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Site Servicing Report

Morgan's Creek - Stage 1 (762 March Road)



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1.0 Introduction

Minto Communities Incorporated (Minto), along with their subsidiary companies, is one of the major landowners in the Kanata North Urban Area, located in the western portion of the City of Ottawa. In 2012, J.L. Richards & Associates Limited (JLR) was retained by Minto to proceed with the detailed design of municipal infrastructure for a private development located at 760 March Road referred to as Morgan's Creek.

The Morgan's Creek development consisted of a 2.87 ha parcel of land bisected by Shirley's Brook, within the jurisdiction of the Mississippi Valley Conservation Authority (MVCA). Given that Shirley's Brook represents a natural barrier bisecting the parcel, the overall servicing for the property was divided into two sites (for design purposes) and investigated independently based on their respective frontage. The western parcel fronting onto March Road was referred to as the March Road Site (Site 1) while the eastern parcel fronting onto Sandhill Road was referred to as the Sandhill Road Site (Site 2). A Site Servicing Brief has been submitted to the City of Ottawa (City) in 2012, which described infrastructure requirements for both private sites. Subsequently, the City and other regulatory agencies granted Site Plan Approvals. The infrastructure works were tendered in 2012 and a composite utility plan (CUP) was submitted to the City in 2013. Although the Tender was awarded, construction was never initiated on either of the sites.

Minto now wishes to revise the housing product and layout for both sites (March Road and Sandhill Road) to satisfy current housing demands in the Kanata North Urban Area. It is proposed to develop Morgan's Creek in two (2) stages; Stage 1 consists of the development fronting March Road (762 March Road) while Stage 2 consists of the development fronting Sandhill Road (335 Sandhill Road). The approval for Stage 1 will be under Site Plan Control and subsequent Plan of Condominium, while Stage 2 will require approval under Draft Plan of Subdivision and Plan of Condominium. As such, this Site Servicing Report was prepared for Stage 1 (762 March Road) and a Servicing Brief was submitted separately for Stage 2 (335 Sandhill Road).

This Site Servicing Report outlines the design objectives and criteria, servicing constraints and strategies for the development of Morgan's Creek Stage 1 in accordance with the November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa (City) as well as the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins. This includes servicing solutions for water, wastewater and stormwater management, as well as erosion and sedimentation control throughout construction. The City of Ottawa Development Servicing Study Checklist has been included in this document (Appendix 'A').

1.1 Site Description

Morgan's Creek is sited on a ± 2.87 ha parcel of land bisected by Shirley's Brook. Because of this constraint, a significant portion of the parcel (± 0.57 ha) will not be developable as this block is floodplain land. The legal description of the subject property is Part of Lot 10, Concession 4, Township of March, City of Ottawa (refer to Appendix 'A' for Plan of Survey). As noted previously, this Site Servicing Report was prepared solely for Morgan's Creek Stage 1 (762 March Road).

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Stage 1 consists of a 0.77 ha parcel adjacent to March Road that is currently undeveloped with the exception of a small granular pad and access road. The existing topography generally slopes mildly towards Shirley's Brook. Minto wishes to develop Stage 1 into 60 terrace townhouse units serviced from March Road, as shown on the Site Plan included in Appendix 'E'. The 0.77 ha parcel is bounded by vacant lands to the north, by Shirley's Brook to the east, by an existing residential development to the south (Blue Heron cooperative development), and by March Road to the west.

1.2 Existing Infrastructure

The Morgan's Creek Stage 1 development is proposed to be serviced from the existing watermains, sanitary sewers, and storm sewers that are located on March Road. This infrastructure has been identified as being readily accessible, if residual capacity can be proven available.

Water

There are two (2) existing 200 mm diameter watermain stubs (connected to the existing 400 mm diameter trunk feedermain on March Road) that have been constructed for servicing this property. There is also an existing 200 mm diameter watermain on Mersey Drive within the Morgan's Grant subdivision, which is proposed to provide a third supply connection to the subject site.

Sanitary

There are no immediate sanitary sewers bounding the site. However, there is an existing 200 mm diameter sanitary sewer stub that is capped at both ends across March Road. This 200 mm diameter stub was intended to provide conveyance for wastewater across March Road to the existing Mersey Drive 200 mm diameter PVC sanitary sewer, within the Morgan's Grant Subdivision. It is proposed to replace that stub so that wastewater flows from Stage 1 can be conveyed to the Morgan's Grant system.

Storm

There is an existing 675 mm diameter trunk storm sewer along March Road that was designed for the subject site. In addition, there is an existing 450 mm diameter storm sewer stub capped at the property line of the site as the dedicated outlet for Stage 1.

1.3 Background Documents

Infrastructure associated with the Morgan's Creek development has been designed in accordance with the following documents:

- March Road Reconstruction – Morgan's Grant Way to Old Carp Road (Halton Terrace Extension) Drainage Design Brief and Detailed Design Drawings 018, 019 and DA1, Stantec, October 3, 2010.
- Shirley's Brook Stormwater Management Facility 1 – West, Design Brief, David McManus Engineering Ltd., April 15, 2009

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- Detailed Design Information (Morgan's Grant) - As-constructed Drawings 16087-11 and Sanitary Sewer Design Sheet, J.L. Richards & Associates Limited, July 2018.

1.4 Consultation and Permits

Two (2) pre-consultation meetings were held in 2012 for Morgan's Creek. Due to the six (6) year time lapse since the original pre-consultation meetings, another pre-consultation meeting was held on August 22, 2018 (refer to Appendix 'A' for meeting notes). Subsequently, a written confirmation from the MVCA was received in regards to the weeping tile drainage system (Appendix 'A').

The Ministry of the Environment, Conservation and Parks (MECP) has confirmed that an Environmental Compliance Approval (ECA) will be required for the proposed sanitary sewer extension under the Transfer of Review process. An ECA will not be required for the proposed storm sewers, the stormwater management works, or the foundation drain outlet to Shirley's Brook (regardless of whether there will be multiple property owners or multiple condo associations) since the subject site will remain as one (1) parcel with one (1) PIN.

2.0 Geotechnical

A geotechnical investigation was carried out by Paterson Group Inc. (Paterson) to assess general soil, groundwater and infiltration capabilities, and to provide recommendations for development, including construction considerations. The findings and recommendations of this investigation were compiled in the Report entitled "Geotechnical Investigation Proposed Residential Development, Sandhill Road at Ottawa, Ontario," Report Number PG2234-2, dated July 13, 2011. In 2012, a complete copy of this Report was provided to the City.

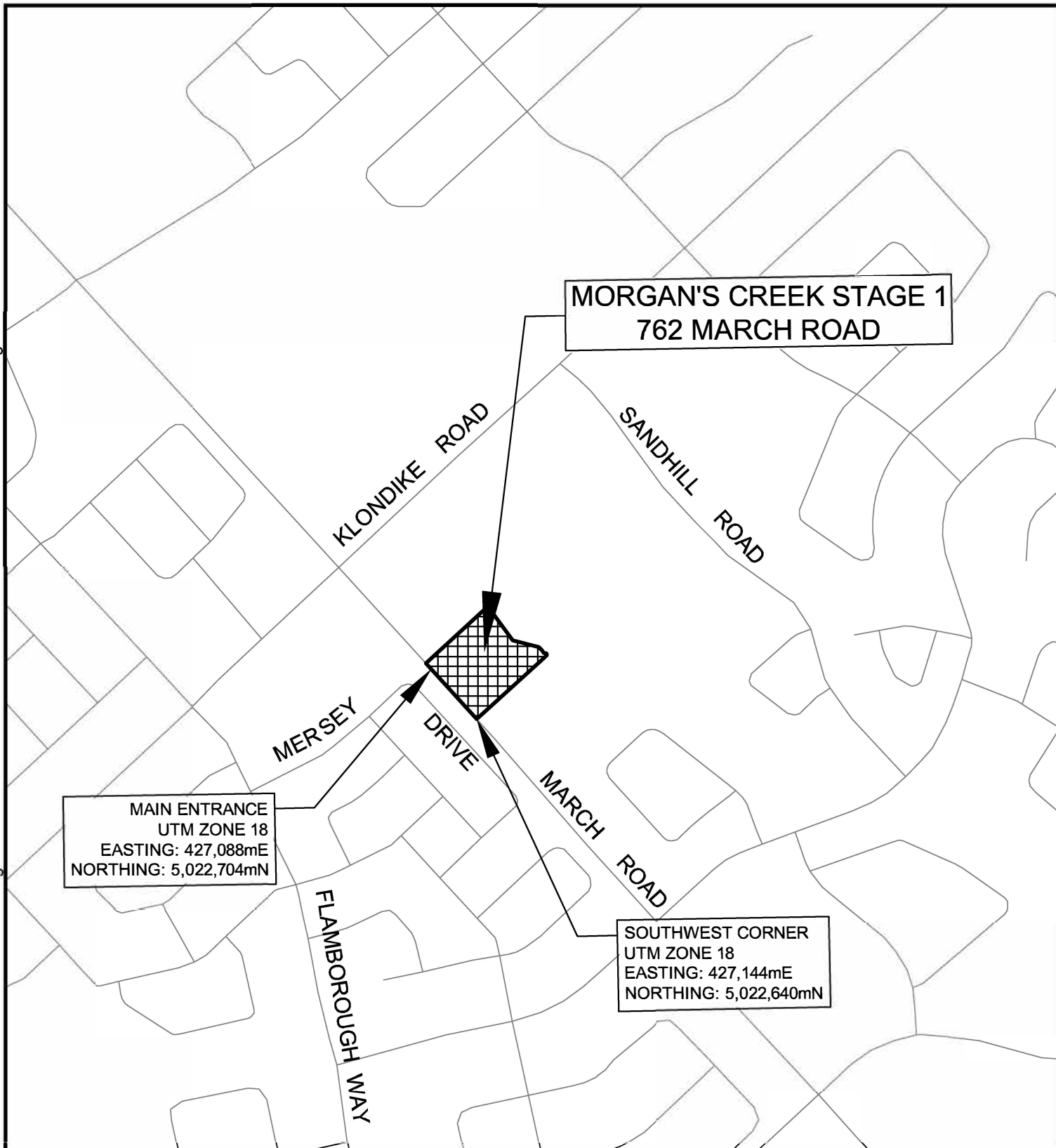
Paterson carried out an updated geotechnical investigation (dated April 16, 2019). A copy of this Report has been provided to the City.

3.0 Water Servicing

3.1 Design Criteria

A Hydraulic Network Analysis (HNA) was conducted for Morgan's Creek Stage 1 to confirm that the existing and proposed watermain can provide adequate supply while complying with both the City of Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02 and ISTB-2018-02. These documents have been referred to in this section as the Design Guidelines, TB-2014-02 and TB-2018-02, respectively. The Design Guidelines require that a water supply system be designed to satisfy the following demand criteria:

- maximum day demand plus fire flow; and
- maximum hourly demand (peak hour demand).



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DRAWING: **LOCATION PLAN**

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Section 4.2.2 of the Design Guidelines requires that all new development additions to the public water distribution system be designed such that the minimum and maximum water pressures, as well as flow rates, conform to the following:

- Under maximum hourly demand conditions (peak hour), the pressures shall not be less than 276 kPa (40 psi);
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi);
- In accordance with the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi);
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and
- Feeder mains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

To satisfy the design criteria and water demand, supply to Morgan's Creek Stage 1 will be achieved from the existing connections listed in Section 1.2. To minimize degradation of water quality, the following is proposed:

- Providing the best available configuration of the system, by looping the proposed watermain that will supply the on-site hydrants; and
- Optimizing and limiting the sizes of proposed infrastructure to minimize water degradation. Note that the proposed water mains servicing the multi-unit residential buildings have been limited to 200 mm in diameter, as per the recommendations of TB-2014-02, and the water service for the units fronting Shirley's Brook is proposed to be 38 mm in diameter.

3.2 Domestic Water Demands

The water demands presented in this section were calculated for 60 terrace townhouse (duplex) units, as proposed on the Site Plan (refer to Appendix 'E'). A population density of 2.3 persons/unit was used, as prescribed in Table 4.1 of the Design Guidelines.

The residential consumption rate for average day demand was set in accordance with Table 4-2 of the Design Guidelines. Given that the population for Stage 1 is less than 500 people, peaking factors interpolated from the MOE Design Guidelines (Table 3-3) were used to generate the maximum day and peak hour demands. Table 3-1 summarizes the water consumption rates and peaking factors used in the HNA.

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Table 3-4: PVC Watermain Internal Diameters

Nominal Diameter	Inside Diameter
150 mm	155 mm
200 mm	204 mm
250 mm	250 mm
300 mm	297 mm
400 mm	393 mm

3.4 Fire Flow Requirements

3.4.1 General

Various Guidelines are used throughout North America to establish fire flow requirements for different types of buildings. The Guidelines entitled "Water Supply for Public Fire Protection (1999)" developed by the Fire Underwriters Survey (FUS) govern fire flow protection in the City of Ottawa.

Fire flow requirements for this HNA were calculated for the terrace townhome units in accordance with the FUS Guidelines, as well as TB-2014-02 and TB-2018-02. Specifically, the protocol for the application of the FUS method was used as outlined in Appendix H: Protocol to Clarify the Application of the Fire Flow calculation method Published by Fire Underwriters Survey (FUS) of TB-2018-02.

3.4.2 Required Fire Flow

The Design Guidelines as well as TB-2014-02 and TB-2018-02 require that fire flow requirements be calculated based on the type of unit, exposure to adjacent units, building material, etc. In addition, the required fire flow (RFF) must consider all structures separated by less than 3.0 m as a single fire area (per FUS).

Within the subject site, the units do not qualify for the capped fire flow of 10,000 L/min (167 L/s) as they are multi-unit residential buildings. The maximum RFF was estimated at 12,000 L/min (200 L/s) as summarized in Table 3-5 (refer to Appendix 'B' for FUS calculations).

Table 3-5: FUS Fire Flow Requirements

Block Number	Fire Flow L/min (L/s)	Capped Flow L/min (L/s)	Targeted Flow L/min (L/s)
TE-2	12,000 (200)	N/A ¹	12,000 (200)

¹ The proposed units do not qualify for the capped fire flow per ISTB-2014-02.

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Table 3-1: Water Consumption Rates and Peaking Factors

Demand Scenario	Residential
Average Day Demand	350 L/c/d
Maximum Day Demand (Interpolated from Table 3-3)	5.4 x Avg. Day
Peak Hour Demand (Interpolated from Table 3-3)	8.1 x Avg. Day

Table 3-2 summarizes the overall water demands computed using the aforementioned consumption rates and peaking factors (refer to Appendix 'B' for detailed calculations).

Table 3-2: Calculated Water Demands

Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
0.56	3.02	4.53

3.3 Proposed Water Servicing and Roughness Coefficients

The proposed water servicing for the site includes a 200 mm diameter watermain within the private roadway to supply the three (3) on-site hydrants. The 200 mm diameter on-site watermain is proposed to connect to the two (2) existing stubs off March Road, and a third connection is proposed across March Road to the existing 200 mm diameter watermain on Mersey Drive. The City has agreed to the March Road crossing as a solution to provide an alternative supply to the site if the existing March Road watermain were to be closed (refer to Appendix 'A'). A 150 mm diameter watermain is proposed to extend in front of the units fronting March Road and a 38 mm diameter watermain is proposed to service the units fronting Shirley's Brook, since all services must enter at the front of the units. The overall watermain layout for Stage 1 is shown on the Site Servicing Plan (Drawing S1). Watermain roughness coefficients were determined using the friction factors presented in Section 4.2.12 of the Design Guidelines and summarized in Table 3-3 below. The internal pipe diameters were modelled based on Section 4.3.5 of the Design Guidelines, as summarized in Table 3-4 below.

Table 3-3: Watermain Roughness Coefficients

Watermain Diameter	C-Factor
150 mm	100
200 mm to 250 mm	110
300 mm to 600 mm	120

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3.5 Hydraulic Boundary Conditions

The HNA was carried out using hydraulic boundary conditions given by the City for various water demand conditions (refer to Appendix 'B' for a copy of the City correspondence). Potable water will be supplied to Stage 1 via a 200 mm diameter watermain loop. Table 3-6 summarizes the hydraulic boundary conditions used in the HNA.

Table 3-6: Hydraulic Boundary Conditions at Existing Stubs

Demand Scenarios	Head (m)
Peak Hour	124.2
Maximum Day + Fire Flow 13,000 L/min (217 L/s) ¹	121.4
Maximum Pressure Check	131.6

¹ Due to minor Site Plan **layout** changes, the given boundary condition represents a more conservative fire flow.

3.6 Simulation Results

The proposed water distribution system (refer to Appendix 'B' for Schematic), as depicted on the Site Servicing Plan (Drawing S1) was modelled in WaterCAD® and evaluated under various water demand scenarios in accordance with the Design Guidelines. The model simulation results are summarized below (refer to Appendix 'B' for detailed results).

3.6.1 Peak Hour

The peak hour demand shown in Table 3-2 was distributed between two main junctions within the site. Using the boundary condition shown in Table 3-6, the minimum pressures were found to be between 414 kPa (60.0 psi) at Junction J-6 and 450 kPa (65.3 psi) at Junctions J-2 and J-3, as shown in Appendix 'B'. The simulated hydraulic grade lines (HGL) were found to be 120.98 m and 122.22 m at junctions J-6 and J-5, respectively, while the remainder of the development was found to be constant at an elevation of 124.20 m.

The top finished floor was also investigated to ensure a minimum pressure of 276 kPa (40 psi). A conservative height of 9.0 m from finished ground was assumed, which represents a pressure reduction of 88 kPa (12.8 psi). This gives a minimum pressure of 326 kPa (47.3 psi) at the top finished floor (junction J-6), which meets the minimum pressure requirement.

Based on these simulation results, the minimum pressure criterion of 276 kPa (40 psi) will be exceeded throughout the site.

3.6.2 Maximum Day Plus Fire Flow

To ensure adequate fire protection, the maximum day demand shown in Table 3-2 was simulated simultaneously with the fire flow. The simulation was carried out using the boundary condition presented in Table 3-6. Although the maximum RFF

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for the site was calculated at 12,000 L/min (200 L/s), the conservative boundary condition of 13,000 L/min (217 L/s) was used for the analysis.

The fire flow simulation was carried out by allowing WaterCAD® to calculate the maximum fire flow that can be drawn from each hydrant without allowing any part of the system to experience pressures less than 140 kPa (20 psi), and recognizing that hydrants have limited capacity. The simulation results showed that 95 L/s (the maximum fire flow that can be supplied by a hydrant per ISTB-2018-02) can be drawn from each proposed hydrant within Stage 1 while maintaining a minimum system pressure of 140 kPa.

The simulation results (Appendix 'B') show that the proposed water distribution system is capable of delivering fire flows ranging between 33,960 L/min (566 L/s) and 57,960 L/s (966 L/s) within Stage 1 under the 13,000 L/min (217 L/s) boundary condition. Hence, the RFF can be fulfilled everywhere within Stage 1.

Three (3) hydrants are proposed within Stage 1 to achieve the aggregate fire flow requirement of 12,000 L/min (200 L/s) for the critical residential block TE-2. For this block, the RFF can be provided by the following hydrants as per the limitations described in ISTB-2018-02:

Block TE-2 (12,000 L/min or 200 L/s):

- 5,700 L/min (95 L/s) at H-1 and H-2;
- 3,780 L/min (63 L/s) at H-3.

As shown above, the RFF for Stage 1 can be met with hydrant spacing depicted on the Site Servicing Plan.

3.6.3 Maximum HGL

The Design Guidelines require that a high pressure check (maximum hydraulic grade elevation) be performed on the proposed system to ensure that the maximum pressure constraint of 552 kPa (80 psi) is not exceeded. Based on the average day demand shown in Table 3-2 and the boundary condition shown in Table 3-6, maximum pressures between 515 kPa (74.7 psi) and 522 kPa (75.7 psi) are anticipated within the site (refer to Appendix 'B'). These maximum pressures are below the maximum pressure constraint of 552 kPa (80 psi).

4.0 Sanitary Servicing

4.1 Design Criteria

Local sanitary sewers for Morgan's Creek Stage 1 were designed in accordance with the City of Ottawa Sewer Design Guidelines (2012) and Technical Bulletins. Key design parameters have been summarized in Table 4-1 below.

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Table 4-1: Wastewater Servicing Design Criteria

Design Criteria	Design Value	Reference
Residential average flow	280 L/cap/day	ISTB-2018-01
Residential peaking factor	Harmon Formula x 0.8	ISTB-2018-01
Commercial average flow	28,000 L/gross ha/day	ISTB-2018-01
ICI peaking factor ⁽¹⁾	1.0/1.5	ISTB-2018-01
Total Infiltration	0.33 L/s/ha	ISTB-2018-01
Minimum velocity	0.6 m/s	OSDG Section 6.1.2.2
Maximum velocity	3.0 m/s	OSDG Section 6.1.2.2
Manning Roughness Coefficient (for smooth wall pipes)	0.013	OSDG Section 6.1.8.2
Minimum allowable slopes	Varies	OSDG Table 6.2, Section 6.1.2.2
Population Density	Towns: 2.7 pers/unit	OSDG Table 4.2, Section 4.3

⁽¹⁾ 1.5 if ICI contribution >20%, 1.0 otherwise

4.2 Proposed Sanitary Sewer Servicing and Calculations

It is proposed to collect and convey wastewater generated by the Stage 1 site to the existing Mersey Drive sanitary sewer system by replacing an existing 200 mm diameter sewer stub that was previously constructed across March Road (refer to Appendix 'C' for copies of email correspondence dated October 12, 2010). As noted in this correspondence, this sanitary sewer stub was capped at both ends of March Road. Copies of design and as-constructed drawings issued by Stantec are included in Appendix 'C' (Drawings 018, 019 and DA1 and the Storm Sewer Design Worksheet – Minor Flow Analysis). Based on the capacity calculations presented in the noted correspondence, this 200 mm diameter sanitary stub was sized to provide the conveyance of wastewater generated by two (2) parcels; i) the Morgan's Creek Stage 1 lands (762 March Road) with an estimated area of 0.69 ha and ii) the northern adjacent commercial parcel (788 March Road), with an estimated area of 0.83 ha. Since a Certificate of Approval was never sought for this sanitary sewer stub, the connection to the Mersey Drive 200 mm diameter sanitary sewer was not completed. This sanitary stub was constructed approximately 2 m past the west pavement edge of March Road, short of the existing Bell/fibre optic duct, and ended approximately 12 m east of the Mersey Drive 200 mm diameter sanitary sewer (refer to Drawing S1 at the back of the Report for stub location and Appendix 'C' for Stantec Design Drawings).

Based on as-constructed information noted in a separate email issued by Stantec (dated October 14, 2010) and also on an "as-constructed" drawing issued by Stantec, the sanitary stub was constructed at an elevation below the existing invert elevation of the sanitary sewer at maintenance hole MH124. Copies of the "as-constructed" drawing for the Morgan's Grant

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Subdivision - Drawing 16087-11 and Sanitary Drainage Plan and copies of Sanitary Sewer Design Sheets are presented in Appendix 'C'. In developing a servicing solution for the redundant watermain supply across March Road, the City has agreed that the sanitary stub can also be reconstructed across March Road to raise the sewer elevation and allow for a gravity fed system (refer to Appendix 'A').

Peak sanitary flows of 2.11 L/s and 4.20 L/s were calculated for the subject site and the adjacent commercial site, respectively, for an overall peak flow of 6.31 L/s (refer to Appendix 'C' for Sanitary Sewer Design Sheet – and information provided by David Schaeffer engineering Ltd. for 788 March Rd.).

This overall peak flow of 6.31 L/s is proposed to be conveyed across March Road, via the reconstructed sanitary sewer stub and discharge into the Mersey Drive 200 mm diameter sanitary sewer system. The Sanitary Sewer Design Sheet for this development provides all sanitary sewer works proposed for the Morgan's Creek development along with those associated with the existing system for the Morgan's Grant Subdivision. Based on this compiled information and wastewater calculations, the Morgan's Grant sanitary sewer system (i.e., Mersey Drive 200 mm diameter sanitary sewer) has the capacity to accommodate the anticipated flow increase of 6.31 L/s. Although the 6.31 L/s is slightly higher than the allocation of 3.61 L/s previously approved through JLR's 2012 submission for the subject site, the peak design flow at the downstream end (MH15A-8C) in the Briar Brooke Subdivision has been reduced from the 2012 approved design due to the City's recent technical bulletin ISTB-2018-01. It should also be noted that the peak flow for the subject site has been reduced from 2.66 L/s to 2.11 L/s based on this design submission.

4.3 Summary and Conclusions

Based on the above servicing details and the Sanitary Sewer Design Sheet (refer to Appendix 'C'), it is recommended that the sanitary servicing proposed on Drawing S1 (at the back of the Report) be implemented for Morgan's Creek Stage 1.

5.0 Storm Servicing and Stormwater Management

5.1 General

This section of the report presents the analyses completed to confirm that the existing and proposed storm sewers and stormwater management measures can accommodate the proposed development.

5.2 Storm Criteria

Servicing of Morgan's Creek Stage 1 will require that it be developed and designed in accordance with the following:

1. The March Road reconstruction project where a trunk storm sewer system was identified as the dedicated sewer for the Stage 1 lands (refer to Section 1.3 for details); and
2. The end-of-pipe facility referred to as SWM Facility 1 - West (refer to Section 1.3 for details), the dedicated outlet for the Stage 1 lands.

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In addition to the above constraints, servicing within Morgan's Creek Stage 1 must be designed in accordance with the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins.

The design information compiled for the March Road reconstruction project (refer to Appendix 'A' for Drawings and Appendix 'D' for Storm Sewer Design Sheet), shows that the existing 675 mm diameter trunk sewer was sized as the outlet for an overall 1.52 ha parcel with a runoff coefficient of 0.8. This parcel includes the March Road site (0.77 ha) and the adjacent commercial parcel sited at 788 March Road.

Storm runoff from these parcels is to be collected and conveyed by a local collection system and discharge to the existing March Road 675 mm diameter trunk storm sewer via a 450 mm diameter storm sewer stub located along the northern perimeter of the March Road site (refer to Appendix 'E' for Drawings). Once captured, runoff is to be conveyed northerly along the March Road storm sewer (from ex. MH 13 to ex. MH6) where it eventually discharges into an end-of-pipe facility referred to as SWM Facility 1 – West (refer to Section 1.3) where water quantity and quality control is provided. Based on the above infrastructure, the following summarizes the servicing constraints for Morgan's Creek Stage 1:

- A capacity of 159.89 L/s was assigned to the existing March Road 675 mm diameter trunk sewer for the subject site. The allocated capacity was based on a 0.69 ha parcel, a runoff coefficient (C) of 0.8 and a time of concentration of 10 minutes (refer to Appendix 'D' for Storm Sewer Design Worksheet).
- The dedicated facility for Morgan's Creek Stage 1, namely the SWM Facility 1 – West, was designed by David McManus Engineering (DME) based on a unit rate of 70 L/s/ha for the lands east of March Road. These lands have been referred to as the Klondike Area (A-500), which has been simulated as a 1.52 ha parcel at a total imperviousness of 0.86 (C-Factor = 0.80). The allowable release rate for Morgan's Creek Stage 1 (0.77 ha) was based on the unit capture rate of 70 L/s/ha. Consequently, SWM Facility 1 – West was sized to provide Morgan's Creek Stage 1 with an allocated capacity of 53.90 L/s (0.77 ha x 70 L/s), which is more restrictive than the capacity allocated in the March Road trunk storm sewer (159.89 L/s).

The storm and stormwater management system for Stage 1 were designed based on the lesser of the above two (2) design constraints, which is an allowable capacity of 53.90 L/s.

In terms of major overland flow, the stormwater management design was carried out such that the 1:100 year post-development flows generated by Stage 1 would be detained on-site while releasing to the maximum allowable release rate of 53.90 L/s. On-site detention up to the 1:100 year design storm event is mandatory given that the site is bounded by an arterial roadway. Based on the design of the March Road trunk storm sewer system, there is a restriction in regard to the hydraulic grade line (HGL) along this trunk sewer system. As noted by Stantec, areas connecting to the existing March Road 675 mm diameter trunk storm sewer system will be impacted by high HGLs (refer to Note 1 on Drawings 018 and 019, Appendix 'A'). Since the HGLs that may be encountered could reach roadway grades, no direct service connections are to be made to the March Road trunk storm sewer (refer to Note 1 on Drawings 018 and 019). Consequently, a secondary sewer system is proposed to convey only the weeping tile flows to Shirley's Brook.

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This servicing solution was approved in 2012 by regulatory agencies. The MVCA has re-confirmed that they do not object to a system collecting and discharging weeping tile drainage to Shirley's Brook (see Appendix 'A' for email correspondence).

- To achieve the above minor and major system constraints, storm servicing will incorporate an Inlet Control Device (ICD) along with above-ground storage via the parking lot surface which will be supplemented by underground storage from oversized storm sewers.
- In terms of fish habitat protection, the subject site is tributary to the Shirley's Brook watershed and, as such, provision of water quality control measures is mandatory. Given that runoff conveyed by the existing March Road 675 mm diameter sewer eventually outlets to a wet detention facility (i.e., SWM Facility 1 – West) which was sized for water quality control, no additional water quality control measures are warranted for 762 March Road. The MVCA has agreed that the normal level of Stormwater quality treatment provided by the receiving wet pond is acceptable and sufficient. Refer to Appendix 'A' for email correspondence.
- As previously noted, Shirley's Brook bisects the total 2.89 ha Morgan's Creek parcel. The floodplain mapping for Shirley's Brook was revised by the MVCA in 2017. The 1:100 year floodplain elevation in the subject area is 74.10 m. This floodplain elevation was considered in the layout of the development.

5.3 Proposed Storm Servicing and Stormwater Management Evaluation

5.3.1 General

Storm servicing for Morgan's Creek Stage 1 was designed such that the minor system can capture and convey runoff during frequent storm events while the major system was designed to detain flows up to the 1:100 year recurrence. The dual drainage system has been designed in accordance with the City of Ottawa Sewer Design Guidelines (2012), all Technical Bulletins and the servicing constraints summarized in Section 5.2. The general stormwater servicing design parameters used to complete the detailed design for the subject site are listed in Table 5-1.

Table 5-1: Stormwater Servicing Design Criteria

General Design Criteria
Maximum allowable release rate = 53.9 L/s
1:100 year major overland flow to be contained on-site
Water quality control by means of SWM Facility 1 - West
Minimum swale grades at 1.5% (with lower grades sub-drain must be provided).
Minimum roadway profile grades at 0.5%.
Minimum roadway slope of 0.1% from crest to crest for overland flow route.
Minimum freeboard of 0.30 m between the finished floor elevation and the maximum street ponding elevation.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

General Design Criteria
Maximum ponding depth of 0.35 m.
Minimum of 0.30 m clearance between the underside of footing and the 1:100 year HGL elevation (N/A as units are not connected to storm system).
Minimum circular orifice diameter of 75 mm or Commercially Distributed Restrictors.
Ensure ponding water does not directly enter the sanitary sewer system through sanitary maintenance holes.
Storm sewers sized for the 1:5 year storm event using the Rational Method and City of Ottawa Intensity-Duration-Frequency (IDF) curves.
Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

5.3.2 Minor System

The proposed storm sewer system for Stage 1 was designed using the Rational Method to size the minor system. Storage requirements, release rates, and the computed hydraulic grade line (HGL) elevations were then evaluated using PCSWMM, as this software platform has the ability to perform hydraulic and hydrologic calculations. An inlet time of ten (10) minutes was utilized in the Rational Method at the upstream end of the sewer system along with runoff coefficients (C) ranging between 0.45 and 0.85 as shown on Drawing 'SWM'.

The 1:5 year rainfall intensities used in the Rational Method were set based on the rainfall equations reported in Section 5.4.2 of the Design Guidelines. The Rational Method Storm Sewer Design Sheet provides the proposed storm sewer configuration for Stage 1 (refer to Appendix 'D' for copies of the Storm Sewer Design Sheet) and Drawing 'SWM' provides the details in regard to drainage for the site.

5.3.3 Stormwater Management Calculations

The performance of the proposed storm and stormwater management systems was evaluated via computer modelling to demonstrate that the design criteria listed in Section 5.2 and Section 5.3 were fulfilled (i.e., allowable release rate and on-site capture of 1:100 year storm) such that the integrity of the downstream minor/major systems is preserved. Given that Stage 1 will incorporate surface and underground storage, the storage volume requirements were assessed using the PCSWMM software platform.

The stormwater management calculations shown in Appendix 'D' along with Drawings SWM and S1 show the servicing strategy. The allowable release rate of 53.9 L/s included an uncontrolled area of 0.07 ha for the lands fronting onto March Road. Based on the Rational Method calculation (Appendix 'D'), this uncontrolled area was found to generate a 1:100 year peak flow of 22.59 L/s which was

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

deducted from the total allowable release rate. Consequently, the proposed on-site storm and stormwater management systems must be designed to detain the 1:100 year design storm while releasing flows below 31.31 L/s, the allocated minor system release rate for the remainder of Stage 1. The allowable flow of 31.31 L/s can outlet at the existing storm sewer stub located downstream of proposed storm MH506. It is proposed that the minor system flow be controlled using an ICD placed in MH506. Simulation results indicate that a 120mm diameter orifice ICD placed at MH506 results in a maximum release rate of 30 L/s during a 1:100 year storm event and is, therefore, being proposed.

Parking lot depressions and oversized sewers are being proposed to fulfill the on-site storage requirements for the site. The PCSWMM modelling platform was used to verify that the storage requirements, HGL levels and release rates were met. Drainage areas, modelling parameters and results are shown in Appendix 'D'. Table 5-2 below summarizes the available on-site storage. The modelling results shown in the table below indicate that the available storage provided from the road sags and pipe network are sufficient.

Table 5-2: Available On-Site Storage

Surface Storage		
Ponding Area	Available Storage (m ³) Road Sags	Storage Used (m ³) 1:100 Year Modelling Results
CB 1	63	47
CB 2	50	50
CB 3	21	5
Underground Storage		
Pipe Reach (450mm Dia.)	Available Storage (m ³)	Modelling Storage Used (m ³)
CB3-MH508 (24m)	3.8	3.8
MH507-MH507 (85m)	13.5	13.5
MH507-MH506 (30m)	4.8	4.8

The above summarized simulation results show that the on-site storage provided by the design is sufficient to detain the 1:100 year.

5.3.4 Dual Drainage Modelling

The analysis of both major and minor drainage systems was carried out to demonstrate their compliance with respect to the design criteria described in Sections 5.2 and 5.3. The performance of the major overland system and minor storm sewer system was analyzed with PCSWMM. This software is a dynamic model which allows both hydrologic and hydraulic components to be simulated in the same platform and also allows the simulation of the interaction between the major and minor systems. The PCSWMM software platform was used to:

- i) Generate the surface runoff hydrograph for each sub-area under various recurrences;

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Morgan's Creek Stage 1 (762 March Road)

- ii) Subdivide each inflow hydrograph into its minor and major system components based on the proposed inlet capture rates and roadway sag storage;
- iii) Assess capture of runoff and evaluate cascading, if any.

The model consists of the following components:

Subcatchments

Each subcatchment was represented in PCSWMM by a series of parameters, which allowed for the simulation of runoff from the various land covers during different storm events; the resulting hydrographs drain to the low points in the model;

Conduits

Closed (minor system sewer) conduits were used to route flows and compute a time history of flows and heads throughout the system.

Storage

Nodes that represent the manholes and catchbasins along the storm sewer system were imported directly from Civil 3D and simulated as storage nodes. Where the manhole invert is below the boundary condition HGL, an initial water depth has been applied to avoid the need for a hot-start file and provide stability in the model. Storage nodes were also used to represent surface geometry (pavement elevations) in order to calculate ponding depths for the various storm events.

Orifice

The custom ICD being proposed was modelled using an orifice link between MH506 and the downstream pipe reach.

Outfall

An outfall was used to simulate the boundary condition of the receiving system. For the larger storm events (1:100 year, 1:100+20%) the 1:100 year HGL (77.3 m) at ex. MH11 was extracted from the March road reconstruction drawing 019 dated September 2019 (refer to Appendix 'A') and taken as a boundary condition. For smaller events (<1:100 year storms) the pipe obvert (75.43m) at ex. MH11 was used as a boundary condition.

