

# Servicing Design Brief

**12 Townhouse Units and 1 Semi Development  
368 Aqueduct Street and 155 Gadsby Ave.  
Welland, Ontario**

*Submitted on behalf of Lucchetta Builders Inc.*

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# 12 Townhouse Units and 1 Semi Development Servicing Design Brief

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## 1.0 Introduction

This Servicing Design Brief is submitted for Zoning By-Law and Official Plan Amendment for review and approval by the City of Welland, Niagara Region, Niagara Peninsula Conservation Authority and other applicable agencies and utilities pursuant to the conditions of approval for 12 townhouse units and one semi unit residential development at 368 Aqueduct Street and 155 Gadsby Ave.

## 2.0 Background

The Townhouse Units Development proposal contemplates two parcels of land into 12 Townhouse units and one Semi unit. The plan contemplates new semi fronting Gadsby Ave. and 12 townhouse new units fronting behind the single. The subject site is located in the City of Welland urban area, on the east side of aqueduct Street and north of Gadsby Ave.. The parcel on Aqueduct Street has approximate frontage and depth of 16m and 168m respectively, totaling 0.63 hectares. The parcel on Gadsby has approximate frontage of 21m and depth of 39m, totaling 0.08 hectares.

The plans indicate the subject property shown in Appendix A, B, C & D.

### 3.0 Water Supply and Distribution

Domestic water is proposed to be supplied through a 150mm watermain on the new private road with 20 mm copper services for Townhouses and existing water service/proposed water service for Semi from Gadsby Ave.. New watermain is proposed to connect to the existing 150mm diameter PVC watermain on Aqueduct Street. Location for the proposed watermain and individual unit water services are shown on Watermain/Fire Hydrant Plan in Appendix A.

One municipal hydrant currently exists near the development. One new hydrant is proposed within the right-of-way of private road. Given the one proposed and one existing hydrant location, all units will have hydrant coverage such that all principal entrances and greater than 50% of the building perimeter will be within a 90m hydrant distance per OBC requirements.

The network pressure information received verbally from the City of Welland there may be sufficient capacity existing for domestic and fire-fighting purposes for this development. Fire Flow and Pressure tests will be completed at the nearest existing hydrants at site plan stage to verify sufficient capacity exists for development.

Design parameters for water supply and distribution are outlined in the table below:

No. of Dwelling Units	14 [12 townhouse units &, 1 semi unit]
Population Density	2.55 persons/unit
Total Design Population	36 persons
Per capita demand	450 L•cap/day
Fire Flow Min. Residual Pressure	20 psi (14.1 m head)
Max-Day Minimum Residual Pressure	40 psi (28.2 m head)
Hazen-Williams 'C'	110 for 150 mm diameter
Design Pipe Specification	PVC, CIOD, DR-18, CL235

## 4.0 Sanitary Sewerage

The development's sanitary sewage collection system will cater for peak domestic flows and potential infiltration for the proposed units. The proposed sanitary sewer outlet is the existing 250mm existing sanitary sewer on Aqueduct Street for the Townhouses existing 135mm sanitary service for Semi on Gadsby Ave..

The subject development will be serviced by a 200mm diameter DR-35 PVC pipe, minimum 2.4m finished cover, extending through the private roadway, with individual 135mm diameter DR-28 laterals for each townhouse unit. The capacity of the 200mm pipe at 1.0% is about 55 l/s. See Appendix C for sanitary sewer plan SS-1.

Key design data for sanitary sewage servicing is as follows:

No. of Dwelling Units	14 [12 townhouse units &, 1 semi unit]
Population Density (2016)	2.55 persons/unit
Sanitary Design Population	36 persons
Mean Sewage Flow	300 L•cap/day
Sewage shed Area (total)	0.5ha .
Manning's 'n'	0.013
Infiltration Rate	0.100 L/ha•s
Peaking Factor Formula	Babbitt

An appropriate level of occupancy for this development can be taken from the Region of Niagara 2016 forecast at 2.55persons/unit.

The peak sewage flow for this development is approximately  $((36 \times 300 \text{ L/day}) + (0.63\text{ha} \times 0.100\text{L/ha}\cdot\text{s})) \times 4 = 0.75 \text{ l/s}$

## 5.0 Drainage and Stormwater Management

The design sheet for the minor system and accompanying drainage area plan SSD1 are attached in Appendix B. The design of the minor storm sewer system to accept 5-year return period flows and will be oversized to accept up to 100-year return period flows for the development and drain to pre-development flows into existing 525mm storm sewer on Aqueduct Street.

