
APPENDIX 7

VISUAL CONDITION ASSESSMENT REPORT



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September 18, 2020

RVA 195072

The Corporation of the Town of Caledon
6311 Old Church Road
Caledon, ON
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**Attention: Mr. Arash Olia, Manager
Transportation Engineering**

Dear Mr. Olia:

Re: Coventry Bridge Visual Condition Assessment
Final Report

1.0 INTRODUCTION

The Town of Caledon retained R.V. Anderson Associates Limited (RVA) to carry out a Schedule 'B' Class Environmental Assessment and 30% Preliminary Design for the reconstruction of Columbia Way from Highway 50 to Caledon King Townline. Included in the scope of work is the 30% Design for structural culverts or bridges requiring rehabilitation or replacement.

A field inspection was carried out by David O'Sullivan, P.Eng. of RVA on September 10, 2020. Work included an inspection of all visible portions of the bridge, with recommendations for remedial work or replacement as required.

1.1. Background Information

The Coventry Bridge is located on Columbia Way, approximately 0.48 km west of Caledon-King Townline. It is an approximately 10.6 m long by 8.6 m wide cast in place concrete single-span rigid frame structure. The bridge was constructed in 1950, and it was rehabilitated in approximately 1998.

The structure comprises of a cast in place deck with arched soffit and full-height abutments, with wingwalls at all four corners of the bridge. Rigid moment connections are provided at the deck-abutment interfaces, as well as at the abutment-wingwall interfaces. Based on the information available, the bridge does not have any approach slabs.

The bridge is founded on cast-in-place footings atop of timber piles.

The Ontario Structure Inspection Manual (OSIM) inspections from 2017 and 2019 were reviewed after carrying out the inspection on site. The 2019 report indicated that reviewed rehabilitation of the Abutment Walls, Wing Walls, and Soffits is estimated to be required within one to five years of the date of the inspection (June 2019). It also noted that the bridge railings required rehabilitation within one year and the wearing surface at the bridge approached required rehabilitation within two years of the date of the report.

The overall Bridge Condition Index (BCI) of 69.4 noted in 2019 is just under the threshold value of 70 which is generally considered to be “good” condition. Structures falling within the BCI in the range of 60-70 are generally slated for rehabilitation within 1 to 5 years.

RVA was informed that Columbia Way was resurfaced during the Summer of 2020 in the area near to and including the Bridge. Significant settlement cracks were present in the road near to the East bridge abutment, which were observed in review of OSIM Reports, Google Streetview, and identified in discussions with the Town.

2. METHODOLOGY

RVA carried out a field inspection on September 10, 2020, at 3:30 pm. The weather was overcast and the ambient temperature was approximately 20°C. The purpose of the inspection was to document the condition of all accessible and visible portions of the bridge structure. The visual inspection included accessing the underside of the bridge. Visible structural elements above the water and ground surface were assessed and photographed.

No destructive or non-destructive performance testing was conducted as a part of this review. Photographs of areas of concern taken during this inspection are provided at the end of this Report.

3. OBSERVATIONS

3.1. Approaches

There was perceptible settlement of the roadway at the approach, nor any visible erosion to approaches to the bridge (See [Figure 1](#) and [Figure 7](#)).

3.2. Wearing Surface

The wearing surface (See [Figure 1](#)) was replaced in Summer 2020, and no concerns were noted. Previously observed cracking in the wearing surface prior to repaving is no longer present. The wearing surface is in good condition.

3.3. Parapet Walls

The parapet walls were observed to be in good condition. Some minor staining was observed. Shrinkage cracks which are typically present on this type of parapet wall were observed (See [Figure 1](#), [Figure 6](#), [Figure 10](#), and [Figure 12](#)).

3.4. Railings

The railings were in good condition. The current railing height is set for pedestrians (1070 mm) and does not meet requirements for protecting cyclists (1400 mm). (see [Figure 2](#) and [Figure 10](#))

3.5. Guiderails

The southwest guiderail is in poor condition from what appears to be collision damage (see [Figure 15](#)). All other guiderails are in good condition. (See [Figure 1](#) and [Figure 7](#))

3.6. Abutments – Abutment Walls

The east abutment is in good condition (See [Figure 8](#)). The west abutment is in fair condition, with a few areas of spalling, and exposed, corroded reinforcing steel (See [Figure 9](#)).

