Functional Servicing & Stormwater Management Report

Summerside Subdivision Phase 19 – Block 34
1389 Commissioners Road East, London, ON

Project Number: DEL24-018
Date: November 22, 2024

Prepared For:
Ironstone Building Company

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Statement of Qualifications and Limitations
This Report has been prepared for Ironstone Building Company based upon currently available information, to support the site plan approval application to be filed for the proposed medium density residential development. This report has been prepared for the sole use of Ironstone Building Company and any reliance upon this information by any third party is made at the risk of that party. Development Engineering (London) Limited assumes no liability for any injury, loss or damage suffered by any third party based upon decisions made or actions that arise due to that party's reliance upon or interpretation of the contents of this report.

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1.0 Introduction

Development Engineering (London) Ltd. (DevEng) has been retained by Ironstone Building Company to provide detailed site engineering design for a proposed medium density residential development to be constructed at 1389 Commissioners Road East in London, Ontario.

The subject parcel is 2.13 ha, and fronts Evans Boulevard to the east and is bound by existing residential properties to the south, Highbury Avenue to the west and by existing commercial lands to the north. The proposed development is to include two (2) six-story apartment buildings, two (2) stacked townhouse buildings, five (5) standard townhouse buildings and associated parking, drive aisles, and landscaping. A total of 174 units are proposed within the development.

The purpose of this report is to address the design constraints related to storm, sanitary, and water servicing, as well as stormwater management, and provide site-level design solutions to meet the requirements of the proposed development and the City of London in support of Site Plan Approval (SPA).

2.0 Background Information

2.1 Previous Consultations

- Pre-Consultation with the City of London (April 03, 2024)

2.2 Previous and Concurrent Studies and Reports

- Geotechnical Investigation by EXP. (February 2021)
- As-builts / record drawings referenced:
    - Site Plan Consultation for 1389 Commissioners Rd E (Block 175, Phase 19 Summerside), London ON – File Number SPC24-021 (CoL April 2024).
    - Summerside Third Pipe System Outlet Analysis (DevEng 2017).
    - Final Stormwater Management Report for the Summerside Subdivision (DevEng Sept. 2004).
    - Summerside Subdivision Phase 17-20 Third Pipe Area Plan 1 & Design Sheet (DevEng May 2024).
    - Summerside Subdivision Phase 17-20 Storm Area Plan 1 & Design Sheet Project No. DEL20-035, (DevEng May 2024)
    - Summerside Subdivision Phase 17-20 Sanitary Area Plan 1 & Design Sheet, Project No. DEL20-035, (DevEng May 2024)
    - Summerside Subdivision Phase 17-20 Water Distribution Plan, Project No. DEL20-035, (DevEng May 2024)
    - Class Environmental Assessment – Servicing Proposal for Jackson District (Delcan, 1989).
    - Dingman Creek Subwatershed Study (Aquafor Beech, 1995).

2.3 Related Design Specifications

- City of London Design Specifications & Requirements Manual (DSRM) (January 2024)
- MECP Stormwater Management Plan and SWMP Design (March 2003)

2.4 SWM Targets

Through pre-consultation with the City of London, the following SWM criteria were established:

- The medium density block development was assigned a C-value of C=0.65. Any exceedance of the approved C-value, the site is to store volumes in excess of the allowable release rate;
- The third pipe tributary area was assigned an AxC-value of AxC=0.107. Any exceedance of the approved C-value, the site is to store volumes in excess of the allowable release rate;
- The post-development peak flows are to be equal to or less than the allowable peak flows for all storm events up to and including the 100-year design storm event (based on City of London IDF parameters);
- Per City of London's DSRM for Permanent Private Systems, major overland flow is to be contained on-site up to the 250-year design storm event; and
- An 'enhanced' level of protection (80% total suspended solids removal for 90% of annual runoff) is to be provided in accordance with the MOE Stormwater Management Planning and Design Manual.

