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SITE SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

MATTINO DEVELOPMENTS INC.
255 MOUNTSHANNON DRIVE–BLOCK 2

CITY OF OTTAWA

PROJECT NO.: 17-976
CITY APPLICATION NO.: D07-12-XX-XXXX

SEPTEMBER 2018 – REV 1

SITE SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
MATTINO DEVELOPMENTS INC.
255 MOUNTSHANNON DRIVE–BLOCK 2

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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Mattino Developments Inc. to prepare a Site Servicing and Stormwater Management report in support of the application for Site Plan Control (SPC) at 255 Mountshannon Drive (Block 2).

The subject property is located within the City of Ottawa urban boundary, in the Barrhaven ward. As illustrated in ***Figure 1***, the subject property is located northwest of the intersection of Mountshannon Drive and Mattino Way. The subject property measures approximately ***0.19 ha*** and is zoned residential Fourth density (R4A).

Figure 1: Site Location

The proposed SPC would allow for the development of a 3-storey residential stacked building fronting onto Mattino Way with parking access from Mountshannon Drive. The stacked townhome is comprised of approximately ***16 units***. A copy of the proposed site plan is included in ***Drawings/Figures***.

The subject site was previously contemplated within the ***Longfields Central Site Servicing and Stormwater Management Study*** (***2014 MSS***) prepared by Novatech Engineering Consultants Ltd. and was contemplated as residential lands consisting of 10 stacked residential units.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development is supported by existing municipal services and by the ***2014 MSS***.

1.1 Existing Conditions

The existing site includes a gravel staging area used in the construction of the Longfields Central Development. The elevations range between 92.45 m and 92.95 m with a minimal grade change of approximate 0.80% from the Northeast to the Southwest corner of the property.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

Mountshannon Drive:

- 406 mm diameter PVC watermain;
- 375 mm diameter concrete storm sewer, outletting to the **Clarke Bellinger Environmental Facility** (***CBEF***);
- 250 mm diameter PVC sanitary sewer, tributary to the Barrhaven Trunk Collector.

Mattino Way:

- 203 mm diameter PVC watermain;
- 825 mm diameter concrete storm sewer outletting to the ***CBEF*** ;
- 200 mm diameter PVC sanitary sewer tributary to the Barrhaven Trunk Collector.
- 1350 mm diameter concrete storm sewer tributary to 2250 mm diameter concrete storm sewer;
- 400 mm diameter concrete sanitary sewer tributary to the Barrhaven Trunk Collector.

Northeast Hydro Corridor:

- 1350 mm diameter concrete storm sewer tributary to 2250 mm diameter concrete storm sewer;
- 400 mm diameter concrete sanitary sewer tributary to the Barrhaven Trunk Collector.

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002*, October 2012.
  (City Standards)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-03*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

  - **Technical Bulletin ISDTB-2018-02**
    City of Ottawa, March 21, 2018.
    (*ISDTB-2018-02*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch,
  January 1, 2010 Update.
  (OBC)

- **Geotechnical Investigation**
  Paterson Group, January 31, 2013.

- **Longfields Central Site Servicing and Stormwater Management Study**
  Novatech Engineering Consultants Ltd., April 3, 2014.
  (*2014 MSS*)

- **Longfields/Davidson Heights Serviceability Study**
  Oliver, Mangione, McCalla & Associates and Planners, February 1993.
  (1993 MSS)

- **City of Nepean Design Guidelines Longfield / Davidson Heights**
  Erion Associates, Stanley Consulting Group Ltd., Ainley Graham and Associates, February 1998.
  (1998 MSS)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 2W2C pressure zone, as shown by the Pressure Zone map in ***Appendix B***. A local 406 mm diameter watermain exists within the Mountshannon Drive right-of-way and a 203 mm diameter watermain exists within the Mattino Way right-of-way.

3.2 Water Supply Servicing Design

Units will be serviced in pairs via 25 mm diameter connections to either the 100 mm diameter internal watermain network or to the existing 203 mm diameter watermain within the Mattino Way right-of-way. Fire hydrants along Mattino Way and Mountshannon Drive are available to service the development. Both hydrants are located within 30 meters of the North East and South West corners of the proposed development. Detailed layout and sizing are shown by drawing ***SSP-1***, which accompanies this report.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential Townhouse	2.7 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	4.9 x Average Daily *
Residential Maximum Hourly	7.4 x Average Daily *
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons. -Table updated to reflect ISD-2010-2*	

Table 2, below, summarizes the estimated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines*** and the site statistics prepared by Pierre J. Tabet Architect.

Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Estimated Demand[1] (L/min)	Boundary Condition[2] Connection 1 (m H_2O @ Ground Elevation / kPa)	Boundary Condition[2] Connection 2 (m H_2O @ Ground Elevation / kPa)
Average Daily Demand	8.6	40.2 / 401.4	40.5 / 397.5
Max Day + Fire Flow	41.9 + 10,000 = 10,041.9	32.5 / 332.8	28.6 / 332.8
Peak Hour	63.3	33.9 / 319.0	33.9 / 280.8

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 91.98 at Connection 1 (Mountshannon Drive) and Connection 2 (Mattino Way). See ***Appendix B.***

Fire flow requirements are to be determined in accordance with City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Fire flow requirements were estimated per City of Ottawa Technical Bulletin ***ISTB-2018-02***. The following assumptions were assumed:

- Type of construction - Ordinary Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Non-Sprinklered System.

The above assumptions result in an estimated fire flow of approximately ***10,000 L/min***, noting that actual building materials selected will affect the estimated flow.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in ***Appendix B***.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand for the demands, as indicated by the correspondence in ***Appendix B***. As shown by ***Table 2***, the minimum and maximum pressures fall within the required range identified in ***Table 1***.

A ***0.014 kPa*** pressure loss along the proposed 100 mm diameter watermain was estimated using the Darcy-Weisbach equation, as shown by the calculation included in ***Appendix B***. As a result, the pressures within the proposed building connections are within the required range outlined by the ***Water Supply Guidelines***.

3.3 Water Supply Conclusion

As demonstrated by ***Table 2***, based on the boundary conditions provided by the City of Ottawa, sufficient water supply is available based on the max day plus ***10,000 L/min*** fire flow demand as estimated by City of Ottawa Technical Bulletin ***ISTB-2018-02***.

A pressure loss analysis was prepared to evaluate pressures along the internal watermain. Based on the Darcy-Weisbach equation, pressures are within the required pressure range specified by the ***Water Supply Guidelines***.

DSEL employed a daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ***ISTB-2018-03***. As a result, DSEL is submitting for a deviation from the ***Water Supply Guidelines***.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Barrhaven Trunk Collector Sewer catchment area, as shown by the City sewer mapping included in ***Appendix C***. An existing 250 mm diameter sanitary sewer within Mountshannon Drive and an existing 200 mm diameter sanitary sewer within Mattino Way are both available to service the proposed development. Both sanitary sewers are tributary to the Barrhaven Trunk Collector sewer, located approximately 500 m downstream of the site.

As indicated by the ***2014 MSS***, the subject site was contemplated to be serviced via the 200 mm diameter sanitary sewer within the Mattino Way right-of-way. The subject site is located within area A14 as illustrated by the *Longfield's Central Sanitary Sewer Design Sheet* and the *Sanitary Drainage Area Plan,* included in ***Appendix C***.

4.2 Wastewater Design

Units within the proposed development will be serviced internally via 135 mm diameter sanitary service laterals to either the proposed 200 mm diameter private sanitary sewer network or to the existing 200 mm diameter sanitary sewer within the Mattino Way right-of-way. Detailed layout and sizing of the internal sewer network is shown by drawing ***SSP-1***, included with this report.

Table 3, below, summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 3
Wastewater Design Criteria

Design Parameter	Value
Residential Townhouse	2.7 P/unit
Average Daily Demand	350 L/d/per (***2014 MSS***) 280 L/d/per (Proposed Conditions)
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Peaking Factor 0.8 (Proposed Conditions)
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28L/s/ha (Wet Weather & ***2014 MSS***) 0.33 L/s/ha (Total)
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 4, below, demonstrates the estimated peak flow from the proposed development based on the development statistics provided by Pierre J. Tabet Architect. See ***Appendix C*** for associated calculations.

Table 4
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow Mattino Way (L/s)	Total Flow Mountshannon Drive (L/s)	Total Flow (L/s)
Estimated Average Dry Weather Flow	0.08	0.08	**0.15**
Estimated Peak Dry Weather Flow	0.27	0.27	**0.53**
Estimated Peak Wet Weather Flow	0.30	0.30	**0.59**

As demonstrated by ***Table 4***, the estimated peak wet weather sanitary flow for the proposed development is ***0.59 L/s***.

Table 5, below, demonstrates the estimated peak flow from the proposed development as established by the ***2014 MSS***. See ***Appendix C*** for associated calculations.

Table 5
Summary of Contemplated 2014 MSS Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	0.11
Estimated Peak Dry Weather Flow	0.44
Estimated Peak Wet Weather Flow	0.49

As specified by ***Table 5***, the ***2014 MSS*** contemplated that the peak wet weather sanitary flow from the development (consisting of 10 stacked townhome units) was ***0.49 L/s*** to be tributary to the Mattino Way sanitary sewer. Based on ***Table 4***, ***0.30 L/s*** is proposed to outlet to the Mattino Way sanitary sewer. As a result, there is a ***0.19 L/s*** decrease in peak wet weather sanitary flow. A detailed sanitary sewer analysis of the Mattino Way sanitary sewer prepared for the ***2014 MSS*** is included in ***Appendix C***.

As illustrated by ***Table 4***, ***0.30 L/s*** of peak wet weather sanitary flow is proposed to discharge to the existing 250 mm diameter sanitary sewer within the Mountshannon Drive right-of-way. In order to assess the available capacity, a sanitary analysis was conducted for the local municipal sanitary sewers located across the frontage of the subject property in conjunction with the *Sanitary Drainage Plan* included in the ***1993 MSS***.

A calculation sheet review of the capacity of the downstream areas was created based on sanitary sewer drainage areas outlined by the ***1993 MSS***. As demonstrated on the attached sanitary sewer calculation sheet located in ***Appendix C***, the controlling section of the local sewer system is located along Daventry Crescent (section 820-830) with an

available residual capacity of ***22.4 L/s***. As a result, it is anticipated that there is sufficient capacity available in the local sewers to accommodate the proposed development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Barrhaven Trunk Collector sewer; based on the sanitary analysis, sufficient capacity is available to accommodate the anticipated ***0.59 L/s*** peak wet weather flow from the proposed development.

The proposed wastewater design conforms to all relevant ***City Standards***.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Barrhaven Creek sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Lower Rideau watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Consultation with the RVCA is located in ***Appendix A***.

Stormwater released from the proposed development to the existing stormwater infrastructure on Mountshannon Drive will ultimately be conveyed to the existing stormwater management facility located southwest of the Prince of Wales Drive / Waterbridge Drive intersection (***CBEF***). This facility provides quality treatment prior to discharging treated stormwater to the Rideau River.

Major system flows, those in excess of the minor system inlet capacity, are directed overland to existing dry pond located with Utman Park (SWM Park 959). This facility provides attenuation prior to discharge to the minor system within Mountshannon Drive.

The infrastructure in the area surrounding the subject property was designed and constructed in accordance with the ***Longfields/Davidson Heights Serviceability Study*** (***1993 MSS***) recommendations.

The ***2014 MSS*** analyzed storage requirements and flow conveyance for the Mattino Development lands. The ***2014 MSS*** refers to the subject site as area 30 within the catchment and as Block 2. Relevant excerpts have been included in ***Appendix D*** of the report.

5.2 Post-development Stormwater Management Objectives

The underlying principle for stormwater management in the Longfield / Davidson-Heights Subdivision is to restrict flow entering the minor system to ***64 L/s/ha***, while a major storm drainage system was established to convey storm events in excess of the minor system capacity. Industrial and Commercial lands were required to contain the 100-year event, while other development areas were to direct flow in excess of the minor system to the major system.

Based on the ***2014 MSS***, major system flow from the subject site, up to ***10.3 L/s***, is to be conveyed to the municipal right-of-ways and stored as surface storage by the existing SWM Park 959. As indicated by the ***2014 MSS***, ***167 m^3/ha*** of storage is to be provided onsite.

Stormwater management requirements for the proposed development were outlined by the ***2014 MSS***, where the site is required to:

- Meet an allowable minor system flow of ***63.9 L/s/ha*** and a max major system flow rate towards Mountshannon Drive of ***10.3 L/s***;
- Provide ***167 m³/ha*** of surface/sub-surface storage onsite;
- Quality controls are not required for the proposed development due to downstream stormwater facility; correspondence with the RVCA is included in ***Appendix A***.

Based on the above parameters outlined in the ***2014 MSS***, the allowable release rate to the minor system is ***12.2 L/s***, with a storage requirement of ***31.7 m³***. Relevant excerpts from the ***2014 MSS*** are included in ***Appendix D***.

5.3 Proposed Stormwater Management System

It is proposed that the stormwater outlet from the proposed development will be to the existing 375 mm diameter storm sewer within the Mountshannon Drive right-of-way. To meet the stormwater objectives the proposed development will utilize surface and subsurface storage.

The private stormwater sewer system has been sized to convey an uncontrolled 5-year storm runoff rate in accordance with the ***2014 MSS***. Detailed layout and sizing is illustrated by ***SSP-1*** included with this report and the sewer calculation sheet in ***Appendix D***.

Runoff from the parking areas will be directed to a catchbasin system; approximately ***33.9 m³*** of storage will be provided by surface ponding and catchbasins. The private storm sewer system and underground storage system will attenuate flow using a ***Tempest LMF95 ICD*** or an approved equivalent located on the outlet side of STM102. Detailed calculations are included in ***Appendix D***.

Table 6, below, summarizes post-development flow rates during a 5-year storm event. Storms in excess of a 5-year storm are proposed to be directed towards the municipal right-of-ways per the ***2014 MSS***.

Table 6
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	Available Storage
	(L/s)	(m³)	(m³)
C1,C2,C3	12.1	15.1	31.8
Total	**12.1**	**15.1**	**31.8**

It is estimated that approximately ***15.1 m³*** of surface storage will be required on site to attenuate flow to the established release rate of ***12.2 L/s***; storage calculations are

contained within ***Appendix D***. Based on ***Table 6***, sufficient storage is provided on site to satisfy the storage requirements outlined by the ***2014 MSS***.

5.4 Hydraulic Grade Line Analysis

Based on the ***Update to Longfields/Davidson-Heights model*** memorandum prepared by Stantec Engineering Consultants Ltd. for each of the storm events models, the subject site is tributary to Node 17 with an estimated HGL of 90.2236 m. The minimum freeboard between the underside of footing elevation and the HGL will be 0.30 m, as a result, the proposed USF must be a minimum elevation of 90.56 m. Relevant excerpts are included in ***Appendix D***.

5.5 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year storm in accordance with the ***2014 MSS***. The post-development allowable release rate was calculated as ***12.2 L/s*** in which ***31.8 m^3*** of surface storage is provided.

Based on consultation with the RVCA, stormwater quality controls are not required as they are provided by the ***CBEF***.

The proposed stormwater design conforms to the ***2014 MSS***.

6.0 UTILITIES

Gas and Hydro services currently exist within the Mountshannon Avenue right-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated;

Catch basins will have SILTSACKs or an approved equivalent installed under the grate during construction to protect from silt entering the storm sewer system;

A mud mat will be installed at the construction access in order to prevent mud tracking onto adjacent roads;

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time;
- Re-vegetate exposed areas as soon as possible;
- Minimize the area to be cleared and grubbed;
- Protect exposed slopes with plastic or synthetic mulches;
- Install silt fence to prevent sediment from entering existing ditches;
- No refueling or cleaning of equipment near existing watercourses;
- Provide sediment traps and basins during dewatering;
- Install filter cloth between catch basins and frames;
- Plan construction at proper time to avoid flooding; and
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers; and
- Clean and change filter cloth at catch basins.