Overland flow will reach public roads or valley lands without threat to residences. Generally split drainage has been employed with grassed swales along the site boundary to capture surface runoff. House foundation drainage will be discharged at grade and directed to rear yard swales typically.

The storm sewer will have an oil grit separator Stormceptor STC or equivalent at the end of the pipe before it discharges into the receiving watercourse for water quality purposes.

## 6.0 Roadway

The proposed private roadway for development is shown on SS1 plan. The pavement width for the private road will be 6.0m. The design of the roadway will meet the City of Welland standards.

Report prepared by:



*F Ierfino*

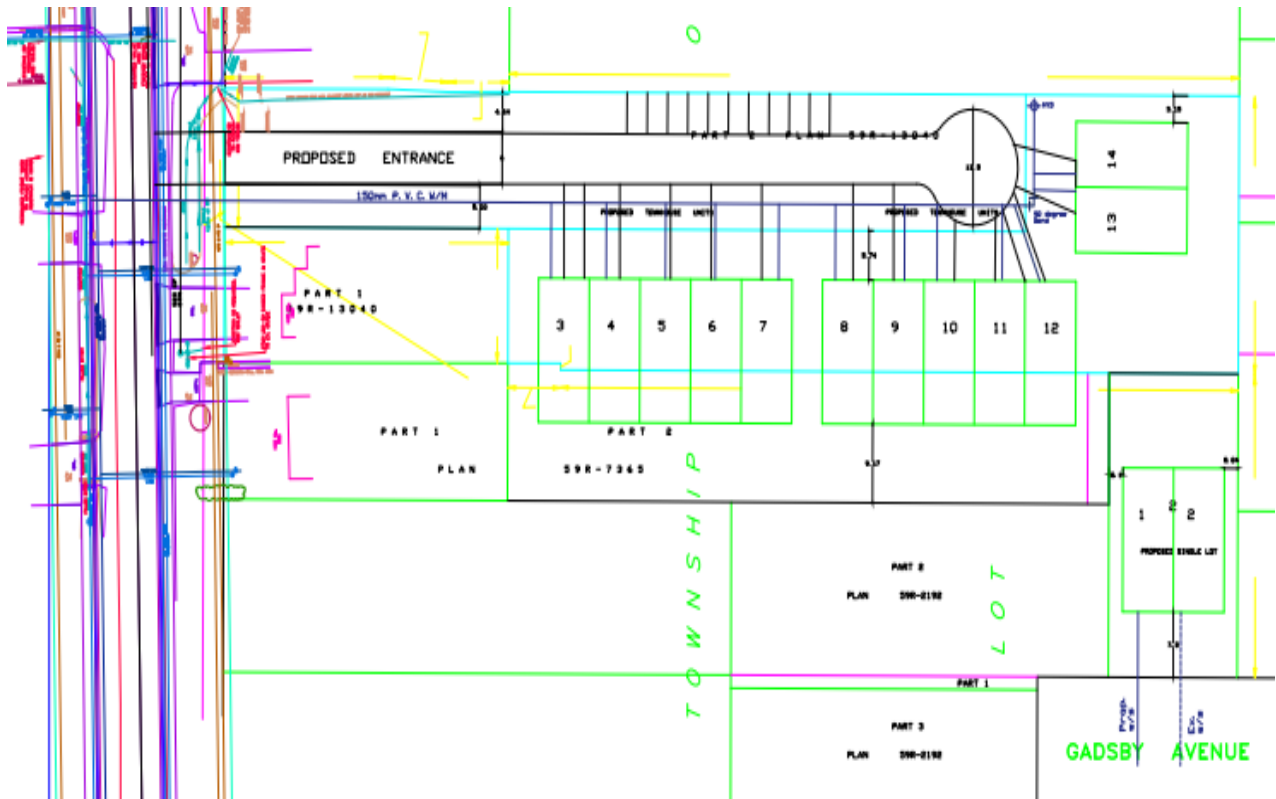
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Frank Ierfino, P. Eng.  
Senior Municipal Engineer

