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11476 Highway 26

FUNCTIONAL SERVICING REPORT

Integricon Property Restoration and Construction Group Inc.

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Issue	Date	Description
1	February 17, 2023	Functional Servicing Report

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1 Introduction

1.1 OBJECTIVES

Tatham Engineering Limited has been retained by the Integricon Property Restoration and Construction Group Inc. to prepare a Functional Servicing Report in support of a proposed condominium development (formerly the Beacon Glow Motel) in the Town of Collingwood. The primary objective of this report is to assess the feasibility of providing adequate servicing for the proposed addition and provide recommendations for any improvements required. This report will also demonstrate that the proposed servicing plan conforms to applicable Municipal and Provincial guidelines.

1.2 BACKGROUND & GUIDELINES

This report was prepared recognizing the pertinent background reports in support of the proposed addition and Municipal and Provincial guidelines including the following publications:

- *Cranberry Inn Addition, Stormwater Management Report*, C.C. Tatham & Associates Limited. (April, 2001);
- *Stormwater Management Practices Planning and Design Manual*, Ministry of the Environment, Conservation and Parks (MECP) (2003);
- *Development Standards*, Town of Collingwood (July 2007);
- *Design Guidelines for Drinking-Water Systems*, Ministry of the Environment (2008); and
- *Design Guidelines for Sewage Works*, Ministry of the Environment (2008).



2 Development Site

2.1 LOCATION

The subject site is located Northwest of Downtown Collingwood on Highway 26. The legal description of the site is Part 1 of plan 51R-27666. More specifically, the property is approximately 2.65 hectares and is surrounded by the Lighthouse Point Development on all sides excluding Highway 26. The site is bounded by Highway 26 to the South, Johnston Park Ave to the North and Waterfalls Lane to the East, as illustrated in Figure 1.

2.2 EXISTING CONDITIONS

2.2.1 Surface Conditions

The subject property was formerly known as the Beacon Glow Motel and consisted of approximately two dozen motel units, an office, modest amenities, and parking. The property has since been vacant for several years and is covered in tall grass, moderate vegetation, and trees as well as coastal shoreline wetlands in the north portion. An *Environmental Impact Study* prepared by LGL Environmental consultants was completed and provides a detailed description of the existing wetland and adjacent environmental features.

The topography of the site generally slopes to the northeast and northwest corners of the site, directing storm runoff flows towards Johnston Park Ave as overland flow. While due to existing grades it is expected that some of the flow will drain internally due to low areas. The overland flow from the property travels North and eventually makes its way to Georgian Bay.

2.2.2 Subsurface Conditions

A geotechnical investigation prepared by DS Consulting revealed the underlying soils to consist of topsoil, silty sand, sandy gravel before reaching bedrock at approximately 0.9 metres to 1.6 metres below grade. Ground water elevations are estimated to be approximately 0.7 metres and 0.9 metres below grade.

2.3 PROPOSED CONDITIONS

The proposed development features two 6-storey residential buildings (100 and 94 units respectively) connected by a ground floor common area including a pub, lounge, exercise facilities and changerooms. The roof will consist of mechanical rooms, lounge, and washrooms. Site access will be provided by a private driveway access from Highway 26. Most of the property will remain in its current state to preserve the designated coastal wetlands as identified above in Section 2.2.



3 Water Supply & Distribution

3.1 EXISTING INFRASTRUCTURE

The property is currently serviced with an abandoned water service and connected to an existing 300 mm diameter watermain is located along the north side of Highway 26. Two existing fire hydrants along the north side of Highway 26 front the property.

3.2 PROPOSED INFRASTRUCTURE

A single 200 mm diameter watermain will be connected to the 300 mm diameter watermain on Highway 26 which will extend to the building's mechanical room where it will be connected to the building's backflow preventor and water meter in accordance with the Town's requirements (one service, one meter).

The proposed water service design is shown on Drawing 120232-SG-1 which is enclosed with this report.

3.2.1 Water Demands

During the pre-consultation phase of the design, the Town confirmed the water capacity of the existing distribution system be analyzed through the Town's water model at the developer's expense. Water demand calculations based on MECP and Town engineering standards have been completed and are summarized below:

- Average Day Demand = 2.97 L/s
- Maximum Day Demand = 5.93 L/s
- Peak Hour Demand = 13.35 L/s

Also, in accordance with Town standards and the Fire Underwriter's Study (FUS), the fire flow demand was calculated to be 356 L/s.

Water supply for firefighting purposes will be provided by the two existing fire hydrants located along Highway 26 fronting the proposed building(s) as well as an internal hydrant located within the island of the drop-off area.

See Appendix A for detailed calculations and Drawing 120232-1 SG-1 for the hydrant locations.



