exterior of a bridge structure that prevents debris from falling on traffic below. An example of protective screening is chain link fencing. Also included would be railing with protective screening (mesh fence) embedded into it.

On the inspection report form protective screening is recorded in units of “each” for one continuous span along a bridge. Therefore, for fencing on each side of a bridge, the quantity would be two protective screens.

It is the inspector’s task to examine each protective screening assessment and reasonably assign the most severe assessment condition to each assessment. This will quantify the assessment’s state of deterioration and help generate quantity/cost estimates for future remedial work.



Figure 2.7.1-25: Assessment 9337 – Protective Screening

Assessment Condition

- Good:** Chain link fence or screening has little or no deterioration. Galvanizing or vinyl coating is sound.
- Fair:** Chain link fence or screening has minor deterioration. Coating may have minor failure - surface rust may be present. Fence components are properly aligned (all connections are sound).
- Poor:** Chain link fence or screening has moderate deterioration. Coating may have moderate failure - surface rust may be prevalent. Components may be slightly bent or misaligned - connections may be slightly loose. Fabric may have snags or holes (areas may be slightly stretched or deformed).
- Severe:** Chain link fence or screening has extensive deterioration. Coating may have extensive failure - there may be section loss. Components may be bent or



misaligned - connections may be loose. Fabric may have numerous snags or holes (areas may be stretched or deformed).