3.0 Approval Agencies

3.1 City of London

The subject site is located within the City of London and subject to the Site Plan Control By-law. The Site Plan Approval and engineering design must be submitted to and subsequently approved by the City. The City will also be responsible for the approval of building permits associated within the subject site.

4.0 Existing Conditions

The subject parcel is 2.13 ha, and fronts Evans Boulevard to the east and is bound by existing residential properties to the south, Highbury Avenue to the west and by existing commercial lands to the north. The subject site currently consists of vegetation free stripped ground in a site pregrade condition.

4.1 Site Topography and Drainage

Information pertaining to topography and drainage was obtained via field investigation and topographic survey by DevEng in February 2020. Following site pre-grading operations, the site will generally slope at 0.5% from west to east, with geodetic elevations ranging from approximately 281.00 to 280.00m along the north and south limits of the site respectively. The geodetic elevations along the north and south limits of the site are generally consistent.

Stormwater surface flow from the subject site is currently directed southeast into the temporary ESC basin of Summerside Subdivision Phase 19. Following the subdivision servicing works (ongoing as of the date of this report), all site drainage will be directed to a DICB located on the site storm private drain connection (PDC).

4.2 Soil Conditions

A geotechnical investigation report was prepared by EXP (project no. LON-00018460-GE, dated February 2021). 7 boreholes and 16 test pits were advanced to determine the subsurface conditions of the site and the surrounding area. Test pit TP201 is within the subject site, along the south limits of the site. Within test pit TP201 a layer of black/brown clayey silt with some sand and organics with trace gravel fill 2.6m deep was found. Between depths of 2.6-4.0m, brown silt with some sand was found. TP201 encountered clayey silt till with some sand and trace gravel. The test pit was terminated at a depth of 4.3m and was left open upon completion, no groundwater seepage was observed.

4.3 Existing Servicing

Based on our review of the records and field investigations identified in Section 2.2 the following observations have been made regarding the state of the servicing in proximity to the site following the ongoing (as of the date of this report) subdivision servicing works.

4.3.1 Watermain

There is an existing 250mm diameter municipal watermain within the Evans Boulevard right-of-way east of the site. There is one existing municipal fire hydrant on the east side of Evans Boulevard directly opposite the subject site. The site's surrounding watermains are located within the Westmount/Pond Mills pressure zone with a design hydraulic grade line (HGL) of 335.00m as per City SPC comments.

4.3.2 Sanitary Sewers

There is an existing 200mm dia. municipal sanitary sewer within the Evans Boulevard right-of-way east of the site. A 200mm sanitary stub at 1.00% slope has been provided to property line in the southeast region of the subject site.

The subject site was included as Area 'A3' in the May 2024 Sanitary Sewer Drainage Area Plan & Design Sheet by DevEng (project no. DEL20-035) and designated a population of 332 people. Refer to Appendix A for the Summerside Phase 17-20 Sanitary Sewer Area Plan for more information.

4.3.3 Storm Sewers

The site is tributary to the downstream Summerside Subdivision stormwater management facility (SWMF) via a 600mm diameter private drain connection (PDC) at 1.00% slope, located on Evans Boulevard to the east. The sewers were designed for all runoff from the main eastern portion of the site as per the Summerside Subdivision Phase 17-20 Storm Sewer Area Plan. The Summerside Phase 17-20 Storm Sewer Area Plan allocates 1.912 ha (area A4) of the subject site at C=0.65 (AxC=1.243) to the Evans Boulevard Municipal storm sewer. Additionally, the rest of the subject site is tributary to a 300mm diameter PDC connected to a Municipal third pipe storm sewer system located within Evans Boulevard to the east to supply clean runoff to a provincially significant wetland complex, as per the Third Pipe System Outlet Analysis by Deveng (2017). The Summerside Subdivision Phase 17-20 Third Pipe Storm Sewer Area Plan allocates 0.213 ha of clean runoff at a runoff coefficient of C=0.50 (AxC=0.106) for the subject site. Refer to Appendix A for the Summerside Phase 17-20 Storm Sewer Area Plan for more information.