8.0 CONCLUSION AND RECOMMENDATIONS

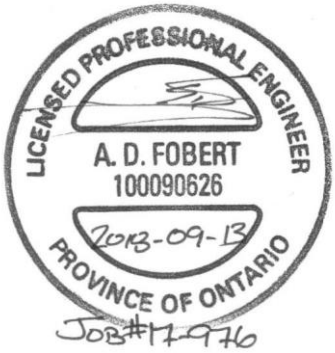
David Schaeffer Engineering Ltd. (DSEL) has been retained by Mattino Developments Inc. to prepare a Site Servicing and Stormwater Management report in support of the application for a Site Plan Control (SPC) at 255 Mountshannon Drive – Block 2. The preceding report outlines the following:

- Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range;
- City of Ottawa Technical Bulletin ISTB-2018-02 method for estimating fire flow indicated ***10,000 L/min*** is required for the proposed development;
- The proposed development is estimated to have a peak wet weather flow of ***0.59 L/s***; Based on the **2014 MSS** and the sanitary analysis conducted, the existing municipal sewer infrastructure has sufficient capacity to support the proposed ***0.1 L/s*** increase from the development;
- Based on the ***2014 MSS***, the proposed development will be required to attenuate post development flows to the minor system and to an equivalent release rate of ***64 L/s/ha*** (***12.2 L/s***) and proivde ***167 m^3/ha*** (***31.7 m^3***) of storage;
- It is proposed that stormwater objectives may be met through storm water retention via ICD control and surface storage where ***31.8 m^3*** is provided to meet the established release rate above.
- Based on consultation with the RVCA, stormwater quality controls are not required due to the outlet as they are provided by the ***CBEF***.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alison J. Gosling, EIT.

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Adam D. Fobert, P.Eng

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

17-976 09/11/2018

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures, EX-1
☒	Plan showing the site and location of all existing services.	Figure 1, EX-1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0, Section 5.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3, Appendix A
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1, EX-1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	GP-1
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 2.1
☒	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	Drawings/Figures

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2, Appendix B
☒	Confirmation of adequate domestic supply and pressure	Section 3.2, 3.2.1, 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2, Appendix B
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.2.1, 3.3
☐	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 3.2, SSP-1
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2, Appendix B
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☒	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1, EX-1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2, Appendix C
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2, SSP-1
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☒	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 5.3, 5.5
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3, Appendix D
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☒	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.3
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☒	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Section 5.4
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☒	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

MEMO

Date: 07-05-2018

To / Destinataire	Melanie, Gervais	
From / Expéditeur	Golam Sharif, Project Manager, Infrastructure Approvals	
Subject / Objet	**Pre-Application Consultation** **651 Longfields Dr, Ward No 3,** *3.5 storey stacked townhouse in two blocks of Longfields Subdivision - 20 units and 16 units.*	File No. PC2018-0122

Please note the following information regarding the engineering design submission for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2/guide-preparing-studies-and-plans

2. Servicing and site works shall be in accordance with the following documents:

   - ⇨ Ottawa Sewer Design Guidelines (October 2012) and Technical Bulletin PIEDTB-2016-01 and ISTB-2018-01
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
   - ⇨ City of Ottawa Accessibility Design Standards (2012)

- ⇨ Ottawa Standard Tender Documents (latest version)
- ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

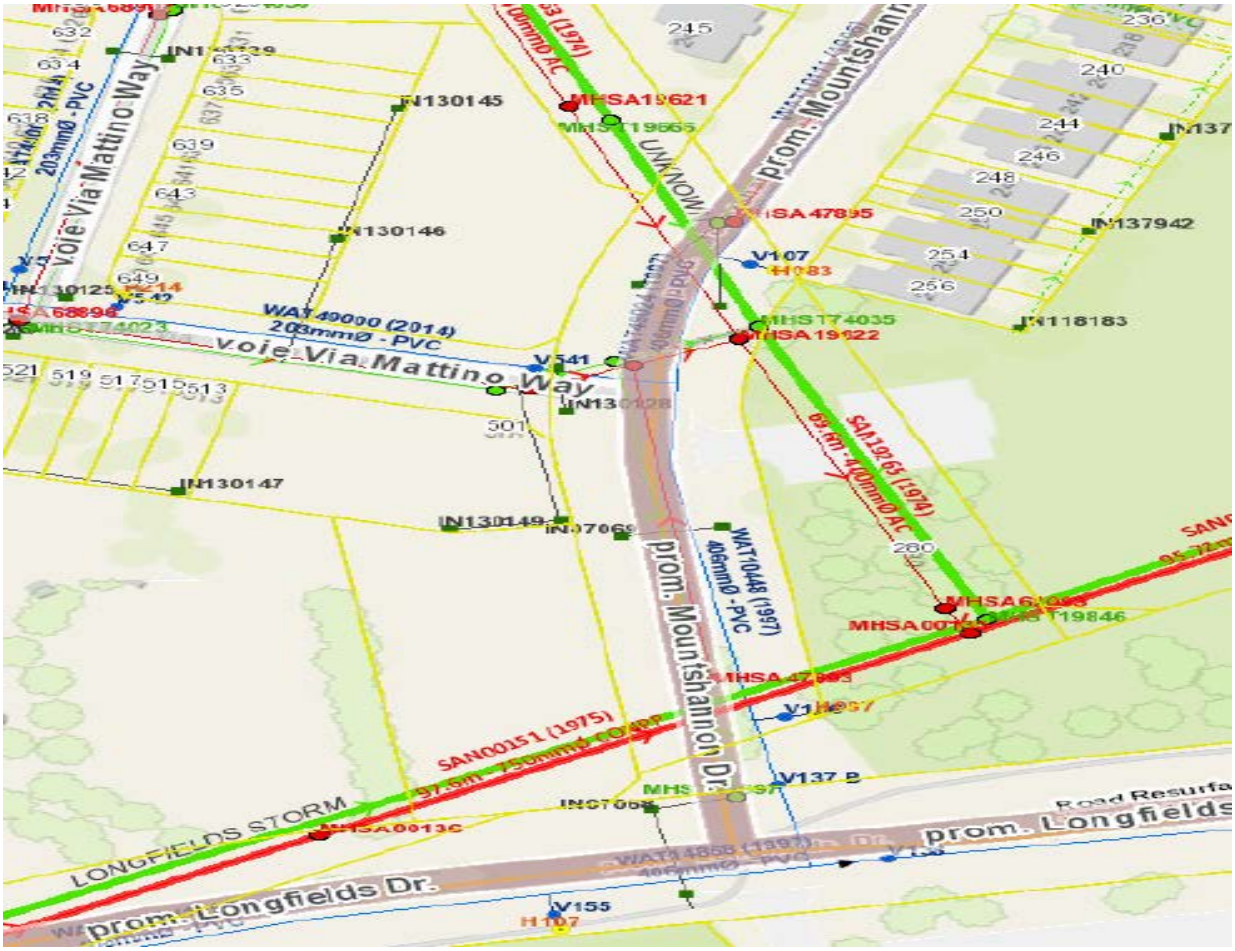
3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

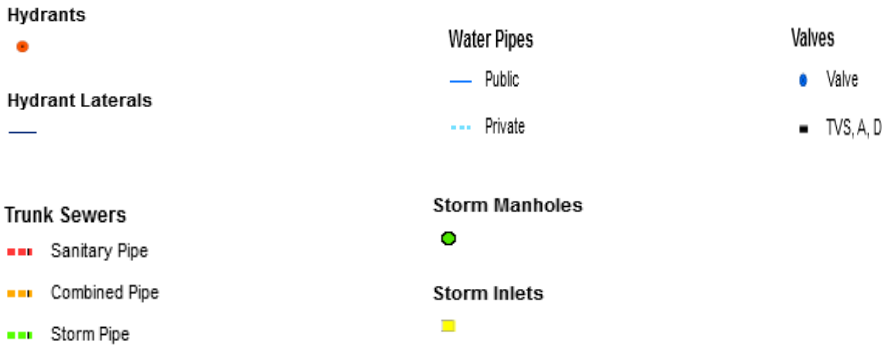
4. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   i. The approved Longfields Davidson Stromwater Management Study criteria must be followed to design stormwater management for this site.

   ii. Major and minor system must be control on site as per Longfields Davidson SWM study.

5. Deep Services (Storm, Sanitary & Water Supply)





i. A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:

   a. Mattino Way

      i. Sanitary – 200 mm.

      ii. Storm – 200 mm.

      iii. Water – 203 mm.

   b. Mountshannon Drive

      i. Sanitary – 250 mm.

      ii. Storm – 525 mm.

      iii. Water – 406 mm.

ii. As per City's Sewer Design guideline a monitoring manhole shall be required just inside the property line located in an accessible location (ie. Not in a parking area) for all non-residential and multi residential buildings connections from a private sewer to a public sewer.

iii. As per City's Sewer Design guideline it is expected that the alternative of a high level sewer in a public right-of-way and connected to the collector sewer is the preferred method of servicing properties.

iv. Provide a common access area to design the condominium servicing for future maintenance requirement.

6. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

   i. Location of service

   ii. Type of development and the amount of fire flow required (as per FUS, 1999).

   iii. Average daily demand: ___ l/s.

   iv. Maximum daily demand: ___l/s.

   v. Maximum hourly daily demand: ___ l/s.

   vi. Hydrant location and spacing to meet City's Water Design guidelines.

7. General comments –

   i. Longfields Storm Trunk and Barrhaven Sanitary Trunk are crossing the south part of the Block 1 (20 Unites site). Therefore, any construction must follow with caution.

   ii. There is very limited capacity available at Longfields Strom Trunk. Therefore, please follow the quantity and quality criteria from the Longfields Davidson SWM study and provide reference in the site servicing report clearly.

   iii. Site-specific Geotechnical brief/ report is required apart from the Subdivision report.

   iv. Site-specific Noise study is required apart from the Subdivision report.

   v. The forecasted timeline of road resurfacing works on Longfields Dr. is 2018 season.

Should you have any questions or require additional information, please contact me directly at (613) 580-2424, x 20763 or by email at sharif.sharif@ottawa.ca.

Golam Sharif
Project Manager – Infrastructure Approvals
Development Review, South Branch

Alison Gosling

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Thursday, August 2, 2018 12:27 PM
To: Alison Gosling
Subject: RE: 17-976 255 Mountshannon Drive - RVCA

Follow Up Flag: Follow up
Flag Status: Completed

Hi Alison,

The end of pipe stormwater facility is providing quality control protection and supports the proposed lot. No on-site quality controls measures are required, however, best management practices and opportunities for on-site infiltration are encouraged where possible.

Thanks,

Eric Lalande, MCIP, RPP
Planner, Rideau Valley Conservation Authority
613-692-3571 x1137

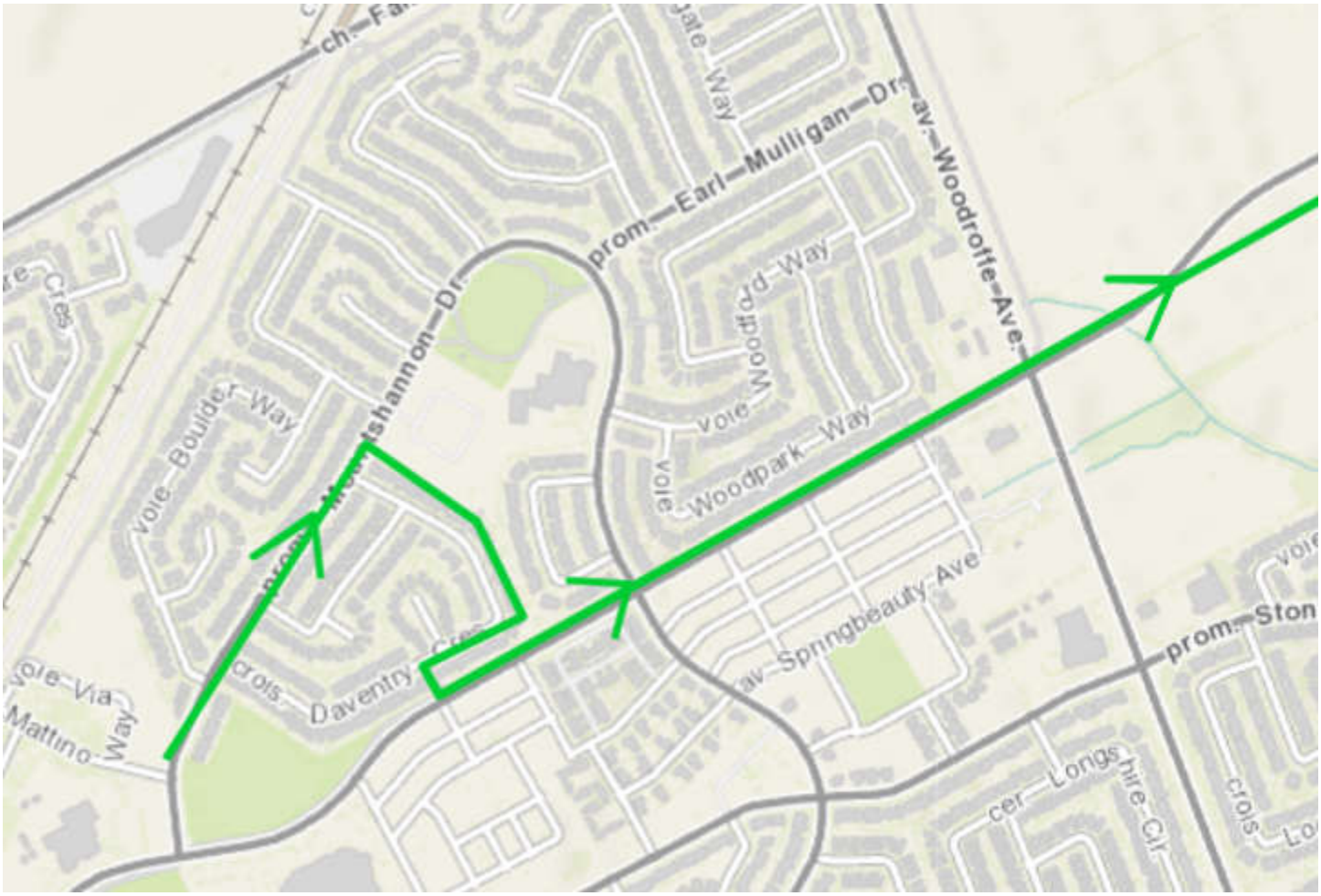
From: Alison Gosling <AGosling@dsel.ca>
Sent: Monday, July 30, 2018 1:50 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Charlotte Kelly <CKelly@dsel.ca>
Subject: 17-976 255 Mountshannon Drive - RVCA

Good afternoon Jamie,

We wanted to touch base with you regarding a development we are working on located at 255 Mountshannon Drive, Barrhaven.

The subject site is currently vacant consisting of gravel and grassed areas. The development proposes to construct a stacked townhouse with associated above ground parking. The development will discharge stormwater to the existing 375 mm diameter storm sewer within Mountshannon Drive and will travel approximately 3km to the end-of-pipe stormwater management facility, **Clarke Bellinger Environmental Facility**, as shown by below.

It is our assumption that stormwater quality controls will not be required for the development due to the outlet. Can you please confirm our assumption?



