

Bridge Inspection Report

Inkerman Bridge

Road Name: *Queen Street*
Site ID: *03-124*
Structure Type: *Precast Box Beam*
Owner: *United Counties SDG*
Built: *1964*
Length: *20.5 m*
Width: *9.5 m*
Spans: *1*
Spans Arrange: *1 @ 19.5*
Feature Under: *Water*
Crossing: *North Branch of South Nation Riv*
Location: *Intersection of McIntosh Road & Queen Street (In*

Inspection Date: *July-20-21*
Inspector: *Harold Kleywegt, P.Eng.*
Assistant: *Kyle Davis, Eng Student*

Comments:

Irreparable corrosion damage to prestressing strands of girders means full superstructure replacement is now required. Bridge may need to be load posted until such time as rehabilitation can be implemented.

Recommended Investigations:

Structural Evaluation

Recommended Capital Works:

Misc Concrete Repairs, Superstructure Replacement

Estimated Replacement Value: **\$2,060,000**

Estimated replacement value is based on replacement in kind

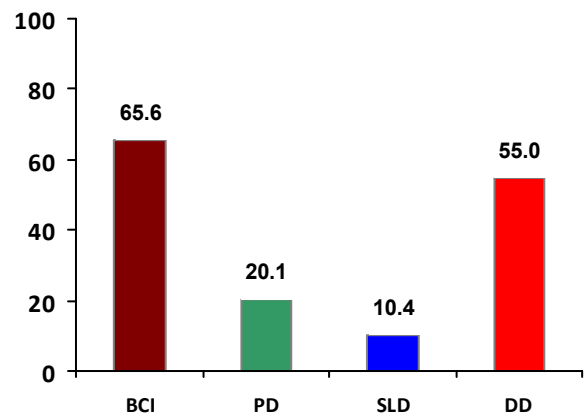
Estimated Remaining Service Life: **3 Years**

Rehabilitation Year and Estimated Cost: 2023 \$1,391,000



AADT: *1200* **Latitude:** *45.03448346*
Lanes: *2* **Longitude:** *-75.39511146*
Skew: *0 °* **Orientation:** *N-S*
Speed: *50 km/h* **Road Width:** *9 m*
Trucks *10%* **Load Posting:** *No Posting*

Bridge Condition



BCI = Bridge Condition Index MTO Calculation

PD = Parabolic Depreciation
% retained value

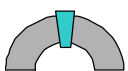
SLD = Straight Line Depreciation
% retained value

DD = Defects and Damage
% loss of retained value



Component Inspection Information

Protected BSRC Deck (1)	Defects 0.0%		
Deck Surface	Damage 10.0%	Minor Delamination	
Length: 20 m	Maintenance None		Partial Inspection
Width: 9.5 m	Capital Rec. None		
Height:	<i>Asphalt hiding topping slab. Suspected leakage from construction joint in topping slab. Given the condition of asphalt on deck it is assumed damage below asphalt on deck top.</i>		
Asphalt Wear Surf (1)	Defects 25.0%	Moderate Ravelling	
Deck Wearing Surface	Damage 25.0%	Moderate Cracking, Moderate Potholing	
Length: 20 m	Maintenance None		
Width: 9.5 m	Capital Rec. Replace in 1 year		
Height:	<i>Asphalt on deck has numerous unsealed random cracks, potholes, & patches. Padding at approach slabs added in 2016.</i>		
Asphalt Wear Surf (2)	Defects 0.0%		
Appr Wearing Surface	Damage 20.0%	Moderate Cracking, Moderate Uneven Surface	
Length: 15 m	Maintenance None		
Width: 9 m	Capital Rec. None		
Height:	<i>Approach asphalt has moderate cracking. Expansion joints padded in 2016.</i>		
X- Joint Conventional (2)	Defects 10.0%	Moderate Scaling/Abrasion	
Expansion Joints	Damage 3.0%	Moderate Plow Gouging, Minor End Dam Breakage	
Length: 9.5 m	Maintenance None		
Width:	Capital Rec. None		
Height:	<i>End dams have narrow transverse cracking micro-spalling & light scaling. Expansion joint armoring has moderate impact damage from plows. Seals are intact.</i>		
Scupper & Pipe (6)	Defects 60.0%	Major Corrosion	
Deck Drains	Damage 40.0%	Moderate Perforation, Moderate Section Loss	
Length:	Maintenance None		
Width:	Capital Rec. Replace in 1 year		Perf Def: Collateral Damage
Height:	<i>Deck drains are severely rusted and perforated. Drains penetrate 2nd girder from west & the east girder. Drainage impinging on girder soffits.</i>		
Conc Curb (1)	Defects 4.0%	Minor Scaling, Minor Abrasion	
Deck Safety Curb	Damage 0.0%		
Length: 37 m	Maintenance None		
Width: 0.68 m	Capital Rec. None		
Height: 0.15 m	<i>Curb on east side. Light scaling & abrasion on curb face, mostly good condition..</i>		



