2.0 CHAPTER 2 – CONCRETE DECK INSPECTION (CDK2)

2.1 INTRODUCTION

The Level 2 Concrete Deck Inspection is primarily a quantitative condition inspection. It is a visual inspection that groups areas of like condition and quantifies signs of deterioration such as cracking, staining and debonding. The inspection is focused on the concrete components of the deck, but includes other elements that influence the condition and service life of the concrete components, such as a wearing surface or concrete overlay. The inspection also focuses on components that would be included in rehabilitation work done to the deck, such as concrete edge elements or deck joints.

Level 2 deck inspections are usually performed by specialized inspectors without the use of special tools, with the exception of a chain for chain dragging. The inspection is usually performed from the deck, ground level, or from permanent access-ways such as catwalks. No special access is generally required.

The components of the deck that are inspected are the following:

- Wearing Surface
- Concrete Overlay
- Concrete Deck
- Concrete Edge Elements
- Deck Joints

Additional reference information on these bridge components can be found in the Level 1 BIM Inspection Manual.

Level 2 concrete deck inspections are currently performed on approximately 120 bridge sites per year throughout Alberta on a 4 to 5 year inspection cycle. Additional Level 2 deck inspections are also carried out on an 'as required' basis on other bridge sites. These may be completed as part of a bridge assessment or because of a need identified in a previous Level 1 inspection.

2.1.1 PURPOSE OF LEVEL 2 CONCRETE DECK INSPECTIONS

The purpose of the inspection is to rate and measure the deterioration according to established guidelines in order to provide a condition assessment of the deck components. This assessment gives the Department a detailed picture of the deck condition to help determine appropriate deck maintenance and rehabilitation strategies.

2.2 LEVEL 2 ELEMENT RATINGS

Level 2 concrete deck inspection ratings are fundamentally different than those of the Level 1 inspection ratings. Level 2 inspections collect quantified condition data that provide information on how much of each deck element is in a particular condition state. This condition, and change in

condition, can then be tracked over time. Level 1 inspections only reflect the worst condition state of a particular element to flag the Department to follow up with a more detailed inspection.

2.2.1 PERCENT INSPECTED (%/I) AND RATING BREAKDOWN

The inspector identifies the visible amount of each major component to be inspected. If the entire component is visible, the inspector records that 100% of the component was inspected in the %/I field. If only half of the component is visible, the inspector records that 50% of the component is inspected.

The inspector then rates the area of the component that is visible. The ratings are based on the 9 point rating scale used in the Level 1 inspections as shown in Table 2.1. For additional information on this rating scale, refer to Section 1 of the Level 1 BIM Inspection Manual. This rating scale reflects the condition and functionality, as well as the priority or urgency for maintenance actions. This urgency for maintenance depends heavily on the importance of the element to the safe function of the structure.

Rating		Commentary	Maintenance Priority
9	Very Good	New condition.	No repairs in foreseeable future.
8		Almost new condition.	No repairs in foreseeable future.
7	Good	Could be upgraded to new condition with very little effort.	No repairs necessary at this time.
6		Generally good condition. Functioning as designed with no signs of distress of deterioration.	No repairs necessary at this time.
5	Adequate	Acceptable condition. Minor flaws, but functioning as intended.	No repairs necessary. Consider preventative measures.
4		Below minimum acceptable condition.	Low priority.
3	Poor	Presence of distress or deterioration. Not functioning as intended.	Medium priority.
2		May require continued observation until work is completed.	High priority.
1	Immediate Action	Danger of collapse and/or danger to users.	Immediate action required. Bridge closure.

Table 2.1 – Condition Rating System

In Level 2 inspections, several ratings are grouped together into categories. Ratings from 9-7 are grouped together since these are very good condition ratings, and then ratings 6 and 5 are also grouped as adequate ratings. Ratings of 4 and 3 each have their own category since these ratings are the most critical and will influence the maintenance priority of the element. Ratings of 2 and 1 are grouped together as well since these ratings are relatively uncommon and the maintenance or repair approach for these ratings is basically the same – fix the element now.

If the visible area of the component has one uniform condition throughout, then one general rating will suffice. When the visible area of the component has numerous areas of varying conditions, then each different area receives its own rating. The inspector identifies how much of the visible area is represented by each particular rating. For example, 60% of the area may be rated 6/5, 35% of the area may be rated 4, and 5% of the visible area may be rated 3. The total of the ratings should always add up to 100%, as in this example 60% + 35% + 5% = 100% of the visible area.

When determining the respective percentage amounts of the inspected area in each rating category, the inspector should use areas that are multiples of 5%. The only exception to this rule is when there is a very small or isolated area that is in poor condition and the rest of the element is in adequate, good or very good condition. In this case, rate the area of the element that is in very poor condition as if it is 1% of the area, even though the actual affected area may be much less that 1%.

For additional clarification, consider the example of a wearing surface rating as shown in Figure 2.1. In this example, the wearing surface is a polymer overlay over the entire deck, with a seal coat placed overtop of the polymer. However, the seal coat was not applied from curb to curb but only in the travel lanes and not on the shoulders. The entire seal coat wearing surface is visible, so it is 100% inspected as shown in the %/I column. On the shoulders, the polymer overlay is still visible, therefore 10% of the polymer overlay can be inspected and '10' is recorded in the %/I column. Of that 10% visible area of the polymer, 90% is rated 6/5, and the remaining 10% is rated 4. Meanwhile, the entire surface of the seal coat is visible and 95% is rated 9-7 and 5% is rated 4.

ITEM		CONDITION NOW					
		%/I	9-7	6/5	4	3	2/1
Polymer rating:	% area	10		90	10		
ACP rating:	% area	X					
Seal Coat rating:	% area	100	95		5		

Figure 2.1 – Example of Concrete Deck Inspection Ratings for a Wearing Surface

2.2.2 CONDITION LAST / CONDITION NOW

Each major element that is inspected in the Level 2 deck inspection has columns for both the current condition and the ratings from the previous Level 2 inspection. These are respectively, the Condition Now and the Condition Last columns. The inspector is only required to complete the Condition Now fields and not the Condition Last fields. The Condition Last fields will be brought forward from the previous Level 2 deck inspection if it exists. These previous values are provided only for comparison to the current ratings.

2.2.3 COMMENT FIELDS

Each section of the Level 2 Concrete Deck Inspection form has four lines provided for additional comments. These comment lines should be used to help describe the situation at the bridge. Clarifying comments are required for ratings of 4 or less. These can be general

comments for large areas of like ratings but they should be more location specific for smaller or isolated areas of deterioration.

One of the goals of the Level 2 deck inspection is to create a clear picture of an existing problem or concern at a bridge site for the Department such that a decision or course of action can be undertaken. Inspectors must continually ask themselves if their inspection report is accomplishing this goal of accurately portraying a bridge site.

2.2.4 FOLLOW-UP ACTION

The inspector is required to follow up on any inspected elements that are in such poor condition that a structural or safety hazard to the travelling public exists. These items must be photographed and reported to an appropriate Department representative, such as the Bridge Manager. The inspector should also complete the Items Requiring Immediate Attention field on the last page of the Level 2 forms, as described in Section 1.5.2.

Similar to Level 1 inspections, the inspector should photograph and comment on all deteriorated areas that are rated 3 or less. These may also be reported to the Bridge Manager as critical items. A rating of 2 or less for a critical element must be reported to the Bridge Manager immediately. Ratings of 4 require a comment and may also be photographed at the inspector's discretion.

The Level 2 inspection reports should also include additional photographs that illustrate the representative condition of the deck underside, wearing surface or rideability, curbs, parapets, medians, bridgerail, deck joints, superstructure, bearings, and substructure. Photos of any special or unique problems should also be included. The photos should be notated to indicate the location relative to the bridge and whether the subject is a typical phenomena throughout the site or an isolated single occurrence. The goal is to effectively communicate the current condition of the bridge to the Department.

2.2.5 CRACK WIDTHS

A crack is defined as a break without complete separation of the parts. It can be described as the following:

- **Structural** - Flexural, shear, anchorage
- **Shrinkage** - Caused by rapid drying of concrete
- **Settlement** - Caused by settling of formwork or foundation
- **Map** - Closely spaced cracks in all directions
- **Corrosion of steel reinforcement** - Usually due to lack of cover

Cracks in concrete deck elements are measure and recorded during a Level 2 inspection. The cracks are further categorized by crack width definitions as follows:

H -	Hairline	Less than 0.1 mm
N -	Narrow	0.1 mm to less than 0.3 mm
M -	Medium	0.3 mm to less than 1.0 mm
W -	Wide	Equal to or greater than 1.0 mm

2.2.6 SCALING

Scaling is the deterioration of the concrete surface due to a continuous loss of surface mortar and aggregate. Under certain conditions the hardened sand and cement paste that forms the smooth surface layer of the concrete breaks down over time, and falls away in scaly patches. This scaling can be caused by inadequate air entrainment, repeated freeze-thaw cycles in the presence of salts, or poor workmanship. Scaling can also be found under an asphalt wearing surface without a waterproofed membrane.

Typically, the depth of the scaling patches is shallow, but the coarse aggregate of the interior generally becomes exposed. The extent of scaling, for the purpose of Level 2 inspections, is described below:

L -	Light	Loss of surface mortar only up to 5 mm depth. Some surface exposure of coarse aggregate.
M -	Moderate	Loss of surface mortar to a depth of 10 mm. Some exposure of coarse aggregate.
H -	Heavy	Loss of surface mortar to a depth of 25 mm. Coarse aggregate clearly exposed and projecting from the surface.
S -	Severe	Loss of surface mortar to a depth greater than 25 mm. Loss of coarse aggregate.