The 1:100 year design storm event (3 hour Chicago Storm) was used to evaluate the performance of the on-site stormwater management system by ensuring that the allowable release rate is not exceeded and that the on-site storage is sufficient to detain the 1:100 year design storm. In order to simulate the receiving system

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(March Road Storm Sewer), one full pipe length downstream of the proposed site was incorporated in the model and the 1:100 year HGL in the trunk storm sewer was set as the boundary condition. Table 5-2 summarizes the simulation results and confirms the on-site containment of the 1:100 year design storm.

5.3.5 On Site Ponding and HGL Elevations

Ponding levels were generated using PCSWMM for the 3-Hr Chicago 2-, 5-, and 100-year design storms and climate change event (100+20%). Table 5-3 summarizes the ponding elevations for the various storm events.

Table 5-3: On-Site Ponding Elevations

ID	Top of Grate (m)	Drainage Area (ha)	1:2 year		1:5 year	
			Peak Flow Generated (m ³ /s)	Depth (m)	Peak Flow Generated (m ³ /s)	Depth (m)
CB1	78.00	0.092	0.02	No Ponding	0.02	No Ponding
CB2	78.05	0.24	0.05	No Ponding	0.06	No Ponding
CB3	78.20	0.062	0.02	No Ponding	0.02	No Ponding

ID	Top of Grate (m)	Drainage Area (ha)	1:100 year			1:100 year +20%		
			Peak Flow Generated (m ³ /s)	Elevation (m)	Depth (m)	Peak Flow Generated (m ³ /s)	Elevation (m)	Depth (m)
CB1	78.00	0.092	0.05	78.31	0.31	0.05	78.34	0.34
CB2	78.05	0.24	0.12	78.34	0.29	0.12	78.36	0.31
CB3	78.20	0.062	0.03	78.32	0.12	0.03	78.35	0.15

The simulation results presented in Table 5-3 show that ponding does not occur for the 2- and 5-year storm events. Maximum ponding depths of 0.31m and 0.34m were found for the 1:100 year and climate change design events, respectively. The lowest grade surrounding the units is proposed at an elevation of 78.65 m (unit TE-1). This elevation is higher than the maximum ponding elevation of 78.37 shown in the above table.

Table 5-4 below presents the maximum 1:100 year HGL elevations and a comparison to the maintenance hole top of grate elevations. The results show that the HGLs remain below the top of grate elevation at all maintenance holes during this storm event.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

Table 5-4: 1:100 year HGL Elevations (3-hour Chicago)

ID	Max. HGL (m)	Top of Grate (m)
MH508	78.32	78.44
MH507	78.31	78.40
MH506	78.30	78.38
EX.MH13	77.33	78.25

5.3.6 Stormwater Quality

Storm runoff generated from Stage 1 will be collected and conveyed to SWM Facility 1 – West where water quality control is provided to meet regulatory requirements. Consequently, no other water quality measures are proposed.

5.4 Peak Flow Assessment

5.4.1 General

Site servicing for Morgan's Creek Stage 1 is presented on Drawing S1. As illustrated on that drawing, runoff from the site is collected by on-site storm sewers that outlet to the March Road trunk storm sewer system, which ultimately discharge into an end-of-pipe facility referred to as SWM Facility 1 – West.

Due to the grade differential along the site and other constraints, runoff from a strip of land totaling 0.31 ha (post-development) will continue to sheet flow towards Shirley's Brook. This strip of land includes landscaped areas and half of the rooftops of the eastern units. Allowing sheet flow drainage from rear yard areas (consisting of landscaped and rooftop areas) to adjacent watercourses is common and accepted in residential subdivisions as runoff from rooftops is free of grit.

The impact of the uncontrolled flows on Shirley's Brook was assessed in the following sub-sections. A desktop analysis was carried out under both existing (Section 5.4.2) and post-development conditions (Section 5.4.3) to estimate pre- and post-development flows discharging to Shirley's Brook. Section 5.4.4 evaluates the aggregate sum of the peak flows discharging to Shirley's Brook from Morgan's Creek Stage 1 and SWM Facility 1 – West. Desktop calculations for Sections 5.4.2 and 5.4.3 as well as the information associated with Section 5.4.4 has been included in Appendix 'D'.

5.4.2 Existing Development Condition

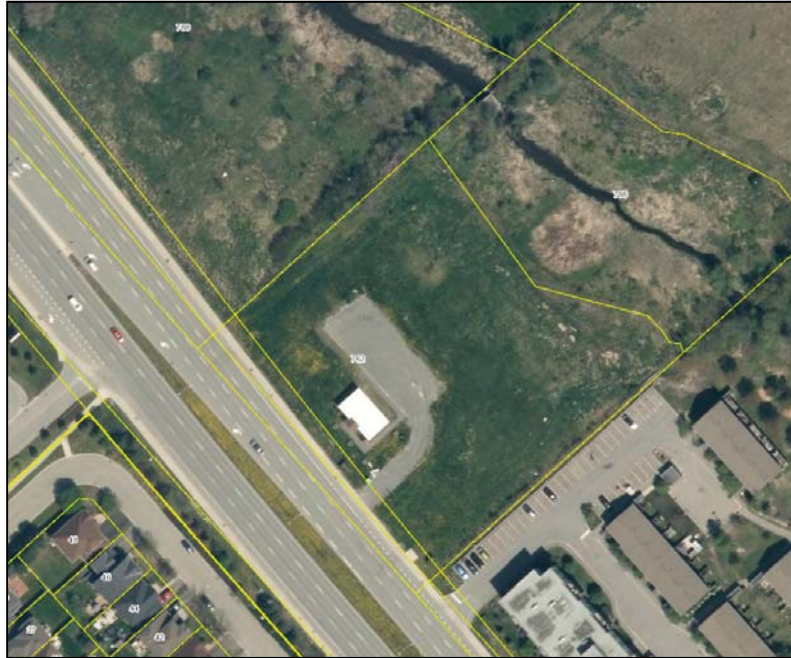
The 1:100 year peak flow under existing conditions was estimated using the Rational Method. A review of the existing surfaces was conducted using the 2017 aerial photography from the City of Ottawa E-Map. As illustrated below, the 762 March Road property consists largely of an open area (landscaped), and a granular access road and parking surface. The total parcel is 0.77 ha, which includes 0.08 ha of gravel area. Appendix 'D' includes an existing drainage area plan (Figure A),

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

the runoff coefficient calculation, the time of concentration calculation, and the Rational Method calculation. Based on this information, an existing 1:100 year peak flow of 87.91 L/s was estimated.

Existing Condition – 762 March Road



5.4.3 Post-Development Condition

The same analysis was conducted under post-development conditions once the servicing shown on Drawing S1 has been implemented. Based on that condition, the area sheet flowing towards Shirley's Brook will be reduced from 0.77 ha to 0.31 ha with a C-Factor of 0.45. Appendix 'D' includes a post-development drainage area plan (Figure B) for the area sheet flowing towards Shirley's Brook, the runoff coefficient calculation, the time of concentration calculation, and the Rational Method calculation. Based on this information, a post-development 1:100 year peak flow of 69.25 L/s was estimated for the 0.31 ha area.

These calculations show that the peak flow discharged to Shirley's Brook will be reduced from 87.91 L/s to 69.25 L/s once the proposed servicing is implemented. Consequently, peak flows will be reduced from those experienced under existing conditions when assessed based on the subject site alone; however, Section 5.4.4 (below) assesses the impact along Shirley's Brook when considering outflows from SWM Facility 1- West. From a water quality perspective and as discussed above, flows from rooftops are free from grit.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

5.4.4 Impact on Shirley's Brook

Sections 5.4.2 and 5.4.3 have shown that the 1:100 year peak flows conveyed to Shirley's Brook will be reduced when compared to those under existing conditions. This analysis however, was conducted on a lot basis independent of the flows from SWM Facility 1 – West. A further review was carried out to assess the impact of the uncontrolled flows from the subject site while considering those from SWM Facility 1- West. In order to do so, the stormwater modelling developed in support of the Design Brief for SWM Facility 1 – West (David McManus Engineering Ltd (DME), April 15, 2009), was reviewed. Specifically, the hydrological modelling (SWMHYMO) and the hydraulic modelling (XPSWMM) was reviewed to assess the timing of peak flows between Morgan's Creek Stage 1 and SWM Facility 1 – West.

The review of DME's SWMHYMO model showed that the 12-hour SCS Type II design storm was identified as the critical event (page 1, Appendix 'D' – DME Report). The rainfall hyetograph showed that the simulated peak rainfall intensity was 80.387 mm/hr and occurred between 5.67 hour and 6.00 hour (page 1, Appendix 'D' – DME Report). The model also showed a minor system peak flow of 2.412 cms that was conveyed to SWM Facility 1 – West (page 2, Appendix 'D' – DME Report), and which occurred at time step 6.00 hour. The drainage area drawings for the overall area serviced by SWM Facility 1 – West was also included in Appendix 'D' – DME Report. Given the proximity of Morgan's Creek Stage 1 to Shirley's Brook and SWM Facility 1 – West, the timing of the peak flow for this small subcatchment should also occur at 6.00 hour or earlier. The next verification was to review the routed flows from SWM Facility 1 – West, particularly those discharged to Shirley's Brook. Based on the XPSWMM output file, the maximum computed outflow to Shirley's Brook (referred to in the XPSWMM model as 'MAINCH') occurred at 7 hour 10 minute and was estimated at 0.515 cms (page 3, Appendix 'D' – DME Report). The XPSWMM graphical output was then reviewed to investigate the timing of peak flows; the subject site was likely to peak at 6 hour 0 min or slightly earlier while SWM Facility 1 – West peaked at 7 hour 10 min. Using the XPSWMM graphical output (page 4, Appendix 'D' – DME Report), it was determined that at time step 6 hour 0 min, the peak outflow along Shirley's Brook (MAINCH) is 0.25 cms. Therefore, combining the 1:100 year uncontrolled peak flow of 0.069 cms (Section 5.4.3) to the peak outflow discharge to Shirley's Brook of 0.25 cms yielded a total peak flow discharge to Shirley's Brook of 0.319 cms, which is less than the computed peak flow from SWM Facility 1 – West to Shirley's Brook of 0.515 cms (at 7 hour 10 min). Consequently, there is no adverse impact to Shirley's Brook from the uncontrolled flows for the proposed development.

5.5 Weeping Tile Drainage (Foundation Drains)

Weeping tile drainage associated with Stage 1 will be collected by a separate storm sewer system, which will outlet directly to Shirley's Brook since a connection to the March Road trunk storm sewer cannot be made due to high hydraulic grades. The outlet for the weeping tile drainage will not accept any other runoff from the site (foundation drains only). This servicing strategy was accepted in 2012 and is maintained for the current design, and the MVCA has accepted and re-confirmed the acceptability of this approach (refer to Appendix 'A').

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

5.6 Floodplain

The MVCA's latest floodplain mapping (2017) shows that the 1:100 year floodplain encroaches on a small area of private property on the east side of Shirley's Brook (within the Stage 2 site at 335 Sandhill Road), which Minto intends to develop in the near future. To accommodate the Stage 2 development, a small area of the floodplain is proposed to be filled on the east side of Shirley's Brook and the corresponding volume is proposed to be cut on the west side of Shirley's Brook (within the Stage 1 site at 762 March Road). The cut and fill analysis is included in Appendix 'D' (refer to Figure C). The proposed volume of excavation from the edge of the subject site is approximately 30 m³, which is equal to the volume proposed to be filled on the east side of Shirley's Brook (Stage 2). Furthermore, the cut and fill volumes have been balanced at each flood plain increment. Except for tie-in points to the existing floodplain, the proposed excavation is located outside of the 60 m wide corridor, which is to be transferred to the City to protect the Category 2 habitat. The extent of the proposed floodplain excavation is shown on the Grading Plan (refer to Drawing G1 in Appendix 'E'). The Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) has been updated to discuss the proposed cut and fill operation. The MECP has confirmed that the proposed cut and fill operation can proceed without obtaining a permit under the Endangered Species Act. A permit under the Conservation Authorities Act will still be required. Relevant correspondence is included in Appendix 'D'.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

6.0 Erosion and Sedimentation Control

During the construction of Morgan's Creek Stage 1, appropriate erosion and sedimentation control measures, as outlined in the Ontario Ministry of Natural Resources (MNR) Guidelines on Erosion and Sediment Control for Urban Construction Sites, will be implemented to trap sediment on site. As a minimum, the following erosion and sedimentation control measures are proposed, as shown on Drawing RESC:

- Supply and installation of a silt fence barrier, as per OPSD 219.110;
- Supply and installation of filter fabric between the frame and cover of catch basins and maintenance holes adjacent to the project area during construction, to prevent sediment from entering the sewer system. The filter fabric is to be inspected regularly and corrected as required;
- Stockpiling of material during construction is to be located along flat areas away from drainage paths. For material placed on sloped areas, stockpiles are to be enclosed with a silt fence to protect watercourses;
- All catch basins are to be equipped with sumps, inspected frequently, and cleaned as required; and
- Sandbags are to be placed blocking part of the sewer pipe in the connecting storm maintenance holes to eliminate construction debris from entering the existing storm sewer system. The sandbags are to be removed after the proposed storm sewers have been fully cleaned.

The proposed erosion control measures shall conform to the following documents:

- "Guidelines on Erosion and Sediment Control for Urban Construction Sites" published by Ontario Ministries of Natural Resources, Environment, Municipal Affairs, and Transportation & Communication, Association of Construction Authorities of Ontario and Urban Development Institute, Ontario, May 1987.
- "MTO Drainage Manual", Chapter F: "Erosion of Materials and Sediment Control", Ministry of Transportation & Communications, 1985.
- "Erosion and Sediment Control" Training Manual by Ministry of Environment, Spring 1998.
- Applicable Regulations and Guidelines of the Ministry of Natural Resources.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

7.0 Conclusions and Recommendations

This Site Servicing Report and associated Drawings describe the proposed servicing and grading design for Morgan's Creek Stage 1, which is in general compliance with the Ottawa Sewer Design Guidelines and the Design Guidelines for Water Distribution and associated Technical Bulletins.

The existing water infrastructure has sufficient capacity to service the subject site and the proposed system was found to comply with the pressure and fire flow requirements given in the Design Guidelines. There is adequate capacity in the existing storm and sanitary outlet sewers for the subject site. Grade raises have been kept below the maximum allowable limit and geotechnical recommendations have been respected. Storm and stormwater management servicing has been designed to provide sufficient on-site storage to detain the 1:100 year design storm with flows to the prescribed unit rate of 70 L/s/ha. Construction details shall be in accordance with Local and Provincial design standards.

Local and Provincial Regulating Authorities (City of Ottawa, MECP and MVCA) have been made aware of the project, and the required permits and approvals are either obtained or are forthcoming. It is recommended that this Site Servicing Report along with the Geotechnical Report (under separate cover) be reviewed with the intent of granting the Owner approval to proceed with the development of Morgan's Creek Stage 1.

Site Servicing Report

Morgan's Creek Stage 1 (762 March Road)

This report has been prepared for the exclusive use of Minto Communities Inc., for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Minto Communities Inc. and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:



Annie Williams, P.Eng.
Civil Engineer

Reviewed by:



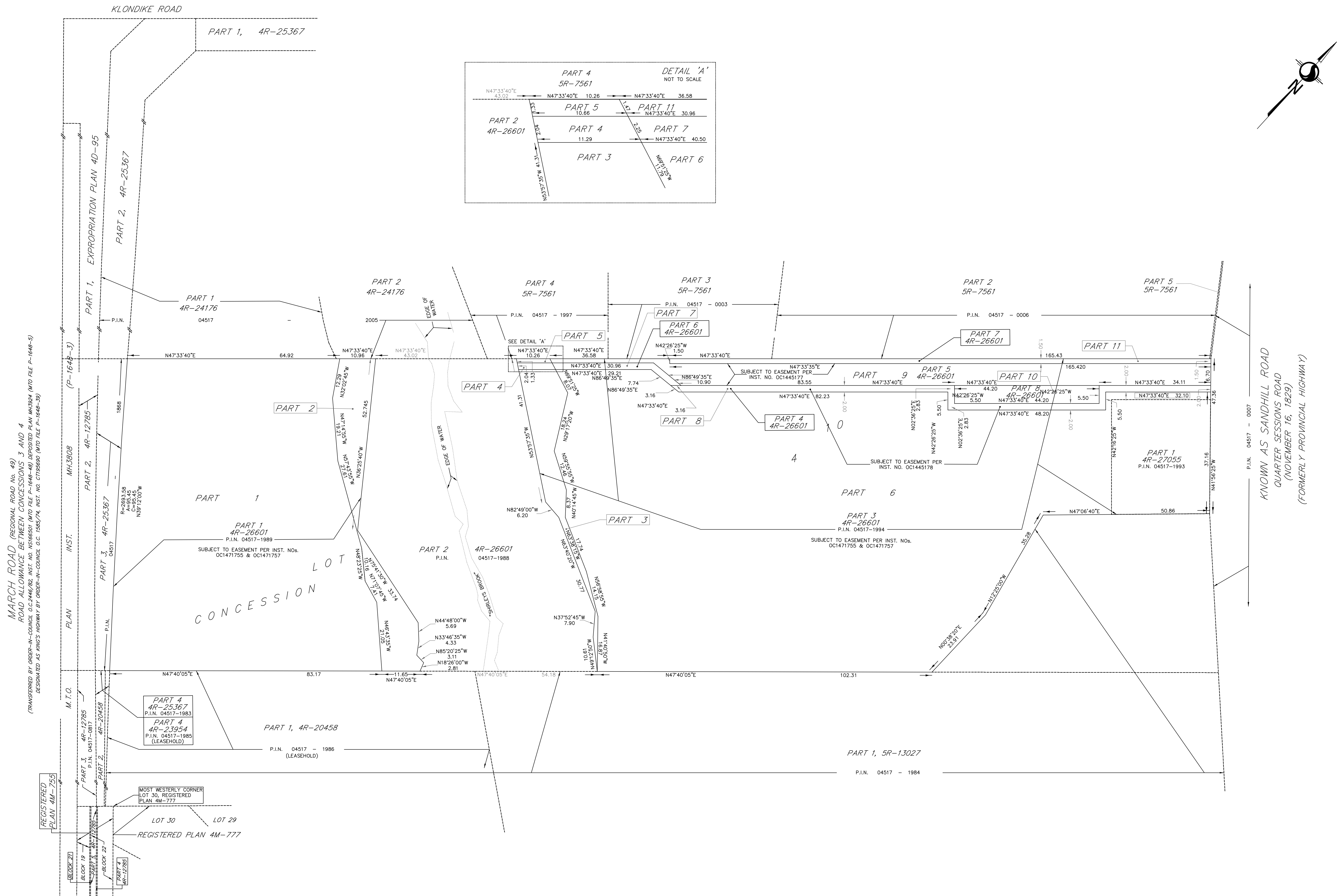
Guy Forget, P.Eng., LEED AP
Senior Water Resources Engineer

Site Servicing Report
Morgan's Creek Stage 1 (762 March Road)

Appendix 'A'

Background Documents &
Site Servicing Checklist

Plan of Survey



I REQUIRE THIS PLAN TO BE DEPOSITED
UNDER THE LAND TITLES ACT.

DATE: _____

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

PLAN 4R-_____

RECEIVED AND DEPOSITED

DATE: _____

REPRESENTATIVE FOR THE LAND
REGISTRAR FOR THE LAND TITLES DIVISION
OF OTTAWA-CARLETON NO. 4































SCHEDULE			
PART	LOT	CONCESSION	PIN
1	10	4	PIN 04517-1989
2			PIN 04517-1994
3			
4			
5			
6			
7			
8			
9			
10			
11			

PARTS 1 TO 11 ARE SUBJECT TO EASEMENT PER INST. NOS. OC1471757 & OC1471755
PARTS 4, 5, 7 & 9 ARE SUBJECT TO EASEMENT PER INST. NO OC1445177
PARTS 7 & 8 ARE SUBJECT TO EASEMENT PER INST. NO OC1445178

PLAN OF SURVEY of
**PART OF LOT 10
CONCESSION 4**
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA



METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

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BEARING NOTE
BEARINGS ARE GRID, DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

GRID SCALE CONVERSION
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999916.

SURVEYOR'S CERTIFICATE

CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE DAY OF , 2018.

DATE

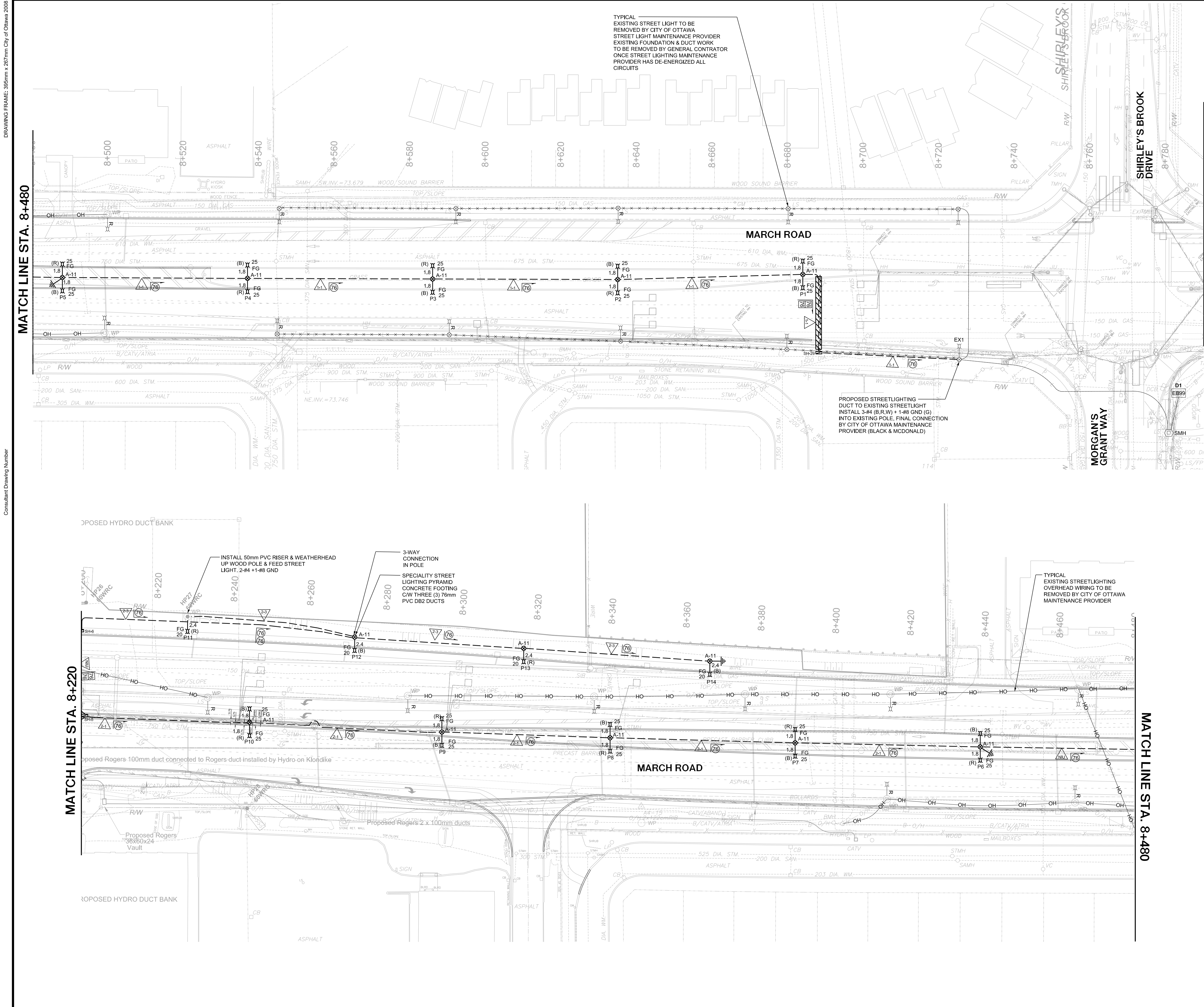
BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

 Stantec					Stantec Geomatics Ltd. CANADA LANDS SURVEYORS ONTARIO LAND SURVEYORS 1331 CRYSTAL AVENUE, SUITE 400 OTTAWA, ONTARIO, K2C 3E4 TEL. 613.722.4420 FAX. 613.722.2799 stantec.com	
DRAWN: TMT	CHECKED: CT	PM: CT	FIELD: *	PROJECT No.: 161613946-117		

March Road As-Constructed

DRAWING FRAME: 395mm x 267mm City of Ottawa 2008

Consultant Drawing Number



LIMIT OF CONTRACT

MARCH ROAD RECONSTRUCTION MORGAN'S GRANT WAY TO OLD CARP ROAD

Street Light
STA. 8 +790 TO STA. 8 +220

Scott Edey
Program Manager

William Quackenbush, P. Eng.
Street Light Engineer

Contract No.
ISB07-5166

Dwg. No.
SL1

Sheet
1 of 8

SLD Project No.
SLD2008-072

Asset Group
SL

Des. RP

CHK'd. SE

Dwn. RP

Inspector RP

Utility Circ. No.

Index No.

Approved By:
SCOTT EDEY

Scale:
HORIZONTAL 1:500
0m 5 10 20

NOTE:
The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

All Street Light Materials and Installations shall conform to the City of Ottawa 2009 Standards and Specifications, Including ESA & CSA Standards.

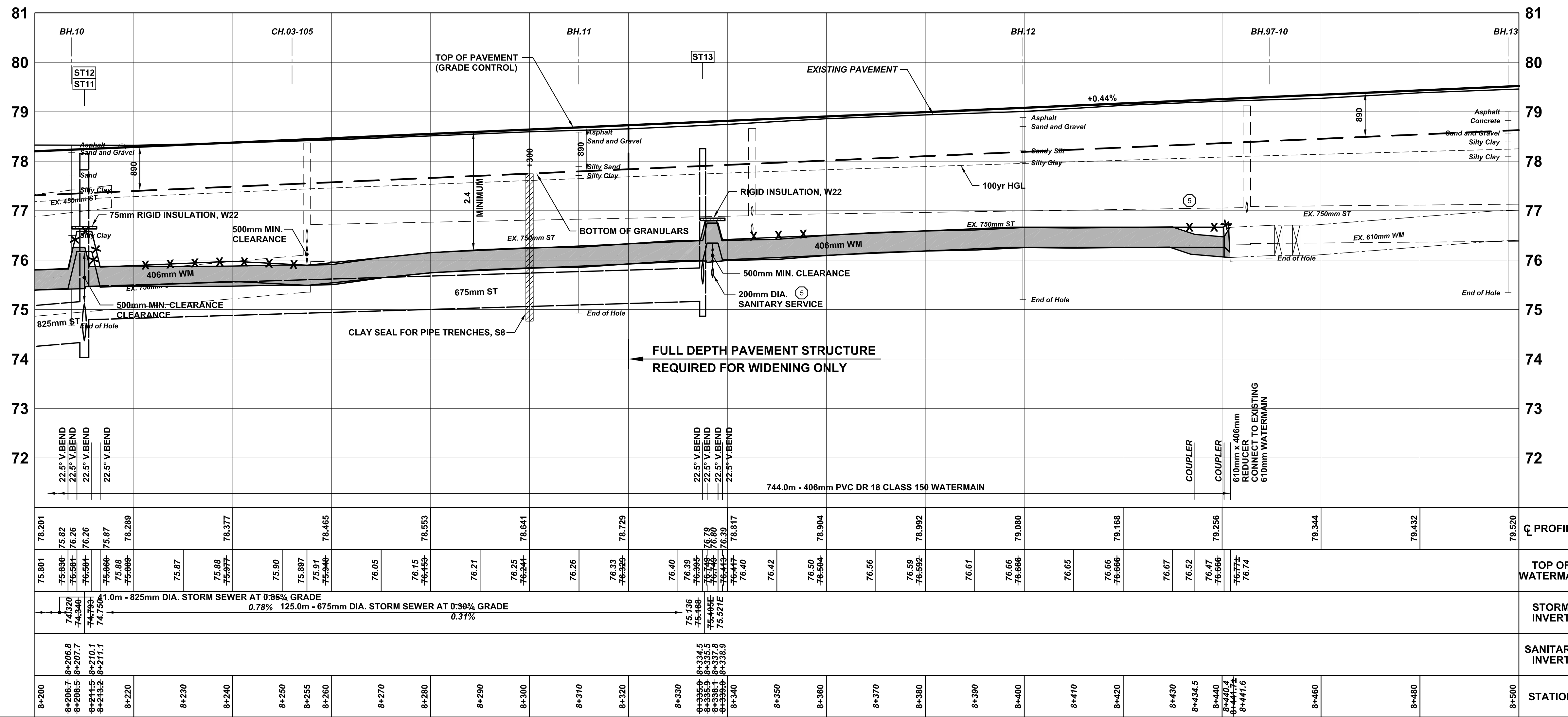
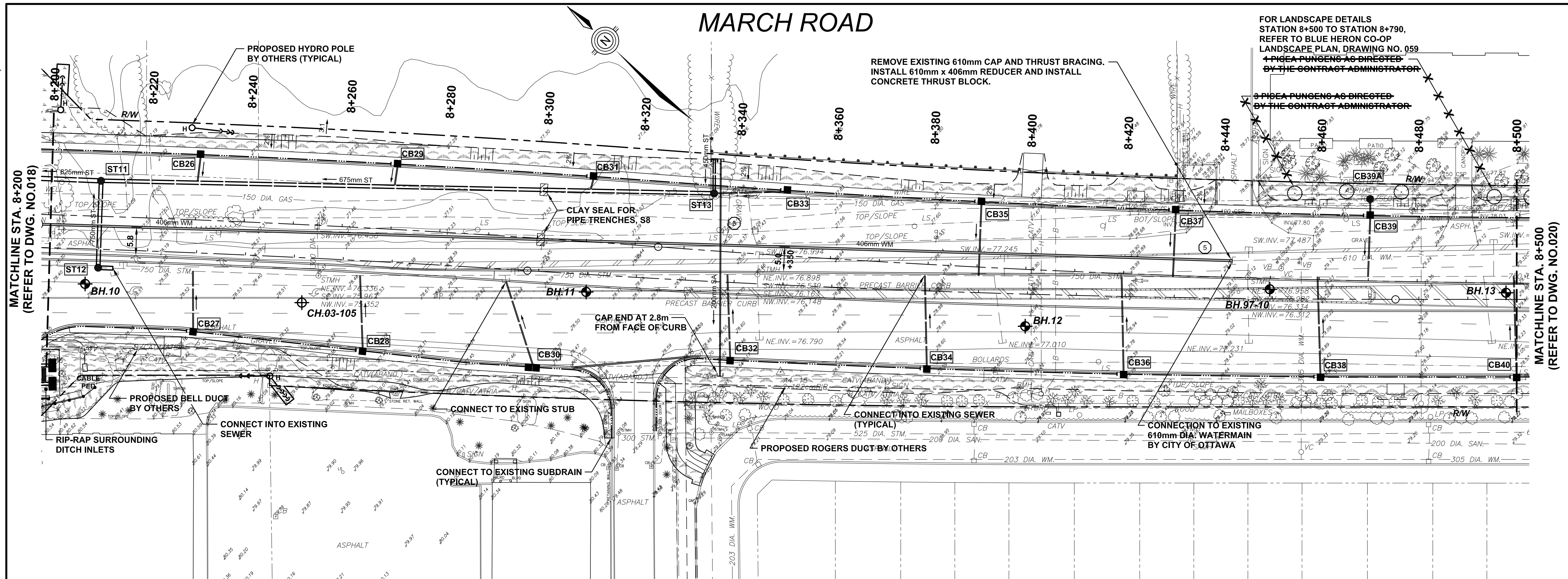
All Driveways and Sidewalks are to be Bored if possible, Roadway Crossings to be Concrete Encased or Bored using Free Duct.


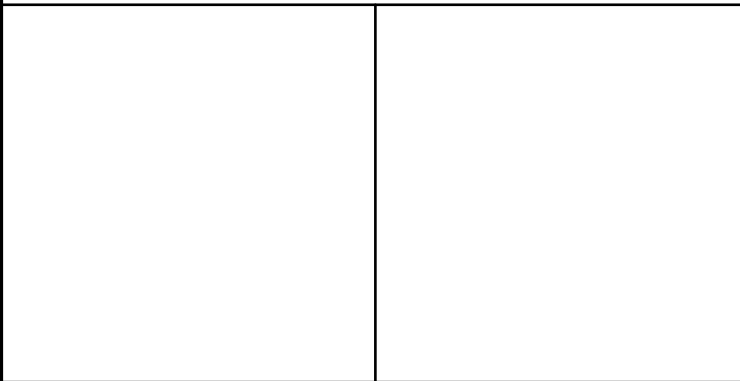

Boring must be used when crossing the Root Zone (Drip Line) of the trees.

No.	Description	By	Date (dd/mm/yyyy)
1	ISSUED FOR MUNICIPAL CONSENT	R.PUCCI	28/08/09
2	ISSUED FOR TENDER	R. PUCCI	18/09/09
3	AS-BUILT	R.PUCCI	12/09/11

STREET LIGHT LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Proposed Street Light		Existing Street Light
	Proposed Joint Use Pole		Existing Joint Use Pole
	Proposed Bracket and Luminaire		Existing Hydro Wood Pole
	Proposed Relocation of Street Light		Hydro Transformer
	Proposed Removal of Street Light		Hydro Pedestal
	Proposed Concrete Encased Road Crossing		Existing Concrete Encased Road Crossing
	Proposed Ground Rod		Existing Ground Rod
	Proposed Street Light MH		Existing Street Light MH
	Proposed Street Light Handhole		Existing Street Light Handhole
	Proposed Street Light Disconnect		Existing Street Light Disconnect
	Proposed EB99 Disconnect		Existing EB99 Disconnect
	Proposed Duct		Existing Duct
	Proposed Street Light Duct Configuration		Existing Duct to be Abandoned
	Proposed Street Light Concrete Encased Duct Configuration		Existing Direct Buried
	Street Light Circuit Designation 3x#4 STR Cu (B,W,R), 1x#8 STR Cu (G)		Existing Direct Buried to be Abandoned
	Street Light Circuit: Not In Use		Temporary Overhead



<p align="center">MARCH ROAD RECONSTRUCTION MORGAN'S GRANT WAY TO OLD CARP ROAD</p>				
<p align="center">PLAN AND PROFILE STA. 8+200 TO STA. 8+500</p>		Contract No. ISB07-5166	Dwg. No. 019	
<p>B.M. MASON, P.ENG. <i>Design and Construction (Municipal) - West</i></p>		<p>L. FOLEY, P.ENG. <i>Senior Engineer Infrastructure Projects</i></p>		
		Sheet 19 of 59		
		Asset No.		
		Asset Group		
		Des.	Chk'd.	
		G.C.	S.G.D.	
		Dwn.	Chk'd.	
G.R.L.	G.C.			
Utility Circ. No.		Index No.		
Const. Inspector		Scale:		
		HORIZONTAL		
		0m 5 10 20		
		0m 1 2		
		VERTICAL		
		1:50		
<p>NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.</p>		 <p> Stantec Consulting Ltd. 1505 Leporelle Avenue Ottawa ON Canada K1Z 7T1 Tel. 613.722.4420 Fax: 613.722.2799 www.stantec.com </p>		
REVISIONS	No.	Description	By	Date (dd/mm/yyyy)
	6	AS-BUILT	S.G.D.	12/09/2011
	2	ISSUED FOR MUNICIPAL CONSENT	S.G.D.	21/08/2009
	3	ISSUED FOR TENDER	S.G.D.	25/09/2009
	4	ISSUED FOR CONSTRUCTION	S.G.D.	10/11/2009
	5	REVISED SEWER AND WATERMAIN	G.C.	10/03/2016

CATCHBASIN & MAINTENANCE HOLE DATA							
NO.	STATION	OFFSET (m)	TYPE		ELEVATION		
			Structure	Cover	Grate	Low Inv.	
ST11	8+210.0	14.00 LT	1220x1220	SL	77.825	74.340	74.320
ST12	8+210.0	3.80 RT	701.012	SL	78.156	74.470	74.479
CB26	8+230.0	19.50 LT	705.010	S22/S23	77.748	76.940	75.923
CB27	8+230.0	16.11 RT	705.010	S22/S23	77.850	76.050	76.224
CB28	8+265.0	18.02 RT	705.010	S22/S23	77.948	76.440	76.659
CB29	8+270.0	19.50 LT	705.010	S22/S23	77.924	76.124	76.067
CB30	8+300.0	19.00 RT	705.020	S22/S23(2)	78.071	76.524	76.619
CB31	8+310.0	19.45 LT	705.010	S22/S23	78.101	76.604	76.289
ST13	8+335.0	18.00 LT	701.011	SL	78.254	76.160	75.136
CB32	8+340.0	15.25 RT	705.010	S22/S23	78.359	76.550	76.700
CB33	8+350.0	18.75 LT	705.010	S22/S23	78.298	76.490	76.461
CB34	8+380.0	15.25 RT	705.010	S22/S23	78.535	76.735	76.890
CB35	8+390.0	18.00 LT	705.010	S22/S23	78.497	77.250	77.062
CB36	8+420.0	15.25 RT	705.010	S22/S23	78.711	77.511	77.077
CB37	8+430.0	17.24 LT	705.010	S22/S23	78.696	77.250	77.180
CB38	8+460.0	15.25 RT	705.010	S22/S23	78.887	77.067	77.262
CB39	8+470.0	16.52 LT	705.010	S22/S23	78.893	77.450	77.362
CB39A	8+470.0	20.50 LT	S31	S31	78.680	77.680	77.537
CB40	8+500.0	15.25 RT	705.010	S22/S23	79.063	77.263	77.240

STORM SEWER DATA							
NO. to NO.	SIZE (mm)	LENGTH (m)	CLASS	INVERTS			
				Inlet	Outlet		
STUB ST13	450	7	CONC 1400	75.690	75.520	75.596	75.521
ST13 ST11	675	125	CONC 1000	75.460	74.793	75.136	74.750
EXIST. ST12	750	3	CONC 1000	MATCH	74.890		75.057
ST12 ST11	750	18	CONC 1000	74.470	74.330	74.479	74.331
CB26 SEWER	200	5	SDR 35	75.640	75.848 *	75.923	
CB27 EXIST.	200	13	SDR 35	76.050	75.790 *	76.224	
CB28 EXIST.	200	15	SDR 35	76.440	76.298	76.619	
CB29 SEWER	200	4	SDR 35	76.424	76.044 *	76.067	
CB30 EXIST.	200	18	SDR 35	76.624	76.341	76.619	
CB31 SEWER	200	3	SDR 35	76.601	76.211	76.289	
CB32 EXIST.	200	17	SDR 35	76.550	76.399	76.700	
CB33 ST13	200	15	SDR 35	76.490	76.190	76.461	76.181
CB34 EXIST.	200	19	SDR 35	76.725	76.545	76.890	
CB35 EXIST.	200	15	SDR 35	77.050	77.100 *	77.062	
CB36 EXIST.	200	20	SDR 35	76.611	76.511	77.077	
CB37 EXIST.	200	13	SDR 35	77.250	77.120 *	77.180	
CB38 EXIST.	200	20	SDR 35	77.067	76.687	77.262	
CB39 EXIST.	200	12	SDR 35	77.450	77.330 *	77.362	
CB39A CB39	250	4	HDPE PERF.	77.680	77.640	77.537	
CB40 EXIST.	200	20	SDR 35	77.263	76.963	77.240	77.

