FUNCTIONAL SERVICING REPORT

HODGSON AVENUE STACKED TOWNHOUSE DEVELOPMENT

5372 & 5390 Hodgson Avenue
Niagara Falls, ON

Prepared by: *Quartek Group Inc.*
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Contents

Attachments

Drawing – 25113-CSS – Conceptual Site Servicing
Appendix A – Sanitary Sewer Design Sheet

1.0 Introduction

This functional servicing report (FSR) serves to demonstrate how servicing of the subject development can be appropriately achieved and to provide a basis for detailed engineering. This FSR will discuss the following key aspects of municipal design:

- Water Supply and Distribution
- Sanitary Sewerage
- Drainage and Site Grading
- Utility Servicing
- Servicing Locations

2.0 Background

The subject property is located on the east side of Hodgson Avenue, south of Watson Street – municipally referred to as 5372 and 5390 Hodgson Avenue (before consolidation). The consolidated property is approximately 3953.3 m^2 (0.40 ha) in size. There is 53.6m of frontage along Hodgson Avenue. An aerial map showing the subject property is shown in Figure 1.

3.0 Development Proposal

The current proposal is to develop thirty (30) townhouse dwellings, in two (2) blocks which are stacked two (2) suites high.

Figure 1 – Aerial Map of Development Site

4.0 Water Supply and Distribution

The City of Niagara Fall's water system is supplied by the Niagara Falls Water Treatment Plant. There is one single pressure zone of 250m in the water system. Based on Niagara Region's *2021 Water and Wastewater Master Servicing Plan Update*, the existing peak hour minimum pressure at the development site ranges from 60-80psi.

Water supply will be taken from the municipal 150mmØ PVC watermain located in the east boulevard on Hodgson Avenue. The existing water service connections will be decommissioned at the main. Two new connections will be proposed at the existing watermain – a 150mmØ hydrant lead and a 100mmØ domestic water service. The fire and domestic lines are separated as per the guidelines on the City's *Fire and Domestic Water Servicing for Commercial, Industrial and High-Density Residential Buildings* detail, given that the existing watermain is less than 4.5m from the west property line. Only the domestic water service is required to be metered in this scenario.

A 32mmØ type "K" copper water service is provided for each townhouse stack (i.e. set of 2 suites), based on the following:

- Fixture demand for one (1) townhouse stack of two (2) 2-bedroom suites is as follows: two (2) 3-piece bathroom groups (7.2 FU), one (1) 3-piece bathroom group with double lavatory (4.3 FU), one (1) 2-piece bathroom group (2.9 FU), two (2) dishwashers (2.8 FU), two (2) clothes washers (8.0 FU), two (2) kitchen sinks (4 FU), and one (1) 1/2" hose bibb (2.5 FU) for a total of 31.7 fixture units.

Table 7.6.3.4 in the OBC provides a maximum fixture unit count/hydraulic load for a 25mmØ water service as 31 fixture units. The next size, 32mmØ, has a maximum hydraulic load of 57 fixture units. Therefore, the water services will be proposed as 32mmØ instead of 25mmØ.

There are thirty (30) 2-bedroom suites in total. The total fixture unit count for all of the suites is 475.5 FU.

In addition to the suites, four (4) additional 1/2" hose bibbs (10 FU) will be installed, bringing the proposed development's total to 485.5 FU.

Using Table 7.4.10.5 in the OBC, 485.5 FU converts to 113.1 USGPM or 7.1 L/s. The anticipated dynamic headloss in the 100mmØ domestic water service (including an allowance of 5psi through the water meter) is approximately 6.6psi (using C=100), which is acceptable. The anticipated dynamic headloss in the 50mmØ domestic water service that services the northern block of suites is approximately 18.2psi (using C=120), which is acceptable.

The fire demand flow rate for the northern townhouse block is computed at 8,000 L/min (133 L/s or 2108 USGPM) per the Fire Underwriter's Survey (FUS), using a worst-case assumption of all-

combustible construction. This block was chosen as the worst-case scenario after analyzing both townhouse blocks. A summary of the FUS calculation and adjustments is shown in Figure 2 below.

