Site Servicing and Stormwater Management Report
1869 Maple Grove Road, Ottawa, ON

Client:
10886378 Canada Incorporated
190 Lisgar Street
Ottawa, ON K2P OCA

Submitted for:
Zoning By-law Amendment, Plan of Subdivision

Project Name:
1869 Maple Grove Road

Project Number:
OTT-00254810-A0

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Date Submitted:
September 25, 2020

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1 Introduction

1.1 Overview

EXP Services Inc. (EXP) was retained by 10886378 Canada Incorporated to prepare a Site Servicing and Stormwater Management Report for the proposed redevelopment of 1869 Maple Grove Road in support of a Plan of Subdivision, Zoning By-law Amendment and Part Lot Control applications.

The 0.41-hectare site is situated along Maple Grove Road as illustrated in **Figure 1-1** below. The site is within the City of Ottawa urban boundary, outside the Greenbelt, and situated in Ward 6 (Stitsville-Kanata West). The description of the subject property is noted below:

- Part of Lot 1, Concession 1, Geographic Township of Huntley, City of Ottawa, Part 1, Plan 5R-2908, PIN 044870350

The proposed development will consist of three (3) blocks containing a total of eight (8) townhomes that will face Maple Grove Road, eight (8) townhomes that will face Bensinger Way, and two (2) townhomes that will face Mykonos Crescent.

This report will discuss the adequacy of the adjacent municipal watermain, sanitary sewers and storm sewers to provide the required water supply, convey the sewage and stormwater flows that will result from the proposed development. This report provides a design brief for submission, along with the engineering drawings, for City approval.

Figure 1-1 - Site Location

2 Existing Conditions

The existing property is surrounded by the Fairwinds West residential subdivision. Development of the adjacent subdivision began in 2012 and was completed in 2015.

The existing site topography slopes northwest towards Bensinger Way and appears to be self contained with no drainage outlet. A single residential home is situated on the property.

3 Existing Infrastructure

The site includes a single-family detached home that will be removed during the redevelopment of the site.

From review of the sewer and watermain mapping, as-built drawings and Utility Central Registry (UCC) plans, the following summarizes the infrastructure within the subject property and the infrastructure on the adjacent streets along the frontage of the property and adjacent offsite infrastructure:

Within property

- A well, and septic system within the property that will be abandoned.

Maple Grove Road

- 300mm watermain.
- 200mm sanitary sewer.
- 450mm sanitary sewer.
- 525mm storm sewer.
- 2250mm storm sewer.
- Gas / Bell / Streetlighting/ Hydro.

Bensinger Way

- 200mm watermain.
- 200mm sanitary sewer.
- 600mm storm sewer.
- Gas /Bell / Streetlighting / Hydro.

Mykonos Crescent

- 200mm watermain.
- 200mm sanitary sewer.
- 375mm storm sewer.
- 450mm storm sewer.
- Gas / Hydro / Bell / Streetlighting.

As-built drawings for Maple Grove Road, Bensinger Way, and Mykonos Crescent were obtained from the City of Ottawa and are included in **Appendix F** for reference.

1.3 Pre-Consultation / Permits / Approvals

A pre-consultation meeting was held with the City prior to design commencement. This meeting outlined the submission requirements and provided information to assist with the development proposal. The proposed site is located within Mississippi Valley Conservation Authority (MVCA) jurisdiction, therefore signoff from the MVCA will be required prior to final approval. The MVCA was contacted to confirm the stormwater management quality control requirements. A copy of the correspondence with the MVCA is attached in **Appendix E**.

It is expected that an Environmental Compliance Approval (ECA) will be required from the Ministry of Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC), for this onsite private Sewage Works. The onsite Sewage Works will include the onsite stormwater works for flow controls and associated stormwater detention. Further discussions with City of Ottawa staff will be required to confirm the ECA requirements and to determine whether a direct submission or Transfer-of-Review submission will be required.

In addition, various design guidelines were referred to in preparing the current report including:

- Bulletin ISDTB-2012-4 (20 June 2012)
  - Technical Bulletin ISDTB-2014-01 (05 February 2014)
  - Technical Bulletin PIEDTB-2016-01 (September 6, 2016)
  - Technical Bulletin ISDTB-2018-01 (21 March 2018)
  - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
  - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
  - Technical Bulletin ISTB-2018-02 (21 March 2018)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 1999.
- Ontario Building Code 2012, Ministry of Municipal Affairs and Housing.
- Kanata West Master Servicing Study, Stantec, CCL/IBI, June 16, 2020 (Volumes 1 ad 2)
- Deign Brief for Pond 4 Kanata West, Mattamy Homes, DSEL, JFSA, December 10, 2014

4 Water Servicing

4.1 Existing Water Servicing

The site is within the City of Ottawa 3W pressure zone and supplied from the Stittsville elevated reservoir. The existing home is serviced by an onsite well which will be abandoned prior to development.

4.2 Water Servicing Proposal

The proposed development will consist of 18-townhome units. An architectural site plan is provided in **Appendix H.** The site will be serviced by the existing 305mm watermain on Maple Grove Road, the 203mm watermain on Bensinger Way, and the 203mm watermain on Mykonos Crescent.

Water supply for each townhome will be provided by individual water services connecting to the existing watermains. The proposed servicing is detailed on Drawing C002.

4.3 Water Servicing Design

The water servicing requirements for the proposed development is designed in accordance with the City Design Guidelines (July 2010). The following steps indicate the basic methodology that was used in our analysis:

- Estimated water demands under average day, maximum day and peak hour conditions. As the total population estimate was less than 500, therefore residential peaking factors based on MECP Table 3-3 used.
- Estimated the required fire flow (RFF) based on the Fire Underwriters Survey (FUS).
- Obtained hydraulic boundary conditions (HGL) from the City, based on the above water demands and required fire flows.
- Boundary condition data and water demands were used to estimate the pressure at the proposed blocks, and this was compared to the City's design criteria.

Please refer to **Appendix B** for detailed calculations of the total water demands.

A review of the estimated watermain pressures at the building connections, based on the boundary conditions provided, were completed based on using a single water service feed to each individual townhome unit. **Table B6** in **Appendix B** provides a comparison of anticipated pressures at the building connection based on using a single 19mm service.

Based on results, a single 19mm service to each unit would result in a pressure of 66.7 psi to 66.9 psi at the buildings under peak hour conditions.

Detailed calculations of the anticipated water pressures, based on City of Ottawa boundary conditions, is provided in **Table B6**.

No pressure reducing measures are required as operating pressures are within 50 psi and 80 psi. It was estimated that the anticipated pressures under average day demands will range between 72.9 psi and 73.1 psi.

4.4 Water Servicing Design Criteria

The design parameters that were used to establish water and fire flow demands are summarized **Table 4-1**.

Table 4-1 - Summary of Water Supply Design Criteria

Design Parameter	Value	Applies
Population Density – Single-family Home	3.4 persons/unit	
Population Density – Semi-detached Home	2.7 persons/unit	
Population Density – Townhome or Terrace Flat	1.8 persons/unit	✓
Population Density – Bachelor Apartment	1.4 persons/unit	
Population Density – Bachelor + Den Apartment	1.4 persons/unit	
Population Density – One Bedroom Apartment	1.4 persons/unit	
Population Density – One Bedroom plus Den Apartment	1.4 persons/unit	
Population Density – Two Bedroom Apartment	2.1 persons/unit	
Population Density – Two Bedroom plus Den Apartment	2.1 persons/unit	
Average Day Demands – Residential	350 L/person/day	✓
Average Day Demands – Commercial / Institutional	28,000 L/gross ha/day	
Average Day Demands – Light Industrial / Heavy Industrial	35,000 or 55,000 L/gross ha/day	
Maximum Day Demands – Residential	9.5 x Average Day Demands (MECP)	✓
Maximum Day Demands – Commercial / Institutional	1.5 x Average Day Demands	
Peak Hour Demands – Residential	14.3 x Average Day Demands (MECP)	✓
Peak Hour Demands – Commercial / Institutional	2.7 x Average Day Demands	
Fire Flow Requirements Calculation	FUS	✓
Depth of Cover Required	2.4m	✓
Maximum Allowable Pressure	551.6 kPa (80 psi)	✓
Minimum Allowable Pressure	275.8 kPa (40 psi)	✓
Minimum Allowable Pressure during fire flow conditions	137.9 kPa (20 psi)	✓

4.5 Estimated Water Demands

Table 4-2 below summarizes the anticipated domestic water demands for all residential blocks under average day, maximum day and peak hour conditions.

Table 4-2 : Water Demand Summary

Water Demand Conditions	Water Demands (L/sec) for Block #			Totals (L/sec)
	Block 1	Block 2	Block 3	
Average Day	0.09	0.02	0.09	0.20
Max Day	0.83	0.21	0.83	1.87
Peak Hour	1.25	0.31	1.25	2.82

4.6 Boundary Conditions

Hydraulic Grade Line (HGL) boundary conditions were obtained from the City for design purposes. A copy of the correspondence received from the City is provided in **Appendix F**.

The following hydraulic grade line (HGL) boundary conditions are summarized in **Table 4-3** below:

Table 4-3 : Boundary Conditions and Pressures Summary

Water Demand Conditions	Demands per Block		
	Block 1	Block 2	Block 3
Minimum HGL	156.4	156.4	156.4
Max Day + Fire Flow	154.7	147.0	141.4
Maximum HGL	160.2	160.2	160.2
Min Pressure (psi)	69.4	69.4	69.7
Max Pressure (psi)	74.8	74.8	75.1

4.7 Fire Flow Requirements

Water for fire protection will be available utilizing the proposed fire hydrants located along the adjacent roadways: Maple Grove Road, Bensinger Way, and Mykonos Crescent. The required fire flows for the proposed blocks were calculated based on typical values as established by the Fire Underwriters Survey 1999 (FUS).

The following equation from the Fire Underwriters document "Water Supply for Public Fire Protection", 1991, was used for calculation of the on-site supply rates required to be supplied by the hydrants:

$F = 200 * C * \sqrt{(A)}$

where:

F	=	Required Fire flow in Litres per minute
C	=	Coefficient related to type of Construction
A	=	Total Floor Area in square metres

The proceeding **Table 4-4** summarizes the parameters used for estimating the Required Fire Flows (RFF) based on the Fire Underwriters Survey (FUS) and the latest City of Ottawa Technical Bulletins. The RFFs were estimated in accordance with ISTB-2018-02, and based on floor areas provided by the architect, which are illustrates in **Appendix H.**

The following summarizes the parameters used for both proposed blocks.

- Type of Construction — Non-combustible
- Occupancy — Limited combustible
- Sprinkler Protection — no sprinkler system

Blocks 1 and 3 will be divided in half with a firewall to reduce the building area and the required fire flow.

Table 4-4 : Summary of Design Parameters Used in Calculating Required Fire Flows (RFF) Using FUS

Design Parameter	Block 1		Block 2	Block 3	
	4 western units	4 eastern units		4 western units	4 eastern units
Coefficient Related to type of Construction., C	1.5	1.5	1.5	1.5	1.5
Total Floor Area (m2)	673	673	368	673	673
Fire Flow prior to reduction (L/min)	9,000	9,000	6,000	9,000	9,000
Reduction Due to Occupancy Non-combustible (-25%), Limited Combustible (-15%), Combustible (0%), Free Burning (+15%), Rapid Burning (+25%)	-15%	-15%	-15%	-15%	-15%
Reduction due to Sprinkler (Max 50%) Sprinkler Conforming to NFPA 13 (-30%), Standard Water Supply (-10%), Fully Supervised Sprinkler (-10%)	0%	0%	0%	0%	0%
Increase due to Exposures	+44%	+40%	+39%	+52%	+32%
Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no)	no	yes	yes	yes	yes
Total RFF	183	167	117	167	167

The estimated required fire flows (RFFs) based on the FUS methods is: 183 L/sec for Block 1 (most critical), 117 L/sec for Block 2, and 167 L/sec for Block 3.

4.8 Review of Hydrant Spacing

A review of the hydrant spacing was completed to ensure compliance with Appendix I of Technical Bulletin ISTB-2018-02. As per Section 3 of Appendix I all hydrants within 150 metres were reviewed to assess the total possible contribution of flow from these contributing hydrants. For each hydrant the distance to the proposed block was determined to arrive at the contribution of fire flow from each. All hydrants are expected to be of Class AA as per Section 5.1 of Appendix I. For each hydrant the straight-line distance, distance measured along a fire route or roadway, whether its location is accessible, and its contribution to the required fire flow.

Table 4-5 – Required Fire Flows

Block Number	Required Fire Flow (L/min)	Available Fire Flow Based on Hydrant Spacing as per ISTB-2018-02 (L/min)
Block 1 (4 west units)	11,000 (or 183 L/sec)	±24,700
Block 1 (4 east units)	10,000 (or 167 L/sec)	±22,800
Block 2	7,000 (or 117 L/sec)	±13,300
Block 3 West (4 west units)	10,000 (or 167 L/sec)	±17,100
Block 3 East (4 east units)	10,000 (or 167 L/sec)	±17,100

The total minimum available contribution of flow from hydrants was estimated at 22,800 L/min for Block 1, 13,300 L/min for Block 2, and 17,100 L/min for Block 3, whereas the maximum required fire flows (RFF) for each block is 11,000 L/min, 7,000 L/min, and 10,000 L/min respectively. Therefore, the available flows from hydrants exceed each building's fire flow requirements as identified in Appendix I of Technical Bulletin ISTB-2018-02. Additional information on the available flows from hydrants is provided in **Table B5**.

5 Sewage Servicing

5.1 Existing Sewage Conditions

Sewage from the existing onsite residential home is discharged into a septic tank and field bed.

5.2 Proposed Sewage Conditions

It is proposed to provide single sanitary sewer service connections from each proposed townhome unit to the existing sanitary sewers on Maple Grove Drive, Bensinger Way, and Mykonos Crescent. The sanitary sewer laterals were sized based on a population flow with an area-based infiltration allowance. Individual 135mm diameter sanitary sewer laterals are proposed with a minimum 1.0% slope, having a capacity of 11.5 L/sec based on Manning's Equation under full flow conditions. **Table 5-1** below summarizes the design parameters used.

Table 5-1 – Summary of Wastewater Design Criteria / Parameters

Design Parameter	Value	Applies
Population Density – Single-family Home	3.4 persons/unit	
Population Density – Semi-detached Home	2.7 persons/unit	
Population Density – Duplex	2.3 persons/unit	
Population Density – Townhome (row)	2.7 persons/unit	✓
Population Density – Bachelor Apartment	1.4 persons/unit	
Population Density – Bachelor + Den Apartment	1.4 persons/unit	
Population Density – One Bedroom Apartment	1.4 persons/unit	
Population Density – One Bedroom plus Den Apartment	1.4 persons/unit	
Population Density – Two Bedroom Apartment	2.1 persons/unit	
Population Density – Two Bedroom plus Den Apartment	2.1 persons/unit	
Average Daily Residential Sewage Flow	280 L/person/day	✓
Average Daily Commercial / Intuitional Flow	28,000 L/gross ha/day	
Average Light / Heavy Industrial Daily Flow	35,000 / 55,000 L/gross ha/day	
Residential Peaking Factor – Harmon Formula (Min = 2.0, Max =4.0, with K=0.8)	$M = 1 + \frac{14}{4 + P^{0.5}} * k$	✓
Commercial Peaking Factor	1.5	
Institutional Peaking Factor	1.5	
Industrial Peaking Factor	As per Table 4-B (SDG002)	
Unit of Peak Extraneous Flow (Dry Weather / Wet Weather)	0.05 or 0.28 L/s/gross ha	
Unit of Peak Extraneous Flow (Total I/I)	0.33 L/s/gross ha	✓

The total estimated peak sanitary flow rate from the proposed property is **0.75 L/sec** (all blocks) based on City Design Guidelines. Sewage rates below include a total infiltration allowance of 0.33 L/ha/sec based on the total gross site area.

Table 5-2 – Summary of Anticipated Sewage Rates

Sewage Condition	Sanitary Sewage Flow (L/sec)		
	Maple Grove Drive	Bensinger Way	Mykonos Cres
Average Day Sewage Flow	0.070	0.070	0.018
Infiltration Flow (at 0.33 L/ha/sec)	0.045	0.045	0.045
Peak Wet Weather Sewage Flow	0.32	0.32	0.11

The minimum sewer capacity of the 200mm diameter connecting sanitary sewer run on Maple Grove Drive (with a slope of 0.60%) has a calculated full flow capacity of 25.9 L/sec. The 200mm diameter pipe then connects into a 450mm diameter pipe downstream of the sewer run. The total estimated peak sewage flow is 0.75 L/s compared to the existing single home with an estimated peak sewage flow of 0.18 L/sec. It is anticipated that the increase in peak sewage flows can be accommodated in the downstream sanitary sewer system.