2.2.7 SPALLING

Spalling is the breaking or bursting of concrete that occurs due to expansion forces that develop when steel reinforcing bars begin to corrode. Spalling also occurs to a lesser extent when poor quality aggregate swells. Divot-like deteriorated areas in the concrete surface are referred to as ‘spalls’.

2.2.8 STAINING

Inspectors have to distinguish between water staining and corrosion staining as these represent two different stages of deterioration. Water staining is an earlier stage and is generally white or gray coloured. Corrosion stains originate from the reinforcing steel or prestressing strands and are generally red or rust coloured.

In this Level 2 inspection, the staining severity guides are described below:

L -	Light	Efflorescence or exudation at cracks. Light grey damp appearance.
M -	Moderate	Dark grey damp appearance.
H -	Heavy	Efflorescence or exudation in stained areas. Light rust stains.
S -	Severe	Heavy rust stains.

2.2.8.1 Stained Cracks

Cracks in concrete can be stained as described in Section 2.2.8. Rust stains are the most serious stains that can be observed coming from cracks. Commonly, cracks in the underside of concrete components will have areas of white carbonate salt stains called efflorescence. These stains result from the evaporation of a calcium hydroxide solution that flows out of the concrete.

2.3 THE CDK2 FORM - STRUCTURE INVENTORY INFORMATION

The inventory information found at the top of the Level 2 Concrete Deck Inspection form (CDK2) contains the same inventory data found on the typical Level 1 and other Level 2 bridge and culvert inspection forms. Descriptions of these fields are found in Section 1.3.2 of the Level 2 Inspection Manual or Section 4 of the Level 1 BIM Inspection Manual.

Ensure the date of the Level 2 inspection is recorded in the header information on the first page. This date will be echoed onto the last page of the CDK2 form.

2.3.1 ADDITIONAL STRUCTURE INVENTORY INFORMATION

In addition to the inventory data in the header of the form, the CDK2 form provides additional information about the bridge structure. This section is located immediately below the header information on page one of the CDK2 form and is shown in Figure 2.2. Refer to Section 1.4 for a complete description of the Structure Information fields.

```
STRUCTURE INFORMATION:

No. of spans: ..    Span Types: .../...  Substructure Types: .../...
Span Lengths: .....-.....-.....-.....-.....m    Total Length: .....m
```

Figure 2.2 – CDK2, Additional Structure Information

2.4 WEARING SURFACES

The wearing surface of the deck is typically defined as the surface that is in direct contact with the wheels of a vehicle. In the Level 2 Concrete Deck Inspection, the wearing surface definition is refined further to include layers that are added on top of the concrete deck or concrete overlays. This includes polymer overlays, asphalt or seal coats. Note that polymer overlays may also be referred to as epoxy overlays, asphalt may be referred to as ACP, and seal coats may be called a chip coat or a chip seal.

The wearing surface typically extends across the entire bridge deck surface. It is considered to be a sacrificial layer that protects the structural deck or overlay against wear, road salt, and environmental effects. It also provides a smooth riding surface and skid resistance. The wearing surface is not considered a structural component, as it does not contribute to the load-carrying capacity of the bridge.

2.4.1 WEARING SURFACE INVENTORY INFORMATION

At the top of the Wearing Surface section as shown in Figure 2.3, there is a subsection that contains specific inventory information on the polymer, ACP, or seal coat wearing surfaces.

The inspector is required to complete the 'yes' or 'no' (Y/N) fields at the top of the section to indicate which wearing surfaces are present on the bridge. A 'Y' is recorded for all types that are present while an 'N' is recorded for all others. Note that the wearing surface does not necessarily have to be the top surface or be visible to be recorded.

WEARING SURFACE: Polymer (Y/N): _ ACP (Y/N): _ Seal Coat (Y/N): _

	Type	Year 1	Year 2	Avg. Total Thickness	Area
Polymer	...	....	....	..mm	.....sq m
ACP	...	....	....	...mm	.....sq m
Seal Coat	...	....	....	..mm	.....sq m

Figure 2.3 – CDK2, Wearing Surface Inventory Information

The remaining detailed inventory information in this section should be brought forward automatically from the Department's inventory system or from a previous inspection. If the fields are blank, the inspector should attempt to fill in what they can, but only with known values. It is not required that the inspector determine all of the inventory items unless specifically directed by the Department.

The fields in the wearing surface inventory are further explained below:

- **Type** - This field is for the specific type of wearing surface within the generic type. For example, polymer modified asphalt is a sub type of ACP.
- **Year 1** - This is the year that the wearing surface was placed.
- **Year 2** - This field is for the year that a second placement of the wearing surface occurred. This can occur with ACP and seal coat wearing surfaces. Polymer overlays will not use this field as only one placement year is allowed.
- **Average Total Thickness** - This is the total wearing surface thickness, in millimetres. The wearing surface thickness can vary greatly, but generally they are in the order of 5-10 mm for polymer, 50-150 mm for ACP, and 15 mm for seal coat. If the ACP depth varies greatly, the average thickness is provided.
- **Area** - This is the surface area of the wearing surface, in square metres.

2.4.2 WEARING SURFACE INSPECTION

The Wearing Surface Inspection part of the form is shown in Figure 2.4. This section requires entry of rating information on the polymer, ACP, or seal coat wearing surfaces.

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Polymer rating: % area												
ACP rating: % area												
Seal Coat rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
tot. debond/lost area (sq m)	P_____ A_____ S_____						P_____ A_____ S_____					

Figure 2.4 – CDK2, Wearing Surface Inspection

2.4.2.1 Rating Wearing Surfaces

Inspect the visible wearing surfaces and record the percentage of the total area inspected to the nearest 5% in the %/I field.

The top wearing surface is always 100% inspected unless it is covered by thick dirt and gravel. If there is a significant amount of area missing from the top wearing surface, such as 10%, the percent of the wearing surface inspected would still be 100% and not 90%. This is because 100% of the overall wearing surface area is visible and can be inspected, despite 10% of it being in very poor condition because it is missing.

If there are multiple layers of wearing surfaces, such as a seal coat applied on top of a polymer overlay or ACP, rate the top wearing surface and all lower wearing surfaces that are visible as shown previously in the example in Section 2.2.1. If the lower wearing surface is not visible at all, record an 'N' in the %/I field. Record an 'X' in the field if the wearing surface is not present at this site. Use comments whenever necessary to clarify why the wearing surface was not 100% inspected.

Rating guides for polymer, seal coat, and ACP wearing surfaces are shown in Tables 2.2, 2.3, and 2.4. These tables are guidelines only, as the actual wearing surface rating is based on the inspector's judgement. Group areas of like condition together and record the percent of the total area visible that falls into each rating category. Ensure that these areas add up to 100%. Consider the urgency of required maintenance or repairs in determining the rating.

As an example to illustrate how to rate wearing surfaces with large amounts of lost or debonded area, consider a site that has 10% missing polymer. Group the areas of the wearing surface into groups of like condition. According to Table 2.2, a polymer wearing surface with 10% area that is missing is rated 4. The remaining 90% of the area, assuming it is of uniform condition throughout, would be rated according to its condition, such as a rating of 6 or 7.

Rating	Polymer Debond/ Lost Area	Seal Coat Lost Area	Polymer Cracking	Slipperiness
7		≤1%		
6	≤1%	≤3%	$\leq {}^{1}/_{30}$ m/m^2	
5	≤3%	≤10%	$\leq {}^{1}/_{10}$ m/m^2	Light
4	≤10%	≤30%	$\leq {}^{1}/_{3}$ m/m^2	Moderate
3	≤30%	>30%	$\leq {}^{1}/_{1}$ m/m^2	Heavy
2	>30%		$> {}^{1}/_{1}$ m/m^2	Severe

Table 2.2 – Polymer & Seal Coat Wearing Surface Rating Guide

Rating	Severity	Flushing	Rutting and Surface Distortions	Skid Resistance (Skid Number)	Longitudinal, Transverse, Random Cracks	Lost Area (%) Potholes & Patches	Debond (%)
6					$\leq {}^{1}/_{30}$ m/m^2		≤1
5	Light	Variable colouring, localised veining	>10 mm	40-50	$\leq {}^{1}/_{10}$ m/m^2	≤1	≤3
4	Moderate	Distinct colour with free asphalt	10-25 mm	30-40	$\leq {}^{1}/_{3}$ m/m^2	≤3	≤10
3	Heavy	Wet look & tire noise. Traffic leaves tire impressions	25-50 mm	20-30	$\leq {}^{1}/_{1}$ m/m^2	≤10	≤30
2	Severe	Excess free asphalt with wet look. Feet leave impressions	>50 mm	< 20	$> {}^{1}/_{1}$ m/m^2	>10	>30

Table 2.3 – ACP Wearing Surface Rating Guide (1 of 2)

Rating	Severity	Ravelling	Cracking
5	Light	Noticeable loss of material.	1+ cracks < 10 mm width. Alligator pattern establishing, numerous interconnecting cracks. 1 or 2 edge cracks within 600 mm of edge.
4	Moderate	Shallow disintegration of surface with open textured appearance	1+ cracks 10-20 mm width. Alligator pattern established with corners of polygons fracturing. Multiple edge cracks within 900 mm of edge.
3	Heavy	Shallow disintegration of surface, small potholes. Open texture loose surface materials	1+ cracks 20-30 mm width. Alligator pattern established with spalling of polygon blocks. Multiple edge cracks within 1200 mm of edge with alligator cracking along edges.
2	Severe	Deep surface disintegration many potholes Very open texture with loose surface materials.	1+ cracks >30 mm width. Alligator cracking with polygon blocks lifting, creating potholes. Multiple edge cracks over 1200 mm of edge with alligator cracking along edges.