Building Name:	**North Block**	Quartek
Project #:	**25113**	
Total Effective Area (sq. m):		1474.2
Building Construction Coefficient:		1
Initial Fire Flow:		8000
Occupancy Adjustment:		-1200
Sprinkler Protection Adjustment:		0
Standard Water Supply Adjustment:		0
Supervised System Adjustments:		0
Community Level Automatic Sprinkler Protection of Area Adjustment		0
Fire Subdivision with Risk and/or Unprotected Openings Adjustment		0
Total Exposure Charge Adjustment		1200
Total Fireflow with Adjustments - (Rounded to nearest 1000 L/min)		**8000 L/min**

Figure 2 – 2020 Fire Underwriter's Survey Calculation Parameters

One (1) new fire hydrant is proposed within the development. The proposed private hydrant will provide adequate fire protection for this development based on the following: all units are covered by the proposed hydrant within the OBC's maximum hose-path distances of 45m from hydrant to truck and 45m from truck to principal entrance. In addition, the existing system fire flow near the development is shown in the Region's master servicing plan to be greater than 200 L/s, which is adequate to meet the fire demand flow rate for the northern townhouse block. The site entrance is designed to comply with minimum OBC fire route requirements, and since the length is less than 90m a turn-around facility is not required.

5.0 Sanitary Sewerage

The outlet for the site is the existing 450mmØ AC combined sewer on Hodgson Avenue.

A 200mmØ sanitary sewer is proposed to connect to the existing combined sewer and extend east approximately 74.9m, through the proposed driveway and parking lot, to service the development. A 1200mmØ maintenance hole (MH1A) will be installed as an access point near the west property line.

The sanitary sewage collection system will cater for peak domestic flows and potential infiltration and inflow. Sanitary flows will be collected from each unit through 100mmØ laterals.

Key design data for sanitary servicing is as follows:

No. of Dwelling Units	30 units
Population Density	3.0 persons/2-bedroom units
Total Design Population	90
Mean sewage flow	450 L/person/day
Sewage shed area (total)	0.395 ha
Infiltration Rate	0.28 L/s/ha
Manning's 'n'	0.013

A sanitary design sheet has been provided as an attachment.

It is noted that the capacity of the receiving sewer, the 450mmØ AC combined sewer with a slope of 0.29% is 153.4 L/s. The additional sanitary flow from the development (1.99 L/s) represents 1.3% of the sewer's capacity (assuming unsurcharged operation).

Based on the preceding analysis, and with the implementation of necessary SWM controls to reduce net flows from the proposed development to the combined sewer, it is expected that there are no impediments to connecting this development to the existing combined sewer on Hodgson Avenue.

6.0 Drainage and Stormwater Management

A Stormwater Management Report will be included under separate cover for the SPA submission. Below is a brief synopsis of the design/report:

- The minor storm system will be designed to convey runoff from the 1:5 year storm event in an unsurcharged state.
- Site grading will be designed to direct major storm flows toward Hodgson Avenue where possible – new hardscaped areas will overflow to Hodgson Avenue but existing areas along the north and east property lines with either substantial existing drainage patterns or mature trees will not be changed.
- Post-development peak flow for the 1:5 year storm event will be controlled to a rate less than the 1:5 year pre-development peak flow rate, while also factoring in the peak sanitary design flow, to reduce net flows to the combined sewer (as per pre-consultation comments). A tempest inlet control device installed in STM MH1 will restrict flow.
- Underground detention will be used to achieve the required quantity control.
- The underground detention could consist of 1050mmØ concrete “super-pipe” and the utilization of volume within the proposed catchbasin maintenance holes – altogether providing ±48m^3 of storage.
- As per *F-5-5 – Determination of Treatment Requirements for Municipal and Private Combined (Ministry of the Environment, Conservation and Parks)*, the quality control of wet weather flows within combined sewers may occur at the central Sewage Treatment Plant or at other locations such as satellite treatment facilities. There will not be any extensive quality control measures on the subject property.
- Software modelling will be performed using MIDUSS (Micro Interactive Design of Urban Storm Sewers) software.
- The defining parameters for the design storms used for modelling are derived from the Rainfall Intensity Duration Curve for Niagara Falls, namely using a Chicago Storm Hyetograph with 3-hour duration. These parameters are summarized in Table 2 below and will be incorporated in the computerized modelling.