City of Ottawa Pre-Consultation

Tyler Cassidy

From: Kevin A. Harper <KHarper@minto.com>
Sent: September 4, 2018 3:07 PM
To: Lucie Dalrymple; Christopher Gordon (christopher.gordon@cghtransportation.com)
Cc: Thomas Couper; Susan Murphy
Subject: FW: Pre-Consultation Follow-Up: 760 March Road
Attachments: Tech bulletin ISTB-2018-02.pdf; Plan & Study List.pdf; MVCA - Reg Mapping Compilation - August 21, 2018.pdf

Good afternoon to you both. Please find the summary notes from our pre-consult with the City back on August 22. We'll be in touch regarding next steps shortly. Thank you.

Kevin



Kevin A. Harper, AICP, MCIP, RPP, LEED AP
Development Manager - High Rise
MINTO COMMUNITIES - CANADA
200-180 Kent St, Ottawa, ON K1P 0B6
T 613.751.2857
A division of The Minto Group

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From: McCreight, Laurel [mailto:Laurel.McCreight@ottawa.ca]
Sent: August-29-18 8:35 AM
To: Kevin A. Harper <KHarper@minto.com>
Subject: Pre-Consultation Follow-Up: 760 March Road

Hi Kevin,

Please refer to the below regarding the Pre-Consultation Meeting held on Wednesday August 22nd, 2018 for the property at 760 March Road for a residential development. I have also attached the Plans & Study List.

General

- Site plan application previously approved and the agreement registered in January 2013
 - Original proposal approved 156 units in 12 buildings

- Development put on hold in April 2013 due to a product review
- Current proposal introduces a unit increase of 20 (total of 176 units) in 12 buildings
 - Back-to-back stacked townhouses
 - Site plan for the entire property, but development will be phased with the units on March Road end to be developed first
- Application can be treated as revision application, subject to public consultation

Planning/Urban Design

- Upgraded elevations will be required on March and Sandhill
 - Landscaping, masonry, balconies
- How will the amenity areas between the units along the creek be treated?
- Perhaps the amenity area for the units along Sandhill could be considered as a stonedust pathway through the heritage buffer

Engineering

- Please use [The Servicing Study Guidelines for Development Applications](#)
- Servicing and site works shall be in accordance with the following documents:
 - Ottawa Sewer Design Guidelines (October 2012)
 - Ottawa Design Guidelines – Water Distribution (2010)
 - 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)
- Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at <mailto:InformationCentre@ottawa.ca> or by phone at (613) 580-2424 x.44455)
- The Stormwater Management Criteria, for the subject site, is to be based on the following:
 - The requirements set by the Shirley's Brook SWM Facility 1-West (report attached);
 - The requirements set by the Shirley's Brook SWM Facility 'C' dated November 2006 completed by Novatech;
 - The requirements set by March Road Reconstruction dated October, 2010 completed by Stantec;
 - ****Please provide this report****
 - Flows to the storm sewer in excess of the release rates set by the above report, up to and including the 100-year storm event, must be detained on site; and
 - A calculated time of concentration (Cannot be less than 10 minutes)
- Shirley's Brook Area-Specific Development Charges for Stormwater Management Facilities apply
 - Required fees can be found [here](#)
- Please use the following link to access The Facility 1-West document
https://www.dropbox.com/s/a2elx1l1mivv8l/2654_-_Shirley%27s_Brook_-_SWM_Facility_1_-_West%20Complete.pdf?dl=0
- 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:0
 - Location of service (map/plan view) including location of ROW hydrant to be utilized for RFF purposes, if any (Refer to Technical Bulletin-ISTB-2018-02 (dated March 21, 2018) for hydrant capacity and placement requirements (attached))
 - Type of development and the amount of fire flow required (as per FUS, 1999)
 - Average daily demand: ____ L/s
 - Maximum daily demand: ____ L/s
 - Maximum hourly daily demand: ____ L/s

- Water Frontage Fees apply and will be applied within the Site Plan Agreement Financial Requirements
- Please contact the local Ottawa District Ministry of the Environment and Climate Change office to discuss if an MOECC Environmental Compliance Approval (Private Sewage Works) amendment or new application will be required for the proposed development. For residential applications contact [Charlie Primeau](#) (613) 521-3450, ext. 251
- History of the site servicing was noted at the pre-consultation meeting including:
 - The sanitary service lateral for the site area fronting March Road has already been installed during the March Road Reconstruction project
 - The lateral is capped at both ends and extends to Mersey Drive
 - A section of the existing sanitary sewer along Mersey Drive was re-laid by Minto complete with an MOE ECA application, to ensure the lateral for this site can connect to the sewer, as the lateral was installed lower than the previous Mersey Drive sewer elevation
 - Two (2) water laterals have already been installed along March Road as part of the March Road Reconstruction project
 - An MOE ECA application had been filed and accepted for the foundation drain outlet to Shirley's Brook, however the approval has since lapsed
 - This outlet was preferred due to the high HGL on March Road.
- Please contact [Gabrielle Schaeffer](#) for any engineering related questions

Transportation

- Follow Traffic Impact Assessment Guidelines – Screening form to start, full Traffic Impact Assessment if any of the triggers on the screening form are satisfied
 - Start this process immediately
 - Applicant advised that their application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable)
- ROW protection on March between Terry Fox and Richardson is 44.5m even
- Noise Impact Studies required for the following:
 - Road
 - Stationary (due to the proximity to neighbouring exposed mechanical equipment)
- Clear throat requirements for apartments style units that is >100 units on an arterial is 15m
- Sidewalks will be required along the full length of the frontage on Sandhill
- On drawings:
 - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks
 - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions)
 - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
 - Show road/lane/aisle widths
 - Show depressed curb locations along pedestrian paths
- Please contact [Rosanna Baggs](#) for any transportation related questions

Environmental

- A Blanding's Turtle has been found in Shirley's Brook since the previous approval
 - Within a 2 km radius the riparian lands become a significant habitat
 - Significant habitat is 30 metre with a 55 metre meander belt
 - You can apply for a permit from MNR for a reduced width
- An environmental consultant will be required to address the species at risk
- A tree removal permit is required for any trees to be removed greater than 10 cm in diameter
- The environmental impact statement and tree conservation report can be combined
- Please contact [Matthew Hayley](#) for any environmental related questions

MVCA

- Updated regulation mapping was completed in November 2017
- A meander belt hazard of 87 metres was introduced
 - A erosion hazard study/meander belt width study can be completed to determine that actual width of meander belt to be required
 - Can also work with adjacent landowners
- Please contact [Niall Oddie](#) at MVCA for any questions

Please do not hesitate to contact me if you have any questions.

Regards,
Laurel

Laurel McCreight MCIP, RPP

Planner

Development Review West

Urbaniste

Examen des demandes d'aménagement ouest

City of Ottawa | Ville d'Ottawa

☎ 613.580.2424 ext./poste 16587

ottawa.ca/planning / ottawa.ca/urbanisme

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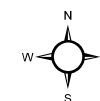
MVCA Regulation Mapping Compilation

Ontario Regulation 153/06

760 March Rd
City of Ottawa

Legend

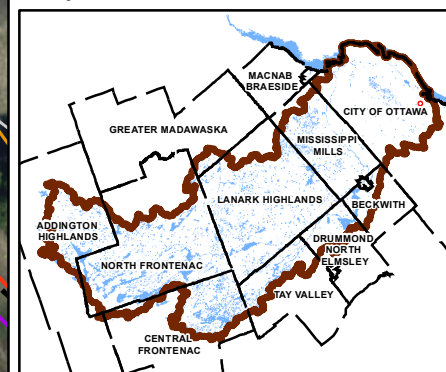
- 1:100 yr Flood Plain
- MVCA Flood Plain (old)
- - - Meander Belt Erosion Hazard
- Regulation Limit
- MVCA Regulation Limit (old)
- Property Boundary



1:1,095

0 5 10 20 30
Meters

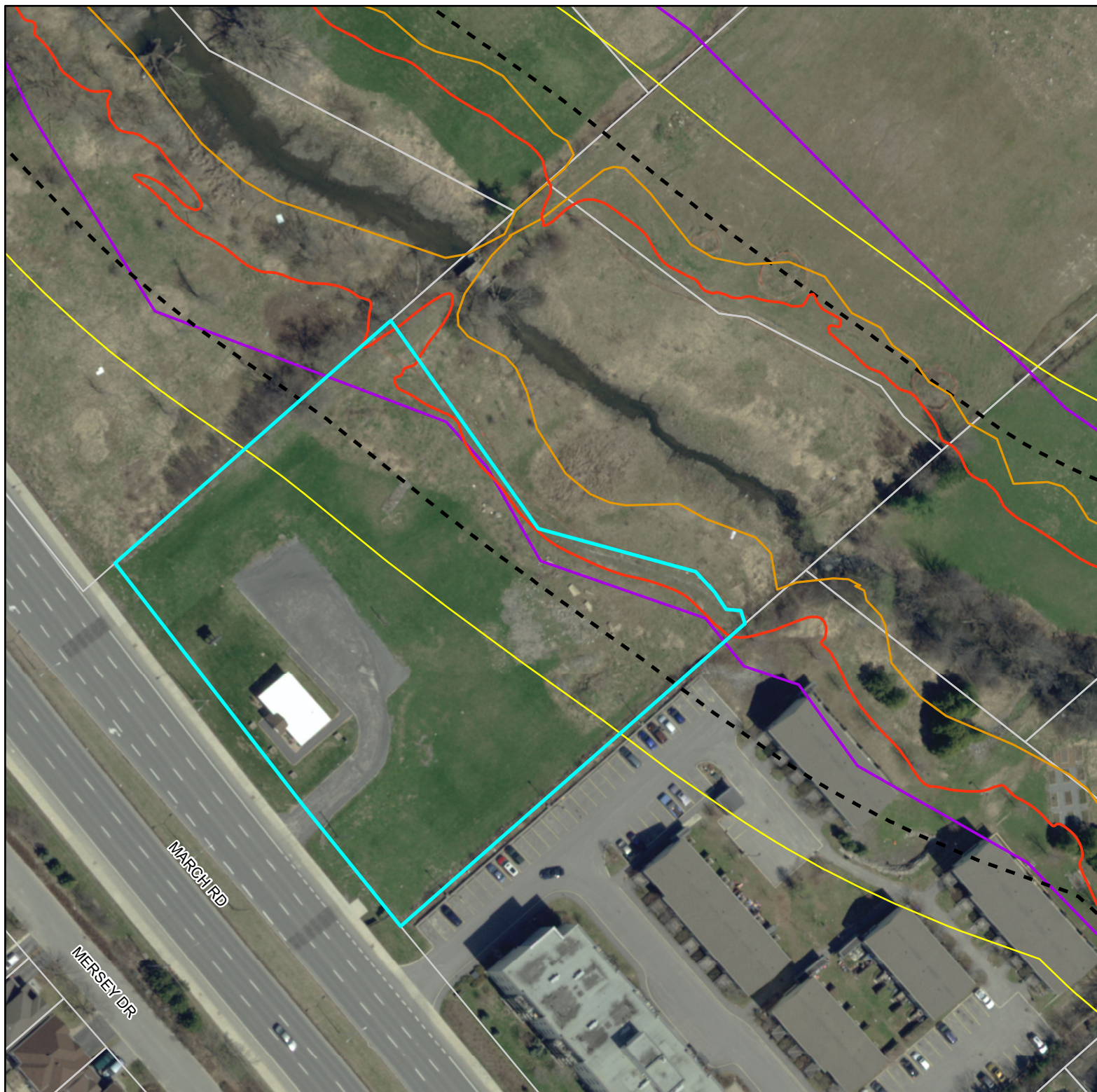
Projection: UTM Zone18 - NAD 83 Datum



This map is produced in part with data provided by the Ontario Geographic Data Exchange under License with the Ontario Ministry of Natural Resources and the Queen's Printer for Ontario, 2018

Imagery @ Fugro Geospatial, May 2014

Date: 8/17/2018



Plan & Study List



APPLICANT’S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.
A indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information and guidance on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	10	1. Site Servicing Plan	2. Site Servicing Brief	S	3
S	10	3. Grade Control and Drainage Plan	4. Geotechnical Study and Meander Belt Width Study	S	3
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
S	6	9. Transportation Impact Brief	10.Erosion and Sediment Control Plan / Brief	S	3
S	3	11.Storm water Management Brief	12.Hydro geological and Terrain Analysis		
S	3	13.Hydraulic Water main Analysis	14.Stationary Noise Study	S	2
	10	15.Roadway Modification Design Plan	16.Confederation Line Proximity Study		
S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
		17.Draft Plan of Subdivision	18.Plan Showing Layout of Parking Garage		
		19.Draft Plan of Condominium	20.Planning Rationale	S	3
S	10	21.Site Plan	22.Minimum Distance Separation (MDS)		
		23.Concept Plan Showing Proposed Land Uses and Landscaping	24.Agrology and Soil Capability Study		
		25.Concept Plan Showing Ultimate Use of Land	26.Cultural Heritage Impact Statement		
S	10	27.Landscape Plan	28.Archaeological Resource Assessment Requirements: S (site plan) A (subdivision, condo)		
S	1	29.Survey Plan	30.Shadow Analysis		
S	3	31.Architectural Building Elevation Drawings (dimensioned)	32.Design Brief (includes the Design Review Panel Submission Requirements)		Available online
		33.Wind Analysis			
S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	3	34.Phase 1 Environmental Site Assessment (update if necessary)	35.Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		
		36.Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37.Assessment of Landform Features		
		38.Record of Site Condition	39.Mineral Resource Impact Assessment		
S	3	40.Tree Conservation Report	41.Environmental Impact Statement / Impact Assessment of Endangered Species		3
		42.Mine Hazard Study / Abandoned Pit or Quarry Study	43.Integrated Environmental Review (Draft, as part of Planning Rationale)		
S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
S	3	44. Site Light Lighting Plan/Letter	45.		

Meeting Date: August 22, 2018

File Lead (Assigned Planner): Laurel McCreight

Site Address (Municipal Address): 760 March Road

Application Type: *Site Plan Control*

Infrastructure Approvals Project Manager: Gabrielle Schaeffer

*Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5☐

*One (1) indicates that considerable major revisions are required before a planning application is submitted, while five (5) suggests that proposal appears to meet the City’s key land use policies and guidelines. **This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.**

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, the Planning, Infrastructure and Economic Development Department will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City’s standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the Planning, Infrastructure and Economic Development Department.

MECP Correspondence

Annie Williams

From: Annie Williams
Sent: Wednesday, April 3, 2019 2:33 PM
To: 'Primeau, Charlie (MECP)'
Cc: Kevin A. Harper; Thomas Couper; Lucie Dalrymple; 'Laurel.McCreight@ottawa.ca'; 'Sharif, Sharif'; Andrew McKinley
Subject: 762 March Road - ECA Requirements

Good afternoon Charlie,

Following our phone conversation today, I have prepared a quick summary to document our discussion. Please advise of any errors or omissions.

- We will require an ECA (Transfer of Review) for the proposed sanitary sewer extension.
- If the entire site will remain as 1 parcel with 1 PIN, there is no need for an ECA for storm sewers, stormwater management, or foundation drain outlet to Shirley's Brook (regardless of whether there are multiple property owners or multiple condo associations). If the site will be divided into multiple parcels, then we will require an ECA (Transfer of Review) for the above-noted storm works.
- If the site has a Part II Order, this may trigger a Direct Submission ECA.

Since we understand that this site will remain as 1 parcel and does not have a Part II Order, we will apply for one (1) ECA through the Transfer of Review Process for the proposed sanitary sewer extension.

Thank you,

Annie Williams

From: Annie Williams
Sent: Monday, April 1, 2019 4:33 PM
To: 'Primeau, Charlie (MECP)'
Subject: RE: 762 March Road - ECA Inquiry

Hi Charlie,

Yes, we have had a few discussions with the City and we were told that an ECA would not be required for the sewers since the site is 1 single parcel (even with multiple owners) and that an ECA would also not be required for the proposed outlet to Shirley's Brook since it will only be the building foundation drains outletting here.

We wanted to confirm with you – do we require an ECA for any of the proposed works (storm sewers, stormwater management, sanitary sewers, foundation drain outlet) to develop this site?

Thank you,

From: Primeau, Charlie (MECP) <Charlie.Primeau@ontario.ca>
Sent: Monday, April 1, 2019 4:21 PM
To: Annie Williams <awilliams@jlrichards.ca>
Subject: Re: 762 March Road - ECA Inquiry

Hi Annie,

I'm out of the office today so will look into it tomorrow. In the meantime, can you tell me if you have had a discussion with the City on this issue? If so, what did they say?

You mention site plan application - are you asking if you have to have an ECA before you go to the City for site plan approval?

Thx in advance

Charlie p

Get [Outlook for iOS](#)

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Monday, April 1, 2019 4:04 PM
To: Primeau, Charlie (MECP)
Subject: 762 March Road - ECA Inquiry

Hi Charlie,

We would like to confirm whether an ECA is required for Minto's Morgan's Creek Stage 1 residential site plan application located at 762 March Road, in Kanata.

This site was previously designed and approved in 2012. The previous site included both developments on either side of Shirley's Brook. Since then, the parcels have been divided and the current application is for the west side only (762 March Road). I have attached the previous ECAs (1 Transfer of Review for sanitary sewers, 1 Direct Submission for storm sewers, stormwater management and foundation drain outlet).

The proposed development consists of 60 stacked condo units. Wastewater and stormwater from the site will be conveyed to the existing infrastructure on March Road. Due to a high storm HGL on March Road, the building foundation drains are proposed to outlet to Shirley's Brook (currently MVCA approved and previously approved by MECP). I have attached our initial Site Servicing Plan to illustrate, with the foundation drains highlighted.

Please let me know if we require a new ECA (if so – for what specifically and through which process) and if you require any further information.

Thank you,

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



**J.L. Richards
& Associates Limited**
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MVCA Correspondence

Annie Williams

From: Niall Oddie <NOddie@mvc.on.ca>
Sent: November 27, 2018 9:52 AM
To: Annie Williams
Cc: Nader Nakhaei
Subject: RE: Morgan's Creek - 760 March Road

Categories: Blue Category

Annie,

We've discussed internally and provided that the outlet is only for foundation drains we have no objection.

Thanks,

Niall Oddie MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, Ontario K7C 3P1
www.mvc.on.ca | t. 613 253 0006 ext. 229 | f. 613 253 0122 | noddie@mvc.on.ca



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From: Annie Williams [mailto:awilliams@jlrichards.ca]
Sent: Tuesday, November 27, 2018 9:41 AM
To: Niall Oddie <NOddie@mvc.on.ca>
Subject: RE: Morgan's Creek - 760 March Road

Hi Niall,

Do you know when we can expect a response?

Thank you,

Annie Williams, EIT
Civil Engineering Intern

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



From: Annie Williams
Sent: November 21, 2018 3:48 PM
To: 'NOddie@mvc.on.ca' <NOddie@mvc.on.ca>
Subject: Morgan's Creek - 760 March Road

Hi Niall,

As discussed, please find attached the Site Servicing Plan from August 2012.

MVCA and MECP previously approved. Weeping tile to outlet to Shirley's Brook, and we will re-apply for ECA due to lapse.

Thank you,

Annie Williams

From: Annie Williams
Sent: Wednesday, June 12, 2019 9:34 AM
To: Niall Oddie
Cc: Nader Nakhaei; Guy Forget; Kevin A. Harper; Matt Craig; McCreight, Laurel
Subject: RE: Morgan's Creek Cut & Fill

Hi Niall,

Thank you for your response and understanding. We will submit our proposed design as is, with the subject site outletting to the stormwater management facility which provides a normal level of quality treatment.

We will also include this correspondence in our Site Servicing Report.

Thank you,

From: Niall Oddie <noddie@mvc.on.ca>
Sent: Wednesday, June 12, 2019 9:15 AM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Nader Nakhaei <nnakhaei@mvc.on.ca>; Guy Forget <gforget@jlrichards.ca>; Kevin A. Harper <KHarp@mint.com>; Matt Craig <mcraig@mvc.on.ca>; McCreight, Laurel <Laurel.McCreight@ottawa.ca>
Subject: RE: Morgan's Creek Cut & Fill

Annie,

Sorry for the delay, I was unexpectedly out of the office yesterday.

Acknowledging that this is essentially an update of a previously approved site plan and it is understood that the previous approval treated to a normal level we will accept the same for this site on this submission.

Moving forward, we are looking for enhanced treatment for Shirley's Brook. MVCA will be reviewing the quality treatment recommendations for various watercourses within the developing portions of Kanata and Stittsville later this fall and will provide updated documents to the City.

Thanks,

Niall Oddie MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, Ontario K7C 3P1
www.mvc.on.ca | t. 613 253 0006 ext. 229 | f. 613 253 0122 | noddie@mvc.on.ca



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From: Annie Williams [<mailto:awilliams@jlrichards.ca>]
Sent: 11-Jun-19 5:47 PM

To: Niall Oddie <noddie@mvc.on.ca>

Cc: Nader Nakhaei <nnakhaei@mvc.on.ca>; Guy Forget <gforget@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>

Subject: RE: Morgan's Creek Cut & Fill

Hi Niall,

Are you available tomorrow morning to discuss? We need to sort this out ASAP as this is holding up our design submission.

Let me know what time works for you and we will give you a call.

Thank you,

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



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& Associates Limited**
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From: Niall Oddie <noddie@mvc.on.ca>

Sent: Monday, June 10, 2019 4:02 PM

To: Annie Williams <awilliams@jlrichards.ca>

Cc: Nader Nakhaei <nnakhaei@mvc.on.ca>

Subject: RE: Morgan's Creek Cut & Fill

Annie,

We are aware of additional and more recent information relating to water quality targets for Shirley's Brook, we will be discussing internally tomorrow and will be in touch shortly.

Thanks,

Niall Oddie MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, Ontario K7C 3P1
www.mvc.on.ca | t. 613 253 0006 ext. 229 | f. 613 253 0122 | noddie@mvc.on.ca



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From: Annie Williams [<mailto:awilliams@jlrichards.ca>]

Sent: 10-Jun-19 10:31 AM

To: Niall Oddie <noddie@mvc.on.ca>

Cc: Nader Nakhaei <nnakhaei@mvc.on.ca>; Kevin A. Harper <KHarper@minto.com>; Guy Forget

<gforget@jlrichards.ca>; Lucie Dalrymple <ldalrymple@jlrichards.ca>

Subject: RE: Morgan's Creek Cut & Fill

Hi Niall,

Thanks for your comments on the subject property. However, we would like to discuss the comment made about the additional pre-treatment that the MVCA prefers for Minto's site.

We have reviewed the Shirley's Brook Subwatershed Study, and the design of the SWM Facility 1 (McManus) which relied on both the Subwatershed Study and Environmental Plan for Shirley's Brook, all of which recommend that a normal protection level (or Type II) be provided rather than an enhanced protection level. We have attached for your review the Shirley's Brook excerpts (refer to page 5/5) and also the McManus Design.

Please let us know when we can discuss further as it is our opinion that the existing infrastructure (SWM Facility 1) was designed to meet the MOE quality targets which should be sufficient.

Thank you,

Annie Williams, P.Eng.
Civil Engineer

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700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



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From: Niall Oddie <noddie@mvc.on.ca>
Sent: Friday, June 7, 2019 12:15 PM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Nader Nakhaei <nnakhaei@mvc.on.ca>
Subject: RE: Morgan's Creek Cut & Fill

Annie,

Following up from our conversation a moment ago, it would be preferred if a degree of pre-treatment would be provided onsite. Shirley's Brook should be receiving enhanced treatment, whereas I understand the existing swm pond provided normal treatment. Acknowledging that the site is tight, perhaps you could consider some of the products used as inserts into existing catch basins to provide this additional treatment.

I'm going to be out on site visits for much of the afternoon, but we can discuss if you wish.

We'll be in touch regarding the cut/fill calculation next week.

Thanks,

Niall Oddie MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, Ontario K7C 3P1
www.mvc.on.ca | t. 613 253 0006 ext. 229 | f. 613 253 0122 | noddie@mvc.on.ca



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From: Annie Williams [<mailto:awilliams@jlrichards.ca>]

Sent: 6-Jun-19 3:27 PM

To: Niall Oddie <noddie@mvc.on.ca>

Cc: Kevin A. Harper <KHarper@minto.com>

Subject: Morgan's Creek Cut & Fill

Hi Niall,

As discussed yesterday, please find attached our revised Cut & Fill Figure-1 for Minto's Morgan's Creek development.

As shown on the Figure, we have balanced the cut and fill at the floodplain increments. Please let us know if this is acceptable to the MVCA.

I also require confirmation from you that additional quality treatment will not be required for the 762 March Road site. Please advise at your earliest convenience as we are looking to resubmit our design drawings tomorrow.

Thank you,

Annie Williams, P.Eng.
Civil Engineer

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Tel: 613-728-3571 Fax: 613-728-6012



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10731854 Canada Inc. Correspondence

Annie Williams

From: Raphaël Esposito <resposito@omnipex.ca>
Sent: Monday, April 15, 2019 9:42 AM
To: Steve Merrick
Cc: Amr Salem; Nico Church; Lucie Dalrymple
Subject: RE: 762 March Road - Letter re: storm drainage

Hi Steve

10731854 Canada Inc. agrees to allow the Minto Group to provide for the 1m of drainage from their property unto our property, so long as it does not have any negative impact to the site at 788 March Rd.

Yours very truly,

Ralph Esposito, Jr.
10731854 Canada Inc.
47 Clarence Street, Suite 406
Ottawa ON, K1N 9K1
Cel: 514-294-4355

From: Steve Merrick <SMerrick@dsel.ca>
Sent: Wednesday, April 10, 2019 2:33 PM
To: Raphaël Esposito <resposito@omnipex.ca>
Cc: Amr Salem <ASalem@dsel.ca>; Nico Church <church@fotenn.com>
Subject: FW: 762 March Road - Letter re: storm drainage

Hi Ralph, hope all is well. I understand that the project has been put on hold as you work through potential site plan changes. JLR has asked us to reach out to you regarding potential changing grades at the property line or they request a letter indicating that 1m of drainage from their property is acceptable to drain onto your property. The two options they have provided are the following:

- Provide a letter accepting 1m of drainage from the adjacent property, based on the current site plan this has no negative impact to the site.
- Allow grade raised at the property line, no letter required. If Minto proceeds first, this would result in some temporary grading required on your property. Again, based on the current site plan this has no negative impact and can be accommodated.

Both options work with the current site plan, however, I will leave it to you to confirm if either option would not be possible based on future site plan changes. At the end of the day this is your property and you can decide to not allow either of the above noted options, this would likely result in a retaining wall required along Minto's property line.

Thanks,

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

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

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

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From: Annie Williams [<mailto:awilliams@jlrichards.ca>]
Sent: Wednesday, April 10, 2019 2:09 PM
To: Steve Merrick <SMerrick@dsel.ca>
Cc: Amr Salem <ASalem@dsel.ca>
Subject: RE: 762 March Road - Letter re: storm drainage

Hi Steve,

Per my voicemail, is there any chance we could look at raising the property line grades?

Feel free to give me a call.

Thanks,

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



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From: Steve Merrick <SMerrick@dsel.ca>
Sent: Tuesday, April 9, 2019 3:17 PM
To: Annie Williams <awilliams@jlrichards.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 762 March Road - Letter re: storm drainage

Hi Annie,

Can you draft up a letter describing the exact drainage (brief description, drainage area, 100-year flow) that would be entering the site for us to send onto our client.

Please note, we have been told that there will be potential site plan changes coming for the property, I am unsure our client will want to sign a letter indicating they can accept the drainage without knowing what will change with the site plan.

Thanks,

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL

david schaeffer engineering ltd.

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

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

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From: Annie Williams [<mailto:awilliams@jlrichards.ca>]
Sent: Tuesday, April 9, 2019 2:19 PM
To: Amr Salem <ASalem@dsel.ca>
Cc: Steve Merrick <SMerrick@dsel.ca>
Subject: 762 March Road - Letter re: storm drainage

Hi Amr,

As discussed, we are looking for a brief letter from the Owner of your site stating that they give permission for us to direct some flow onto their site. The City comment we received is below, note that we have raised the north side barrier curb slightly and we are not directing our emergency overland flow onto your site.

Based on the proposed barrier curb located on the north side (top of the barrier curb elevation 78.35 m), It appears that some of the emergency overland flow will be directed to the adjacent property on the north side. Do you have permission from the adjacent property owner to do this?

I have attached our previous Grading Plan and Drainage Plan. Note that we are in the process of updating these.

We will be resubmitting our design this Friday and would appreciate receiving the letter before noon on Thursday.

Please contact me if you have any questions.

Thank you,

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1

Blue Heron Correspondence

Annie Williams

From: Kevin A. Harper <KHarper@minto.com>
Sent: Tuesday, May 7, 2019 12:26 PM
To: 'Michelle Bainbridge'
Cc: John Wilker-Blakley; 'Thomas Cousins'; Annie Williams; Thomas Couper
Subject: RE: 762 March -- Drainage Condition Along Shared Property Line

Good afternoon, Michelle. Thank you for your support on the proposed drainage condition along our shared property line...that will be very helpful.

Regarding the creek crossing, you are correct, the previous plan did include a pathway crossing of Shirley's Brook. However, with the recent identification of Shirley's Brook as Blandings Turtle habitat, our environmental consultant is recommending against any human access through the creek corridor. As I mentioned, that is why we're in this strange situation with the City wanting us to show a pathway along the creek corridor, but not necessarily crossing it, even though the pathway would run through Species at Risk habitat. We dedicated the creek corridor to the City back in 2012, so we no longer own the property. Our position is that the City should seek all the approvals required from the Province to do the pathway – if it would even be permitted. As for lighting, none is proposed along the property line and all onsite lighting must have the required cut-off to prevent light spillage onto neighbouring properties.

I hope this is helpful and if you require anything further, then by all means let me know...happy to assist. Thank you again and talk soon.

Kevin



Kevin A. Harper, AICP, MCIP, RPP, LEED AP
Development Manager - High Rise
MINTO COMMUNITIES - CANADA
200-180 Kent St, Ottawa, ON K1P 0B6
T 613.751.2857
A division of The Minto Group

From: Michelle Bainbridge [mailto:blueheroncoop@bellnet.ca]
Sent: May-07-19 11:54 AM
To: Kevin A. Harper <KHarper@minto.com>
Cc: John Wilker-Blakley <march.priest@rogers.com>; 'Thomas Cousins' <cousins247@gmail.com>
Subject: RE: 762 March -- Drainage Condition Along Shared Property Line

Hi Kevin,

Thank you for the clarification. I have included Pastor John Wilker-Blakley and Tom Cousins of the Parish of March on this email since we lease the land from the Parish.

Our Board reviewed the proposed development and agreed to the proposed plan as you have described.

However, our Board has a clarification and a question to ask of you:

1. In the previous plan there was a sidewalk for public access and access to cross Shirley's Brook and we discussed this during our site visit last week. A desire for a sidewalk is of great interest for us and our children to be able to walk to Sandhill Road.

I explained to my Board that the flood plain and creek are property of the City of Ottawa and that no development will be part of your plan due to the designation of Blanding turtle habitat. However, I am still relaying their interest to you to see if there is a possibility of this being considered.

2. What kind of lighting is being proposed for the shared property line, where will light posts be placed and will there be requirement to reduce "backsplash" from our parking lot lighting?

Hoping to hear back from you soon,

Michelle Bainbridge
Co-ordinator
Blue Heron Co-operative Homes, Inc.
613-254-7492

From: Kevin A. Harper [<mailto:KHarper@minto.com>]

Sent: Friday, May 03, 2019 1:37 PM

To: 'Michelle Bainbridge'

Cc: awilliams@jrichards.ca

Subject: RE: 762 March -- Drainage Condition Along Shared Property Line

Good afternoon, Michelle. Thank you again for taking the time to meet with Annie and me yesterday morning on this. I have a couple of minor comments on your summary as follows:

Item 2: the trees/shrubs be removed up to the 30m setback line from the normal high water mark of Shirley's Brook (areas within the 30m setback are Category 2 habitat for the Blandings Turtle).

Item 3: The base of the grass slope will start right at the property line (matching existing PL grades) and incline steeply up to the proposed parking lot curb. We are not proposing any fill material on the Blue Heron property.

Item 4: Only the drainage from the grassed areas along the property line (1.0m in width) and the grassed area south of Block TE-3 will drain into the Blue Heron ditch.

I hope this clarifies things a bit more. If you have any questions at all then please let me know. Thank you again and enjoy the weekend.

Kevin



Kevin A. Harper, AICP, MCIP, RPP, LEED AP
Development Manager - High Rise
MINTO COMMUNITIES - CANADA
200-180 Kent St, Ottawa, ON K1P 0B6
T 613.751.2857
A division of The Minto Group

From: Michelle Bainbridge [<mailto:blueheroncoop@bellnet.ca>]
Sent: May-02-19 1:23 PM
To: Kevin A. Harper <KHarper@minto.com>
Cc: awilliams@jrichards.ca
Subject: RE: 762 March -- Drainage Condition Along Shared Property Line

Hi Kevin,

I prepared a summary of our meeting this morning and have attached it for your review to ensure I have the main points we discussed correct. Please confirm that they are and then I will forward it to the property owner for the Church and to my board for their meeting on Monday night.