6 Storm Servicing & Stormwater Management

The stormwater works are subject to both the Mississippi Valley Conservation Authority (MVCA) and City of Ottawa (COO) approval. The MVCA as contacted to clarify the quality control requirements. The MVCA has noted that the original criteria from the Kanata West Master Servicing Plan was normal water quality control or 70% TSS removal. This was upgrades to enhanced protection (80% TSS), so therefore it is understood that quality control is already in place for the development. Correspondence from the MVCA is provided in **Appendix E**, which clarifies that no onsite quality control is required.

Also clarified during the pre-consultation meeting, the requirements related to stormwater quantity control are noted as follows:

- *Stormwater quantity control criteria – be consistent with the criteria specified in the Pond 4 final report (see attached) and/or in the Kanata west Master servicing Study.*
- When using the modified rational method to calculate the storage requirements for the site, the underground storage should not be included in the overall available storage. The modified rational method assumes that the restricted flow rate is constant throughout the storm which, in this case, underestimates the storage requirement prior to the 100-year head elevation being reached. Alternately, if you wish to include the underground storage, you may use an assumed average release rate equal to 50% of the peak allowable rate. Otherwise, disregard the underground storage as available storage or provide modeling to support the design.

6.1 Design Criteria

A review of the reports; Kanata West Master Servicing Study (KWMSS), Deign Brief for Pond 4 (DBP4), along with contacting the MVCA was completed to determine the stormwater management quantity and quality control requirements for the site. The following briefly summarizes the SWM requirements

- Minor system flows to discharge to local storm sewer on Maple Grove Road.
- The allowable discharge rate to the local storm sewer to be based on 5-year storm with a time of concentration of (Tc) of 10 minutes and runoff coefficient (C_{AVG}) of 0.65. This was established from the storm sewer design for Pond 4.
- Provide quantity control for runoff in excess of the allowable rate for all storms up to the 100-year event.
- No onsite quality control requirements are required, as the site is located within the drainage catchment tributary to the City's Pond 4 which is located approximately 1.6 km east of the site along Maple Grove Road. Pond 4 was designed for an enhanced treatment (80%TSS) as noted in the DBP4.
- An infiltration target range between 70-100 mm/yr is required as noted in Section 5.7 of the Kanata West Mater Servicing Study. A slightly higher infiltration target of 104 mm/yr was established. Developments upstream of Pond 4 are required to provide pre- versus post-development water balance. Infiltration BMPs to be used to meet infiltration targets.

The proposed stormwater system is designed in conformance with the above-noted criteria along with the latest version of the City of Ottawa Design Guidelines (October 2012). Additional design criteria that relates to this design report is provided in the proceeding sections below.

6.2 Minor System Design Criteria

- Onsite storm sewer was sized based on the Rational Method and Manning's Equation under free flow conditions for the 5-year storm using a 10-minute inlet time.
- Since a detailed site plan was available for the site, including building footprints, calculations of the average runoff coefficients for each drainage area was completed.
- Minimum sewer slopes to be based on minimum velocities for storm sewers of 0.80 m/sec.

- Allowable maximum discharge rate established based on the 5-year storm with a time of concentration of (Tc) of 10 minutes and runoff coefficient (C_{AVG}) of 0.65.

6.3 Major System Design Criteria

- The major system has been designed to accommodate on-site detention with sufficient capacity to attenuate the 100-year design storm. On-site storage is calculated based on the 100-year design storm with on-site detention storage provided using underground chambers.
- On site storage is provided and calculated for up to the 100-year design storm. There is no surface ponding proposed on the ground surface. Outflow rates from underground storage chamber were set at 50% of the rate to account for head, as per City guidelines.
- Overland flow routes are provided.
- The vertical distance from the spill elevation on the street and the ground elevation at the buildings is at least 150mm.
- The emergency overflow spill elevation is at least 30 cm below the lowest building opening.

6.4 Runoff Coefficients

Runoff coefficients used were based on actual areas taken from CAD. Runoff coefficients for impervious surfaces (roofs, asphalt, and concrete) were taken as 0.90, whereas those for pervious surfaces (grass/landscaping) were taken as 0.20. Average runoff coefficients were calculated for catchments (or drainage areas) using the area-weighting routine in PCSWMM.

The runoff coefficients for pre-development and post-development catchments are provided in **Appendix D**, with a summary provided in in **Table 6-1** below.

Table 6-1 – Summary of Runoff Coefficients

Location	Area (hectares)	Pre-Development		Post-Development	
		Cavg	Imp (%)	Cavg	Imp (%)
Entire Site	0.4052	0.28	11.9	0.53	47.8

6.5 Pre-Development Conditions

No specific design requirements were established to meet a pre-development flow rate, rather the stormwater design shall meet the requirements of the master servicing reports. A pre-development time of concentration was calculated for comparison with the standard 10 minutes, set by the SDG002. A time of concentration of 15.8 minutes was calculated based on the slope and length of the site catchment. Under pre-development conditions stormwater runoff from the 0.4052-hectare site is relatively self contained due to the build up of residential homes around it. Prior to development of the adjacent subdivision, runoff from the site was directed in a north easterly direction. **Figure A1** illustrates these pre-development conditions and the following

Table 6-2 provides pre-development peak runoff rates using the calculated time of concentration of 15.8 minutes, however it should be noted that the standard time of concentration of 10 minutes was used to estimate peak runoff under post-development conditions.

Table 6-2 – Summary of Pre-Development Flows

Return Period Storm	Total Peak Flows (L/sec)
2-year	18.9
5-year	25.6
100-year	54.7

6.6 Allowable Release Rate

The Kanata West Master Servicing Study assigned a runoff coefficient of 0.65 for the subject site based on the 5-year storm with a time of concentration of 10 minutes. Therefore, control of runoff for up to the 100-year storm will be controlled to the 5-year rate. The allowable release rate was calculated at 76.4 L/sec based on a 5-year storm event. **Table D3** provides detailed calculations on the allowable peak flow.

6.7 Proposed Stormwater System

Stormwater runoff from the proposed site will drain from a combination of controlled and uncontrolled areas. As a result of the changes onsite the overall post-development runoff coefficient will increase over pre-development conditions. This increase in runoff is the result of changes due to site development (i.e. additional hard surfaces, roof areas and hard landscaping).

A storm drainage plan is illustrated on **Figure A2**. A total four (4) subcatchments (or drainage areas) within the development site are shown on this drawing with average runoff coefficients calculated for each drainage area. The proposed stormwater works consists of the following elements:

- Underground storage chambers complete with a downstream inlet control device (ICD). This then discharges to the storm sewer on Maple Grove Road.
- Remaining drainage areas along frontage of Maple Grove Road, Bensinger Way and Mykonos Crescent flow uncontrolled to the municipal right-of-way.

Table 6-3 – Summary of Post-Development Flows

Return Period Storm	Peak Flows to Maple Grove Road Storm Sewers (L/sec)		Peak Uncontrolled Flows to Bensinger Way (L/sec)	Peak Uncontrolled Flows to Mykonos Cres (L/sec)	Total Peak Flows (L/sec)	Allowable Peak Flows (L/sec)
	Uncontrolled	Controlled				
2-year	10.4	3.10	10.1	2.6	26.2	76.4
5-year	14.2	4.20	13.7	3.5	35.6	
100-year	30.3	9.00	29.4	7.5	76.2	

6.8 Flow Attenuation and Storagep

As a result of utilizing flow control, attenuation (or storage) of runoff is necessary. This will be achieved utilizing storage in underground chambers. Using the allowable release rates, the Modified Rational Method was used to determine the 2-year, 5-year, 100-year 100-yr + 20% (Climate change) volumes that are necessary for corresponding release rates. It should be noted that the release rates used for the 100-year and Climate Change storm events were set at 50% of the maximum allowable release rate. The maximum release rate of 9.0 L/sec was set, in order to ensure that the summation of all controlled and uncontrolled peak flows discharging (both minor and major system) meet the allowable rate of 76.4 L/sec.

The largest internal drainage area (S01) which is located in the rear-yards of the townhomes is tributary to proposed underground chambers. The chambers were sized to accommodate the 100-yr plus 20% storm within the chambers, without psurface ponding.

Table 6-4 below provides the volumes necessary to detain the 100-year plus 20$ storm, based on 50% of the allowable release rate (taking into account uncontrolled runoff). **Table D12** summarizes the combined controlled and uncontrolled flows leaving the subject site. A summary of the 100-year flows, 100-year required storage volumes, with the provided voles in Identified in **Table 6-4** below.

Table 6-4 – Summary of Post-Development Storage

Area No.	Outlet	Release Rate (L/s)			Storage Required (m^3) (MRM)			Storage Provided (m^3)	Control Method
		2-yr	5-yr	100-yr	2-yr	5-yr	100-yr	Chambers	ICD
S01	Maple Grove Road Storm Sewer	2.8	3.7	8.0	21.8	29.0	61.2	62.7	TEMPEST Model LMF-75

6.9 Water Balance

As noted in Design Criteria6.1- Design Criteria an infiltration target of 100 mm/year is required as noted in the Kanata West Master Servicing Study, and 104 mm/year is noted in the Pond 4 Design Brief. Infiltration BMPs to be used to meet infiltration targets as developments upstream of Pond 4 are required to provide pre- versus post-development water balance.

A review of the water balance method, as noted in section 3.2.3 of the MECP's SMPDM was competed to estimate the anticipated change in infiltration that will occur as a result of development of the subject property.

From Table 3.1 of the Ministry's SMPDM the total yearly pre-development and post-development infiltration amounts we estimated based on the site area and corresponding percent pervious. Using an infiltration allowance of 276 mm for fine sand within urban lawns (Table 3.1), the following infiltration amounts were estimated as follows:

- total yearly infiltration = 276 mm x Area(ha) x (100-%IMP)/100 x (1/1000mm/m x 10000 m^2/ha)
- total yearly infiltration (pre-dev) = 276 mm x 0.4052 ha x (100%-11.9%)/100x 10m^3/ha/mm = 985 m^3
- total yearly infiltration (post-dev) = 276 mm x 0.4052 ha x (100%-47.8%)/100x 10m^3/ha/mm = 584 m^3

Based on the area of the site and a yearly infiltration target of 104 mm/year, the infiltration requirement would be: 104 mm/year x 0.4052x10 = 421.4 m^3. Although there would be a net increase of 401 m3 between pre and post development, the target infiltration rate is 104 mm/year. The total yearly infiltration under post-development conditions is estimated at 584 m^3, therefore no additional infiltration practises are necessary, based on the calculated level of imperviousness.

Although the proposed stormwater design already meets the minimum infiltration target of 104 mm/year, additional infiltration will result since underground storage chambers will be used for quantity control. The proposed underground chambers consist of open-bottom pipes (half-arches) with granular bottom areas that will promote infiltration. The following briefly summarizes the additional infiltration practises proposed:

- (35.6m^2 + 51 m^2) = 86.6 m^2 footprint area of the StormTech Chambers. These chambers are 1.14m in high arch pipes having open bottoms to promote infiltration (230mm bedding).
- 80.8m of 250mm perforated pipes and swales in rear-yard swales. (As per S29, 0.85m bottom width, 75mm bedding)

The following summarizes the additional underground volumes that will be available for infiltration based on a stone void ratio of 0.40.

- Infiltration volume below chambers = 86.6 m^2 x 0.23m x 0.40 = 8.0 m^3
- Infiltration volume below swales = 80.8m x 0.85m x 0.15m x 0.40 = 4.1 m^3

= 12.1 m^3

The post-development yearly infiltration of 584 m3, exceeds the required target of 421.4 m3 based target rate of 104 mm/yr as established in the master studies. An additional 12.1 m3 of underground infiltration will be provided, during storm events.

7 Erosion & Sediment Control

During all construction activities, erosion and sedimentation shall be controlled by the following techniques:

- Filter cloth shall be installed between the frame and cover of all adjacent catch basins and catch basin manhole structures.
- Heavy duty silt fencing will be used to control runoff around the construction area. Silt fencing locations are identified on the site grading and erosion control plan.
- A mud mat will be installed at the construction entrance to help avoid mud from being transported to offsite roads.
- Visual inspection shall be completed daily on sediment control barriers and any damage repaired immediately. Care will be taken to prevent damage during construction operations.
- In some cases, barriers may be removed temporarily to accommodate the construction operations. The affected barriers will be reinstated at night when construction is completed.
- Sediment control devices will be cleaned of accumulated silt as required. The deposits will be disposed of as per the requirements of the contract.
- During the course of construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer.
- Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification (OPSS) OPSS 805 and City of Ottawa specifications.

8 Conclusions and Recommendations

This Functional Servicing & Stormwater Report outlines the rationale which will be used to service the proposed development. The following summarizes the servicing requirements for the site:

Water

- Single water services shall connect into each townhome connecting off the facing street.
- The Required Fire Flows (RFFs) were estimated at **11,000 L/min** (183 L/sec) and **10,000 L/min** (167 L/sec) for Block 1, **7,000 L/min** (117 L/sec) for Block 2, and **10,000 L/min** (167 L/sec) for Block 3. For Blocks 1 and 3, fire walls will be used to separate the blocks into two areas. The total available flows for firefighting purposes, based on the contribution from hydrants, was estimated at **22,800 L/min** for Block 1, **13,300 L/min** for Block 2, and **17,100 L/min** for Block 3.
- Based on hydraulic boundary conditions (HGL) provided by the City of Ottawa, a system pressure of between **66.7 psi** and **66.9 psi** under peak hourly demands is anticipated at all three blocks. This exceeds the City's guideline of 20 psi.

Sewage

- Estimated peak sewage flows **0.75 L/sec** are anticipated. This exceeds current sewage flows of 0.18 L/sec under existing conditions. Although peak sewage rates exceed existing conditions, the receiving sanitary sewers on adjacent streets have adequate capacity to convey sewage flows, as offsite sanitary sewers accounted for the site during their design process.

Stormwater

- For the stormwater system, the allowable capture rate from the entire site was calculated based on a runoff coefficient of 0.65, time of concentration of 10 minutes for a 5-year storm event. The allowable release rate for the entire site was calculated to be **76.4 L/sec**. Runoff in excess of this will be detained onsite for up to the 100-year storm.
- Two minor surface drainage areas will flow uncontrolled to the right-of-way. The 100-year peak flows from these two areas were accounted for (i.e. subtracted) from the total runoff rate to establish the allowable rate.
- In order to meet the allowable release rate, a total retention volume of **±58.9 m³** metres is required for the 100-yr storm. In addition, the 100-yr +20% volume is **74.8 m³**.
- Runoff from the surface areas will be collected and detained in an underground stormwater chamber located along the east side of the site and connects into Maple Grove Road storm sewer. The volume necessary to detain the 100-year event, is **58.9 m³**, based on using 50% of the allowable release rate as required by the City of Ottawa. The underground chambers will be sized to hold a minimum volume of approximately **79.2 m³.**
- A single inlet control device (**Tempest LMF-90**) within a storm manhole just downstream of the underground chambers will be used to control storm outflow.
- A yearly infiltration target of 104mm/year was taken from the Pond 4 Design Brief. Based on this, the yearly infiltration requirement is **421.4 m³**. The total yearly infiltration under post-development conditions was estimated at **584 m³**, therefore meeting the target rate.

Erosion & Sediment Control

- Erosion and sediment control methods will be used during construction to limit erosion potential.

