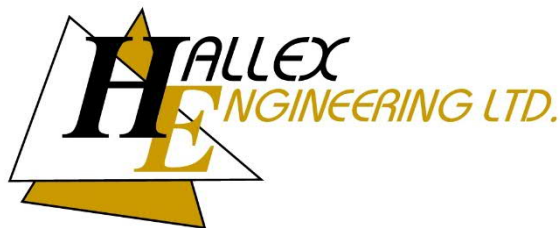

BUCHANAN APARTMENT BUILDING
5640 STANLEY AVENUE, NIAGARA FALLS

FUNCTIONAL SERVICING DESIGN BRIEF
NEW SANITARY AND WATER SERVICES

REV 0 – July 05, 2023

PREPARED BY:



HALLEX PROJECT #221014

HALLEX NIAGARA
4999 VICTORIA AVENUE
NIAGARA FALLS, ON L2E 4C9

HALLEX HAMILTON
745 SOUTH SERVICE ROAD, UNIT 205
STONEY CREEK, ON L8E 5Z2

TABLE OF CONTENTS

1. INTRODUCTION	1
2. EXISTING MUNICIPAL INFRASTRUCTURE	1
2.1 SANITARY SEWER	1
2.2 WATERMAIN	1
3. SANITARY SEWER SYSTEM	1
4. WATER DISTRIBUTION SYSTEM	2
5. CONCLUSION	3

EXHIBITS – Servicing Design Sheets

1. INTRODUCTION

The proposed Buchanan apartment building development consists of the demolition of the existing buildings and parking areas and the construction of a new apartment building, asphalt laneway & parking areas, underground parking garage and grass areas. This development is located at 5640 Stanley Avenue, which is at the southeast corner of the Stanley Avenue and North Street intersection and at the southwest corner of the Buchanan Avenue and North Street intersection in the City of Niagara Falls, ON.

The purpose of the service assessment is to determine the functional sizing of the proposed sanitary and water services in addition to the post-development flows from the site to determine the impact on the existing municipal infrastructure.

2. EXISTING MUNICIPAL INFRASTRUCTURE

2.1 SANITARY SEWER

The existing site is currently serviced with multiple sanitary lateral connections to Buchanan Avenue, North Street and Stanley Avenue as it consisted of the existing hotel and two single family dwellings, however the size and location of all the existing sanitary laterals are not fully known. The existing municipal sanitary infrastructure consists of a 250mm sanitary sewer at Buchanan Avenue, a 250mm sanitary sewer at North Street and a 1350mm combined sewer at Stanley Avenue. The municipal sanitary sewer at North Street drains to the municipal sanitary sewer at Buchanan Avenue which continues to drain northerly towards Kitchener Street. The municipal combined sewer at Stanley Avenue drains northerly towards Kitchener Street.

2.2 WATERMAIN

The existing site is currently serviced with multiple water service connections to Buchanan Avenue, North Street and Stanley Avenue as it consisted of the existing hotel and two single family dwellings, however the size and location of all the existing water service connections are not fully known. The existing municipal watermain infrastructure consists of a 150mm watermain at Buchanan Avenue, a 200mm watermain at North Street and a 500mm regional watermain at Stanley Avenue. The municipal watermains at Buchanan Avenue and North Street are connected to the regional watermain at Stanley Avenue.

3. SANITARY SEWER SYSTEM

Given the site is to be completely redeveloped for the proposed Buchanan apartment building development, all existing sanitary laterals are to be located, capped and abandoned as required at the property line. A new sanitary lateral shall be proposed from the building to the existing 1350mm municipal combined sewer at Stanley Avenue.

The building development is currently in the concept phase; therefore, the following assumptions based on the architectural drawings are made in carrying out the calculations:

- The fourteen-storey mixed-use building is assumed to have thirteen floors consisting of 162 two-bedroom apartment units. Each apartment is assumed to have a maximum of 2 persons per bedroom.
- The fourteen-storey mixed-use building is assumed to have one floor partly consisting of 5 tenant retail spaces with a combined floor area of 291.5m² and an assumed 1 water closet per retail space.
- The fourteen-storey mixed-use building is assumed to have one floor partly consisting of a tenant café with a combined total of 50 seats.
- The plumbing fixtures and the number of plumbing fixtures indicated in Exhibit #12 are assumed and may not represent the final building plumbing design.

The peak drainage rate for the proposed Buchanan apartment building development is determined to be 1,067L/min based on the fixtures and fixture units shown in Exhibit #1 attached. Table 7.4.10.5 in the Ontario Building Code is used to determine probable peak drainage rates for the total fixture units. The wastewater generation for the proposed development is determined to be 190,600L/day using Table 8.2.1.3A/B of the Ontario Building Code as shown in Exhibit #1, attached.

Based on the above, Hallex recommends a minimum 250mm diameter sanitary sewer @ 1.0% to be installed to convey sanitary flows from the proposed building to the existing 1350mm municipal combined sewer at Stanley Avenue.

4. WATER DISTRIBUTION SYSTEM

Given the site is to be completely redeveloped for the proposed Buchanan apartment building development, all existing water services are to be located, capped and abandoned as required at the municipal watermain. A new water service shall be proposed from the building to the existing 200mm municipal watermain at North Street.