The company we used for the retaining wall is Ashton Landscaping and the contact info I have for them is Sandra Hall at office@ashtonlandscape.com or call the office at 613-836-6424.

However, and unfortunately, according to their Facebook page they are permanently closed.

Michelle Bainbridge
Co-ordinator
Blue Heron Co-operative Homes, Inc.
613-254-7492

From: Kevin A. Harper [<mailto:KHarper@minto.com>]
Sent: Monday, April 22, 2019 12:39 PM
To: 'blueheroncoop@bellnet.ca'
Subject: 762 March -- Drainage Condition Along Shared Property Line

Good afternoon, Michelle. I hope you're enjoying our recent signs of spring...long overdue to be sure! I just wanted to touch base with you regarding how we propose to deal with the grading and drainage along our shared property line. In order to tie into the existing grade along the shared property line, we're proposing that the 1.0m width along the property line drain toward the existing ditch along your side of the property line. This represents an area of 0.009 ha and a 1:100 year peak flow of 0.9 L/s. I've attached a drawing of how it would work.

We have sought and received permission from our new neighbour to the north to handle the drainage in this manner along the northern property line. Although what we're proposing very likely represents the existing condition and is a typical request in situations such as this, I wanted to formally seek your permission before finalizing the grading and drainage in this area of the site.

Please review and make me aware of any questions or concerns. An email confirmation from the Board is all we would from you. Thank you and talk soon.

Kevin



Development Manager - High Rise
MINTO COMMUNITIES - CANADA
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City Correspondence for March Road Crossing

Annie Williams

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: Monday, May 13, 2019 9:32 AM
To: Lucie Dalrymple; Bougadis, John; Moodie, Derrick
Cc: Annie Williams; Kevin A. Harper; Thomas Couper; McCreight, Laurel
Subject: RE: 762 March Rd - watermain looping

Hi Lucie,

What you are proposing is acceptable to the City. Please make the appropriate changes and submit hard copies to the City for our review. You can submit the hard copies now or submit it at the time of next submission.

Thanks,

Santhosh

From: Lucie Dalrymple <ldalrymple@jlrichards.ca>
Sent: May 09, 2019 4:55 PM
To: Bougadis, John <John.Bougadis@ottawa.ca>; Moodie, Derrick <Derrick.Moodie@ottawa.ca>
Cc: Annie Williams <awilliams@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>; Thomas Couper <TCouper@minto.com>; Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Subject: FW: March Rd - watermain looping

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Hi John and Derrick,

Derrick:

Sorry for the late reply. The reason I did not respond earlier is that we may have found a more feasible solution which may address concerns and requirements from both the City and Minto.

John:

Would you please review the attached propose watermain loop across March Road (from the subject property to Mersey Drive) and call Annie or I to discuss. Note that should this concept be acceptable to the City, we would propose to also reconstruct the sanitary stub across March Road (to the correct depth) simultaneously with the installation of the watermain and carry out the restatement of March Road in one road cut. With this concept, we would not have to excavate the sanitary sewer on Mersey Dr (originally anticipated to be +/- 60m) to lower it such to accommodate the capped stub which was previously installed on March Road by others.

Thank you,

Lucie

Lucie Dalrymple, P.Eng.
Associate
Senior Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



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From: Moodie, Derrick <Derrick.Moodie@ottawa.ca>

Sent: May 3, 2019 2:57 PM

To: Lucie Dalrymple <ldalrymple@jlrichards.ca>; 'kevin.harper@minto.com' <kevin.harper@minto.com>

Cc: Bougadis, John <John.Bougadis@ottawa.ca>; Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>; McCreight, Laurel <Laurel.McCreight@ottawa.ca>

Subject: March Rd

Hi Lucie,

It seems we have an issue that just doesn't want to go away, with respect to the water service for Minto's sites on Sandhill and March Rd.

I really don't see our water division softening in their position related to having a secondary feed for each of these developments. I appreciate that it is 'expensive' to provide a connection to Klondike or crossing under the creek. However, I have no reference point to what 'expensive' really means. Do you have any specifics on what we are talking about for each of these solutions?

The flip side of this issue is that it is 'expensive' for our operations to provide temporary service to these developments every time they want to isolate the main on March Road, and they aren't very interested in deviating from their standards in order to incur these additional ongoing costs. I will also be seeking some understanding of what 'expensive' means in this regard as well.

Derrick

,

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City Checklist

MINTO COMMUNITIES INC., MORGAN'S CREEK, 762 MARCH ROAD

DEVELOPMENT SERVICING STUDY CHECKLIST

REFERENCED STUDIES AND REPORTS	REFERENCE
Site Servicing Report, Minto Communities Inc., Morgan's Creek Stage 1, 762 March Road (J.L. Richards & Associates Limited, December 2018)	SR
Kanata North Environmental / Stormwater Management Plan (CH2M Gore & Storrie, 2001)	EMP
March Road Reconstruction - Morgan's Grant Way to Old Carp Road (Halton Terrace Extension) Drainage Design Brief	MR
Shirley's Brook Floodplain Analysis and Stormwater Management Report (Novatech Engineering Consultants Ltd., November 2006)	SBFP
Shirley's Brook SWM Facility 'C' Detailed Design Report (Novatech Engineering Consultants Ltd., November 2006)	SBC
Klondike Road Lands Stormwater Management Study (Novatech Engineering Consultants Ltd., October 2007)	KRSWM
Letter-type Report regarding 'Briar Ridge Phase 2 – Sandhill Road' (IBI Group, June 16, 2009)	BRP2
Geotechnical Investigation, Proposed Residential Development, 760 March Road, Ottawa, Ontario for Minto Communities, Report Number PG2234-2 Revision 1 (Paterson Group, November 9, 2018)	GR

4.1	GENERAL CONTENT	REFERENCE
<input type="checkbox"/>	Executive Summary (for larger reports only).	N/A
<input checked="" type="checkbox"/>	Date and revision number of the report.	SR (Title Page)
<input checked="" type="checkbox"/>	Location map and plan showing municipal address, boundary, and layout of proposed development.	Site Servicing Plan S1
<input checked="" type="checkbox"/>	Plan showing the site and location of all existing services.	Site Servicing Plan S1
<input checked="" type="checkbox"/>	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	SR (Section 1)
<input checked="" type="checkbox"/>	Summary of Pre-consultation Meetings with City and other approval agencies.	SR (Section 1, Appendix 'A')

<input checked="" type="checkbox"/>	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 defensible design criteria.	EMP MR KRSWM BRP2
<input checked="" type="checkbox"/>	Statement of objectives and servicing criteria.	SR (Section 3, 4, 5)
<input checked="" type="checkbox"/>	Identification of existing and proposed infrastructure available in the immediate area.	SR (Section 1) Site Servicing Plan S1
<input checked="" type="checkbox"/>	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).	EMP MR KRSWM
<input checked="" type="checkbox"/>	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.	SR (Section 5) Grading Plan G1 Ponding Plan SWM
<input type="checkbox"/>	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
<input type="checkbox"/>	Proposed phasing of the development, if applicable.	N/A
<input checked="" type="checkbox"/>	Reference to geotechnical studies and recommendations concerning servicing.	SR (Section 2)
<input checked="" type="checkbox"/>	All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> ▪ 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 	All Drawings

4.2	DEVELOPMENT SERVICING REPORT: WATER	REFERENCE
<input type="checkbox"/>	Confirm consistency with Master Servicing Study, if available.	N/A
<input checked="" type="checkbox"/>	Availability of public infrastructure to service proposed development.	SR (Section 1) Site Servicing Plan S1
<input checked="" type="checkbox"/>	Identification of system constraints.	SR (Section 3)
<input checked="" type="checkbox"/>	Identify boundary conditions.	SR (Section 3, Appendix 'B')

<input checked="" type="checkbox"/>	Confirmation of adequate domestic supply and pressure.	SR (Section 3, Appendix 'B')
<input checked="" type="checkbox"/>	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.	SR (Section 3, Appendix 'B')
<input checked="" type="checkbox"/>	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.	SR (Section 3, Appendix 'B')
<input type="checkbox"/>	Definition of phasing constraints. Hydraulic modelling is required to confirm servicing for all defined phases of the project, including the ultimate design.	N/A
<input type="checkbox"/>	Address reliability requirements, such as appropriate location of shutoff valves.	N/A
<input type="checkbox"/>	Check on the necessity of a pressure zone boundary modification.	N/A
<input checked="" type="checkbox"/>	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.	SR (Section 3, Appendix 'B')
<input checked="" type="checkbox"/>	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.	SR (Section 3, Appendix 'B') Site Servicing Plan S1
<input type="checkbox"/>	Description of off-site required feeder mains, 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
<input checked="" type="checkbox"/>	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	SR (Section 3)
<input checked="" type="checkbox"/>	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	SR (Appendix 'B')

4.3	DEVELOPMENT SERVICING REPORT: WASTEWATER	REFERENCE
<input checked="" type="checkbox"/>	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).	SR (Section 4)
<input type="checkbox"/>	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A

<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	SR (Section , 4, Appendix 'C')
<input checked="" type="checkbox"/>	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.)	BRP2 SR (Section 4)
<input checked="" type="checkbox"/>	Calculations related to dry weather and wet weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	SR (Appendix 'C')
<input checked="" type="checkbox"/>	Description of proposed sewer network, including sewers, pumping stations and forcemains.	SR (Section 4) Site Servicing Plan S1 Sanitary Drainage Plan D-SAN
<input type="checkbox"/>	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
<input type="checkbox"/>	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/>	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/>	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
<input type="checkbox"/>	Special considerations, such as contamination, corrosive environment, etc.	N/A

4.4	DEVELOPMENT SERVICING REPORT: STORMWATER	REFERENCE
<input checked="" type="checkbox"/>	Description of drainage outlets and downstream constraints, including legality of outlets (i.e., municipal drain, right-of-way, watercourse, or private property).	EMP MR KRSWM BRP2 SR (Section 5)
<input checked="" type="checkbox"/>	Analysis of available capacity in existing public infrastructure.	SBC MR KRSWM BP2

<input checked="" type="checkbox"/>	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Servicing Plan S1 Storm Drainage Plan D-STM Ponding Plan SWM
<input checked="" type="checkbox"/>	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.	SR (Section 5)
<input checked="" type="checkbox"/>	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	SR (Section 5)
<input checked="" type="checkbox"/>	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	SR (Section 5)
<input type="checkbox"/>	Setback from private sewage disposal systems.	N/A
<input checked="" type="checkbox"/>	Watercourse and hazard lands setbacks.	SBFP
<input checked="" type="checkbox"/>	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	SR (Section 1)
<input checked="" type="checkbox"/>	Confirm consistency with subwatershed and Master Servicing Study, if applicable study exists.	SR (Section 5)
<input checked="" type="checkbox"/>	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	SR (Section 5, Appendix 'D')
<input checked="" type="checkbox"/>	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	EMP MR KRSWM Erosion & Sedimentation Control Plan ESC
<input checked="" type="checkbox"/>	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.	SR (Section 5)
<input type="checkbox"/>	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
<input checked="" type="checkbox"/>	Proposed minor and major systems, including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	SR (Section 5) Site Servicing Plan S1 Ponding Plan SWM
<input type="checkbox"/>	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
<input type="checkbox"/>	Identification of potential impacts to receiving watercourses.	N/A

<input type="checkbox"/>	Identification of municipal drains and related approval requirements.	N/A
<input checked="" type="checkbox"/>	Description of how the conveyance and storage capacity will be achieved for the development.	SR (Section 5) Site Servicing Plan S1 Storm Drainage Plan D-STM Ponding Plan SWM
<input checked="" type="checkbox"/>	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	SBFP SR (Section 5) Grading Plan G1 Ponding Plan SWM
<input checked="" type="checkbox"/>	Inclusion of hydraulic analysis, including hydraulic grade line elevations.	SR (Section 5, Appendix 'D') Plan & Profile Drawings 01-02
<input checked="" type="checkbox"/>	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	SR (Section 6) Erosion & Sedimentation Control Plan ESC
<input checked="" type="checkbox"/>	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.	SBFP
<input type="checkbox"/>	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5	APPROVAL AND PERMIT REQUIREMENTS	REFERENCE
The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development, as well as the relevant issues affecting such approval. The approval and permitting shall include but not be limited to the following:		
<input checked="" type="checkbox"/>	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 Act. 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.	MVCA Approval
<input type="checkbox"/>	Application for Environmental Compliance Approval (ECA) under the Ontario Water Resources Act.	To Follow
<input type="checkbox"/>	Changes to Municipal Drains.	N/A
<input type="checkbox"/>	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation, etc.).	N/A

4.6	CONCLUSION CHECKLIST	REFERENCE
<input checked="" type="checkbox"/>	Clearly stated conclusions and recommendations.	SR (Section 3, 4, 5)

<input type="checkbox"/>	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.	N/A
<input checked="" type="checkbox"/>	All draft and final reports shall be signed and stamped by a Professional Engineer registered in Ontario.	SR All Drawings

Appendix 'B'

Water Distribution System –
Hydraulic Network Analysis

Water Demand and FUS Calculation

Water Demand Calculations
Morgan's Creek (JLR 24566-001)

Site 1 - March Road

No. Duplex Units	60	units
Density	2.3	p/p/u
No. Ppl	138	ppl
Average Day Consumption Rate	350	L/c/d
Average Day Demand	0.56	L/s
Maximum Day Peaking Factor	5.4	x Avg Day (Table 3-3, MOE 2008)
Maximum Day Demand	3.02	L/s
Peak Hour Peaking Factor	8.1	x Avg Day (Table 3-3, MOE 2008)
Peak Hour Demand	4.53	L/s

FUS Fire Flow Calculations - SITE 1 (Terrace Block TE-2 - Duplex)

24566-001 Morgan's Creek - 760 March Road

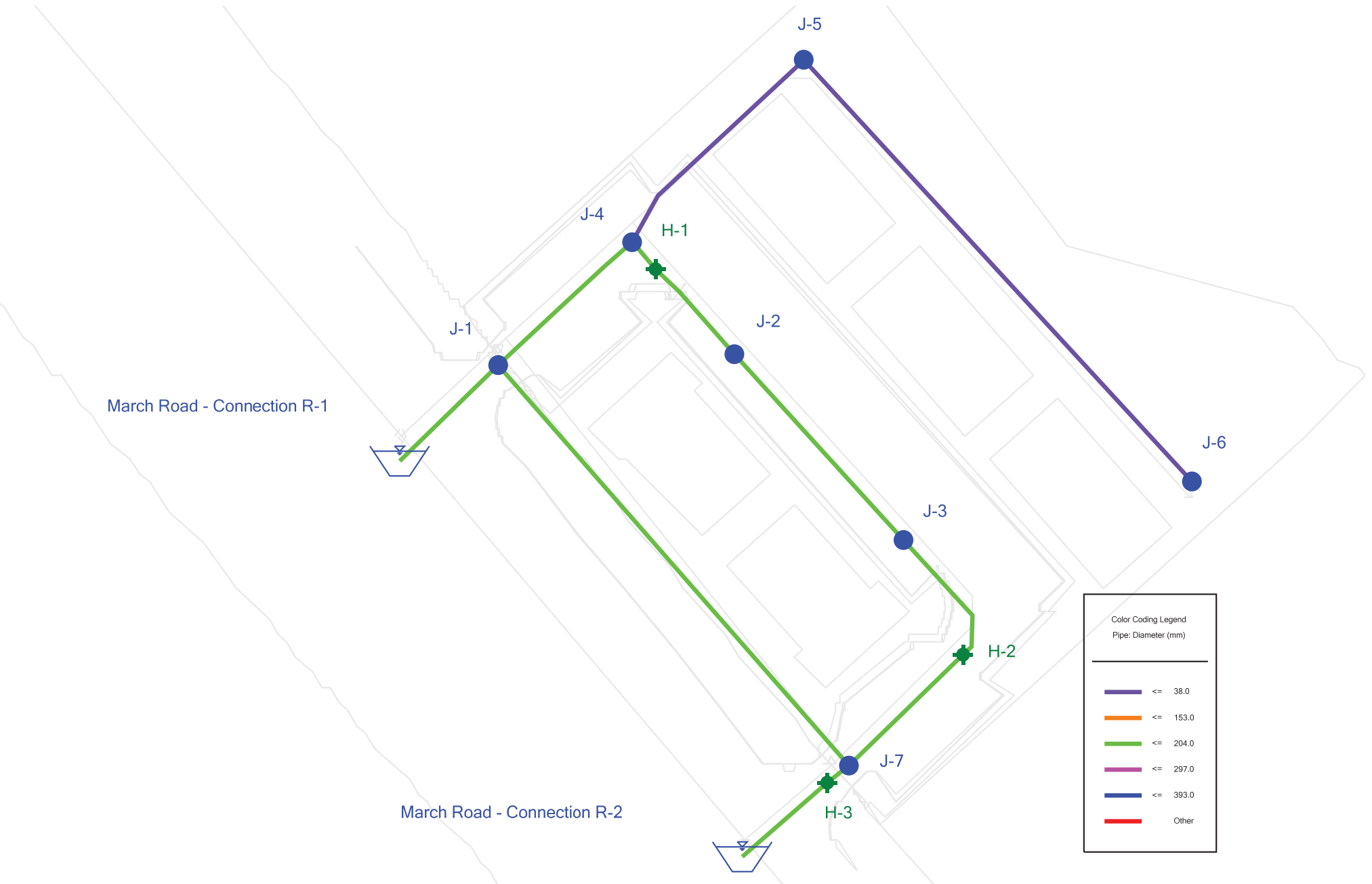
Step	Parameter	Value	Note
A	Type of Construction	Wood Frame	
	Coefficient (C)	1.5	
B	Ground Floor Area	326 m ²	Includes 16 units within fire flow area, separated by less than 3.0 m.
C	Height in storeys	3 storeys	Basements are excluded.
	Total Floor Area	978 m ²	
D	Fire Flow Formula	F=220C ^{0.5} V ^{0.5} A	
	Fire Flow	10320 L/min	
	Rounded Fire Flow	10000 L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible	Residential buildings have a limited combustible occupancy
	Occupancy Charge	-15%	
	Occupancy Increase or Decrease	-1500	
	Fire Flow	8500 L/min	No rounding applied.
F	Sprinkler Protection	None	
	Sprinkler Credit	0%	
	Decrease for Sprinkler	0 L/min	
G	<i>North Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	13.4 m	
	Height of Exposed Wall:	3 storeys	
	Length-Height Factor	40.1 m-storeys	
	Separation Distance	3.8 m	
	North Side Exposure Charge	18%	
	<i>East Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	0.0 m	
	Height of Exposed Wall:	0 storeys	
	Length-Height Factor	0.0 m-storeys	
	Separation Distance	100 m	
	East Side Exposure Charge	0%	
	<i>South Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	13.4 m	
	Height of Exposed Wall:	3 storeys	
	Length-Height Factor	40.1 m-storeys	
	Separation Distance	3.8 m	
	South Side Exposure Charge	18%	
	<i>West Side Exposure</i>		
	Exposing Wall:	Wood Frame	
	Exposed Wall:	Wood Frame	
	Length of Exposed Wall:	9.8 m	
	Height of Exposed Wall:	3 storeys	
	Length-Height Factor	29.5 m-storeys	
	Separation Distance	24.86 m	
	West Side Exposure Charge	8%	
	Total Exposure Charge	44%	The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	3740 L/min	
H	Fire Flow	12240 L/min	
	Rounded Fire Flow	12000 L/min	Flow rounded to nearest 1000 L/min.
City Cap	Required Fire Flow (RFF)	12000 L/min	The City of Ottawa's cap does not apply since these are duplex units.
		200 L/s	

Fire Underwriters Survey (FUS) Fire Flow Calculations

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

Model Schematic

Morgan's Creek Stage 1 Development Model Schematic



City Correspondence and Hydraulic Boundary Conditions

Boundary Conditions for 760 March

Information Provided:

Date provided: November 2018

March Road

Scenario	Demand	
	L/min	L/s
Average Daily Demand	33.6	0.56
Maximum Daily Demand	181.2	3.02
Peak Hour	271.8	4.53
Fire Flow Demand #1	13020	217
Fire Flow Demand #2	16980	283

Sandhill Road

Scenario	Demand	
	L/min	L/s
Average Daily Demand	39.6	0.66
Maximum Daily Demand	189	3.15
Peak Hour	287.4	4.79
Fire Flow Demand #1	13980	233
Fire Flow Demand #2	16980	283

Location:



Results:

Connection 1 - March

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	131.6	74.6
Peak Hour	124.2	64.1
Max Day plus Fire (13,000 l/min)	121.4	60.2
Max Day plus Fire (17,000 L/min)	118.9	56.6

¹ Ground Elevation = 79.1m

Connection 2 - Sandhill

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	131.6	76.9
Peak Hour	124.2	66.4
Max Day plus Fire (14,000 l/min)	117.7	57.2
Max Day plus Fire (17,000 L/min)	114.4	52.5

¹ Ground Elevation = 77.5m

Notes:

- 1) Avoid oversizing local watermains to accommodate large required fire flows (refer to Tech Bulletin ISTDB-2014-02). Servicing studies often use a design fire flow rate of 13,000 L/min to evaluate existing and proposed water distribution systems.
- 2) Connecting site's 1 and 2 with a watermain under Shirley's Brook (refer to site plan) is an attractive option. The watermain will provide sufficient looping and eliminate the "P-Loop" design off Sandhill Road and the need to insert an isolation valve on the existing backbone watermain on March Road (to ensure an uninterrupted supply of water during a planned closure or emergency condition).

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.

Ivan Dzeperoski

From: Annie Williams
Sent: Wednesday, December 12, 2018 12:39 PM
To: Ivan Dzeperoski
Subject: FW: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road
Attachments: 760March_BC_05Dec2018.docx

Annie Williams, EIT
Civil Engineering Intern

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
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From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: December 5, 2018 1:55 PM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>; Lucie Dalrymple <ldalrymple@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Annie,

Attached are the boundary conditions for the 2 connection off March Rd and 2 connections off Sandhill Rd. As stated in the notes, a watermain from March Rd to Sandhill under Shirley's Brook is the preferred design instead of what is currently proposed.

If you wish to discuss, please feel free to contact me.

Regards,
Gabrielle

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Friday, November 30, 2018 9:45 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>; Lucie Dalrymple <ldalrymple@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Since the boundary condition modelling begins on Tuesday, I wanted to provide the minor updates below and attached which correspond with the latest subdivision plan received from Minto. The only change is 60 units in Site 2 (instead of

57). I also re-checked the FUS calculation for Site 2, no change overall. We still wish to request two (2) fire flow boundary conditions for each site, as noted below:

Site 1 (March Road)

Average Day = 0.56 L/s

Maximum Day = 3.02 L/s

Peak Hour = 4.53 L/s

Required Fire Flow (RFF) = 217 L/s AND 283 L/s

Site 2 (Sandhill Road)

Average Day = 0.66 L/s

Maximum Day = 3.15 L/s

Peak Hour = 4.79 L/s

Required Fire Flow (RFF) = 233 L/s AND 283 L/s

This email summarizes the latest information and should be used to run the model on Tuesday.

Should you have any questions, please do not hesitate to contact me.

Thank you,

Annie Williams, EIT
Civil Engineering Intern

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From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: November 29, 2018 2:53 PM
To: Lucie Dalrymple <ldalrymple@jlrichards.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Certainly.

Gabrielle

From: Lucie Dalrymple <ldalrymple@jlrichards.ca>
Sent: Thursday, November 29, 2018 2:52 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Thank you Gabrielle for the update. We will work around that, but would it be possible for you to ask the modeller to start with our request first thing Tuesday upon his return.

Would be greatly appreciated.

Thank you

Lucie

Lucie Dalrymple, P.Eng.
Associate
Senior Civil Engineer

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From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: November 29, 2018 1:54 PM
To: Lucie Dalrymple <ldalrymple@jlrichards.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Lucie,

Unfortunately, Tuesday is the earliest our modelling group can get BCs back to me. One modeler is away until then and the other is in meetings all three days (today, tomorrow and Monday). If you wish to proceed, I will accept the first submission with either: using the old BCs, or no boundary conditions/watermain sizing analysis. Additionally, I will accept a revised Water Servicing section and Water Appendix via email after the formal submittal has been made, but before review, comments are issued.

I hope these options help at this time.

Regards,
Gabrielle

From: Lucie Dalrymple <ldalrymple@jlrichards.ca>
Sent: Thursday, November 29, 2018 12:22 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Guy Forget <gforget@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Unfortunately, the timing in which the boundary conditions will be available (next Tuesday per your email) presents a significant delivery problem from the team of consultants. We have been coordinating this request with the City since October 26, 2018. There was approximately one month lost due to the uncertainty of the existence of the two watermain stubs off of March Road, which was discussed at the August 22, 2018 pre-consultation meeting and which was confirmed in the meeting minutes issued on August 29th, 2018 (copy attached).

We understand that it is not you personally calculating the boundary condition, so would you please assist us in coordinating with the responsible City staff to see if these boundary conditions provided to JLR no later than end of day tomorrow? It would be greatly appreciated.

There is a lot of coordination efforts on all consultants to prepared a complete submission and when one study cannot be completed at the same time as all others, it presents issues. As Annie mentioned, the submission was to be issued tomorrow (based on a 3 week turn around for the boundary condition requested on October 26, 2018). We managed to push the submission date forward to next Friday, which means that the boundary conditions must be received this week.

Please advise if the BC can be provided sooner than next Tuesday.

We appreciate your assistance.

Thank you,

Lucie

Lucie Dalrymple, P.Eng.

Associate

Senior Civil Engineer

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From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: November 29, 2018 11:57 AM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Annie,

I touched base with our modelling group. I am expecting to receive the BCs Tuesday.

Gabrielle

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Thursday, November 29, 2018 11:43 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Per my voicemail from this morning, please let us know when we can expect to receive these boundary conditions.

As mentioned, our original deadline for the March Road design was tomorrow and we have shifted it to next week. We need to prepare our detailed water servicing design within the next few days.

Feel free to give me a call if there is something holding this up.

Thank you,

Annie Williams, EIT
Civil Engineering Intern

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From: Annie Williams
Sent: November 26, 2018 2:05 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Following our phone conversation, I have attached the revised water demand calculations. As noted, the Site 2 plan has changed slightly to accommodate 57 units.

Thank you,

From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: November 26, 2018 11:40 AM
To: Annie Williams <awilliams@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Annie,

I just completed my review. FUS calcs look good. Domestic calcs need revision:

- Since each population is less than 500 person, please use Table 3-3 of the MOE Design Guidelines for Drinking Water Systems to establish peaking factors for both sites. Please either interpolate the peaking factors or utilize the higher peaking factor which is associated with the lower population in the table (i.e. for 138 person you can use the peaking factors for 100 persons since they are higher than the peaking factors for 150 persons)
- The number of units for Site 2 appear to be high. I see 51 units on the plan provided, not 57.

Once I have the revised calcs, I can provide the boundary conditions.

Regards,
Gabrielle

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Friday, November 23, 2018 4:32 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Please let us know if the provided information is sufficient and when we can expect the boundary conditions.

Thank you,

Annie Williams, EIT
Civil Engineering Intern

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From: Annie Williams
Sent: November 22, 2018 10:41 AM
To: 'Schaeffer, Gabrielle' <gabrielle.schaeffer@Ottawa.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

Minto has slightly revised their layout on the Sandhill site so I have revised the domestic demand calculations (attached).

We would also like to request a second boundary condition for fire flow on each of the sites for 17,000 L/min (283 L/s). The City has indicated previously that the boundary conditions can be interpolated should further revisions to the draft plan occur.

Let me know if you have any questions and when we can expect to receive the boundary conditions.

Thank you,

From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: November 20, 2018 10:08 AM
To: Annie Williams <awilliams@jlrichards.ca>
Subject: RE: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Annie,

Thanks for your voicemail yesterday. I was unaware that water services were already installed for this site (at least fronting March). As of right now, I will proceed with the proposed double connection to March as previous proposed, however I am waiting on approval from operations so we're not in the clear yet.

Please provide me with supporting calcs for your domestic demand calculations. We're trying to minimize the number of boundary condition requestes we run so we're doing the water review up front and just doing a check that the circumstances are the same in application review.

Regards,
Gabrielle

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Friday, October 26, 2018 4:13 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: McCreight, Laurel <Laurel.McCreight@ottawa.ca>; Guy Forget <gforget@jlrichards.ca>; Lucie Dalrymple

<ldalrymple@jlrichards.ca>; Thomas Couper <TCouper@minto.com>; Kevin A. Harper <KHarper@minto.com>

Subject: Request for Hydraulic Boundary Conditions - Morgan's Creek - 760 March Road

Hi Gabrielle,

We would like to obtain updated hydraulic boundary conditions in support of a Site Plan Application for Minto's development of a residential site (Morgan's Creek) located at 760 March Road in the City of Ottawa (refer to attached Site Plan).

The City previously provided hydraulic boundary conditions for this site back in 2011 (attached). Approvals for the site were granted under Site Plan control; however, the site was never developed. Since that time, the Site Plan has been slightly revised though the general concept remains as follows:

The site is bisected by Shirley's Brook with the western portion (Site 1) fronting onto March Road and the eastern portion (Site 2) fronting onto Sandhill Road. Site 1 includes 60 terrace (duplex) units and is proposed to be serviced from two (2) connections to the existing March Road 400 mm diameter watermain. Site 2 includes 51 row townhouse units and is proposed to be serviced from two (2) connections to the existing 300 mm diameter watermain on Sandhill Road.

We request hydraulic boundary conditions for both Site 1 and Site 2 along the existing watermains at the proposed site entrances (as depicted on the Site Plan).

Based on the City Design Guidelines, the following demands are anticipated:

Site 1

Average Day = 0.56 L/s

Maximum Day = 1.40 L/s

Peak Hour = 3.07 L/s

Required Fire Flow (RFF) = 217 L/s

Site 2

Average Day = 0.56 L/s

Maximum Day = 1.40 L/s

Peak Hour = 3.07 L/s

Required Fire Flow (RFF) = 233 L/s

Furthermore, if static conditions are expected to fluctuate between existing and future build-out conditions, we would like to obtain both.

The RFF was calculated in accordance with the City Design Guidelines for Water Distribution and associated Technical Bulletins, including the latest ISTB-2018-02. Detailed calculations are attached.

Should you have any questions or require any further information, please do not hesitate to contact me.

Thank you,

Annie Williams, EIT
Civil Engineering Intern

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012



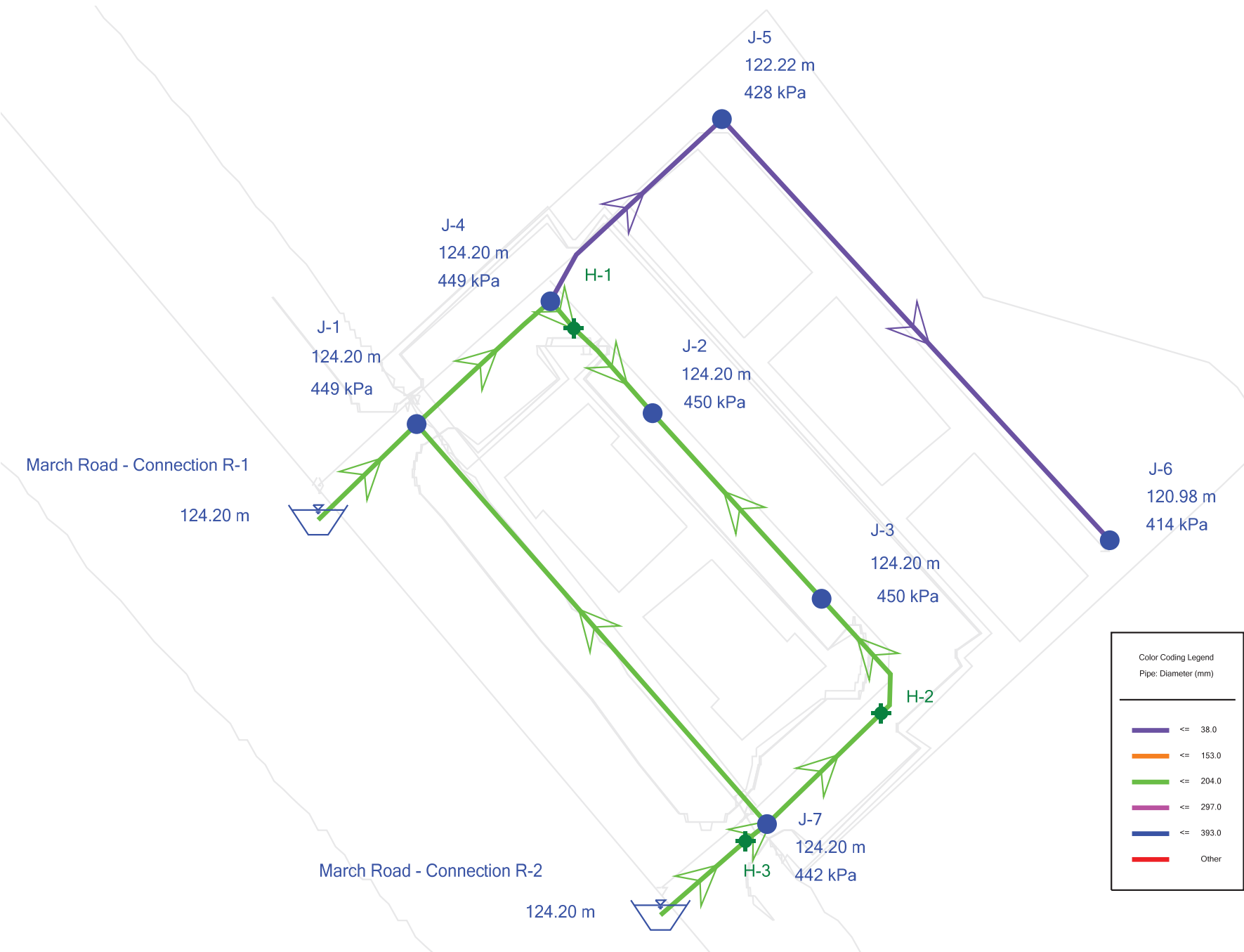
**J.L. Richards
& Associates Limited**
ENGINEERS • ARCHITECTS • PLANNERS



This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Simulation Results – Peak Hour Demand

Morgan's Creek Stage 1 Development
Peak Hour Demand



Morgan's Creek Stage 1 Development
Peak Hour Demand
Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-6	78.65	0.69	120.98	414
J-5	78.50	0.69	122.22	428
J-7	79.01	0.46	124.20	442
J-4	78.33	0.00	124.20	449
J-1	78.33	0.46	124.20	449
J-2	78.26	1.15	124.20	450
J-3	78.24	1.15	124.20	450