Table 2.4 – ACP Wearing Surface Rating Guide (2 of 2)

The inspector should also note the following other wearing surface rating guidelines from the Level 1 BIM Inspection Manual:

- If a wearing surface is relatively smooth without defects or cracks, it is rated 9-7.
- If an area of the wearing surface is in relatively good condition but has some cracking, it is rated 6/5.
- If traffic speed has to be reduced due to cracks, potholes, or other defects, it should be rated 4 or less.
- Seal coat ratings of 3 are rare, and should not be rated less than a 3. It is never critical that a seal coat be replaced immediately.
- If a thick wearing surface does not extend all the way to the curbs and the condition may be hazardous, it is rated 4 or less. The problem should be described in the comment field.
- If an excessive thickness of asphalt is found on the bridge deck, the wearing surface in not automatically rated down. The wearing surface is rated according to its condition and functionality. Make a comment describing the thickness and possibly recommend reducing the wearing surface thickness. If there are structural concerns, request an evaluation of the load carrying capacity of the bridge with the additional asphalt dead load.
- If certain areas of the wearing surface for a particular bridge seem to be in worse condition than others such as along a cold joint, in the gutters, or in a specific lane this should be identified in the comment lines.
- Note any longitudinal cracks that have reflected through the wearing surface in the comments.

2.4.2.2 Measured Damage

The inspector is to complete the measured damage field for all visible areas of the wearing surface. The measured damage field is further described below:

- **Total Debond/Lost Area (m²)** - Record the Total Debonded or Lost Area for each wearing surface. Debonded areas require chain dragging or hammer sounding to identify while lost area measurements are determined visually. Patched areas are included as lost area for ACP and seal coat. Patched areas on polymer overlays are treated the same as areas that are not patched. Complete loss of seal coat aggregate counts towards the lost area.

Record the amount of de-bonded or lost area for all wearing surfaces that are present at the site, even if the amount is zero. If the particular wearing surface is not present at the bridge site, put a '**-**' in the Total Debond/Lost Area field.

2.4.2.3 Comments

The inspector may use the comment area to distinguish how much of the recorded value is debonding and how much is lost area. They can also identify the location of localized debonding or lost areas.

2.5 CONCRETE OVERLAYS

A concrete overlay is a layer of concrete placed on the existing concrete deck, subsequent to or at the time of construction. The concrete overlay may have traffic directly on top of it or it may have an additional wearing surface placed on top of it, such as a seal coat or polymer overlay.

The purpose of the concrete overlay is to protect the underlying concrete deck from the ingress of chloride ions. This concrete overlay also adds protective cover to the rebar and has a relatively low permeability. Overlays may also contain steel fibre reinforcement to help control cracking.

2.5.1 CONCRETE OVERLAY INVENTORY INFORMATION

At the top of the Concrete Overlay section, there is a subsection that contains specific inventory information on the concrete overlay as shown in Figure 2.5. Each span type is inspected separately and the inspection results for each span type are located on a separate page. Therefore, if there are two span types at the bridge site, there will be two different pages for the concrete overlay inspection, with one for each span type. These pages of the CDK2 form will be numbered pages 2A and 2B.

For each span type, the inspector is required to complete the 'yes' or 'no' (Y/N) field at the top of the section that states whether or not a concrete overlay is present on the bridge. A 'Y' in this field means that a concrete overlay is present, even if there is another wearing surface on top of it. A 'N' is recorded when there is no overlay.

```
CONCRETE OVERLAY:        Overlay (Y/N): _

Deck Group: ..    Span Type: ...    Span Numbers: ...........     Area: .....sq m
Overlay Type: ...      Year Placed: ....    Avg. Thick.: ...mm
Long. Rebar -> Type: ..   Size: ...   Cover: ...mm   Spacing: ....mm
Trans. Rebar -> Type: ..   Size: ...   Cover: ...mm   Spacing: ....mm
Avg. 28 Day Strength: ....Mpa
```

Figure 2.5 – CDK2, Concrete Overlay Inventory Information

The remaining detailed inventory information in this section should be brought forward automatically from the Department's inventory system or from a previous inspection. However, if the fields are blank, the inspector is required to complete the Deck Group, Span Type, Span Numbers, Area and Overlay Type fields for each different span type. These fields are described below:

- **Deck Group** - A group number, starting with 1, is assigned to each span type. The main span should be Deck Group 1 and secondary span types should be 2 or greater.

- **Span Type** - The Span Type code according to the BIS Inventory. Examples of concrete spans types are in the BIS Codes and Explanations Manual.
- **Span Numbers** - All of the spans are numbered, beginning with number 1. They are numbered from south to north or from west to east. List all the span numbers that are included in the specific Deck Group in this field, separated by a comma. For example, if the site had 5 spans, and the middle 3 were in Deck Group 1 (the main spans), the Span Numbers field would be '2, 3, 4'.
- **Area (m²)** - The deck area of all of the spans in the Deck Group, in square metres.
- **Overlay Type** - The type of concrete overlay, according to the BIS codes listed below. If more than one overlay type exists in the deck group, record both codes separated by a slash. If there are multiple overlay types, describe the areas with the different overlay types in the comment lines.

  C - Concrete
  F - Fibre Reinforced Concrete
  H - High Density Concrete
  I - Silica Fume Concrete
  J - Silica Fume Concrete with Steel Fibre Reinforcement
  L - Latex Modified Concrete
  Y - Pyrament Concrete
  Z - Pyrament Concrete with Steel Fibre Reinforcement
  X - Other

  The year the overlay was placed may provide information as to the kind of overlay that may be present at a site. High density concrete overlays were placed on both new construction and on rehab projects from 1977 to 1985. Pyrament concrete was placed on a limited number of structures in the early 1990's and was found to be susceptible to early onset cracking. Since 1990, most concrete overlays are silica fume concrete, with or without steel fibre reinforcement.

The inspector can attempt to fill in the remaining fields of this section, but only with verified values. It is not required that the inspector determine all of the inventory items unless specifically directed by the Department. These remaining fields are listed below:

- **Year Placed** - The year the concrete overlay was placed.
- **Average Thickness (mm)** - The actual average thickness of the concrete overlay, above the deck, in millimetres. Several overlays are specified to a nominal 50 mm depth. However, the actual thickness tends to be 65-75 mm due to the removal of the top 15-25 mm of the concrete deck prior to placement of the overlay. The thickness can be variable along the length or width of the bridge due to adjustments made for camber, sag and crown.
- **Longitudinal and Transverse Rebar** - These fields describe the reinforcing steel that is in the reinforced concrete overlay. If the overlay does not have steel

reinforcement in it, then leave these fields blank. Do not include information on the rebar found in the deck, as it is recorded in the Deck section as described in Section 2.6.1. Identify the following for the steel reinforcement in the overlay:

- **Type** - The type of reinforcing in the edge element, if applicable. Examples include plain steel, epoxy coated, stainless steel, galvanized and steel fibre.
- **Size** - The size designation of the reinforcement, if applicable.
- **Cover** - The actual average clear cover over the reinforcement, if applicable.
- **Spacing** - The nominal bar spacing of the reinforcement, if applicable.

- **Average 28 Day Strength** - The average 28 day compressive strength of the concrete overlay, in MPa. The tested value is preferred.

2.5.2 CONCRETE OVERLAY INSPECTION

The Concrete Overlay Inspection section of the form is shown in Figure 2.6.

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Overlay rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						D_____ s_____ p_____					

Figure 2.6 – CDK2, Concrete Overlay Inspection

2.5.2.1 Rating Concrete Overlays

Inspect the visible area of the concrete overlay in the Deck Group and record the percentage of the total area inspected to the nearest 5% in the %/I field.

The top of the concrete overlay will be 100% inspected unless it is covered by thick dirt and gravel or unless there is another wearing surface applied on top of the overlay. If there is no overlay present at all, record an 'X' in the %/I field. If the overlay is covered completely by another wearing surface, record a 'N'. Use comments when necessary to clarify why the overlay was not inspected. For example, an appropriate comment might be "Overlay not inspected because it is protected by a polymer overlay".

A rating guide for concrete overlays is included as Table 2.5. This table provides rating guidelines for concrete overlays, however the final rating breakdown is based on the inspector's own judgement. Group areas of like condition together first, then record the percent of the total area that falls into each rating category. Consider the urgency of the required maintenance or repairs when determining the rating.

