

Table 4-2

## CRITERIA FOR CLASSIFICATION OF SEVERITY OF DAMAGE

CODE	TYPE OF DAMAGES	SEVERITY OF DAMAGE	
1	<b>CORROSION</b> (Steel)	<b>LIGHT</b>	Loose rust formation and pitting in the paint surface. No noticeable section loss.
		<b>MEDIUM</b>	Loose rust formation with scales/flakes. Definite areas of rust up to 10% section loss.
		<b>SEVERE</b>	Stratified rust with pitting of metal surface. 10% to 20% section loss.
		<b>V.SEVERE</b>	Extensive rusting with local perforation/rusting through. >20% section loss.
2	<b>FRACTURE AT STEEL</b> (Steel)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
3	<b>LOOSE CONNECTIONS</b> Primary (Steel)	<b>LIGHT</b>	Up to 10% of fasteners loose or missing
		<b>MEDIUM</b>	10 to 20% of fasteners loose or missing
		<b>SEVERE</b>	20 to 30% of fasteners loose or missing
		<b>V.SEVERE</b>	> 30% of fasteners loose or missing
	<b>LOOSE CONNECTIONS</b> Secondary	<b>LIGHT</b>	Up to 20% of fasteners loose or missing
		<b>MEDIUM</b>	20 to 40% of fasteners loose or missing
		<b>SEVERE</b>	40 to 60% of fasteners loose or missing
		<b>V.SEVERE</b>	> 60% of fasteners loose or missing
4	<b>PERMANENT DEFORMATIONS</b> (Steel & Rubber)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
5	<b>PAINT DETERIORATION</b> (Steel)	<b>LIGHT</b>	Up to 10% of surface area affected
		<b>MEDIUM</b>	10 to 20% of surface area affected
		<b>SEVERE</b>	20 to 30% of surface area affected
		<b>V.SEVERE</b>	> 30% of surface area affected
6	<b>CRACK</b> (Reinforced Concrete)	<b>LIGHT</b>	If cracks are <b>Hairline</b> i.e. < 0.1mm wide, rating shall be 1
		<b>MEDIUM</b>	If cracks are <b>Narrow</b> i.e. - 0.1mm to 0.3mm wide, rating shall be 2
		<b>SEVERE</b>	If cracks are <b>Medium</b> size i.e. - 0.3mm to 1.0mm wide, rating shall be 3
		<b>V.SEVERE</b>	If cracks are <b>Wide</b> size i.e. - > 1.0mm wide, rating shall be 4
	<b>CRACK</b> (Prestressed Concrete)	<b>LIGHT</b>	
		<b>MEDIUM</b>	If cracks are <b>Narrow</b> i.e. > 0.2mm & crack spacing between 500mm & 1000mm, rating shall be 2
		<b>SEVERE</b>	If cracks are <b>Medium</b> size i.e. > 0.3mm & crack spacing < 500mm, rating shall be 3
		<b>V.SEVERE</b>	If cracks are <b>Wide</b> size i.e. - > 1.0mm wide, rating shall be 4
7	<b>SPALLING</b> (Reinforced Concrete)	<b>LIGHT</b>	Spalled area measuring < 150mm in any direction or < 25mm in depth.
		<b>MEDIUM</b>	Area measuring 150mm - 300mm in any direction or between 25mm - 50mm in depth.
		<b>SEVERE</b>	Area measuring 300mm - 600mm in any direction or between 50mm - 100mm in depth.
		<b>V.SEVERE</b>	Spalled area measuring > 600mm in any direction or > 100mm in depth.
	<b>SPALLING</b> (Prestressed Concrete)	<b>LIGHT</b>	Spalled area measuring < 25mm in any direction or < 25mm in depth.
		<b>MEDIUM</b>	Area measuring 25mm - 50mm in any direction or 25mm - 50mm in depth, rating shall be 2.
		<b>SEVERE</b>	Area measuring 50mm - 100mm in any direction or 50mm - 100mm in depth, rating shall be 3.
		<b>V.SEVERE</b>	Spalled area measuring > 100mm in any direction or > 100mm in depth, rating shall be 4.
8	<b>CORROSION OF REINFORCEMENT</b> (Concrete)	<b>LIGHT</b>	Light rust stain on the concrete surface.
		<b>MEDIUM</b>	Exposed rebar with uniform light rust. Loss of reinforcing steel section <10%.