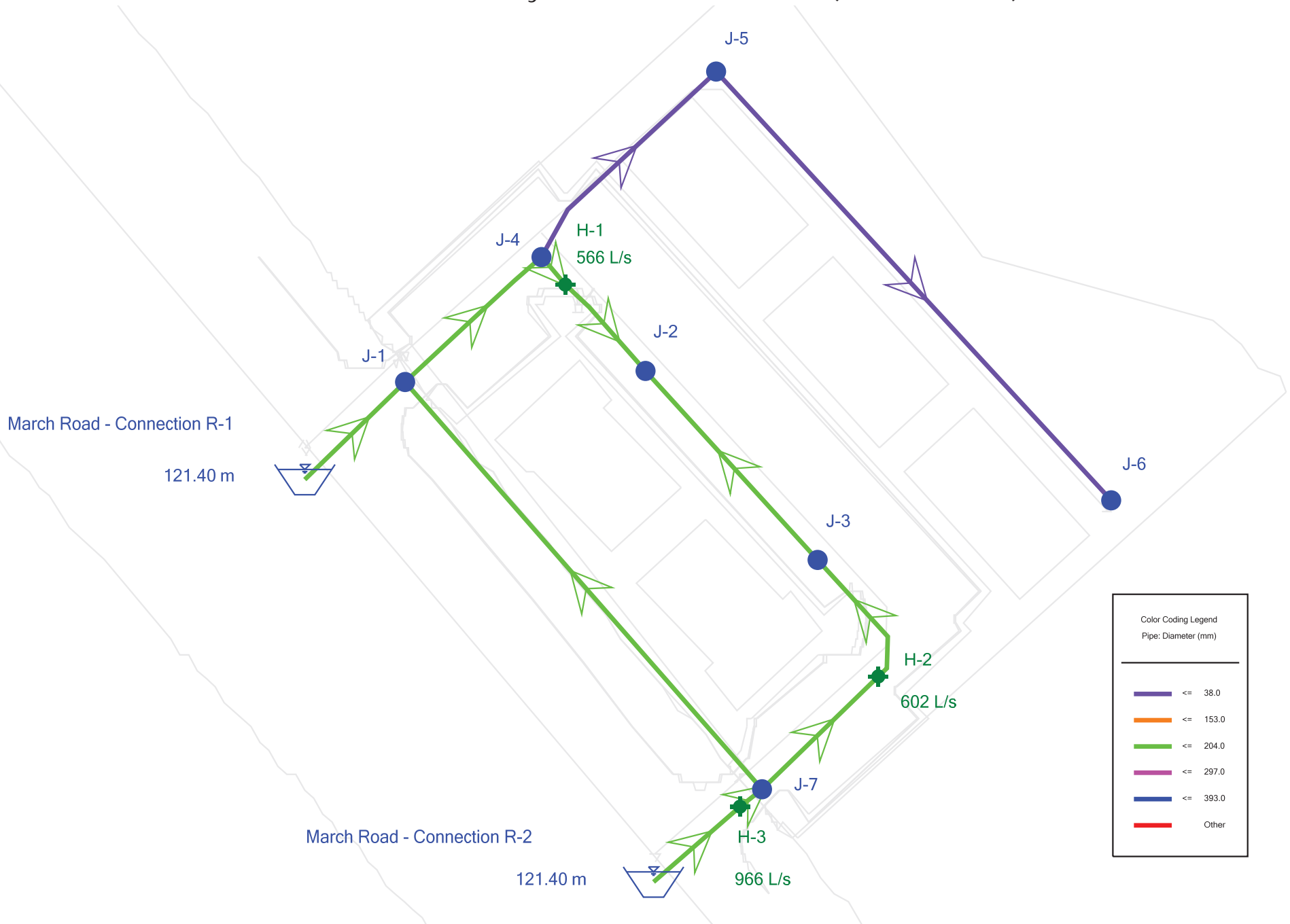
Morgan's Creek Stage 1 Development
Peak Hour Demand
Pipe Table

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-25	83	38.0	Copper	130.0	122.22	120.98	0.69	0.61
P-24	36	38.0	Copper	130.0	124.20	122.22	1.38	1.22
P-17(1)	17	204.0	PVC	110.0	124.20	124.20	0.69	0.02
P-17(2)	36	204.0	PVC	110.0	124.20	124.20	-0.46	0.01
P-22(2)	5	204.0	PVC	110.0	124.20	124.20	0.69	0.02
P-22(1)	26	204.0	PVC	110.0	124.20	124.20	2.07	0.06
P-18	21	204.0	PVC	110.0	124.20	124.20	-1.61	0.05
P-23(2)	23	204.0	PVC	110.0	124.20	124.20	1.61	0.05
P-14	20	204.0	PVC	110.0	124.20	124.20	2.34	0.07
P-26	77	204.0	PVC	110.0	124.20	124.20	0.19	0.01
P-23(1)	4	204.0	PVC	110.0	124.20	124.20	2.26	0.07
P-21	16	204.0	PVC	110.0	124.20	124.20	-2.26	0.07

Simulation Results – Maximum Day plus Fire Flow

Morgan's Creek Stage 1 Development

Max Day Demand + Fire Flow (12,000 L/min)

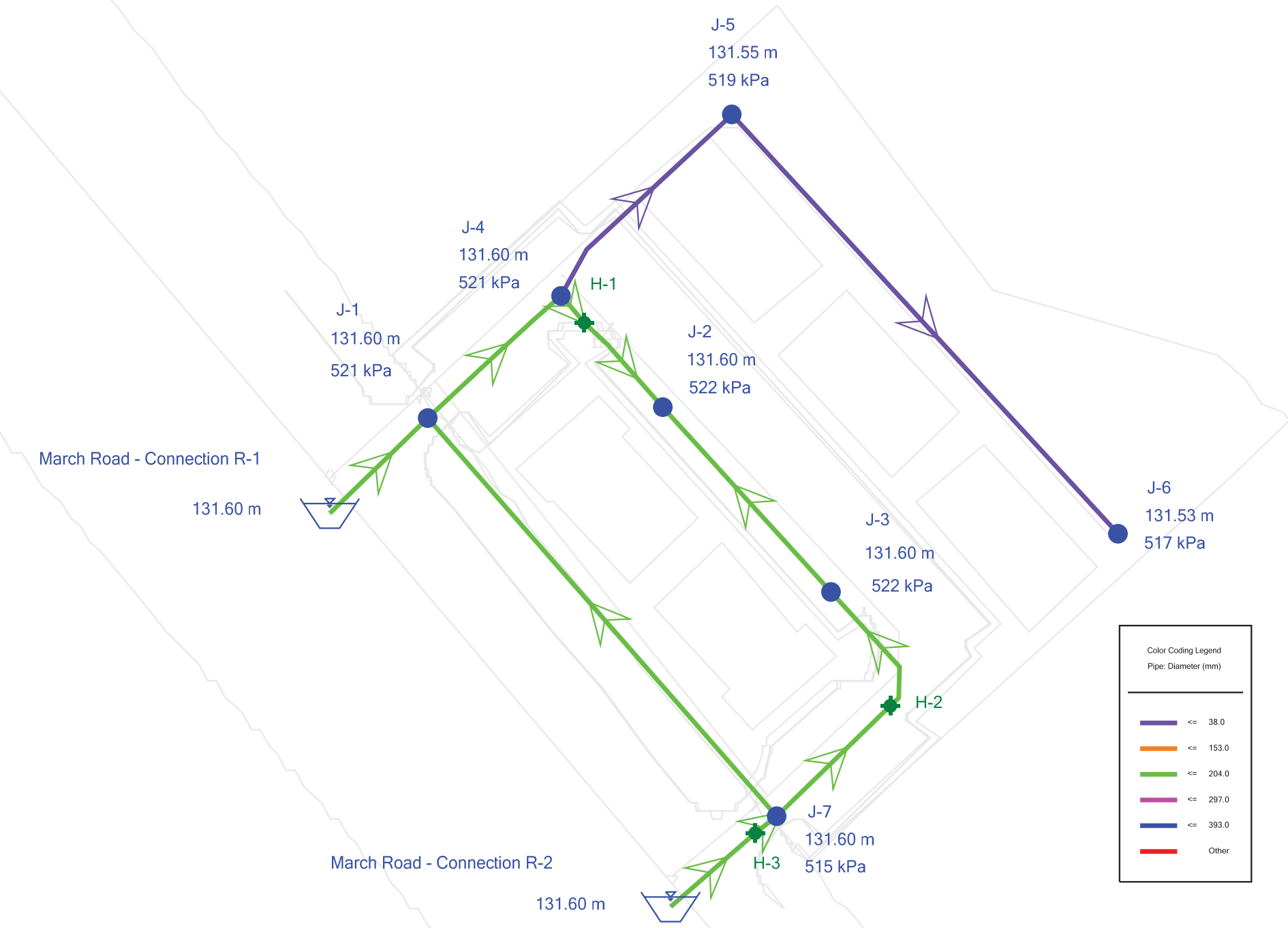


Morgan's Creek Stage 1 Development
Max Day Demand + Fire Flow (12,000 L/min)

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Satisfies Fire Flow Constraints?	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Junction w/ Minimum Pressure (System)
H-2	217	602	602	True	140	140	J-3
H-3	217	966	966	True	140	140	J-7
H-1	217	566	566	True	140	140	J-6

Simulation Results – High Pressure Check

Morgan's Creek Stage 1 Development
High Pressure Check



Morgan's Creek Stage 1 Development
High Pressure Check
Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-6	78.65	0.09	131.53	517
J-5	78.50	0.09	131.55	519
J-3	78.24	0.14	131.60	522
J-2	78.26	0.14	131.60	522
J-4	78.33	0.00	131.60	521
J-1	78.33	0.06	131.60	521
J-7	79.01	0.06	131.60	515

Morgan's Creek Stage 1 Development
High Pressure Check
Pipe Table

Label	Length (Scaled) (m)	Diameter (mm)	Material	Hazen-Williams C	Hydraulic Grade (Start) (m)	Hydraulic Grade (Stop) (m)	Flow (L/s)	Velocity (m/s)
P-25	83	38.0	Copper	130.0	131.55	131.53	0.09	0.08
P-24	36	38.0	Copper	130.0	131.60	131.55	0.18	0.16
P-17(1)	17	204.0	PVC	110.0	131.60	131.60	0.08	0.00
P-17(2)	36	204.0	PVC	110.0	131.60	131.60	-0.06	0.00
P-22(1)	26	204.0	PVC	110.0	131.60	131.60	0.26	0.01
P-22(2)	5	204.0	PVC	110.0	131.60	131.60	0.08	0.00
P-18	21	204.0	PVC	110.0	131.60	131.60	-0.20	0.01
P-23(2)	23	204.0	PVC	110.0	131.60	131.60	0.20	0.01
P-14	20	204.0	PVC	110.0	131.60	131.60	0.29	0.01
P-26	77	204.0	PVC	110.0	131.60	131.60	0.02	0.00
P-23(1)	4	204.0	PVC	110.0	131.60	131.60	0.29	0.01
P-21	16	204.0	PVC	110.0	131.60	131.60	-0.29	0.01

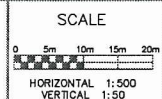
Appendix 'C'

Sanitary Sewer Design

Morgan's Grant As-Constructed

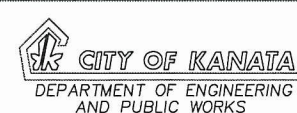
[illegible]

					5	04/12/98	REAR YARD DRAINAGE REVISED	D.S.
					4	04/11/98	REAR YARD CATCH BASIN LEAD CLASS REVISED, CB/WH AND WH BOZA ADDED	D.S.
8	28/04/00	AS RECORDED INFO. ADDED	D.S.	3	30/09/98	WATERMAN AND HYDRANTS REVISED AS PER R.M.C.C. COMMENTS	D.S.	
7	21/07/99	RELOTING OF WESTMEATH CR., NERSEY DR. AND WILTON AVE.	D.S.	2	14/09/98	REAR LOT DRAINAGE REVISED	D.S.	
6	18/2/99	NEW LOT NUMBERS AND STREET NAMES ADDED	D.S.	1	24/07/98	ISSUED FOR MOE APPROVAL	D.S.	



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

DESIGN	
CHECKED	D.S.
DRAWN	MHL
CHECKED	
APPROVED	



MORGAN'S GRANT
PHASE IV
MERSEY DRIVE
PLAN & PROFILE
FROM STA. 0+285 TO STA. 0+480.900
FROM STA. 0+050 TO STA. 0+128.917

DATED	JULY 1998
DWG. No.	16087-11



**MINTO DEVELOPMENTS INC.
MORGAN'S GRANT SUBDIVISION**

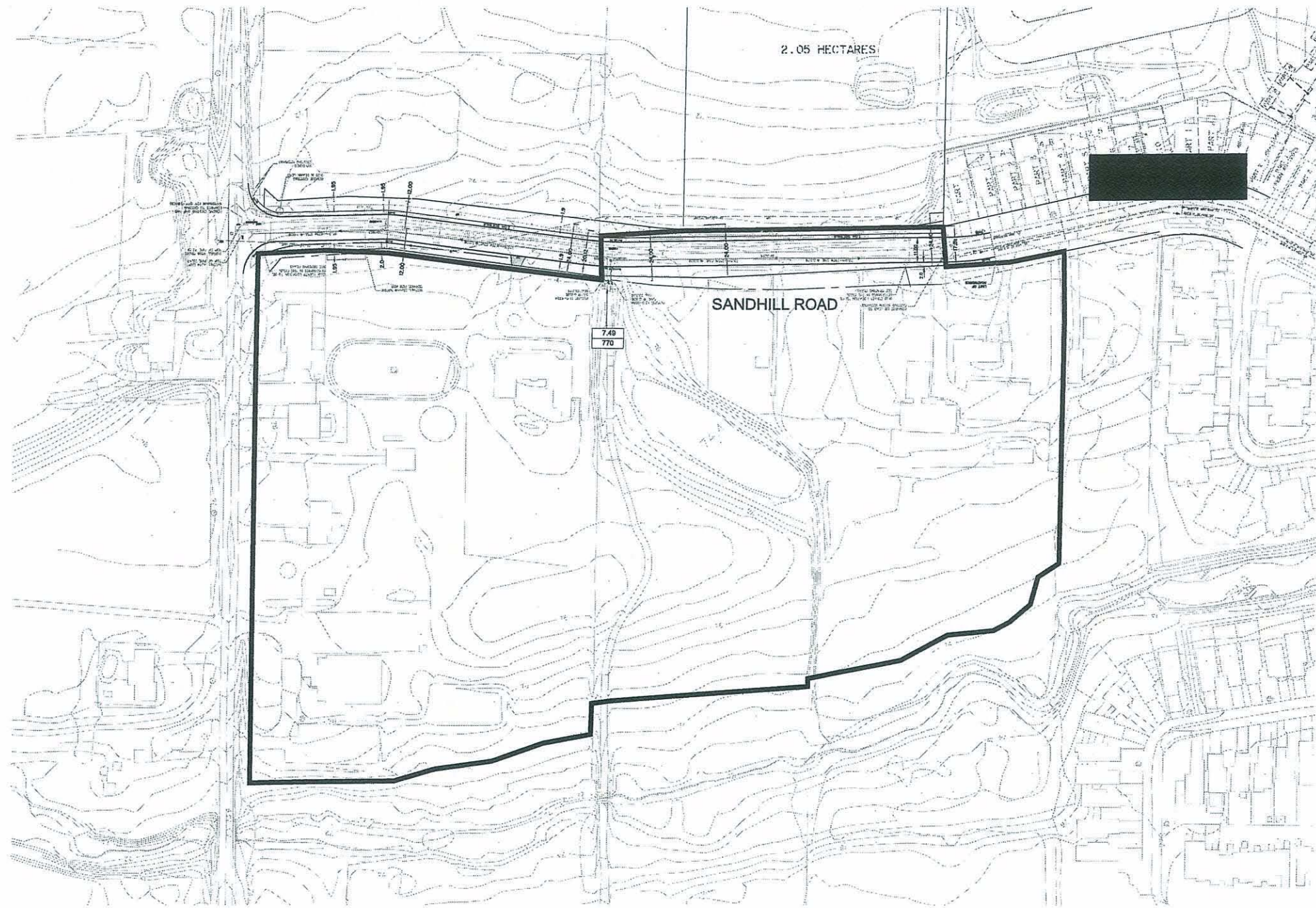
SANITARY SEWER DESIGN SHEET
Rev. No. 0: MOE Submission for Phase 12D - May 11/ 2005
Rev. No. 1: City Comments for Phase 12D - July 11/ 2005
Rev. No. 2: Revised Area for Klondike Commercial Site - Nov. 5, 2007

Designed by: J.B.
Checked by: L.J.

I = 0.280	l/s/ha	q (res) = 350	l/cap/day
Singles = 4.0	pers / unit	q (com) = 50,000	l/ha/day
Townhouses = 4.0	pers / unit	q (inst) = 50,000	l/ha/day

STREET	M.H. #		NO. of UNITS	RESIDENTIAL				NON-RESIDENTIAL				INFIL. FLOW l/s	PEAK FLOW l/s	SEWER DATA						UPSTREAM				DOWNSTREAM			COMMENTS				
	FROM	TO		POPUL. people	AREA ha	CUMMULATIVE POPUL. people	CUMMULATIVE AREA ha	Peaking Factor	POPUL. FLOW l/s	AREA ha	CUMM. AREA ha			Peaking Factor	NON-RES. FLOW (l/s)	DIA. mm	Slope %	CAPAC. l/s	VEL. m/s	LENGTH m	RESIDUAL CAP. (l/s)	Obvert Drop	Obvert	Invert	Cover	Obvert		Invert	Cover		
Whithorn Avenue	116	119		8	0.14	8	0.14	4.00	0.13	0.00	0.00	1.50	0.00	0.04	0.17	200	2.00	48.38	1.49	8.1	48.22										
	119	118		24	0.22	32	0.36	4.00	0.52	0.00	0.00	1.50	0.00	0.10	0.62	200	2.69	56.10	1.73	37.2	55.48										
	118	117		44	0.50	76	0.86	4.00	1.23	0.00	0.00	1.50	0.00	0.24	1.47	200	2.21	50.86	1.57	81.1	49.39										
Westmoreland Avenue	117	110		24	0.31	2600	44.01	3.49	36.81	0.00	5.92	1.50	5.14	12.32	54.27	300	0.42	65.49	0.90	68.8	11.22										
	111	110		12	0.33	12	0.33	4.00	0.19	0.00	0.00	1.50	0.00	0.09	0.29	200	1.91	47.28	1.46	46.0	47.00										
Westmoreland Avenue	110	109		16	0.30	2628	44.64	3.49	37.16	0.00	5.92	1.50	5.14	12.50	54.80	300	0.36	60.31	0.83	66.3	5.51										
	115	114		20	0.32	20	0.32	4.00	0.32	0.00	0.00	1.50	0.00	0.09	0.41	200	4.49	72.51	2.24	51.2	72.10										
	116	114		20	0.30	20	0.30	4.00	0.32	0.00	0.00	1.50	0.00	0.08	0.41	200	0.58	26.06	0.80	64.5	25.65										
	114	113		32	0.40	72	1.02	4.00	1.17	0.00	0.00	1.50	0.00	0.29	1.45	200	0.62	26.94	0.83	72.8	25.49										
	113	112		16	0.32	88	1.34	4.00	1.43	0.00	0.00	1.50	0.00	0.38	1.80	200	0.50	24.24	0.75	67.7	22.44										
	112A	112		16	0.35	16	0.35	4.00	0.26	0.00	0.00	1.50	0.00	0.10	0.36	200	1.00	34.21	1.06	48.0	33.86										
	112	109		16	0.32	120	2.01	4.00	1.94	0.00	0.00	1.50	0.00	0.56	2.51	200	1.71	44.74	1.38	70.0	42.23										
Mersey Drive	109	108		24	0.33	2772	46.98	3.47	38.98	0.00	5.92	1.50	5.14	13.16	57.27	300	0.46	68.74	0.94	68.7	11.46										
Mersey Drive	124	123		28	0.44	28	0.44	4.00	0.45	0.00	0.00	1.50	0.00	0.12	0.58	200	0.55	25.38	0.78	96.3	24.80										
	123	108		32	0.42	60	0.86	4.00	0.97	0.00	0.00	1.50	0.00	0.24	1.21	200	0.59	26.27	0.81	109.2	25.06										
Easement	108	101		0	0.00	2832	47.84	3.46	39.73	0.00	5.92	1.50	5.14	13.40	58.27	375	0.32	103.88	0.91	12.4	45.61										
	127	126		56	0.78	56	0.78	4.00	0.91	0.00	0.00	1.50	0.00	0.22	1.13	200	1.00	34.21	1.06	100.7	33.09										
	126	126A		16	0.19	72	0.97	4.00	1.17	0.00	0.00	1.50	0.00	0.27	1.44	200	0.58	26.06	0.80	13.1	24.62										
	126A	103		0	0.00	72	0.97	4.00	1.17	0.00	0.00	1.50	0.00	0.27	1.44	200	2.83	57.56	1.77	49.8	56.12										
	107	106		12	0.19	12	0.19	4.00	0.19	0.00	0.00	1.50	0.00	0.05	0.25	200	1.00	34.21	1.06	41.0	33.97										
	106	105		36	0.36	48	0.55	4.00	0.78	0.00	0.00	1.50	0.00	0.15	0.93	200	0.58	26.06	0.80	69.9	25.12										
	105	104		32	0.39	80	0.94	4.00	1.30	0.00	0.00	1.50	0.00	0.26	1.56	200	0.58	26.06	0.80	59.2	24.50										
	104	103		4	0.01	84	0.95	4.00	1.36	0.00	0.00	1.50	0.00	0.27	1.63	200	1.00	34.21	1.06	14.9	32.59										
	103	102		0	0.02	156	1.94	4.00	2.53	0.00	0.00	1.50	0.00	0.54	3.07	200	0.58	26.03	0.80	20.1	22.96										
	102	101		0	0.07	156	2.01	4.00	2.53	0.00	0.00	1.50	0.00	0.56	3.09	200	0.58	26.08	0.80	49.0	22.99										
Total from Morgan's Grant Subdivision March Rd (4 pers/unit) Point C	101	STUB		0	0.00	2988	49.85	3.44	41.69	0.00	5.92	1.50	5.14	13.96	60.78	375	0.30	100.18	0.88	1.0	39.39										
				2988	49.85					5.9																					

IBI Group, Sanitary Design



LEGEND:

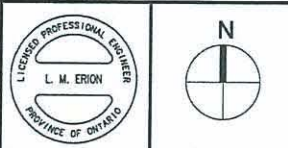
7.49 AREA IN HECTARES
770 POPULATION

14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	ISSUED FOR APPROVAL	08/03/04	
No.	REVISIONS	By	Date

TENTH LINE DEVELOPMENT INC.

IBI GROUP
1770 Woodward Drive
Suite 100
Ottawa, Ontario
Canada K2C 0P6
Tel (613) 225-1311
Fax (613) 225-9968

Project Title
**BRIAR RIDGE
PHASE 2**



Drawing Title
**SANITARY DRAINAGE
AREA PLAN
SANDHILL ROAD**

Scale
1:1000

Design	L.M.E.	Date	MARCH '09
Drawn	M.M.	Checked	R.W.W.
Project No.	10518	Drawing No.	501-1



PROJECT: Briar Ridge Phase 2 - Sandhill Road
LOCATION: City of Ottawa
CLIENT: Tenth Line Development Inc.

J:\10518_BriarRdg2\15.7 Calculations\CCS_Sanitary Sewer Design Sheet_2009-03-05 05/10/2010 11:56 PM

Omniplex Sanitary Info from DSEL

Dec. 15th, 2018

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



Site Area 0.66 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.22 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		0
Stacked Townhouse (Duplex)	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	96	135
2 Bedroom	2.1	88	185
3 Bedroom	3.1	12	38
Average	1.8		0
Total Pop			358

Average Domestic Flow 1.16 L/s

Peaking Factor 3.44

Peak Domestic Flow 3.99 L/s

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	50,000 L/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	1.16 L/s
Total Estimated Peak Dry Weather Flow Rate	3.99 L/s
Total Estimated Peak Wet Weather Flow Rate	4.20 L/s

JLR 2012 Sanitary Design Sheet Submission



MORGAN'S CREEK
760 MARCH ROAD
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR PROJECT NO.: 24566

0.95 L/s peak flow
Allocation for 788
March Rd.

Commercial/Institutional Flow =	50,000	L/day/ha
q =	350	L/cap/d
i =	0.28	L/s/ha
TOWNS HOUSING	2.7	pers/unit
STACKS HOUSING	2.7	pers/unit
SINGLES HOUSING	3.4	pers/unit
Manning's Coefficient (n) =	0.013	

SANITARY SEWER DESIGN SHEET
Designed: K.F.
Checked By: L.D.

Date: May 2012

STREET	SAN MH #		RESIDENTIAL								COM/INST			RES+ COM + INFILTR.		SEWER DATA					UPSTREAM					DOWNSTREAM						
			NUMBER OF UNITS					CUMULATIVE		PEAKING FACTOR	POP. FLOW L/s	AREA ha	CUM. AREA L/s	COM/INST FLOW L/s	PEAK EXTR. FLOW L/s	PEAK DES. FLOW L/s	DIA. mm	SLOPE %	CAPAC. L/s	VEL. (full) m/s	LENGTH m	Center Line	Obvert Drop	Obvert	Invert	Cover	Center Line		Obvert	Invert	Cover	
	SINGLES units	STACKS units	TOWNS units	POP. pers	AREA ha	POP. pers	AREA ha																									
FROM	TO																															
FLOW TO 250mmØ SANITARY - SANDHILL ROAD																																
Morgan's Creek - Private Road	5	4		20		54	0.25	54	0.25	4.00	0.88				0.07	0.95	200	0.33	19.66	0.61	28.40	76.50	0.02	74.81	74.61	1.69	76.75		74.71	74.51	2.04	
Morgan's Creek - Private Road	4	3		24		65	0.29	119	0.5						0.15	2.08	200	0.33	19.66	0.61	50.70	76.75	0.02	74.69	74.49	2.06	76.55		74.53	74.33	2.02	
Morgan's Creek - Private Road	3	2		16		43	0.27	162	0.8						0.23	2.85	200	0.33	19.66	0.61	57.70	76.55	0.02	74.51	74.31	2.04	76.50		74.32	74.12	2.18	
Morgan's Creek - Private Road	2	1		28		76	0.43	238	1.2						0.35	4.20	200	0.33	19.66	0.61	74.20	76.50	0.02	74.30	74.10	2.20	76.85		74.05	73.85	2.80	
Morgan's Creek Private Road/ Sandhill Road	1	EX. 300A		12		32	0.24	270	1.4						0.41	4.79	200	0.41	21.91	0.68	99.10	76.85		74.03	73.83	2.82	76.90		73.63	73.43	3.28	
Sandhill Road	EX. 300A	Ex. 301A			4	11	0.11	281	1.5						0.45	5.00	250	0.29	33.64	0.66	72.80	76.90		73.68	73.43	3.23	77.90		73.46	73.21	4.44	
				100	4	270	1.48																									
<div>SANDHILL ROAD- AS BUILT INFORMATION</div> <div>Ex. Inv @ SANMH 300A (SE) 73.425</div> <div>Ex. Obv @ SANMH 300A(SE) 73.625</div> <div>Information taken from IBI Group As-Built Plans - Briar Ridge Phase 2</div> <div>DWG No. 109-1 , Rev 5 (As-built) - Sandhill Road (Sta. 1+000 to Klondike)</div>																																
LOW TO SANITARY - MARCH ROAD/ MERSEY DRIVE																																
Morgan's Creek - Private Road	8	7		56		151	0.71	151	0.71	4.00	2.45				0.20	2.65	200	0.35	20.24	0.62	75.10	78.60	0.06	76.40	76.20	2.20	78.35		76.14	75.94	2.21	
Morgan's Creek - Private Road	7	6					0.05	151	0.76	4.00	2.45				0.21	2.66	200	0.35	20.24	0.62	31.90	78.35	0.06	76.08	75.88	2.27	78.30		75.97	75.77	2.33	
Commercial Site - 788 March RD	Future Site	6										0.83	0.83	0.72	0.23	0.95	Detailed Design of Commercial Site located at 788 March Road to be completed in future															
Morgan's Creek Private Rd /March Rd/ Mersey Dr	6	9						151	0.76	4.00	2.45		0.83	0.72	0.45	3.62	200	0.67	28.04	0.86	47.08	78.30	0.03	75.91	75.71	2.39	78.70		75.59	75.39	3.11	
Mersey Drive	9	10						151	0.76	4.00	2.45		0.83	0.72	0.45	3.62	200	0.35	20.24	0.62	38.80	78.70		75.56	75.36	3.14	79.02		75.42	75.22	3.59	
Mersey Drive	124	10				4	0.14	4	0.14	4.00	0.06				0.04	0.10	200	0.55	25.38	0.78	33.00	79.27		75.60	75.40	3.66	79.02		75.42	75.22	3.60	
Mersey Drive	10	123				24	0.30	179	1.20	4.00	2.90		0.83	0.72	0.57	4.19	200	0.55	25.38	0.78	63.30	79.02		75.42	75.22	3.60	79.46		75.07	74.87	4.39	
Mersey Drive	123	108				32	0.42	211	1.62	4.00	3.42				0.45	3.88	200	0.59	26.28	0.81	109.20	79.46		75.07	74.87	4.40	80.00		74.42	74.22	5.58	
Mersey Drive	122	121				24	0.38	24	0.38	4.00	0.39				0.11	0.50	200	3.78	66.52	2.05	63.50	84.45		80.40	80.20	4.05	81.82		78.00	77.80	3.82	
Mersey Drive	121	120				24	0.28	48	0.66	4.00	0.78				0.18	0.96	200	2.53	54.43	1.68	68.00	81.82		77.90	77.70	3.92	80.27		76.18	75.98	4.09	
Argent Private	3	2		12		32	0.26	32	0.26	4.00	0.53				0.07	0.60	200	0.90	32.46	1.00	52.70	84.25	0.06	81.66	81.46	2.59	84.20		81.19	80.99	3.01	
Argent Private	2	1A		16		43	0.33	76	0.59	4.00	1.23				0.17	1.39	200	0.90	32.46	1.00	89.20	84.20	0.60	81.13	80.93	3.07	82.45		80.33	80.13	2.12	
Argent Private	3	4		28		76	0.41	76	0.41	4.00	1.23				0.11	1.34	200	0.90	32.46	1.00	69.30	84.25	0.06	80.71	80.51	3.54	82.80		80.09	79.89	2.71	
Argent Private	4	1A		20		54	0.28	130	0.69	4.00	2.10				0.19	2.29	200	0.40	21.64	0.67	74.90	82.80		80.03	79.83	2.77	82.45		79.73	79.53	2.72	
Argent Private	1A	1					0.02	205	1.30	4.00	3.33				0.36	3.69	200	0.90	32.46	1.00	18.50	82.45	0.50	79.73	79.53	2.72	82.45		79.56	79.36	2.89	
Commercial Plaza	1	120A						205	1.30	4.00	3.33				0.36	3.69	250	0.98	61.42	1.21	44.80	82.45	3.05	79.11	78.86	3.34	80.39		78.67	78.42	1.72	
Klondike Rd/ MG Phase 13/ Commercial Piza	Upstream	120A						2432	38.86	3.52	34.66	1.69	4.62	4.01	12.18	50.85	300	0.30	55.26								80.39		75.61	75.31	4.78	
Klondike Commercial Plaza	120A	120						2637	40.16	3.49	37.28		4.62	4.01	12.54	53.83	300	0.97	99.36	1.36	15.80	80.39		75.62	75.31	4.77	80.25		75.47	75.17	4.78	
Westmoreland Avenue	120	117				20	0.33	2705	41.15	3.48	38.14		4.62	4.01	12.82	54.96	300	0.42	65.32	0.90	70.60	80.27	0.01	75.47	75.17	4.80	80.40		75.17	74.87	5.23	
Whithorn Avenue	116	119				8	0.14	8	0.14	4.00	0.13				0.04	0.17	200	2.00	48.39	1.49	8.10	83.34	0.10	79.26	79.06	4.08	83.30		79.10	78.90	4.20	
Whithorn Avenue	119	118				24	0.22	32	0.36	4.00	0.52				0.10	0.62	200	2.69	56.11	1.73	37.20	83.30	0.30	79.00	78.80	4.30	82.32		78.00	77.80	4.32	
Whithorn Avenue	118	117				44	0.50	76	0.86	4.00	1.23				0.24	1.47	200	2.21	50.87	1.57	81.10	82.32	0.75	77.70	77.50	4.62	80.40		75.91	75.71	4.49	
Westmoreland Avenue	117	110				24	0.31	2805	42.32	3.47	39.40		4.62	4.01	13.14	56.55	300	0.42	65.50	0.90	68.80	80.40	0.03	75.16	74.86	5.24	80.80		74.87	74.57	5.93	
Spalding Avenue	111	110				12	0.33	12	0.33	4.00	0.19				0.09	0.29	200	1.91	47.29	1.46	46.00	81.25	0.78	76.50	76.30	4.75	80.80		75.62	75.42	5.18	
Westmoreland Avenue	110	109				16	0.30	2833	42.95	3.46	39.75		4.62	4.01	13.32	57.08	300	0.36	60.32	0.83	66.30	80.80	0.02	74.84	74.54	5.96	80.80		74.60	74.30	6.20	
Mersey Drive	Upstream	109				120	2.01	120	2.01	4.00	1.94				0.56	2.51	200	1.00	34.22								81.85		77.20	77.00	4.65	
Mersey Drive	109	108				24	0.33	2977	45.29	3.45	41.55		4.62	4.01	13.98	59.54	300	0.46	68.74	0.94	68.70	80.80	0.02	74.58	74.28	6.22	79.90		74.26	73.96	5.64	
March Road Easement (West Side)	108	101						3188	46.91	3.42	44.17		4.62	4.01	14.43	62.61	375	0.32	103.89	0.91	12.40	80.00	0.06	74.25	73.87	5.76	80.00		74.21	73.83	5.80	
March Road Easement (West Side)	Upstream	101				156	2.01	156	2.01	4.00	2.53				0.56	3.09	200	0.58	26.08								80.00		74.38	74.18	5.62	



MORGAN'S CREEK
760 MARCH ROAD
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR PROJECT NO.: 24566

Commercial/Institutional Flow =	50,000	L/day/ha
q =	350	L/cap/d
i =	0.28	L/s/ha
TOWNS HOUSING	2.7	pers/unit
STACKS HOUSING	2.7	pers/unit
SINGLES HOUSING	3.4	pers/unit
Manning's Coefficient (n) =	0.013	

SANITARY SEWER DESIGN SHEET
Designed: K.F.
Checked By: L.D.

Date: May 2012

STREET	SAN MH #		RESIDENTIAL										COMINST			RES+ COM + INFILTR.		SEWER DATA					UPSTREAM					DOWNSTREAM			
			NUMBER OF UNITS					CUMULATIVE		PEAKING FACTOR	POP. FLOW L/s	AREA ha	CUM. AREA L/s	COM/INST FLOW L/s	PEAK EXTR. FLOW L/s	PEAK DES. FLOW L/s	DIA. mm	SLOPE %	CAPAC. L/s	VEL. (full) m/s	LENGTH m	Center Line	Obvert Drop	Obvert	Invert	Cover	Center Line		Obvert	Invert	Cover
	FROM	TO	SINGLES units	STACKS units	TOWNS units	POP. pers	AREA ha	POP. pers	AREA ha																						
March Road Crossing	101	15A						3188	46.91	3.42	44.17		4.62	4.01	14.43	62.61	375	0.30	100.18	0.88	47.00	80.00	0.02	74.15	73.77	5.85	79.41		74.00	73.63	5.41
Briar Brook Subdivision	15A	8C						3188	46.91	3.42	44.17		4.62	4.01	14.43	62.61	375	0.31	101.84	0.89	63.20	79.41		73.98	73.61	5.43	78.20		73.79	73.41	4.41

LEGEND	
<div></div>	DENOTES EXISTING SEWERS
<div></div>	DENOTES PROPOSED SEWERS
<div></div>	DENOTES SEWERS FOR THE KLONDIKE CROSSING (SUBMITTED JULY 2011) OR FUTURE SEWERS

KLONDIKE COMMERCIAL SITE- AS BUILT INFORMATION	
Ex. Inv @ SAN MH 120 (Westmoreland Ave)	75.167
Ex. Obv @ SAN MH 120 (Westmoreland Ave)	75.472
Information taken from JLR As-Built Plans -Klondike Commercial Site (Morgan's Grant)	
DWG No. 20668-S1, Rev. 18 (As-Built) - Klondike Commercial Site	

MARCH ROAD- AS BUILT INFORMATION	
Ex. Inv @ INLET (East Blvd) = 75.69	
Ex. Inv @ OUTLET (West Blvd) = 75.40	
As-built Length 43.18, Slope = 0.67 %	
Information taken from Stantec As-Built Plans - March Road Reconstruction	
ISB07-5166 - Dwg. No. 19 , Rev 5 (As-built) - March Rd (Sta 8+200 to 8+500)	

MERSEY DRIVE- AS BUILT INFORMATION	
Ex. Inv @ MH 124(SW) = 75.40	
Ex. Inv @ MH 123 (NW) = 74.87	
Information taken from JLR As-Built Plans - Mersey Drive (Morgan's Grant Phase 4)	
DWG No. 16087-11 , Rev 8 (As-built) - Mersey Drive (Sta 0+285 to Sta 0+480.9)	

Sanitary Stub Correspondence

Guy Forget - RE: March Road - Drainage Area & Stormwater Design Sheet

From: "Chamberlain, Gordon" <gordon.chamberlain@stantec.com>
To: Guy Forget <GForget@JLRICHARDS.CA>
Date: 10/12/2010 2:30 PM
Subject: RE: March Road - Drainage Area & Stormwater Design Sheet
CC: "Foley, Luke" <Luke.Foley@ottawa.ca>, "Lay, Jack" <jack.lay@stantec.com>
Attachments: 760-788 March Rd Sanitary Servicing Plan.pdf

Hi Guy:

Below is the basis which was used for the 200mm dia. pipe.
 It comes from a high level assessment and input on possible development provided by the City.