9 Legal Notification

This report was prepared by EXP Services Inc. for the account of 10886378 Canada Incorporated.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Appendix A - Figures

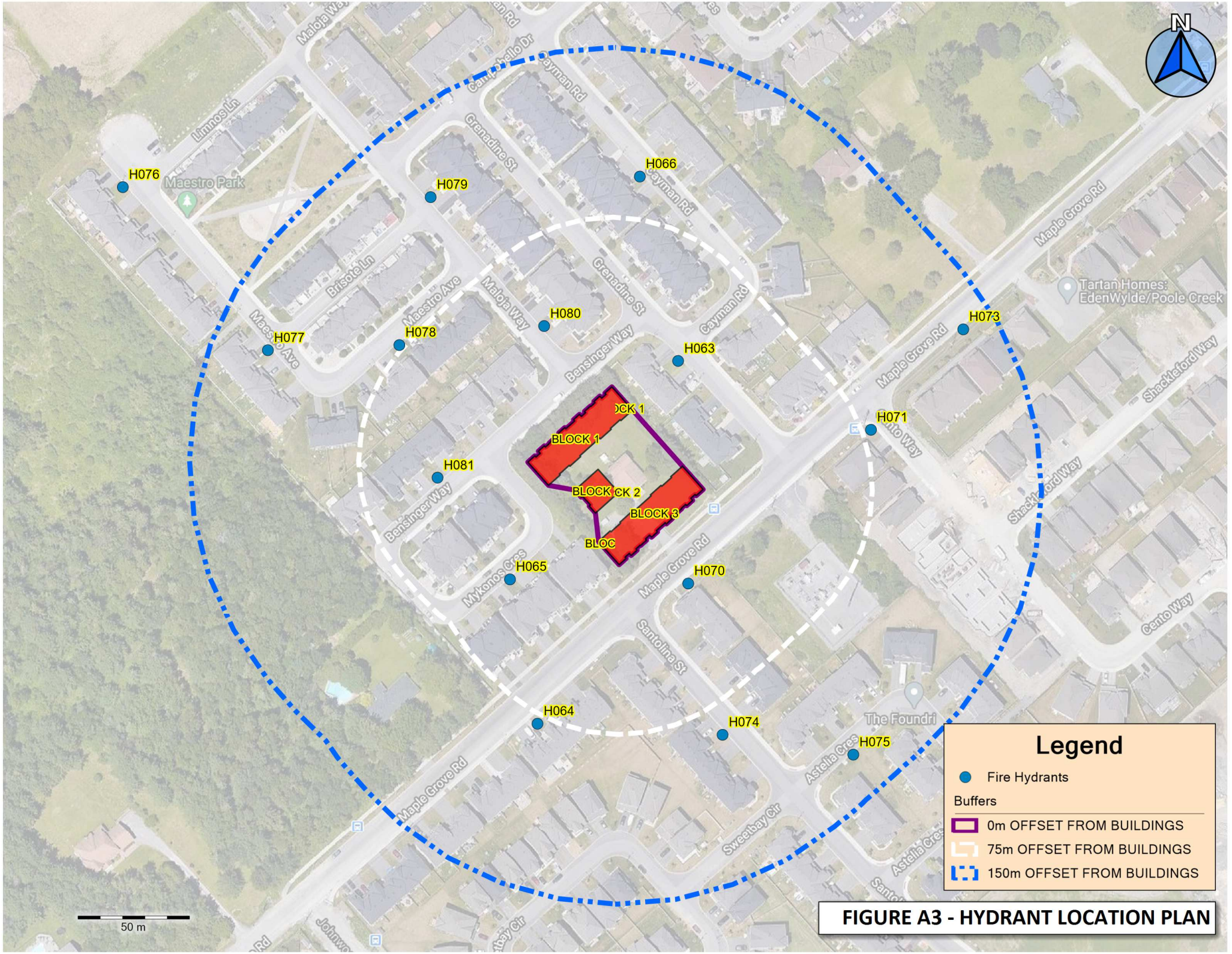
Figure A1 - Pre-Development Drainage Areas

Figure A2 - Post-Development Drainage Areas

Figure A3 – Fire Hydrant Locations

FIGURE A1 - PRE-DEVELOPMENT DRAINAGE AREA

FIGURE A2 - POST-DEVELOPMENT DRAINAGE AREAS


N
H076
H079
H066
H080
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H077
H063
H073
H071
H081
H065
H070
H064
H074
H075
BLOCK 1
BLOCK 2
BLOCK 3
Maestro Park
Limnos Ln
Brisote Ln
Maestro Ave
Maloja Way
Grenadine St
Cayman Rd
Bensinger Way
Maple Grove Rd
Mykonos Cres
Santolina St
Sweetbay Cir
Astella Cres
Shackleford Way
Cento Way
Tartan Homes: EdenWylde/Poole Creek
The Foundri
50 m
Legend
Fire Hydrants
Buffers
0m OFFSET FROM BUILDINGS
75m OFFSET FROM BUILDINGS
150m OFFSET FROM BUILDINGS
FIGURE A3 - HYDRANT LOCATION PLAN

Appendix B – Water Servicing Tables

Table B1 – Water Demand Chart

Table B2 – Fire Flow Requirements Based on Fire Underwriters Survey (FUS) – Block 1-West

Table B3 – Fire Flow Requirements Based on Fire Underwriters Survey (FUS) – Block 1-East

Table B4 – Fire Flow Requirements Based on Fire Underwriters Survey (FUS) – Block 2

Table B5 – Fire Flow Requirements Based on Fire Underwriters Survey (FUS) – Block 3-West

Table B6 – Fire Flow Requirements Based on Fire Underwriters Survey (FUS) – Block 3-East

Table B7 – Available Fire Flows Based on Hydrant Spacing

Table B8 – Estimated Water Pressure at Proposed Blocks

TABLE B1: Water Demand Chart

Location: 1869 Maple Grove Rd
Project No: OTT-00254810
Designed by: J.Fitzpatrick
Checked By: B. Thomas
Date Revised: Sept 2020

Water Consumption
Residential = **350** L/cap/day
Commercial = 5,000 L/1000m^2/day

Population Densities

Single Family	3.4	person/unit
Semi-Detahced	2.7	person/unit
Duplex	2.3	person/unit
Townhome (Row)	2.7	person/unit
Bachelor Apartment	1.4	person/unit
1 Bedroom Apartment	1.4	person/unit
2 Bedroom Apartment	2.1	person/unit
3 Bedroom Apartment	3.1	person/unit
4 Bedroom Apartment	4.1	person/unit
Avg. Apartment	1.8	person/unit

Proposed Buildings	No. of Residential Units										Total Persons (pop)	Residential Demands in (L/sec)					Commercial						Total Demands (L/sec)		
	Singles/Semis/Towns				Apartments								Peaking Factors (x Avg Day)						Peaking Factors (x Avg Day)						
	Single Family	Semi-Detached	Duplexz	Townhome	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	Avg Apt.		Avg. Day Demand (L/day)	Max Day	Peak Hour	Max Day Demand (L/day)	Peak Hour Demand (L/day)	Area (m^2)	Avg Demand (L/day)	Max Day	Peak Hour	Max Day Demand (L/day)	Peak Hour Demand (L/day)	Avg Day (L/s)	Max Day (L/s)	Max Hour (L/s)
Block 1				8							21.6	7,560	9.50	14.30	71,820	108,108							0.09	0.83	1.25
Block 2				2							5.4	1890	9.50	14.30	17,955	27,027							0.02	0.21	0.31
Block 3				8							21.6	7,560	9.50	14.30	71,820	108,108							0.09	0.83	1.25
Total =				18							48.6	17,010			161,595	243,243							0.20	1.87	2.82

PEAKING FACTORS FROM MOECC TABLE 3-3 (Peaking Factors for Water Systems Servicing Fewer Than 500 persons

Dwelling Units Serviced	Equiv Pop	Night Min Factor	Maximum Day Factor	Peak Hour Factor
10	30	0.10	9.50	14.30
50	150	0.10	4.90	7.40
100	300	0.20	3.60	5.40
150	450	0.30	3.00	4.50
167	500	0.40	2.90	4.30

TABLE B-2
FIRE FLOW REQUIREMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 1999
LOCATION: **Block 1 - WEST**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input				Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Wood Frame				1.5	
	Ordinary Construction	1						
	Non-combustible Construction	0.8						
	Fire Resistive Construction	0.6						
Input Building Floor Areas (A)			Area	% Used	Area Used	Fire Wall Used to Split Block	673.0 m²	
	Floor 2		673	50%	337			
	Floor 1		673	50%	337			
Fire Flow (F)	F = 220 * C * SQRT(A)							8,561
Fire Flow (F)	Rounded to nearest 1,000							9,000

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-1,350	7,650
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	No Sprinkler	0%	0	7,650
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Not Standard Water Supply or Unavailable	0%	0	7,650
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Not Fully Supervised or N/A	0%	0	7,650
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Lenth-height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	Side 1 (west)	23	4	20.1 to 30	Type A	14	2	28	4A	8%	44%	3,366	11,016
	Side 2 (east)	0	1	0 to 3	Fire Wall					10%			
	Side 3 (north)	27	4	20.1 to 30	Type A	31	2	62	4C	9%			
	Side 4 (south)	9	2	3.1 to 10	Type A	14	2	28	2A	17%			

Obtain Required Fire Flow		
	Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	11,000
	Total Required Fire Flow, L/s =	183
	Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no) =	No
	Total Required Fire Flow (RFF). If RFF < 167 use RFF (L/sec) =	183

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type A	Wood-Frame or non-conbustible
Type B	Ordinary or fire-resisitve with unprotected openings
Type C	Ordinary or fire-resisitve with semi-protected openings
Type D	Ordinary or fire-resisitve with blank wall

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
30.1m to 45m	5
> 45.1m	6

TABLE B-3
FIRE FLOW REQUIREMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 1999
LOCATION: **Block 1 - EAST**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input				Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Wood Frame				1.5	
	Ordinary Construction	1						
	Non-combustible Construction	0.8						
	Fire Resistive Construction	0.6						
Input Building Floor Areas (A)			Area	% Used	Area Used	Fire Wall Used to Split Block	673.0 m²	
	Floor 2		673	50%	337			
	Floor 1		673	50%	337			
Fire Flow (F)	F = 220 * C * SQRT(A)							8,561
Fire Flow (F)	Rounded to nearest 1,000							9,000

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-1,350	7,650
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	No Sprinkler	0%	0	7,650
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Not Standard Water Supply or Unavailable	0%	0	7,650
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Not Fully Supervised or N/A	0%	0	7,650
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Lenth-height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	Side 1 (west)	23	4	20.1 to 30	Type A	Fire Wall				10%	40%	3,060	10,710
	Side 2 (east)	9	2	3.1 to 10	Type A	14	2	28	2A	17%			
	Side 3 (north)	26	4	20.1 to 30	Type A	4.6	2	9.2	4A	8%			
	Side 4 (south)	34	5	30.1 to 45	Type A	25	2	50	5B	5%			

Obtain Required Fire Flow		
	Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	11,000
	Total Required Fire Flow, L/s =	183
	Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no) =	Yes
	Total Required Fire Flow (RFF). If RFF < 167 use RFF (L/sec) =	167

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type A	Wood-Frame or non-conbustible
Type B	Ordinary or fire-resisitve with unprotected openings
Type C	Ordinary or fire-resisitve with semi-protected openings
Type D	Ordinary or fire-resisitve with blank wall

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
30.1m to 45m	5
> 45.1m	6

TABLE B-4
FIRE FLOW REQUIREMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 1999
LOCATION: **Block 2**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input				Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Wood Frame				1.5	
	Ordinary Construction	1						
	Non-combustible Construction	0.8						
	Fire Resistive Construction	0.6						
Input Building Floor Areas (A)			Area	% Used	Area Used		368.0 m²	
	Floor 2		184	100%	184			
	Floor 1		184	100%	184			
Fire Flow (F)	F = 220 * C * SQRT(A)							6,330
Fire Flow (F)	Rounded to nearest 1,000							**6,000**

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-900	5,100
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	No Sprinkler	0%	0	5,100
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Not Standard Water Supply or Unavailable	0%	0	5,100
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Not Fully Supervised or N/A	0%	0	5,100
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Lenth-height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	Side 1 (west)	50	6	> 45.1	Type A	0	0	0	6	0%			
	Side 2 (east)	38	5	30.1 to 45	Type A	14	2	28	5A	5%	39%	1,989	7,089
	Side 3 (north)	9	2	3.1 to 10	Type A	14	2	28	2A	17%			
	Side 4 (south)	10	2	3.1 to 10	Type A	14	2	28	2A	17%			

Obtain Required Fire Flow		
	Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	**7,000**
	Total Required Fire Flow, L/s =	**117**
	Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no) =	**Yes**
	Total Required Fire Flow (RFF). If RFF < 167 use RFF (L/sec) =	**117**

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type A	Wood-Frame or non-conbustible
Type B	Ordinary or fire-resisitve with unprotected openings
Type C	Ordinary or fire-resisitve with semi-protected openings
Type D	Ordinary or fire-resisitve with blank wall

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
30.1m to 45m	5
> 45.1m	6

TABLE B-5
FIRE FLOW REQUIREMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 1999
LOCATION: **Block 3 - WEST**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input				Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Wood Frame				1.5	
	Ordinary Construction	1						
	Non-combustible Construction	0.8						
	Fire Resistive Construction	0.6						
Input Building Floor Areas (A)			Area	% Used	Area Used		673.0 m²	
	Floor 2		673	50%	337			
	Floor 1		673	50%	337			
Fire Flow (F)	F = 220 * C * SQRT(A)							8,561
Fire Flow (F)	Rounded to nearest 1,000							9,000

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-1,350	7,650
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	No Sprinkler	0%	0	7,650
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Not Standard Water Supply or Unavailable	0%	0	7,650
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Not Fully Supervised or N/A	0%	0	7,650
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Lenth-height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	Side 1 (west)	6	2	3.1 to 10	Type A	14	2	28	2A	17%	52%	3,978	11,628
	Side 2 (east)	0	1	0 to 3	Type A	Fire Wall				10%			
	Side 3 (north)	10	2	3.1 to 10	Type A	14	2	28	2A	17%			
	Side 4 (south)	30	4	20.1 to 30	Type A	15	2	30	4A	8%			

Obtain Required Fire Flow		
	Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	12,000
	Total Required Fire Flow, L/s =	200
	Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no) =	Yes
	Total Required Fire Flow (RFF). If RFF < 167 use RFF (L/sec) =	167

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type A	Wood-Frame or non-conbustible
Type B	Ordinary or fire-resisitve with unprotected openings
Type C	Ordinary or fire-resisitve with semi-protected openings
Type D	Ordinary or fire-resisitve with blank wall

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
30.1m to 45m	5
> 45.1m	6

TABLE B-6
FIRE FLOW REQUIREMENTS BASED ON FIRE UNDERWRITERS SURVEY(FUS) 1999
LOCATION: **Block 3 - EAST**

An estimate of the Fire Flow required for a given fire area may be estimated by:

F = 220 * C * SQRT(A)

where: F = required fire flow in litres per minute
A = total floor area in m^2 (including all storeys, but excluding basements at least 50% below grade)
C = coefficient related to the type of construction

Task	Options	Multiplier	Input				Value Used	Fire Flow Total (L/min)
Choose Building Frame (C)	Wood Frame	1.5	Wood Frame				1.5	
	Ordinary Construction	1						
	Non-combustible Construction	0.8						
	Fire Resistive Construction	0.6						
Input Building Floor Areas (A)			Area	% Used	Area Used		673.0 m²	
	Floor 2		673	50%	337			
	Floor 1		673	50%	337			
Fire Flow (F)	F = 220 * C * SQRT(A)							8,561
Fire Flow (F)	Rounded to nearest 1,000							9,000

Reductions/Increases Due to Factors Effecting Burning

Task	Options	Multiplier	Input	Value Used	Fire Flow Change (L/min)	Fire Flow Total (L/min)
Choose Combustibility of Building Contents	Non-combustible	-25%	Limited Combustible	-15%	-1,350	7,650
	Limited Combustible	-15%				
	Combustible	0%				
	Free Burning	15%				
	Rapid Burning	25%				
Choose Reduction Due to Sprinkler System	**Adequate** Sprinkler Conforms to NFPA13	-30%	No Sprinkler	0%	0	7,650
	No Sprinkler	0%				
	Standard Water Supply for Fire Department Hose Line and for Sprinkler System	-10%	Not Standard Water Supply or Unavailable	0%	0	7,650
	Not Standard Water Supply or Unavailable	0%				
	Fully Supervised Sprinkler System	-10%	Not Fully Supervised or N/A	0%	0	7,650
	Not Fully Supervised or N/A	0%				

Choose Structure Exposure Distance	Exposures	Separ-ation Dist (m)	Cond	Separation Conditon	Exposed Wall type	Exposed Wall Length: Length (m)	No of Storeys	Lenth-height Factor	Sub-Conditon	Charge (%)	Total Charge (%)	Total Exposure Charge (L/min)	
	Side 1 (west)	0	1	0 to 3	Type A	Fire Wall				10%	32%	2,448	10,098
	Side 2 (east)	10	2	3.1 to 10	Type A	14	2	28	2A	17%			
	Side 3 (north)	34	5	30.1 to 45	Type A	25	2	50	5B	5%			
	Side 4 (south)	50	6	> 45.1	Type A	0	0	0	6	0%			

Obtain Required Fire Flow		
	Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	10,000
	Total Required Fire Flow, L/s =	167
	Can the Total Fire Flow be Capped at 10,000 L/min (167 L/sec) based on "TECHNCAL BULLETIN ISTB-2018-02", (yes/no) =	Yes
	Total Required Fire Flow (RFF). If RFF < 167 use RFF (L/sec) =	167

Exposure Charges for Exposing Walls of Wood Frame Construciton (from Table G5)

Type A	Wood-Frame or non-conbustible
Type B	Ordinary or fire-resisitve with unprotected openings
Type C	Ordinary or fire-resisitve with semi-protected openings
Type D	Ordinary or fire-resisitve with blank wall

Conditons for Separation

Separation Dist	Condition
0m to 3m	1
3.1m to 10m	2
10.1m to 20m	3
20.1m to 30m	4
30.1m to 45m	5
> 45.1m	6

TABLE B7: FIRE FLOW CONTRIBUTIONS BASED ON HYDRANT SPACING

Hydrant #	Block 1 (West)		Block 1 (East)		Block 2		Block 3 (West)		Block 3 (East)	
	[1]Distance (m)	[2]Fire Flow Contribution (L/min)	[1]Distance (m)	[2]Fire Flow Contribution (L/min)	Distance (m)	Fire Flow Contribution (L/min)	Distance (m)	Fire Flow Contribution (L/min)	Distance (m)	Fire Flow Contribution (L/min)
348015H064	NA		NA		NA		83	3,800	104	3,800
348016H070	NA		NA		NA		29	5,700	36	5,700
348016H071	NA		NA		NA		118	3,800	94	3,800
348015H065	59	5,700	127	3,800	50	5,700	NA		NA	
348016H081	50	5,700	73	5,700	79	3,800	NA		NA	
348016H080	63	5,700	63	5,700	132	3,800	NA		NA	
348016H079	136	3,800	119	3,800	NA		NA		NA	
348016H063	107	3,800	83	3,800	NA		147	3,800	125	3,800
Total Fire Fflow Avail in L/min (L/sec)		24,700		22,800		13,300		17,100		17,100
		(412)		(380)		(222)		(285)		(285)
FUS RFF in L/min (L/sec)		11,000		10,020		7,000		10,020		10,020
		(183)		(167)		(117)		(167)		(167)
Meets Requreiment (Yes/No)		Yes		Yes		Yes		Yes		Yes

Notes:

[1]Distance is measured along a road or fire route.