Rating	Scaling	Crack Frequency	Delaminated Areas	Spalled & Patched Areas
7		H/N $\leq {}^{1}/_{30}$ m/m^2		
6		H/N $\leq {}^{1}/_{10}$ m/m^2 M/W $\leq {}^{1}/_{30}$ m/m^2	≤1%	
5	Light	H/N $\leq {}^{1}/_{3}$ m/m^2 M/W $\leq {}^{1}/_{10}$ m/m^2	≤3%	
4	Moderate	H/N $\leq {}^{1}/_{1}$ m/m^2 M/W $\leq {}^{1}/_{3}$ m/m^2	≤10%	≤1%
3	Heavy	H/N $> {}^{1}/_{1}$ m/m^2 M/W $\leq {}^{1}/_{1}$ m/m^2	≤30%	≤3%
2	Severe	M/W $> {}^{1}/_{1}$ m/m^2	>30%	>3%

Table 2.5 – Concrete Overlay Rating Guide

Use the comment fields to help describe the condition at the site. Identify locations of similar condition, especially for areas of the overlay that are in poor condition. Also describe notable trends or generalities. For example, make a comment if most of the cracks are transverse and near the piers, if the cracks are random or in a certain lane, or if the majority of the delaminated areas are in the gutter or along the cold joint. Note any longitudinal or grout key cracks. Measure their distance out from the inside curb face and record which spans they are located on.

2.5.2.2 Measured Damage – Concrete Overlay

The inspector is to complete the measured damage fields for all visible areas of the concrete overlay. A '0' should be recorded if no damage is observed in a particular field. These measured damage fields are described below:

- **Total Crack Length (m)** - When measuring the crack length, only consider Medium (M) and Wide (W) cracks. Give the total crack length to the nearest metre for the entire Deck Group or Span Type. On large overlays with frequent cracks, a representative area can be measured such as ½ or ¼ of the area, and then extrapolated for the entire overlay. The inspector can only extrapolate for visible areas of the overlay that are in uniform condition throughout.
- **Total Scaled Area (m²)** - Record the scaled area of the concrete overlay to the nearest square metre. Light scaling (L) is measured separately from Moderate, Heavy or Severe scaling, which are all grouped together (M/H/S).
- **Delaminated Area (m²)** - Chain drag or hammer-sound the overlay and measure the total area of the overlay that is delaminated. Record it to the nearest square metre.
- **Spalled Area (m²)** - Measure the total area of spalls in the overlay and record them to the nearest square metre.

- **Patched Area (m²)** - Measure and record the area of all visible patches in the concrete overlay to the nearest square metre.

If there is no concrete overlay at the site, record a '**-**' in each of the measured damage fields.

2.6 CONCRETE DECKS

The concrete deck referred to in this section is the structural deck. The primary function of the deck is to carry traffic and transfer live loads from the vehicles to the bridge's main structural members below.

The deck top is the surface to which the concrete overlay or wearing surface is bonded. The deck may also serve as the wearing surface in the absence of a concrete overlay or other wearing surface. If the deck top is also acting as the wearing surface, it will be in direct contact with the traffic, so it must also provide a smooth skid resistant surface for vehicles. Typically, the top surface of concrete box girders is also the deck top.

The deck underside is the bottom side of the deck above the girders. In the case of precast concrete channel girders, the deck underside is considered to be the area between the girder legs. The underside needs to be inspected and monitored as serious deck problems can be observed from the underside such as cracking and heavy staining.

The inspector may not be able to inspect the deck underside of some box girders or voided slab spans because the visible bottom surface of the girder is not the underside of the deck. However, in some cases the inspector may still be able to rate the exposed deck underside between girder units.

2.6.1 CONCRETE DECK INVENTORY INFORMATION

At the top of the Concrete Deck Inventory Information section, there is a subsection containing specific inventory information on the deck as shown in Figure 2.7. Each span type is presented on separate pages. Therefore, if the bridge has two span types, each span type will have its own deck inspection page. All sites inspected with the CDK2 Level 2 form will have a concrete deck.

DECK:

```
Deck Group: ..    Span Type: ...    Span Numbers: ...........     Area: .....sq m
Deck Type: ...    Year Const: ....   Year Widened: ....    Min. Thickness: ...mm
Long. Rebar -> Type: ..   Size: ...   Cover: ...mm   Spacing: ....mm
Trans. Rebar -> Type: ..   Size: ...   Cover: ...mm   Spacing: ....mm
Avg. 28 Day Strength: ....Mpa
```

Figure 2.7 – CDK2, Concrete Deck Inventory Information

The detailed inventory information in this Concrete Deck Inventory Information section should be brought forward automatically from the Department's inventory system or from a previous inspection. If there is a concrete overlay at the site, the values for the Deck Group, Span Type, Span Numbers, and Area are the same as the Concrete Overlay Inventory Information described in Section 2.5.1. However, if the fields are blank, the inspector is required to

complete the Deck Group, Span Type, Span Numbers, Area and Deck Type fields for each different span type. These fields are further described below:

- **Deck Group** - A group number, starting with 1, is assigned to each span type. The main span should be Deck Group 1 and secondary span types should be 2 or greater.
- **Span Type** - The Span Type code according to the BIS Inventory. Examples of spans types are in the BIS Codes and Explanations Manual.
- **Span Numbers** - All of the spans are numbered, beginning with number 1. They are numbered from south to north or from west to east. List all the span numbers that are included in the specific Deck Group in this field, separated by a comma. For example, if the site had 5 spans, and the middle 3 were in Deck Group 1 (the main spans), the Span Numbers field would be '2, 3, 4'.
- **Area (m²)** - The deck area of all of the spans in the Deck Group, in square metres.
- **Deck Type** - The type of deck. Since this is a concrete deck inspection, all of the decks will be made of concrete. Record a 'C' in this field for 'reinforced concrete'.

The inspector can attempt to fill in the remaining fields of this section, but only with verified values. It is not required that the inspector determine all of the inventory items unless specifically directed by the Department. These remaining fields are listed below:

- **Year Constructed** - Identify the construction year of the deck.
- **Year Widened** - If the deck has been widened, identify the year. If the deck has not been widened, this field will be blank.
- **Minimum Thickness (mm)** - This field is the actual thickness of the concrete deck. For variable thickness decks, this will be the minimum thickness. If the thickness has been reduced (i.e. milling the surface to place an overlay), the deck thickness is to be reduced to the new value.
- **Longitudinal and Transverse Rebar** - These fields describe the top mat of reinforcing steel that is in the concrete deck. If the site has a reinforced concrete overlay on top of the deck, do not include information on the rebar found in the concrete overlay. It is recorded in the Concrete Overlay section described in Section 2.5.1. Identify the following for the steel reinforcement in the deck:
  - **Type** - The type of reinforcing in the deck. Examples include plain steel, epoxy coated, stainless steel, galvanized, and steel fibre.
  - **Size** - The size designation of the reinforcement, if applicable.
  - **Cover** - The actual average clear cover over the reinforcement in the deck. Do not include any additional wearing surfaces or overlays.
  - **Spacing** - The nominal bar spacing of the reinforcement, if applicable.
- **Average 28 Day Strength** - The average 28 day compressive strength of the concrete deck, in MPa. The tested value is preferred.

2.6.2 CONCRETE DECK INSPECTION ITEMS

The Concrete Deck Inspection area of the form is shown in Figure 2.8. This section requires entry of rating information on the concrete deck.

DECK:

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Top rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						d_____ s_____ p_____					
Underside rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total stained area (sq m)	M _____ H/S _____						M _____ H/S _____					
tot. crk. Len. (m)/% stained	M/W _____ % stn ____						M/W _____ % stn ____					

Figure 2.8 – CDK2, Concrete Deck Inspection

2.6.2.1 Deck Top Ratings

Inspect the visible area of the concrete deck in the Deck Group and record the percentage of the total area inspected to the nearest 5% in the %/I field.

If the deck top is completely exposed, it will be 100% inspected. If parts of the deck are covered with a wearing surface or debris, the percent inspected will be reduced accordingly. If the deck top is not visible at all because it is completely covered by an overlay or other wearing surface, then the inspector should record a 'N' in the %/I field. Comments should be used for clarification when the deck was partially inspected or not inspected at all.

A rating guide for concrete deck tops is included in Table 2.6. This table is only a guideline, as the actual concrete deck top rating breakdown is based on the inspector's judgement. Group areas of like condition together and record the percent of the visible areas of the concrete deck top that fall into each rating category. Consider the urgency of required maintenance or repairs in each area to determine the rating.

Rating	Scaling	Crack Frequency	Delaminated Areas	Spalled & Patched Areas	Underside Staining
7		H/N $\leq {}^{1}/_{30}$ m/m^2			
6		H/N $\leq {}^{1}/_{10}$ m/m^2 M/W $\leq {}^{1}/_{30}$ m/m^2			
5	Light	H/N $\leq {}^{1}/_{3}$ m/m^2 M/W $\leq {}^{1}/_{10}$ m/m^2	≤1%		Light
4	Moderate	H/N $\leq {}^{1}/_{1}$ m/m^2 M/W $\leq {}^{1}/_{3}$ m/m^2	≤3%	≤1%	Moderate
3	Heavy	H/N $> {}^{1}/_{1}$ m/m^2 M/W $\leq {}^{1}/_{1}$ m/m^2	≤10%	≤3%	Heavy
2	Severe	M/W $> {}^{1}/_{1}$ m/m^2	>10%	>3%	Severe

Table 2.6 – Concrete Deck Rating Guide

Other relevant aspects to consider when rating a deck top are listed below:

- The concrete paving lip that is visible on decks with an ACP wearing surface is part of the deck top and should therefore be included in the inspection of the deck top. Use the comments to note this situation.
- The top of concrete box girders and concrete channel girders is considered to be the deck top.
- Only measure and record the length of Medium (M) and Wide (W) cracks. Note in the comments if there are widespread or notable narrow cracks.
- Use the comment fields to help describe the condition at the site. Identify locations of similar condition, especially for areas of the deck in poor condition. Also describe notable trends or generalities. For example, make comments if most of the cracks are transverse and near the piers, if the cracks are random or in a certain lane, or if the majority of the delaminated areas are in the gutter or along the cold joint. Note any longitudinal or grout key cracks. Measure their distance out from the inside curb face and record which spans they are found on.