The available capacity of the downstream sewers (outlet) need to be confirmed.

"According to the City's electronic mapping (attached), the corner property (788 March Road) is zoned commercial, LC7(1523), the second (760 March Road) is zoned DR. Based on the input from the City, the second property is expected to be residential and anticipated to be medium to high density once fully developed.

Given the design flows for sanitary servicing these sites are estimated as follows:

i) Commercial lot (788 March Road): Area = 0.83ha
 $= 50,000 \times 1.5 \times 0.83 / 86,400 + 0.28 \times 0.83 = 0.72 \text{ l/s} + 0.23 \text{ l/s}$
 $= 0.95 \text{ l/s}$

ii) Residential lot (760 March Road): Area = 0.69ha
 Medium Density = 540persons/ha High Density = 1800persons/ha
 Medium density sanitary flow
 $= \text{pop'n} \times 350 \text{ l/cap.da} \times 1 / 86,400 \times \text{PF} + 0.28 \text{ l/s/ha} \times \text{Area}$
 $= ((540 \times 0.69) \times 350 / 86,400) \times (1 + 14 / (4 + ((540 \times 0.69) / 1000)^{0.5})) \times 1 + 0.28 \times 0.69$
 $= (372.6 \times 350 / 86,400) \times 4 \times 1 + 0.19$
 $= 6.23 \text{ l/s}$

High density sanitary flow
 $= \text{pop'n} \times 350 \text{ l/cap.da} \times 1 / 86,400 \times \text{PF} + 0.28 \text{ l/s/ha} \times \text{Area}$
 $= ((1800 \times 0.69) \times 350 / 86,400) \times (1 + 14 / (4 + ((1800 \times 0.69) / 1000)^{0.5})) \times 1 + 0.28 \times 0.69$
 $= (1242 \times 350 / 86,400) \times 3.737 \times 1 + 0.28 \times 0.69$
 $= 19.0 \text{ l/s}$

The estimated total Sanitary demand for these two properties, based on the above, ranges between 7.18 l/s and 19.95 l/s assuming medium and high density residential, respectively, at 760 March Road."

The City has installed the 200mm dia. pipe (stubbed) across March Road to potentially avoid a road cut. Unfortunately, I don't have asbuilt information.

Hope this helps.

L. Gordon Chamberlain, P. Eng.
 Transportation Engineer
 Stantec
 1505 Laperriere Avenue
 Ottawa ON K1Z 7T1
 Ph: (613) 724-4390
 Fx: (613) 722-2799
 gordon.chamberlain@stantec.com

stantec.com

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From: Guy Forget [mailto:GForget@JLRICHARDS.CA]
Sent: Tuesday, October 12, 2010 11:40 AM
To: Chamberlain, Gordon
Subject: RE: March Road - Drainage Area & Stormwater Design Sheet

Hi Gordon,

Have you had a chance to look into the future 200 mm diameter sanitary connection?

Guy

Guy Forget, P.Eng., LEED®AP
Associate
Senior Water Resources Engineer
J.L. Richards & Associates Limited
Tel: (613)728-3572 Ext. 1279
Fax: (613)728-6012
email: gforget@jlrichards.ca
web: www.jlrichards.ca

>>> "Chamberlain, Gordon" <gordon.chamberlain@stantec.com> 10/8/2010 1:20 PM >>>
Hi Guy:

I'm out of the office today and won't be able to provide the info requested until Tuesday.

Gord

From: Guy Forget [GForget@JLRICHARDS.CA]
Sent: Friday, October 08, 2010 6:26 AM
To: Chamberlain, Gordon
Subject: Re: March Road - Drainage Area & Stormwater Design Sheet

Hi Gord,

If possible, can you send me a copy of the Sanitary Drainage Plan for the same stretch of the roadway. I just want to confirm the limits of the areas included in the 200 mm diameter sanitary sewer connection, adjacent to ST13 (labeled by others).

Thanks again for your help on this matter.

Guy

Guy Forget, P.Eng., LEED®AP
Associate
Senior Water Resources Engineer
J.L. Richards & Associates Limited
Tel: (613)728-3572 Ext. 1279
Fax: (613)728-6012
email: gforget@jlrichards.ca
web: www.jlrichards.ca

>>> "Chamberlain, Gordon" <gordon.chamberlain@stantec.com> 10/7/2010 11:46 AM >>>

file:///C:/Documents and Settings/GForget/Local Settings/Temp/XPgrpwise/4CB470F3JLROTTPO100168... 10/20/2010

Hi Guy:

Attached are pdfs of the Drainage Area plan and Sewer design sheet relevant to the area discussed.

Should you need anything else or further clarification, please let me know.

L. Gordon Chamberlain, P. Eng.

Transportation Engineer

Stantec

1505 Laperriere Avenue

Ottawa ON K1Z 7T1

Ph: (613) 724-4390

Fx: (613) 722-2799

gordon.chamberlain@stantec.com

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Guy Forget - As-built elevations for 200 dia. Sanitary line

From: "Jakowec, Paul" <Paul.Jakowec@stantec.com>
To: "Mask, Richard" <Richard.Mask@ottawa.ca>
Date: 10/14/2010 2:22 PM
Subject: As-built elevations for 200 dia. Sanitary line

Rick,

The elevations are 75.69m(east side) and 75.40m(west side Sta 8 + 334.4 o/s 2.8 m from e.p). The sanitary was supposed to go further to the west but the contractor did not want to get too close to the bell duct. They were short by 1.0m . As I had mentioned to you in August, the sanitary is lower then the existing sanitary manhole that this line was to be tied into.

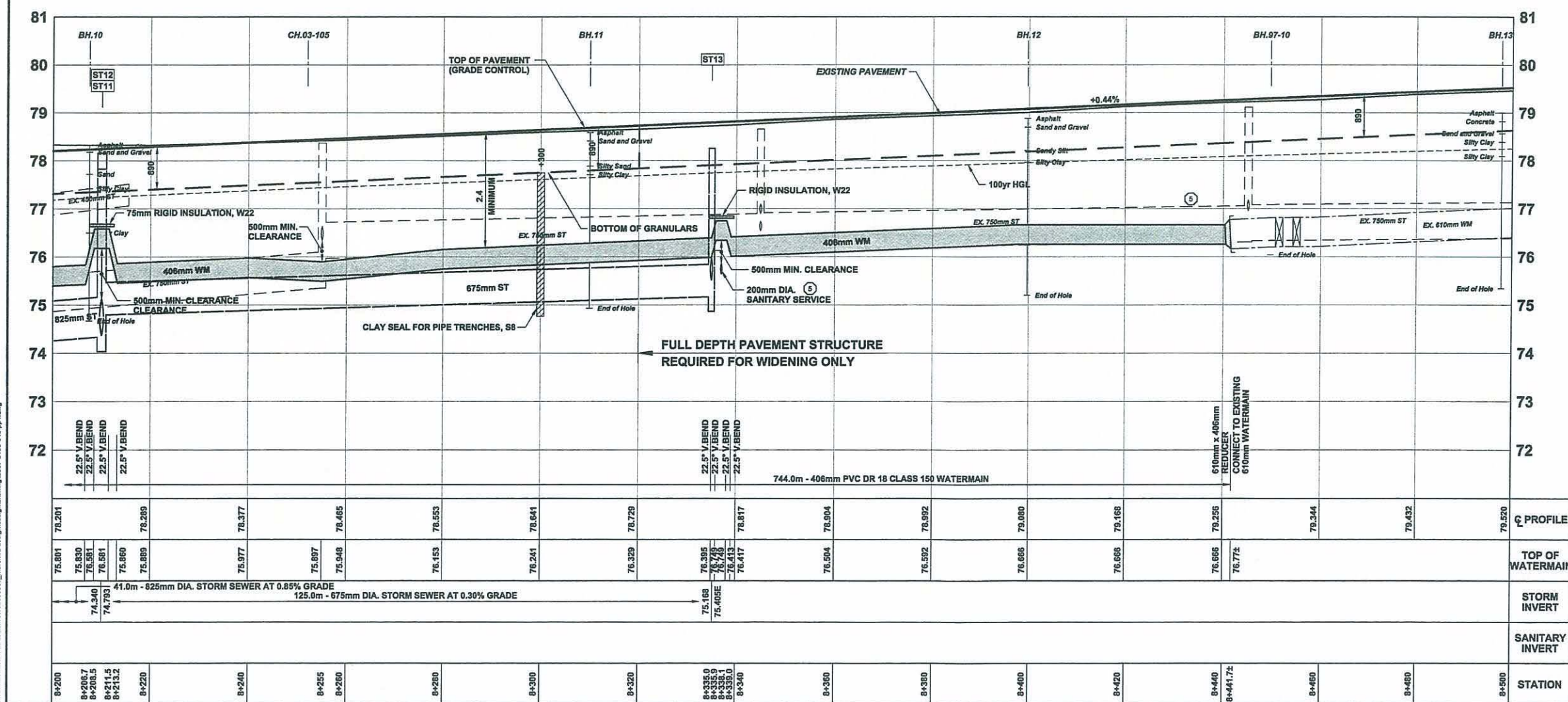
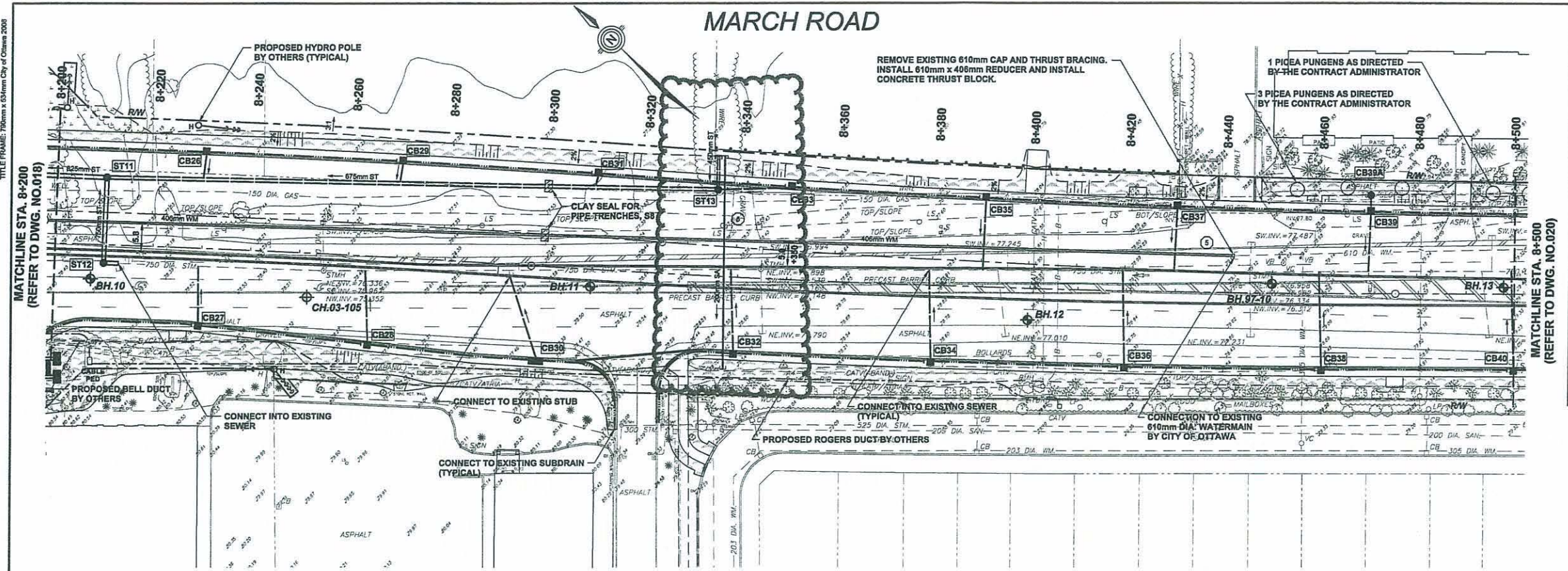
Paul

Paul Jakowec
Transportation Technologist
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2010-03-11 2:17 PM v:\projects\10300007_march rd design\dwg\march rd 5186-010.spl.dwg
TITLE FRAME: 760mm x 534mm City of Ottawa 2008



**MARCH ROAD
RECONSTRUCTION
MORGAN'S GRANT WAY
TO OLD CARP ROAD**

**PLAN AND PROFILE
STA. 8+200 TO STA. 8+500**

B.M. MASON, P.ENG.
Design and Construction
(Municipal) - West

L. FOLEY, P.ENG.
Senior Engineer
Infrastructure Projects

PROFESSIONAL ENGINEER
G. CHOCHINSKI
PROVINCE OF ONTARIO

PROFESSIONAL ENGINEER
S. G. D'AMOUR
PROVINCE OF ONTARIO

Contract No.
ISB07-5166

Dwg. No.
019

Sheet 19 of 59

Asset No.

Asset Group

Des. G.C. Ch'd. S.G.D.

Dwn. G.R.L. Ch'd. G.C.

Utility Ctr. No. Index No.

Const. Inspector

Scale:
HORIZONTAL 1:500
VERTICAL 1:50

NOTE:
The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

No.	Description	By	Date
1	ISSUED FOR MOE/COA	S.G.D.	22/08/2009
2	ISSUED FOR MUNICIPAL CONSENT	S.G.D.	21/08/2009
3	ISSUED FOR TENDER	S.G.D.	25/09/2009
4	ISSUED FOR CONSTRUCTION	S.G.D.	10/11/2009
5	REVISED SEWER AND WATERMAIN	G.C.	10/03/2010

NOTE:
1. THE MARCH ROAD SEWER SERVES AS A MAJOR DRAINAGE RELIEF SEWER AND MAY BE SUBJECT TO HIGH HYDRAULIC GRADE LINES (I.E. TO ROADWAY SURFACE). THEREFORE, NO DIRECT SERVICE CONNECTIONS SHOULD BE MADE WITHOUT PROPER ENGINEERING CONSIDERATION. SUMP PUMPS OR SLAB ON GRADE CONSTRUCTION WILL LIKELY BE REQUIRED.

CATCHBASIN & MAINTENANCE HOLE DATA						
NO.	STATION	OFFSET (m)	TYPE		ELEVATION	
			Structure	Cover	Grate	Low Inv.
ST11	8+210.0	14.00 LT	1220x1220	SL	77.825	74.340
ST12	8+210.0	3.80 RT	701.012	SL	77.158	74.470
CB26	8+230.0	19.50 LT	705.010	S22/S23	77.748	75.948
CB27	8+230.0	16.11 RT	705.010	S22/S23	77.850	76.050
CB28	8+265.0	18.02 RT	705.010	S22/S23	77.948	76.448
CB29	8+270.0	19.50 LT	705.010	S22/S23	77.924	76.124
CB30	8+300.0	19.00 RT	705.020	S22/S23(2)	78.071	76.521
CB31	8+310.0	19.45 LT	705.010	S22/S23	78.101	76.301
ST13	8+335.0	18.00 LT	701.011	SL	78.254	75.188
CB32	8+340.0	15.25 RT	705.010	S22/S23	78.359	76.559
CB33	8+350.0	18.75 LT	705.010	S22/S23	78.298	76.498
CB34	8+380.0	15.25 RT	705.010	S22/S23	78.535	76.735
CB35	8+390.0	18.00 LT	705.010	S22/S23	78.497	77.250
CB36	8+420.0	15.25 RT	705.010	S22/S23	78.711	76.911
CB37	8+430.0	17.24 LT	705.010	S22/S23	78.696	77.250
CB38	8+460.0	15.25 RT	705.010	S22/S23	78.887	77.087
CB39	8+470.0	16.52 LT	705.010	S22/S23	78.893	77.450
CB39A	8+470.0	20.50 LT	S31	S31	78.680	77.680
CB40	8+500.0	15.25 RT	705.010	S22/S23	79.083	77.283

STORM SEWER DATA						
NO. to NO.	SIZE (mm)	LENGTH (m)	CLASS	INVERTS		
				Inlet	Outlet	
STUB	ST13	450	7	CONC 1400	75.800	75.520
ST13	ST11	875	125	CONC 1000	75.168	74.793
EXIST.	ST12	750	3	CONC 1000	MATCH	74.890
ST12	ST11	750	18	CONC 1000	74.470	74.370
CB26	SEWER	200	5	SDR 35	76.948	76.848 *
CB27	EXIST.	200	13	SDR 35	76.050	75.790 *
CB28	EXIST.	200	15	SDR 35	76.448	76.298
CB29	SEWER	200	4	SDR 35	76.124	76.044 *
CB30	EXIST.	200	18	SDR 35	76.521	76.341 *
CB31	SEWER	200	3	SDR 35	76.301	76.241 *
CB32	EXIST.	200	17	SDR 35	76.559	76.399
CB33	ST13	200	15	SDR 35	76.498	76.198
CB34	EXIST.	200	19	SDR 35	76.735	76.645
CB35	EXIST.	200	15	SDR 35	77.250	77.100 *
CB36	EXIST.	200	20	SDR 35	76.911	76.511
CB37	EXIST.	200	13	SDR 35	77.250	77.120 *
CB38	EXIST.	200	20	SDR 35	77.087	76.687
CB39	EXIST.	200	12	SDR 35	77.450	77.330 *
CB39A	CB39	250	4	HDPE PERF.	77.880	77.640
CB40	EXIST.	200	20	SDR 35	77.283	76.883

* DENOTES INVERT GIVEN AT TOP OF RISER

⑤ SANITARY SEWER DATA						
COORDINATES		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
Inlet	Outlet				Inlet	Outlet
N 5,023,959.300	N 5,023,829.583	200	45	SDR 35	75.696	75.474
E 348,394.345	E 349,361.353					

Sanitary Design Sheet



MORGAN'S CREEK
760 MARCH ROAD
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR PROJECT NO.: 24566

SANITARY SEWER DESIGN SHEET
Designed: A.T.
Checked By: A.W.
Date: April 15th, 2019

SAN MH #		SEWER DATA					UPSTREAM					DOWNSTREAM				
		DIA. mm	SLOPE %	CAPAC. L/s	VEL. (full) m/s	LENGTH m	Center Line	Obvert Drop	Obvert	Invert	Cover	Center Line	Obvert Drop	Obvert	Invert	Cover
FROM	TO															
1	2	200	0.35	20.24	0.62	84.9	78.57		76.93	76.73	1.64	78.52		76.63	76.43	1.89
2	5	200	0.35	20.24	0.62	22.22	78.52		76.63	76.43	1.89	78.52		76.56	76.35	1.96
3	5	200	0.35	20.24	0.62	85.2	78.41		76.86	76.65	1.55	78.52		76.56	76.35	1.96
5	6	200	0.35	20.24	0.62	35.41	78.52		76.56	76.35	1.96	78.63	0.59	76.43	76.23	2.20
4	6	200	0.35	20.24	0.62	69.1	78.80		76.67	76.47	2.13	78.63	0.59	76.43	76.23	2.20
Omniplex	6	200	0.35	20.24	0.62	4.05	78.30		76.49	76.29	1.81	78.63	0.64	76.48	76.28	2.15
6	7	200	0.32	19.36	0.60	40.2	78.63		75.84	75.64	2.79			75.71	75.51	
7	Ex.124	200	0.32	19.36	0.60	19.2	78.42		75.71	75.51	2.71	78.30	0.05	75.65	75.45	2.65
ex. 75.60 75.40																

MARCH ROAD- AS BUILT INFORMATION
Ex. Inv @ INLET (East Blvd) = 75.69 Ex. Inv @ OUTLET (West Blvd) = 75.40 As-built Length 43.18, Slope = 0.67 % Information taken from Stantec As-Built Plans - March Road Reconstruction ISB07-5166 - Dwg. No. 19 , Rev 5 (As-built) - March Rd (Sta 8+200 to 8+500)

Residential Flow Allocation	
Number of Units	60 units
Occupancy	2.7 Pers/unit
Flow Allocation	280 L/cap/day
Peaking Factor (Harmon Formula)	3.54
Total Residential Flow Allocation	1.86 L/s
Infiltration	
Total Area	0.77 ha
I/I Allocation	0.33 L/s/ha
Total Infiltration	0.25 L/s
Total Peak Flow	2.11 L/s

Appendix 'D'

Storm Sewer and Stormwater
Management Design

Storm Design Sheet

Storm Design Sheet



MORGAN'S CREEK
CITY OF OTTAWA
MINTO COMMUNITIES INC.
JLR PROJECT NO.: 24566

STORM SEWER DESIGN SHEET
1:5 YEAR IDF CURVE

Designed: A.T.
Checked By: L.D.

Date: Dec 2018

5 YEAR IDF CURVE
Manning's Coefficient (n) = 0.013

STREET	MANHOLE NUMBER		AREAS (ha)						1:5 YR PEAK FLOW GENERATION					Q _d /Q _{cap}	SEWER DATA						UPSTREAM				DOWNSTREAM					
	From	To	0.50	0.65	0.70	0.80	0.85	0.90	2.78AR	2.78AR CUMM	Time min	Intens. mm/hr	Peak Flow (l/s)		Dia (mm)	Slope %	Q full (l/s)	V full (m/s)	Length (m)	Flow Time (min)	Pr. Center Line	Obvert	Invert	Cover	Pr. Center Line	Obvert	Invert	Cover		
FLOW TO 675mmΦ STORM - MARCH ROAD																														

MARCH ROAD- AS CONSTRUCTED INFORMATION
Ex. ST MH 13 - INV (NE) (East Blvd) = 75.521
Ex. STUB Inv (East Blvd)) = 75.596
As-built Length 7, Slope = 1.07%
Information taken from Stantec As-Built Plans - March Road Reconstruction
ISB07-5166 - Dwg. No. 19 , Rev 5 (As-built) - March Rd (Sta 8+200 to 8+500)

Stantec Design Sheet

LEGEND:

- MH3**
0.391ha 0.162ha
C=0.9 C=0.3
- 4**
PROPOSED STORM SEWER, MANHOLE,
FLOW DIRECTION AND IDENTIFICATION NUMBER
- DRAINAGE AREA LIMIT
- 170**
EXISTING STORM SEWER, MANHOLE,
FLOW DIRECTION AND IDENTIFICATION NUMBER
- STW**



NO.	REVISION	BY	DATE
1	REVISED DRAINAGE AREAS	J.G.L.	12/15/08
2	ISSUED FOR MOE/COA	S.G.D.	6/22/09

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

MARCH ROAD
RECONSTRUCTION
MORGAN'S GRANT WAY TO
OLD CARP ROAD

MINOR SYSTEM
DRAINAGE PLAN

B.M. MASON, P.ENG.
Design and Construction
(Municipal) - West

S. STODDARD, P.ENG.
Senior Engineer
Infrastructure Projects

Des: G.R.L. Chkd: S.G.D. Des: S.G.D. Chkd: J.G.L.

Ottawa

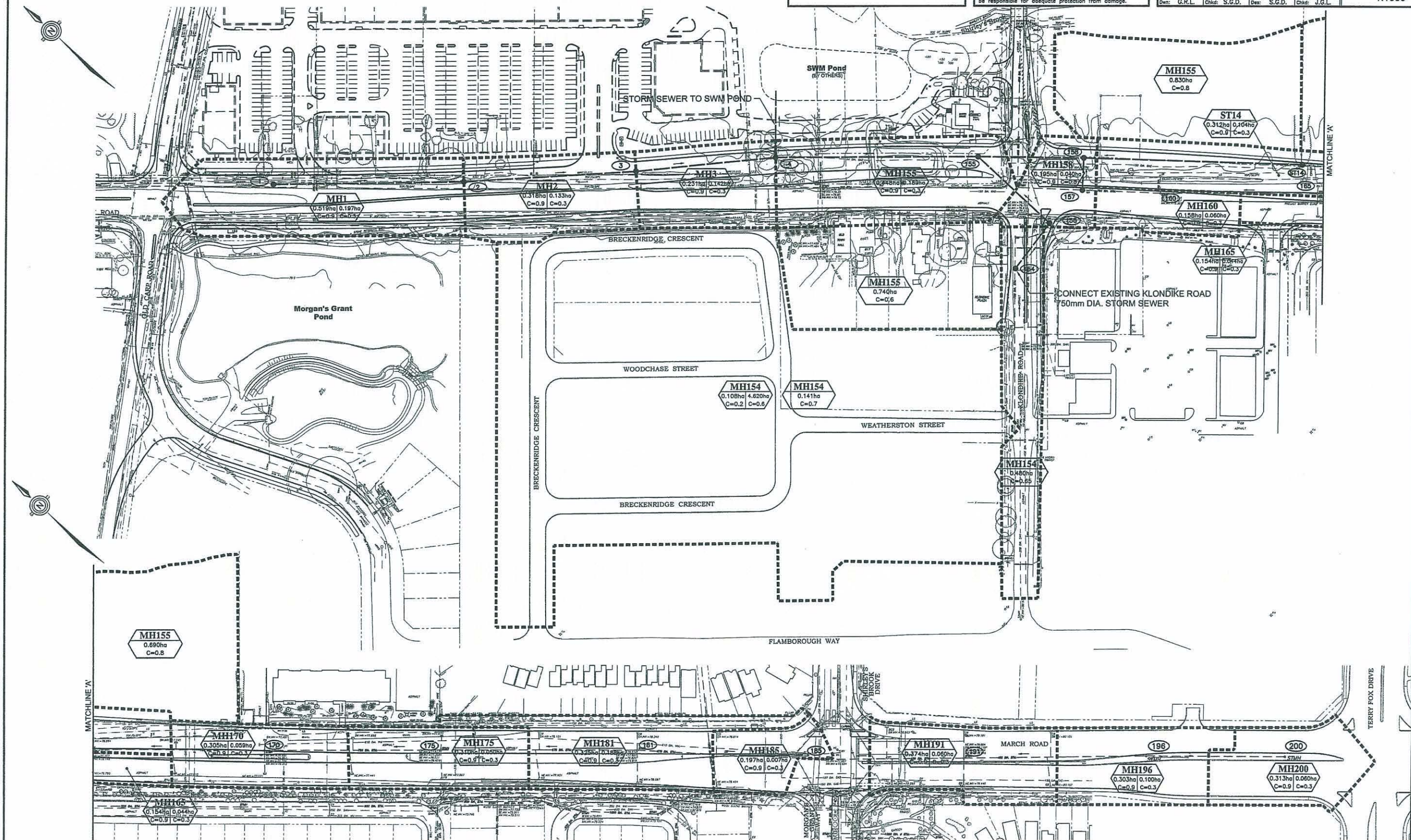
CONTRACT NO.
163600607

DWG. NO.
DA1

SHEET 1 OF 1

Date: JUNE 2009

Scale: 1:1000



STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			AREAS (ha)				INDIV. 2.78 AR	ACCUM. 2.78 AR	TIME OF CONC.	RAIN- FALL INT. I	PEAK FLOW Q (L/s)	SEWER DATA										
												TYPE OF PIPE	NOM. DIA. (mm)	SLOPE (%)	LENGTH (m)	FULL CAP. (L/s)	CAP. VEL. (m/s)	TIME OF FLOW (min)	Q/Qcap			
STREET	FROM	TO	R=0.60	R=0.30	R=0.80	R=0.90																
MARCH ROAD																						
Existing Storm Sewer - Area 9A	200	196		0.060		0.313	0.83	0.83	10.0	122.1	102	Conc.	375	1.00	80	183	1.60	0.8	0.56			
Existing Storm Sewer - Area 9	196	191		0.100		0.303	0.84	1.67	10.8	117.2	196	Conc.	450	1.10	105	312	1.90	0.9	0.63			
Existing Storm Sewer - Area 8	191	185		0.060		0.374	0.99	2.66	11.8	112.2	299	Conc.	450	1.10	78	312	1.90	0.7	0.96			
Existing Storm Sewer - Area 7	185	181		0.007		0.197	0.50	3.16	12.4	108.8	344	Conc.	675	0.16	107	351	0.95	1.9	0.98			
Existing Storm Sewer - Area 6	181	175		0.188		0.325	0.97	4.13	14.3	100.5	415	Conc.	675	0.25	110	438	1.19	1.5	0.95			
Existing Storm Sewer - Area 5	175	170		0.050		0.310	0.82	4.95	15.9	94.7	468	Conc.	750	0.16	100	465	1.02	1.6	1.01			
Existing Storm Sewer - Area 4	170	165		0.059		0.305	0.81	5.76	17.5	89.3	514	Conc.	750	0.18	100	493	1.08	1.5	1.04			
Existing Storm Sewer - Area 3	165	160		0.044		0.154	0.42	6.18	19.0	84.8	524	Conc.	750	0.21	90	532	1.17	1.3	0.98			
Existing Storm Sewer - Area 2	160	157		0.060		0.158	0.44	6.62	20.3	81.4	539	Conc.	750	0.95	45	1132	2.48	0.3	0.48			
	157	158					0.00	6.62	20.6	80.6	534	Conc.	750	0.50	20	821	1.80	0.2	0.65			
Properties east of Klondike-March intersection (5-year)	ST14	158			1.520		3.38	3.38	10.0	104.2	352											
NE half of March Rd (10-yr)	ST14	158		0.104		0.312	0.87	0.87	10.0	122.1	106											
Total to ST14	ST14	158							Total		458	Conc.	675	0.30	125	480	1.30	1.6	0.95			
	158	155		0.040		0.195	0.52	8.01	20.8	80.2	995	Conc.	825	0.85	60	1381	2.50	0.4	0.72			
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154				Controlled discharge from JLR design (w/ ICDs)					367		750	0.20	71	519	1.14	1.0	0.71			
	154	156									367		750	1.30	45	1324	2.90	0.3	0.28			
KLONDIKE ROAD (Major contribution from DICB at Intersection)	2 DICB	156a		Flow split between 4 leads determined using solvermatching U/S HGLs									2 Leads	610	1.25	6	748	2.48	0.0	0.00		
	2 DICB	156a										2 Leads	525	4.50	6	952	4.26	0.0	0.00			
									Total		0											
	156a	156									0	Conc.	1500	0.70	23	6170	3.38	0.1	0.00			
	156	155									367	Conc.	1650	0.70	42	7955	3.60	0.2	0.05			
	155	4	0.74	0.189		0.448	2.51	10.53	21.2	79.2	1,553	Conc.	1800	0.15	136	4644	1.77	1.3	0.33			
MARCH ROAD (North of Klondike)	1	2		0.197		0.519	1.46	1.46	10.0	122.1	179	Conc.	450	0.46	110	202	1.23	1.5	0.89			
	2	3		0.133		0.318	0.91	2.37	11.5	113.6	269	Conc.	525	0.40	97	284	1.27	1.3	0.95			
	3	4		0.142		0.231	0.70	3.07	12.8	107.3	329	Conc.	600	0.75	78	555	1.90	0.7	0.59			
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB																				
MARCH Rd SAG Station 8+050 - (Major from 0.8 ha property on corner)		DICB																				
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB																				
Sum of Above (to DICB)	2 DICB	4									0	twin leads	525	1.75	33	594	2.66	0.2	0.00			
Storm Sewer to Diversion Chamber	4	STMH211					0.00	13.59	22.5	76.3	1,756	Conc.	1950	0.15	22	5749	1.87	0.2	0.31			
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond									1,756	Conc.	1800	0.44	16	7954	3.03	0.1	0.22			
Definitions: Q = 2.78 AIR, where Q = Peak Flow in Litres per second (L/s) A = Areas in hectares (ha) I = Rainfall Intensity in millimeters per hour (mm/h) R = Runoff Coefficient				Notes: 1) 10 yr storm design 2) Accommodates future road widening 3) Mannings n=0.013 n=0.011 PVC 4) 100yr CB Capture = 100% of 10-yr					Designed MT			PROJECT: MARCH ROAD RECONSTRUCTION Solandt Road to Old Carp Road										
												LOCATION: TERRY FOX DRIVE to OLD CARP ROAD										
									Checked: SGD			File Ref.: 1636-00607/300							Date: 09-Jul-09		Sheet No.:	
												Dwg. Reference:										

STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			AREAS (ha)				INDIV. 2.78 AR	ACCUM. 2.78 AR	TIME OF CONC.	RAIN- FALL INT. I	PEAK FLOW Q (L/s)	SEWER DATA								SEWER DATA							
												TYPE OF PIPE	NOM. DIA. (mm)	ACT. DIA. (m)	SLOPE (%)	LENGTH (m)	FULL CAP. (L/s)	CAP. VEL. (m/s)	TIME OF FLOW (min)	Q/Qcap	MH ELEVATION		INVERT		OBVERT		COV
																					U/S (m)	D/S (m)	U/S (m)	D/S (m)	U/S (m)	D/S (m)	
STREET	FROM	TO	R=0.60	R=0.30	R=0.80	R=0.90																					
MARCH ROAD																											
Existing Storm Sewer - Area 9A	200	196		0.060		0.313	0.83	0.83	10.0	122.1	122	Conc.	375	0.381	1.00	80	183	1.60	0.8	0.67	83.4	82.541	81.000	80.200	81.381	80.581	2.019
Existing Storm Sewer - Area 9	196	191		0.100		0.303	0.84	1.67	10.8	117.2	236	Conc.	450	0.457	1.10	105	312	1.90	0.9	0.76	82.541	81.2	80.130	78.970	80.587	79.427	1.954
Existing Storm Sewer - Area 8	191	185		0.060		0.374	0.99	2.66	11.8	112.2	358	Conc.	450	0.457	1.10	78	312	1.90	0.7	1.15	81.2	80.7	78.690	77.840	79.147	78.297	2.053
Existing Storm Sewer - Area 7	185	181		0.007		0.197	0.50	3.16	12.4	108.8	413	Conc.	675	0.686	0.16	107	351	0.95	1.9	1.18	80.700	80.100	77.000	76.830	77.686	77.516	3.014
Existing Storm Sewer - Area 6	181	175		0.188		0.325	0.97	4.13	14.3	100.5	498	Conc.	675	0.686	0.25	110	438	1.19	1.5	1.14	80.100	79.616	76.830	76.550	77.516	77.236	2.584
Existing Storm Sewer - Area 5	175	170		0.050		0.310	0.82	4.95	15.9	94.7	562	Conc.	750	0.762	0.16	100	465	1.02	1.6	1.21	79.616	79.141	76.480	76.320	77.242	77.082	2.374
Existing Storm Sewer - Area 4	170	165		0.059		0.305	0.81	5.76	17.5	89.3	617	Conc.	750	0.762	0.18	100	493	1.08	1.5	1.25	79.141	78.688	76.320	76.140	77.082	76.902	2.059
Existing Storm Sewer - Area 3	165	160		0.044		0.154	0.42	6.18	19.0	84.8	629	Conc.	750	0.762	0.21	90	532	1.17	1.3	1.18	78.688	78.420	76.140	75.950	76.902	76.712	1.786
Existing Storm Sewer - Area 2	160	157		0.060		0.158	0.44	6.62	20.3	81.4	647	Conc.	750	0.762	0.95	45	1132	2.48	0.3	0.57	78.420	78.360	75.350	74.923	76.112	75.685	2.308
	157	158					0.00	6.62	20.6	80.6	641	Conc.	750	0.762	0.50	20	821	1.80	0.2	0.78	78.420	78.360	74.850	74.750	75.612	75.512	2.808
Properties east of Klondike-March intersection (5-year)	ST14	158			1.520		3.38	3.38	10.0	104.2	352																
NE half of March Rd (10-yr)	ST14	158		0.104		0.312	0.87	0.87	10.0	122.1	127																
Total to ST14	ST14	158								Total	479	Conc.	675	0.686	0.30	125	480	1.30	1.6	1.00	78.254	77.825	75.168	74.793	75.854	75.479	2.400
	158	155		0.040		0.195	0.52	8.01	20.8	80.2	1,123	Conc.	825	0.838	0.85	60	1381	2.50	0.4	0.81	78.200	78.400	74.641	74.131	75.479	74.969	2.721
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154				1:100-yr discharge from JLR design (w/ ICDs)					367		750	0.762	0.20	71	519	1.14	1.0	0.71	80.350	78.600	76.693	76.551	77.455	77.313	2.895
	154	156									367		750	0.762	1.30	45	1324	2.90	0.3	0.28	78.600	78.200	76.000	75.415	76.762	76.177	1.838
KLONDIKE ROAD (Major contribution from DICB at Intersection)	2 DICB	156a	Flow split between 4 leads determined using solvermatching U/S HGLs								2,005	2 Leads	610	0.620	1.25	3	748	2.48	0.0	0.89	77.500	78.200	75.950	75.913	76.570	76.532	0.930
	2 DICB	156a									0																
											1,375	2 Leads	525	0.533	4.50	4	952	4.26	0.0	0.72	77.500	78.200	76.000	75.820	76.533	76.353	0.967
	156a	156									3,380																
	156	155									3,747	Conc.	1650	1.676	0.70	42	7955	3.60	0.2	0.47	78.200	78.400	73.857	73.563	75.534	75.240	2.666
	155	4	0.74	0.189		0.448	2.51	10.53	21.2	79.2	5,100	Conc.	1800	1.829	0.15	136	4644	1.77	1.3	1.10	78.360	78.633	73.411	73.207	75.240	75.036	3.120
MARCH ROAD (North of Klondike)	1	2		0.197		0.519	1.46	1.46	10.0	122.1	214	Conc.	450	0.457	0.46	110	202	1.23	1.5	1.06	78.530	78.060	75.870	75.364	76.327	75.821	2.203
	2	3		0.133		0.318	0.91	2.37	11.5	113.6	323	Conc.	525	0.533	0.40	97	284	1.27	1.3	1.14	78.060	77.430	75.288	74.900	75.821	75.433	2.239
	3	4		0.142		0.231	0.70	3.07	12.8	107.3	395	Conc.	600	0.610	0.75	78	555	1.90	0.7	0.71	77.430	77.230	74.385	73.800	74.995	74.410	2.435
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB									207																
MARCH Rd SAG Station 8+050 - (Major from 0.8 ha property on corner)		DICB									181																
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB									780																
Sum of Above (to DICB)	2 DICB	4									1,168	twin leads	525	0.533	1.75	33	594	2.66	0.2	0.98	77.000	78.633	75.563	74.986	76.096	75.519	0.904
Storm Sewer to Diversion Chamber	4	STMH211					0.00	13.59	22.5	76.3	6,512	Conc.	1950	1.981	0.15	22	5749	1.87	0.2	1.13	78.633		73.133	73.100	75.114	75.081	3.519
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond									6,512	Conc.	1800	1.829	0.44	16	7954	3.03	0.1	0.82	78.633		73.070	73.000	74.899	74.829	3.734
Definitions: Q = 2.78 AIR, where Q = Peak Flow in Litres per second (L/s) A = Areas in hectares (ha) I = Rainfall Intensity in millimeters per hour (mm/h) R = Runoff Coefficient			Notes: 1) 10 yr storm design 2) Accommodates future road widening n=0.013 3) Mannings n=0.011 PVC 4) 100yr CB Capture = 120% of 10-yr					Designed MT		PROJECT: MARCH ROAD RECONSTRUCTION Solandt Road to Old Carp Road																	
								Checked: SGD		LOCATION: TERRY FOX DRIVE to OLD CARP ROAD																	
								Dwg. Reference:		File Ref.: 1636-00607/300				Date: 09-Jul-09		Sheet No.:											

STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			I/ER	HYDRAULIC GRADE LINE ANALYSIS												
				R _h	A (m ²)	V (m/s)	V ² /2g (m)	f'	H _f (m)	K Exit	K Entrance	Kbend Benched	K Losses (m)	Total HL (m)	U/S HGL (m)	U/S HGL FREEBOARD (HGL-T/G)(m)
STREET	FROM	TO	D/S (m)													
MARCH ROAD																
Existing Storm Sewer - Area 9A	200	196	1.960	0.095	0.114	1.07	0.058	0.0290	0.357				0.000	0.357	80.68	2.72
Existing Storm Sewer - Area 9	196	191	1.773	0.114	0.164	1.43	0.105	0.0273	0.658				0.000	0.658	80.02	2.52
Existing Storm Sewer - Area 8	191	185	2.403	0.114	0.164	2.18	0.243	0.0273	1.132				0.000	1.132	78.89	2.31
Existing Storm Sewer - Area 7	185	181	2.584	0.171	0.369	1.12	0.064	0.0239	0.237				0.000	0.237	78.65	2.05
Existing Storm Sewer - Area 6	181	175	2.380	0.171	0.369	1.35	0.093	0.0239	0.355				0.000	0.355	78.41	1.69
Existing Storm Sewer - Area 5	175	170	2.059	0.191	0.456	1.23	0.077	0.0231	0.234				0.000	0.234	78.06	1.56
Existing Storm Sewer - Area 4	170	165	1.786	0.191	0.456	1.35	0.093	0.0231	0.282				0.000	0.282	77.82	1.32
Existing Storm Sewer - Area 3	165	160	1.708	0.191	0.456	1.38	0.097	0.0231	0.264				0.000	0.264	77.54	1.15
Existing Storm Sewer - Area 2	160	157	2.676	0.191	0.456	1.42	0.103	0.0231	0.140				0.000	0.140	77.28	1.14
	157	158	2.848	0.191	0.456	1.41	0.101	0.0231	0.061				0.000	0.061	77.14	1.28
Properties east of Klondike-March intersection (5-year)	ST14	158														
NE half of March Rd (10-yr)	ST14	158														
Total to ST14	ST14	158	2.346	0.171	0.369	1.30	0.086	0.0239	0.373	0.5		0.3	0.069	0.442	77.52	0.73
	158	155	3.431	0.210	0.552	2.04	0.211	0.0223	0.338	0.5			0.106	0.443	77.08	1.12
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154	1.287	0.191	0.456	0.80	0.033	0.0231	0.071				0.000	0.071	76.95	3.40
	154	156	2.023	0.191	0.456	0.80	0.033	0.0231	0.045	0.5			0.017	0.061	76.88	1.72
KLONDIKE ROAD (Major contribution from DICB at Intersection)	2 DICB	156a	1.668	0.155	0.302	3.32	0.563	0.0177	0.048	1.0	0.5		0.844	0.892	77.90	-0.40
								check 77.90 + 0.111 grate losses <= to 78.05 m which is elevation to keep 1 lane of March Rd. free - OK								
	2 DICB	156a	1.847	0.133	0.223	3.08	0.483	0.0186	0.067	1.0	0.5		0.724	0.791	77.80	-0.30
								check 77.80 + 0.212 grate losses <= to 78.05 m which is elevation to keep 1 lane of March Rd. free - OK								
	156a	156	2.806	0.381	1.824	1.85	0.175	0.0183	0.048	0.5		0.3	0.140	0.188	77.01	1.19
	156	155	3.160	0.419	2.207	1.70	0.147	0.0177	0.065	0.5		0.3	0.118	0.183	76.82	1.38
	155	4	3.597	0.457	2.627	1.94	0.192	0.0172	0.246	0.5		0.3	0.154	0.400	76.63	1.73
MARCH ROAD (North of Klondike)	1	2	2.239	0.114	0.164	1.31	0.087	0.0273	0.572				0.000	0.572	77.68	0.85
	2	3	1.997	0.133	0.223	1.45	0.106	0.0260	0.503				0.000	0.503	77.11	0.95
	3	4	2.820	0.152	0.292	1.35	0.093	0.0248	0.296	0.5		0.3	0.075	0.371	76.61	0.82
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB														
MARCH Rd SAG Station 8+050 - (Major from 0.8 ha property on corner)		DICB														
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB														
Sum of Above (to DICB)	2 DICB	4	3.114	0.133	0.223	2.61	0.348	0.0260	0.559	0.5	0.5		0.348	0.907	77.14	-0.14
								check 77.14 + 0.038 grate losses <= to 77.50 m which is elevation to keep 1 lane of March Rd free - OK								
Storm Sewer to Diversion Chamber	4	STMH211		0.495	3.083	2.11	0.227	0.0168	0.042	0.3			0.068	0.111	76.23	2.40
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond		0.457	2.627	2.48	0.313	0.0172	0.047	1.0	0.3		0.407	0.454	76.12	2.51
								100 year water level in proposed Shirley's Brook pond (Option 4)								
Definitions: Q = 2.78 AIR, where Q = Peak Flow in Litres per second (L/s) A = Areas in hectares (ha) I = Rainfall Intensity in millimeters per hour (mm/h) R = Runoff Coefficient																
$h_L = f \frac{L V^2}{d 2g} \qquad f' = \frac{8g}{c^2} \qquad c = \frac{1}{n} R_h^{1/6}$																

IBI Group, Storm Sewer Design Sheet

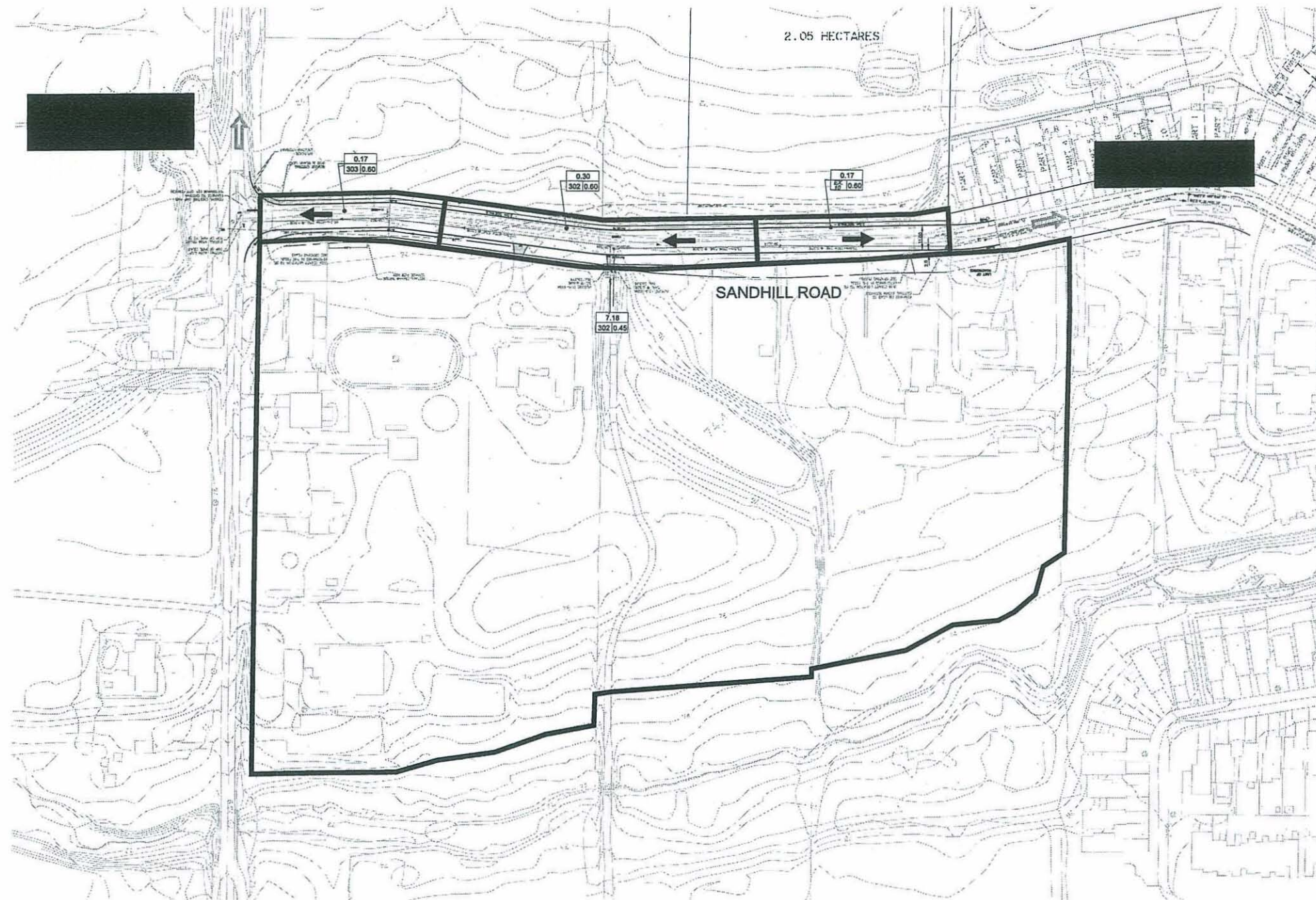


IBI Group
333 Preston Street - Suite 400
Ottawa, Ontario
K1S 5N4

STORM SEWER DESIGN SHEET

PROJECT: Briar Ridge Phase 2 - Sandhill Road
LOCATION: City of Ottawa
CLIENT: Tenth Line Development Inc.

LOCATION			AREA (Ha)										RATIONAL DESIGN FLOW					LEVEL OF SERVICE				ICD RESTRICTED FLOW										SEWER DATA							
STREET	FROM MH	TO MH	C= 0.20	C= 0.30	C= 0.45	C= 0.50	C= 0.60	C= 0.65	INDIV. 2.78AC	ACCUM. 2.78AC	INLET (min.)	TIME IN PIPE	TOTAL (min.)	I (mm/Hr)	PEAK FLOW (L/s)	AREA (ha) INDIV.	ACCUM.	INDIV.	ACCUM.	INLET (L/s)					INDIV. FLOW (L/s)	ACCUM. FLOW (L/s)	CAP. (L/s)	LENGTH (M)	PIPE (mm)	SLOPE (%)	VEL. (M/s)	AVAIL. CAP. (L/s) (%)							
OUTLET TO KLONDIKE ROAD																				6.0	8.0	10.0	14.0	21.0															
External Area	STUB	302			7.18				8.98	8.98	15.00	0.08	15.08	83.56	750.34	7.18	7.18	610.30	610.30					25	525.00	525.00	831.87	11.0	675	0.90	2.252	81.52	9.80%						
Sandhill Road	302	301					0.30		0.50	9.48	15.08	0.74	15.83	83.30	789.65	0.30	7.48	25.50	635.80					4	84.00	609.00	831.87	100.5	675	0.90	2.252	42.22	5.07%						
Sandhill Road	301	Ex. 159					0.17		0.28	9.76	15.83	0.49	16.32	81.27	793.18	0.17	7.65	14.45	650.25					2	42.00	651.00	831.87	66.7	675	0.90	2.252	38.68	4.65%						
Klondike Road *	Ex. 159	Ex. 158				5.09		0.48	7.94	17.70	20.67	0.72	21.39	66.53	1,177.66											1,197.97	94.0	825	0.64	2.171	20.31	1.70%							
OUTLET TO SANDHILL ROAD																																							
Sandhill Road **	Ex. 10	Ex. 9			0.91		0.17		1.42	1.42	22.84	1.45	24.29	61.54	87.38											175.99	93.0	450	0.35	1.072	88.61	50.35%							



LEGEND:

0.30 AREA IN HECTARES
302 0.60 "C" COEFFICIENT
RECEIVING MANHOLE

MAJOR SYSTEM ROUTE

14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	ISSUED FOR APPROVAL	08-03-04	
No.	REVISIONS	By	Date

TENTH LINE DEVELOPMENT INC.

IBI GROUP 1770 Woodward Drive
Suite 100
Ottawa, Ontario
Canada K2C 0P8
Tel (613) 225-1311
FAX (613) 225-9868

Project Title
**BRIAR RIDGE
PHASE 2**



Drawing Title
**STORM DRAINAGE
AREA PLAN
SANDHILL ROAD**

Scale
1:1000

Design	L.M.E.	Date	MARCH '09
Drawn	M.M.	Checked	R.W.W.
Project No.	10518	Drawing No.	500-1

PCSWMM Parameters

**MODEL REPORT – APPENDIX D
PCSWMM PARAMETER DESCRIPTIONS**

**MINTO COMMUNITIES INC.
MORGAN'S CREEK STAGE 1
762 MARCH ROAD**

E1.0 SUBCATCHMENTS

Parameter	Units	Description				
Name	-	The name of the subcatchments are based on their outlets and have the suffix _SUB.				
Tag	-	Tags have not been incorporated.				
Rain Gauge	-	The storm type selected for the model run. The following storm files are used: <table><tr><td>Distribution</td><td>Return Period</td></tr><tr><td>3 hour Chicago</td><td>1:100</td></tr></table>	Distribution	Return Period	3 hour Chicago	1:100
Distribution	Return Period					
3 hour Chicago	1:100					
Outlet	-	The downstream major system node to which the subcatchment drains.				
Area	ha	The area is calculated internally by PCSWMM.				
Width / Flow Length	m	Width is calculated to be approximately twice the lot segment length.				
Slope	%	A representative value of 2% is used for all subcatchments based on crossfalls and average grading.				
Imperv	%	The percentage of impervious area is determined based on the runoff coefficient (C-Factor), which was calculated using the layout of proposed development and the percentage area of impervious and pervious surfaces.				
N Imperv	-	A constant of 0.013 is selected as the Manning's N for impervious surfaces such as roads, sidewalk and parking areas. The value is representative of smooth impervious surface as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).				

Parameter	Units	Description
N Perv	-	A constant of 0.25 is selected as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
DStore Imperv	mm	A constant of 1.57 mm is used as the impervious depression storage as per the City of Ottawa Sewer Design Guidelines 2012 Section 5.4.5.4.
DStore Perv	mm	A constant of 4.67 mm is used as the pervious depression storage as per the City of Ottawa Sewer Design Guidelines 2012 Section 5.4.5.4.
Zero Imperv	%	Determines areas where it is considered that there is no depression storage. Not applied in this model.
Subarea Routing	-	The constant 'IMPERVIOUS' is entered to simulate the subarea of impervious surface, such as the rear part of roofs, which may flow over pervious areas prior to discharging to the outlet of the subcatchment.
Percent Routed	%	The percentage of impervious catchment area within each subcatchment that is routed across the pervious area.
Drying Time	days	The time for a fully saturated soil to completely dry is set at 7 days although the parameter is not used in the analysis.
Horton Infiltration Parameters	-	The Horton approach is used to simulate infiltration losses. As per recommendation of the Ottawa Sewer Design Guidelines $F_o=76.2\text{mm}$, $F_c=13.2\text{ mm/hr}$ and K of 4.14 1/hr are used.

The parameters Curb Length, Snow Pack, LID Controls, Groundwater and Erosion are not used in the model.

E2.0 LINK ELEMENTS

E2.1 Conduits

Parameter	Units	Description
Name	-	Minor system conduits (storm sewer pipes) are named after the storm sewer reach between two maintenance hole structures (ex., MH133-MH110);
Inlet Node	-	Upstream node of the link element.

Parameter	Units	Description																								
Outlet Node	-	Downstream node of the link element.																								
Tag	-	<div>Conduits are tagged based on the type of flow system (minor or major system flow), and on flow routing criteria (i.e., street, storm sewer, etc.).</div> <table><thead><tr><th>Conduit Type</th><th>Flow Routing</th><th>Tag</th></tr></thead><tbody><tr><td>Storm Sewer</td><td>Pipe Flow</td><td>Storm_Sewer/Existing_Storm</td></tr><tr><td>CB Lead</td><td>Pipe Flow</td><td>CB_Lead</td></tr></tbody></table>	Conduit Type	Flow Routing	Tag	Storm Sewer	Pipe Flow	Storm_Sewer/Existing_Storm	CB Lead	Pipe Flow	CB_Lead															
Conduit Type	Flow Routing	Tag																								
Storm Sewer	Pipe Flow	Storm_Sewer/Existing_Storm																								
CB Lead	Pipe Flow	CB_Lead																								
Length	m	Length is auto-calculated in PCSWMM.																								
Roughness	-	The roughness coefficient of 0.013 is used for all minor system conduits Where the conduit is part of the major system the roughness is contained within the transect and this value is not read by the model.																								
Inlet Elevation	m	Elevation of conduit invert at the inlet.																								
Outlet Elevation	m	Elevation of conduit invert at the outlet.																								
Initial Flow	m³/s	No initial flows are applied to conduits in the model.																								
Flow Limit	m³/s	No flow limits are applied in the model																								
Entry Loss Coeff.	-	No entrance losses are applied to conduits representing pipes;																								
Exit Loss Coeff.	-	<div>For the minor system the exit loss coefficient is based on the angle of change in flow direction at the upstream manhole as per the values below (read from City of Ottawa Sewer Design Guidelines Appendix 6-B). Exit losses to a large receiving water body are set as 1. No losses are applied to the major system.</div> <table><thead><tr><th>Angle °</th><th>Loss Coeff.</th></tr></thead><tbody><tr><td>0</td><td>0.020</td></tr><tr><td>10</td><td>0.045</td></tr><tr><td>15</td><td>0.150</td></tr><tr><td>20</td><td>0.118</td></tr><tr><td>30</td><td>0.210</td></tr><tr><td>40</td><td>0.325</td></tr><tr><td>50</td><td>0.460</td></tr><tr><td>60</td><td>0.635</td></tr><tr><td>70</td><td>0.840</td></tr><tr><td>80</td><td>1.065</td></tr><tr><td>90</td><td>1.320</td></tr></tbody></table>	Angle °	Loss Coeff.	0	0.020	10	0.045	15	0.150	20	0.118	30	0.210	40	0.325	50	0.460	60	0.635	70	0.840	80	1.065	90	1.320
Angle °	Loss Coeff.																									
0	0.020																									
10	0.045																									
15	0.150																									
20	0.118																									
30	0.210																									
40	0.325																									
50	0.460																									
60	0.635																									
70	0.840																									
80	1.065																									
90	1.320																									
Average Loss Coeff.	-	The average loss coefficient is not used in this model.																								
Seepage Rate	mm/hr	There is no seepage applied to conduits in this model.																								

Parameter	Units	Description
Flap Gate	-	No flap gates are applied to the model conduits.
Cross Section	-	Minor system conduits have the cross section as per the City of Ottawa Sewer Design Guideline (OSDG) for the pipe sizes and shapes for concrete pipes.
Geometry	m	The geometry of the conduit for cross sections other than irregular. For minor systems the single value is the pipe diameter.
Barrels	-	The number of identical sewers within the conduit, usually 1.
Transect	-	Not used in this model.
Shape Curve	-	Not used in this model
Culvert Code	-	Not used in this model

E2.2 Orifices

Parameter	Units	Description / Values
Name	-	An Orifice is used to model the Inlet Control Device placed in MH 506, Named ICD
Inlet Node	-	Upstream node of the orifice link.
Outlet Node	-	Downstream node of the orifice link.
Tag	-	The orifice is tagged "Inlet_Control_Device".
Type	-	Orifice in the Model is a side orifices
Cross Section	-	The orifices used to simulate the ICD has a circular cross section.
Height	m	The ICD orifice has a height of 0.12m, set to achieve the allowable release rate.
Width	m	All circular orifices have a width of 0.
Inlet Elevation	m	The inlet invert elevations are set based the inlet of elevation of the upstream node/junctions.

Parameter	Units	Description / Values
Discharge Coefficient	-	The discharge coefficient is set to 0.61.
Flap Gate	-	Flap gate was not used for the orifice links.
Time to Open/Close	H	N.A.

E3.0 NODE ELEMENTS

E3.1 Junctions

For standard manholes the Storage node type is used. A Junction node type is used to link the orifice to MH506. Nodes and have no storage or spatial dimensions, other than elevation, associated with them.

Parameter	Units	Description / Values
Name	-	Minor system nodes are described below under Section A3.2.
Tag	-	The tag ICD is used
Inflows	-	No additional inflows in the system are simulated through junction nodes.
Treatment	-	No treatment is modelled.
Invert Elevation	m	Invert of MH506 is used.
Rim Elevation	m	Rim elevation set based on the height of the upstream pipe diameter.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are set as the difference between the invert elevation and 1:100 year HGL in the existing March Rd. sewer network.
Surcharge Depth	m	A surcharge depths of 10m is used.
Ponded Area	m ²	No ponded areas are set in the model.

E3.2 Storage

Parameter	Units	Description / Values
Name	-	Storage nodes are used to represent maintenance hole structures of the storm sewer network. The maintenance hole nodes have the prefix 'MH' and their associated ID number (ex., MH101); Storage nodes are also used to represent catch basins and the surface sags. They are labelled with the suffix _STORAGE.
Tag	-	Storage nodes representing manholes are tagged 'maintenance_hole'.
Inflows	-	No inflows are used in the model
Treatment	-	No treatment is modelled.
Invert Elevation	m	For minor system junctions the invert is the elevation extracted from the proposed design of the storm sewer system.
Rim Elevation	m	For minor system junctions the RIM elevation is the elevation from the road surface at nodes plus the depth of the surface transects to allow for transfer of flow between the major and minor systems through the outlet link.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are set as the difference between the invert elevation and the 1:100 year HGL level in the existing March Road Storm Sewer.
Ponded Area	m ²	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.
Storage Curve	-	For maintenance holes, the storage curve is functional with a constant area which represents the floor area of the required manhole depending on the connecting pipe sizes. For catch basins, the storage curve is tabular where a relationship between elevation and area is specified. The bottom elevation represents the catch basin lead invert. The storage provided includes the storage from the catch basin and from the parking lot sag from top of grate to the maximum spill elevation. The sag storage from the parking lot is exported from contour lines created in autoCAD Civil 3D.

E3.3 Outfalls

Parameter	Units	Description / Values
Name	-	There is a single outfall node in the model. The outfall represents the boundary condition during a 1:100year storm event in the existing March Rd Sewer. The 1:100year HGL level was extracted from as-constructed drawings provided in Appendix D.
Tag	-	The outfall node does not have a Tag.
Inflows	-	No external inflows are applied at the outfall node.
Treatment	-	No treatment is modelled.
Invert Elevation	m	Invert elevation for the Outfall node is taken from as constructed drawings presented in Appendix 'D'.
Rim Elevation	m	RIM elevation for the outfall node is not used in the model as such a value of 0 is attributed.
Tide Gate	-	No backflow is prevented in the model outfall and therefore 'No' is selected.
Route To	-	Parameter is left blank as flow from the Outfall is not directed to an adjacent subcatchment.
Type	-	Type 'FIXED' is selected in the model.

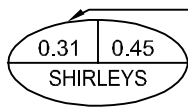
Modeling Parameters

Subcatchment ID	Tag	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Percent Routed (%)	Max. Infil. Rate (mm/hr)	Min. Infil. Rate (mm/hr)	Decay Constant (1/hr)	Drying Time (days)
SUB_CB3		0.062	70.000	8.814	2.0	85.7	0.013	0.25	1.57	4.7	100	76.2	13.2	4.14	7
SUB_CB1		0.092	98.000	9.398	2.0	92.9	0.013	0.25	1.57	4.7	100	76.2	13.2	4.14	7
SUB_CB2		0.237	105.220	22.477	2.0	92.9	0.013	0.25	1.57	4.7	100	76.2	13.2	4.14	7

SWMM Calculations



LEGEND



AREA IN HECTARES
RUNOFF COEFFICIENT
AREA ID



DRAINAGE BOUNDARY



OVERLAND FLOW DIRECTION

PROJECT:

MORGAN'S CREEK STAGE 1
762 MARCH ROAD

DRAWING:

PRE-DEVELOPMENT DRAINAGE PLAN



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DESIGN: AW
DRAWN: CJM
CHECKED: LD
JLR #: 24566-001

DRAWING #:

FIGURE A

Morgan's Creek

STORMWATER MANAGEMENT CALCULATIONS

PRE-DEVELOPMENT FLOWS TO SHIRLEY'S BROOKE					
UNRESTRICTED AREAS					
LOCATION	DRAINING TO	Total Area (ha)	AREA w/ C = 0.2	AREA w/ C = 0.5	Used "C"
UNCONTROLLED	SHIRLEY'S BROOK	0.77	0.69	0.08	0.23
TOTALS		0.77 ha			
NOTES:					

Uplands Method

$$T_c = L_1/V_1 + L_2/V_2 + L_3/V_3$$

	Length (m)	slope (%)	Velocity (m/s)	Minutes
1	7.52	6.3	0.57	0.22
2	53.45	2.6	0.35	2.55
3	16.04	12.5	1.3	0.21
4	34.19	6.3	0.57	1.00

Total 111.2 Total Time (min.) 3.97
 (minimum of 10 minutes used for the calculation)

Parameters Used

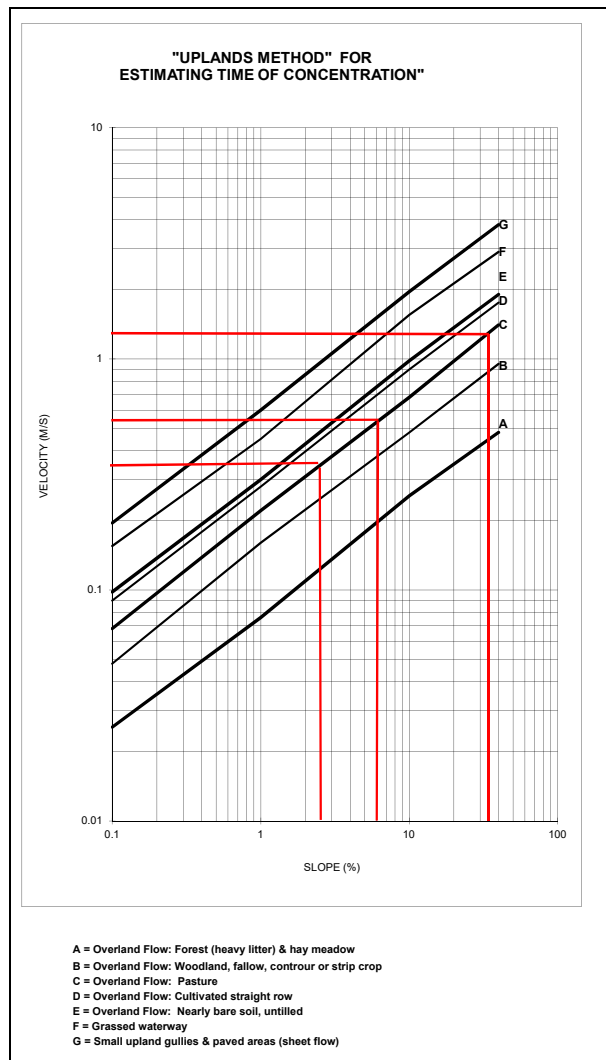
c	Runoff Coefficient	0.23
L	Catchment Length (m)	111.2
A	Catchment Area (ha)	0.77
Tc	Time of Concentration (mins)	10.00

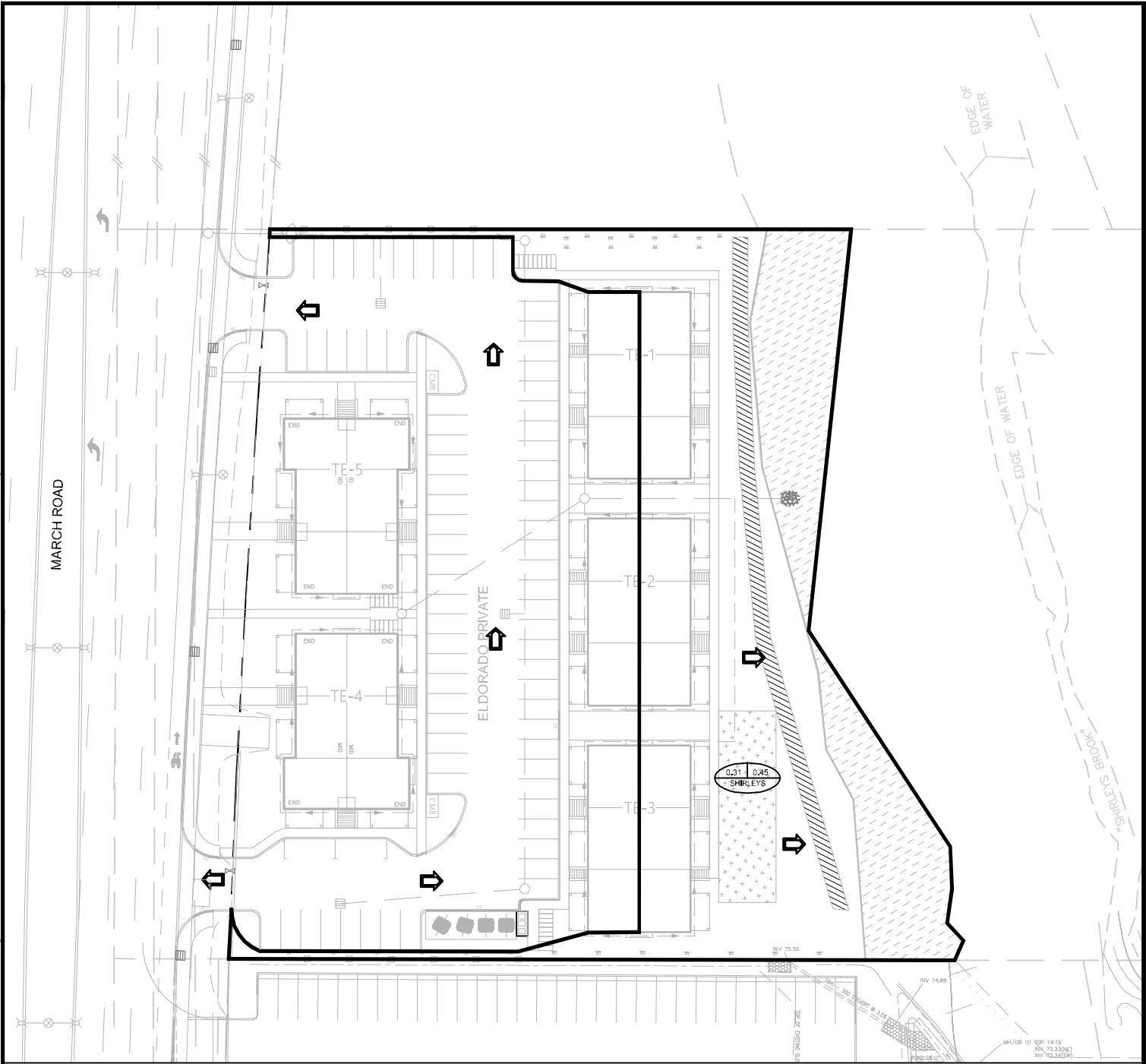
Pre-Development Flowrate generated from March Rd. Site to Shirley's Brooke

1:100 year Rainfall Intensity (Tc =10 mins.)	178.56 mm/hr
Unrestricted Area outletting to Shirley's Brooke	0.77 ha.
Runoff Coefficient	0.23
1:100 year Uncontrolled Peak Fow	87.91 L/s

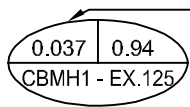
OVERLAND FLOW CHART

SLOPE	A	B	C	D	E	F	G
0.1	0.1950	0.1550	0.0980	0.0900	0.0680	0.0480	0.0255
1	0.6000	0.4500	0.3000	0.2800	0.2200	0.1600	0.0760
10	1.9500	1.5500	0.9800	0.9000	0.6800	0.4800	0.2550
40	3.8000	2.9000	1.9000	1.7500	1.4000	0.9500	0.4800





LEGEND



AREA IN HECTARES
RUNOFF COEFFICIENT (1:100YR)
TRIBUTARY PIPE REACH

DRAINAGE BOUNDARY
OVERLAND FLOW DIRECTION

PROJECT:

MORGAN'S CREEK STAGE 1
762 MARCH ROAD

DRAWING:

POST-DEVELOPMENT DRAINAGE PLAN



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DESIGN: AW
DRAWN: CJM
CHECKED: LD
JLR #: 24566-001

DRAWING #:
FIGURE B

Morgan's Creek

STORMWATER MANAGEMENT CALCULATIONS

PRE-DEVELOPMENT FLOWS TO SHIRLEY'S BROOKE					
UNRESTRICTED AREAS					
LOCATION	DRAINING TO	Total Area (ha)	AREA w/ C = 0.2	AREA w/ C = 0.5	Used "C"
UNCONTROLLED	SHIRLEY'S BROOK	0.31	0.22	0.09	0.45
TOTALS		0.31 ha			
NOTES:					