Thank you,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.542
fax: (613) 836-7183
email: agosling@dsel.ca

APPENDIX B

Water Supply

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7	16	44
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day †		Peak Hour ‡	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	44	12.3	8.6	60.4	41.9	91.2	63.3

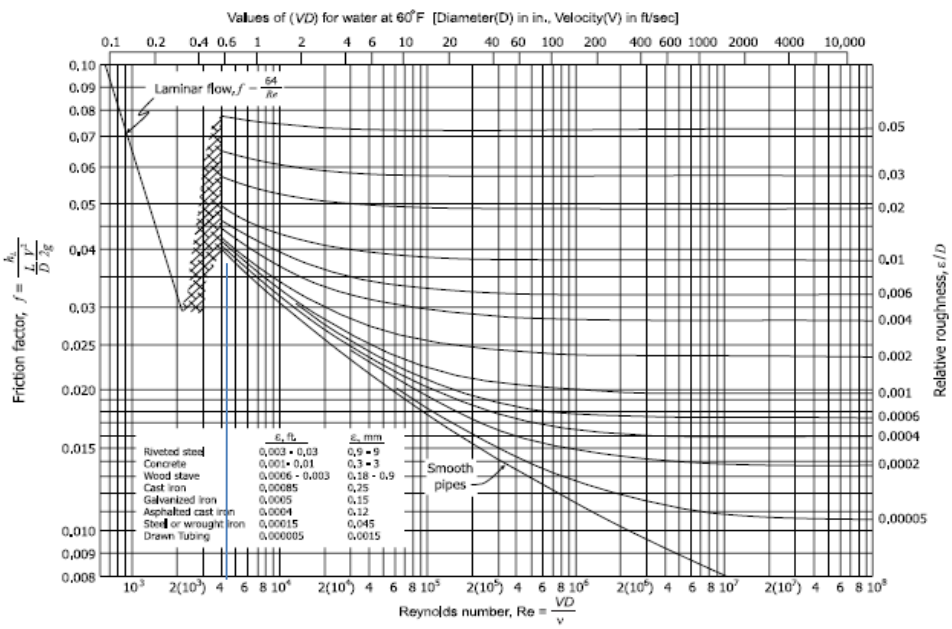
Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Amenity space	2.5	$L/m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Office	75	$L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125	L/seat/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000	L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000	L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
			Total I/CI Demand	0.0	0.0	0.0	0.0	0.0	0.0
			Total Demand	**12.3**	**8.6**	**60.4**	**41.9**	**91.2**	**63.3**

† Max Day Peaking Factor = 4.9
‡ Peak Hour Peaking Factor = 7.4

Estimated Head Loss per Darcy-Weisbach

Service Size	100	mm
Service Length	42.1	m
Peak Demand	1.06	L/s
Relative Roughness	0.0013	
Kinematic Viscosity @ 4°C, v	0.00000151	m^2/s
Velocity, V	0.13	m/s
Re	8,938	



Friction Factor, f 0.0375 (From Moody Diagram)

Head Loss

$$h_f = \frac{fL}{D}\frac{V^2}{2g}$$

h_f	1.47E-02	m H_2O
h_f	1.44E-01	kPa

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$

L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	1824.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	9395.8	L/min	
	9000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**7650.0**	**L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered	0%	
Reduction	**0**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Ordinary - Unprotected Openings	30.1m-45m	24	1	24	5%	
S	Ordinary - Unprotected Openings	>45m			0	0%	
E	Wood Frame	30.1m-45m	19	2	38	5%	
W	Ordinary - Unprotected Openings	3.1m-10m	19	2	38	16%	
		% Increase				**26%**	*value not to exceed 75%*

Increase	**1989.0**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	9639.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	10000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by Pierre J. Tabet architect.
-Calculations based on Fire Underwriters Survey - Part II

Boundary Conditions Unit Conversion: Connection 1 (Mountshannon Drive

Grnd Elev 91.98

	Node	Ground Elevation		
	m H_2O	m H_2O	PSI	kPa
Avg. Day	**132.9**	**40.9**	58.2	401.4
Peak Hour	**125.9**	**33.9**	48.3	332.8
Max Day + FF	**124.5**	**32.5**	46.3	319.0

Fire Flow 10000 L/min

Boundary Conditions Unit Conversion: Connection 2 (Mattino Way

Grnd Elev 91.98

	Node	Ground Elevation		
	m H_2O	m H_2O	PSI	kPa
Avg. Day	**132.5**	**40.5**	57.7	397.5
Peak Hour	**125.9**	**33.9**	48.3	332.8
Max Day + FF	**120.6**	**28.6**	40.7	280.8

Fire Flow 10000 L/min

Alison Gosling

From: Charlotte Kelly
Sent: Wednesday, July 25, 2018 12:07 PM
To: Sharif, Sharif
Cc: Alison Gosling; Robert Freel
Subject: RE: 18-976 B - 255 Mountshannon Drive (Block 2)
Attachments: wtr-2018-07-23_17-976_BLOCK2.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hello Sharif,

Please find the FUS calculations attached.

Please let me know if you have any questions.

Thank-you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

From: Sharif, Sharif <sharif.sharif@ottawa.ca>
Sent: July 25, 2018 9:25 AM
To: Charlotte Kelly <CKelly@dsel.ca>
Cc: Alison Gosling <AGosling@dsel.ca>; Robert Freel <RFreel@dsel.ca>
Subject: RE: 18-976 A - 255 Mountshannon Drive (Block 2)

Hello Kelly,

Please provide the FUS calculation sheet. Thanks.

Sharif

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: Tuesday, July 24, 2018 11:36 AM
To: Sharif, Sharif <sharif.sharif@ottawa.ca>
Cc: Alison Gosling <AGosling@dsel.ca>; Robert Freel <RFreel@dsel.ca>
Subject: 18-976 A - 255 Mountshannon Drive (Block 2)

Good morning Sharif,

We would like to request water boundary conditions for Mountshannon Drive using the following proposed development demands:

1. Location of Service / Street Number: 255 Mountshannon Drive

2. Type of development and the amount of fire flow required for the proposed development:

- The proposed development is residential use consisting of 16 units.
  - It is anticipated that the development will have a connection to be serviced from the existing 400 mm diameter watermain within Mountshannon Drive, as well as a connection to the existing 200 mm diameter watermain within Mattino Way, as shown by the attached map.
  - Fire demand based on FUS was used to calculate a fire demand of 10 000 L/min.

3.

	L/min	L/s
Avg. Daily	8.6	0.14
Max Day	41.9	0.70
Peak Hour	63.3	1.06

If you have any questions please feel free to contact me.

Thank you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

'

'

BOUNDARY CONDITIONS

Boundary Conditions For: 18-976 B – 255 Mountshannon Dr.

Date of Boundary Conditions: 2018-Aug-02

Provided Information:

Scenario	Demand	
	L/min	L/s
Average Daily Demand	8.4	0.1
Maximum Daily Demand	42	0.7
Peak Hour	63.6	1.1
Fire Flow #1 Demand	10,000	167

Number Of Connections: 2

Location:

BOUNDARY CONDITIONS

Results:

Connection #: 1

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.9	57.4
Peak Hour	125.9	47.4
Max Day Plus Fire (10,000) L/min	124.5	46.3

[1]Elevation: **91.980 m**

Connection #: 2

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.5	58.2
Peak Hour	125.9	48.3
Max Day Plus Fire (10,000) L/min	120.6	39.8

[1]Elevation: **91.980 m**

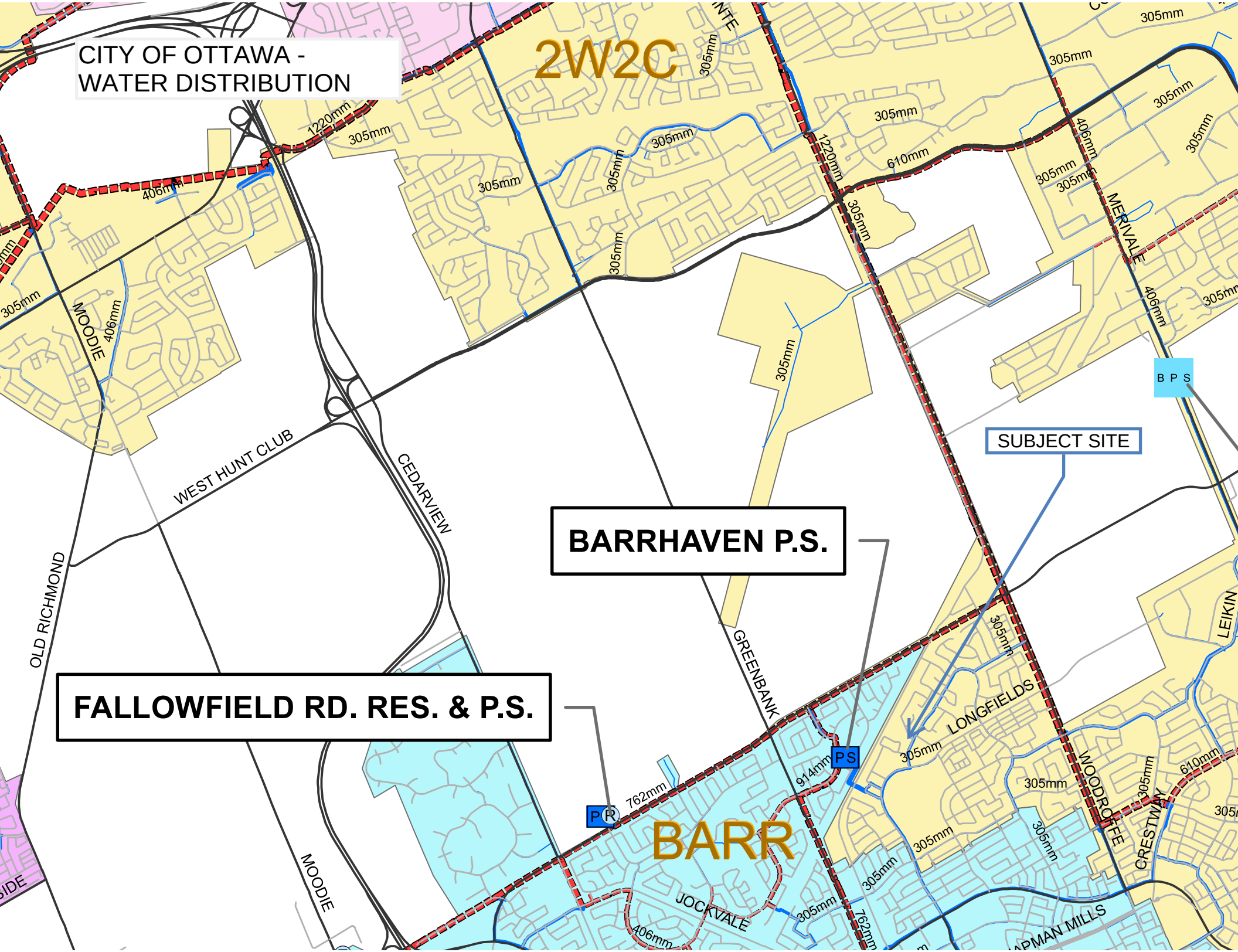
Notes:

1) As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:

a) If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
b) Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.


CITY OF OTTAWA -
WATER DISTRIBUTION
2W2C
BARR
BARRHAVEN P.S.
FALLOWFIELD RD. RES. & P.S.
SUBJECT SITE
B P S
PS
PR
WEST HUNT CLUB
CEDARVIEW
OLD RICHMOND
MOODIE
GREENBANK
MERIVALE
LONGFIELDS
WOODROFFE
CRESTWAY
JOCKVALE
CHAPMAN MILLS
1220mm
610mm
914mm
762mm
406mm
305mm

APPENDIX C

Wastewater Collection

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area	0.190	**ha**

Extraneous Flow Allowances

Infiltration / Inflow	**0.05**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7	10	27
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**27**	
Average Domestic Flow	**0.11**	**L/s**
Peaking Factor	**4.00**	
Peak Domestic Flow	**0.44**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$		0.00
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Ex. Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.00**
Peak Institutional / Commercial Flow	0.00
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.00**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**0.11**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.44**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.49**	**L/s**

Residential demands, Harmon's Correction Factor, Extraneous Flow Rates and Commercial Peaking Factor established by the City of Ottawa Technical Bulletin ISTB-2018-01. Commercial demands established by City of Ottawa Sewer Design Guidelines Appendix 4A.

Mattino Developments Inc.
255 Mountshannon Drive - Block 2
Proposed Site Conditions to Mattino Way

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.095 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.00**	**L/s**
Infiltration / Inflow (Wet)	**0.03**	**L/s**
Infiltration / Inflow (Total)	**0.03**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7	8	22
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**22**	
Average Domestic Flow	**0.07**	**L/s**
Peaking Factor	**3.66**	
Peak Domestic Flow	**0.26**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$		0.00
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Ex. Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.00**
Peak Institutional / Commercial Flow	0.00
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.00**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**0.08**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.27**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.30**	**L/s**

Residential demands, Harmon's Correction Factor, Extraneous Flow Rates and Commercial Peaking Factor established by the City of Ottawa Technical Bulletin ISTB-2018-01. Commercial demands established by City of Ottawa Sewer Design Guidelines Appendix 4A.

Mattino Developments Inc.
255 Mountshannon Drive - Block 2
Proposed Site Conditions to Mountshannon Drive

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.095 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.00**	**L/s**
Infiltration / Inflow (Wet)	**0.03**	**L/s**
Infiltration / Inflow (Total)	**0.03**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7	8	22
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**22**	
Average Domestic Flow	**0.07**	**L/s**
Peaking Factor	**3.66**	
Peak Domestic Flow	**0.26**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$		0.00
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Ex. Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.00**
Peak Institutional / Commercial Flow	0.00
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.00**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**0.08**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.27**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.30**	**L/s**

Residential demands, Harmon's Correction Factor, Extraneous Flow Rates and Commercial Peaking Factor established by the City of Ottawa Technical Bulletin ISTB-2018-01. Commercial demands established by City of Ottawa Sewer Design Guidelines Appendix 4A.

Mattino Developments Inc.
255 Mountshannon Drive - Block 2
Proposed Site Conditions - Total

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area	0.190	**ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.01**	**L/s**
Infiltration / Inflow (Wet)	**0.05**	**L/s**
Infiltration / Inflow (Total)	**0.06**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7	16	44
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**44**	
Average Domestic Flow	**0.14**	**L/s**
Peaking Factor	**3.66**	
Peak Domestic Flow	**0.52**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$		0.00
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Ex. Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.00**
Peak Institutional / Commercial Flow	0.00
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.00**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**0.15**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.53**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.59**	**L/s**

Residential demands, Harmon's Correction Factor, Extraneous Flow Rates and Commercial Peaking Factor established by the City of Ottawa Technical Bulletin ISTB-2018-01. Commercial demands established by City of Ottawa Sewer Design Guidelines Appendix 4A.

