



Environmental Study Report

Wycroft Road Improvements from Bronte Road to Kerr Street

Appendix H: Structures and Culverts

Submitted to Town of Oakville
by IBI Group
January 2020



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Memorandum

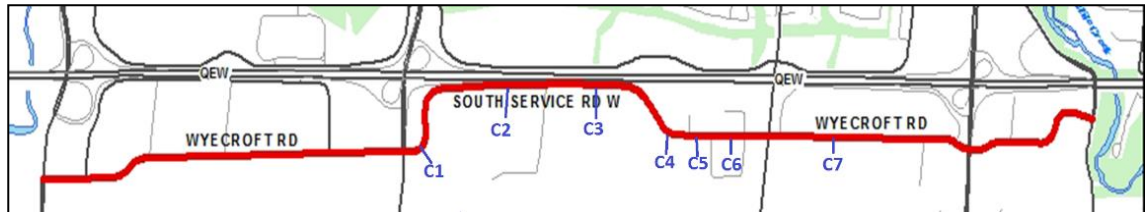
To/Attention Margaret Parkhill, P.Eng. **Date** August 28, 2018

From Zaid Al-Qaysi, M.Eng., EIT **Project No** 114331_Wyecroft_EA

cc Sardar Nabi, P.Eng.
Rose Wang, P.Eng.

Subject Town of Oakville - Wyecroft EA - Visual Inspection of Structures

The Town of Oakville has retained IBI Group to complete Class Environmental Assessment services for Wyecroft Road. This memorandum summarizes the findings of the visual inspection carried out for the structures within project limits:



Key Plan - Crossings

Structure ID 803006 – Culvert (C1)

General Description

The existing structure is located on South Service Road West over Fourteen Mile Creek, approximately 0.11km east of Third Line in the Town of Oakville. The structure is a twin-cell cast-in-place reinforced concrete box culvert with a clear cell span of 6.0m and a vertical opening of 3.05m between the soffit of the top slab and the bottom slab. The top slab is 0.457m thick and is partially covered with fill and bituminous surfacing. The culvert has a length of 23.5m with a roadway width of 7.3m which accommodates two lanes of vehicular traffic. The structure was constructed on a skew angle of 25° perpendicular to the roadway alignment. Structural drawings for of the culvert are available dated June 1985.

Observations and Findings

The structure was inspected on May 30, 2018 by Donald Moore, P. Eng and Zaid Al-Qaysi from IBI Group and pertinent site specific data was recorded. The following is a summary of our observations and findings:

- The bituminous surfacing exhibits transverse and random longitudinal cracks.
- Deck soffit exhibits transverse stained cracks on both south and north cells.
- The reinforcement chairs were visible from the deck soffit.
- It was observed that top slab exhibits water drainage problems.

The existing structure requires minor rehabilitation works including patch repairs to improve the durability of the structure and prevent further concrete deterioration.

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South Approach



Condition of Existing Guide Rail System

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West Elevation



East Elevation

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North-West Wingwall



South-West Wingwall

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North-East Wingwall



South-East Wingwall

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North Cell Looking West



Transverse Crack in the North Cell (Typical)

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Sediment Buildup in the South Cell Looking West



Transverse Crack in the South Cell (Typical)

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Structure ID 804005 – Culvert (C3)

General Description

The structure comprises of three sections; centre (original) section, north and south extension sections. The south extension culvert is located on South Service Road West over McCraney Creek, approximately 0.27km east of Progress Court in the Town of Oakville. The centre section of the structure is a single cell cast in-place reinforced concrete box culvert while the south and north extension sections are cast in-place reinforced concrete open footing culverts. The clear span of the south extension culvert is 3.05m with a vertical opening of 1.6m between the soffit of the top slab and the invert slab. The top slab is 0.25m thick and is partially covered with fill and bituminous surfacing. The south extension culvert has a length of approximately 20.7m with roadway width of 7.1m which accommodates two lanes of vehicular traffic. It was also noted that a concrete invert slab was constructed at the south extension culvert. The south extension culvert was constructed perpendicular to the roadway alignment. Structural drawings for the extension sections are available dated November 1957. Additional information about the culvert rehabilitation history is not available.

Observations and Findings

The structure was inspected on June 14, 2018 by D.B. Moore, P. Eng and Zaid Al-Qaysi from IBI Group and pertinent site specific data was recorded. The following is a summary of our observations and findings:

- The bottom slab exhibits severe concrete disintegration at the drop-off location where centre (original) section connect with the south extension section of the culvert.
- Scouring of streambed and erosion of adjacent embankment slopes was noted at the culvert outlet
- New concrete patch repairs were completed for centre and the south extension sections of culvert.

The existing structure requires rehabilitation works including concrete repairs and embankment restoration.