Uplands Method

$$T_c = L_1/V_1 + L_2/V_2 + L_3/V_3$$

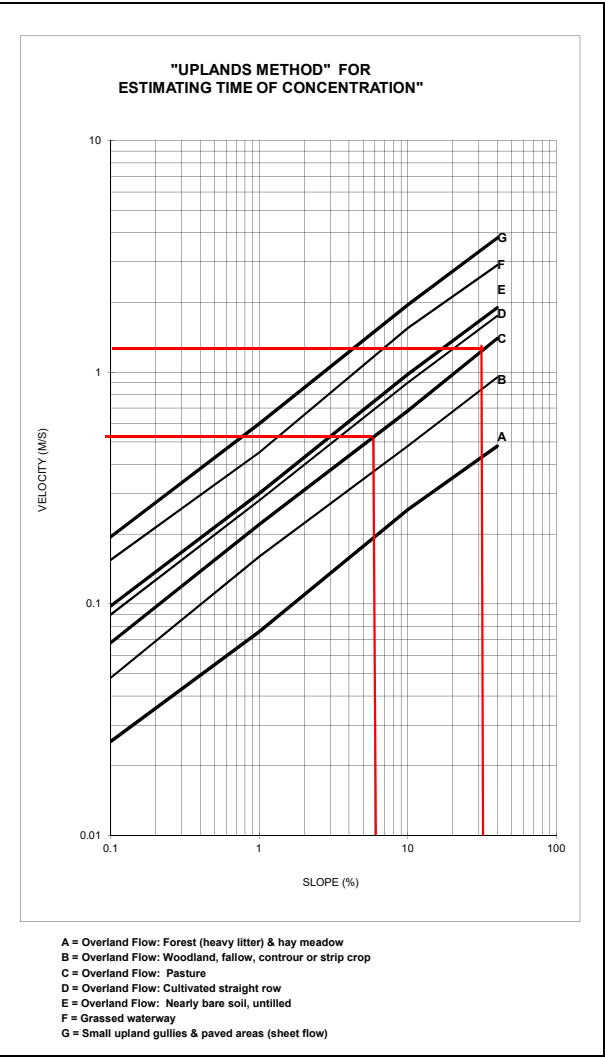
Roof Leader	10 mins	Roof
L2/V2 = 30.3m/1.3m/s/60s/min	0.4 Mins	Up To property limit at 3:1
L3/V3 = 21.01m/0.51m/s/60min/s	0.7 Mins	Property limit to brooke 6.3%
Total Tc	11.1 Mins	
Tc Used	10.0 mins	(Conservative estimate)

Post-Development Flowrate generated from March Rd. Site to Shirley's Brooke

1:100 year Rainfall Intensity (Tc =10 mins.)	178.56 mm/hr
Unrestricted Area outletting to Shirley's Brooke	0.31 ha.
Runoff Coefficient	0.45
1:100 year Uncontrolled Peak Fow	69.25 L/s

OVERLAND FLOW CHART

SLOPE	A	B	C	D	E	F	G
0.1	0.1950	0.1550	0.0980	0.0900	0.0680	0.0480	0.0255
1	0.6000	0.4500	0.3000	0.2800	0.2200	0.1600	0.0780
10	1.9500	1.5500	0.9800	0.9000	0.6800	0.4800	0.2550
40	3.8000	2.9000	1.9000	1.7500	1.4000	0.9500	0.4800



STORMWATER MANAGEMENT CALCULATIONS
Runoff Coefficients - Unrestricted Areas (MARCH, SHIRLEYS)

UNRESTRICTED AREAS						
LOCATION	DRAINING TO	Total Area (ha)	AREA w/ C = 0.2	AREA w/ C = 0.9	Actual "C"	Used "C"
UNCONTROLLED	MARCH RD.	0.07	0.03	0.04	0.61	0.65
UNCONTROLLED	SHIRLEY'S BROOK	0.31	0.18	0.09	0.39	0.45
TOTALS		0.38 ha				
NOTES: 1. The coefficients were calculated on a proportional bases, using % of area of non-hard surface @ C=0.2 and % of area of hard surface @ a C=0.9						

Runoff Coefficients - Restricted Areas

RESTRICTED AREAS						
LOCATION		Total Area (ha)	AREA w/ C = 0.2	AREA w/ C = 0.9	Actual "C"	Used "C"
CB3	508-507	0.06	0.01	0.05	0.81	0.80
CB2	508-507	0.24	0.02	0.22	0.84	0.85
CB1	507-506	0.09	0.01	0.08	0.82	0.85
TOTALS		0.39 ha				
NOTES: 1. The coefficients were calculated on a proportional bases, using % of area of non-hard surface @ C=0.2 and % of area of hard surface @ a C=0.9						

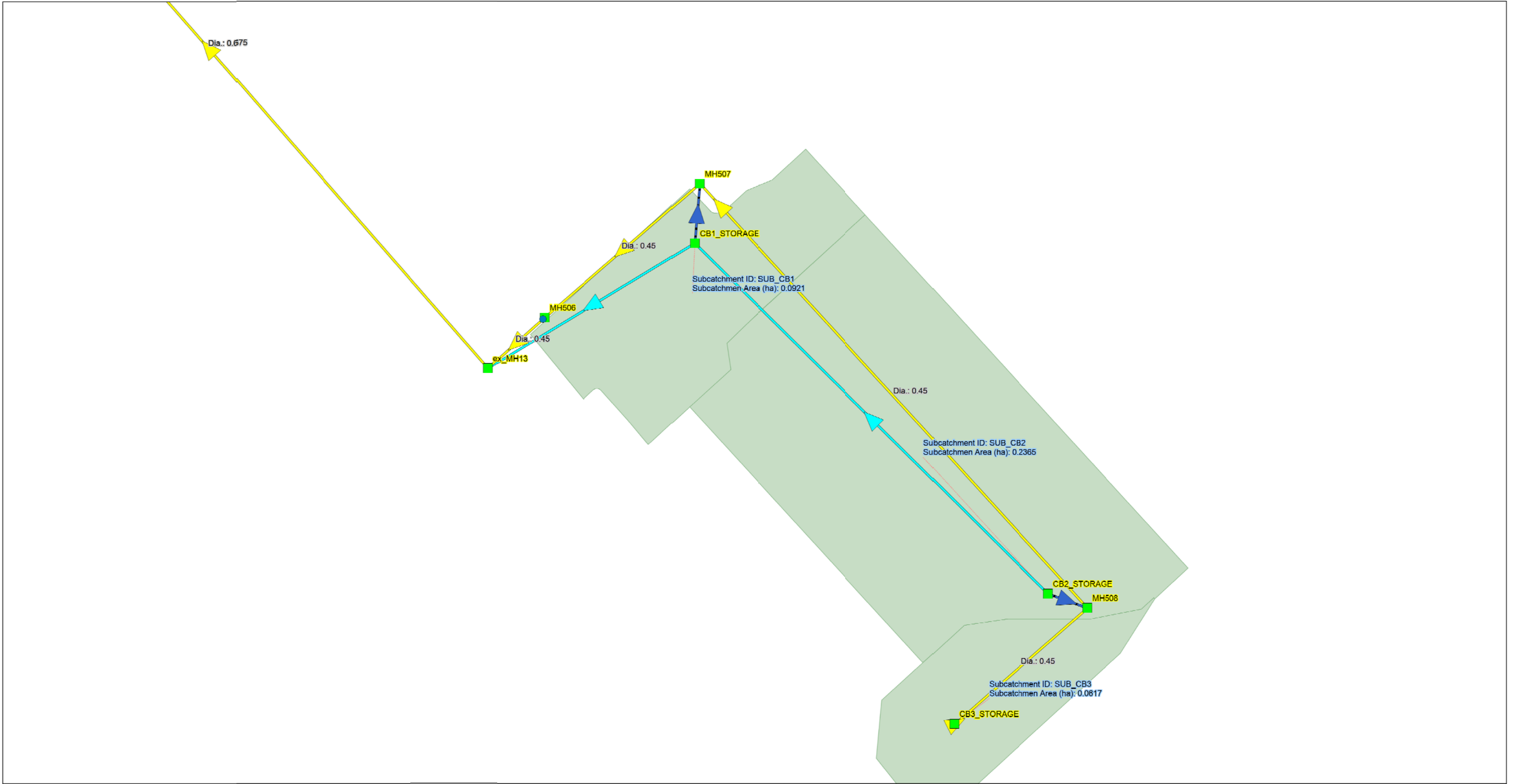
Acceptable Release Rate (0.77ha x 70 L/s/ha.) = 53.9 L/s
 (Based on SWM Facility 1 - West, Design Brief, David McManus Engineering Ltd., April 15, 2009)

Unrestricted Release rate to March Road.

1:100 year Rainfall Intensity (10 min. Tc) 178.56 mm/hr
 Unrestricted Area outletting to March Road 0.07 ha.
 Runoff Coefficient 0.65
 1:100 year Uncontrolled Peak Fow 22.59 L/s

Acceptable Release Rate 53.9 L/s
 - Unrestricted areas outletting to March Rd. 22.59 L/s
 March Road Restricted Release Rate 31.31 L/s

Model Schematic



Legend

●

Junctions

▲

Outfalls

■

Storages

Conduits

—

Storm Sewer

—

CB Leads

—

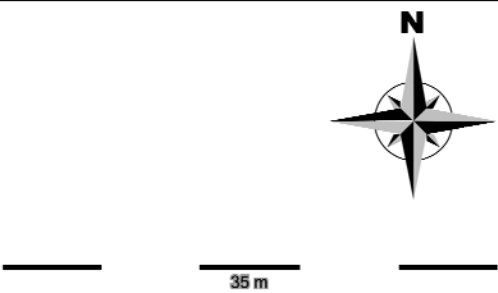
Orifices

—

Weirs

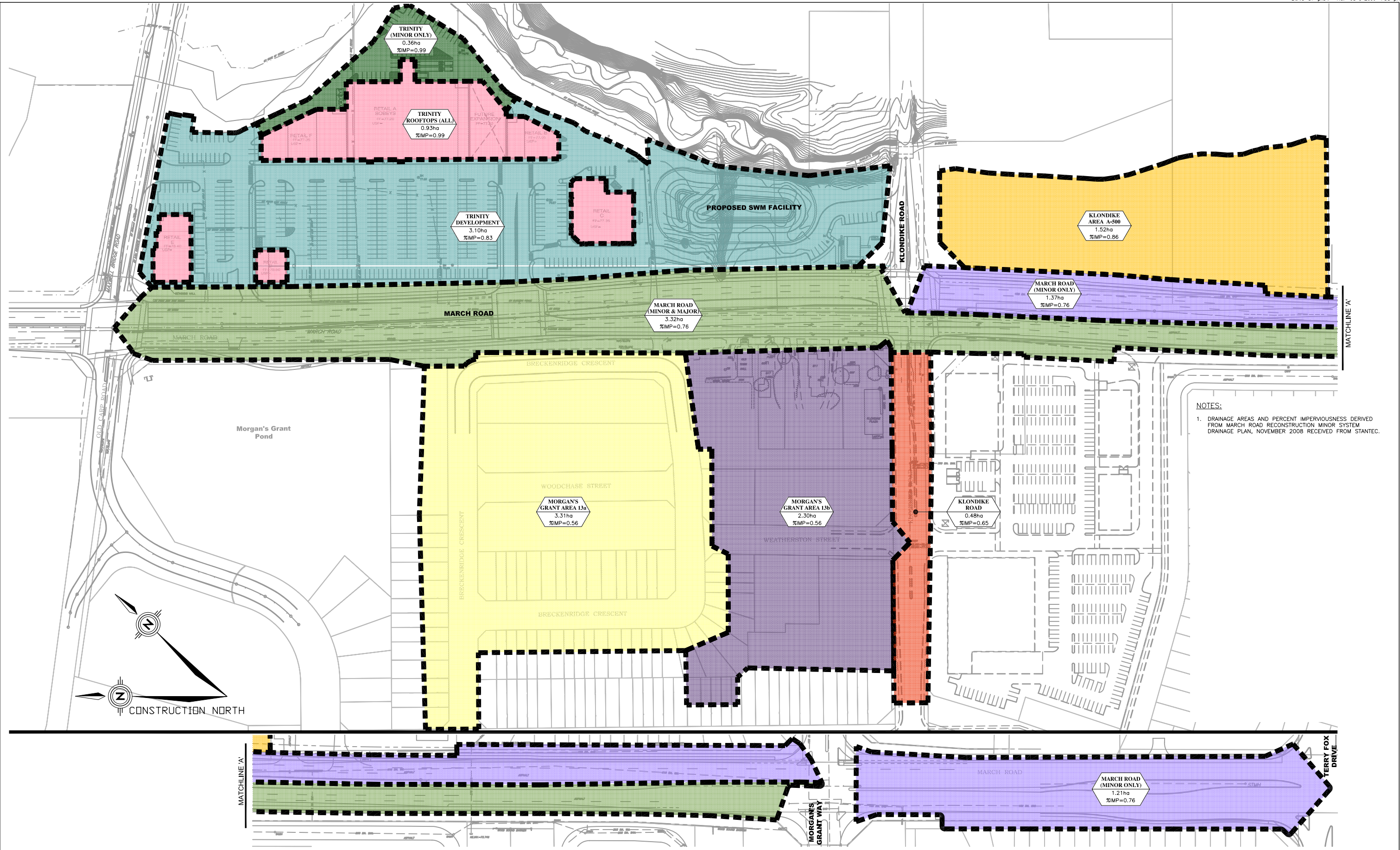
■

Subcatchments



PROJECT:				MORGAN'S CREEK STAGE 1 762 MARCH RD., OTTAWA, ONTARIO	
DRAWING:					
MODEL SCHEMATIC					
	This drawing is copyright protected and may not be reproduced or use for purposes other than execution of the described work without the express written consent of J.L. Richards & Associates Limited.	DESIGN:	AT	JLR NO.:	24566-001
		DRAWN:	AT	DRAWING NO.:	APPENDIX 'D'
		CHECKED:	BP		

Shirley's Brook Stormwater Management Facility 1 - West



NOTES:
1. DRAINAGE AREAS AND PERCENT IMPERVIOUSNESS DERIVED FROM MARCH ROAD RECONSTRUCTION MINOR SYSTEM DRAINAGE PLAN, NOVEMBER 2008 RECEIVED FROM STANTEC.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.



No.	REVISION	DATE	BY	



BASEPLAN	DME
DESIGN	
CHECKED	
CAD	ACF
PRD. MGR.	MJG
APPROVED	HGS

SCALE	
NOT TO SCALE	

TRINITY DEVELOPMENT GROUP
MARCH ROAD
CITY OF OTTAWA

SERVICE AREA DRAINAGE PLAN

PROJECT No.	2654
SURVEY BY	STANTEC
DATE	MARCH 2009
DRAWING No.	STM-AREAS


```

                                SWMA100.dat
                                I AIMP=1.57 mm SLPI=1.0% LGI=250 m MNI=0.013 SCI=0 min -1

*%-----|-----
* Trinity Development Minor Only (Klondike Area A-400 Minor Only)
* (0.36 ha Commercial)
* Minor System only to SWM Pond
* Minor system capture = 85 L/s/ha
* Major system storage = 0 m3/ha
* -----
*
CALIB STANDHYD      ID=4 NHYD=["A400min"] DT=2 min AREA=0.36 ha
                    XIMP=0.99 TIMP=0.99 DWF=0 LOSS=2 CN=85
                    IAPER=4.67 mm SLPP=2.0% LGP=5 m MNP=0.25 SCP=0 min
                    I AIMP=1.57 mm SLPI=1.0% LGI=250 m MNI=0.013 SCI=0 min -1

COMPUTE DUALHYD     IDIN=4 CINLET=0.031 cms NINLET=1
                    MAJID=6 MAJNHYD=["A400maj"]
                    MINID=7 MINHYD=["A400min"]
                    TMJSTO=0 cu.M

*
*%-----|-----
* Trinity Development Rooftops (Klondike Area A-400 Rooftops)
* (0.93 ha of Commercial Rooftops)
* Runoff to be controlled to 40L/s/ha from Rooftops
* Minor system capture = 40 L/s/ha
* Major system storage = 594 m3/ha (Rational Method)
* -----
*
CALIB STANDHYD      ID=4 NHYD=["A400Roof"] DT=2 min AREA=0.93 ha
                    XIMP=0.99 TIMP=0.99 DWF=0 LOSS=2 CN=85
                    IAPER=4.67 mm SLPP=2.0% LGP=5 m MNP=0.25 SCP=0 min
                    I AIMP=1.57 mm SLPI=1.0% LGI=250 m MNI=0.013 SCI=0 min -1

COMPUTE DUALHYD     IDIN=4 CINLET=0.037 cms NINLET=1
                    MAJID=6 MAJNHYD=["Roofmaj"]
                    MINID=9 MINHYD=["Roofmin"]
                    TMJSTO=552 cu.M

*
*      Flows from Trinity Development
*
ADD HYD              ID=4 NHYD=["TRINITY"] IDS TO ADD 3, 7, 6, 9
PRINT HYD            ID=4 -1
*
*%-----|-----
*      Klondike Area A-500
*      (Commercial/Residential)
*      Minor system capture = 70 L/s/ha
*      Major system storage = 242 m3/ha (Rational Method)
* -----
*
DESIGN STANDHYD      ID=1 NHYD=["A-500"] DT=2 min AREA=1.52 ha
                    XIMP=0.69 TIMP=0.86 DWF=0 LOSS=2 CN=85
                    SLOPE=1.0% -1

*      Release Rate of 70 L/s/ha for Area A-500
*
COMPUTE DUALHYD     IDIN=1 CINLET=0.106 cms NINLET=1
                    MAJID=6 MAJNHYD=["A500maj"]
                    MINID=7 MINHYD=["A500min"]
                    TMJSTO=368 cu.M

*
ADD HYD              ID=10 NHYD=["SWMF A"] IDS TO ADD 4, 5, 7, 8

```


File Location: V:\24000\24566.LD Minto Lands\24566-002 - 2018 Design - SANDHILL Rd\3-JLR DWG\1-Civil\Attach Civil\Just in Case\24566-002 C CUT FILL-2.dwg



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-0.40	-0.30	Red
2	-0.30	-0.20	Orange
3	-0.20	-0.10	Yellow
4	-0.10	0.00	Light Green
5	0.00	0.10	Green
6	0.10	0.20	Dark Green
7	0.20	0.30	Very Dark Green
8	0.30	0.40	Black

335 SANDHILL ROAD	
Interval	Fill - m ³
73.84-73.94	16.90
73.94-74.04	10.35
74.04-74.10	3.75
Total	30.99

SUMMARY:			
Interval	Cut - m ³	Fill - m ³	Net - m ³
73.84-73.94	-16.74	16.90	0.16
73.94-74.04	-9.78	10.35	0.56
74.04-74.10	-4.55	3.75	-0.81
Total	-31.08	30.99	-0.09

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER

June 6, 2019

A WILLIAMS

100218983

Province of Ontario

PROFESSIONAL STAMP

LICENSED PROFESSIONAL ENGINEER

M. N. L. DALRYMPLE

June 6/19

Province of Ontario

PROJECT:

MORGAN'S CREEK (STAGES 1&2)

762 MARCH ROAD & 335 SANDHILL ROAD

DRAWING:

CUT & FILL FOR SHIRLEY'S BROOK FLOODPLAIN CORRIDOR

J.L.Richards

ENGINEERS - ARCHITECTS - PLANNERS

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DESIGN: AW

DRAWN: SK

CHECKED: LD

JLR #: 24566-002

Scale 1:500

DRAWING#:

FIGURE-1

PLOT DATE: June 6, 2019 2:48:56 PM

From: [McKinley Environmental](#)
To: [Thomas Couper](#); [Kevin A. Harper](#); [Lucie Dalrymple](#); [Annie Williams](#)
Subject: Fwd: 760 March Road Minor Grading
Date: Monday, April 15, 2019 9:43:16 PM

----- Forwarded message -----

From: **Hann, Carolyn (MECP)** <Carolyn.Hann@ontario.ca>
Date: Mon, Apr 15, 2019 at 12:19 PM
Subject: RE: 760 March Road Minor Grading
To: McKinley Environmental <mckinleyenvironmental@gmail.com>

Hello Andrew,

After review of the additional work that needs to occur, MECP agrees with your assessment that the work being proposed is consistent with previous mitigation/avoidance measures. Impacts to Blanding's Turtle and contravention to the Endangered Species Act should be avoided if avoidance measures and mitigation are implemented as described. Again, if further details of the project change, I recommend that you contact SAROntario@ontario.ca and request a follow-up review.

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

Best,

Carolyn Hann

Management Biologist | Ontario Ministry of Environment, Conservation and Parks | 10-1 Campus Drive,
Kemptville, Ontario, K0G 1J0 | PH: 613.258.8267 | Email: carolyn.hann@ontario.ca

From: McKinley Environmental <mckinleyenvironmental@gmail.com>
Sent: April-09-19 10:15 AM
To: Hann, Carolyn (MECP) <Carolyn.Hann@ontario.ca>
Cc: Lucie Dalrymple <LDalrymple@jlrichards.ca>; Annie Williams <awilliams@jlrichards.ca>; Kevin A. Harper <KHarper@minto.com>; Thomas Couper <TCouper@minto.com>; Susan Murphy <SMurphy@minto.com>
Subject: 760 March Road Minor Grading

Hi Carolyn,

I wanted to send an update regarding the 760 March Road project. We previously submitted an Information Gathering Form for this project, which was reviewed by the OMNRF. I previously discussed this project with Aaron Foss, but I'm guessing you probably reviewed the IGF? If not, please let me know if there is someone else I should follow-up with at the MECP, now that Aaron is no longer working on these files.

After review of the IGF was complete, Aaron notified us that the OMNRF agreed that contravention of the ESA will be avoided, pending that the mitigation and avoidance measures are implemented as described in the submission (I've copied his email confirmation below).

The mitigation and avoidance measures are continuing as described in the IGF, however, there is a minor change that I wanted to run by you. As described in the IGF, Minto plans to convey land to create a 60 m wide corridor surrounding Shirley's Brook, thereby avoiding any impacts to Category 2 habitat.

However, during the design process we've recently realized that some minor grading will be required within the 60 m wide corridor, in order to complete a cut and fill operation. As shown in the attached, the reason for this is that portions of Block 9 overlap the revised floodplain (as shown by recent MVCA mapping). A small area of the floodplain (outside the 60 m wide corridor) will require fill on the east side of Shirley's Brook to accommodate Block 9. We are required to compensate for floodplain capacity, so a corresponding cut is proposed on the west side of Shirley's Brook (again outside the 60 m wide corridor).

The major portion of the cut and fill volumes are both proposed outside the 60 m wide corridor, however, portions of the adjacent slopes would need to be graded. The grading is required to create a smooth transition from the cut/fill, as otherwise we'll be left with an abrupt elevation change that would be prone to erosion.

The grading on both the west and east sides of Shirley's Brook would only extend about 3 m beyond the 60 m wide corridor limit (on each side). The total elevation change along the slope would be approximately +/- 20 to 40 cm. The minor grading changes shouldn't significantly affect Shirley's Brook, as the grading will occur more than 20 m from the water's edge, and the overall floodplain capacity won't change. The overall catchment and flow of water to Shirley's Brook also won't change, as the grading changes will mirror each other on either side of the watercourse.

During grading work, the area will be isolated with a temporary Blanding's Turtle exclusion fence and sweeps will be completed prior to vegetation removal (as described in the IGF). There is no significant tree clearing required, as the work area is already open Cultural Meadow, so we would only be removing groundcover. Following completion, the grading areas will be allowed to regenerate, so there will be no loss of Category 2 habitat and/or any permanent loss of buffer functionality.

We believe the grading is a minor and temporary disturbance which shouldn't have any significant impacts on Blanding's Turtle or the Category 2 habitat, and that this work is consistent with the previous mitigation/avoidance measures and the OMNRF's determination for the project.

Please let me know if you have any questions or comments.

Thanks,

Andrew

On Wed, Dec 5, 2018 at 1:19 PM Foss, Aaron (MNRF) <Aaron.Foss@ontario.ca> wrote:

Good afternoon Andrew,

After review, MNRF agrees with your assessment that impacts to Blanding's turtle, and contravention to the ESA should be avoided if avoidance and mitigation measures are implemented as described.

If any details of the project change, I recommend that you contact our office for a follow up review.

Any questions, feel free to contact me.

Cheers

Aaron Foss

Sr. Fish and Wildlife Technical Specialist
Ministry of Natural Resources and Forestry
Kemptville District
10-1 Campus Drive
Kemptville, ON K0G 1J0
Ph: 613-258-8386

From: McKinley Environmental <mckinleyenvironmental@gmail.com>

Sent: November 8, 2018 1:48 PM

To: Foss, Aaron (MNRF) <Aaron.Foss@ontario.ca>

Cc: Kevin A. Harper <KHarper@minto.com>; Susan Murphy <SMurphy@minto.com>

Subject: 760 March Road IGF Submission Part 1 of 2

Hi Aaron,

Minto are currently submitting a Site Plan/Draft Plan of Subdivision application to develop the properties at 760 March Road and 329 Sandhill Road. For reference, the 760 March Road parcel is located directly south of the 788 March Road project, which was recently reviewed by the OMNRF.

The Minto project includes development of two parcels (both owned by Minto) on either side of Shirley's Brook. Both parcels are relatively small (about 2.2. ha total) and are surrounded by existing development on all sides. The two parcels are being developed concurrently by Minto, and so are addressed together.

The proposal for this project is similar to the adjacent 788 March Road property. In this case, Minto proposes to maintain a full 60 m wide corridor surrounding Shirley's Brook (30 m setback from the normal high-water mark on both sides) in order to preserve Category 2 Blanding's Turtle habitat. A comparatively small area of Category 3 Blanding's Turtle habitat will be removed by the development. However, as with the adjacent 788 March Road development, the Category 3 habitat is highly degraded and surrounded by existing development on all sides, and hence is unlikely to provide any significant habitat function. Minto are also proposing to provide fencing on both sides of the 60 m wide corridor, in order to mitigate any potential impacts to Blanding's Turtle. The fencing is anticipated to address the existing risk of road mortality on March Road and Sandhill Road, thereby offsetting any potential impacts associated with the removal of the non-functional Category 3 habitat.

Overall, the arrangement and habitat conditions are very similar to the recently reviewed 788 March Road project (which is located immediately to the north).

As with the adjacent project, we believe the proposed mitigation is sufficient that there will be no significant negative impacts to Blanding's Turtle or their habitat, and therefore that an Overall Benefit Permit should not be required.

In order to facilitate the OMNRF review, I have prepared the Information Gathering Form (attached). I am also sending a copy of the Combined Environmental Impact Statement and Tree Conservation Report, and Figures (separate email).

As discussed with other recent applications, I have summarized the surveying in Table 2 of the IGF. As recently discussed, I haven't included a description of the mitigation measures (which will be included in the AAF). Once the OMNRF has confirmed acceptance of the IGF, I will submit the Alternatives Assessment Form.

We are looking forward to receiving your comments.

Thanks,

Andrew

--

Andrew McKinley, PhD, MA, BA (Hons), EP, RP Bio
Senior Biologist | McKinley Environmental Solutions
(613) 620-2255 | Ottawa, Ontario
mckinleyenvironmental@gmail.com | www.mckinleyenvironmental.com

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Crossings Tables

Morgan's Creek Stage 1 - 762 March Road
Crossings Table (Sanitary and Storm Sewers)

Date: 6/11/2019



ID	Type	Dia. (m)	FROM	TO	Slope	At Crossing		Type	Dia. (m)	FROM	TO	Slope	At Crossing		Clearance	Crossing Order
			MH	MH		Top of Pipe	Bottom of Pipe			MH	MH		Top of Pipe	Bottom of Pipe		
1	STM	0.45	508	507	0.20%	76.36	75.73	STM	0.15	509	510	1.02%	75.46	75.31	0.27	STM is below STM
2	STM	0.45	508	507	0.20%	76.25	75.62	SAN	0.20	5	6	0.35%	76.54	76.34	0.09	STM is below SAN
3	STM	0.45	506	EX 13	1.11%	76.16	75.54	SAN	0.20	Stub	6	0.25%	76.48	76.28	0.12	STM is below SAN
4	SUBDRAIN	0.10	Edge of 203	90 Bend	0.76%	75.68	75.58	SAN	0.20	1	2	0.35%	76.73	76.53	0.86	SUBDRAIN is below SAN
5	STM	0.15	509	510	1.02%	75.43	75.28	SAN	0.20	3	5	0.35%	76.75	76.55	1.12	STM is below SAN

Morgan's Creek Stage 1 - 762 March Road
Water Services Crossings Table

Date: 6/11/2019



ID	Type	Dia. (m)	Length (m)	FROM	TO	Slope	At Crossing		Type	Unit	USF	Lateral Dia.	At Crossing		Clearance ¹	Cover ²	Crossing Order
				MH	MH		Top of Pipe	Bottom of Pipe					Inv.	Obv.			
1	SAN	0.20	84.70	1	2	0.35%	76.66	76.46	LAT	201	77.13	0.025	76.13	76.16	0.30	2.36	LAT Is below SAN
2	SAN	0.20	84.70	1	2	0.35%	76.69	76.49	LAT	202	77.13	0.025	76.16	76.19	0.30	2.26	LAT Is below SAN
3	SAN	0.20	84.70	1	2	0.35%	76.72	76.52	LAT	203	77.13	0.025	76.19	76.22	0.30	2.30	LAT Is below SAN
4	SAN	0.20	84.70	1	2	0.35%	76.76	76.56	LAT	207	77.13	0.025	76.24	76.26	0.30	2.26	LAT Is below SAN
5	SAN	0.20	84.70	1	2	0.35%	76.79	76.59	LAT	208	77.13	0.025	76.27	76.29	0.30	2.22	LAT Is below SAN
6	SAN	0.20	84.70	1	2	0.35%	76.82	76.62	LAT	209	77.13	0.025	76.30	76.32	0.30	2.19	LAT Is below SAN
7	SAN	0.20	84.70	1	2	0.35%	76.87	76.67	LAT	213	77.13	0.025	76.34	76.37	0.30	2.14	LAT Is below SAN
8	SAN	0.20	84.70	1	2	0.35%	76.91	76.71	LAT	214	77.13	0.025	76.38	76.41	0.30	2.17	LAT Is below SAN
9	SAN	0.20	84.70	1	2	0.35%	76.93	76.73	LAT	215	77.13	0.025	76.40	76.43	0.30	2.16	LAT Is below SAN
10	SAN	0.2	85.2	3	5	0.35%	76.58	76.38	LAT	206	77.13	0.025	76.05	76.08	0.30	2.57	LAT Is below SAN
11	SAN	0.2	85.2	3	5	0.35%	76.61	76.41	LAT	205	77.13	0.025	76.08	76.11	0.30	2.54	LAT Is below SAN
12	SAN	0.2	85.2	3	5	0.35%	76.64	76.44	LAT	204	77.13	0.025	76.11	76.14	0.30	2.41	LAT Is below SAN
13	SAN	0.2	85.2	3	5	0.35%	76.68	76.48	LAT	212	77.13	0.025	76.16	76.18	0.30	2.19	LAT Is below SAN
14	SAN	0.2	85.2	3	5	0.35%	76.71	76.51	LAT	211	77.13	0.025	76.18	76.21	0.30	2.16	LAT Is below SAN
15	SAN	0.2	85.2	3	5	0.35%	76.74	76.54	LAT	210	77.13	0.025	76.21	76.24	0.30	2.28	LAT Is below SAN
16	SAN	0.2	85.2	3	5	0.35%	76.79	76.59	LAT	218	77.13	0.025	76.26	76.29	0.30	2.28	LAT Is below SAN
17	SAN	0.2	85.2	3	5	0.35%	76.82	76.62	LAT	217	77.13	0.025	76.29	76.32	0.30	2.23	LAT Is below SAN
18	SAN	0.2	85.2	3	5	0.35%	76.84	76.64	LAT	217	77.13	0.025	76.32	76.34	0.30	2.11	LAT Is below SAN
19	STM	0.45	84.68	508	507	0.20%	76.26	75.64	LAT	206	77.13	0.025	75.31	75.34	0.30	3.03	LAT Is below STM
20	STM	0.45	84.68	508	507	0.20%	76.28	75.65	LAT	205	77.13	0.025	75.33	75.35	0.30	3.02	LAT Is below STM
21	STM	0.45	84.68	508	507	0.20%	76.29	75.67	LAT	204	77.13	0.025	75.35	75.37	0.30	3.00	LAT Is below STM
22	STM	0.45	84.68	508	507	0.20%	76.32	75.70	LAT	212	77.13	0.025	75.37	75.40	0.30	2.97	LAT Is below STM
23	STM	0.45	84.68	508	507	0.20%	76.34	75.71	LAT	211	77.13	0.025	75.39	75.41	0.30	2.96	LAT Is below STM
24	STM	0.45	84.68	508	507	0.20%	76.35	75.73	LAT	210	77.13	0.025	75.41	75.43	0.30	2.94	LAT Is below STM
25	STM	0.45	84.68	508	507	0.20%	76.38	75.76	LAT	218	77.13	0.025	75.43	75.46	0.30	2.91	LAT Is below STM
26	STM	0.45	84.68	508	507	0.20%	76.40	75.77	LAT	217	77.13	0.025	75.45	75.47	0.30	2.90	LAT Is below STM
27	STM	0.45	24.19	CB3	508	0.20%	76.41	75.79	LAT	216	77.13	0.025	75.46	75.49	0.30	2.88	LAT Is below STM

Notes:

1. Clearance between service and sewer is 0.3m as per City of Ottawa Standard Detail W38
2. Locations where the min 2.4m cover is not met, additional insulation will be provided as per City of Ottawa Standard Detail W22

Morgan's Creek Stage 1 - 762 March Road
Sanitary Services Crossings Table

Date: 6/11/2019



ID	Type	Dia. (m)	FROM	TO	At Crossing		Type	Unit	USF	Lateral Dia.	At Crossing		Clearance	Elev.	Cover	Crossing Order
			MH	MH	Top of Pipe	Bottom of Pipe					Inv.	Obv.				
1	STM	0.45	508	507	76.30	75.67	LAT	225	77.33	0.150	76.88	77.03	0.73	78.34	1.31	STM is below LAT
2	STM	0.45	508	507	76.31	75.68	LAT	226	77.33	0.150	76.86	77.01	0.71	78.30	1.29	STM is below LAT
3	STM	0.45	508	507	76.32	75.70	LAT	227	77.33	0.150	76.86	77.01	0.69	78.19	1.17	STM is below LAT
4	STM	0.45	508	507	76.35	75.73	LAT	219	77.38	0.150	76.91	77.06	0.71	78.22	1.15	STM is below LAT
5	STM	0.45	508	507	76.37	75.74	LAT	220	77.38	0.150	76.91	77.06	0.70	78.30	1.23	STM is below LAT
6	STM	0.45	508	507	76.38	75.75	LAT	221	77.38	0.150	76.93	77.08	0.70	78.35	1.27	STM is below LAT

Morgan's Creek Stage 1 - 762 March Road
Watermain Crossings Table

Date: 6/11/2019



ID	Type	Dia. (m)	FROM	TO	At Crossing		Watermain Over/Under	Clearance ¹	WM Dia.	WM Inv.	WM Obv	Grade	Cover ²
			MH	MH	Top of Pipe	Bottom of Pipe							
1	STM	0.45	508	507	76.25	75.63	Under	0.50	0.038	75.09	75.13	78.36	3.23
2	SAN	0.20	3	5	76.56	76.36	Under	0.50	0.038	75.82	75.86	78.37	2.51
3	SAN	0.20	1	2	76.65	76.45	Under	0.50	0.038	75.91	75.95	78.39	2.45
4	STM	0.15	509	510	75.55	75.40	Over	0.25	0.038	75.80	75.84	78.20	2.36
5	SAN	0.20	4	6	76.45	76.25	Under	0.50	0.200	75.55	75.75	78.53	2.78
6	SAN	0.20	6	7	75.83	75.63	Over	0.56	0.200	76.39	76.59	78.30	1.71
7	STM	0.45	506	Ex. 13	76.11	75.48	Over	0.25	0.200	76.36	76.56	78.50	1.94
8	STM	0.15	510	Outlet	74.82	74.67	Over	0.25	1.200	75.07	76.27	79.50	3.23
9	SAN	0.20	4	6	76.44	76.24	Under	0.50	1.200	74.54	75.74	79.50	3.76

Notes:

¹ Clearance between watermain is per City of Ottawa Standard Details W25 & W25.2

² Locations where 2.4m cover is not met, additional insulation will be provided as per City of Ottawa Standard Detail W22



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