4 Sanitary Servicing

4.1 EXISTING INFRASTRUCTURE

The property is currently serviced with an abandoned sanitary service connected to an existing 750 mm diameter gravity sewer along the north side Highway 26. The existing 750 mm diameter sanitary sewer drains east to the Black Ash Creek Sewage Pumping Station where it is conveyed to the Town's sewage treatment plant.

4.2 PROPOSED INFRASTRUCTURE

Based on pre-consultation with the Town, a single 200 mm diameter sanitary service will be connected to the 750 mm diameter sanitary sewer on Highway 26 which will extend to the building's mechanical room where it will be connected to the building's internal sewage collection system.

The proposed sanitary service is shown on Drawing 120232-SG-1 which is enclosed with this report.

4.2.1 Sanitary Demands

During the pre-consultation phase of the design, the Town confirmed the downstream capacity of the existing sanitary collection system will be analysed through the Town's sanitary model at the developer's expense. Sewage flow calculations based on MECP and Town engineering standards have been completed and are summarized below (see Appendix B for detailed calculations):

- Average Day Demand = 1.34 L/s
- Peak Flow = 11.86 L/s



5 Stormwater Management

A separate *Stormwater Management Report* has been completed in support of the site plan application and should be read in conjunction with this report.

Due to the existing site conditions, most of the property will remain the same in order to maintain the coastal wetland features and drainage patterns including the existing drainage feature located along the west property line.

In summary, the stormwater management plan consists primarily of providing enhanced level water quality treatment, corresponding to 80% TSS removal, to the development area exclusive of the rooftop area which is generally considered to produce clean runoff. Treated runoff will be conveyed to the existing Highway 26 ditch and discharge to the existing source-water fed coastal wetland within the site via an existing drainage easement. The wetland and associated 30.0 m buffer will be respected and be relatively undisturbed by the proposed development.

Minor improvements will be made to remove the remnants of the existing hotel foundation within the buffer and revegetate the area. To achieve NVCA requirements for erosion control, a low impact development feature (rain garden) is also proposed within the buffer which will intercept rooftop runoff and provide infiltration of the equivalent 5.0 mm runoff volume generated from impervious areas on site. Clean rooftop runoff from approximately 73% of the total rooftop area will feed the low impact development (LID) feature.

It is noted that as overall site impervious ratio marginally increases from approximately 25% to 29%, it has been determined that adequate peak flow attenuation and water quantity controls can be provided via the existing 800 mm diameter CSP culvert (located at the northwest corner of the site) and the wetland, and, therefore, additional water quantity controls within the development area are not required.



6 Traffic & Parking

Separate reports have been prepared to address the potential traffic impacts of the site and to review the proposed parking supply in support of the site plan application. Both should be read in conjunction with this report.



7 Utilities

The property is currently surrounded by existing utilities including hydro, cable, telephone, and gas. The applicable utility providers have been notified of the proposed development and are in the process of confirming their plant can service the proposed development.

Final coordination for the designs and drawings will be provided for approval prior to construction.



8 Summary

Based on the preceding analyses, the proposed development can be appropriately serviced. Specifically, the proposed strategy for servicing includes:

- utilizing the existing 750 mm diameter sanitary sewer along Highway 26;
- connecting to the existing 300 mm diameter watermain along Highway 26 to the building's mechanical room (a new backflow preventor and water meter will be installed as required by Town standards);
- utilizing the existing wetland features and drainage patterns (drainage feature along west property line) as well as conventional oil grit separators to satisfy the requirements of the Town and Conservation Authority; and
- providing hydro, gas, cable and telephone services via extensions of existing infrastructure (to be completed by the respective service providers).



Figure 1: Site Location



Appendix A: Water Demand Calculations


PROJECT	11476 Highway 26	FILE	120232
		DATE	10/20/2022
SUBJECT	FUS Fire Flow Calculations	NAME	KRL
		CHECKED	KRS
REVISIONS			