3.7. Abutments - Wingwalls

The connection between the southeast wingwall and the south abutment has failed. Movement of the wingwall exceeding 50 mm was observed (See [Figure 8](#) and [Figure 11](#)). This is believed to be a structural failure of the connection caused by forces acting on the wingwall and transferred into the joint, which does not have adequate structural capacity to withstand the applied load.

Moderate cracking of the face of the southwest abutment was observed (See [Figure 10](#) and [Figure 12](#)). Minor cracking and spalling of the northwest and northeast wingwalls was observed (See [Figure 2](#) and [Figure 3](#)).

3.8. Deck - Soffit

The deck soffit is in fair condition, with minor spalling visible (See [Figure 8](#)). The west abutment is in fair condition, with a few areas of spalling and exposed, corroded reinforcing steel. (See [Figure 9](#))

3.9. Deck - Soffit

The deck soffit is in fair condition with minor spalling observed (See [Figure 9](#) and [Figure 14](#))

3.10. Deck - Fascia

The deck fascia on the south side is in poor condition with major spalling observed (See [Figure 10](#) and [Figure 14](#)). The deck fascia on the north side is in good condition (See [Figure 4](#)).

3.11. Embankments

Minor erosion was observed at the northwest embankment (See [Figure 2](#)). All other embankments appeared to be in good condition (See [Figure 6](#), [Figure 10](#) and [Figure 12](#)).

4. RECOMMENDATIONS

The most recent OSIM inspection provided a Bridge Condition Index (BCI) of 69.4, which is below the threshold BCI of 70 for a bridge in "Good" condition. Bridges with a BCI in the range of 60-70 are generally recommended to undergo a structural rehabilitation within 1-5.

Of particular concern is the structural failure of the connection between the southeast wingwall and the east abutment. This joint is no longer restraining movement of the wingwall, and further movement of the wingwall could result in slope erosion and / or settlement of the road.

Structural rehabilitation of this bridge, including the following scope is recommended:

- Carry out detailed structural analysis for the southwest and southeast wingwalls. If the wall(s) are determined to be structurally adequate, they should be modified or replaced.
- Replace the southwest guiderail and all other guiderails that have sustained damage at the time of the rehabilitation work. At this time, the end treatments should also be replaced if they have been determined to have sustained impact damage. This would provide the Town an opportunity to use SoftStop or other current standard end treatments.
- Carry out repairs to all spalling of the abutments, wingwall, soffit and fascia.
- Clean all staining from the concrete and steel bridge components and apply sealer.
- Clean and touch up any corrosion on existing railings with zinc rich primer or replace railings with bicycle-height railings.

Complete replacement of the bridge structure is not recommended at this time, unless it is required for another reason such as hydraulic capacity improvements, improvements to the vertical / horizontal profile of the road or widening of the road platform.

Should you have any questions or require additional clarification, please do not hesitate to contact the undersigned.

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED



David O'Sullivan, P.Eng, PMP
Structural Engineer, Associate



Figure 1 – View of Bridge, looking West



Figure 2 – North Parapet Wall and Railing, Northwest Wingwall



Figure 3 – Northeast Wingwall at Abutment



Figure 4 – Underside of Bridge, looking west



Figure 5 – Underside of Bridge, looking south



Figure 6 – North Elevation of Bridge



Figure 7 – Guiderails at east side of Bridge



Figure 8 – East abutment, looking south shifted southwest abutment visible)



Figure 9 – West abutment and soffit, looking west



Figure 10 – South side of bridge, southwest wingwall



Figure 11 – Structural failure at connection between east abutment and southeast wingwall



Figure 12 – South elevation of Bridge



Figure 13 – Southwest wingwall (cracking visible)



Figure 14 – Soffit of bridge looking north (spalling visible)



Figure 15 – Damaged southwest guiderail



Figure 16 – Damaged southwest guiderail