		<b>SEVERE</b>	Exposed rebar with heavy rusting and localized pitting. Loss of section 10%-20%
		<b>V.SEVERE</b>	Exposed rebar with very heavy rusting and pitting. Loss of section > 20%
9	<b>WEAR/ABRASION</b> (Concrete)	<b>LIGHT</b>	Section loss up to 25mm in depth with some loss of coarse aggregate.
		<b>MEDIUM</b>	Section loss 25mm - 50mm deep, loss of aggregate & exposure of rebar
		<b>SEVERE</b>	Section loss 50mm - 100mm deep, loss of aggregate & rebar exposure large area.
		<b>V.SEVERE</b>	Section loss > 100mm deep & extending over large area.
10	<b>MATERIAL DETERIORATION</b> (Concrete)	<b>LIGHT</b>	Section loss up to 25mm in depth with some loss of coarse aggregate.
		<b>MEDIUM</b>	Section loss 25mm - 50mm deep, loss of aggregate & exposure of rebar.
		<b>SEVERE</b>	Section loss 50mm - 100mm deep, loss of aggregate & rebar exposure large area.
		<b>V.SEVERE</b>	Section loss > 100mm deep & extending over large area.
	<b>MATERIAL DETERIORATION</b> (Masonry)	<b>LIGHT</b>	Mortar lost from the joints in a few places, to a depth of 20 mm.
		<b>MEDIUM</b>	Mortar lost from the joints over an extended area, to a depth between 20 and 50 mm.
		<b>SEVERE</b>	Extensive loss of mortar resulting in the loss of a few stones.
		<b>V.SEVERE</b>	Extensive loss of stones endangering the stability of the structure
11	<b>SURFACE DEFECTS</b> (Concrete)	<b>LIGHT</b>	Honeycomb area measuring < 150mm in any direction.
		<b>MEDIUM</b>	Honeycomb area measuring 150mm - 300mm in any direction.
		<b>SEVERE</b>	Honeycomb area measuring 300mm - 600mm in any direction.
		<b>V.SEVERE</b>	Honeycomb area measuring > 600mm in any direction.
12	<b>DELAMINATION</b> (Concrete)	<b>LIGHT</b>	Delaminated area measuring < 150mm in any direction.
		<b>MEDIUM</b>	Delaminated area measuring 150mm - 300mm in any direction.
		<b>SEVERE</b>	Delaminated area measuring 300mm - 600mm in any direction.
		<b>V.SEVERE</b>	Delaminated area measuring > 600mm in any direction.

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## CRITERIA FOR CLASSIFICATION OF SEVERITY OF DAMAGE

CODE	TYPE OF DAMAGES	SEVERITY OF DAMAGE	
13	<b>ABNORMAL VIBRATION/ DEFLECTION</b> (At Beam)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
14	<b>WATER LEAK</b> (At Deck/Culvert) (Concrete)	<b>LIGHT</b>	If detected area measure < 2%, rating shall be 1
		<b>MEDIUM</b>	If detected area measure 2% - 5%, rating shall be 2
		<b>SEVERE</b>	If detected area measure 5% - 10%, rating shall be 3
		<b>V.SEVERE</b>	If detected area > 10%, rating shall be 4
	<b>WATER LEAK</b> (At Expansion Joint)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	If detected area measure up to 25%, rating shall be 2
		<b>SEVERE</b>	If detected area measure 25% - 50%, rating shall be 3
		<b>V.SEVERE</b>	If detected area > 50%, rating shall be 4
15	<b>TILT/SETTLEMENT</b> (At Abutment/pier)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
16	<b>ABNORMAL MOVEMENT</b>	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
17	<b>SCOURING</b> (At Abutment/pier)	<b>LIGHT</b>	If undermining and loss of support up to 5% of foundation, rating shall be 1
		<b>MEDIUM</b>	If undermining and loss of support of between 5 to 15% of foundation, rating shall be 2
		<b>SEVERE</b>	If undermining and loss of support of between 15% to 20% of foundation, rating shall be 3
		<b>V.SEVERE</b>	If undermining and loss of support of more than 20% of foundation, rating shall be 4
	(At Slope Protection)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	Scour area measuring 10%-20% in any direction, rating shall be 2
		<b>SEVERE</b>	Scour area measuring 20%-30% in any direction, rating shall be 3
		<b>V.SEVERE</b>	Scour area measuring >30% in any direction, rating shall be 4
	(At Culvert)	<b>LIGHT</b>	Minor scour at inlet\outlet of culvert, scour depth < 200mm
		<b>MEDIUM</b>	Significant scour at inlet\outlet of culvert, scour depth between 200mm - 300mm.