5.0 Proposed Servicing

The total population is determined by assumed populations for the residential units in accordance with the City of London DRSM. The 50 medium density residential units at a population density of 2.4 ppl/unit, result in a population of 120 people. The 124 high density residential units at a population of 1.6ppl/unit, result in a population of 200 people for a total site population of 320. New private watermains, sanitary sewers and storm sewers are proposed to service the new development.

5.1 Watermain

5.1.1 Proposed Water Distribution Network

The subject site will require a private water service for domestic and fire flow demands. Pipe sizes within the network were optimized with an iterative design approach to minimize sizes. Watermain looping is important to maintain adequate pressures and fire protection within the development while also providing a level of redundancy in case of a localized disruptions such as a watermain break. However, only a single watermain connection is proposed for this development to avoid the requirement of premise isolation in accordance with DSRM section 7.9.5.

One (1) connection to the existing 250mm watermain on Evans Boulevard is proposed as follows:

- Connection using a 250x250mm cut-in tee to the existing 250mm watermain on Evans Boulevard.

Two private fire hydrants are proposed within the development in accordance with City of London and OBC requirements to provide adequate fire protection to the proposed units. Water valves will be constructed in standard locations in accordance with City of London requirements.

5.1.2 Domestic Water Demands

Design populations were used to determine the average daily domestic demands for the proposed buildings, based on Average Day domestic rates of 255 L/person/day (City of London DSRM). For Maximum Day and Peak Hour demands, peaking factors of 3.5 and 7.8 respectively, were utilized in accordance with City of London DSRM.

5.1.3 Fire Flow Requirements

Two methods for determining fire flow demands are considered depending on the type of development. As required by the City of London DSRM, when estimating fire flow demands, engineers should refer to the guide "Water Supply for Public Fire Protection – A Guide to Recommended Practice" prepared by the Fire Underwriters Survey (FUS). On private property, fire flow demands shall be determined in accordance with Section 3.2 of the Ontario Building Code (OBC).

The proposed townhouse blocks are subject to the OBC and its methodology for estimate fire flow demands. The OBC calculation requires knowledge of the building(s), such as its volume and setbacks. As provided by the Site Plan, the building specifications and fire flow calculations are represented in the Fire Flow Demand Calculations in Appendix B. A conservative fire flow demand of 5400 L/min (90 L/s) has been utilized for all medium density townhouse blocks as a worst-case scenario.

It is our understanding the two new apartment buildings will have internal sprinkler systems for fire protection purposes, and Fire Department connections proposed on their eastern facades. A sprinkler demand of 400 USGPM (~25 L/s) was assumed for the proposed apartment buildings based on direction from the mechanical engineer (SBM) for similar buildings and a 250 USGPM (~16 L/s) hose demand included per the National Fire Protection Association (NFPA) standard 13 (normal hazard occupancy), for a total fire flow demand of 650 USGPM (~41 L/s) for those buildings.

A summary of the domestic and fire protection demands is provided in Appendix B. Refer to the Water Distribution Schematic in Appendix B for the lot groupings in these scenarios.

5.1.4 Water Distribution Model

A water distribution network was modeled using WaterCAD Version 8.1i released by Bentley Systems Inc. While EPANET2.0 by the US Environmental Protection Agency (EPA) is widely accepted and the City of London has confirmed its use for water distribution modeling, the WaterCAD model can be converted to an EPANET model if the City so requires a copy for review.

The water distribution network was modeled using demand nodes representing groups of townhouse units, the proposed apartment building connections at the building face and junctions at connection points of pipes. These were grouped together at various demand nodes even though each townhouse unit will have its own water service connection. Grouping of lots for the proposed development can be seen on the Water Distribution Schematic provided in Appendix B. The proposed watermain network and sizing is included on the WaterCAD network diagram included in Appendix B.