Component Inspection Information

Sidewalk (1)	Defects 10.0%	Minor Abrasion
Deck Sidewalk	Damage 1.0%	Minor Impact, Minor Cracking
Length: 37 m	Maintenance None	
Width: 1.65 m	Capital Rec. None	Perf Def: Settlement
Height: 0.15 m	<i>Sidewalk located on the west side. Sidewalk has minor abrasion on face. Vegetation growing through joint on approach sidewalk. Approach split sidewalk settling next to wing walls. Little change in 2021.</i>	
Single Pipe Hand Rail (2)	Defects 0.0%	
Railings	Damage 0.0%	
Length: 35.4 m	Maintenance None	
Width:	Capital Rec. None	
Height:	<i>Good condition.</i>	
RC Parapet (2)	Defects 5.0%	Minor AAR Cracking
Barrier / Parapet Walls	Damage 0.1%	Minor Delamination
Length: 37 m	Maintenance None	
Width:	Capital Rec. None	
Height: 0.85 m	<i>Parapet walls have areas of light AAR cracking. Small delamination on exterior in the NE quadrant. Utility located in west wall. Little change in 2021.</i>	
Voided Prestressed Box (9)	Defects 10.0%	Minor Formed Patches, Minor Rust Staining
Girders	Damage 25.0%	Critical Spalling, Major Delamination
Length: 20.5 m	Maintenance None	
Width: 1.2 m	Capital Rec. Replace in 2 years	
Height: 0.55 m	<i>Water has leaked through the joint between girders. Previous patches to girder bottoms have mostly delaminated or failed. Other girders starting to show delamination. Prestressing strands visible and corroded at one location. The girders appear to be too short or the abutments were not placed properly based on the gaps at the bridge seats. Two interior girders (5&6 of 9) exhibit the worst damage, exterior girders are in satisfactory condition. Utility attached to the east exterior.</i>	
RC Abutment Wall (2)	Defects 10.0%	Minor Rust Staining, Minor Scaling
Abutment Walls	Damage 1.0%	Minor Cracking
Length:	Maintenance None	
Width: 11.2 m	Capital Rec. None	
Height: 3 m	<i>Abutments are in good condition. Minor scaling & rust staining noted.</i>	



Component Inspection Information

RC Ballast Wall (2) Ballast Walls Length: Width: 11.2 m Height: 1 m	Defects 0.0% Damage 0.0% Maintenance None Capital Rec. None <i>Unable to view.</i>	Not Inspected
RC Wing Walls (4) Wingwalls Length: 7.3 m Width: Height: 4.2 m	Defects 0.0% Damage 0.0% Maintenance None Capital Rec. None <i>Good condition.</i>	
Plain Rubber Bearing (36) Bearings Length: Width: Height:	Defects 5.0% Moderate Excess Bulging, Moderate Weathering Damage 10.0% Maintenance None Capital Rec. Replace in 5 years <i>Unable to fully inspect, several were visible. Over compressed at the south end with cracking, splitting and bulging.</i>	Partial Inspection
Spread Footing (2) Foundations Length: Width: Height:	Defects 0.0% Damage 0.0% Maintenance None Capital Rec. None <i>Stable. South footing is exposed.</i>	Partial Inspection
Water Channel (1) Streams and Waterways Length: Width: Height:	Defects 0.0% Damage 0.0% Maintenance None Capital Rec. None <i>Shallow stream with small riffle under bridge. Cobble lined channel. Adequate opening.</i>	
Embankment (2) Embankments	Defects 0.0% Damage 0.0% Maintenance Remove Brush/Trees Capital Rec. None <i>Stable, vegetated. Trees & brush around wing walls should be cleared. No approach guide rail at bridge.</i>	



