

TOWNSHIP OF PUSLINCH 2019 Bridge and Culvert Inspections



Why Bridge and Culvert Inspections?

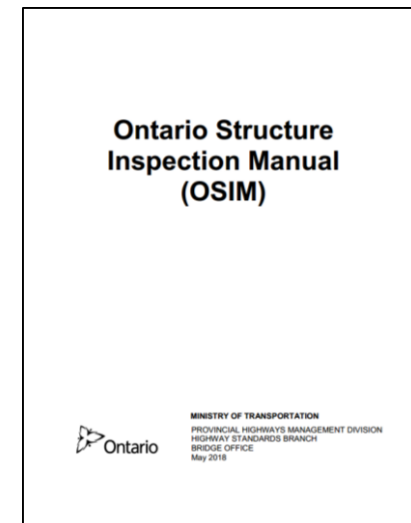
O.Reg. 104/97: STANDARDS FOR BRIDGES

(3) The structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer and in accordance with the Ontario Structure Inspection Manual. O. Reg. 472/10, s. 2.

What is a Bridge Inspection?

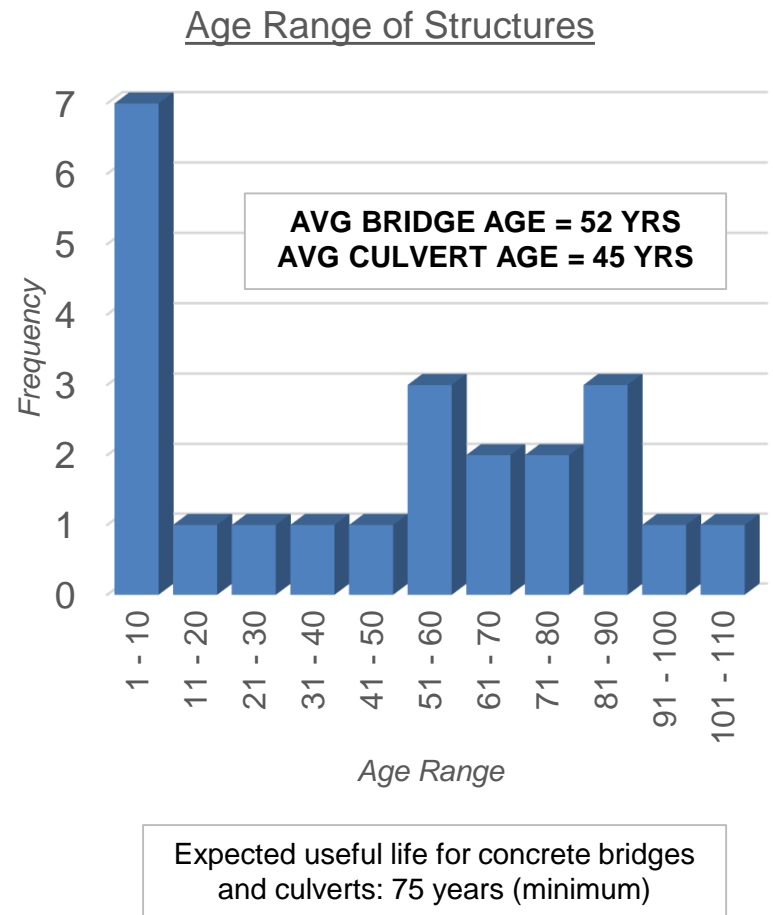
Ontario Structure Inspection Manual (OSIM) Inspections

- Visual inspections of bridges or culverts completed using a standardized format and methodology
- Also referred to as biennial inspections, detailed visual inspections, appraisals, etc.
- Meant to convey an element-by-element inspection of material defects, performance deficiencies and additional needs (capital, maintenance or studies) for a structure