SANITARY SEWER CALCULATION SHEET

CLIENT: **Mattino Developments Inc.**
LOCATION: **255 Moutshannon Drive - Block 2**
FILE REF: **17-976**
DATE: **12-Sep-18**

DESIGN PARAMETERS

Avg. Daily Flow Res.	280	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.28	L/s/ha
Avg. Daily Flow Comn	50,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	50,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population										Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units				Pop.	Cumulative		Peak.	Q_{res}	Area	Accu.	Area	Accu.	Area	Accu.	Q_{C+I+I}	Total	Accu.	Infiltration	Total	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
				by type					Area	Pop.	Fact.			Area		Area		Area		Area	Area	Flow	Flow								
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
	SAN2	SAN1	0.190			8		22.0	0.190	22.0	4.00	0.29		0.00		0.00		0.00	0.0	0.190	0.190	0.053	0.34	200	0.35	20.2	0.031	0.050	0.62	19.4	0.02
	SAN1	EX.MH	0.000					0.0	0.190	22.0	4.00	0.29		0.00		0.00		0.00	0.0	0.000	0.000	0.000	0.29	200	0.50	17.3	0.031	0.050	0.74	23.2	0.01

SANITARY SEWER CALCULATION SHEET

PROJECT:	**Mattino Developments Inc.**
LOCATION:	**255 Mountshannon Drive**
FILE REF:	**17-976**
DATE:	**12-Sep-18**

DESIGN PARAMETERS

Avg. Daily Flow Res.	350	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.28	L/s/ha
Avg. Daily Flow Comm.	50,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	50,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population							Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Street	Up	Down	Area	Proposed Units	Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
			(ha)			(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
Bonita Private	1	EX 100	2.379		310.0	2.379	310.0	4.00	5.02		0.00		0.00		0.00	0.0	2.379	2.379	0.666	5.69	200	0.35	11.1	0.031	0.050	0.62	19.4	0.29
	James Long Ct.	*EX 400*	*1.480*		*92.0*	*1.480*	*92.0*	*4.00*	*1.49*		*0.00*		*0.00*		*0.00*	*0.0*	*1.480*	*1.480*	*0.414*	*1.91*								
Mountshannon Dr.	12	*EX 400*	0.051	3	8.0	0.051	8.0	4.00	0.13		0.00		0.00		0.00	0.0	0.051	0.051	0.014	0.14	200	0.65	34.7	0.031	0.050	0.84	26.4	0.005
Mountshannon Dr.	EX 400	EX 100	0.222	10	27.0	1.752	127.0	4.00	2.06		0.00		0.00		0.00	0.0	0.222	1.752	0.491	2.55	250	0.88	85.0	0.049	0.063	1.14	55.8	0.05
	Sutcliffe Terr.	*EX 100*	*6.050*		*334*	*6.050*	*334.0*	*4.00*	*5.41*		*0.00*		*0.00*		*0.00*	*0.0*	*6.050*	*6.050*	*1.694*	*7.11*								
Mountshannon Dr.	EX 100	EX 600	0.608	8	*56*	10.789	827.0	3.85	12.90		0.00		0.00		0.00	0.0	0.608	10.789	3.021	15.92	250	0.88	85.0	0.049	0.063	1.14	55.8	0.29
Daventry Cres.	*600*	*890*	*1.460*		*127*	*12.25*	*954*	*3.81*	*14.74*		*0.00*		*0.00*		*0.00*	*0.0*	*1.460*	*12.249*	*3.430*	*18.17*	*250*	*0.33*	*88.6*	*0.049*	*0.063*	*0.70*	*34.2*	*0.53*
Daventry Cres.	*890*	*880*	*3.890*		*308*	*16.14*	*1262*	*3.73*	*19.08*		*0.00*		*0.00*		*0.00*	*0.0*	*3.890*	*16.139*	*4.519*	*23.60*	*250*	*0.28*	*79.2*	*0.049*	*0.063*	*0.64*	*31.5*	*0.75*
Daventry Cres.	*880*	*870*	*0.330*		*28*	*16.47*	*1290*	*3.73*	*19.47*		*0.00*		*0.00*		*0.00*	*0.0*	*0.330*	*16.469*	*4.611*	*24.08*	*250*	*0.24*	*31.7*	*0.049*	*0.063*	*0.59*	*29.1*	*0.83*
Daventry Cres.	*870*	*860*	*0.800*		*95*	*17.27*	*1385*	*3.70*	*20.78*		*0.00*		*0.00*		*0.00*	*0.0*	*0.800*	*17.269*	*4.835*	*25.62*	*250*	*0.28*	*92.9*	*0.049*	*0.063*	*0.64*	*31.5*	*0.81*
Daventry Cres.	*860*	*850*	*0.090*		*7*	*17.36*	*1392*	*3.70*	*20.88*		*0.00*		*0.00*		*0.00*	*0.0*	*0.090*	*17.359*	*4.861*	*25.74*	*250*	*0.51*	*10.0*	*0.049*	*0.063*	*0.87*	*42.5*	*0.61*
Daventry Cres.	*850*	*8411*	*0.510*		*49*	*17.87*	*1441*	*3.69*	*21.55*		*0.00*		*0.00*		*0.00*	*0.0*	*0.510*	*17.869*	*5.003*	*26.56*	*300*	*0.32*	*80.5*	*0.071*	*0.075*	*0.77*	*54.7*	*0.49*
Daventry Cres.	*8411*	*8402*	*1.310*		*86*	*19.18*	*1527*	*3.67*	*22.73*		*0.00*		*0.00*		*0.00*	*0.0*	*1.310*	*19.179*	*5.370*	*28.10*	*300*	*0.32*	*29.7*	*0.071*	*0.075*	*0.77*	*54.7*	*0.51*
Mountshannon Dr.	*660*	*650*	*0.690*		*40*	*0.69*	*40*	*4.00*	*0.65*		*0.00*		*0.00*		*0.00*	*0.0*	*0.690*	*0.690*	*0.193*	*0.84*	*250*	*0.40*	*95.6*	*0.049*	*0.063*	*0.77*	*37.6*	*0.02*
Mountshannon Dr.	*650*	*640*	*3.770*		*244*	*4.46*	*284*	*4.00*	*4.60*		*0.00*		*0.00*		*0.00*	*0.0*	*3.770*	*4.460*	*1.249*	*5.85*	*250*	*1.50*	*45.3*	*0.049*	*0.063*	*1.48*	*72.8*	*0.08*
															0.00	*0.0*												
Mountshannon Dr.	*620*	*630*	*0.690*		*20*	*0.69*	*20*	*4.00*	*0.32*		*0.00*		*0.00*		*0.00*	*0.0*	*0.690*	*0.690*	*0.193*	*0.52*	*250*	*0.26*	*79.7*	*0.049*	*0.063*	*0.62*	*30.3*	*0.02*
Mountshannon Dr.	*630*	*640*	*0.490*		*49*	*1.18*	*69*	*4.00*	*1.12*		*0.00*		*0.00*		*0.00*	*0.0*	*0.490*	*1.180*	*0.330*	*1.45*	*250*	*0.62*	*85.5*	*0.049*	*0.063*	*0.95*	*46.8*	*0.03*
Daventry Cresent	*640*	*800*	*0.650*		*63*	*6.29*	*416*	*4.00*	*6.74*		*0.00*		*0.00*		*0.00*	*0.0*	*0.650*	*6.300*	*1.764*	*8.50*	*250*	*0.40*	*82.0*	*0.049*	*0.063*	*0.77*	*37.6*	*0.23*
Daventry Cresent	*800*	*810*	*0.660*		*60*	*6.95*	*476*	*3.99*	*7.68*		*0.00*		*0.00*		*0.00*	*0.0*	*0.660*	*6.960*	*1.949*	*9.63*	*250*	*0.32*	*71.0*	*0.049*	*0.063*	*0.69*	*33.6*	*0.29*
Daventry Cresent	*810*	*820*	*0.160*		*11*	*7.11*	*487*	*3.98*	*7.85*		*0.00*		*0.00*		*0.00*	*0.0*	*0.160*	*7.120*	*1.994*	*9.85*	*250*	*0.43*	*13.9*	*0.049*	*0.063*	*0.79*	*39.0*	*0.25*
Daventry Cresent	*820*	*830*	*0.660*		*77*	*7.77*	*564*	*3.95*	*9.02*		*0.00*		*0.00*		*0.00*	*0.0*	*0.660*	*7.780*	*2.178*	*11.20*	*250*	*0.32*	*74.5*	*0.049*	*0.063*	*0.69*	*33.6*	*0.33*
Daventry Cresent	*830*	*8402*	*0.610*		*70*	*8.38*	*634*	*3.92*	*10.06*		*0.00*		*0.00*		*0.00*	*0.0*	*0.610*	*8.390*	*2.349*	*12.41*	*250*	*1.39*	*74.6*	*0.049*	*0.063*	*1.43*	*70.1*	*0.18*
Service Easement	*8402*	*8414*	*0.000*		*0*	*27.56*	*2161*	*3.56*	*31.16*		*0.00*		*0.00*		*0.00*	*0.0*	*0.000*	*27.569*	*7.719*	*38.88*	*300*	*0.49*	*57.0*	*0.071*	*0.075*	*0.96*	*67.7*	*0.57*

Sewers downstream of subject site

Corresponding structure identified by Sanitary Drainage Plan of the 1993 MSS.

LONGFIELDS CENTRAL
SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Novatech Engineering Consultants Ltd.
April 3rd, 2014

7.0 WASTEWATER COLLECTION SYSTEM

The sanitary sewers in this development will connect to the north branch of the existing East Barrhaven Trunk (EBHT) sanitary sewer. The EBHT drains into the West Rideau Collector Sewer (WRCS) on Merivale Road and eventually makes its way to the Robert O. Pickard Environmental Centre to be treated before being released to the Ottawa River. The wastewater collection system is shown below in **Figure 7.1**.

Population estimates and sanitary flows for the proposed development are calculated using design criteria from the Sewer Design Guidelines:

Table 7-1: Wastewater Design Parameters

Parameter	Design Parameter
Town Home/Stacked Unit Population Density	2.7 people/unit
Average Apartment Unit Population Density	1.8 people/unit
Residential Flow Rate, Average Daily	350 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0)
Commercial & Institutional Flow Rate	50,000 L/day/ha
ICI Peaking Factor	1.5
Infiltration Rate	0.28 L/s/ha
Minimum Pipe Size	250 mm (ICI), 200mm (Res)
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s

The proposed peak sanitary flows are summarized below in **Table 7-2**.

Table 7-2: Proposed Wastewater Flow Summary

Development Condition	Towns/ Stacked Towns	Apart-ments	Res. Area (ha)	Institutional Area (ha)	Infiltration Area (ha)	Peak Design Flow (L/s)
Proposed Site	103	80	4.17	0	4.80	8.84
External Upstream Contributions	16	0	0.21	0	0.46	0.81
Total	**135**	**80**	**4.90**	**0**	**5.79**	**9.63**
1998 Servicing Study Update	**-**	**-**	**5.91**	**-**	**5.91**	**9.83**

The theoretical peak design flow from the total development area will be 9.80L/s. Internally the proposed site peak flow is 9.63 L/s which can be serviced by 200mm diameter pipes with a minimum slope of 0.32% which have a capacity of 19.4L/s.

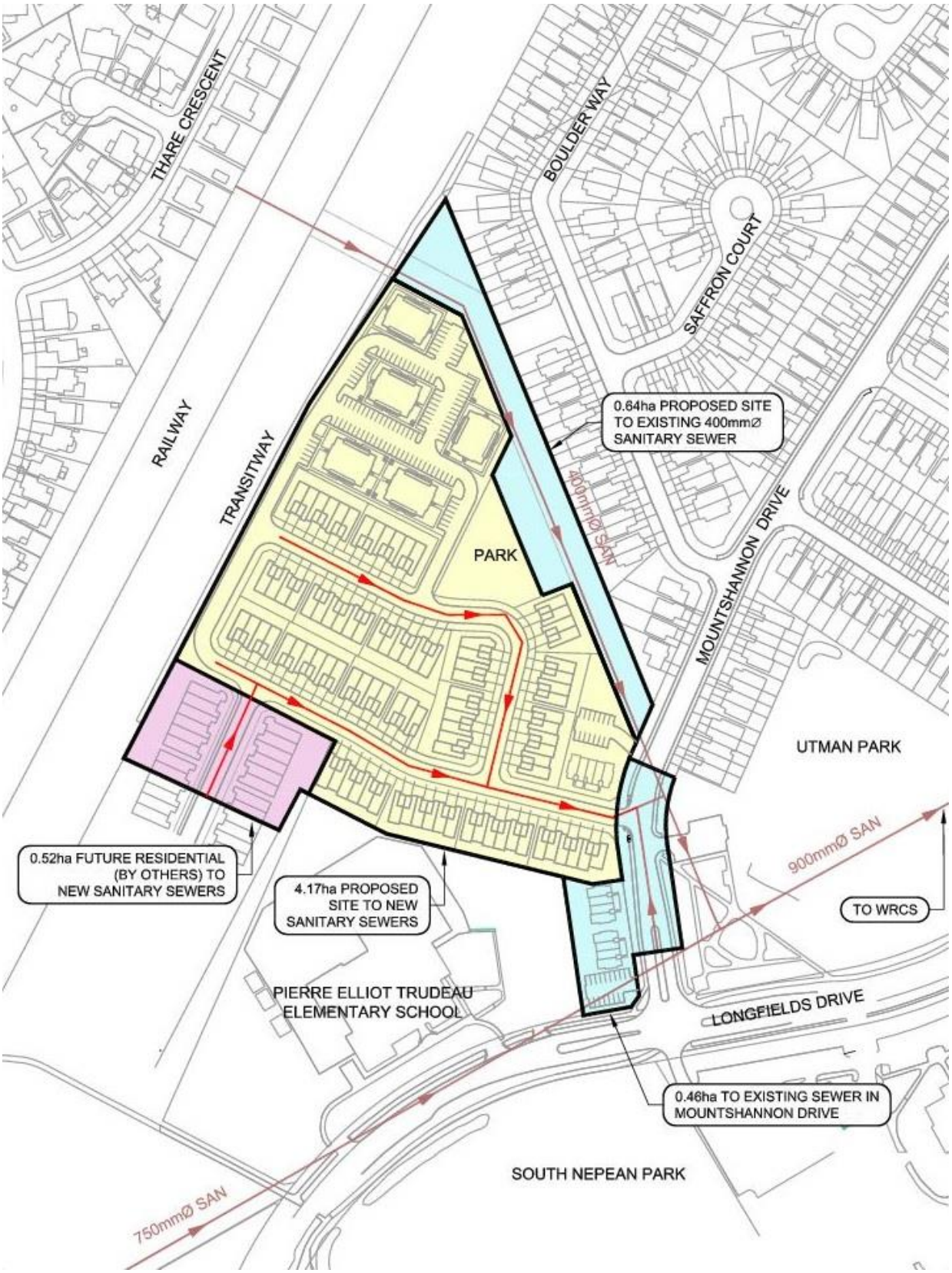


Figure 7.1: Wastewater Collection System

The 1998 Longfields Davidson Heights Servicing Study Update assigned a value of 86 people/gross ha to the area, resulting in an anticipated peak flow of 9.83 L/s. The proposed total peak flow is 0.03 L/s lower than this update had accounted for (0.30%). The downstream pipes are 900mm diameter with capacities of 707 L/s. None of the downstream pipes are running above capacity, therefore there is adequate downstream capacity to service the proposed development. Design sheets from the 1998 Servicing Study update are attached in **Appendix B**.

The proposed development will tie into the existing sanitary sewer in Mountshannon Drive at manhole MS3. The existing sewer is a 300mm diameter pipe with 0.32% slope and a capacity of approximately 57 L/s. Currently there are no additional services (no flow) in this section of sewer.

Block 1, consisting of 16 stacked townhomes will also be serviced into the existing sewer in Mountshannon Drive, between manholes MS3 and MS1. This is the most upstream section of the existing sewer with the only contribution coming from the proposed site. The existing sewer is a 250mm diameter pipe at 0.30% which has a capacity of 34 L/s.

Design calculations for the sewershed are attached in **Appendix B,** and a Sanitary Drainage Area Plan is located in **Appendix E**.