The following design scenarios were considered to determine if the proposed water distribution network satisfies the City of London DSRM requirements:

1. Water Age Analysis during Average Day Demand;
2. Max Day + Fire Demand.
3. Peak Hour Demand; and,
4. Hydrant Colour Coding.

5.1.5 Modeling Results

Table 1: Worst Case WaterCAD Results

Scenario	Minimum Pressure (kPa)	Node	Max Velocity (m/s)	Pipe	Max Water Age (hr)	Node/Pipe
Average Day	525	105	0.02	P-1	5.3/5.1	105/P-6
Max. Day + Fire Flow @ H-2	506	105	1.92	P-1	N/A	N/A
Max. Day + Fire Flow @ H-1	512	105	2.05	P-11	N/A	N/A
Peak Hour	524	105	0.15	P-1	0.8/0.8	105/P-6

The water distribution network satisfies the City pressure criterion (pressure > 140 kPa) and the velocity criterion (velocity < 2.40 m/s) during the Maximum Day + Fire Flow scenario.

During the Peak Hour scenario all pressures and velocities for the Phase 1 water distribution network satisfy the City requirements for minimum pressure and maximum velocity (pressure > 275 kPa, velocity < 1.50 m/s).

During the average day demand scenario, the maximum pressure and age of water satisfied the City criteria (pressure < 550 kPa, age < 72.0 hours).

5.1.6 Fire Hydrant Colour Coding

There are two proposed private hydrants on the subject. Each hydrant has been modeled to verify the maximum fire flow available while maintaining a residual pressure of 140 kPa (20 psi) within the local network. The results of the fire hydrant modeling for the subject site are provided below in Table 2. These results include the required colour coding in accordance with Section 7.8 of City of London DSRM. Refer to Appendix B for the 'Hydrant Colours' model outputs and model diagrams.

Table 2: Hydrant WaterCAD Results

Hydrant ID	Pressure at Required Fire Flow (kPa)	Maximum Flow at 140 kPa (L/s)	Maximum Flow at 140 kPa (L/min)	Class	Colour
H-1	518	509.72	30,583	AA	Light Blue
H-2	512	447.67	26,860	AA	Light Blue

5.2 Sanitary Sewers

A new 200mm diameter on-site private sanitary sewer system is proposed to service this development, which is to be connected to the existing 200mm diameter sanitary PDC provided for the development connected to an existing sanitary maintenance hole (SA302) within the Evans Boulevard Right of Way.

As indicated in Section 4.3.2, the subject site was allocated a residential design population of 332 people at an allowable peak flow rate of 4.160 L/s per Area 'A3' in the May 2024 Sanitary Sewer Drainage Area Plan & Design Sheet by DevEng (project no. DEL20-035).

The development proposes a residential population of 320 people as outline previously in section 5.0. Detailed calculations are provided in Appendix C. The residential population at per capita flow rate of 230 L/p/day, including infiltration flow, the 2.125 ha site will produce an estimated total peak sanitary sewage rate of 3.676 L/s, as summarized in Appendix C.

The residential population and flow rate for the development are both less than that identified for Area 'A3' in the May 2024 Sanitary Sewer Drainage Area Plan & Design Sheet by DevEng (project no. DEL20-035). As such, no issues with regards to sanitary capacity are anticipated for the proposed development.

5.3 Storm Sewers

There are two (2) existing PDCs/storm systems proposed to service the subject site, located within Evans Boulevard to the east. One proposed storm sewer is designed to collect clean runoff from roofs and rear yards and convey it to a 300mm dia. third pipe storm stub which provides flow to the provincially significant Westminster Ponds/Pond Mills wetland complex for water balance purposes. The other storm system is proposed to collect runoff from the rest of the site and discharge flows into the 600mm dia. storm stub tributary to the Summerside Subdivision SWMF. Refer to the site servicing engineering drawings included in this submission under separate cover for more information.