2.6.2.2 Measured Damage – Deck Top

The inspector is to complete the measured damage fields for all visible areas of the concrete deck. A '0' should be recorded if the deck top area was inspected, but no damage was observed for a particular field. These measured damage fields are further described below:

- **Total Crack Length (m)** - When measuring the crack length, only consider Medium (M) and Wide (W) cracks. Give the total crack length to the nearest metre for the entire Deck Group or Span Type. On large decks with frequent cracks, a representative area can be measured such

as ½ of the area, and then extrapolated for the entire deck. The inspector can only extrapolate for visible areas of the deck that are in uniform condition throughout.

- **Total Scaled Area (m²)** - Record the scaled area of the deck to the nearest square metre. Light scaling (L) is measured separately from Moderate, Heavy or Severe scaling, which are all grouped together (M/H/S).
- **Delaminated Area (m²)** - Chain drag or hammer-sound the deck and measure the total delaminated area. Record it to the nearest square metre.
- **Spalled Area (m²)** - Measure the total area of spalls in the overlay and record them to the nearest square metre.
- **Patched Area (m²)** - Measure and record the area of all visible patches in the concrete overlay to the nearest square metre.

If the deck is not visible at all, such as if there is a wearing surface on top of it, record a '**-**' in each of the measured damage fields.

2.6.2.3 Deck Underside Ratings

Inspect the visible area of the concrete deck underside in the Deck Group and record the percentage of the total area inspected to the nearest 5% in the %/I field.

If the deck underside is completely exposed and accessible, it will be 100% inspected. If parts of the deck are over water and cannot be inspected, reduce the percent inspected accordingly.

When a cast-in-place deck is inspected, the deck underside is visible in all locations except directly above the girder flanges, such as for WG or PO girders. However, this will not affect the percent inspected, as the deck underside is still considered to be 100% visible. Precast channel girders, such as FC girders, are also inspected in this way. The underside of channel girders is considered to be the deck underside and the legs do not affect the percent inspected, as they are not part of the deck underside,.

The deck underside is not generally visible when concrete box girders or voided slabs are present. The deck underside is considered to be the underside of the top surface of the box girder, not the underside of the bottom surface of the girder. In this situation, the inspector is to record a 'N' in the %/I field. If some area of the deck underside is visible between the girders then this area can be inspected. Use comments to clarify why the deck underside was not inspected. Also comment on the condition of the girders. Note cracked areas, stains between girders and other notable features.

Steel box girders also impair the visibility of the deck underside. Reduce the percent inspected by the percent of deck area that the steel box girders cover. The inspector can only rate the reduced area of the deck underside between the steel box girders.

A rating guide for concrete deck undersides is included in Table 2.6. This rating guide is only a recommendation of how to rate deck undersides as the final rating breakdown is based on the inspector's own judgement. Group areas of like condition together first, then record the percent of the total area that falls into each rating category. Consider the urgency of required maintenance or repairs in each area to determine the rating. Stained areas may be indicators of the deck underside condition.

Other relevant aspects to consider when rating a deck underside are listed below:

- Note any shear or lateral stressing that is present at the site in the comment field.
- Only measure and record the length of Medium (M) and Wide (W) cracks in the deck underside. Note in the comments if there are widespread or notable narrow cracks. Also comment on whether typical cracks are longitudinal, transverse, or random for all widths.
- Describe location and degree of staining in the comment lines, especially for Moderate (M), Heavy (H), or Severe (S) stains.
- Rate and note bearing condition in the Deck Joints section, as described in Section 2.8.
- Girders and the legs of precast channel girders are not rated as part of the deck inspection. Their condition does not influence the deck underside rating. However, the inspector should make brief general comments on any notable deterioration. Note defects such as cracking, staining between box girders, and shoe plate anchorage problems. Also note problems with steel or concrete diaphragms.
- Use the comment fields to help describe the condition at the site. Identify locations of similar condition, especially for areas of the deck underside in poor condition. Also describe notable trends or generalities. For example, make comments if most of the cracks are transverse and near the piers or if the cracks are random or in a certain area of the deck underside.

2.6.2.4 Measured Damage – Deck Underside

The inspector is to complete the measured damage fields for all visible areas of the deck underside. The girder legs should not be included in the measurements. Record a '0' if the underside was inspected, but no damage was observed for a particular field. These measured damage fields are further described below:

- **Total Stained Area (m^2)** - Record the total stained area of the deck underside to the nearest square metre. It is not required to record the amount of light scaling. Moderate scaling (M) is measured separately from Heavy or Severe scaling, which are grouped together (H/S). Do not include stains from cracks in this field. Stained cracks are identified separately.

- **Total Crack Length (m) / Percent Stained -** When measuring the crack length, only consider Medium (M) and Wide (W) cracks. Give the total crack length to the nearest metre for the entire Deck Group or Span Type. On large decks with frequent cracks, a representative area can be measured such as ½ of the area, and then extrapolated for the entire deck, but only if the entire deck underside is accessible. The inspector can only extrapolate for visible areas of the deck underside that are in uniform condition throughout.

  Record the percent of cracks that are stained in the '% stained' field. Efflorescence is considered staining. Comment in the comment lines if the stains are not efflorescence, such as if they are wet, dark grey, or rust coloured.

  Chamfer cracks in precast channel girders are not considered to be cracks in the deck underside.

If the deck underside is not visible at all, as in the case of concrete box girders for example, record a '**-**' in each of the measured damage fields.

2.7 EDGE ELEMENTS

Edge elements are raised surfaces located at the edges of the roadway. These are used to guide or redirect traffic, minimize damage to other bridge components, and redirect vehicles back onto the road in the event of a collision. Only precast and cast-in-place concrete edge elements are considered in this Level 2 inspection.

Exterior bridge elements like curbs, parapets, medians and sidewalks are generally designed without being part of the load carrying system.

An edge element consists of the vertical or sloped face along the edge of the roadway, the fascia, and the raised horizontal surface. The inspection includes the top and vertical surfaces as well as the fascia. These components are exposed to the same types of physical and chemical attacks as the deck, but the conditions can be more severe.

2.7.1 CURB, PARAPET, MEDIAN, AND SIDEWALK INVENTORY INFORMATION

At the top of the Edge Element section, there is subsection that contains specific inventory information on the concrete curbs, parapets, medians and sidewalks as shown in Figure 2.9.

The inspector is required to complete the 'yes' or 'no' (Y/N) fields at the top of the section to indicate which edge elements are present on the bridge. A 'Y' is recorded for all types that are present while a 'N' is recorded for all others.

Note that if there is a sidewalk along one side of the bridge, there is no curb along that same side. However, there may still be a curb along the other side of the deck.

EDGE ELEMENTS: Curbs (Y/N) : _ Parapets (Y/N) : _
Medians (Y/N): _ Sidewalks (Y/N): _

	Type	Tot. Len.	Ht.	Width	Avg. Str.	Reinforcement Type	Size	Cover	Spacing
Curbs	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Parapets	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Medians	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Sidewalks	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm

Figure 2.9 – CDK2, Curb, Parapet, Median, and Sidewalk Inventory Information

The remaining detailed inventory information in this section should be brought forward automatically from the Department's inventory system or from a previous inspection. If the fields are blank, the inspector should attempt to fill in what they can. It is not required that the inspector determine all of the inventory items unless specifically directed by the Department.

For each edge element, the following inventory information should be provided:

- **Type** - The code for the specific type of edge element within the generic type. For example, reinforced concrete is shown as 'C'. All edge elements inspected in this Level 2 form will be reinforced concrete.
- **Total length** - The total length of the edge element on the bridge to the nearest 0.1 m. For most edge elements, this would typically be the bridge length multiplied by 2.
- **Height** - The height of the edge element in millimetres.
- **Width** - The width of the edge element in millimetres.
- **Average Strength** - The average 28 day compressive strength of the concrete, in Mpa. The tested value is preferred. This field is only used for concrete edge elements.
- **Reinforcement**:
  - **Type** - The type of reinforcing in the edge element, if applicable. Examples include plain steel, epoxy coated, stainless steel, galvanized, and steel fibre.
  - **Size** - The size designation of the reinforcement, if applicable.
  - **Cover** - The actual average clear cover over the reinforcement, if applicable.
  - **Spacing** - The nominal bar spacing of the reinforcement, if applicable.

2.7.2 CURB AND PARAPET INSPECTION ITEMS

Curbs and parapets are both edge elements found along the exterior edges of bridges and are therefore rated using the same fields. The inspection fields are shown in Figure 2.10.

It is uncommon for parapets and curbs to be at the same site, but it is nevertheless possible. When it does happen, they are not rated any differently from a site that has two curbs or two parapets. If the ratings between the curb and parapet are significantly different, the comments are used to describe which has the worse rating. The following subsections will describe the rating fields in terms of curbs, although the same guidelines apply to parapets.