Component Inspection Information

Delineator (2)	Defects 0.0%
Signs	Damage 0.0%
Length:	Maintenance None
Width:	Capital Rec. None
Height:	<i>No delineators at bridge.</i>



Capital Needs Cost Estimate Break-Down

Item	Req'd	Units	Quantity	Unit Price \$	Estimated Cost
<i>Misc Concrete Repairs</i>	✓	m ²	10.0	\$800	\$8,000
<i>Deck Concrete Overlay</i>	✗	m ²	194.8	\$400	\$0
<i>Deck Replacement</i>	✗	m ²	194.8	\$2,500	\$0
<i>Barrier Wall Replacement</i>	✗	m	44.5	\$3,000	\$0
<i>Expansion Joint</i>	✗	m	19.0	\$5,500	\$0
<i>Waterproof & Pave</i>	✗	m ²	194.8	\$220	\$0
<i>Bearing Replacement</i>	✗	Count	18.0	\$5,000	\$0
<i>Approach Guide Rail</i>	✗	m	80.0	\$250	\$0

Other Work

Superstructure Replacement \$1,000,000

Structural Items Subtotal	\$1,008,000
Mobilization General Sitework	\$101,000
Estimated Traffic Management & Civil Items	\$50,000
Contract Admin & Contingencies 20%	\$232,000
Total Rehabilitation Cost Estimate	\$1,391,000

Recommended Capital Work Summary

Recommended Capital Year **2023**

Misc Concrete Repairs, Superstructure Replacement

Inspection Comments

Irreparable corrosion damage to prestressing strands of girders means full superstructure replacement is now required. Bridge may need to be load posted until such time as rehabilitation can be implemented.



Image 187



East elevation

Image 169



South approach

Image 170



Plaque SE

Image 171



South expansion joint

Image 172



SE end post with AAR

Image 173



East channel



Image 174



North expansion joint

Image 175



West channel

Image 176



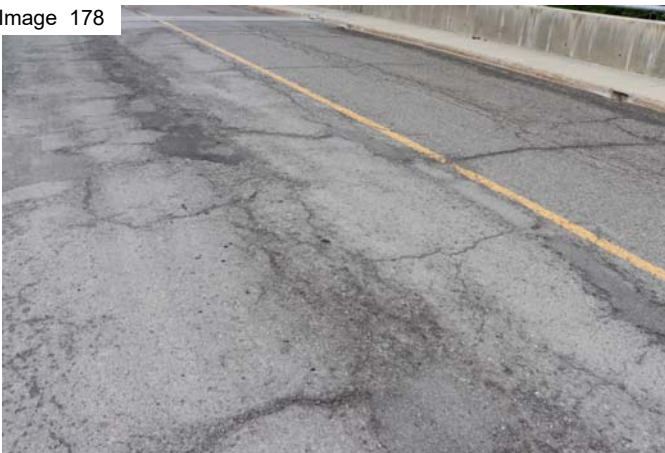
West sidewalk and parapet wall

Image 177



East curb and parapet wall

Image 178



Asphalt on deck (typical)

Image 179



South abutment



Image 180



Soffit

Image 181



Girder 5 south end spall

Image 182



Girders 5 and 6 spalling

Image 183



Girder 6 spalling with prestressing strands visible

Image 184



North abutment

Image 185



East deck drain end (typical)



Image 186



Leaching along east fascia

Image 188



SW abutment corner

Image 189



SW wing wall

Image 190



West fascia