[2]Fire Flow Contribution for Class AA Hydrant from Table 1 of Appendix I, ISTB-2018-02

TABLE B4

ESTIMATED WATER PRESSURE AT PROPOSED BUILDING

Description	From	To	Demand (L/sec)	Pipe Length (m)	Pipe Dia (mm)	Dia (m)	Q (m3/sec)	Area (m2)	C	Vel (m/s)	Slope of HGL (m/m)	Head Loss (m)	Elev From (m)	Elev To (m)	*Elev Diff (m)	Pressure From kPa	Pressure From (psi)	Pressure To kPa	Pressure To (psi)	Pressure Drop (psi)
Avg Day Conditons																				
Single 19mm service Block 1	Main	Building	0.01	15 m	19	0.019	0.0000	0.000284	110	0.0397	0.00029	0.0044	107.60	108.96	-1.4	516.0	(74.8)	502.6	(72.9)	1.9
Single 19mm service Block 2	Main	Building	0.01	15 m	19	0.019	0.0000	0.000284	110	0.0353	0.00023	0.0035	107.60	108.96	-1.4	516.0	(74.8)	502.6	(72.9)	1.9
Single 19mm service Block 3	Main	Building	0.01	15 m	19	0.019	0.0000	0.000284	110	0.0397	0.00029	0.0044	107.40	108.80	-1.4	518.0	(75.1)	504.2	(73.1)	2.0
Max Day Conditons																				
Single 19mm service Block 1	Main	Building	0.10	15 m	19	0.019	0.0001	0.000284	110	0.3659	0.01784	0.2676	107.60	108.96	-1.4	516.0	(74.8)	500.0	(72.5)	2.3
Single 19mm service Block 2	Main	Building	0.11	15 m	19	0.019	0.0001	0.000284	110	0.3703	0.01824	0.2736	107.60	108.96	-1.4	516.0	(74.8)	500.0	(72.5)	2.3
Single 19mm service Block 3	Main	Building	0.10	15 m	19	0.019	0.0001	0.000284	110	0.3659	0.01784	0.2676	107.40	108.80	-1.4	518.0	(75.1)	501.6	(72.8)	2.4
Peak Hour Conditons																				
Single 19mm service Block 1	Main	Building	0.16	15 m	19	0.019	0.0002	0.000284	110	0.5511	0.03809	0.5713	107.60	108.96	-1.4	478.7	(69.4)	459.8	(66.7)	2.7
Single 19mm service Block 2	Main	Building	0.16	15 m	19	0.019	0.0002	0.000284	110	0.5467	0.03753	0.5629	107.60	108.96	-1.4	478.7	(69.4)	459.9	(66.7)	2.7
Single 19mm service Block 3	Main	Building	0.16	15 m	19	0.019	0.0002	0.000284	110	0.5511	0.03809	0.5713	107.40	108.80	-1.4	480.7	(69.7)	461.4	(66.9)	2.8

Water Demand Info	Block 1	Block 2	Block 3
Average Demand (L/sec) =	0.09	0.02	0.09
Max Day Demand (L/sec) =	0.83	0.21	0.83
Peak Hr Deamand (L/sec) =	1.25	0.31	1.25
Fireflow Requriement (L/sec) =	183	117	167
Max Day Plus FF Demand (L/sec) =	183.8	117.2	167.8
From watermain to building =	15 m	15 m	15 m
Connection # (from City)	#3	#2	#1
Connection to	Bensinger	Mykonos	Maple Grove
Min HGL (m)	156.4	156.4	156.4
Max HGL (m)	160.2	160.2	160.2
Max Day + FF (167 L/s) HGL (m)	141.4	147.0	154.7
Approx Ground Elev at Conn (m) =	107.6	107.6	107.4
Approx Bldg FF Elev (m) =	108.96	108.96	108.80
Min Pressure (m) =	48.8	48.8	49.0
Max Pressure (m) =	52.6	52.6	52.8
Min Pressure (Pa) =	478,728	478,728	480,690
Max Pressure (Pa) =	516,006	516,006	517,968
Min Pressure (psi) =	69.4	69.4	69.7
Max Pressure (psi) =	74.8	74.8	75.1

Hazen Williams C Factor for Friction Loss in Pipe, C= 110

Appendix C – Sanitary Servicing Tables

Table C1 – Sanitary Sewer Design Sheet

Table C1: SANITARY SEWER CALCULATION SHEET

LOCATION				RESEDENTIAL AREAS AND POPULAITONS												COMMERCIAL			INDUSTRIAL			INSTITUTIONAL		INFILTRATION				SEWER DATA						
					NUMBER OF UNITS							POPULATION				AREA (ha)			AREA (ha)					AREA (ha)									
Street	U/S MH	D/S MH	Desc	Area (ha)	Singles	Semis	Towns	1-Bed Apt.	2-Bed Apt.	3-Bed Apt.	4-Bed Apt.	INDIV	ACCU	Peak Factor	Peak Flow (L/sec)	INDIV	ACCU	Peak Flow (L/sec)	INDIV	ACCU	Peak Factor (per MOE)	AREA (Ha)	ACCU AREA (Ha)	INDIV	ACCU	INFILT FLOW (L/s)	TOTAL FLOW (L/s)	Nom Dia (mm)	Actual Dia (mm)	Slope (%)	Length (m)	Capacity (L/sec)	Q/Q_{CAP} (%)	Full Velocity (m/s)
Maple Grove Rd	**MHSA65072**	**MHSA65073**		**0.1719**			**8.00**					**21.6**	**21.6**	**3.70**	**0.26**									**0.1719**	**0.17**	**0.06**	**0.32**	**200**	**201.2**	**0.58**	**72.020**	**25.4**	**1%**	**0.92**
Mykonos Cres			*EXSA1*	*0.2521*			*14.00*					*37.8*	37.8																				
Mykonos Cres			*EXSA2*	*0.0512*			*2.00*					*5.4*	43.2																				
Mykonos Cres	**MHSA65629**	**MHSA65630**	**SA2**	**0.0665**			**2.00**					**5.4**	**48.6**	**3.65**	**0.57**									**0.0665**	**0.3186**	**0.11**	**0.68**	**200**	**201.2**	**1.51**	**10.610**	**41.0**	**2%**	**1.49**
Mykonos Cres	MHSA65630	MHSA6526	*EXSA3*	0.0530									48.6	3.65	0.57									0.0530	0.3716	0.12	0.70	200	201.2	1.00	35.120	33.3	2%	1.21
														3.80																		
Bensinger Way			*EXSA4*	*0.3682*			*15.00*					*40.5*	89.1	3.61	1.04									0.3682	0.7398	0.24	1.29						
Bensinger Way			*EXSA5*	*0.1883*			*5.00*					*13.5*	102.6	3.59	1.19									0.1883	0.1883	0.06	1.26						
Bensinger Way	**MHSA6526**	**MHSA6525**	**SA3**	**0.1667**			**8.00**					**21.6**	**124.2**	**3.57**	**1.44**									**0.1667**	**0.5383**	**0.18**	**1.61**	**200**	**201.2**	**1.04**	**50.840**	**34.0**	**5%**	**1.24**
				1.32			**54**					**145.8**			**5.08**									**1.01**									

Residential Avg. Daily Flow, q (L/p/day) = 280
Commercial Avg. Daily Flow (L/gross ha/day) = 28,000
or L/gross ha/sec = 0.324
Institutianal Avg. Daily Flow (L/s/ha) = 28,000
or L/gross ha/sec = 0.324
Light Industrial Flow (L/gross ha/day) = 35,000
or L/gross ha/sec = 0.40509
Light Industrial Flow (L/gross ha/day) = 55,000
or L/gross ha/sec = 0.637

Commercial Peak Factor = 1.5 (when area >20%); 1.0 (when area <20%)
Institutional Peak Factor = 1.5 (when area >20%); 1.0 (when area <20%)
Residential Correction Factor, K = 0.80
Manning N = 0.013
Peak extraneous flow, I (L/s/ha) = 0.33 (Total I/I)

Peak Population Flow, (L/sec) = P*q*M/86.4
Peak Extraneous Flow, (L/sec) = I*Ac
Residential Peaking Factor, M = 1 + (14/(4+P^0.5)) * K
A_c = Cumulative Area (hectares)
P = Population (thousands)
Sewer Capacity, Qcap (L/sec) = $1/N \; S^{1/2} \; R^{2/3} \; A_c$
(Manning's Equation)

Unti Type	Persons/Unit
Singles	3.4
Semi-Detached	5.7
Townhomes	2.7
Single Apt. Unit	1.4
2-bed Apt. Unit	2.1
3-bed Apt. Unit	3.1
4-bed Apt. Unit	4.1

Designed:	Project:
J. Fitzpatrick, P.Eng.	1869 Maple Grove Drive
Checked:	Location:
B. Thomas, P.Eng.	Ottawa, Ontario
File Reference:	Page No:
254810 SAN - Sewer Design Sheet, Sept 25, 2020.xlsx	**1 of 1**

Appendix D – Stormwater Servicing

Table D1 – Estimation of Catchment Time of Concentration for Pre-Development Conditions

Table D2 – Estimation of Peak Flows (Pre-Development Conditions) Using Calculated Time Of Concentration

Table D3 – Estimation of Allowable Minor System Flows to Maple Grove Storm Sewer

Table D4 – Average Runoff Coefficients for Post-Development Conditions

Table D5 – Summary of Post-Development Peak Flows (Uncontrolled and Controlled)

Table D6 – Summary of Post Development Storage

Table D7 – Storage Volumes for 2-year, 5-year, 100-year, and 100-year Plus 20% Storms (Based on MRM)

Table D8 – 5-Year Storm Sewer Calculation Sheet

StormTech Chambers – North (Layout)

StormTech Chambers – North

StormTech Chambers – South (Layout)

StormTech Chambers - South

StormTech MC3500 Chambers - Spec Sheet

Tempest-Technical-Manual (page 5 only)

TABLE D1

ESTIMATION OF CATCHMENT TIME OF CONCENTRATION (PRE-DEVELOPMENT CONDITIONS)

Catchment No.	Area (ha)	High Elev (m)	Low Elev (m)	Flow Path Length (m)	Indiv Slope	Avg. C	Time of Conc. Tc	Description
PRE_S01	0.4052	107.5	106.6	51.0	1.8	**0.28**	15.77	See Note 1
Total	0.4052							

Notes

1) For Catchments with Runoff Coefficient less than C=0.40, Time of Concentration Based on Federal Aviation Formula (Airport Method), from MTO Drainage Manual Equation 8.16, where: $T_C = 3.26 * (1.1-C) * L^{0.5} / S_W^{0.33}$

TABLE D2

ESTIMATION OF PEAK FLOWS (PRE-DEVELOPMENT CONDITIONS) USING CALACUTLED TIME OF CONCENTRATIONS

Catchment No.	Area (ha)	Time of Conc, Tc (min)	Storm = 2 yr			Storm = 5 yr			Storm = 100 yr		
			I_2 (mm/hr)	Cavg	Q_{5PRE} (L/sec)	I_5 (mm/hr)	Cavg	Q_{5PRE} (L/sec)	I_{100} (mm/hr)	Cavg	Q_{100PRE} (L/sec)
PRE_S01	0.4052	15.77	60.01	0.28	18.9	81.15	0.28	25.6	138.74	0.35	54.7
Total	0.4052				18.9			25.6			54.7

Notes

1) Intensity, $I = 732.951/(Tc+6.199)^{0.810}$ (2-year, City of 0ttawa)

2) Intensity, $I = 998.071/(Tc+6.035)^{0.814}$ (5-year, City of 0ttawa)

3) Intensity, $I = 1735.688/(Tc+6.014)^{0.820}$ (100-year, City of Ottawa)

4) Cavg for 100-year is increased by 25% to a maximum of 1.0

TABLE D3

ESTIMATION OF ALLOWABLE MINOR SYSTEM FLOWS TO MAPLE GROVE STORM SEWER

Based on 5-year Storm Sewer Design with C=0.65 & Tc=10mins (Pond 4 Desing Brief, DSEL)

Catchment No.	Area (ha)	Time of Conc, Tc (min)	Storm = 5 yr		
			I_5 (mm/hr)	Cavg	Q_{ALLOW} (L/sec)
PRE_S01	0.4052	10	104.29	0.65	76.4
Total					**76.4**
Notes					
1) Allowable Flows to Storm Sewer on Maple Grove Based on DSEL Strm Sewer Desing for Pond 4 with Cavg or C = 0.65, Tc=10 mins, A=0.40 ha					
2) Peak flows in excess of Allowable rate to be discharged downstream, and strored in roadway pondng areas and park storage as per Pond 4 Design Brief DSEL					

TABLE D4

AVERAGE RUNOFF COEFFICIENTS (Post-Development)

Runoff Coeffients $C_{ASPH/CONC}$ = 0.90 C_{ROOF} = 0.90 C_{GRASS} = 0.20

Area No.	Asphalt & Conc Areas (m^2)	A * C_{ASPH}	Roof Areas (m^2)	A * C_{ROOF}	Grassed Areas (m^2)	A * C_{GRASS}	Sum AC	Total Area (m^2)	C_{AVG} (see note)	Comment
S01								2433	0.44	Surface Areas
S02								719	0.68	Surface Areas
S03								696	0.68	Surface Areas
S04								202	0.60	Surface Areas
Totals								4,050	0.53	

Notes

1) Cavg derived with area-weighting command in PCSWMM

TABLE D5

SUMMARY OF POST-DEVELOPMENT PEAK FLOWS (Uncontrolled and Controlled)

Area No	Area (ha)	Time of Conc, Tc (min)	Storm = 2 yr				Storm = 5 yr				Storm = 100 yr				Comments
			C_{AVG}	I_2 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	C_{AVG}	I_5 (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	C_{AVG}	I_{100} (mm/hr)	Q (L/sec)	Q_{CAP} (L/sec)	
S01	0.2433	10	0.44	76.81	22.9	3.10	0.44	104.19	31.0	4.20	0.55	178.56	66.4	9.00	Controlled - Maple Grove
S02	0.0719	10	0.68	76.81	10.4	(10.4)	0.68	104.19	14.2	(14.2)	0.85	178.56	30.3	(30.3)	Uncontrolled - Maple Grove
Total to Maple Grove Road Storm Sewers (overland+pipe) =						**13.5**				**18.4**				**39.3**	
S03	0.0696	10	0.68	76.81	10.1	(10.1)	0.68	104.19	13.7	(13.7)	0.85	178.56	29.4	(29.4)	Uncontrolled - Bensinger
Total to Bensinger Way Storm Sewers (overland) =						**10.1**				**13.7**				**29.4**	
S04	0.0202	10	0.60	76.81	2.6	2.6	0.60	104.19	3.5	3.5	0.75	178.56	7.5	7.5	Uncontrolled- Mykonos
Total to Mykonos Crescent Storm Sewers (overland) =						**(2.6)**				**(3.5)**				**(7.5)**	
Totals =	**0.4050**				**46.0**	**26.2**			**62.4**	**35.6**			**133.6**	**76.2**	
Allowable rates for comparison														*76.4*	

Notes

2-yr Storm Intensity, I = 732.951/(Tc+6.199)^0.810 (City of Ottawa)

5-yr Storm Intensity, I = 998.071/(Tc+6.035)^0.814 (City of Ottawa)

100-yr Storm Intensity, I = 1735.688/(Tc+6.014)&^0.820 (City of Ottawa)

Time of Concentration (min), Tc = ***10***

For Flows under column Qcap which are shown in brackets ***(0.0)*** *, denotes flows that are uncontrolled*

TABLE D6

SUMMARY OF POST DEVELOPMENT STORAGE

Area No.	Area (ha)	Release Rate (L/s)			[1] Storage Required (m^3)				Storage Provided (m^3)					Control Method
		2-yr	5-yr	100-yr	2-yr (MRM)	5-yr (MRM)	100-yr (MRM)	100-yr +20 (MRM)	Pipe	Surface Ponding	UG Chambers	UG CB/MHs	Total	
S01	0.2433	3.10	4.20	9.00	16.0	21.5	58.9	74.8			79.2		79.2	ICD - TEMPEST LMF TYPE 90 Controlled 9 L/sec @ 1.44m (Actual 8.6 L/sec for LMF 90 at 1.44m)
S02	0.0719	10.44	14.16	30.34										None
S03	0.0696	10.11	13.71	29.37										None
S04	0.0202	2.59	3.51	7.52										None
Totals	0.4050	26.23	35.58	76.22	16.0	21.5	58.9	74.8						

Notes

1) The storage required is based on the Modified Rational Method (MRM) for the relase rates noted.