The building development is currently in the concept phase; therefore, the following assumptions based on the architectural drawings are made in carrying out the calculations:

- The plumbing fixtures and the number of plumbing fixtures indicated in Exhibit #2 are assumed and may not represent the final building plumbing design.
- The building is assumed to be fire protected vertically between floors (including the protection of vertical openings between floors), of non-combustible construction and will have sprinklers and hose cabinets installed throughout the building as per applicable standards.

The domestic water demand for the proposed development is determined to be 974.2L/min based on the fixtures and fixture units shown in Exhibit #2 attached. Table 7.4.10.5 in the Ontario Building Code is used to determine water demands for the total fixture units.

Using the calculations provided in the Fire Underwriters Survey – 2000 Water Supply for Public Fire Protection, the minimum water supply flow rate for fire protection is determined to be 8,000 L/min for the building based on the above assumptions as shown in Exhibit #3, attached. There are four existing municipal fire hydrants located near the site. The first is located immediately adjacent to the southeast corner of the site on the west side of Buchanan Avenue. The second is located immediately adjacent to the northwest corner of the site on the south side of North Street. The third is approximately 51.2m west of the property on the south side of North Street. The fourth is approximately 46.6m south of the property on the west side of Stanley Avenue.

Based on the above, Hallex recommends a minimum 150mm diameter water service to be installed to provide water supply to the proposed building from the existing 200mm diameter municipal watermain at North Street. The water service is to be separated at the property line with a 150mm diameter domestic water service and a 150mm fire protection service and shall extend to the mechanical room of the proposed building.

5. CONCLUSION

The aforementioned calculations and recommendations for the sanitary and water services are based on the current design for the site as of writing this report. A final sealed report, complete with updates to the recommendations made in this report, may be required based on the final site design.

We trust this report meets your approval. Please contact the undersigned should you have any questions or comments.

Yours truly,
HALLEX ENGINEERING LTD



Jim Halucha P.Eng
Civil/Structural Engineer

A handwritten signature in black ink, appearing to read "Jonathan Skinner".

Jonathan Skinner, C.E.T., B.Tech
Civil Technologist



Buchanan Apartment Building
Exhibit #1 - Wastewater Generation Rate & Peak Drainage Rate

7/5/2023
 Job: 221014

WASTEWATER GENERATION ASSESSMENT

Occupancy	# of Units	Development Statistics	Volume (Table 8.2.1.3. A / B)	Total Daily Volume	Notes
Store Area	5	58.3 m2s	5 L/m2	1457.5 L/day	Choose greater of area & water closets
Store Water Closets	5	1 WC	1230 L/WC	6150 L/day	Choose greater of area & water closets
Restaurant (not 24 hour)	1	50 seats	125 L/seat	6250 L/day	
Apartments	162	4 persons	275 L/person	178200 L/day	
Total =				190600 L/day	

Therefore the total calculated sanitary flow from the site is determined to be 190600 L/day.

MAXIMUM PROBABLE DRAINAGE RATE

Fixture	# of Units	# of Plumbing Fixtures	Fixture Units (Table 7.4.9.3.)	Total Sanitary Fixture Units
STORES				
Water closet w/ flush tank (public)	5	1 fixture	4 FUs	20 FUs
Lavatory (public, domestic)	5	1 fixture	1.5 FUs	7.5 FUs
CAFÉ				
Water closet w/ flush tank (public)	1	4 fixtures	4 FUs	16 FUs
Lavatory (public, domestic)	1	4 fixtures	1.5 FUs	6 FUs
Dishwasher (commercial)	1	2 fixtures	3 FUs	6 FUs
Sink (commercial, kitchen)	1	4 fixtures	3 FUs	12 FUs
APARTMENTS				
Bathroom group with flush tank	162	1 fixture	6 FUs	972 FUs
Sink (domestic)	162	1 fixture	1.5 FUs	243 FUs
Dishwasher (domestic)	162	1 fixture	1 FUs	162 FUs
Clothes washer (private, domestic)	162	1 fixture	1.5 FUs	243 FUs
Total =				1687.5 FUs
Total Flow =				1067.0 L/min

Therefore the total calculated peak drainage rate is determined to be 1067L/min.



**Buchanan Apartment Building
Exhibit #2 - Water Demand**

7/5/2023
Job: 221014

DOMESTIC WATER SUPPLY

Fixture	# of Units	# of Plumbing Fixtures	Fixture Units (Table 7.6.3.2.A.)	Total Water Fixture Units
STORES				
Water closet w/ flush tank (public)	5	1 fixture	5 FUs	25 FUs
Lavatory (public, domestic)	5	1 fixture	2 FUs	10 FUs
RESTAURANT				
Water closet w/ flush tank (public)	1	4 fixtures	5 FUs	20 FUs
Lavatory (public, domestic)	1	4 fixtures	2 FUs	8 FUs
Dishwasher (commercial)	1	2 fixtures	8 FUs	16 FUs
Sink (commercial, kitchen)	1	4 fixtures	4 FUs	16 FUs
APARTMENTS				
Bathroom group with flush tank	162	1 fixture	3.6 FUs	583.2 FUs
Sink (domestic)	162	1 fixture	2 FUs	324 FUs
Dishwasher (domestic)	162	1 fixture	1.4 FUs	226.8 FUs
Clothes washer (private, domestic)	162	1 fixture	1.4 FUs	226.8 FUs
Total =				1455.8 FUs
Total Flow =				974.2 L/min

Therefore the maximum domestic water demand is determined to be 974.2 L/min.