Longfields Central
SANITARY SEWER DESIGN SHEET

AREA			RESIDENTIAL							ICI		INFILTRATION				PIPE							
AREA ID	From	To	Towns	Stacked Towns	Java	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)	C/I Area (Ha)	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)	d/D_{full}	v/V_{full} (%)
645 Longfields Drive																							
C1	C32	109	16			43.2	43.2	4.00	0.70			0.52	0.52	0.15	0.85	200	2.60	65.2	55.17	1.70	1.5%	0.08	33.0%
A20	111	109	4			10.8	10.8	4.00	0.18			0.20	0.20	0.06	0.23	200	2.00	24.9	48.39	1.49	0.5%	0.00	0.0%
A1	109	107	10			27.0	81.0	4.00	1.31			0.29	1.01	0.28	1.60	200	0.50	55.8	24.19	0.75	6.6%	0.16	54.0%
A2	107	105	10			27.0	108.0	4.00	1.75			0.27	1.28	0.36	2.11	200	0.55	35.4	25.38	0.78	8.3%	0.19	60.0%
A3	105	103	6			16.2	124.2	4.00	2.01			0.17	1.45	0.41	2.42	200	1.75	41.8	45.26	1.40	5.3%	0.16	54.0%
A5	121	119	25			67.5	67.5	4.00	1.09			0.70	0.70	0.20	1.29	200	1.00	85.1	34.22	1.06	3.8%	0.12	45.0%
A6,A7	119	117	2		80	149.4	216.9	4.00	3.51			1.10	1.80	0.50	4.02	200	0.35	17.3	20.24	0.62	19.9%	0.30	78.0%
A11,A21	117	115	1			2.7	219.6	4.00	3.56	0.20	0.17	0.28	2.08	0.58	4.31	200	0.35	28.5	20.24	0.62	21.3%	0.30	78.0%
A12	115	113	3			8.1	227.7	4.00	3.69			0.09	2.17	0.61	4.30	200	0.35	18.8	20.24	0.62	21.2%	0.30	78.0%
A4	113	103	21			56.7	284.4	4.00	4.61			0.57	2.74	0.77	5.38	200	0.35	75.5	20.24	0.62	26.6%	0.34	83.0%
A13,A14	103	101	11	10		56.7	465.3	3.99	7.52			0.52	4.71	1.32	8.84	200	0.35	67.9	20.24	0.62	43.7%	0.44	96.0%
	101	MS3				0.0	465.3	3.99	7.52			0.00	4.71	1.32	8.84	200	0.35	13.8	20.24	0.62	43.7%	0.44	96.0%
Existing in Mountshannon Drive																							
A15	MS1	MS3		16		43.2	43.2	4.00	0.70			0.38	0.38	0.11	0.81	250	0.30	75.8	33.98	0.67	2.4%	0.08	33.0%
Connection to EBHT																							
A19	MS3	K2				0.0	508.5	3.97	8.18			0.08	5.17	1.45	9.63	300	0.32	15.5	57.07	0.78	16.9%	0.27	73.0%

Design Parameters:

Avg Flow/Person =	350	l/day
Infiltration =	0.28	l/s/ha
Residential Peaking Factor = Harmon Equation (max 4, min 2)		
Pipe Friction n =	0.013	
Comm./Inst. Flow =	50000	l/ha/day
Peaking Factor Comm./Inst. =	1.5	

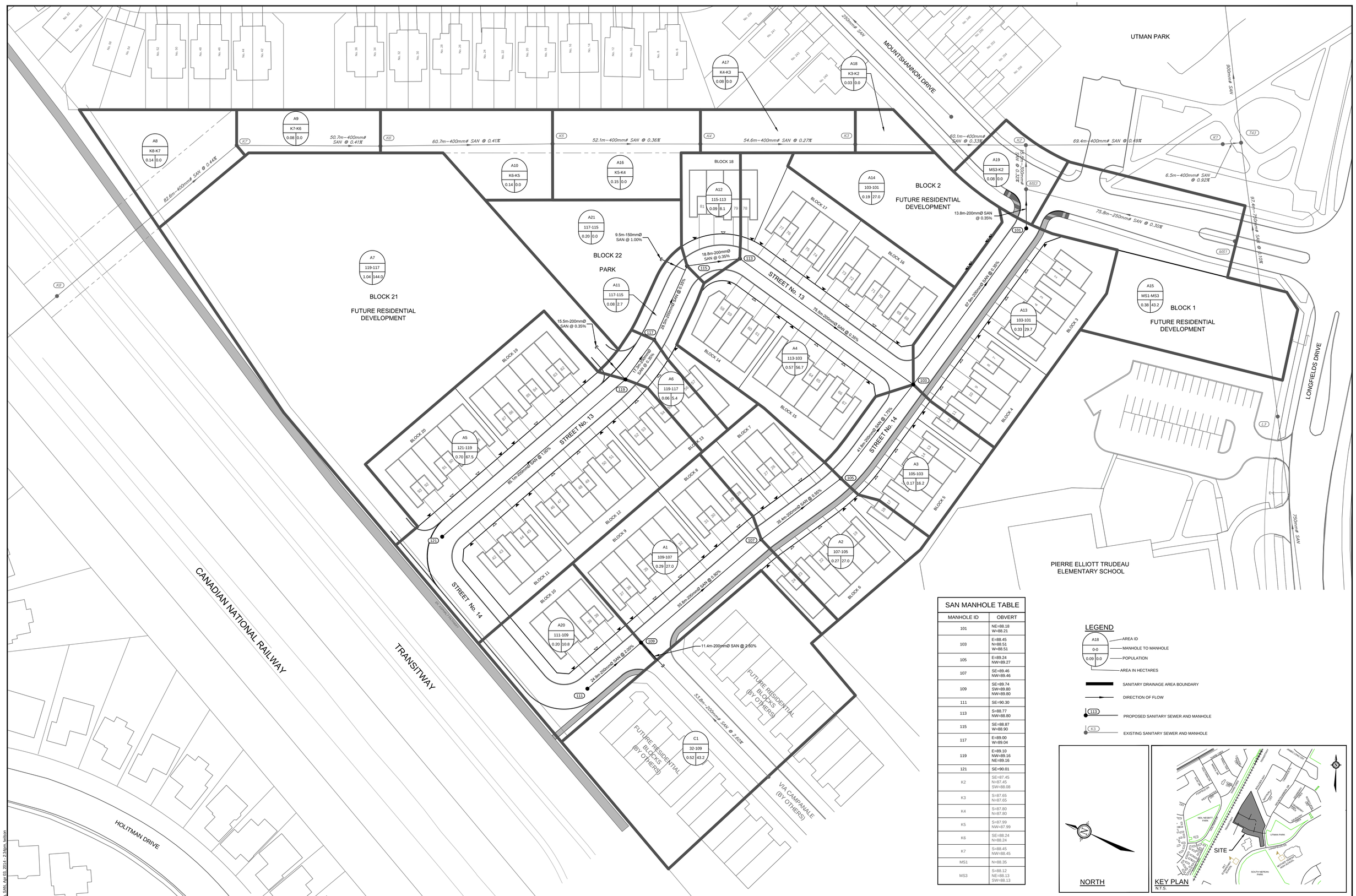
Population Density:

Towns	2.7	ppl/unit
Stacked Towns	2.7	ppl/unit
Java	1.8	ppl/unit

Project: 112021
Designed: LRW
Checked: MAB
Date: April 2, 2014

NOVATECH ENGINEERING CONSULTANTS LTD.

LICENSED PROFESSIONAL ENGINEER
M. A. BISSETT
APR.3/14
PROVINCE OF ONTARIO



SAN MANHOLE TABLE

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105	E=89.24 NW=89.27
107	SE=89.46 NW=89.46
109	SE=89.74 SW=89.80 NW=89.80
111	SE=90.30
113	S=88.77 NW=88.80
115	SE=88.87 W=88.90
117	E=89.00 W=89.04
119	E=89.10 NW=89.16 NE=89.16
121	SE=90.01
K2	SE=87.45 N=87.45 SW=88.08
K3	S=87.65 N=87.65
K4	S=87.80 N=87.80
K5	S=87.99 NW=87.99
K6	SE=88.24 N=88.24
K7	S=88.45 NW=88.45
MS1	N=88.35
MS3	S=88.12 NE=88.13 SW=88.13

LEGEND

- A18 / 0-0 / 0.09 0.0 — AREA ID; MANHOLE TO MANHOLE; POPULATION; AREA IN HECTARES
- SANITARY DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- 113 — PROPOSED SANITARY SEWER AND MANHOLE
- K3 — EXISTING SANITARY SEWER AND MANHOLE

NORTH

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

Mattino DEVELOPMENTS INC.
171 CLARIDGE DRIVE
OTTAWA, ON
K2J 5V8

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	APR 3/14	MAB
2.	REVISED PLAN OF SUBDIVISION	FEB 14/14	MAB
1.	ISSUED FOR APPROVAL	JUN 07/13	KJM

SCALE 1:500

DESIGN	LRW
CHECKED	MAB
DRAWN	DTD
CHECKED	MAB
APPROVED	JGR

FOR REVIEW ONLY

REGISTERED PROFESSIONAL ENGINEER J.G. RIDDELL PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER M.A. BISSETT APR. 3/14 PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

CITY of OTTAWA
LONGFIELDS CENTRAL
591 LONGFIELDS DRIVE

SANITARY DRAINAGE AREA PLAN

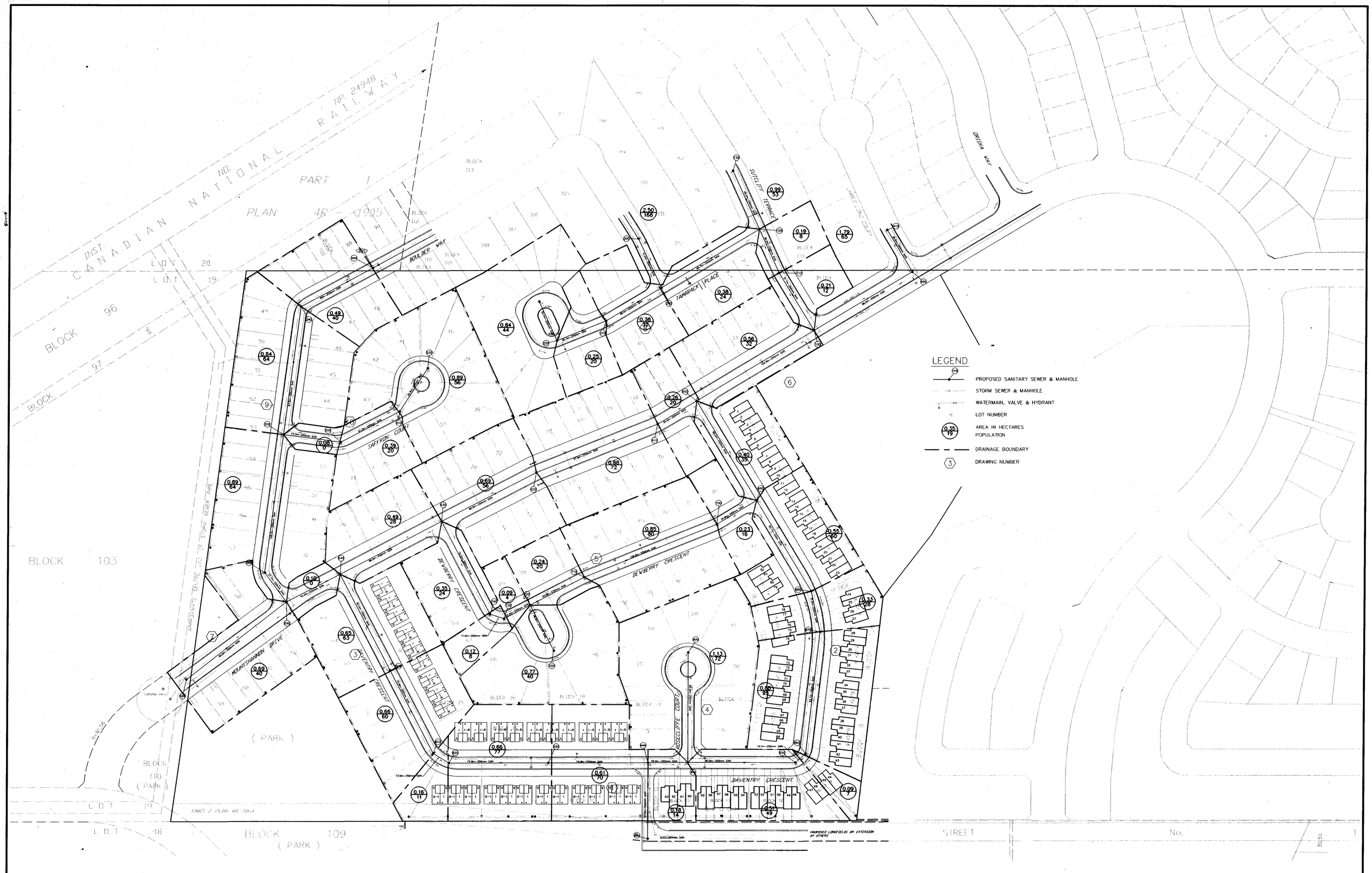
PROJECT No. 112021
REV REV # 3
DRAWING No. 112021-SAN

PLANB1.DWG - 1000mmx707mm

M:\2012\112021\CAD\Design\112021-SAN.dwg, SAN, Apr 03, 2014 - 2:34pm, lwilson

LONGFIELDS/DAVIDSON HEIGHTS SERVICEABILITY STUDY
CITY OF NEPEAN

Oliver, Mangione, McCalla & Associates Limited
February 1993



NEPEAN
PUBLIC WORKS DEPARTMENT

J.L. Richards & Associates Limited
Consulting Engineers, Architect & Planners
OTTAWA, KINGSTON, SUDBURY, CANADA.

NO.	DATE	BY	REVISION
3.	16/09/93	W.Z.	AS PER RMOC
2.	AUG. 93	W.Z.	ISSUED FOR MOE APPROVAL
1.	MAR. 93	W.Z.	ISSUED FOR PRELIMINARY APPROVAL

DRAWN BY T.S. DATE JAN.93
DESIGN BY W.Z. DATE JAN.93
CHECKED BY J.G.C. DATE
APPROVED BY DATE
SCALE 1:1250
SURVEY DATA

LONGFIELDS DEVELOPMENTS INC.
NEPCORP DEVELOPMENTS INC.
LONGFIELDS
CITY OF NEPEAN
SANITARY DRAINAGE PLAN

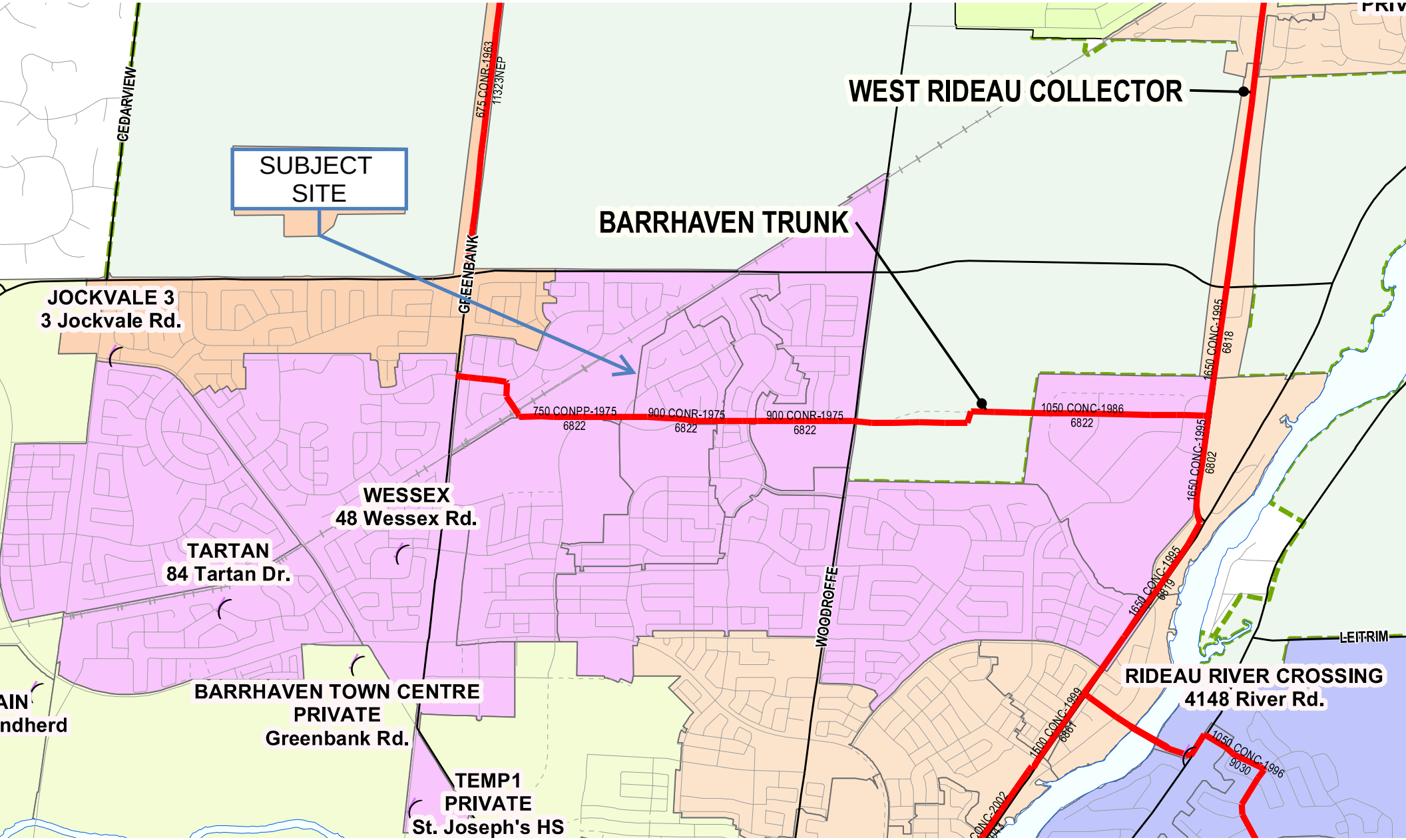
CONTRACT NO. 11753 11754
DRAWING NO. D-SA

PHASE III

11753DSA,31.75,93/09/16,09:03

4062

CITY OF OTTAWA - SANITARY TRUNK SEWERS AND COLLECTION AREAS



APPENDIX D

Stormwater Management

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area	0.190	ha
Minor System		
Q	64.0	L/s/ha
Q	12.2	L/s
Volume Required	167.0	m³/ha
Volume Required	31.7	m³

*Release rate and storage volume required based on Longfields Concentral Site Servicing and Stormwater Management Study prepared by Novatech Engineering Consultants Ltd.