		<b>SEVERE</b>	Severe scour at inlet\outlet of culvert, scour depth between 300mm - 500mm.
		<b>V.SEVERE</b>	Extensive washout around inlet\outlet with loss of embankment fill, scour depth > 500mm.
18	<b>PONDING WATER</b> (At Bearing)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	If detected rating shall be 3
		<b>SEVERE</b>	-
		<b>V.SEVERE</b>	-
19	<b>DEBRIS/ VEGETATION</b> (At Bearing)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	If only debris detected, the rating shall be 3
		<b>SEVERE</b>	If debris with vegetation detected, the rating shall be 4.
		<b>V.SEVERE</b>	-
20	<b>DRAINAGE BLOCKED</b> (At Drainpipe)	<b>LIGHT</b>	Blockage of pipe up to 25%
		<b>MEDIUM</b>	Blockage of pipe 25% - 50%
		<b>SEVERE</b>	Blockage of pipe 50% - 75%
		<b>V.SEVERE</b>	Blockage of pipe > 75%
21	<b>NO PIPE/ INADEQUATE PIPE LENGTH</b> (At Drainpipe)	<b>LIGHT</b>	No water mark observed.
		<b>MEDIUM</b>	Slight water mark observed.
		<b>SEVERE</b>	Water spill directly on facade.
		<b>V.SEVERE</b>	Very wet surface.
22	<b>IMPACT DAMAGE</b> (At Parapet)	<b>LIGHT</b>	Parapet/Body intact
		<b>MEDIUM</b>	Minor indentation to parapet/body.
		<b>SEVERE</b>	Severely damaged parapet/body.
		<b>V.SEVERE</b>	Parapet totally shifted out of position.
23	<b>POT-HOLE</b> (At Pavement)	<b>LIGHT</b>	Holes measuring < 150mm in any direction or 25mm in depth
		<b>MEDIUM</b>	Holes measuring 150mm - 300mm in any direction or between 25mm - 50mm in depth
		<b>SEVERE</b>	Holes measuring 300mm - 600mm in any direction or between 50mm - 100mm in depth
		<b>V.SEVERE</b>	Holes measuring > 600mm in any direction or > 100mm deep
24	<b>RUTTING</b> (At Pavement)	<b>LIGHT</b>	Less than 10mm deep
		<b>MEDIUM</b>	From 10mm - 20mm deep
		<b>SEVERE</b>	From 20mm - 40mm deep
		<b>V.SEVERE</b>	> 40mm deep

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CODE	TYPE OF DAMAGES	SEVERITY OF DAMAGE	
25	<b>LOSS OF BOND &amp; DELAMINATION</b> (At Pavement)	<b>LIGHT</b>	Delaminated area measuring < 150mm in any direction.
		<b>MEDIUM</b>	Delaminated area measuring 150mm - 300mm in any direction.
		<b>SEVERE</b>	Delaminated area measuring 300mm - 600mm in any direction.
		<b>V.SEVERE</b>	Delaminated area measuring > 600mm in any direction.
26	<b>RIPPLING</b> (At Pavement)	<b>LIGHT</b>	Few noticeable bumps
		<b>MEDIUM</b>	Several bumps producing a rough ride.
		<b>SEVERE</b>	Numerous bumps producing a very rough ride with possible loss of vehicle control.
		<b>V.SEVERE</b>	Numerous bumps producing a very rough ride with imminent danger of loss vehicle control.
27	<b>PAVEMENT CRACK</b>	<b>LIGHT</b>	If alligator cracks cover an area of less than 10% within the same span rating shall be <b>1</b>
		<b>MEDIUM</b>	If alligator cracks cover an area of 10% to 15% within the same span rating shall be <b>2</b>
		<b>SEVERE</b>	If alligator cracks cover an area of 15% to 20% within the same span rating shall be <b>3</b>
		<b>V.SEVERE</b>	If alligator cracks cover an area of more than 20% within the same span rating shall be <b>4</b>
28	<b>CRACKS AT EXPANSION JOINT</b>	<b>LIGHT</b>	less than 5mm wide single or multiple cracks.
		<b>MEDIUM</b>	5mm-10mm wide single or multiple cracks.
		<b>SEVERE</b>	10mm-15mm wide single or multiple cracks.
		<b>V.SEVERE</b>	> 15mm wide single or multiple cracks.