6.0 Stormwater Management Strategy

6.1 SWM Design Approach

Consideration has been given to received City Stormwater Management (SWM) Engineering site plan consultation comments (SPC24-021). Stormwater runoff from the subject site is to be designed in general accordance with the criteria outlined in the subdivision SWM report as well as the Third Pipe System report which outlines requirements for the Westminster Ponds/Pond Mills wetland complex (Class I, MNR). Additionally, Permanent Private SWM (PPS) for ICI/Med/High-density sites is applicable, specifically 'Case 2', as there is the downstream Summerside SWMF.

As the number of parking spaces provided on-site exceeds 29, quality control is required for the parking lot as per the City of London DSRM Section 6.2.1.3.a.i. Additionally, comment 26 of the Site Plan pre-consultation notes that the requirement for the site is to meet a minimum of 80% TSS removal (Enhanced) as per the MECP design guidelines.

The recent Dingman EA (Aquafor Beech, 2020) builds on the previous subwatershed work, but mentions the subject lands to be part of a future stage (Stage II) of work. The Dingman EA lays out a stormwater control hierarchy (ranked strategies #1 to #3) with a focus on Low-Impact Development (LID). The preferred approach (#1) are LID retention technologies which utilize infiltration, evapotranspiration and re-use, followed by (#2) LID filtration then release; and ultimately when other LID solutions cannot be practically utilized, (#3) end-of-pipe treatment (typically OGS). Based on the characteristics of the native surficial soils (fill - clayey silt) outlined in the EXP Geotechnical Report LON-00018460-GE Section 3.2, infiltration and LID measures are deemed unsuitable on the subject site for the proposed development.

As such, over treatment through end-of-pipe OGS units (80% TSS removal) in combination with the existing, downstream Summerside SWMF, which treats 70% of suspended solids are proposed to provide the on-site stormwater (quality) treatment.

Based on the above, the SWM objectives for the site are summarized as follows:

- Quantity Control (private) to the mainline storm sewer is to be designed for post-development peak flows to less than an allowable area of 1.912 ha with a runoff coefficient of C=0.65 for a total allowable AxC of 1.243, based on the Summerside Phase 17-20 SWMF Design Sheet, and contain flows on-site up to and including the 100-year storm event;
- Quantity Control (private) to the third pipe storm sewer is also to be designed for post-development peak flows to less than an allowable area of 0.213 ha with a runoff coefficient of C=0.50 for a total allowable AxC of 0.106, based on the Summerside Subdivision Third Pipe SWMF Design Sheet, and contain flows on-site up to and including the 100-year storm event;
- 'Enhanced' Level '1' (80% TSS removal) protection to be applied using OGS treatment for water quality per the Pre-Consult Comments provided by the City; and,
- Storage of stormwater flows on-site and are safely contained up to and including the 100-year storm event. Major overland flow from the 250-year storm event is to be safely conveyed to the adjacent ROW (Evan's Blvd.) enroute to the downstream tributary Summerside SWMF.

6.2 SWM Modeling

The stormwater management (SWM) analysis was completed with PCSWMM hydrologic modelling software using the Intensity-Duration-Frequency (IDF) Parameters outlined in Section 5 the City of London DSRM (2024). An allowable conditions model was completed to establish target peak outflows, and a proposed conditions model was completed to assess the performance of the quantity control measures. Refer to Appendix D for Summary SWM tables as well as the respective allowable and proposed model schematics, inputs, and outputs.