Table 2 – Design Storm Parameters

Storm Return Period	IDF Curve Parameters			Maximum intensity (mm/hr)	Total Depth (mm)
	a	b	c		
5 year	719.50	6.34	0.7687	111.18	38.75
100 year	1264.57	7.72	0.7814	173.34	63.47

**rainfall intensity, $i = a/(t+c)^b$, where t = time of concentration (min.)*
Ratio of time to peak = 0.40

7.0 Utilities

Hydro, Bell and gas utilities are located in the adjacent right of way. Utilities have been notified of the proposed development plan and have not yet expressed any challenges in servicing this development.

8.0 Service Locations

Please refer to the attached drawing which shows approximate locations of the existing municipal services along with the proposed services for the development.

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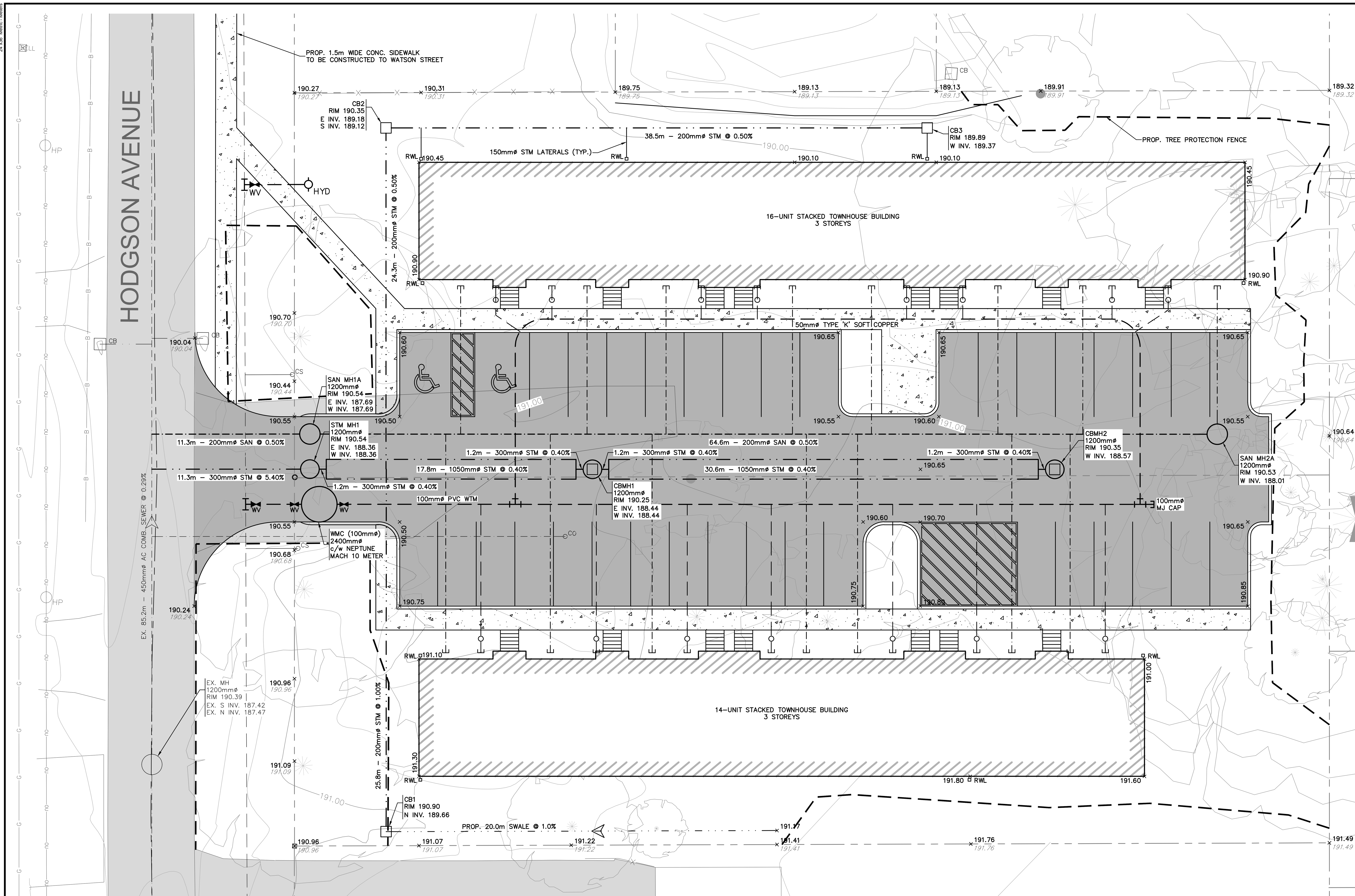
Civil Engineering Designer