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Curbs/Parapets rtg: % len.												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled len. (m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch len. (m)	d_____ s_____ p_____						d_____ s_____ p_____					

Figure 2.10 – CDK2, Curb and Parapet Inspection

2.7.2.1 Curb/Parapet Ratings by Length (Curb/Parapets rtg, % len.)

Inspect the curbs and record the percent of the total length of the curb that is inspected, to the nearest 5%, in the %/I field.

The entire curb length will be inspected as long as the curb is not covered with gravel and debris. If the curb does have significant debris piled on it and in the gutter, note the percentage of the curb that is not covered and make a comment that describes why the remaining curb area was not inspected.

It is not necessary to observe the total length of the curb underside for 100% of the curb to be inspected. However, if the curb and gutter are completely covered in thick debris but the underside and fascia are visible, the curb can still be 50% inspected.

Rate the visible curb along its length and record the percent of the total curb length that falls into each rating category. The rating of the curb is based on the inspector's judgement. Consider the urgency of required maintenance or repairs in the curb to help determine the rating. Also consider the measured damage on the curb such as the total crack length, scaling and spalling.

If there are no curbs or parapets present at the site, put a 'X' in the %/I field.

Other relevant aspects to consider when rating curbs or parapets are listed below:

- Curb lengths that require no maintenance are rated a 5 or higher.
- Curb areas with holes and exposed voids must be rated a 4 or less. It is possible to down rate the length of the immediate curb section in this case, since water may get into the void for the section. It is also possible to down rate the entire curb length if the exposed voids are significant and the voids in the curb are continuous for the length of the structure.
- Curb lengths that are scaled to a depth of 5 mm with exposed aggregate from light scaling are rated a 6/5. Rate a 4 or less if in combination with another type of deterioration.
- When rating, consider curb damage such as snowplow damage, failing patches, and accident damage.

- The curb rating may be reduced if the curb height is insufficient. If the curb height is insufficient, measure and record the height and make a note in the comment lines.
- Make a comment if a sealer is observed on the curbs.
- Curb cover plates are rated in the Deck Joint section, described in Section 2.8.
- If the curbs have both good and deteriorated areas, note the location of the deteriorated areas, such as the side of bridge and span number, in the comment lines.
- The bridgerail condition does not affect the curb rating. Comment on the bridgerail and bridgerail post condition in the comment lines. Note items such as the general paint condition, number of missing nuts, or number of deteriorated concrete posts.
- Parapets are rated in the same way curbs are.

2.7.2.2 Measured Damage – Curbs and Parapets

The inspector is to complete all of the measured damage fields that are located directly below the curb and parapet rating fields. Record a '0' if no damage is observed in a particular field. Parapets are assessed with the same criteria as curbs. These measured damage fields are described below:

- **Total Crack Length (m)** - When measuring the crack length, only consider the crack length that is on the curb top and inside face or the inside face of the parapet. Only Medium (M) and Wide (W) cracks are measured. Record the total crack length to the nearest metre.
- **Total Scaled Length (m)** - Record the length of the curbs that are scaled to the nearest metre. The length of the curbs that show Light scaling (L) are measured separately from the length of the curbs that have Moderate, Heavy or Severe scaling, which are all grouped together (M/H/S).
- **Delaminated Length (m)** - Measure the total length of the curbs that are delaminated and record this value to the nearest metre. Several delaminated areas can be observed visually, such as vertical cracks parallel to the curbs near the inside curb face. Chain drag or hammer-sound other areas where delamination is suspected but cannot be observed visually. Patched areas may also be delaminated. Do not include parging delamination or deterioration in this rating.
- **Spalled Length (m)** - Measure the total length of spalls along the curbs and record to the nearest metre.
- **Patched Length (m)** - Measure the total length of all patches along the curbs and record this value to the nearest metre. Parging is not considered to be patching. If parging is deteriorating, note this in the comments.

If there are no curbs or parapets at the site, record a '**-**' in each of the measured damage fields.

2.7.3 MEDIAN AND SIDEWALK INSPECTION ITEMS

Medians and sidewalks are both rated in the same fields since they are very similar components. Medians delineate traffic flow while sidewalks are for pedestrian usage. The inspection fields are shown in Figure 2.11.

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Medians/Sidewalks rtg: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						d_____ s_____ p_____					

Figure 2.11 – CDK2, Median and Sidewalk Inspection Items

2.7.3.1 Median/Sidewalk Ratings by Percent Area (Medians/ Sidewalks rtg, % area)

Inspect the medians and/or the sidewalk and record the percent of the total area that was inspected to the nearest 5% in the %/I field.

Typically, the entire median or sidewalk will be inspected as long as it is not covered with gravel and debris. If the median or sidewalk does have significant debris piled on it and in the gutter, note the percentage of the total area that is not covered and add a comment that describes why the remaining area was not inspected. Note that if the sidewalk is covered with debris or is obstructed in some way it may be a safety hazard to the public.

If the structure has both a median and a sidewalk, the ratings will be for the combination of these components. If they have different conditions, use the comments section to define which rating applies to which component.

Rate the visible area and record the percent of the total visible area that falls into each rating category. Consider the urgency of required maintenance or repairs to help determine the rating. Also consider the measured damage such as the total crack length, scaling and spalling. The ratings are ultimately based on the inspector's judgement.

If there are no medians or sidewalks present at the site, put a 'X' in the %/I field.

Other relevant aspects to consider when rating medians or sidewalks are listed below:

- Median and sidewalk areas that require no maintenance are rated a 5 or higher.

- Median and sidewalk areas with holes and exposed voids must be rated a 4 or less. It is possible to down rate the length of the immediate median or sidewalk section in this case, since water may get into the void for the section. It is also possible to down rate the entire median or sidewalk length if the exposed voids are significant and the voids are continuous for the length of the structure.
- Median and sidewalk areas that are scaled to a depth of 5 mm with exposed aggregate from light scaling are rated a 6/5. Rate a 4 or less if in combination with another type of deterioration.
- When rating, consider other median and sidewalk damage such as snowplow damage, failing patches and accident damage.
- The median and sidewalk ratings may be reduced if their height is insufficient. If the median or sidewalk height is insufficient, measure and record the height and make a note in the comment lines.
- Make a comment if a sealer is observed on the median or sidewalk.
- If the median or sidewalk has both good and deteriorated areas, note the location of the deteriorated areas such as the general area and span number in the comment lines.
- The bridgerail and pedestrian rail conditions do not affect the median or sidewalk rating. Comment on the bridgerail and bridgerail post condition in the comment lines. Note items such as the general paint condition, number of missing nuts, or number of deteriorated posts.

2.7.3.2 Measured Damage - Medians and Sidewalks

The inspector is to complete all of the measured damage fields that are located directly below the median and sidewalk rating fields. Record a '0' if no damage is observed in a particular field. Medians and sidewalks are assessed with the same criteria. These measured damage fields are further described below:

- **Total Crack Length (m)** - Measure the cracks that are on top of the median or sidewalk. Only Medium (M) and Wide (W) cracks are measured. Record the total crack length to the nearest metre.
- **Total Scaled Area (m²)** - Record the scaled area of the median and/or sidewalk to the nearest square metre. The area that shows Light scaling (L) is measured separately from the area that has Moderate, Heavy or Severe scaling, which are all grouped together (M/H/S).
- **Delaminated Area (m²)** - Measure the total delaminated area to the nearest square metre. Patched areas may also be delaminated.
- **Spalled Area (m²)** - Measure the total spalled area and record to the nearest square metre.
- **Patched Area (m²)** - Measure the total area of all patches and record to the nearest square metre.

If there are no medians or parapets at the site, record a '**-**' in each of the measured damage fields.

2.8 DECK JOINT INSPECTIONS

Deck joints are a structural discontinuity in the deck that permit relative rotation due to vehicular load or translation due to thermal expansion of the superstructure.

On major and standard bridges, deck joints may be watertight, open joints with plumbing, or open joints without plumbing. Open joints that were not designed to be watertight or damaged joints that were designed to be watertight, allow the water and salt to leak onto the superstructure and substructure elements below. This leakage can damage the girder ends, bearings, prestressed cables, abutments and piers, and can significantly reduce the service life of the structure. The Deck Joint inspection fields are shown in Figure 2.12.

DECK JOINTS:

ITEM					CONDITION LAST						CONDITION NOW					
						Leakage		Damage Rating		L1		Leakage		Damage Rating		L1
Grp No.	Type	No. Jts	Exp/ Fix	Location	%/I	% Jts	% Len	Sup	Sub	Jnt Rtg	%/I	% Jts	% Len	Sup	Sub	Jnt Rtg
1	...	..	...	.....												
2	...	..	...	.....												
3	...	..	...	.....												

Figure 2.12 – CDK2, Deck Joint Inspection

2.8.1 DECK JOINT INVENTORY INFORMATION

The deck joint inventory fields are described below. These fields will have to be completed on site unless the information can be brought forward from a previous Level 2 deck inspection.

- **Deck Joint Group Number (Grp No.)** - The group number fields are already completed on the CDK2 form. The different deck joint groups are numbered starting with number 1. Try to number the deck joint groups consistently with previous Level 2 deck inspections whenever possible.
- **Deck Joint Type** - This field defines the type of deck joint in the deck joint group. Record the code for the deck joint type as defined in the BIS Codes and Explanation Manual.

