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FUNCTIONAL SERVICING REPORT

7085 Morrison Street
City of Niagara Falls
October 2022

INTRODUCTION

Upper Canada Consultants has been retained to undertake and provide a Functional Servicing Report to address the servicing needs and requirements as part of the zoning by-law amendment for the proposed development. The project site is known municipally as #7085 Morrison Street in Niagara Falls located west of Dorchester Road, east of Victor Drive and south of Optimist Lane. The development site and surrounding lands were historically the location of Optimist Park, though was largely developed to a residential subdivision in 2014 with the current Optimist Club building being constructed on the proposed 0.98 hectare development site.

The proposed development will consist of an additional building to the existing Optimist Club site containing 9 commercial retail units as well as an extension to the existing parking lot. The site shall include associated asphalt parking lot, concrete curb, catch basins and storm sewer.

The objectives of this study are as follows:

1. Identify domestic and fire protection water service needs for the site;
2. Identify sanitary servicing needs for the site; and,
3. Identify stormwater management needs for the site.

WATER SERVICING

There is an existing 300mm diameter PVC watermain located on the south side of Morrison Street with a 50mm diameter water lateral providing service for the existing Optimist Club building on the site. An existing hydrant located on the south side of Morrison Street fronting the site provides fire protection for the existing building.

With the proposed commercial addition, a minimum 100mm diameter service will be required for domestic purposes. If sprinklers are required within the proposed building addition, then a minimum 150mm diameter water service will be required on site with a fire department connection. The future water service connection will replace the existing 50mm diameter service at the same location.

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SANITARY SERVICING

The existing building on this site currently discharges sanitary flows to a 150mm diameter service at the south limit of the property outletting to the existing 250mm diameter sanitary sewer directing flows easterly on Morrison Street. The proposed addition will discharge sanitary flows to the 150mm diameter service via the existing maintenance hole located at the south limits of the site. A separate on-site service will convey sanitary flows from the proposed addition to the existing maintenance hole at the property line.

An analysis has been conducted of the existing sanitary service and immediate downstream sanitary sewer and included in Appendix A. As shown in the sanitary sewer calculations, the proposed development site will discharge a total peak sanitary flow to the existing sanitary system at a rate of 1.79L/s. The existing 150mm diameter sanitary service as a full flow capacity of 22.47L/s while the existing 250mm diameter Morrison Street sanitary sewer has a full flow capacity of 42.98L/s. Therefore, the proposed development will occupy 8.0% and 4.2% of the full capacity of the existing service and mainline sanitary sewer respectively. It is expected that this will be an acceptable addition to the current capacity of the existing sanitary sewer.

STORMWATER MANAGEMENT PLAN

As part of the site development for the proposed commercial development, the following is a summary of the stormwater management plan.

The criteria provided by the City of Niagara Falls and Region of Niagara for this development includes the requirement to control future development stormwater flows to allowable levels from this site for up to and including the 5 year design storm event. It is also required to improve stormwater quality levels to MECP Normal Protection (70% TSS removal) levels prior to discharge to the existing storm sewer on Morrison Street.

There is an existing 600mm diameter storm sewer fronting the site conveying flows easterly on Morrison Street. An existing on-site storm sewer system collects flows from the parking lot and building and discharges via a 375mm diameter storm service to a maintenance hole at the intersection of Morrison Street and the commercial plaza to the south as part of the existing 600mm diameter storm sewer.

As part of the surrounding Optimist Park residential subdivision development, the proposed development site was included in the Overall Storm Drainage Area Plan conveying stormwater flows to the existing maintenance hole on Morrison Street up to and including the 5 year design storm event. The site was split into two drainage areas: EX1 (west) of 0.47 hectares at a Runoff Coefficient of 0.75, and EX2 (east) of 0.51 hectares at a Runoff Coefficient of 0.20. This results in a combined drainage area of 0.98 hectares at an averaged Runoff Coefficient of 0.46 discharging stormwater flows to the existing storm sewer system. The proposed stormwater management plan for this development will restrict stormwater flows discharging to the existing storm sewer system on Morrison Street to allowable levels, previously determined for this development site. To limit

future stormwater flows to allowable levels, typically a control is placed on the outlet from the site that may include an orifice and site stormwater storage.

To improve stormwater quality levels to Normal Enhancement (70% TSS removal) levels prior to discharging from this site, an oil/grit separator is proposed. Stormwater flows greater than the 5 year design storm event will be directed out to the Morrison Street road allowance as under existing conditions.

CONCLUSIONS AND RECOMMENDATIONS

Therefore, based on the above comments and design calculations provided for this site, the following summarizes the servicing for this site.

1. The existing 300mm diameter watermain will have sufficient capacity to provide both domestic and fire protection water supply.

2. The existing 150mm diameter sanitary service and 300mm diameter municipal sanitary sewer on Morrison Street will have adequate capacity for the proposed development.

3. Stormwater quantity controls will be provided to allowable conditions up to and including the 5 year design storm event prior to discharging to the Morrison Street storm sewer.

4. The site extreme stormwater overland route from the road system is to Morrison Street.

5. Stormwater quality protection will be provided by a stormwater oil/grit separator or approved equivalent to Normal Protection (70% TSS removal) levels.

Based on the above and the accompanying calculations, there exists adequate municipal servicing for this development. We trust the above comments and enclosed calculations are satisfactory for approval. If you have any questions or require additional information, please do not hesitate to contact our office.

Yours very truly,

Jason Schooley, P.Eng.
October 25, 2022

LICENSED PROFESSIONAL ENGINEER
J. P. SCHOOLEY
PROVINCE OF ONTARIO

Encl.

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APPENDICES

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APPENDIX A

Sanitary Sewer Calculations

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DESIGN FLOWS

RESIDENTIAL: 375 LITRES/PERSON/DAY (AVERAGE DAILY FLOW)
COMMERCIAL: 87.5 PERSONS/HECTARE (28,000L/ha/d) - (Design Guideline for Sewage Works, 2008, MOE)
INFILTRATION RATE: 0.21 L / s / ha (M.O.E FLOW ALLOWANCE IS BETWEEN 0.10 & 0.28 L / s / ha)

SEWER DESIGN

PIPE ROUGHNESS: 0.013 FOR MANNING'S EQUATION
PIPE SIZES: 1.016 IMPERIAL EQUIVALENT FACTOR
PERCENT FULL: TOTAL PEAK FLOW / CAPACITY

MUNICIPALITY: CITY OF NIAGARA FALLS
PROJECT : 7085 MORRISON STREET
PROJECT NO: 2223

SANITARY SEWER DESIGN SHEET

Peaking Factor= $M = 1 + \frac{14}{4 + P^{0.5}}$ Where P = design population in thousands

LOCATION			AREA					ACCUMULATED PEAK FLOW				DESIGN FLOW					
Location and Description	From M.H	To M.H.	Increment (hectares)	Accumulated (hectares)	Population Density (persons/ha)	Population Increment	Total Population Served	Peaking Factor	Flow (L/s)	Infiltration Flow L/s	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Percent Full
PROP DEVELOPMENT	SERVICE	EX MH	0.98	0.98	87.5	86	86	4.26	1.59	0.21	1.79	150	19.3	2.00	1.23	22.47	8.0%
MORRISON STREET	EX MH	EX MH		0.98			86	4.26	1.59	0.21	1.79	250		0.48	0.85	42.98	4.2%