Estimated Post Development Peak Flow from Attenuated Areas

Area ID **C1, C2 & C3**

	C1	C2	C3	Total
Area	0.050	0.084	0.056	0.190
C	0.52	0.78	0.63	0.65

Stage Attenuated Areas Storage Summary

		Surface Storage			Surface and Subsurface Storage			
	Stage	Ponding	h_o	delta d	V*	V_{acc}**	$Q_{release}$†	$V_{drawdown}$
	(m)	(m^2)	(m)	(m)	(m^3)	(m^3)	(L/s)	(hr)
Orifice INV	89.77		0.00			0.0	0	0.00
Storage Pipe SL	89.92		0.15	0.15	0.0	0.0	2.7	0.00
Storage Pipe OBV	90.07		0.30	0.15	0.0	0.0	4.5	0.00
T/L	91.90	0.2	2.13	1.83	6.0	6.0	11.6	0.14
0.10m Ponding	92.00	108.0	2.23	0.10	3.7	9.8	12.0	0.23
0.15m Ponding	92.05	228.8	2.28	0.05	8.2	18.0	12.1	0.41
0.20m Ponding	92.10	326.5	2.33	0.05	13.8	31.8	12.3	0.72

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† $Q_{release}$ = Release rate calculated from Tempest LMF Curve

Orifice Location **STM102** **Dia** LMF95
Total Area 0.190 ha
C 0.65 Rational Method runoff coefficient

	5-year				
t_c (min)	i (mm/hr)	Q_{actual}‡ (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	36.0	12.1	23.9	14.3
15	83.6	28.8	12.1	16.8	15.1
20	70.3	24.3	12.1	12.2	14.6
25	60.9	21.0	12.1	9.0	13.4
30	53.9	18.6	12.1	6.5	11.8
35	48.5	16.7	12.1	4.7	9.8
40	44.2	15.3	12.1	3.2	7.6
45	40.6	14.0	12.1	2.0	5.3
50	37.7	13.0	12.1	0.9	2.8
55	35.1	12.1	12.1	0.1	0.2
60	32.9	11.4	11.4	0.0	0.0
65	31.0	10.7	10.7	0.0	0.0
70	29.4	10.1	10.1	0.0	0.0
75	27.9	9.6	9.6	0.0	0.0
80	26.6	9.2	9.2	0.0	0.0
85	25.4	8.8	8.8	0.0	0.0
90	24.3	8.4	8.4	0.0	0.0
95	23.3	8.0	8.0	0.0	0.0
100	22.4	7.7	7.7	0.0	0.0
105	21.6	7.5	7.5	0.0	0.0
110	20.8	7.2	7.2	0.0	0.0

5-year $Q_{attenuated}$	**12.06**	**L/s**
5-year Max. Storage Required	**15.1**	**m^3**
Est. 5-year Storage Elevation	**92.03**	**m**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m^3)	Available Storage (m^3)
A	12.1	15.1	31.8
Total	**12.1**	**15.1**	**31.8**

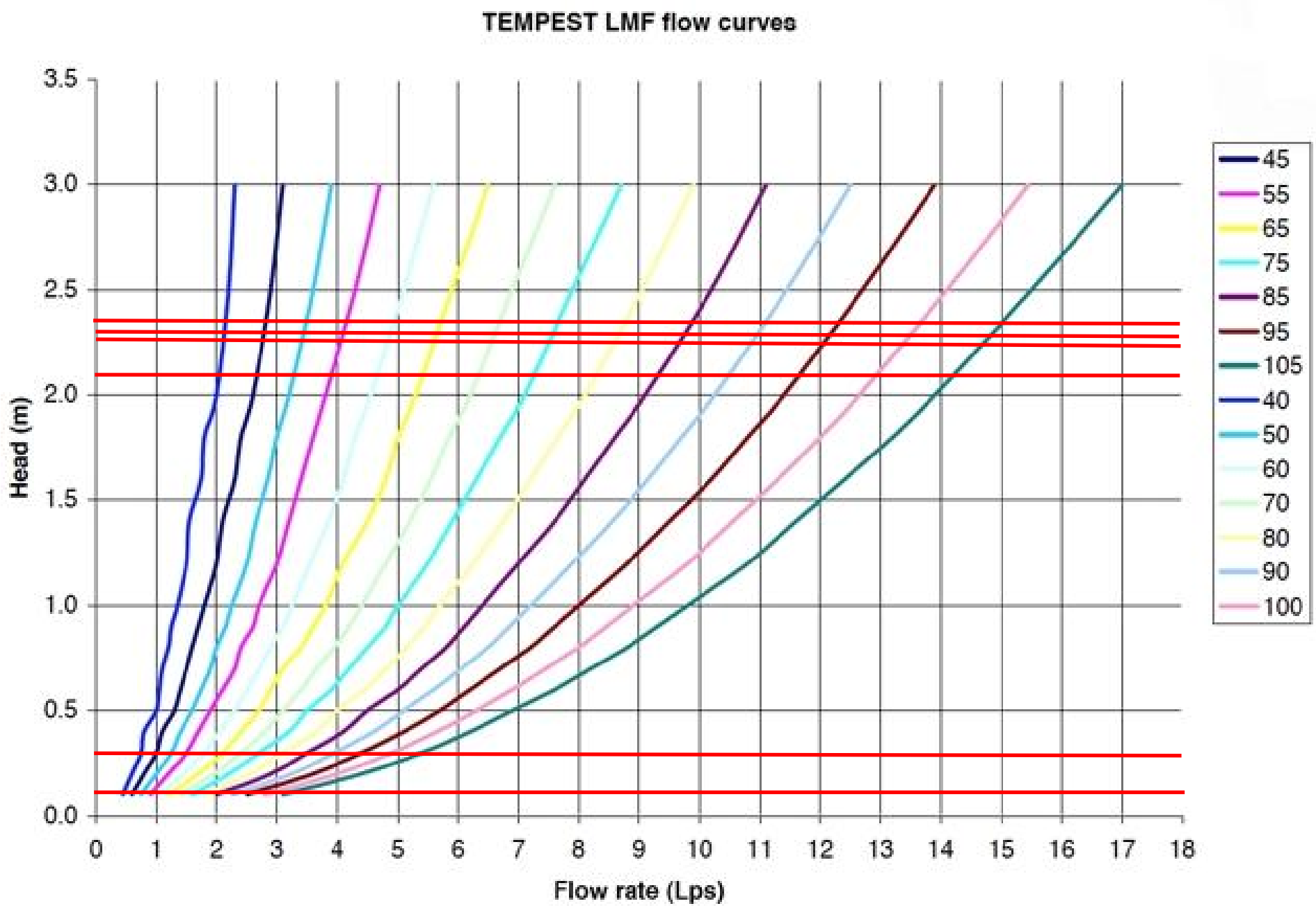
255 Mountshannon Drive - Block 2
Storm Sewer Calculation Sheet

										Sewer Data								
Area ID	**Up**	**Down**	**Area**	**C**	**Indiv AxC**	**Acc AxC**	**T_C**	**I**	**Q**	**DIA**	**Slope**	**Length**	**$A_{hydraulic}$**	**R**	**Velocity**	**Qcap**	**Time Flow**	**Q / Q full**
			(ha)	**(-)**			**(min)**	**(mm/hr)**	**(L/s)**	**(mm)**	**(%)**	**(m)**	**(m^2)**	**(m)**	**(m/s)**	**(L/s)**	**(min)**	**(-)**
C1	CB2	STM101	0.050	0.52	0.03	0.03	10.0	104.2	7.5	250	1.00	13.5	0.049	0.063	1.21	59.5	0.2	0.13
							10.2											
C2	CB1	STM101	0.084	0.78	0.07	0.09	10.2	103.2	26.4	250	1.00	2.0	0.049	0.063	1.21	59.5	0.0	0.44
							10.2											
	STM101	STM102	0.050	0.52	0.03	0.14	10.2	103.1	41.1	300	0.50	17.0	0.071	0.075	0.97	68.4	0.3	0.60
							10.5											
C3	CB'L'8	CB'L'7	0.056	0.63	0.04	0.13	10.2	103.2	36.4	250	0.50	10.8	0.049	0.063	0.86	42.0	0.2	0.87
	CB'L'7	CB'T'6			0.00	0.13	10.2	103.1	36.4	250	0.50	13.6	0.049	0.063	0.86	42.0	0.3	0.87
	CB'T'6	CB'T'5			0.00	0.13	10.5	101.7	35.9	250	0.50	16.4	0.049	0.063	0.86	42.0	0.3	0.85
	CB'T'5	CB'T'4			0.00	0.13	10.8	100.2	35.4	250	0.50	16.9	0.049	0.063	0.86	42.0	0.3	0.84
	CB'T'4	CB3			0.00	0.13	11.1	98.6	34.8	250	0.50	8.6	0.049	0.063	0.86	42.0	0.2	0.83
	CB3	STM MH102			0.00	0.13	11.3	97.8	34.5	250	0.50	7.6	0.049	0.063	0.86	42.0	0.1	0.82
							11.4											
	STM MH102	STM MH103				0.27	11.4	97.2	73.1	300	1.00	4.4	0.071	0.075	1.37	96.7	0.1	0.76
	STM MH103	EX. STM				0.27	11.5	96.9	72.9	300	1.00	13.8	0.071	0.075	1.37	96.7	0.2	0.75
							11.7											

C1	**Imp.**	**Perv.**	**Total**
Area	0.023	0.027	0.050
C	0.9	0.2	0.52

C2	**Imp.**	**Perv.**	**Total**
Area	0.071	0.014	0.084
C	0.9	0.2	0.78

C3	**Imp.**	**Perv.**	**Total**
Area	0.034	0.021	0.056
C	0.9	0.2	0.63


TEMPEST LMF flow curves
Head (m)
Flow rate (Lps)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
45
55
65
75
85
95
105
40
50
60
70
80
90
100

LONGFIELDS CENTRAL
SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Novatech Engineering Consultants Ltd.
April 3rd, 2014

4.0 STORMWATER MANAGEMENT DESIGN

The stormwater management criteria for the proposed development was prepared in accordance with the City of Ottawa Sewer Design Guidelines (October 2012) and the Longfields Davidson Heights Serviceability Study Update Report (1998).

4.1 Storm Drainage/ Conveyance

- Storm sewers will be designed to convey the 1:5 year post-development peak flow for the proposed development
- Overland flows are to be confined within the right-of-ways and/or defined drainage easements for all storms up to the 1:100 year event.
- ICD flow rates are to be calculated for each drainage area to ensure that the following stormwater management (SWM) objectives are satisfied with respect to the 1998 Serviceability Study Update Report (1998) and City of Ottawa Design Guidelines:
    - Flow into the minor system will be controlled to a maximum of 64 L/s/ha where available;
    - Road sags will be designed to allow a maximum ponding depth of 0.25m;
    - Rearyard swales will be designed to allow a maximum static ponding depth of 0.30m;
    - Surface storage in backyards will be accounted for in design computations;
    - Provide total on-site storage (right-of-ways, rearyards, parking lots, rooftop, underground, etc.) of 100 m^3/ha;
    - Maximum flow depths and elevations on streets shall not exceed 300 mm and shall be confined to the road right-of-way and shall not be within 300 mm (vertical) to the nearest building opening.
        - The maximum flow depth on streets (both public and private and on parking lots) under either static or dynamic conditions shall be 300 mm;
    - The product of the 100 year flow depth (m) on street and flow velocity (m/s) shall not exceed 0.6;
    - The 100 year hydraulic grade line within the storm sewers shall not be within 30 cm (vertical) to adjacent building underside of footing;
    - A set downstream HGL of 90.54m at MH 100 will govern the 100-yr HGL throughout the site;
    - A set downstream HGL of 89.92m within the storm trunk will govern the 100-yr HGL at the inlet lead from RYCB-10
    - Major system flow leaving the site will convey along Mountshannon Drive and stored as surface storage in the existing major system outlet of SWM Park 959.

4.2 Storm Sewer Design (Minor System)

The minor system flows from the Longfields Central Development is conveyed through Street 14 and outlets into the existing 1350mm trunk sewer through Manhole MH100 at Mountshannon Drive. The minor system from the large grassed area along the northern section of the site will outlet into the existing 1350mm trunk between Manhole MHT-2 and MHT-3. The overall layout of the proposed storm sewer network is shown on **Figure 4.1**

The proposed storm sewers have been designed using the Rational Method and design sheets are located in **Appendix B.** The corresponding Storm Drainage Area Plan (Drawing 112021-STM) is provided in **Appendix E.** The design criteria used in sizing the storm sewers are summarized in **Table 4-1**.

Table 4-1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	5 Year Return Period
Storm Sewer Design	Rational Method/AutoDesk Storm Analysis
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Time of Concentration (T_c)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

4.2.1 Inlet Control Devices

Inlet control devices (ICD's) will be installed in all road and rearyard catchbasins to limit the inflows to the minor system during all storm events. Catchbasin leads will typically be interconnected with a single ICD controlling inflow to the storm sewer.

Inlet control devices are proposed at all storm sewer inlets within the roadways and rearyards to ensure inflows to the storm sewer system are regulated to 64 L/s/ha. Inlet control devices shall be a combination of CB lead plug/insertion type and Vortex units based on the allowable flow entering the minor system for each sub-catchment. ICD plug sizes are to be selected from the approved Ottawa standards for round orifices (83mm, 94mm, 102mm, 108mm, 127mm, 152mm, 178mm) and Vortex units based on the ICD curves in the Ottawa Sewer Design Guidelines Appendix 7-C.

4.3 Overland Flow Path (Major System)

The right-of-ways have been designed to convey runoff from storms that exceed the allowable flow into the minor system. The road profiles have been graded to ensure that the 100-year peak overland flows are confined within the right-of-way at a maximum static flow depth of 0.30m (static ponding + cascading flow). The major system has been designed to ensure that the product of velocity x depth does not exceed 0.60 during the 100-year event.

4.4 Offsite Major System Storage - SWM PARK 959

It is proposed that all overland major system flow leaving the Longfields Central development will be accommodated as surface storage in the SWM Park 959 located at the intersection of Mountshannon Drive and Longfields Drive as specified in the *Servicing Report for Longfields Development (David McManus Engineering, Revised June 2007).*

4.5 Infiltration Best Management Practices

Lot level and infiltration best management practices (BMPs) will be used to mitigate against the potential reduction in infiltration resulting from development. Proposed BMPs for groundwater infiltration include:

- Roof leaders will be directed to rearyard areas.

By implementing infiltration BMPs as part of the storm drainage design, the impacts of development on the hydrologic cycle can be considerably reduced. Infiltration of clean runoff will have additional benefits for stormwater management.