  If a joint is completely covered by a wearing surface such as ACP and the inspector is unable to determine the joint type from the Deck Joint Maintenance Report or previous Level 1 or Level 2 inspections, record a 'N' in the Joint Type field and make a comment.
- **Number of Deck Joints (No. Jts)** - Record the number of joints that are in the particular deck joint group. Deck joints of different types are in different groups. Also, fixed and expansion joints are also in separate groups.

- **Expansion Joint or Fixed Joint (Exp/Fix)** - Indicate if the deck joints in the particular group are expansion joints or fixed joints. To determine if the joint is an expansion joint or fixed joint, examine the bearings at the bridge site, reference the bridge drawings or locate the information in the BIM Inventory Information. Record 'EXP' in this field if the joints in the group are expansion joints, or 'FIX' if the joints in the group are fixed.
- **Location of Joints (Location) -** List the locations of all the deck joints in that group. Use the two-digit element numbering system described in Section 1.3.1, separating each location by a comma. For example if the deck joint locations of a particular group are located at the west abutment, the west pier and the east abutment, the inspector would record 'A1, P1, A2' in the Location field.

2.8.2 DECK JOINT INSPECTION ITEMS

The following subsections describe the deck joint inspection fields that are to be completed by the inspector during the Level 2 inspection.

2.8.2.1 Percent of Deck Joints Inspected (%/I)

Record the percentage of joints that were inspected from the current deck joint group. The top of the joint and anchorage condition must be visible from the top of the deck in order to count as a joint that is inspected.

The percent of deck joints inspected in each group is the number of joints inspected divided by the total number of joints in that group, multiplied by 100.

If all joints in the group are not visible, for example if they are covered by an ACP wearing surface record a '0' in this field. Note that the Level 1 joint rating would be a 'N' for this joint group.

Partial joints can also be inspected. For example, if there is a single joint in a group, and the joint is covered by a wearing surface such as ACP, except for 5% of the length in the gutter, the percent inspected would be 5%. Use comments to clarify partial inspection amounts.

Joints that are filled with debris should be cleaned and rated if possible. If they cannot be cleaned, describe this in the comment field.

2.8.2.2 Percent of Joints That Leak (Leakage - % Jts)

The underside of the watertight joints must also be inspected for leakage. If the joint is designed to be watertight, it should be flooded with water to help determine if it is still watertight. This field may still be completed even if the top of the deck joint is not visible.

The percent of joints that leak is the number of leaking joints in the group divided by the total number of deck joints in the group, and multiplied by 100. Even the smallest

leak or tear in a joint that is designed to be watertight is considered to be a leaking deck joint.

A gland type joint with a tiny tear in the gland is considered to be a leaking joint even if no leakage is observed. For deck joints with drainage troughs, the trough should be rated in this field. If the trough leaks it is considered a leaking joint.

This field is 100% for joints that are not designed to be watertight, such as buffer angles or sliding plates.

2.8.2.3 Percent of Joint Length That Leaks (Leakage - % Len)

This field records as a percentage the total length of all the joints in the group that are leaking. For example, if there are three deck joints in the group, and 30% of one of the joints is leaking, the percent of the total joint length that is leaking for this deck joint group is 10%.

If a gland type deck joint is visibly torn, yet no water is observed leaking through the joint when it is flooded, the joint is still considered to be leaking. However, the inspector is to note in the comment lines that the joint did not leak through the tear when flooded with water

This field is generally completed using a multiple of 5%, with the exception of a very small tear. A small tear in a watertight joint or drainage trough is entered in the field as 1% of the total length to flag it in the Level 2 inspection, even if the actual length of the tear is much less than 1%. Record the location of the tear in the comment lines.

When the deck joint has a drainage trough, the trough should be rated in this field. If the trough leaks it is recorded as a leaking joint.

This field will always be 100% for joints such as buffer angles or sliding plates that are not designed to be watertight.

2.8.2.4 Superstructure and Substructure Damage Rating (Sup, Sub)

Rate the damage caused to the superstructure and the substructure by the deck joints or leakage through the deck joints.

If other damage that was not related to deck joint function past or present is observed, note the damage in the comment lines but do not down-rate the superstructure or substructure damage rating. Watch for stains to help determine the source of any damage. If still unsure if the damage is related to the joints or not, then rate it as if it was related to the joint.

Superstructure Damage
This is damage to superstructure elements that are related to the deck joint. The superstructure includes the girder ends and bearings. Pay special attention to girder ends that have strand in them as leakage can run along any exposed strand deep into the girder.

On longer structures, the inspector may not be able to observe one of the spans since it is too far from the shore. If the inspector cannot see the span under one deck joint, even if all the others are visible, a 'N' is recorded in this field. Comment on the spans that are visible.

The inspector will not be able to observe and rate the ends of box girders at the abutment or pier joints. Place a 'N' in this field if the structure has box girders. Note whatever condition and staining is visible in the comment lines.

Bearing condition is included in the superstructure damage rating. Do not down-rate the superstructure if the bearings are covered in debris unless it is known that they are damaged or not functioning. Only down-rate the superstructure if problems with the bearing were caused by a deficient deck joint. Regardless of whether the deck joint was the source of problems for the bearing, comment on the bearing condition such as if it is rusted or jammed. Also comment on the bearing condition if it is overextended for the current temperature and record the current temperature.

Substructure Damage
This is damage to substructure elements that are related to the deck joint. The substructure includes the backwall, abutment seat, and piers.

If an inspector cannot see the substructure elements under one of the deck joints, they must record a 'N' in this field. Comment only on the substructure elements under the deck joints that are visible.

Additional Rating Guidelines
Rating the damage to the superstructure and substructure elements is a matter of applying the Department rating guidelines. These guidelines also take into consideration the maintenance priority of the elements.

The inspector's judgement must be used to rate the elements. The rating described in this section however, is not a Level 1 inspection. A Level 1 inspection is used to highlight the worst condition state of an element. The rating described herein is a Level 2 inspection used to collect quantified data in order to provide information on how much of an element is in a particular condition state. The inspector is to rate the general condition and not the worst case. The inspector should note that if the damage was significant to the structural capacity or function of the element, a Level 1 rating should be used that reflects the worst damage to the element.

A rating of 5 or higher is for elements that are functioning as designed. For a rating of 5 an element may have minor structural flaws, but these flaws should not compromise the structural capacity of the member. A rating of 4 is a low maintenance priority, and these elements would generally be scheduled for repair in more than 3 years time. A rating of 3 is a medium priority for maintenance, as repairs would typically be scheduled from 6 months to 3 years away. A rating of 2 is a high priority for maintenance and repairs would likely be less than 6 months away. Finally, a rating of 1 requires immediate action.

It is common for the leaking deck joint that caused damage to the superstructure or substructure to have been repaired or replaced, but the damage to the underside still remains. Rate the superstructure or substructure based on the existing damage even if the cause of the damage has been repaired. The deck joint itself will not be down-rated since it has been repaired and is functional. Further, the percent of leaking joints will also show that no further leakage is occurring. Make a comment to help clarify the situation.

Use the comment lines in the Deck Underside section, described in Section 2.6.2.3, to note deficiencies or damage to the superstructure that are not related to the joint.

2.8.2.5 Level 1 Joint Rating (L1 Jnt Rtg)

Record the one-digit Level 1 rating for the deck joint group in this field. This rating should be the minimum or lowest Level 1 deck joint rating of the joints in the group.

Level 1 ratings rate the worst condition of the element. If the joints are functioning as designed, the rating will be 5 or higher. For example, joints that leak, but are not designed to be watertight, are rated a 5 or higher unless they have an additional problem. If one joint in the group is not functioning as designed, the Level 1 rating will be a 4 or less. Therefore, a single leaking joint in a group of watertight joints ensures that the Level 1 rating for the group of joints is 4 or less. Use a comment to describe which joint brought the rating down and why.

The Level 1 joint rating would be a 'N' for the joint group if one of the joints was not visible and therefore was not inspected.

Curb cover plates are to be rated under the deck joints and not the curb rating. Do not down-rate the joint if a curb cover plate is missing a single bolt. If several bolts are missing or the plate is not functioning, it can be down-rated to a 4 or 3. Ensure comments are made to describe the location of cover plates when bolts are missing or damaged.

For armoured gland plates note all missing bolts and rate a 4 or less. Record the missing location of the bolts and make a comment.

Do not down-rate a joint to a 4 if there is a single snowplow deflector missing, only rate a 4 or less if the plow could get caught in the joint due to several missing snowplow deflectors. In either case, note the number of missing plow deflectors in the comments field.

If the joint has a drainage trough, its performance should be included in the Level 1 rating. Flood the joint and observe if the trough functions as designed. If the trough leaks, rate a 4 or less and comment on the defect that is causing the leakage. Note any rust stains that are observed on galvanized troughs. Also note the leakage in the % Joints Leaking and % Joint Length Leakage fields.

Observe and note any damage in the wearing surface around the joint. Use judgement to determine if this damage affects the structural capacity of the joint.

Refer to Section 7.6 of the Level 1 BIM Inspection Manual for complete Level 1 rating guidelines.

2.9 OTHER CDK2 DATA – LAST PAGE

Refer to Section 1.5 for instructions on completing the last page of the CDK2 form. The last page shares a common format with the other Level 2 forms.