TABLE D7 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)

Area No: **S01**

C_{AVG} = 0.44 (2-yr)

C_{AVG} = 0.44 (5-yr)

C_{AVG} = 0.55 (100-yr, Max 1.0)

Time Interval = 5.00 (mins)

Drainage Area = 0.2433 (hectares)

Actual Release Rate (L/sec) = 9.0

Percentage of Actual Rate (City of Ottawa requirement) = 50% (Set to 50% when U/G storage used)

Release Rate Used for Estimation of 100-year Storage (L/sec) = 4.5

Intensity Incr (%) = 20% Use 20% for Climate Change

Duration (mins)	Release Rate = 3.1 (L/sec); Return Period = 2 (years); IDF Parameters, A = 733.0, B = 0.810, C = 6.199 (I = A/(T_c+C))					Release Rate = 4.2 (L/sec); Return Period = 5 (years); IDF Parameters, A = 998.1, B = 0.814, C = 6.053 (I = A/(T_c+C))					Release Rate = 4.5 (L/sec); Return Period = 100 (years); IDF Parameters, A = 1735.7, B = 0.820, C = 6.014 (I = A/(T_c+C))					Release Rate = 4.5 (L/sec); Return Period = 100+20% (years); IDF Parameters, A = 1735.7, B = 0.820, C = 6.014 (I = A/(T_c+C))				
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	167.2	49.8	3.1	46.7	0.0	230.5	68.6	4.2	64.4	0.0	398.6	148.3	4.5	143.8	0.0	478.3	177.9	4.5	173.4	0.0
5	103.6	30.8	3.1	27.7	8.3	141.2	42.0	4.2	37.8	11.3	242.7	90.3	4.5	85.8	25.7	291.2	108.3	4.5	103.8	31.2
10	76.8	22.9	3.1	19.8	11.9	104.2	31.0	4.2	26.8	16.1	178.6	66.4	4.5	61.9	37.2	214.3	79.7	4.5	75.2	45.1
15	61.8	18.4	3.1	15.3	13.8	83.6	24.9	4.2	20.7	18.6	142.9	53.2	4.5	48.7	43.8	171.5	63.8	4.5	59.3	53.4
20	52.0	15.5	3.1	12.4	14.9	70.3	20.9	4.2	16.7	20.0	120.0	44.6	4.5	40.1	48.1	143.9	53.5	4.5	49.0	58.9
25	45.2	13.4	3.1	10.3	15.5	60.9	18.1	4.2	13.9	20.9	103.8	38.6	4.5	34.1	51.2	124.6	46.4	4.5	41.9	62.8
30	40.0	11.9	3.1	8.8	15.9	53.9	16.0	4.2	11.8	21.3	91.9	34.2	4.5	29.7	53.4	110.2	41.0	4.5	36.5	65.7
35	36.1	10.7	3.1	7.6	16.0	48.5	14.4	4.2	10.2	21.5	82.6	30.7	4.5	26.2	55.1	99.1	36.9	4.5	32.4	68.0
40	32.9	9.8	3.1	6.7	16.0	44.2	13.1	4.2	8.9	21.5	75.1	28.0	4.5	23.5	56.3	90.2	33.5	4.5	29.0	69.7
45	30.2	9.0	3.1	5.9	15.9	40.6	12.1	4.2	7.9	21.3	69.1	25.7	4.5	21.2	57.2	82.9	30.8	4.5	26.3	71.1
50	28.0	8.3	3.1	5.2	15.7	37.7	11.2	4.2	7.0	21.0	64.0	23.8	4.5	19.3	57.9	76.7	28.5	4.5	24.0	72.1
55	26.2	7.8	3.1	4.7	15.5	35.1	10.5	4.2	6.3	20.6	59.6	22.2	4.5	17.7	58.3	71.5	26.6	4.5	22.1	73.0
60	24.6	7.3	3.1	4.2	15.2	32.9	9.8	4.2	5.6	20.2	55.9	20.8	4.5	16.3	58.7	67.1	25.0	4.5	20.5	73.6
65	23.2	6.9	3.1	3.8	14.8	31.0	9.2	4.2	5.0	19.6	52.6	19.6	4.5	15.1	58.8	63.2	23.5	4.5	19.0	74.1
70	21.9	6.5	3.1	3.4	14.4	29.4	8.7	4.2	4.5	19.1	49.8	18.5	4.5	14.0	58.9	59.7	22.2	4.5	17.7	74.5
75	20.8	6.2	3.1	3.1	13.9	27.9	8.3	4.2	4.1	18.4	47.3	17.6	4.5	13.1	58.9	56.7	21.1	4.5	16.6	74.7
80	19.8	5.9	3.1	2.8	13.5	26.6	7.9	4.2	3.7	17.8	45.0	16.7	4.5	12.2	58.7	54.0	20.1	4.5	15.6	74.8
85	18.9	5.6	3.1	2.5	13.0	25.4	7.5	4.2	3.3	17.1	43.0	16.0	4.5	11.5	58.5	51.5	19.2	4.5	14.7	74.8
90	18.1	5.4	3.1	2.3	12.4	24.3	7.2	4.2	3.0	16.3	41.1	15.3	4.5	10.8	58.3	49.3	18.4	4.5	13.9	74.8
95	17.4	5.2	3.1	2.1	11.9	23.3	6.9	4.2	2.7	15.6	39.4	14.7	4.5	10.2	58.0	47.3	17.6	4.5	13.1	74.7
100	16.7	5.0	3.1	1.9	11.3	22.4	6.7	4.2	2.5	14.8	37.9	14.1	4.5	9.6	57.6	45.5	16.9	4.5	12.4	74.5
Max =					**16.0**					**21.5**					**58.9**					**74.8**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I = A/(Tc+C)^B$

3) Release Rate = Min (Release Rate, Peak Flow)

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

7) Parameters a,b,c are for City of Ottawa

City of Ottawa IDF Data (from SDG002)

IDF curve equations (Intensity in mm/hr)

100 year Intensity $= 1735.688 / (\text{Time in min} + 6.014)^{0.820}$

50 year Intensity $= 1569.580 / (\text{Time in min} + 6.014)^{0.820}$

25 year Intensity $= 1402.884 / (\text{Time in min} + 6.018)^{0.819}$

10 year Intensity $= 1174.184 / (\text{Time in min} + 6.014)^{0.816}$

5 year Intensity $= 998.071 / (\text{Time in min} + 6.053)^{0.814}$

2 year Intensity $= 732.951 / (\text{Time in min} + 6.199)^{0.810}$

TABLE D8: 5-YEAR STORM SEWER CALCULATION SHEET

Return Period Storm =	**5-year**	(2-year, 5-year, 100-year)
Default Inlet Time=	10	(minutes)
Manning Coefficient =	0.013	(dimensionless)

From Node	To Node	Street	AREA INFO				FLOW (UNRESTRICTED)							SEWER DATA										
			Area No.	Area (ha)	∑ Area (ha)	Average R	Indiv. 2.78*A*R	Accum. 2.78*A*R	Tc (mins)	I (mm/h)	Indiv. Flow	Return Period	Q (L/s)	Dia (mm) Actual	Dia (mm) Nominal	Type	Slope (%)	Length (m)	Capacity, Q_{CAP} (L/sec)	Velocity (m/s)		Time in Pipe, Tt (min)	Hydraulic Ratios	
																				Vf	Va		Q/Q_{CAP}	Va/Vf
MHST67819	MHST67820	Maple Grove Road	*EX Maple Grove*	*0.9574*	*0.9574*	*0.65*	1.730	*1.730*	*10.00*	*104.19*	*180.25*	*5-year*	*180.3*											
		Maple Grove Road	**S01**	**0.2433**	**1.2007**	**0.46**	**0.311**	**2.041**	**10.00**	**104.19**	**32.42**	**5-year**	**212.7**											
		Maple Grove Road	**S02**	**0.0719**	**1.2726**	**0.66**	**0.132**	**1.862**	**10.00**	**104.19**	**13.75**	**5-year**	**194.0**	**533.0**	**525**	**CONC**	**0.64**	**73.55**	**358.21**	**1.59**	**1.12**	**1.09**	**0.54**	**0.71**
		Mykonos Cres	*EX Mykonos Cres*	0.5100	0.5100	0.69	0.978	0.978	10.60	101.13	98.93	5-year	98.9											
MHST68715	**MHST68712**	**Mykonos Cres**	**S04**	**0.0202**	**0.5302**	**0.52**	**0.029**	**1.007**	**10.60**	**101.13**	**2.95**	**5-year**	**101.9**	**447.9**	**450**	**PVC**	**0.92**	**10.85**	**270.03**	**1.72**	**1.22**	**0.15**	**0.38**	**0.71**
		Bensinger Way	EX Bensinger Way	1.1834	1.1830	0.69	2.270	*2.270*	*12.82*	*91.33*	*207.33*	*5-year*	*207.3*											
MHST68712	**MHST67058**	**Bensinger Way**	**S03**	**0.0696**	**1.2526**	**0.66**	**0.128**	**2.398**	**12.82**	**91.33**	**11.66**	**5-year**	**219.0**	**610.0**	**600**	**PVC**	**0.20**	**10.85**	**286.97**	**0.97**	**0.95**	**0.19**	**0.76**	**0.98**
TOTALS =																								

Definitions:

Q = 2.78*AIR, where

Q = Peak Flow in Litres per second (L/s)

A = Watershed Area (hectares)

I = Rainfall Intensity (mm/h)

R = Runoff Coefficients (dimensionless)

Ottawa Rainfall Intensity Values from Sewer Design Guidelines, SDG002

	a	b	c
2-year	732.951	6.199	0.810
5-year	998.071	6.053	0.814
100-year	1735.688	6.014	0.820

Designed:	Project:	
J. Fitzpatrick, P.Eng.	1869 Hazeldean Road	
Checked:	Location:	
B. Thomas, P.Eng.	1869 Hazeldean Road, Ottawa, ON	
Dwg Reference:	File Ref:	Sheet No:
C004	254810 STM - Sewer Design Sheets, Sept 25, 2020.xlsx	1 of 1

User Inputs

Chamber Model:	MC-3500
Outlet Control Structure:	Yes
Project Name:	1869 Maple Grove
Engineer:	jason fitzpatrick
Project Location:	
Measurement Type:	Metric
Required Storage Volume:	45.00 cubic meters.
Stone Porosity:	40%
Stone Foundation Depth:	229 mm.
Stone Above Chambers:	305 mm.
Average Cover Over Chambers:	457 mm.
Design Constraint Dimensions:	(15.00 m. x 8.50 m.)

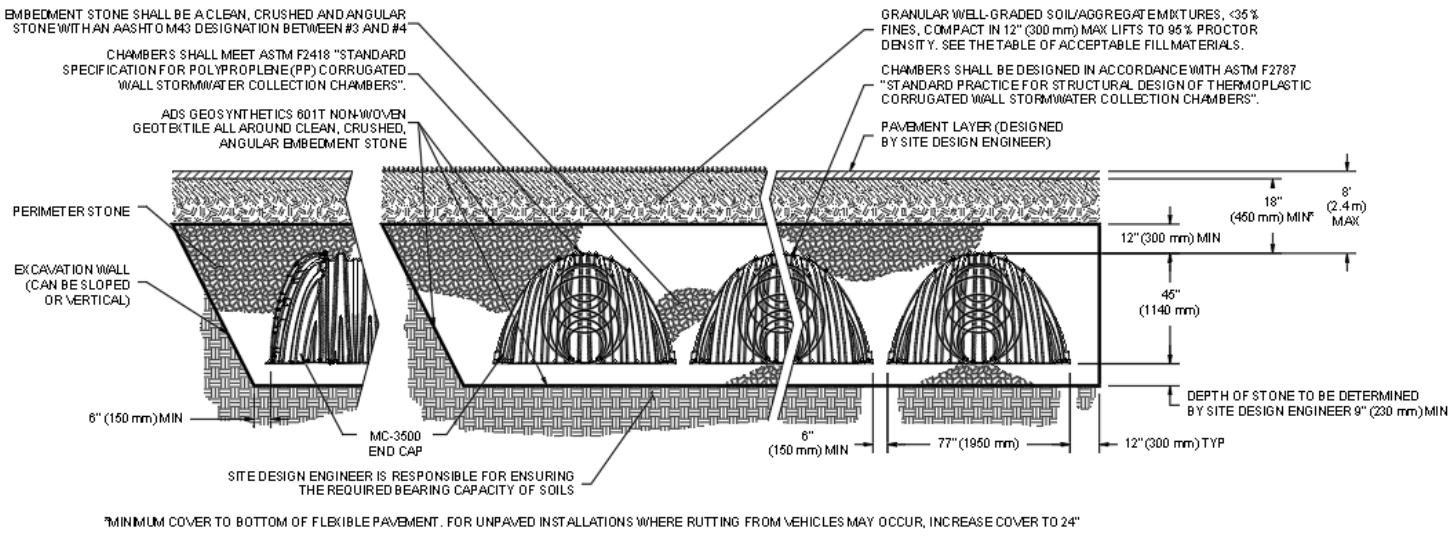
Results

System Volume and Bed Size

Installed Storage Volume:	46.91 cubic meters.
Storage Volume Per Chamber:	3.11 cubic meters.
Number Of Chambers Required:	6
Number Of End Caps Required:	6
Chamber Rows:	3
Maximum Length:	7.32 m.
Maximum Width:	6.96 m.
Approx. Bed Size Required:	50.98 square meters.

System Components

Amount Of Stone Required:	64.26 cubic meters
Volume Of Excavation (Not Including Fill):	85.46 cubic meters



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24"

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- Background & Tools
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- Components
- Advanced settings
- Drawings & Reports
  - Print System Specifications
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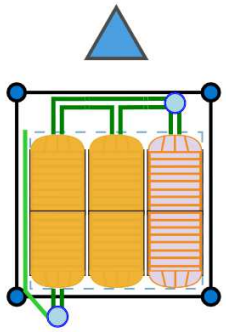
Volume (m^3)	Length (m)	Width (m)	Area (m^2)	Chambers	Caps
46.91	7.32	6.96	50.98	6	6



User Inputs

Chamber Model:	MC-3500
Outlet Control Structure:	Yes
Project Name:	1869 Maple Grove
Engineer:	jason fitzpatrick
Project Location:	
Measurement Type:	Metric
Required Storage Volume:	30.00 cubic meters.
Stone Porosity:	40%
Stone Foundation Depth:	229 mm.
Stone Above Chambers:	305 mm.
Average Cover Over Chambers:	457 mm.
Design Constraint Dimensions:	(15.00 m. x 8.50 m.)

