



Staff Report for Council Meeting

Date of Meeting: June 10, 2020

Report Number: SRCS.20.15

Department: Community Services
Division: Public Works Operation

Subject: **SRCS.20.15 – Culvert Emergency Repairs**

Purpose:

To inform Council and request retroactive approval for emergency repairs completed in April and May to a culvert under North Lake Road between Yonge Street and Lakeland Crescent, and a culvert under Newman Avenue between Bayview Avenue and Wildwood Avenue.

Recommendation(s):

- a) That Council receive this report as information; and
- b) That Council approve the emergency repairs as outlined in this report; and
- c) That Council approve funding the culvert emergency repairs for \$235,000 from the Water Quality Protection Reserve.

Contact Person:

Grant Taylor, Director, C.E.T., Public Works Operations, extension 2966

Jeremy Wychreschuk, P.Eng., Manager, Water Resources, extension 5495

Report Approval:

Submitted by: Darlene Joslin, Commissioner of Community Services (Acting)

Approved by: Mary-Anne Dempster, Interim City Manager

All reports are electronically reviewed and/or approved by the Division Director, Treasurer (as required), City Solicitor (as required), Commissioner and City Manager. Details of the reports approval are attached.

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Background:

Culvert Failures

City staff recently observed damage to the sidewalk and traffic lanes on North Lake Road between Yonge Street and Lakeland Crescent, and on Newman Avenue between Bayview Avenue and Wildwood Avenue. Further investigation determined that the cause of the road damage was due to failing culverts. The North Lake Road culvert is located near a connecting trail boardwalk just west of Lakeland Crescent (see Figure 1), and the Newman Avenue road crossing is located adjacent to a natural wetland (see Figure 2).

The North Lake Road culvert is a 910 mm diameter corrugated steel pipe (CSP) that conveys drainage from a tributary of the East Humber River. Inspection of the culvert determined that the north portion of the culvert collapsed and undermined the sidewalk and roadway base, resulting in the damaged infrastructure. It was also noted that the south portion of the culvert is severely corroded.

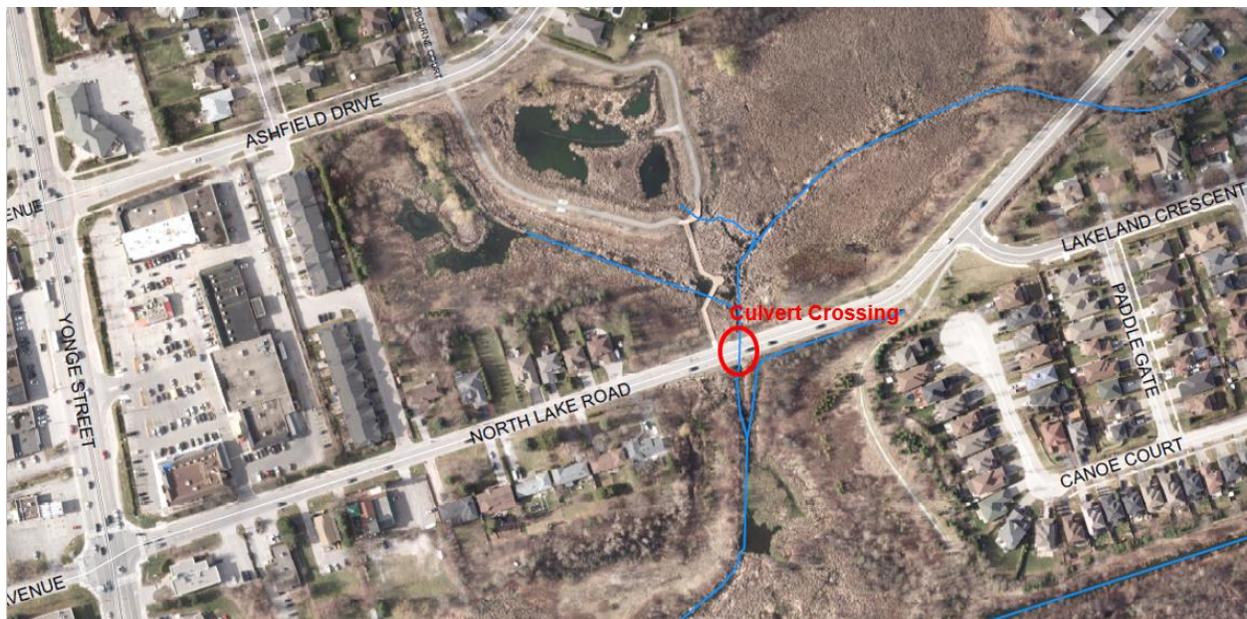


Figure 1 – North Lake Road culvert location

The Newman Avenue culvert is a 450 mm diameter CSP that connects two natural wetland features from the north to the south. Inspection of the culvert determined that the structure was full of debris and collapsed, resulting in the damage to the road and an elevated water level in the north wetland due to the interruption of the natural drainage path.