2.10 CONCRETE DECK INSPECTION SUPPLEMENT

The Level 2 Concrete Deck Inspection Supplement section can be used to assist the inspector when conducting deck inspections. This supplement acts as an organized 'scratch pad' whereby the inspector can record measurements and quantities of the various concrete deck inspection items. These items can then be totaled and summarized to aid the inspector in determining the final ratings for the CDK2 form. The fields on the Supplement section are the same fields as those used in the CDK2 form. The descriptions of the fields in the Supplement section have already been included in this chapter.

ALBERTA TRANSPORTATION — BIM LEVEL 2 REPORT - 2004 — FORM ID: CDK2

CONCRETE DECK INSPECTION SUPPLEMENT

Date: ____/__/__ — Bridge File: ..... — Page: __ of __

Span Group: __ Type: __ Span No.: _____ Tot. Area: _____ m

Segment Location	Area sq m	Polymer			ACP			S/C			Summary			
		%/I	Rtg	Loss	%/I	Rtg	Loss	%/I	Rtg	Loss		Poly	ACP	S/C
											%/I			
											9-7			
											6/5			
											4			
											3			
											2/1			
											Loss			

Figure 2.13 – Sample Section of the CDK2 Supplement

The inspector is not required to complete the CDK2 Supplement, or submit it with the completed CDK2 inspection form. The Supplement is intended only as an additional tool for the inspector. It has been included in this manual with the CDK2 form.

Bridge File Number : ....
Legal Land Location: ...-..-...-..-.
Latitude/Longitude : ...../.....
Road Auth./Region : .../R.
Bridge or Town Name: .....
Stream Name : .....
Highway #:Cntrl Sec: ....:...
Road Classification: .....-...
AADT/Year : .-...../..
Detour Length : ...km

Structure Usage : ..
Year Built : ../..
Clear Roadway/Skew: ....m/...Deg

Prev. Insp. Date : ____/__/__ (YMD)
Insp. Req'd Date : ____/__/__ (YMD)
(based on _____)

Current Insp. Date: ____/__/__ (YMD)
Inspector's Code : ____

STRUCTURE INFORMATION:
No. of Spans: .. Span Types: .../... Substructure Types: .../...
Span Lengths: .....-.....-.....-.....-.....m Total Length: .....m

WEARING SURFACE: Polymer (Y/N): _ ACP (Y/N): _ Seal Coat (Y/N): _

	Type	Year 1	Year 2	Avg. Total Thickness	Area
Polymer	...	....	....	..mm	.....sq m
ACP	...	....	....	...mm	.....sq m
Seal Coat	...	....	....	..mm	.....sq m

ITEM		CONDITION LAST						CONDITION NOW					
		%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Polymer rating:	% area												
ACP rating:	% area												
Seal Coat rating:	% area												
Measured damage:		***	***	***	***	***	***	***	***	***	***	***	***
tot. debond/lost area (sq m)		P_____ A_____ S_____						P_____ A_____ S_____					

Comments:

Debond/lost area includes patched area for ACP and seal coat but not for polymers

Crack Width Key: H - Hairline, N - Narrow, M - Medium, W - Wide
Scaling/Staining Severity Key: L - Light, M - Moderate, H - Heavy, S - Severe

CONCRETE OVERLAY: Overlay (Y/N): _

Deck Group: .. Span Type: ... Span Numbers: ..... Area: .....sq m
Overlay Type: ... Year Placed: .... Avg. Thick.: ...mm
Long. Rebar -> Type: .. Size: ... Cover: ...mm Spacing: ....mm
Trans. Rebar -> Type: .. Size: ... Cover: ...mm Spacing: ....mm
Avg. 28 Day Strength: ....MPa

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Overlay rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						d_____ s_____ p_____					

Comments:

DECK:

Deck Group: .. Span Type: ... Span Numbers: ..... Area: .....sq m
Deck Type: ... Year Const: .... Year Widened: .... Min. Thickness: ...mm
Long. Rebar -> Type: .. Size: ... Cover: ...mm Spacing: ....mm
Trans. Rebar -> Type: .. Size: ... Cover: ...mm Spacing: ....mm
Avg. 28 Day Strength: ....MPa

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Top rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						d_____ s_____ p_____					
Underside rating: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total stained area (sq m)	M _____ H/S _____						M _____ H/S _____					
tot. crk. len. (m)/% stained	M/W _____ % stn ____						M/W _____ % stn ____					

Comments:

Stained area does not include stains at medium or wide cracks. These stains are identified separately as the % of total crack length stained.

EDGE ELEMENTS: Curbs (Y/N) : _ Parapets (Y/N) : _
Medians (Y/N): _ Sidewalks (Y/N): _

	Type	Tot. Len.	Ht.	Width	Avg. Str.	Type	Reinforcement Size	Cover	Spacing
Curbs	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Parapets	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Medians	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm
Sidewalks	...	....m	...mm	....mm	...MPa	..	...	...mm	....mm

ITEM	CONDITION LAST						CONDITION NOW					
	%/I	9-7	6/5	4	3	2/1	%/I	9-7	6/5	4	3	2/1
Curbs/Parapets rtg: % len.												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled len. (m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch len. (m)	d_____ s_____ p_____						d_____ s_____ p_____					
Medians/Sidewalks rtg: % area												
Measured damage:	***	***	***	***	***	***	***	***	***	***	***	***
total crack length (m)	M/W _____						M/W _____					
tot. scaled area (sq m)	L _____ M/H/S _____						L _____ M/H/S _____					
delam/spall/patch area (sq m)	d_____ s_____ p_____						d_____ s_____ p_____					

Comments:

DECK JOINTS:

ITEM					CONDITION LAST						CONDITION NOW					
						Leakage		Damage Rating		L1		Leakage		Damage Rating		L1
Grp No.	Type	No. Jts	Exp/ Fix	Location	%/I	% Jts	% Len	Sup	Sub	Jnt Rtg	%/I	% Jts	% Len	Sup	Sub	Jnt Rtg
1	...	..	...	.....												
2	...	..	...	.....												
3	...	..	...	.....												

Comments:

LEVEL 1 INSPECTION (INFORMATION ONLY) Level 1 date: ____/__/__

Structural Condition Rating: __% Sufficiency Rating: __%
Estimated Remaining Life of Structure: __ years

Special Comments for Next Inspection:

Next Scheduled Level 1 inspection: ____/__/__ Current Cycle: __months

ITEMS REQUIRING IMMEDIATE ATTENTION:

LEVEL 2 INSPECTION SPECIAL REQUIREMENTS:

Y => Snooper: __ Lift: __ Traffic control: __ Boat: __ Ladder: __
Other: _____

INSPECTOR:

Recommended Cycle __ months OR Next Insp. Date ____/__/__ (blank for default)
Recommended Additional Cycles: _ (blank for default, 0 for discontinue)

Inspector's Code: ___	Inspector's Name: _____	Class: _
Assistant's Code: ___	Assistant's Name: _____	Class: _
Assistant's Code: ___	Assistant's Name: _____	Class: _

Comments: _____
_____

REVIEWER: Review Date: ____/__/__

Approved Cycle __ months OR Next Insp. Date ____/__/__ (blank for default)
Approved Additional Cycle: _ (blank for default, 0 for discontinue)\

Reviewer's Code: ___	Reviewer's Name:_____	Class: _

Comments: _____
_____

Default No. of Inspections: _	Number completed to date: __
Default Cycle: __ months	Next Inspection Required Date ____/__/__

ALBERTA TRANSPORTATION

BIM LEVEL 2 REPORT - 2004
CONCRETE DECK INSPECTION
SUPPLEMENT

FORM ID: CDK2
Bridge File: .....
Page: __ of __

Date: ____/__/__

Span Group: __ Type: __ Span No.: _____ Tot. Area: _____ m

Segment Location	Area sq m	Polymer			ACP			S/C			Summary			
		%/I	Rtg	Loss	%/I	Rtg	Loss	%/I	Rtg	Loss		Poly	ACP	S/C
											%/I			
											9-7			
											6/5			
											4			
											3			
											2/1			
											Loss			

Segment Location	Area sq m	Overlay/Deck Top								Summary			
		%/I	Rtg	Crk	Scl/L	Scl/O	Deb	Spl	Ptch				
										%/I		Crk	
										9-7		Sc/L	
										6/5		Sc/O	
										4		Deb	
										3		Spl	
										2/1		Ptch	

Segment Location	Area sq m	Deck Underside							Summary			
		%/I	Rtg	St/M	Stn/HS	Crk	% Stn					
								*****	%/I		St/M	
								*****	9-7		St/H	
								*****	6/5		Crk	
								*****	4		% St	
								*****	3			
								*****	2/1			

Segment Location	Len. m	Curb/Parapets								Summary			
		%/I	Rtg	Crk	Scl/L	Scl/O	Del	Spl	Ptch	%/I		Crk	
										9-7		Sc/L	
										6/5		Sc/O	
										4		Del	
										3		Spl	
										2/1		Ptch	

Segment Location	Area sq m	Medians/Sidewalks								Summary			
		%/I	Rtg	Crk	Scl/L	Scl/O	Del	Spl	Ptch	%/I		Crk	
										9-7		Sc/L	
										6/5		Sc/O	
										4		Del	
										3		Spl	
										2/1		Ptch	

Joint Group _						Joint Group _						Joint Group _					
Jt#	%/I	% LK	Sup	Sub	Rtg	Jt#	%/I	% LK	Sup	Sub	Rtg	Jt#	%/I	% LK	Sup	Sub	Rtg
Sum						Sum						Sum					