29	<b>ABNORMAL SPACING</b> (At Expansion Joint)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
30	<b>DIFFERENCE IN LEVEL</b> (At Expansion Joint)	<b>LIGHT</b>	Difference in level < 10mm at expansion gap/bridge approach.
		<b>MEDIUM</b>	Difference in level between 10mm - 20mm at expansion gap/bridge approach.
		<b>SEVERE</b>	Difference in level between 20mm - 30mm at expansion gap/bridge approach.
		<b>V.SEVERE</b>	Difference in level > 30mm at expansion gap/bridge approach.
31	<b>ABNORMAL NOISE</b> (At Expansion Joint)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	-
		<b>SEVERE</b>	If detected rating shall be 4
		<b>V.SEVERE</b>	-
32	<b>RUPTURE</b> (At Expansion Joint)	<b>LIGHT</b>	Fine or hair line crack detected on rubber seal.
		<b>MEDIUM</b>	Medium crack detected on rubber seal.
		<b>SEVERE</b>	Wide or large crack detected on rubber seal.
		<b>V.SEVERE</b>	Rubber seal dislodge or peel off from location.
33	<b>BULDGING</b> (At Bearing)	<b>LIGHT</b>	
		<b>MEDIUM</b>	
		<b>SEVERE</b>	Severe crack, abnormal buldge, worn out and aged, rating = 4.
		<b>V.SEVERE</b>	
34	<b>ABNORMAL DISPLACEMENT</b> (Bearing)	<b>LIGHT</b>	-
		<b>MEDIUM</b>	If bearing has been displaced by less than 10%, rating shall be <b>2</b> .
		<b>SEVERE</b>	If bearing has been displaced by less than 10% - 20%, rating shall be <b>3</b> .
		<b>V.SEVERE</b>	If bearing has been displaced by more than 20%, rating shall be <b>4</b> .
35	<b>EROSION</b> (At Slope Protection)	<b>LIGHT</b>	Less than 5% loss of materials at embankments directly supporting foundation, rating shall be <b>1</b> .
		<b>MEDIUM</b>	5% to 15% loss of materials at embankments directly supporting foundation, rating shall be <b>2</b> .
		<b>SEVERE</b>	15% to 20% loss of materials at embankments directly supporting foundation, rating shall be <b>3</b> .
		<b>V.SEVERE</b>	More than 20% loss of materials at embankments directly supporting foundation, rating shall be <b>4</b> .
	<b>EROSION</b> (At River Bank)	<b>LIGHT</b>	Less than 10% loss of materials at embankments, rating shall be <b>1</b> .
		<b>MEDIUM</b>	10% to 30% loss of materials at embankments, rating shall be <b>2</b> .
		<b>SEVERE</b>	30% to 40% loss of materials at embankments, rating shall be <b>3</b> .
		<b>V.SEVERE</b>	More than 40% loss of materials at embankments, rating shall be <b>4</b> .
36	<b>MATERIAL LOSS/ DISINTEGRATION</b> (At Slope Protection)	<b>LIGHT</b>	Hairline cracks and minor loss of stones to a depth of 50 mm deep.
		<b>MEDIUM</b>	Narrow cracks and loss of stones between 50 and 100 mm deep.
		<b>SEVERE</b>	Spalling and disintegration of stones with section loss between 100mm to 150mm.
		<b>V.SEVERE</b>	Extensive loss of stones and disintegration endangering the stability of the structure.
37	<b>SILTING</b> (At Culvert)	<b>LIGHT</b>	Silting covered < 20% of culvert height.
		<b>MEDIUM</b>	Silting covered from 20% - 30% of culvert height.
		<b>SEVERE</b>	Silting covered from 30% - 50% of culvert height.
		<b>V.SEVERE</b>	Silting covered > 50% of culvert height.
38	<b>INADEQUATE SIZE</b>	<b>LIGHT</b>	1:1 Ratio of abutment spacing/culvert size to the size of rivers/streams, rating shall be <b>1</b>
		<b>MEDIUM</b>	1:1.5 Ratio of abutment spacing/culvert size to the size of rivers/streams, rating shall be <b>2</b>
		<b>SEVERE</b>	1:2 Ratio of abutment spacing/culvert size to the size of rivers/streams, rating shall be <b>3</b>
		<b>V.SEVERE</b>	>1:2 Ratio of abutment spacing/culvert size to the size of rivers/streams, rating shall be <b>4</b>