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Figure 2 – Newman Avenue culvert location

Immediate Actions Taken

City staff took immediate action to secure the impacted areas. For the North Lake Road location, this included closing the sidewalk and removing a sidewalk bay, and closing the portion of road affected. Since North Lake Road is a secondary road with high traffic volumes, immediate emergency action was deemed necessary due to the high risk of the roadway collapsing. Since the Toronto & Region Conservation Authority (TRCA) regulates the water crossing, a permit is required for any repairs or replacements made to this culvert. The City informed TRCA of the emergency action required and submitted a “Declaration of Emergency Works”. This declaration allows the City to conduct the necessary repairs immediately without first receiving a permit. Once the repairs are complete, the required documentation is provided to TRCA.

For the Newman Avenue location, City staff conducted some water pumping from the north wetland to the south wetland to allow the water to flow along its natural path. When the road showed signs of damage, the impacted road was closed to vehicle traffic. Since Newman Avenue is a well-used local road in the area, immediate emergency action was deemed necessary. Similar to the North Lake Road site, a “Declaration of Emergency Works” was submitted to TRCA so emergency repairs could begin right away.

Construction Activities

Staff determined that both culverts could not be repaired and needed to be replaced. The North Lake Road structure was replaced with a 900 mm diameter concrete culvert. The replacement was made with a culvert of similar size and conveyance capacity so there are negligible impacts to the upstream wetland or the flooding risks downstream.

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The new culvert's material is concrete so it will not corrode and is expected to have a long service life (over 50 years). The Newman Avenue culvert was replaced with a 450 mm diameter HDPE pipe, which was chosen so there are negligible impacts to the upstream and downstream wetlands. The plastic material of the pipe is expected to have a longer service life when compared to a CSP type culvert.

Construction for North Lake Road started during the week of April 27, 2020. High water levels typically encountered during the spring freshet required the temporary installation of cofferdams at both ends of the culvert and water pumping to keep the work area dry. The water was pumped to a sediment bag so sediment and contamination in the water was captured before being discharged to the receiving stream to protect the environment. Beaver management activities also took place downstream of the road crossing to lower water levels around the area to help with the construction activities.

The Newman Avenue culvert construction started the week of May 11, 2020. The high water levels in the north wetland required a cofferdam to be installed upstream of the road crossing. Similar to the North Lake Road site, water was pumped to a sediment bag to protect the environment. Beaver management was necessary since there was an active beaver in the north wetland.

Post Construction Activities

Although the main construction works are complete, restoration activities continue to be undertaken. The upstream and downstream side slopes adjacent to the road base of both sites will be seeded and stabilized with protective coir matting. The North Lake Road site also requires a section of guard rail to be replaced and a section of ditch connected to the culvert outfall to be cleaned. City staff are working with an engineering consultant to produce the documentation required by TRCA for both sites.

Financial/Staffing/Other Implications:

The cost for the North Lake Road construction activities is \$165,000, and the cost for the Newman Avenue culvert replacement is \$70,000, for a total cost of \$235,000. This emergency construction will be funded from the Water Quality Protection Reserve.

Relationship to the Strategic Plan:

The emergency replacement of the culverts under North Lake Road and Newman Avenue aligns with Strategic Plan Goal Four – Wise Management of Resources. Conducting emergency works immediately after damage to infrastructure is detected minimizes the extent of damage and substantially reduces the operation and maintenance costs of the infrastructure.

Conclusion:

Failed culverts caused damage to sidewalk and traffic lanes on North Lake Road between Yonge Street and Lakeland Crescent, and on Newman Avenue between Bayview Avenue and Wildwood Avenue. City staff took immediate action to stabilize

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the area and proceeded to repair the road crossings as emergency works since there was a high risk of the roadways collapsing. The culverts are replaced and both roads have been reinstated. City staff continue to undertake the remaining restoration activities at the two construction sites.

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Report Approval Details

Document Title:	Culvert Emergency Repairs.docx
Attachments:	
Final Approval Date:	May 27, 2020

This report and all of its attachments were approved and signed as outlined below:

David Dexter - May 27, 2020 - 10:33 AM

Grant Taylor - May 27, 2020 - 11:35 AM

Darlene Joslin - May 27, 2020 - 1:16 PM

MaryAnne Dempster - May 27, 2020 - 1:24 PM