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West Approach



East Approach

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Existing Condition of Wearing Surface



Existing Surface Condition of the Top Slab

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South Elevation



Drop-off Location Looking North

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Concrete Disintegration at the Drop-off Location



Patched Concrete Repairs for the South Extension Section of the Culvert

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Condition of Gabion Basket



Scour of Streambed – Note Exposed Geogrid near Outlet

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Structure ID 804004 – Culvert (C4)

General Description

The existing structure is located on South Service Road West over McCraney Creek, approximately west of Cranberry Court in the Town of Oakville. The structure is a single cell reinforced concrete non-structural box culvert. A structure extension was added with a cast-in-place reinforced concrete box culvert. The clear span of the culvert is 2.4m with a vertical opening of 1.5m between the soffit of the top slab and the bottom slab. The top slab is 0.5m thick and is partially covered with fill and bituminous surfacing. The culvert has a length of 43.6m with a roadway width of 17.5m which accommodates three lanes of vehicular traffic. The structure was constructed on a slew angle of 35° perpendicular to the roadway alignment. Structural drawings for the extension section of the culvert are available dated 1986.

Observations and Findings

The structure was inspected on May 30, 2018 by D.B. Moore, P. Eng and Zaid Al-Qaysi from IBI Group and pertinent site specific data was recorded. The following is a summary of our observations and findings:

- The bituminous surfacing exhibits longitudinal and random transverse cracks.
- The culvert exhibits delaminated and spalled concrete areas.
- The deck soffit exhibits transverse separation of the concrete causing joint leaking problems.
- Sediment buildup at the outlet is approximately 0.3m thick.

The structure is in fair condition but it requires rehabilitation works including concrete and joint repairs.

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West Approach



East Approach

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North Elevation



South Elevation

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Existing Surface Condition of the Top Slab



North-East Retaining Wall

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Transverse Separation of the Concrete Segments



Spalled Concrete

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Structure ID 805002 – Culvert (C6)

General Description

The existing structure is located on South Service Road West over Taplow Creek, approximately 0.04km west of Fourth Line in the Town of Oakville. The structure is a twin-cell cast in-place reinforced concrete box culvert. The clear span of the cell is 3.05m with a vertical opening of 1.8m between the soffit of the top slab and the bottom slab. The top slab is partially covered with fill and bituminous surfacing. The culvert has a length of 59m with a roadway width of 19.1m which accommodates four lanes of vehicular traffic. The structure was constructed on a slew angle of 40° perpendicular to the roadway alignment.

Observations and Findings

The structure was inspected on May 30, 2018 by D.B. Moore, P. Eng and Zaid Al-Qaysi from IBI Group and pertinent site specific data was recorded. The following is a summary of our observations and findings:

- The bituminous surfacing exhibits random longitudinal and transverse cracks.
- The culvert exhibits spalled and delaminated areas of concrete.
- Deck soffit exhibits transverse spalling and joint separation causing leaking problems at approximately the same transverse location for both cells.

The existing structure requires rehabilitation works including concrete and joint repairs.

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East Approach



Condition of Existing Guide Rail System

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North Elevation



South Elevation

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North-West Retaining Wall



North-East Retaining Wall

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South-East Retaining Wall



South-West Retaining Wall

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Concrete Spalling and Delamination



Joint Separation

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East Cell Looking South



Condition of Existing Stormwater Sewer

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Structure ID 906004 – Bridge (C7)

General Description

The existing structure is located on Wyecroft Road over Glen Oak Creek, approximately 0.31km east of Fourth Line in the Town of Oakville. The structure is a single span cast-in-place reinforced concrete open footing culvert with a clear span of 6.1m and a vertical opening of 1.1m between the soffit of the top slab and the creekbed. The top slab is 0.305m thick and is partially covered with fill and bituminous surfacing. The culvert has length of 16.3m with a roadway width of 7.3 m which accommodates two lanes of vehicular traffic. The structure was constructed perpendicular to the roadway alignment. Structural drawings for of the culvert are available dated June 1961.

Observations and Findings

The structure was inspected on May 30, 2018 by D.B. Moore, P. Eng and Zaid Al-Qaysi from IBI Group and pertinent site specific data was recorded. The following is a summary of our observations and findings:

- The bituminous surfacing exhibits transverse cracks.
- The first metre of the culvert at the outlet is in poor condition with extensive delamination, areas of spalled concrete, exposed corroded reinforcing steel and honeycombing.
- Heavy sediment buildup on the west side of the bridge.
- The embankment slopes adjacent the culvert inlet and outlet are steep.
- The existing roadside safety treatment does not comply with the Ontario Roadside Design Guide.

The existing structure is in poor condition and should be replaced. This is considering the anticipated unexpected construction delays due to extensive full depth removals and significant cost over runs, the age of the structure, and the significant sediment buildup within the barrel.

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Existing Condition of Wearing Surface



West Approach

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South Elevation



North Elevation

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Spalled Concrete with Exposed Rebar at Outlet



Spalled Concrete with Exposed Rebar of Soffit near Outlet

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Concrete Honeycombing near Outlet



Heavy Sediment Buildup inside the Structure