Table 5-4: Longfields Central Development SWM Breakdown (100-year storm event)

Description	Area	Minor System Flow		Total Static Ponding		Major System Flow
	(ha)	(L/s)	(L/s/ha)	(m^3)	(m^3/ha)	(L/s)
High Density Residential						
Block 1 (A-29)	0.21	6.0	28.8	20.8	100.0	94.3
Block 2 (A-30)	0.15	9.6	63.9	25.0	166.7	10.3
Block 21(A-2a/b)	1.00	37.6	37.5	270.0	270.0	38.7
Medium Density Residential						
Medium-Density	3.63	257.0	70.7	186.4	51.3	314.9
Total	**4.99**	**310.1**	**62.1**	**502.2**	**100.6**	**458.4**

Table 5-5: Longfields Central SWM Summary (100-yr storm event)

Description	Area	Minor System Flow		Total Static Ponding		Major System Flow
	(ha)	(L/s)	(L/s/ha)	(m^3)	(m^3/ha)	(L/s)
Longfields Central Development	4.99	310.1	62.1	502.2	100.6	458.4
*Campanale Dev. Controlled (A-22,31,32)	0.66	42.2	64.0	27.4	41.5	194.2
*Campanale Dev. Uncontrolled (A-17,18)	0.11	-	-	-	-	40.2
*Campanale Dev. Major Overland (A-33)	0.23	-	-	2.3	9.9	45.4
Total to Mountshannon Drive	**5.99**	**352 L/s**	**-**	**-**	**-**	**738 L/s**
****Total Overland Flow into SWM Park 959**	**-**	**-**	**-**	**-**	**-**	**535 L/s**

**Values as per approved Campanale Homes Development taken from Longfields Subdivision (Stantec – 2013)*
*** Dynamic Flow taken from the Autodesk SSA Model (Chicago 100-yr 4 Hour Event)*

Please note in Table 5.5. that the total overland flow into the existing SWM Park 959 is less than the total flow to Mount Shannon Drive from the site due to the dynamic flow routing though Mountshannon Drive and surface storage located at the sag (CB X2-X3) adjacent to SWM Park 959 along Mountshannon Drive.

Results provided above show that the minor system flow leaving the Longfields Central Development is being controlled to 64 L/s/ha as required in the Longfields Davidson Heights Serviceability Study Update Report (1998). A significant amount of major system overland flow is conveyed onto Mountshannon Drive from the Longfields Central development. This is due to the constraint on the minor system inlets through the site and also the large amount of major system flow contributing from the adjacent Campanale Homes development areas.

5.4.4 Major System Outlet – SWM PARK 959

A weighted average runoff coefficient *(C-Value)* for detailed design of the Longfields Central Development site *(4.99 ha)*, based on the parameters stated in Table 5.1 was calculated to be 0.62 *(60.0% IMP).* This updated C-Value was determined to be above the assumed C-Value provided in the Longfields Davidson Heights SWM Park 959 Modeling Update completed by Stantec Engineering *(March 1, 2013)*. The Stantec model update estimated an overall sub-catchment area *(Area ID-23)* of 5.75 ha and runoff coefficient of 0.55. A decrease in area and

increase in imperviousness within the development has changed from the most recent Stantec SWM Model of Park 959 *(March 1, 2013)*.

Modeling updates completed by Stantec Engineering *(March 1, 2013)* for the SWM Park 959 have been completed to address the need for more storage during complete development of the Longfields Davidson Heights area.

To approximate the major system flow differences between the Stantec estimation and the detailed design of the Longfields Central Development by Novatech, the total area of the development site was multiplied by the weighted C-value to get a value that is initially used within the rational method equation. Because no detailed hydrologic modeling is being completed by Novatech for the total tributary areas to SWM Park 959 and Novatech currently does not have the hydrologic model of SWM Park 959, this calculation should suffice in approximating how close the estimated and detailed design major system flows are to each other based on strictly the weighted parameters of the site. The calculations are as follows:

Stantec (March 1, 2013) Design:	Novatech Engineering Detailed Design:
Area (ha) = 5.75 ha	Area (ha) = 4.99 ha
C-Value = 0.55	C-Value = 0.62
A x C = 3.16	A x C = 3.09

It has been determined that Stantec assumed more conservative parameters for the Longfields Central Development than what the detailed design has computed. Therefore, more overland major system flow into SWM Park 959 was computed by Stantec from the subject site than the flow provided within the detailed design by Novatech Engineering in this report. The hydrologic analysis of SWM Park 959 is therefore adequate in representing the Longfields Central Development and no further analysis is required.

5.4.5 Future Development Blocks

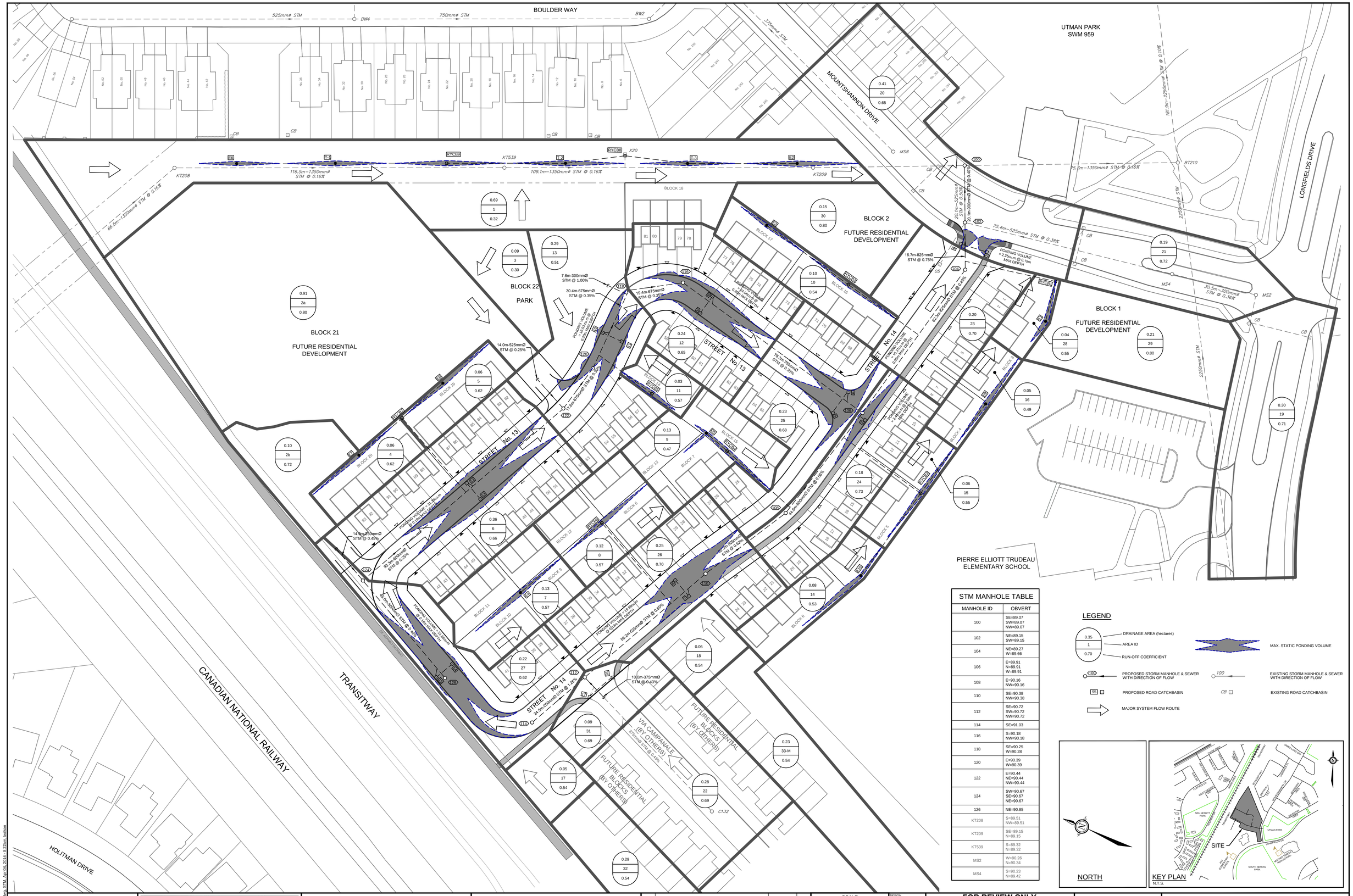
During detailed design of the Longfields Development, it was determined that the medium density residential area is unable to provide the 64 L/s/ha and 100 m^3/ha through storage within the roadway and rearyard areas as requested in the *Longfields Davidson Heights Serviceability Study Update Report (1998)*. To achieve the guidelines set out in the Longfields Davidson Heights Serviceability Study Update Report (1998) throughout the development, the following high unit residential blocks will be restricted to the design criteria provided below:

Block 1 (0.21 ha)

- Restricted minor system flow of 6.0 L/s (28.8 L/s/ha)
- On-Site storage of 20.8 m^3 (100 m^3/ha)

Block 2 (0.15 ha)

- Restricted minor system flow of 9.6 L/s (64 L/s/ha)
- On-Site storage of 25 m^3 (167 m^3/ha)



STM MANHOLE TABLE

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108	E=90.16 NW=90.16
110	SE=90.38 NW=90.38
112	SE=90.72 SW=90.72 NW=90.72
114	SE=91.03
116	S=90.18 NW=90.18
118	SE=90.25 W=90.28
120	E=90.39 W=90.39
122	E=90.44 NE=90.44 NW=90.44
124	SW=90.67 SE=90.67 NE=90.67
126	NE=90.85
KT208	S=89.51 NW=89.51
KT209	SE=89.15 N=89.15
KT539	S=89.32 N=89.32
MS2	W=90.26 N=90.34
MS4	S=90.23 N=89.42

LEGEND

- 0.35 / 1 / 0.70 — DRAINAGE AREA (hectares); AREA ID; RUN-OFF COEFFICIENT
- MAX. STATIC PONDING VOLUME
- 100 — PROPOSED STORM MANHOLE & SEWER WITH DIRECTION OF FLOW
- 100 — EXISTING STORM MANHOLE & SEWER WITH DIRECTION OF FLOW
- 95 — PROPOSED ROAD CATCHBASIN
- CB — EXISTING ROAD CATCHBASIN
- MAJOR SYSTEM FLOW ROUTE

NORTH

KEY PLAN
N.T.S.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

Mattino DEVELOPMENTS INC.
171 CLARIDGE DRIVE
OTTAWA, ON
K2J 5V8

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	APR 03/14	MAB
2.	REVISED PLAN OF SUBDIVISION	FEB 14/14	MAB
1.	ISSUED FOR APPROVAL	JUN 07/13	KJM

SCALE 1:500

DESIGN	LRW
CHECKED	MAB
DRAWN	DTD
CHECKED	MAB
APPROVED	JGR

FOR REVIEW ONLY

REGISTERED PROFESSIONAL ENGINEER J.G. RIDDELL PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER M.A. BISSETT APR. 3/14 PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novatinfo@novatech-eng.com

CITY of OTTAWA
LONGFIELDS CENTRAL
591 LONGFIELDS DRIVE

STORM DRAINAGE AREA PLAN

PROJECT No. 112021
REV REV # 3
DRAWING No. 112021-STM

FILENAME: 112021-STM.DWG

STANTEC 2002 UPDATE

HGL Analysis

August 12th , 2002

File: 634 00365

Jean Lachance, P.Eng.
Program Manager, Infrastructure Approvals (South Ottawa)
Development Services Department
City of Ottawa
2 Constellation Drive, 5th floor
Nepean, On, K2G 5J9

Dear Mr. Lachance

Reference: ***Update to Longfields / Davidson-Heights model***

Further to our July 19th, 2002 memo to Larry Erion (DSD) and Chris Rogers (TUPW) regarding changes to the above noted model, please find herein a summary of the modifications that were undertaken as well as a revised drainage area map, SWM pond summary and HGL summary.

Changes to DDSWMM Model:
The latest DDSWMM version (LDJLY-15.dat) was obtained from the Infrastructure Branch of TUPW. The model was modified to reflect to following changes:

- The major flow from Area 85 now drains to Area 51 and eventually to pond 998 (along Beatrice Dr.) as opposed to draining to pond 198, which is also the culvert on Woodroffe Avenue .

- Area 78 now drains to Area 77 and eventually to pond 998 on Beatrice Drive. This area also used to drain to pond 198 on Woodroffe Avenue.

- It was noted that in the current DDSWMM version, pond 997 (at Beatrice and Claridge) was removed and all areas draining to it were re-routed to pond 998 (on Beatrice, north of Claridge). This change was confirmed by Larry Erion.

- The overland areas draining to pond 198 (Woodroffe culvert) consist of areas 50 and 87 for a total drainage area of 11.14 ha.

- Areas 943 and 944, that consists of Woodroffe avenue between Claridge Drive and Fallowfield Road, were halved since half of Woodroffe avenue will drain to roadside ditches (and eventually into a ravine). The area of Woodroffe that

drains to the minor system was modified to reflect the actual number of Catchbasins (as per the McCormick Ranking Drawings) and the catchbasins were modified to simulate actual CBs with a maximum capture of 50 L/s (as opposed to 19.8 L/s from regular CBs with ICDs).

All changes are documented in the model. The model has been saved as version 16 (LDJLY-16.txt). The revised drainage area map that was produced by TUPW has been revised to reflect the above noted changes. The map is appended herein.

Impact on Woodroffe Avenue Culvert:

The proposed 600 mm dia concrete culvert on Woodroffe Avenue (between Claride Drive and Longfields Drive) was reviewed base on the revised analysis. The original DDSWMM analysis estimated the peak flow at this location to be approximately 3.34 cms. The modifications to the major system have reduced this peak flow to 1.55 cms.

Using the profile information provided by McCormick Ranking, the 600 mm dia culvert will have the following specifications:

- Culvert Dia = 600 mm
- Culvert length = 45 m
- Inlet at 90.48, outlet at 90.35 , slope of 0.29%

The analysis was undertaken using the Environment Canada culvert program. In order to pass the 1.55 cms flow without overtopping the roadway, **twin 600 mm diameter concrete culverts will be required**. The maximum upstream WL will be 92.45 m.

Impact on Pond 998 (Beatrice Drive):

Since more flow is now being diverted to the Beatrice Drive Pond, we have reviewed the required volume for this pond. The total area draining to Pond 998 now consists of 46.05 ha as opposed to 29.73 ha outlined in Appendix J of the 1998 study. The new required volume for this facility is 3656 m3 with a corresponding area of 0.55 ha (assuming a depth of 0.7 m).

We have revised appendix J and have appended it to this letter for your information.

Impact on Minor System (Changes to XP-SWMM model):

The latest XP-SWMM version (LDHNOV15.XP) was obtained from the Infrastructure Branch of TUPW. The revised output from the modified DDSMMM model was interfaced with the XP-SWMM model and a new run was done to obtain new results.

The analysis shows that the HGL has not increased due to the changes to Woodroffe Avenue. Actually, the results show a slight decrease in HGL attributable most likely to the timing of the uncontrolled flow from Woodroffe Avenue.

A new 100 year HGL table has been prepared and is appended to this letter. Please note that most of the changes to the HGL from the original table are due to changes in pipe inverts, lenghts and locations. **It is therefore critical that inverts (or obverts) or proposed or as-built drawings be checked against the model to ensure that HGL are realistic. It may be necessary to revise the model again to reflect what is being proposed.**

We have also included for your information a revised drainage area map that shows the latest drainage area boundaries.