6.3 SWM Allowable Conditions

As noted, the site is tributary to the downstream Summerside Subdivision SWMF via a 600mm diameter storm PDC, and a 300mm diameter third-pipe storm PDC located off Evans Boulevard to the east. The tributary trunk storm sewers were designed to accommodate runoff from the site and surrounding sites as per the Summerside Subdivision Phases 17-20 & Third Pipe system Storm Area Plans. The Summerside Subdivision Storm Area Plan allocates 1.912ha (area A4) of the subject site at a C=0.65 (64% impervious – AxC=1.243) to the Evans Boulevard mainline storm sewer. In addition, an area of 0.213ha (area T1) at a C=0.50 (43% impervious – AxC=0.106) is tributary to the Summerside Subdivision Third pipe sewer per the Third Pipe Storm Sewer Area Plan. Using the previously calculated flow rate on the Summerside Subdivision Storm Area Plan, Area A4 has a total allowable outflow of 283 L/s to the tributary trunk storm sewer on Evan's Boulevard. An additional catchment (T1) is tributary to the site for the third pipe system, at total allowable outflow of 21 L/s for clean rooftop and rear yard runoff. See Appendix A for the Summerside Subdivision Phases 17-20 Storm Area Plan, Third Pipe Area Plan and their respective Design Sheets.

An allowable conditions model was created and calibrated for the 5-year design storm (to which the Municipal storm sewers were designed) to determine the allowable peak flows under the remaining design storm events. The resulting allowable conditions are summarized in Table 3 in Section 6.5 below, as well as in Appendix D.

6.4 Proposed SWM Conditions

The proposed scope of development includes the construction of two (2) new apartment buildings (124 units) as well as seven (7) medium density standard townhouse and cluster townhouse blocks (50 units) for a total of 174 residential units, complete with associated paved service/drive aisles, parking spaces, and peripheral landscape areas. The total post-development site area is approximately 2.13 ha at a runoff coefficient of C=0.63, with 1.99ha at a runoff coefficient of C=0.71 (AxC = 1.41) tributary to the Summerside SWMF sewer system, and 0.14 ha at a runoff coefficient of C=0.61 (AxC = 0.09) tributary to the third pipe system based on the final site grading design. Stormwater quantity controls are proposed for the area tributary to the Summerside SWMF sewer system as the total AxC exceeds that allowable for that catchment as described in Section 6.3. No quantity control is proposed for the area tributary to the third pipe system as the total proposed AxC is less than the allowable AxC for that catchment as described in Section 6.3. Additionally, the requirement to control all site runoff without overland flow leaving the site up to and including the 100-year storm event is also targeted, as outlined in section 6.1.

6.5 SWM Design

6.5.1 Quantity Control

As noted, on-site attenuation of stormwater for the site is proposed so post-development peak flows do not exceed the allowable 5-year sewer flow allocations, and overland flow is contained on-site for all storm events up to and including the 100-year design storm. Based on available site sag surface storage, rooftop storage, and sewer routing, it is anticipated all storm events up to and including the 100-year design storm will be controlled on-site.

Based on prorated minor flow allocations to the storm sewer on Evans Boulevard, orifice restrictions will be required to reduce post-development peak flows from the paved parking and drive aisle areas and utilize available on-site surface sag storage for all storm events to those of the allowable conditions. To meet target outflow rates, two (2) orifice flow controls are proposed. One (1) 140mm diameter orifice is proposed on the outlet of CBMH2, and one (1) 160mm diameter orifice is proposed on the outlet of CBMH6.

All apartment building roof drainage is being directed through flow-controlled roof drains into the minor stormwater system on site. This is to be achieved through use of Watts Accutrol Flow control roof drains, with ½ exposed weirs to throttle flow and induce temporary rooftop storage, in accordance with EABO / OBC design guidelines.

Refer to the Site Engineering plans for details of site surface ponding storage, orifice controls in the parking lot area, and rooftop control information. Typical ponding depth in paved parking areas is limited to 0.3m above inlet to major overland spill routes, and 150mm on rooftops to scupper (overflow) locations per OBC. Refer to Appendix D for surface ponding and respective Allowable and Proposed Conditions PCSWMM model schematics, inputs, and outputs. The following table summarizes the allowable and proposed peak outflows during the 2-year to 250-year design storms. Additional information including unattenuated runoff, surface attenuation, and overland flow rates can be found on the Summary of Flows table in Appendix D.