Reviewed by:

Hank Klassen, P.Eng.
Senior Civil Engineer



LEGEND

- EXISTING GROUND CONTOUR (108.00)
- PROPERTY LINE
- EXISTING GAS
- EXISTING BELL
- EXISTING OVERHEAD UTILITIES
- PROPOSED TREE PROTECTION FENCE
- 93.28 / 93.28 PROPOSED GROUND ELEVATION / EXISTING GROUND ELEVATION
- EXISTING ASPHALT
- PROPOSED ASPHALT
- PROPOSED CONCRETE SIDEWALK
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SWALE
- EXISTING MAINTENANCE HOLE
- EXISTING CATCHBASIN
- PROPOSED MAINTENANCE HOLE
- PROPOSED SINGLE CATCHBASIN
- PROPOSED GRADE ARROW

12 May 2026
PRELIMINARY

issue	issued for	date	init.
A	ZBA	12 MAY 2026	TC

seal

Do not scale drawings. Report any discrepancies to Quartek Group Inc. before proceeding.

Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit applications and / or government approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction.

All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations.

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project title
HODGSON AVE
5372 & 5390 HODGSON AVE
NIAGARA FALLS, ON L2H 1N3

drawing title
CONCEPTUAL SITE SERVICING

drawn by	designed by
TC	TC
scale	date
1:150	12 MAY 2026
job number	issue
25113	A

drawing number
25113-CSS

plotted by: tcrawford on May 12, 2026 - 4:32pm

SANITARY SEWER DESIGN COMPUTATION SHEET

PROJECT: **5372 & 5390 Hodgson Avenue** *FILE #:* **25113** *DATE:* **2026-May-12** *COMPUTED BY:* **TC** *CHECKED BY:*

DRAINAGE AREA PLAN: **Subject Site Only** *REV #:* **N/A** *OUTFALL:* **Ex. 450mmØ Combined Sewer @ 0.29% on Hodgson Avenue**

EQUIVALENT AREA FACTORS: INDUSTRIAL: **—** Persons/ha COMMERCIAL / INSTITUTIONAL: **—** Persons/ha *MANNING'S `n':* **0.013**

POPULATION PER DWELLING: **—** *AVERAGE PER CAPITA DESIGN FLOW:* **450** L/capita/day *PEAKING FACTOR:* **Harmon: M = 1 + (14 / (4 + (P / 1000)$^{0.5}$** *INFILTRATION RATE:* **0.280** L/ha/s

LOCATION	AREA	FROM	TO	FLOW CALCULATION											DESIGN				
				AREA (ha)		Land Use	No. of Units	Population Per Unit	Total Population	Avg. Domestic Flow (L/s)	Peaking Factor	Peak Domestic Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Design Flow (L/s)	PIPE Ø	SLOPE	**CAP.**	VEL.	LENGTH
				Incremental	Total										(mm)	(%)	**(L/s)**	(m/s)	(m)
						Residential North (2 Bedroom)	16	3	48	0.250	4.00	1.000							
						Residential South (2 Bedroom)	14	3	42	0.219	4.00	0.875							
5372 & 5390 Hodgson Avenue	101	SAN MH2A	SAN MH1A	0.395	0.395	(Above)	—	—	90	0.469	—	1.88	0.11	1.99	200	0.50	**23.2**	0.74	63.7
Totals																			