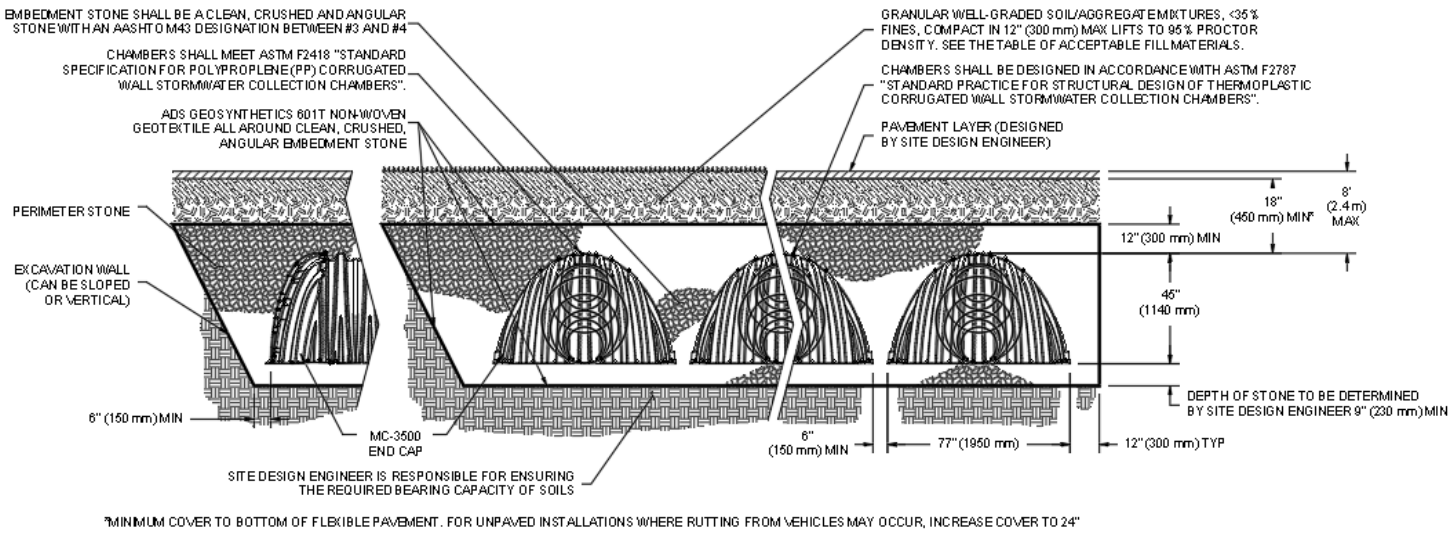
Results

System Volume and Bed Size

Installed Storage Volume:	32.32 cubic meters.
Storage Volume Per Chamber:	3.11 cubic meters.
Number Of Chambers Required:	4
Number Of End Caps Required:	4
Chamber Rows:	2
Maximum Length:	7.32 m.
Maximum Width:	4.86 m.
Approx. Bed Size Required:	35.55 square meters.

System Components

Amount Of Stone Required:	45.45 cubic meters
Volume Of Excavation (Not Including Fill):	59.59 cubic meters



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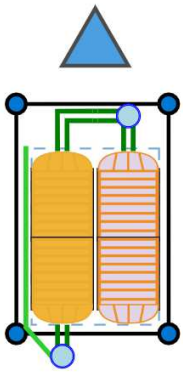
Volume (m^3)	Length (m)	Width (m)	Area (m^2)	Chambers	Caps
32.32	7.32	4.86	35.55	4	4

Storage Volume (m^3)	30.00
Available length (m)	8.50
Available width (m)	15.00
Stone Above Chambers (mm)	305
Stone Below Chambers (mm)	229
Base Stone Elevation (m)	0.000
Stone Porosity (%):	40
Average Cover (mm)	457

Include Underdrain(YES)
Include Outlet (YES)

Generate Design
Reset Design

Components +
Advanced settings +



STORMTECH MC-3500 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH MC-3500 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
90" x 77" x 45"
2,286 mm x 1,956 mm x 1,143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
178.9 ft³ (5.06 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.

STORMTECH MC-3500 END CAP
(not to scale)

Nominal End Cap Specifications

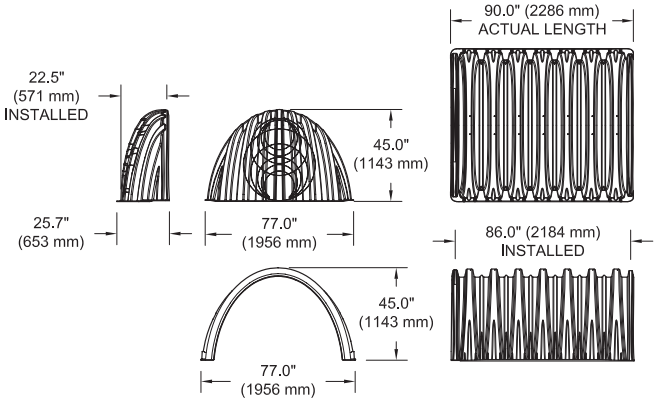
Size (L x W x H)
26.5" x 71" x 45.1"
673 mm x 1,803 mm x 1,145 mm

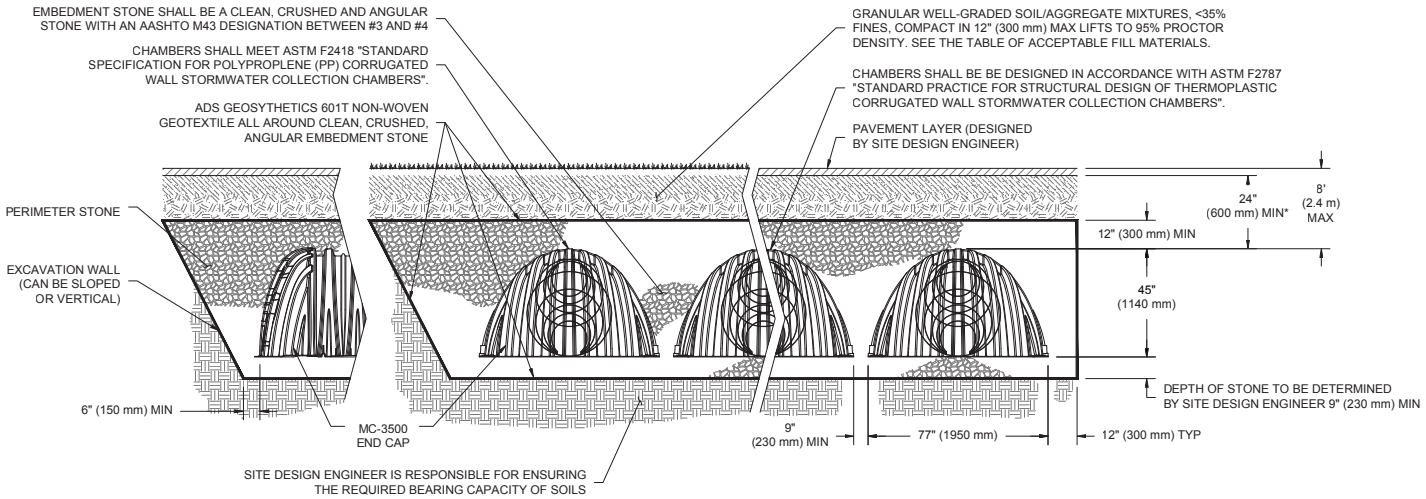
End Cap Storage
14.9 ft³ (1.30 m³)

Min. Installed Storage*
46.0 ft³ (1.30 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 6" (150 mm) of stone perimeter, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

MC-3500 CHAMBER SPECIFICATION

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9" (230 mm)	12" (300 mm)	15" (375 mm)	18" (450 mm)
MC-3500 Chamber	109.9 (3.11)	178.9 (5.06)	184.0 (5.21)	189.2 (5.36)	194.3 (5.5)
MC-3500 End Cap	14.9 (.42)	46.0 (1.33)	47.7 (1.35)	49.4 (1.40)	51.1 (1.45)

Note: Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds³)	Stone Foundation Depth			
	9"	12"	15"	18"
MC-3500 Chamber	9.1 (6.4)	9.7 (6.9)	10.4 (7.3)	11.1 (7.8)
MC-3500 End Cap	4.1 (2.9)	4.3 (3.0)	4.5 (3.2)	4.5 (3.2)
METRIC KILOGRAMS (m³)	**230 mm**	**300 mm**	**375 mm**	**450 mm**
MC-3500 Chamber	8,220 (4.9)	8,831 (5.3)	9,443 (5.6)	10,054 (6.0)
MC-3500 End Cap	3,699 (2.2)	3,900 (2.3)	4,100 (2.5)	4,301 (2.6)

Note: Assumes 12" (300 mm) of stone above and 9" (230 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15" (375mm)	18" (450 mm)
MC-3500 Chamber	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)	13.8 (10.5)
MC-3500 End Cap	4.1 (3.1)	4.2 (3.2)	4.4. (3.3)	4.5 (3.5)

Note: Assumes 9" (230 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

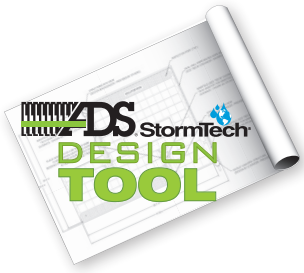


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Chart 1: LMF 14 Preset Flow Curves

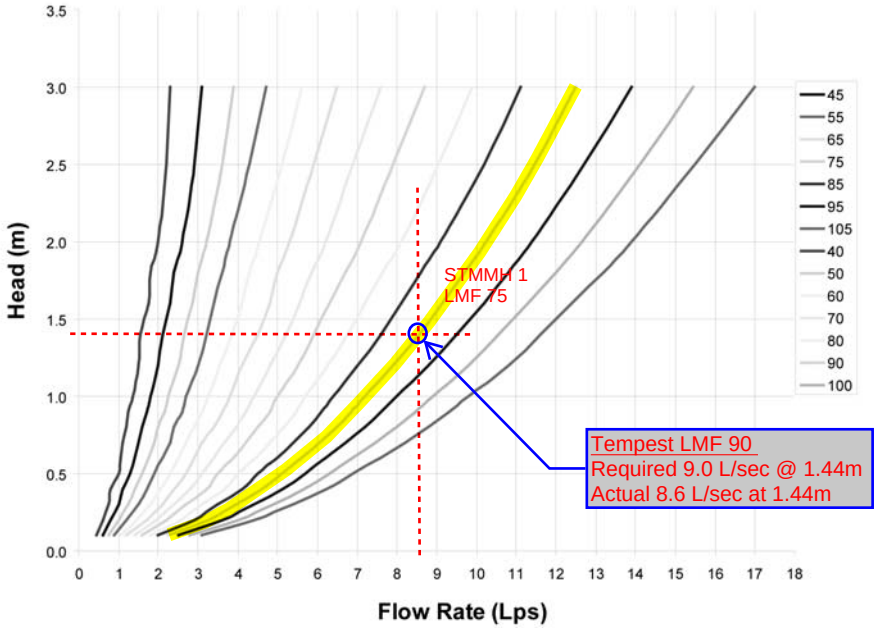
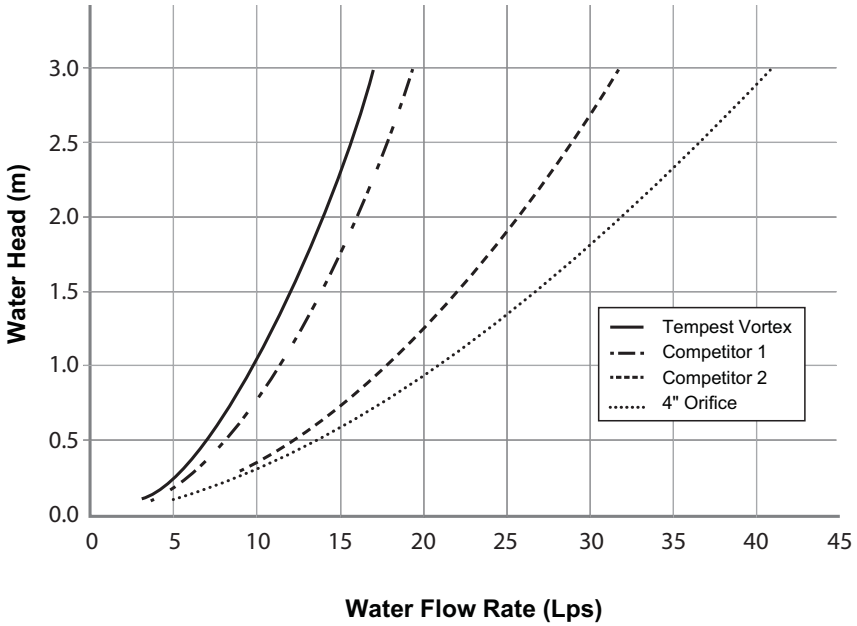


Chart 2: LMF Flow vs. ICD Alternatives



Appendix E – Consultation / Correspondence

Email Received from City of Ottawa on Water System Boundary Conditions.

Email Received from MCVA on Stormwater Quality Control Requirements

Moe Ghadban

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: Friday, March 6, 2020 7:51 AM
To: Moe Ghadban
Cc: Shen, Stream
Subject: RE: Request for Boundary Conditions - 1869 Maple Grove Road
Attachments: 1869 Maple Grove _Boundary Conditions_04March2020.docx

Hi Moe,

Please find attached the boundary conditions for the subject application.

Also, a second feed may be required if the number of units fed by the P-loop exceeds 50. A new watermain connecting BC #1 and #3 is preferred.

Thanks,

Santhosh
Ext. 27599

From: Moe Ghadban <Moe.Ghadban@exp.com>
Sent: February 28, 2020 2:30 PM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Subject: Request for Boundary Conditions - 1869 Maple Grove Road

We are working on a site plan application for 1869 Maple Grove Rd , and would appreciate if you could arrange for IAD/water Resources to provide hydraulic boundary conditions that we will need for the watermain design. I have attached a sketch of the site and the approximate boundary condition locations.

The following is a summary of the demands and the required fire flows (RFF) we have estimated. We would appreciate the hydraulic boundary conditions based on our estimated water demands and required fire flows as noted below:

There are 3 separate blocks, and they shall all connect into different streets (Maple Grove Rd, Mykonos Cres, and Bensinger Way).

1869 Maple Grove Rd (Block 1, Boundary Location #1):

Average Day: 0.09L/sec
Max Day: 0.8 L/sec
Peak Hour: 1.3 L/sec

Fire flow (RFF): 167 L/sec (based on FUS method)
Max Day + FF: 167.8 L/sec.

1869 Maple Grove Rd (Block 2, Boundary Location #2):

Average Day: 0.02L/sec
Max Day: 0.2 L/sec
Peak Hour: 0.31 L/sec
Fire flow (RFF): 117 L/sec (based on FUS method)
Max Day + FF: 117.2 L/sec.

1869 Maple Grove Rd (Block 3, Boundary Location #3):

Average Day: 0.09L/sec
Max Day: 0.8 L/sec
Peak Hour: 1.3 L/sec
Fire flow (RFF): 200 L/sec (based on FUS method)
Max Day + FF: 200.8 L/sec.

Regards,

Moe Ghadban, P.Eng
EXP | Engineering Designer
t : +1.613.688.1899 | m : +1.613.808.4089 | e : moe.ghadban@exp.com
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6
CANADA

Boundary Conditions
1869 Maple Grove

Provided Information

Connection 1	Demand	
	L/min	L/s
Average Daily Demand	5	0.09
Maximum Daily Demand	48	0.80
Peak Hour	78	1.30
Fire Flow Demand #1	10,020	167.00

Connection 2	Demand	
	L/min	L/s
Average Daily Demand	1	0.02
Maximum Daily Demand	12	0.20
Peak Hour	19	0.31
Fire Flow Demand #1	7,020	117.00

Connection 3	Demand	
	L/min	L/s
Average Daily Demand	5	0.09
Maximum Daily Demand	48	0.80
Peak Hour	78	1.30
Fire Flow Demand #1	12,000	200.00

Location

Results

Connection 1 - Maple Grove Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.2	75.1
Peak Hour	156.4	69.7
Max Day plus Fire 1	154.7	67.2

[1] Ground Elevation = 107.4 m

Connection 2 - Mykonos Cres.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.2	74.7
Peak Hour	156.4	69.3
Max Day plus Fire 1	147.0	55.9

[1] Ground Elevation = 107.6 m

Connection 3 - Bensinger Way

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.2	74.8
Peak Hour	156.4	69.4
Max Day plus Fire 1	141.4	48.0

[1] Ground Elevation = 107.6 m

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.

Moe Ghadban

From: Matt Craig <mcraig@mvc.on.ca>
Sent: Wednesday, January 15, 2020 10:05 AM
To: Moe Ghadban
Cc: Jason Fitzpatrick; Bruce Thomas
Subject: RE: Request for SWM Criteria for 1869 Maple Grove

Hi Moe,

The original criteria in the Kanata West Mater Servicing Study is normal water quality control. Recent SWM facility (e.g. Arcadia ponds) have been designed for enhanced water quality control. This increase in criteria is at the request of the City Ottawa.

MVCA issued a permit for Pond 4 (Permit No. W14-126) so it is understood that water quality control criteria is already set for this specific subdivision.

Regards

Matt Craig | Manager of Planning and Regulations | Mississippi Valley Conservation Authority

www.mvc.on.ca |t. 613 253 0006 ext. 226| f. 613 253 0122 | mcraig@mvc.on.ca

---

From: Moe Ghadban <Moe.Ghadban@exp.com>
Sent: January 13, 2020 4:36 PM
To: Matt Craig <mcraig@mvc.on.ca>
Cc: Jason Fitzpatrick <jason.fitzpatrick@exp.com>; Bruce Thomas <bruce.thomas@exp.com>
Subject: FW: Request for SWM Criteria for 1869 Maple Grove

Hi Matt,

We are preparing a site servicing and stormwater report for a proposed 18 unit townhome development, located at 1869 Maple Grove Road in the City of Kanata. As the site is within the MVCA's jurisdiction we are requesting CA's clarification on the stormwater management requirements. The project will require Major Zoning By-law Amendment, Plan of Subdivision and Lifting of Part Lot Control Applications.