Table 3: Summary of Allowable and Post-Development Flows

Design Storm Return Period	**Allowable Conditions - Peak Runoff**	**Allowable Conditions - Peak Runoff**	**Post-Dev.- Peak Runoff**	**Post-Dev.- Peak Runoff**	**Post-Dev.- Peak Runoff**	**Post-Dev.- Peak Runoff**
	A4 (SWMF) (L/s)	T1 (Third Pipe) (L/s)	Peak Site Minor Outflow (L/s)	Peak Site Major Overland Flow (L/s)	Peak Flow – Third Pipe System (L/s)	**Peak Site Outflow to SWMF (L/s)**
2-year	193	*15*	183	0	*11*	**193**
5-year	**284**	***21***	237	0	*19*	**251**
10-year	348	*26*	268	0	*24*	**286**
25-year	432	*32*	343	0	*32*	**357**
50-year	496	*37*	392	0	*37*	**410**
100-year	561	*42*	448	0	*43*	**470**
250-year	689	*52*	550	*7*	*53*	**586**

Note: Allowable conditions model outflow for 5-year design storm calibrated to match 2-year outflow calculated from previously approved design sheet.

Table 4: Site Storage Volumes

Design Storm Event Return Period	Total Parking Lot Surface Storage (m^3)	Total Rooftop Storage (m^3)
2-year	0	36
5-year	32	54
10-year	45	66
25-year	66	81
50-year	81	92
100-year	98	100
250-year	135	108

Table 5: Rooftop Storage Volumes

Building #	Effective Building Area [m^2]	Estimated Rooftop Drains (#)	Available Rooftop Volume at 0.15m Depth (m^3)
A	765	3	57
B	770	3	58

**Effective building area 80% of total building area.*

Table 3 above indicates that under proposed conditions, the peak site outflows to the receiving storm sewers during minor events as well as during major events are less than or equal to the allowable peak outflow up to and including the 250-year event for the overall site. Based on the model results no overland flow is discharged from the site up to and including the 100yr event (contained through on-site temporary surface storage, rooftop storage, and sewer routing). As such, it has been determined that the site SWM design provides sufficient peak flow attenuation storage to meet the stormwater quantity control targets outlined in Section 6.1. See Table 4 above for Site Storage Volumes.

6.5.2 Quality Control

All runoff directed to the existing third pipe system (0.14ha) within Evan's Blvd. to the east is considered clean rooftop and rear yard runoff, and as such, no SWM quality controls are proposed for this system.

For the rest of the site (1.99 ha), quality control is proposed via a downstream oil grit separator (OGS) unit, specifically a CDS model PMSU3020-6-C, to be constructed on the proposed Evan's Boulevard storm outlet. The OGS unit has been sized to provide an 'Enhanced' (80% TSS removal) level of quality control for the tributary area. In addition to the OGS unit treated runoff (excluding clean rooftop drainage), the downstream SWMF was designed to provide a 'Normal' (70% TSS removal) level of treatment before outletting into the Murray Marr Drain (a tributary of Dingman Creek), which serves as a redundancy to the site.

Design calculations for the unit has been provided by Echelon Environmental Inc., see Appendix D for CDS Unit sizing and typical model information. Refer to sheet SE2 from the Engineering drawings in Appendix A for OGS quality control device locations.

6.5.3 Maintenance and Accessibility

Regular CDS unit maintenance and inspection will be required for optimal performance and function of the unit. The CDS Maintenance Guidelines issued to the owner with delivery of the unit cover all aspects relating to inspection, record logs, operational maintenance, and cleaning procedures. It shall be incumbent upon the owner to follow the CDS maintenance documentation in conjunction with licensed commercial waste handlers, as required. It should be noted that the appropriate safety equipment and precautions must be used by maintenance staff or contractors retained for work in confined spaces pursuant to the Occupational Health and Safety Act.