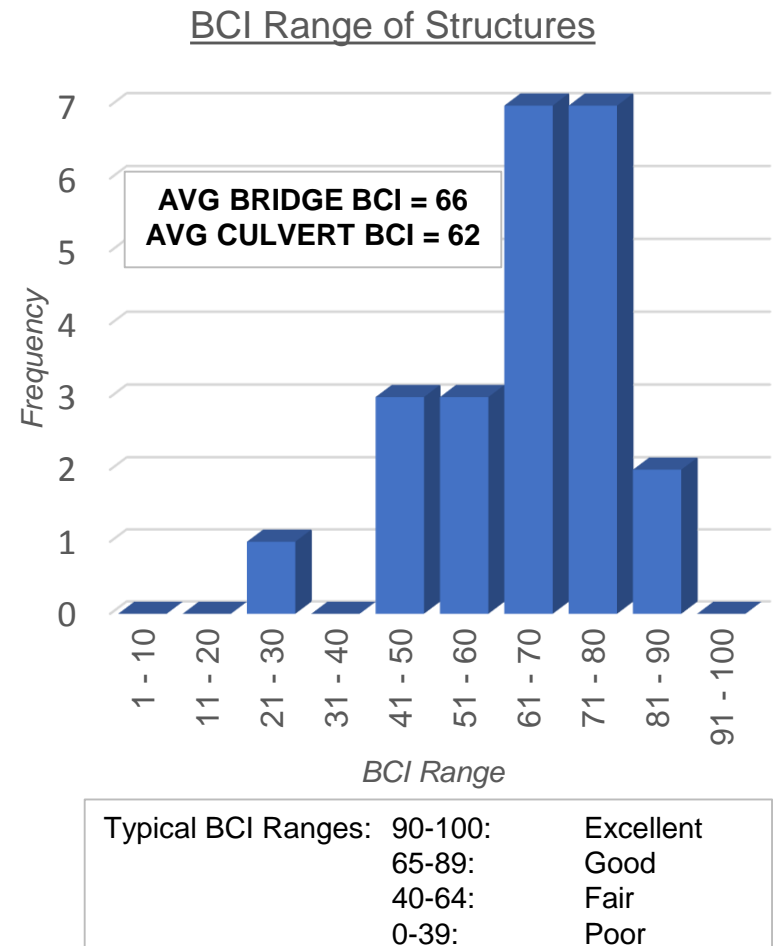
Statistics on Bridges and Culverts in the Township

- 8 bridges and 15 culverts (including structures with a span less than 3m)
- One bridge has a load limit (Little's Bridge, Structure 0003, Sideroad 25 North: 10 tonne)
- Two bridges were replaced in approximately 2010 on Puslinch-Flamborough Townline (Structures 2015 and 2016)



Statistics on Bridges and Culverts in the Township (cont.)

- The MTO uses a Bridge Condition Index (BCI) for planning purposes, which is calculated for each Township structure
- The BCI is meant to give a **general** idea of structure condition, not indicate the safety of a structure



Overall Summary

- Inspections were completed in April 2019 following the methodology provided in the Ontario Structure Inspection Manual (OSIM)
- Defects were recorded for each structure according to material condition state and severity to determine the condition of the structure
- Recommendations were provided following OSIM guidelines for:
 - Maintenance
 - Additional Investigations
 - Capital Works

Maintenance Needs

- A summary list of maintenance needs for each structure is generated outlining corrective and preventative maintenance activities that should be completed as part of an annual maintenance program
- Examples include:
 - Annual expansion joint and bearing seat cleaning
 - Stabilizing eroded embankments
 - Tree/vegetation maintenance
 - Pothole repair
 - Deck cleaning/sweeping



Additional Investigation Needs

- A summary list of recommended additional investigations is generated for structures that may require more detailed investigations, non-destructive testing or advanced engineering analysis
- Examples include:
 - Monitoring of crack widths
 - Detailed concrete condition surveys in advance of rehabilitation
 - Site assessments for guide rail
 - Load limit evaluation



Recommended Capital Works

- A summary list of prioritized recommended capital repairs or replacements is generated based on the priorities of the Ontario Structure Inspection Manual:
 - Urgent – work is required immediately
 - Less than 1 Year – work should be scheduled for completion prior to the next biennial inspection (i.e., designed and constructed in the next 1-2 construction seasons)
 - 1-5 Years – work is to be designed and preferably completed in the next 1-5 years
 - 6-10 Years – work is expected in the next 6-10 years, but there is less certainty on the exact timing of the work

Summary of Inspection Results

Recommended Capital Works (cont.)

Structure Group	Total Estimated Capital Works			
	Urgent	Less Than 1 Year	1-5 Years	6-10 Years
Road Bridges and Culverts	-	\$55,000	\$1,940,000	\$550,000

- Notable changes from the 2017 inspections:
 - Considerations for roadside safety upgrades were included in the capital works as per recommendations in the Township's 2019 Asset Management Plan (set as 1-5 year priority)
 - Work required at Mill Race Culvert (Structure 2002), which was completed in June 2019
 - Moyer's Bridge (Structure 0004) schedule changed from 6-10 years to 1-5 years

Mill Race Culvert (Structure 2002)

- A sinkhole was discovered by Township staff in April 2019 on the west shoulder of the road
- As the OSIM inspection was completed in April, work was recommended for completion in less than 1 year to address the sinkholes and flow of water through the gabion headwall
- Drexler Construction completed repairs to the sinkhole, exploratory test holes to determine limits of undermining and repairs to the upstream gabion headwall to mitigate future erosion and undermining potential
- Work was completed in June 2019

Mill Race Culvert (Structure 2002) (cont.)