The subject property is within the Kanata west – Pond 4 subcatchment, which was designed for normal level of protection (70%TSS). In addition the storm water quantity control requirements were established at a 5 year capture with the minor system flows to the local 525mm on Maple Grove Dr with major system flows routed to maple grove drive. It is our intent to provide a storm connection from the interior rear yard areas, with the remaining drainage from the front yards to discharge directly to Maple Grove Dr, Bensinger Way, and Mykonos Cres.

Please see the attached site plan. Thank you for your review and input.

Regards,

Moe Ghadban
EXP | Engineering Designer
t : +1.613.688.1899 | m : +1.613.808.4089 | e : moe.ghadban@exp.com
2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6
CANADA

Appendix F – Background Information

City of Ottawa Vault Drawings (10 Plans)

Excerpt pages from "Design Brief for the Reconstruction of Maple Grove Road", Mattamy Homes, by DSEL, dated May 31, 2012 (total 3 pages).

Excerpt pages from "Design Brief for Fairwinds North, Phase 2B and 4" Mattamy Homes, by DSEL/JFSA, dated August 02, 2012 (total 3 pages).

Excerpt pages from "Design Brief for Pond 4, Kanata North" Mattamy Homes, by DSEL/JFSA, dated May 31, 2012 (total 10 pages).

Excerpt pages from "Kanata West, Master Servicing Study", Volume 1 of 2, by Stantec / CCL-IBI, dated June 16, 2006 (total 5 pages).

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE WEAR COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE UPPER BINDER COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE LOWER BINDER COURSE
150mm GRANULAR "A" CRUSHED STONE OPSS
600mm GRANULAR "B" TYPE II OPSS

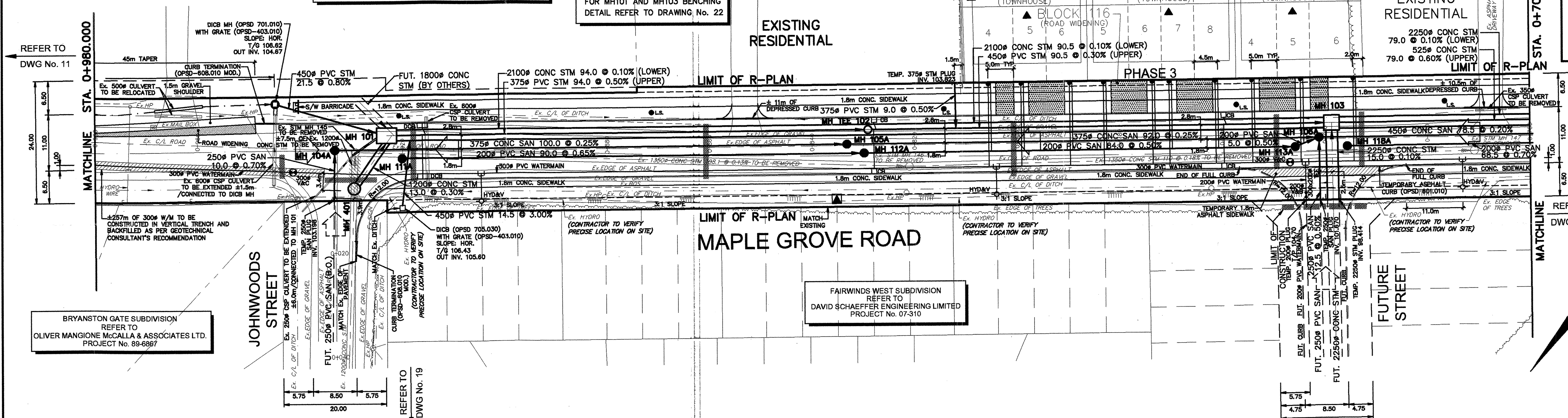
NOTE RE: WATERMAIN / WATER SERVICE

1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.5m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W38 FOR DETAIL

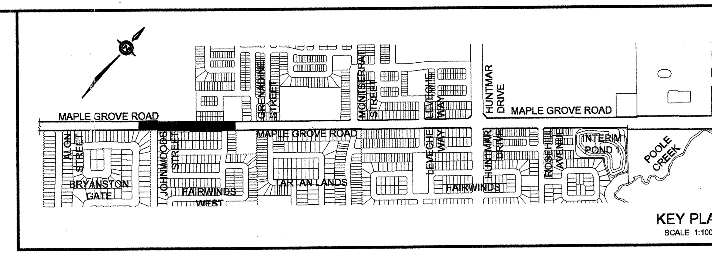
ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

NOTE:
FOR MH101 AND MH103 BENCHING DETAIL REFER TO DRAWING No. 22

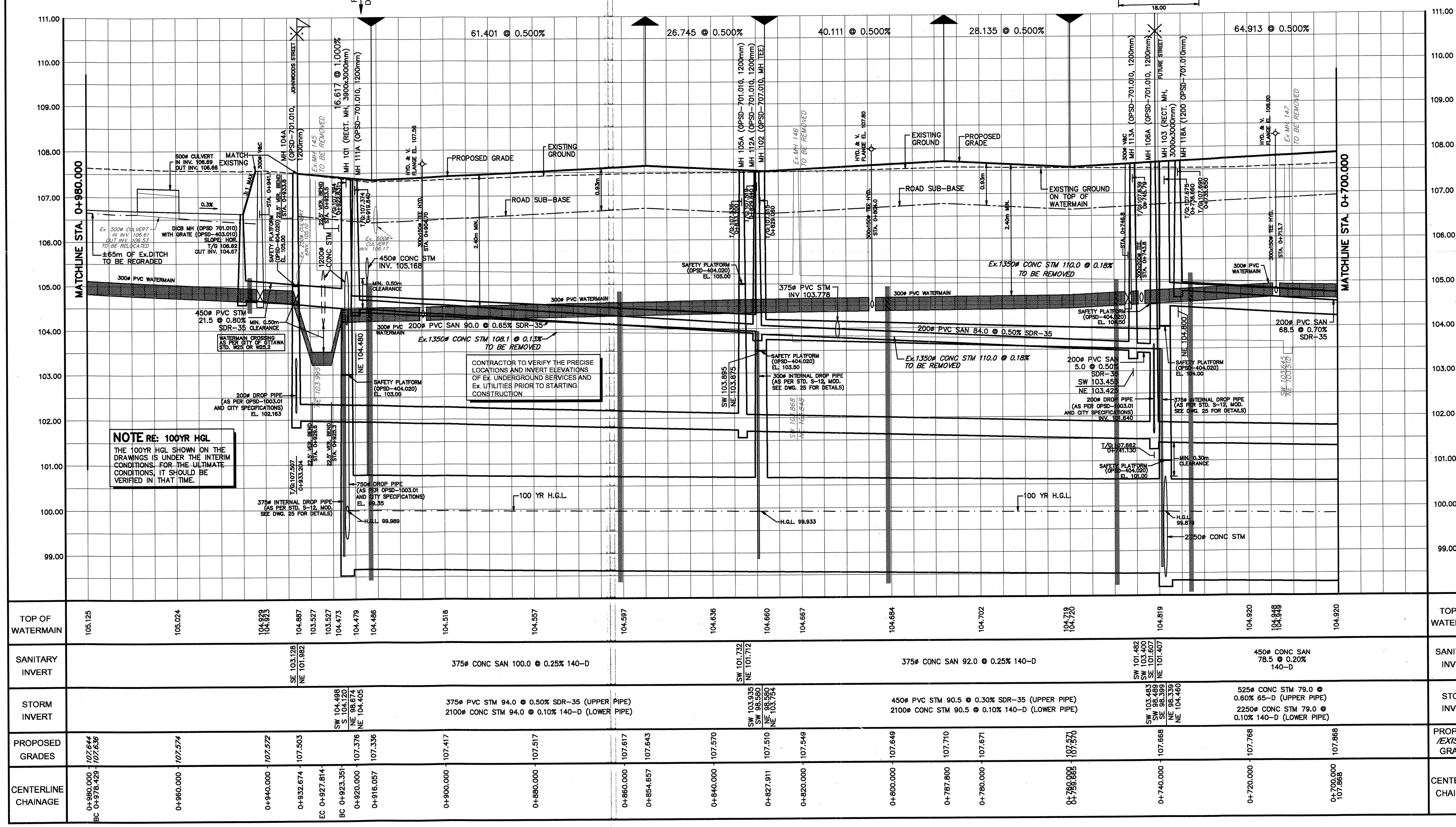


NOTE RE: MH 103
A 0.85m DIAMETER ORIFICE IS TO BE INSTALLED AT THE OUTLET OF MH 103 TO THE DOWNSTREAM OF THE SYSTEM UPON THE COMPLETION OF THE STORM SYSTEM CONNECTED TO ULTIMATE POND 4. THE ACTUAL ORIFICE SIZE TO BE VERIFIED IN THAT TIME.



LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- Ex. STORM MANHOLE
- Ex. SANITARY MANHOLE
- STORM MANHOLE BY OTHERS
- SANITARY MANHOLE BY OTHERS
- CATCH BASIN MANHOLE
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- OVERLAND FLOW DIRECTION
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- PHASE LINE
- BUILDING ENVELOPE
- TRANSFORMER



Reviewed By Development Review Branch
Signed: Omar's Mff
Date: JAN 23, 2013

PLAN #14707

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 05-10-439-02, SURVEY DATED JULY 6, 2011 AND PROJECT No. 0X-10-628-02, SURVEY DATED NOVEMBER 27, 2008 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBURARY 24, 2008 AND PROJECT No. 06-10-628-00, SURVEY DATED MARCH 29, 2007.

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC CONSULTING LIMITED AND WEBSTER & SIMMONDS SURVEYING LIMITED, FILE No. 161610660-111 RECEIVED ON DECEMBER 1, 2006.

LEGAL INFORMATION

CALCULATED R-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 07-10-820-00, SURVEY DATED MAY 30, 2012.

BENCH MARK No. 0011988U502

STITTSVILLE CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.

ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
7	Z.L.	13-01-04	REVISED FUTURE STREET LOCATION & SERVICING LAYOUT	
6	Z.L.	12-09-26	REVISED STM SEWER FROM CBMH TO MH 101 AS PER JFSA	
5	Z.L.	12-09-07	REPLACED MH TEE 401 WITH MANHOLE, AND CONNECTED DICB LEAD TO 2100ø STM BETWEEN MH 101 AND 102	
4	Z.L.	12-05-31	4th SUBMISSION	
3	Z.L.	12-04-13	3rd SUBMISSION	
2	Z.L.	12-02-14	2nd SUBMISSION	
1	Z.L.	11-08-02	1st SUBMISSION	

Ottawa CITY OF OTTAWA

LICENSED PROFESSIONAL ENGINEER Z. LI 3-0-04 PROVINCE OF ONTARIO

PROJECT No. 10-451

PLAN AND PROFILE OF
MAPLE GROVE ROAD
(STA. 0+700.000 TO STA. 0+980.000)

© DSEL

MATTAMY (FAIRWINDS NORTH) LIMITED

RECONSTRUCTION OF MAPLE GROVE ROAD

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		12
SCALE: H1:500 ,V1:50	DATE: JULY 2011		

D07-16-10-0014 MAPLE

14707

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE WEAR COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE UPPER BINDER COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE LOWER BINDER COURSE
150mm GRANULAR "A" CRUSHED STONE OPSS
600mm GRANULAR "B" TYPE II OPSS

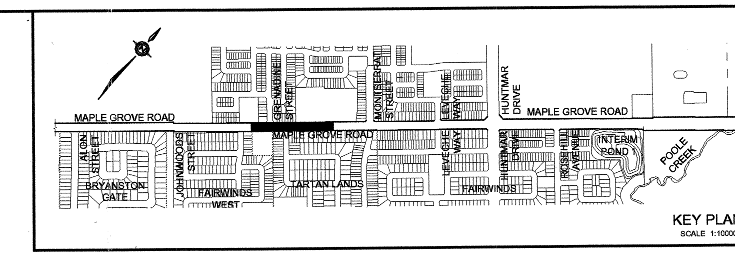
FAIRWINDS NORTH SUBDIVISION
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

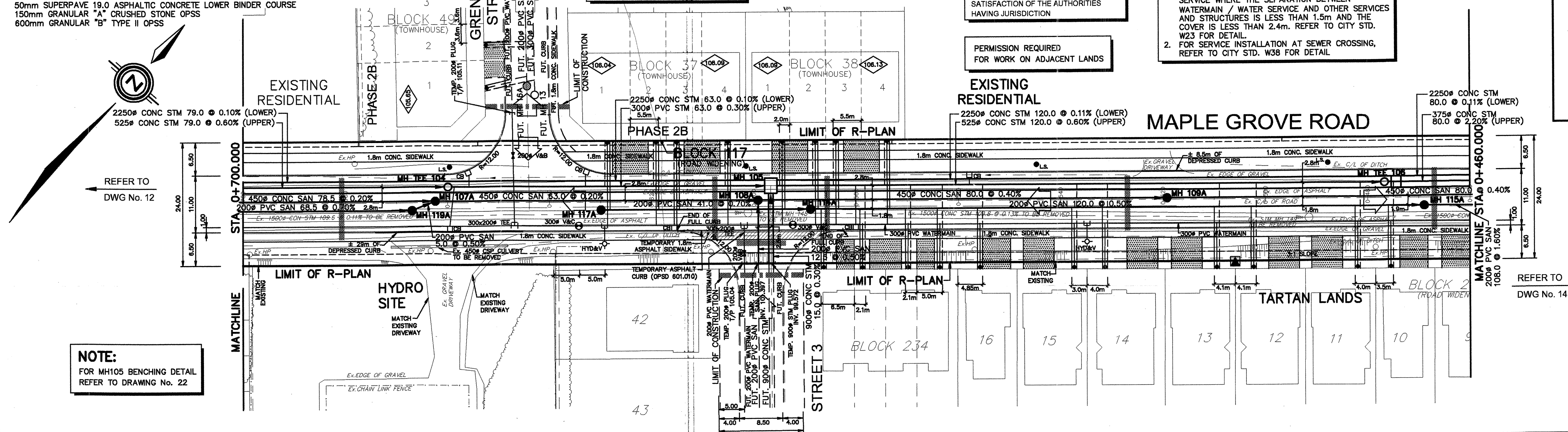
ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

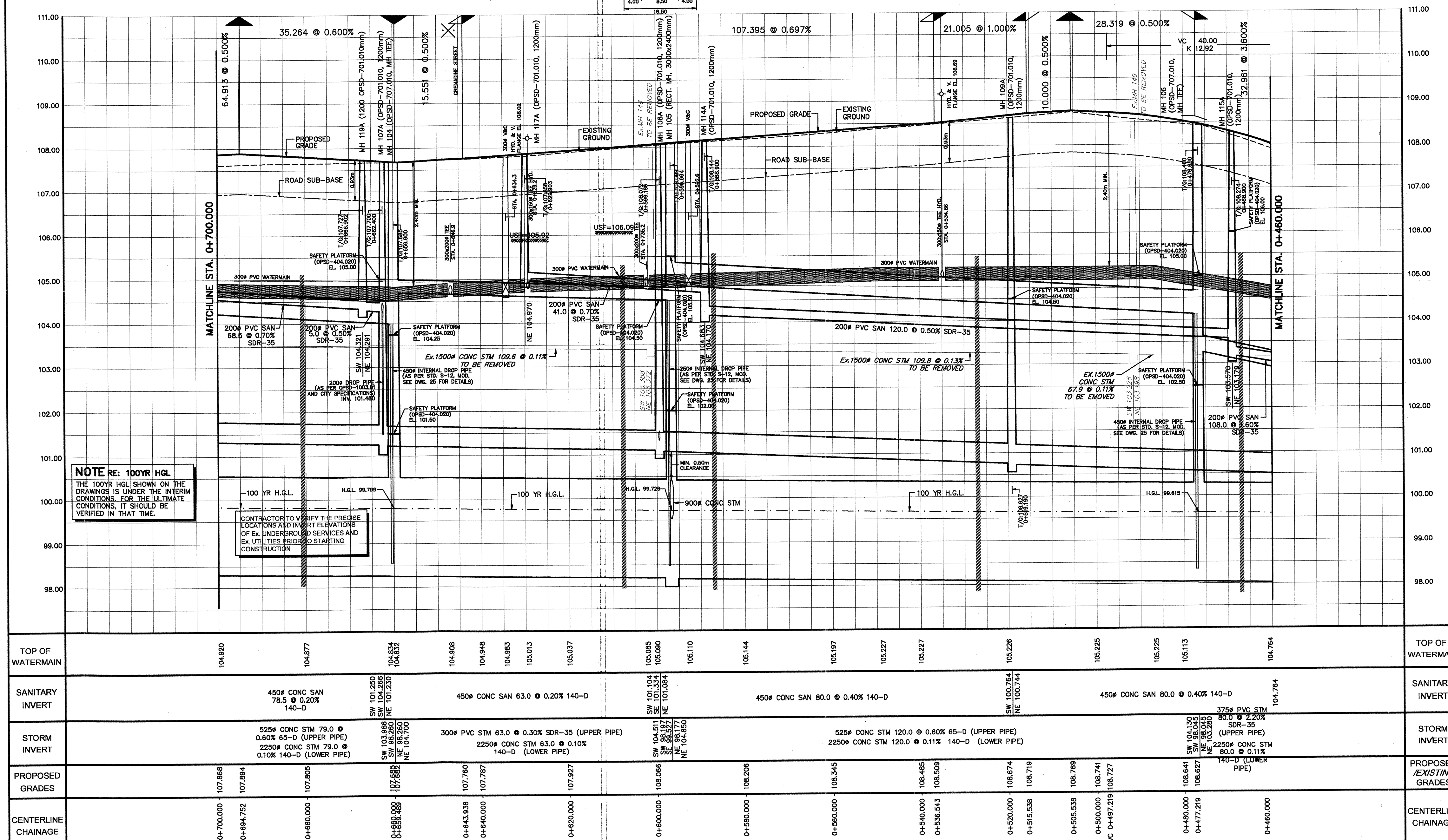
PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