Other site maintenance would include ensuring the orifices are free of obstructions and vacuuming of catchbasin and catchbasin maintenance hole sumps when sediment has reached 75% of the sump depth.

6.5.4 Major System Conveyance

The proposed quantity control and on-site attenuation is modelled and as noted, indicates no overland flow occurs from the site for storms up to and including the 100-year design storm under normal conditions. However, in the event of inlet blockage, runoff in excess of the minor sewer and surface storage SWM system, capacity is to be conveyed east overland towards Evan's Boulevard. See the submitted Site Plan Engineering Drawings for overland flow design routes.

7.0 Erosion and Sediment Control

Complementary to the site servicing and grading design for the on-site development, erosion, and sediment control (ESC) details are included with the detailed Engineering design drawings. Temporary ESC measures are designed to mitigate the offsite migration of sediments by incorporation of various best management practices and control measures. Typical control measures to be implemented on site include:

- Installation of silt control fencing (light duty) around the site perimeter at down-gradient locations;
- Preventing silt or sediment laden runoff from entering inlets (catchbasins / catchbasin maintenance holes) by installing pre-fabricated temporary inlet filter bags and incorporating straw bale or rock dam flow checks;
- Maintaining sediment and erosion control structures in good repair (including periodic cleaning as required) until such time as the Engineer or the Municipality approves their removal;
- Incorporation of temporary measures at site construction entrances to minimize tracking of mud and debris onto municipal road allowances; and,
- Scheduling of critical conveyance works during forecasts of little to no precipitation.

8.0 Summary and Conclusions

The following summary outlines the main discussion points from the report:

- The existing 2.13 ha subject site at 1389 Commissioners Road East, London Ontario currently (following ongoing site servicing works) consists of vegetation free striped ground at site pregrade condition, draining from west to east;
- Existing (following ongoing site servicing works) services on-site include sanitary and storm stubs to the property line. An existing 250mm diameter watermain runs along the east side of Evans Boulevard;
- The proposed development is to include two (2) six-story apartment buildings, two (2) stacked townhouse buildings, five (5) standard townhouse units and associated parking, drive aisles, and landscaping. A total of 174 units are proposed within the development;
- A new 200-250mm diameter private watermain is proposed to service the site. Based on an analysis of the domestic demands and the fire flow requirements, there are no concerns with providing potable water for domestic use and fire protection to support the proposed development;
- A new 200mm diameter private sanitary sewer system is to be installed to service the proposed development with an outlet to the existing 200mm diameter stub. Based on an analysis of the anticipated peak sanitary sewage flown and the conveyance capacity of the proposed sewers, there are no concerns with providing sanitary servicing to support to the proposed development;
- A new private storm sewer system ranging in diameters of 250-600mm is to be installed to convey stormwater to the site outlet to Evans Boulevard;
- Quantity control is to be provided via orifice-controlled underground attenuation and surface storage.
- Quality control is to be provided to 'Enhanced' Level of Protection in accordance with the MECP via an oil/grit separator (Contech Engineering Solutions CDS unit model PMSU3020-6-C);
- Using PCSWMM, an allowable conditions model was created to determine the allowable peak outflow rates from the site. Similarly, a post-development model was created to assess the performance of the proposed on-site storm sewer system; and,
- Erosion and sediment control measures should be implemented to help mitigate potential sediment transport and erosion as a result of construction activities.

We trust this report adequately addresses the outlined design constraints and proposed solutions related to stormwater management in support of the site plan approval application.

Respectfully submitted,

Development Engineering (London) Limited

Appendix A: Background Info & Figures

Appendix B: Water Servicing

Appendix C: Sanitary Servicing

Appendix D: SWM Modelling