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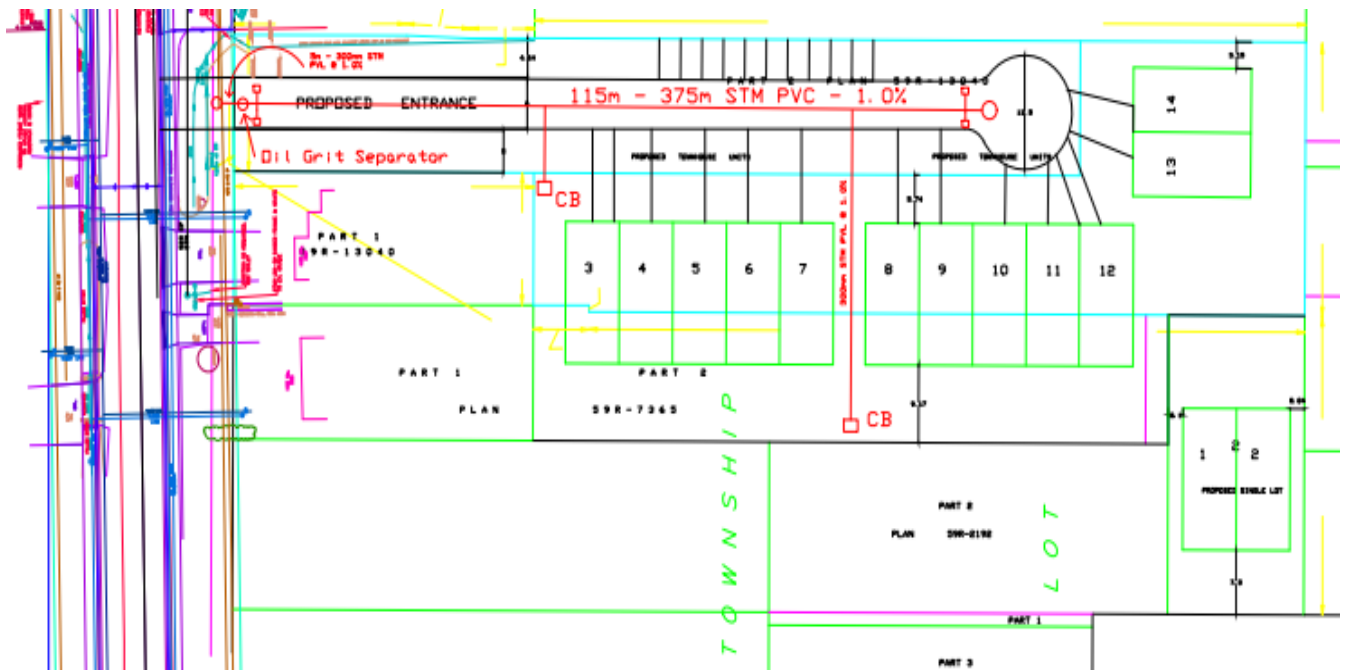
### APPENDIX A Watermain/Fire Hydrant Plan



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### APPENDIX B Storm Sewer Drainage Plan





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## STORM SEWER DESIGN COMPUTATION SHEET

PROJECT:	12 Townhouse Units Development 368 Aqueduct Street	FILE #:	19-06	DATE: 28-Nov.-19	COMPUTED BY: FTI	CHECKED BY: FTI
DRAINAGE AREA PLAN:	SSD1	REV #:	0	OUTFALL: Existing 525 Storm Sewer		

RETURN PERIOD: 5 yr. RAINFALL INTENSITY CURVE: Yarnell MANNING'S 'n': 0.011

RUN-OFF COEFFICIENTS

PARK, OPEN SPACE: 0.20 SINGLE FAMILY RES.: 0.40 SEMI-DETACH. RES.: 0.50 TOWNHOUSE HOUSING RES.: 0.65 HIGH DENSITY RES.: 0.80

