UPPER CANADA CONSULTANTS
ENGINEERS / PLANNERS

Upper Canada
Planning &
Engineering Ltd.
3-30 Hannover Drive
St. Catharines, ON
L2W 1A3
Phone 905-688-9400
Fax 905-688-5274

File: 2169

FUNCTIONAL SERVICING REPORT

Thorowest Village
City of Niagara Falls
January 2023

INTRODUCTION

Upper Canada Consultants has been retained to undertake and provide a Functional Servicing Report to address the servicing needs and requirements for the proposed 46-unit condominium development known as Thorowest Village. This report has been prepared in support of applications for Draft Plan of Vacant Land Condominium and Zoning By-law amendment for lands known municipally as 7769, 7751, and 7735 Thorold Stone Road (Regional Road 57). The proposed development is located west of Montrose Road, east of Cardinal Drive and backs on to Shriner's Creek at the north limit of the site. Historically, the site has been developed with single family residential homes.

The development site is approximately 1.54 hectares and shall consist of 44 townhouse units, 4 semi-detached units and 1 single family dwelling as part of the condominium. The site shall include associated asphalt parking lot, concrete curb, catch basins, storm sewers, sanitary service, and a water service.

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 exists a 300mm diameter PVC municipal watermain located on the south side of Thorold Stone Road (Regional Road 57). It is proposed to connect a 150mm diameter water service to the existing 300mm diameter watermain to provide both domestic water supply and fire protection for the buildings on this site. A proposed private hydrant located within the development shall provide adequate fire protection for the condominium block. The spacing and location shall be identified as part of future detailed design.

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SANITARY SERVICING

There is an existing 250mm diameter municipal sanitary sewer on the south side of Thorold Stone Road conveying flows westerly to an existing 525mm diameter concrete Regional sanitary trunk sewer on Thorold Stone Road at the west limit of the site. Due to the shallow depth of the existing municipal sanitary sewer, it is proposed to connect to the existing sanitary maintenance hole at the south-west limit of the site on Thorold Stone Road and discharge flows to the 525mm diameter Regional Trunk Sewer. This will allow a sanitary sewer of sufficient depth to be constructed within the proposed development site.

Utilizing existing sanitary infrastructure information provided by the City of Niagara Falls and the Region of Niagara, the existing 525mm diameter trunk sanitary sewer has a full flow capacity of approximately 300.97L/s. The proposed 1.54 hectare, 49-unit development will produce a peak sanitary dry weather outflow of 2.28L/s and a wet weather outflow of approximately 2.72L/s, occupying 0.9% of the capacity of the existing 525mm diameter trunk sanitary sewer. It is expected that this will be an acceptable addition to the current capacity of the existing sanitary sewer. All sanitary calculations can be found in Appendix A.

STORMWATER MANAGEMENT

As part of the site development, the following is a summary of the stormwater management plan. The criteria provided by the City of Niagara Falls for this development includes the requirement to control future stormwater flows from this site to existing levels up to and including the 100 year design storm event, and provide stormwater quality controls to MECP Normal Protection (70% TSS removal) levels before outletting from the site.

Under existing conditions, the majority of stormwater flows from the proposed development lands are currently conveyed overland to Shriner's Creek at the north limits of the site. There is an existing 675mm diameter municipal storm sewer on the north side of Thorold Stone Road fronting the site. A portion of the proposed development was included in the drainage area plan for the existing storm sewer.

The proposed stormwater management plan will discharge stormwater flows directly to Shriners Creek at the south-west corner of the site via a proposed headwall directly adjacent to the existing 2.4 x 1.8m box culvert conveying flows beneath Thorold Stone Road. Stormwater quantity controls will be provided within the site by means of a control orifice and a combination of underground pipe storage and an on-site dry pond to restrict flows to allowable levels prior to discharge to Shriners Creek. To improve stormwater quality, typically an oil/grit separator provides the required TSS (Total Suspended Solids) removal for this type of development. The complete stormwater design for this development shall be identified as part of future detailed design.

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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 PVC watermain will have sufficient capacity to provide both domestic and fire protection water supply.

2. The existing 525mm diameter sanitary sewer on Thorold Stone Road (Regional Road 57) will have adequate capacity for the proposed residential development.

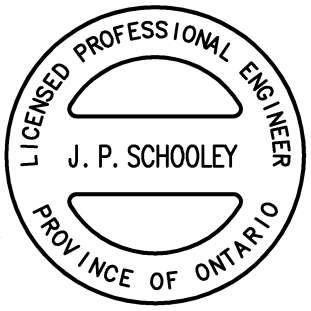
3. Stormwater quantity controls will be provided on-site to existing levels prior to discharging to Shriners Creek.

4. Stormwater quality controls will be provided to MECP Normal Protection (70% TSS removal) levels prior to outletting to Shriners Creek.

5. The site overland flow route from the development is to Shriners Creek.

In conclusion, there exists adequate municipal infrastructure to service the proposed 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.
January 17, 2023
Encl.

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APPENDICES

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APPENDIX A

Sanitary Sewer Design Sheet

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DESIGN FLOWS

RESIDENTIAL: 320 LITRES/PERSON/DAY (AVERAGE DAILY FLOW)
INFILTRATION RATE: 0.286 L / s / ha (M.O.E FLOW ALLOWANCE IS BETWEEN 0.10 & 0.28 L / s / ha)
POPULATION DENSITY: 3.0 PERSONS / UNIT

SEWER DESIGN

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

MUNICIPALITY: NIAGARA FALLS
PROJECT : THOROWEST VILLAGE
PROJECT NO: 2169

SANITARY SEWER DESIGN SHEET

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

LOCATION			AREA		POPULATION				ACCUMULATED PEAK FLOW				DESIGN FLOW					
Location and Description	**From M.H**	**To M.H.**	**Increment (hectares)**	**Accumulated (hectares)**	**Number of Units**	**Population Density (persons/unit)**	**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**
PROPOSED DEVELOPMENT	PROP	EX	1.54	1.54	49	3.0	147	147	4.19	2.28	0.44	2.72	200	50.0	0.40	0.67	21.64	12.6%
THOROLD STONE ROAD	EX	EX		1.54				147	4.19	2.28	0.44	2.72	525	92.0	0.45	1.35	300.97	0.9%