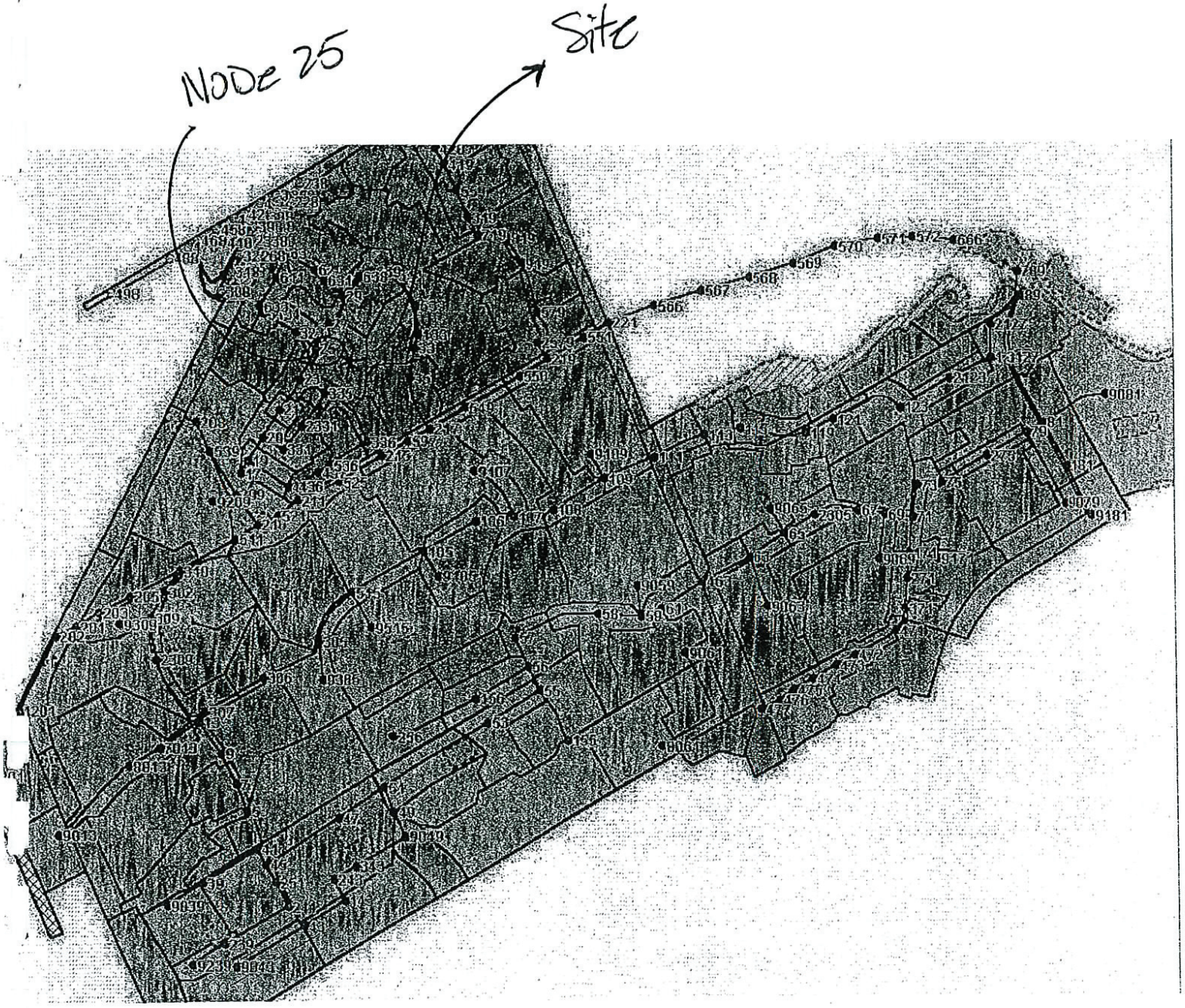
If you have any questions regarding the above, please do not hesitate to contact the undersigned at 724-4085.

Yours very truly,

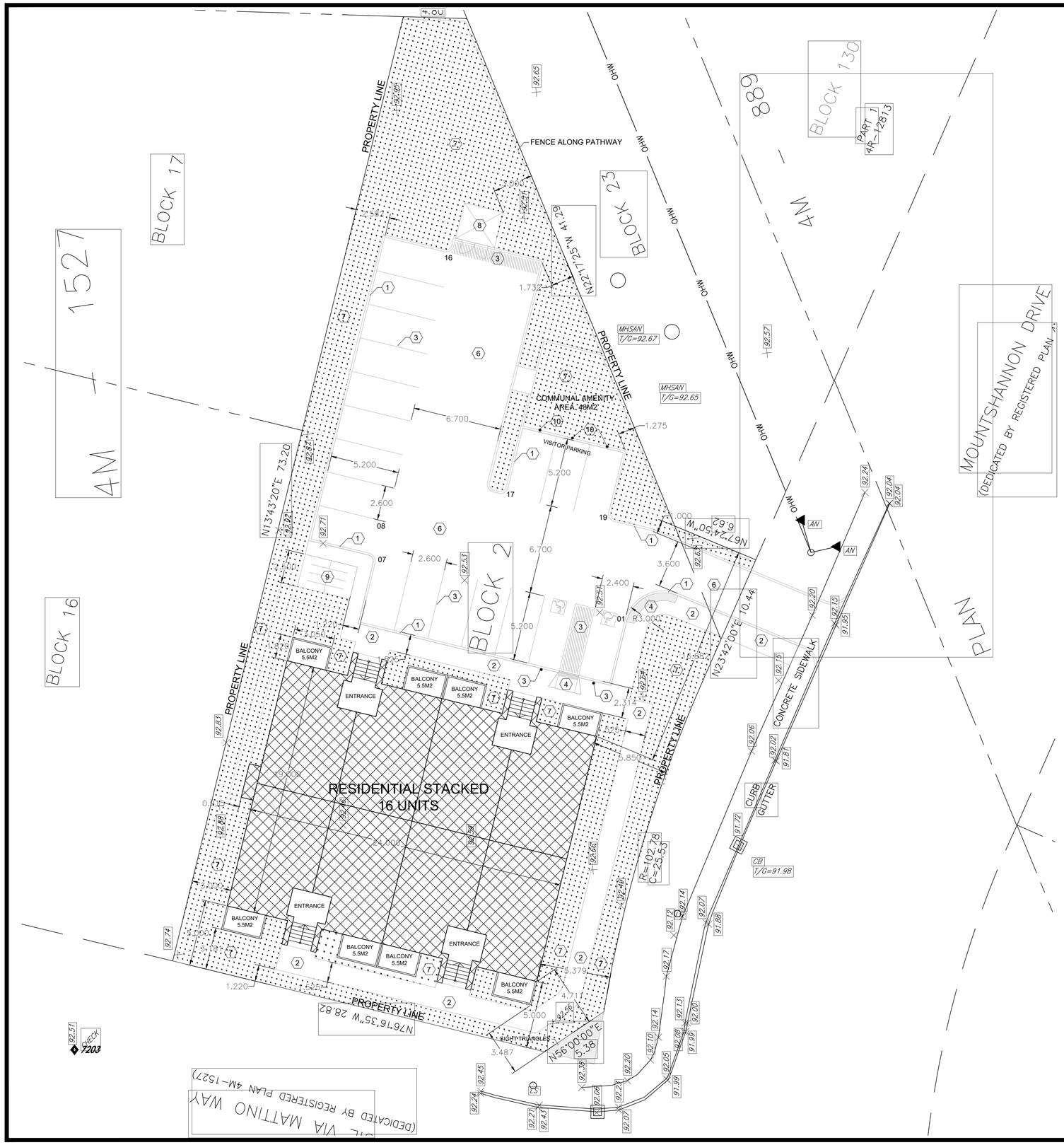
STANTEC CONSULTING LTD.

Eric M. Tousignant, P.Eng.
Senior Environmental Engineer

Revised HGL Table (Aug 2002)				
Longfields Davidson Heights				
Junction Name	Ground Elevation meters	Obvert Elevation meters	Nov 01 version 100 yr HGL meters	Aug 02 version 100 yr HGL meters
638	92.14	88.631	90.1231	90.0813
419	92.06	89.63	89.4739	89.391
559	91.98	89.47	89.4165	89.3237
319	91.88	89.13	89.3557	89.2663
719	91.96	88.989	89.2727	89.1854
541	92.38	88.4	90.0002	89.9579
31	91.56	88.299	89.9187	89.8761
533	92.9	88.169	89.8934	89.8506
33	91.8	87.972	89.8414	89.7986
35	92.19	87.802	89.7716	89.7286
217	92.1	88.276	89.5137	89.4701
819	91.8	88.652	88.9684	88.8981
919	92.4	88.304	88.6794	88.6211
579	92.3	88.164	88.5978	88.5399
111	92.75	87.803	88.3425	88.3329
463	92.5	88.761	89.5013	89.5398
525	92.65	88.696	89.9692	89.934
215	92.2	88.486	89.6761	89.6356
210	92.5	89.273	90.2822	90.254
209	92.69	89.12	90.6863	90.6571
539	92.959	89.24	90.9224	90.8932
208	92.8	89.42	91.1697	91.1406
211	92.89	88.906	90.1189	90.0869
17	92.6	89.533	90.2589	90.2236
19	92.5	89.445	90.2427	90.2074
435	92.65	89.247	90.1453	90.1102
436	92.65	88.987	90.1156	90.0804
437	92.65	88.779	90.0693	90.0342
23	92.6	89.962	90.2522	90.2172
335	92.65	89.129	90.1832	90.1481
336	92.5	88.874	90.1045	90.0693
536	92.96	88.719	90.0515	90.0162
331	92.65	89.498	90.231	90.196
20	92.6	90.111	90.2916	90.2564
21	92.8	90.152	90.283	90.2481
2331	92.6	89.361	90.2155	90.1805
25	92	89.567	90.3021	90.2671
27	92.2	89.732	90.3505	90.3156
2579	92.3	87.904	88.5004	88.442
219	92.8	87.756	88.4566	88.3976
550	92.5	87.966	88.8387	88.7857
549	92.45	88.176	89.2262	89.1788
221	91.1	87.503	87.7226	87.6697


NODE 25
Site

DRAWINGS / FIGURES

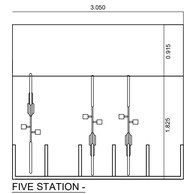


Bike-Up

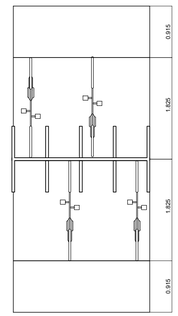
Bicycle Parking Systems

BIKE-UP BICYCLE PARKING SYSTEMS INC.
6 ANTARES DRIVE, PHASE II, UNIT #10 B
NEPEAN, ONTARIO, CANADA K2E 8A9
PHONE: (613) 226-6452
FAX: (613) 228-3539
1-800-661-3506
www.bikeup.com

NOTES:
1. INSTALLATION TO BE COMPLETD IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS
2. DO NOT SCALE DRAWINGS
3. WHEN CALCULATING SPACING, ADD 12" TO BOTH ENDS OF THE RACK TO ALLOW FOR HANDLE BAR CLEARANCE.
4. USE 2" U-CLAMPS TO INSTALL ALL RACKS
   EXCEPTION:
   A. PRMANENT INSTALLATION - USE ANCHOR BOLTS AND SECURITY CAPS
   B. SEASONAL INSTALLATIONS - USE ANCHOR SLEEVES AND LAG BOLTS
5. RUNNERS ARE 1.9"00 - 1/8" WALL PIPE STATIONS ARE 5/8" STEEL ROD.
6. WELDED CONSTRUCTION, HOT-DIPPED GALVANIZED AFTER FABRICATION. PAINTING AVAILABLE.
7. WEIGHTS:
APPROXIMATIVELY 14 LBS PER STATION.
8. CONTRACTORS NOTE: FOR PRODUCT AND PURCHASING INFORMATION, VISIT www.PROJECTmarketsite.com, REFERENCE NUMBER 317-002



FIVE STATION - ONE WAY RACK



EIGHT STATION - TWO WAY RACK

CURRENT ZONING BY LAW

DESCRIPTION	PROPOSED	REQUIRED
LOT AREA	1894.6 m²	660
LOT FRONTAGE	32 m	22 m
LOT DEPTH	72.7m	N/A
MAX. NUMBER OF DWELLING UNITS	16	16 R4A[2162]
FRONT SET BACK	5 m	3 m
CORNER SIDE YARD SETBACK	4.9 m	2 m
INTERIOR SIDE YARD SETBACK	3.06 m	3 m
REAR SET BACK	16.9 m	7.5 m
REAR SET SETBACK BETWEEN UNITS	0	0
BUILDING AREA	456m²	-
GROSS FLOOR AREA	1824 m²	-
BUILDING HEIGHT	10.97 m	11m
AMENITY AREA	-	0
MIN. LANDSCAPING BUFFER	3	3
PARKING SPACE	16	0.5 /UNIT-Rapid Transit
MIN. VISITOR PARKING	3	0.1 /UNIT-Rapid Transit
AMENITY AREA	48m*88m²	130m²
SOFT & HARD LANDSCAPED AREA	800 m²	30% OF LOT AREA

BUILDING CODE ANALYSIS

- 3 STOREYS RESEDENTIAL USE BUILDING WITH BASEMENT
  16 STACKED DWELLING UNITS
- FACING 2 STREETS
- BUILDING AREA: 456m²
- GROSS FLOOR AREA: 1824 m².
- USE: GROUP GROUP "C".
- CLASSIFICATION: 9.10.8.1
- PARTS 9 OF OBC 2012,
- COMBUSTIBLE CONSTRUCTION.
- SECOND FLOOR FIRE SEPARATION: 3/4HR REQUIRED C/W VERTICAL STRUCTURAL COMPONENTS
- UPPER DWELLING STAIRWAY ENTRANCE/EXIT ENCLOSURES FIRE SEPARATION: 3/4HR REQUIRED C/W VERTICAL STRUCTURAL COMPONENTS
- FIRE RESISTANCE FOR ROOF: NOT REQUIRED
- PLUMBING EQUIPMENTS:
  . 1 WASHROOM PER UNIT REQUIRED
  . 10% NATURAL LIGHTNING REQUIRED FOR LIVING ROOMS & DINNING ROOMS
  . 5% NATURAL LIGHTNING REQUIRED FOR BEDROOMS
  . BARRIER FREE PATH OF TRAVEL NOT REQUIRED ACCORDING.

LÉGENDE

1. CONCRETE CURB
2. SIDEWALK
3. PAINT MARKS
4. DEPRESSED SIDEWALK.
5. ACCESSIBLE PARKING VERTICAL SIGNAGE
6. ASPHALT
7. GRASS
8. TRASH ENCLOSURE, SCREENED FROM VIEW BY AN OPAQUE SCREEN WITH TWO METRES HEIGHT.
9. BICYCLE PARKING SPACE ON CONCRETE SLAB SURFACE
10. VISITOR PARKING VERTICAL SIGNAGE

GRADE SCHEDULE

AVERAGE T.O.ASPHALT: 92.66 AVERAGE GRADE: 92.96/ 99 490.
T.O.FOUNDATION: 93.47/ 100 000
T.O.FIRST FLOOR: 94.20/ 100 730 T.O.BASEMENT: 91.14/ 97 670
T.O.SECOND FLOOR: 97.04 / 103 569 T.O.THIRD FLOOR: 99.81 / 106 337
T.O.MID-ROOF: 103.93/ 110 464

Pierre J. Tabet *architect*

167 Rue De Roquebrune, Gatineau Qc J8T 7Y6
Tel. :819-568-3994/ 613-797-5375 Fax : 819-246 4312
E-Mail : pierre.tabet@hotmail.com

Revision	By	Appd.	YY.MM.DD
6			
5			
4			
3			
2			
1			

Issued	By	Appd.	YY.MM.DD
6			
5			
4			
3 NEW SURVEY ADJUSTMENT	A.A.	P.T.	18.07.26
2 SITE PLAN FOR APPROVAL	A.A.	P.T.	18.05.28
1 DESIGN CONCEPT	A.A.	P.T.	18.04.09

Stamp

Project

MATTINO HOMES
16 CONDO UNITS BUILDING
BLOCK 2
255 MOUNTSHANNON DRIVE,
OTTAWA,ON

Title

SITE PLAN

Project #	Scale	Date
	1:150	2018-07-26
Revision	**Sheet**	**Drawing #**
3	01	A-100