Fire Underwriters Survey Fire Flow Calculations - Long Method

Calculation Based on 1999 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated With Option	Choose	Value Used	Unit	Total Fire Flow (L/min)
Framing Material								
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Non-combustible construction	0.8	-	N/A
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (<2 hrs)	0.7				
			Fire resistive construction (>2 hrs)	0.6				
Floor Space Area								
2	Type of Occupancy	Type of Occupancy	Single Family	1	Townhouse/ Apartment-inform # of units	1	Units	N/A
			Townhouse/Apartment-inform # of units	1				
			Other (Comm., Ind., etc.)	1				
2.1	No. of Storeys	Number of Floors/Storeys in the unit (do not include basement)				12	Storeys	
3	Floor Area	Total Floor Area (A) - for all storeys excluding basement			m ²	1460	m ²	N/A
		Measurement Units	Square Feet (ft ²)	0.09290304	17,514			
			Square Metres (m ²)	1				
			Hectares (ha)	10000				
4	Required Fire Flow without Reductions or Increases	Required Fire Flow without Reductions or Increases per FUS: (FF=220xCxA ^{0.5})					L/min	23,000
5	Factors Affecting Burning	Reductions / Increases Due to Factors Affecting Burning						
5.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Combustible	0	N/A	0
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete automatic sprinkler protection	-0.3	Complete automatic sprinkler protection	-0.3	N/A	-6,900
			Standard hoses for both system & Fire Department	-0.1				
			Supervised system	-0.1				
5.3	Separation Distance Between Units	Exposure distance between units	North Side	>45	0.00	0.2	N/A	4,600
			East Side	10.1 - 20 m	0.10			
			South Side	>45	0.00			
			West Side	30.1 - 45 m	0.10			
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:						21,000
		Total Required Fire Flow (above) in L/s:						350
		Required Duration of Fire Flow of 21,000 L/min (hrs):						5
		Required Volume of Fire Flow of 21,000 L/min (m ³):						6300

* - Available fire flow to be confirmed via flow test at nearby hydrants located on Highway 26 fronting the site.

	Project: 11476 Highway 26	Date: 2/3/2023
	File No.: 120232	Designed: KRL
	Subject: Water Demand	Checked: KRS

Building Unit Design Criteria

Person per Unit =	2.3		(Collingwood Development Standards)
Units =	194		
Per Capita Flow =	260.0	L/day	(Collingwood Dev Stds - Staff Report PW2022-18)
Peaking Factors =	2.0	Maximum Day	(Collingwood Development Standards)
	4.5	Peak Hour	(Collingwood Development Standards)

Design Flows

Average Daily Flow =	116,012.00	L/day	
	= 1.343	L/s	
Maximum Day Demand =	Average Flow	x	Peaking Factor
	= 2.69	L/s	
Peak Hour Demand =	Average Flow	x	Peaking Factor
	= 6.04	L/s	

Building Banquet Design Criteria

Total Area =	4286.7	m ³	(Arsenault Architect Inc., Sept 16, 2022)
Area Per Person =	1.1	m ³	(Table 3.1.16.1 - Ontario Building Code)
Per Capita Flow =	36.0	L/day	(Table 8.2.1.3.B - Ontario Building Code)
Peaking Factors =	2.0	Maximum Day	(Collingwood Development Standards)
	4.5	Peak Hour	(Collingwood Development Standards)

Design Flows

Average Daily Flow =	140,293.24	L/day	
	= 1.624	L/s	
Maximum Day Demand =	Average Flow	x	Peaking Factor
	= 3.25	L/s	
Peak Hour Demand =	Average Flow	x	Peaking Factor
	= 7.31	L/s	

Total Design Flows

Average Daily Flow =	256,305.24	L/day	
	= 2.966	L/s	
Maximum Day Demand =	Average Flow	x	Peaking Factor
	= 5.93	L/s	
Peak Hour Demand =	Average Flow	x	Peaking Factor
	= 13.35	L/s	

Fire Underwriters Survey (FUS) =

$$220C\sqrt{A} \quad (\text{Fire Underwriters Survey})$$

Type of Occupancy = Apartment

Coeff. of Type of Construction = 0.80 Non-combustible Construction (Fire Underwriters Survey)

FUS = 23291.92 L/min
 FUS Rounded to Nearest 1000 = 23000 L/min
 = 383 L/s


Dist. Btwn Buildings = 20-30 & 30-45 m (Assume 20% Increase) (Fire Underwriters Survey)
 Sprinkler System = Yes (Assume 30% Reduction) (Fire Underwriters Survey)

Fire Flows = FUS + Increase - Decrease
 = 21000 L/min

Therefore, FUS Fire Flow = 350 L/s

MDD + FUS = 355.93 L/s

Appendix B: Sanitary Sewage Flow Calculations

	Project: 11476 Highway 26	Date: 3-Feb-23
	File No.: 120232	Designed: KRL
	Subject: Sanitary Flow Calculations	Checked: KRS

2.3 persons per unit (Collingwood Development Standards)
 194 Units (Architectural Plans)
Total Persons = 446 persons
 260 l/person/day (Collingwood Development Standards)

Average Day Flow = 116012 l/day
Average Day Flow = 1.343 l/s

Total Banquet Area = 4286.70 m²
 Area Per Person = 1.10 m² (Table 3.1.16.1 - Ontario Building Code)
 Per Capita Flow = 36 L/day (Table 8.2.1.3.B - Ontario Building Code)
Banquet Design Flow = 140292.00 L/day
Banquet Design Flow = 1.62 L/s

Harmon Peaking Factor (PF) = $1 + \frac{14}{4 + (P/1000)^{0.5}}$ (P= 446 As per max. building occupancy as per architectural plans)
 4.00

Peak Flow = 2.90 x 4.01
 = **11.86 L/s**