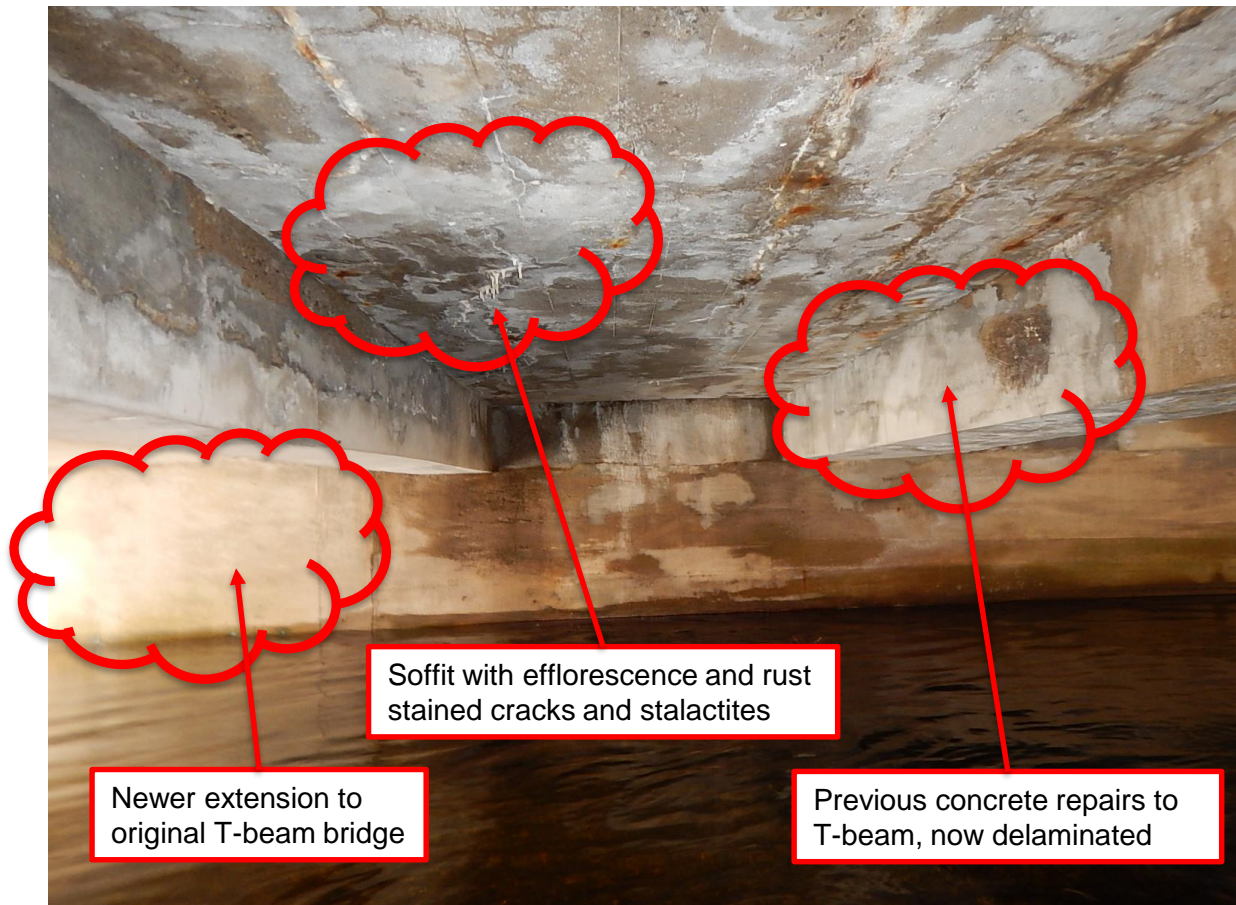
Moyer's Bridge (Structure 0004)

- 6.1 m span concrete T-beam bridge built in approximately 1931, with newer concrete extensions on each end (construction date unknown)
- Last rehabilitation was in 2012 and included repairs to the concrete deck, soffit and T-beam for \$58,000 + HST
- This structure sees heavy truck traffic from adjacent gravel pits, an asphalt plant and the industrial park
- It is unlikely that additional repairs to the concrete T-beams would appreciably extend the useful life of the structure
- Replacement of the structure is recommended

Moyer's Bridge (Structure 0004) (cont.)



Moyer's Bridge (Structure 0004) (cont.)



Soffit with efflorescence and rust stained cracks and stalactites

Newer extension to original T-beam bridge

Previous concrete repairs to T-beam, now delaminated

Summary

- A total of 23 structures were inspected as part of the Township's biennial structure inspections program
- Condition data was recorded for each structure including calculation of the Bridge Condition Index Value
- Recommendations were provided for each structure including maintenance, additional investigations and capital works.

Questions?