ROAD RIGHT-OF-WAY: 0.55 INDUSTRIAL: 0.85 COMMERCIAL: 0.90 PARKING LOTS, ROOF AREAS: 0.90

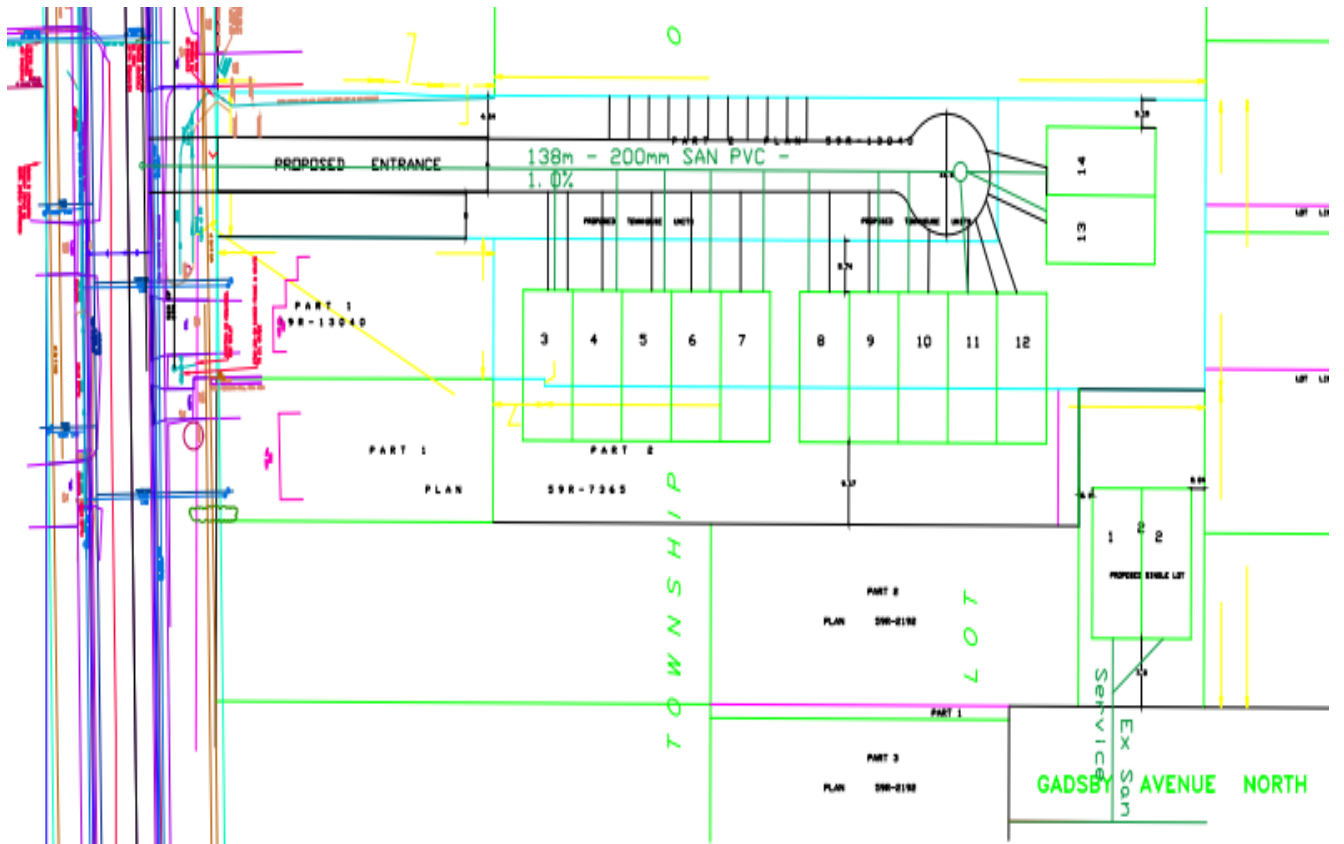
RUN-OFF							DESIGN						DRAINAGE FROM TO AREA #	
AREA (ha)	RUN-OFF COEFF.	A x R INCR.	T of C ACCUM.	I (min)	FLOW (mm/s)	FLOW (cms)	PIPE Ø (mm)	SLOPE (%)	CAP. (cms)	VEL. (m/s)	LENGTH (m)	TIME (min)		
0.63	0.65	0.41	0.41	10	0.025	0.029	375	0.100	.10	1.0	115	1.83	1	1 OGS
0.00	0.65	0.41	0.41	11.8	0.022	0.027	300	0.100	.08	0.8	5.0	0.10	2	OGS ex. sewer

Stm Design Sheet

Notes: 1) The proposed grades for stm. sheet are an assumption. Detail design of storm sewer at site plan stage will provide accurate proposed grades.

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**APPENDIX C Sanitary Sewer Plan**



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**APPENDIX D Preliminary Grading Plan**