NOTE RE: WATERMAIN / WATER SERVICE

1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.5m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W38 FOR DETAIL







LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- Ex. STORM MANHOLE
- Ex. SANITARY MANHOLE
- STORM MANHOLE BY OTHERS
- SANITARY MANHOLE BY OTHERS
- CATCH BASIN MANHOLE
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- OVERLAND FLOW DIRECTION
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- PHASE LINE
- BUILDING ENVELOPE
- TRANSFORMER

Reviewed By Development Review Branch
Signed: [signature]
Date: JAN 25, 2013

PLAN # 14707

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 05-10-439-02, SURVEY DATED JULY 6, 2011 AND PROJECT No. 0X-10-628-02, SURVEY DATED NOVEMBER 27, 2008 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBURARY 24, 2008 AND PROJECT No. 06-10-628-00, SURVEY DATED MARCH 29, 2007.

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC CONSULTING LIMITED AND WEBSTER & SIMMONDS SURVEYING LIMITED, FILE No. 161610660-111 RECEIVED ON DECEMBER 1, 2006.

LEGAL INFORMATION

CALCULATED R-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 07-10-820-00, SURVEY DATED MAY 30, 2012.

BENCH MARK No. 0011988U502

STITTSVILLE CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.

ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
6	Z.L.	13-01-04	REVISED TARTAN LANDS FRONTAGE, SANITARY & STORM PIPES BETWEEN MH's 114A-116A & 106-1060 REVISED	
5	Z.L.	12-09-26	REMOVED ICDS FOR CB AT MAPLE GROVE RD./GRENADINE ST. AS PER JFSA	
4	Z.L.	12-05-31	4th SUBMISSION	
3	Z.L.	12-04-13	3rd SUBMISSION	
2	Z.L.	12-02-14	2nd SUBMISSION	
1	Z.L.	11-08-02	1st SUBMISSION	

Ottawa CITY OF OTTAWA

PROJECT No. 10-451

LICENSED PROFESSIONAL ENGINEER Z. LI 3-0-04 PROVINCE OF ONTARIO

PLAN AND PROFILE OF
MAPLE GROVE ROAD
(STA. 0+460.000 TO STA. 0+700.000)

© DSEL

MATTAMY (FAIRWINDS NORTH) LIMITED

RECONSTRUCTION OF MAPLE GROVE ROAD

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
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DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		13
SCALE: H1:500, V1:50	DATE: JULY 2011		

D07-16-06-0014 MAPLE

14707

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE WEAR COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE UPPER BINDER COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE LOWER BINDER COURSE
150mm GRANULAR "A" CRUSHED STONE OPSS
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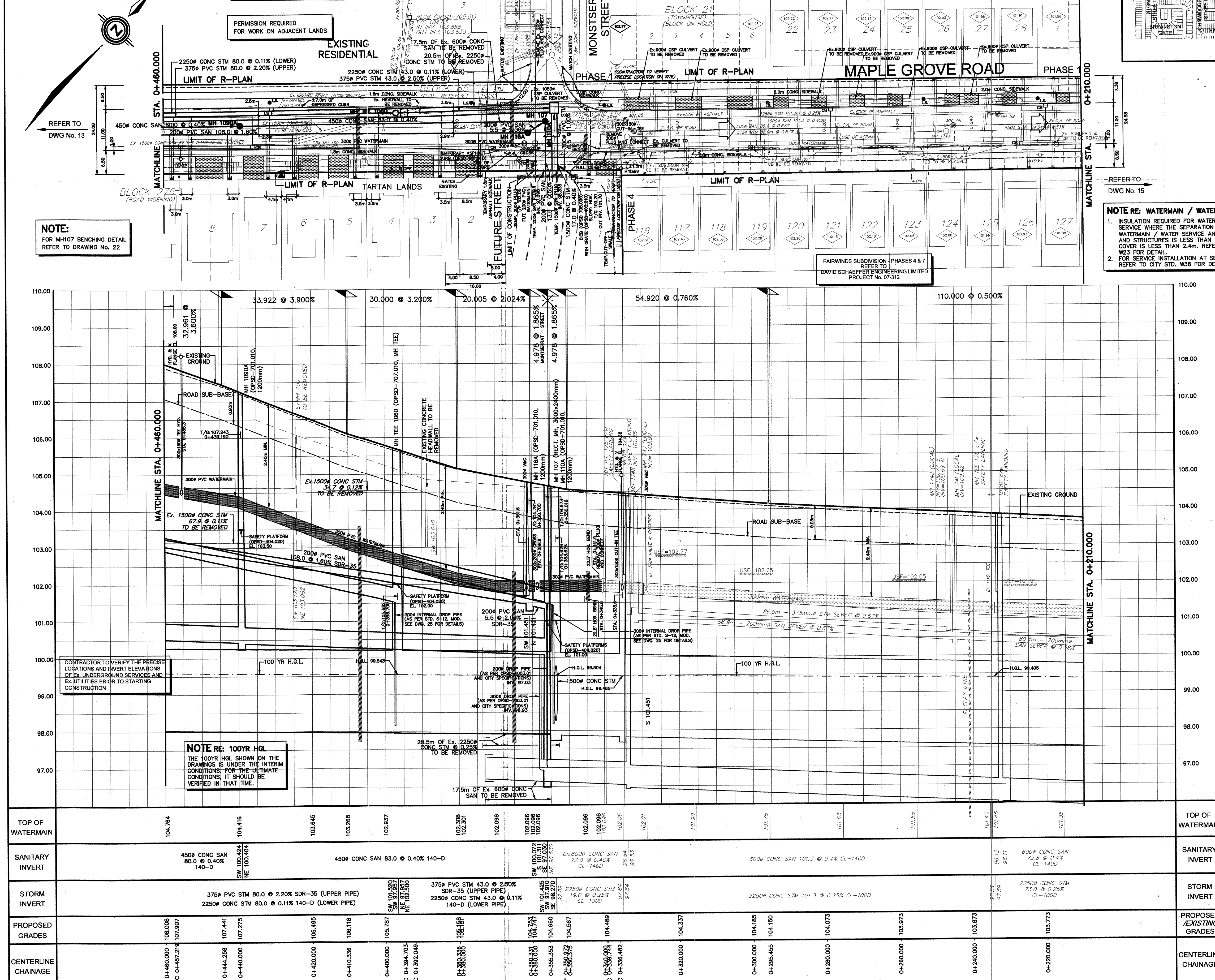
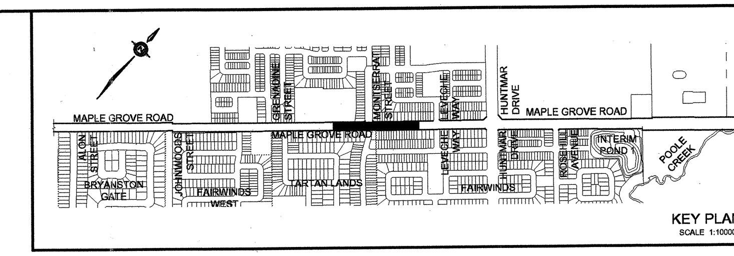
ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS





NOTE RE: WATERMAIN / WATER SERVICE

1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.5m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W38 FOR DETAIL

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- Ex. STORM MANHOLE
- Ex. SANITARY MANHOLE
- STORM MANHOLE BY OTHERS
- SANITARY MANHOLE BY OTHERS
- CATCH BASIN MANHOLE
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- OVERLAND FLOW DIRECTION
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- PHASE LINE
- BUILDING ENVELOPE
- TRANSFORMER

Reviewed By Development Review Branch
Signed: Oamis Mikk
Date: Jan 25, 2013

PLAN # 14707

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 05-10-439-02, SURVEY DATED JULY 6, 2011 AND
PROJECT No. 0X-10-628-02, SURVEY DATED NOVEMBER 27, 2008 AND
PROJECT No. 06-10-561-01-00, SURVEY DATED FEBURARY 24, 2008 AND
PROJECT No. 06-10-628-00, SURVEY DATED MARCH 29, 2007.

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC CONSULTING LIMITED AND WEBSTER & SIMMONDS SURVEYING LIMITED, FILE No. 161610660-111 RECEIVED ON DECEMBER 1, 2006.

LEGAL INFORMATION

CALCULATED R-PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 07-10-820-00, SURVEY DATED MAY 30, 2012.

BENCH MARK No. 0011988U502

STITTSVILLE CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.

ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
5	Z.L.	13-01-04	REVISED TARTAN LANDS FRONTAGE, HYDRANT REVISED OPPOSITE 116 MAPLE GROVE ROAD, SANITARY & STORM PIPES BETWEEN MH's 114A-116A & 106-1060 REVISED	
4	Z.L.	12-05-31	4th SUBMISSION	
3	Z.L.	12-04-13	3rd SUBMISSION	
2	Z.L.	12-02-14	2nd SUBMISSION	
1	Z.L.	11-08-02	1st SUBMISSION	

CITY OF OTTAWA

PROJECT No. 10-451

LICENSED PROFESSIONAL ENGINEER Z. LI 3-0-04 PROVINCE OF ONTARIO

PLAN AND PROFILE OF
MAPLE GROVE ROAD
(STA. 0+210.000 TO STA. 0+460.000)
© DSEL

MATTAMY (FAIRWINDS NORTH) LIMITED

RECONSTRUCTION OF MAPLE GROVE ROAD

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

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DESIGNED BY: K.M.	CHECKED BY: Z.L.		14
SCALE: H1:500 ,V1:50	DATE: JULY 2011		

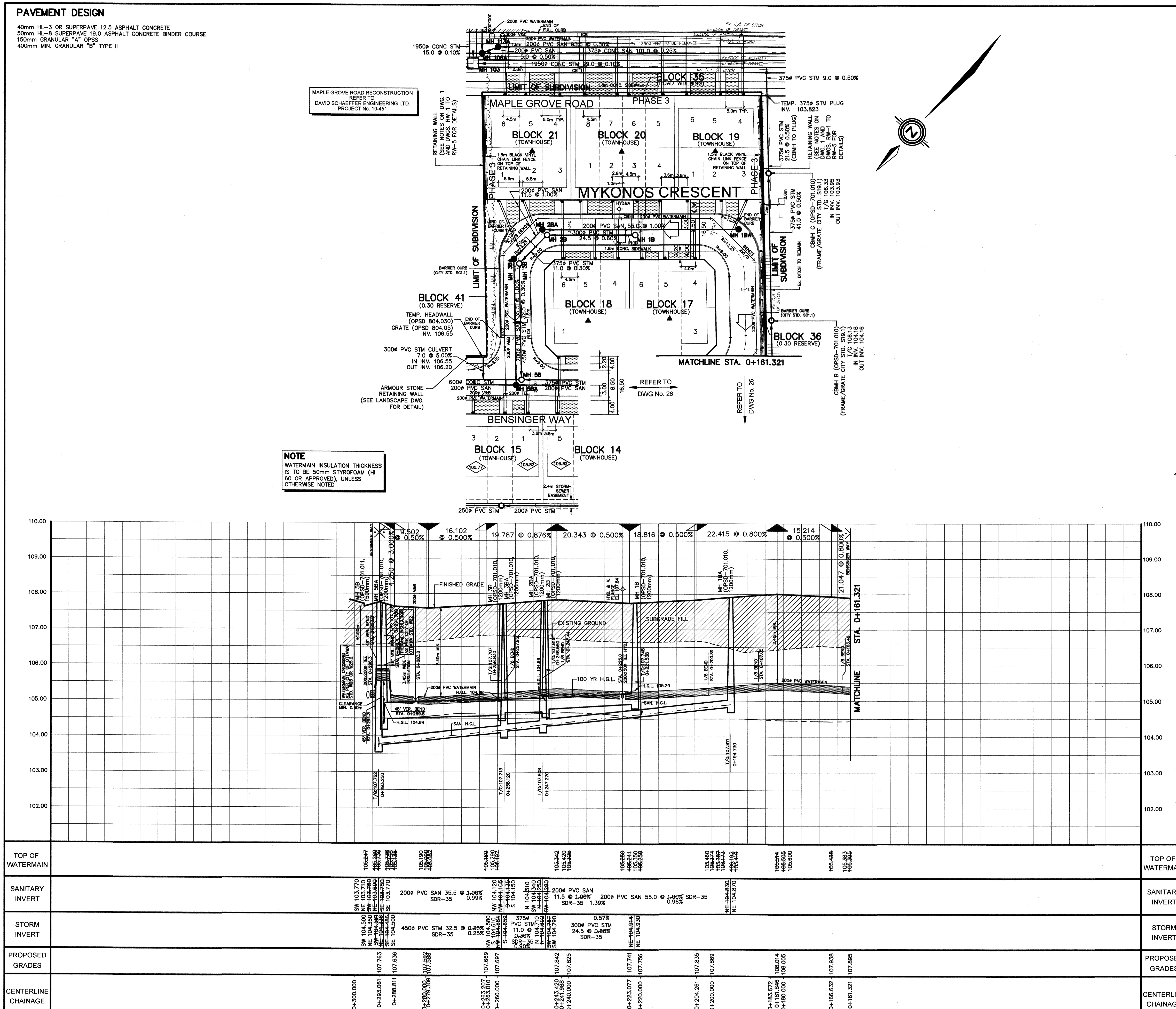
D07-16-06-0014 MAPLE

14707

PAVEMENT DESIGN

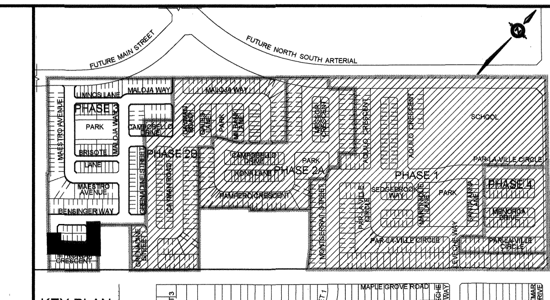
40mm HL-3 OR SUPERPAVE 12.5 ASPHALT CONCRETE
50mm HL-8 SUPERPAVE 19.0 ASPHALT CONCRETE BINDER COURSE
150mm GRANULAR "A" OPSS
400mm MIN. GRANULAR "B" TYPE II

MAPLE GROVE ROAD RECONSTRUCTION REFER TO DAVID SCHAEFFER ENGINEERING LTD. PROJECT No. 10-451



NOTE

WATERMAIN INSULATION THICKNESS IS TO BE 50mm STYROFOAM (HI 60 OR APPROVED), UNLESS OTHERWISE NOTED



KEY PLAN
SCALE N.T.S.

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- CATCHBASIN MANHOLE
- RLCB – TEE SECTION (REFER TO CITY STD. S30)
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS DENOTED AS 100YR INTAKES, WITH STANDARD LEADS UNLESS OTHERWISE NOTED
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE A (Q max = 21.0 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE B (Q max = 28.4 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE C (Q max = 37.0 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE D (Q max = 54.0 l/s)
- LIGHT STANDARD
- MIN. U/S FOOTING ELEVATION
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- BUILDING ENVELOPE
- CLAY SEAL (REFER TO CITY STD. S8, GENERAL NOTES. No.18. 19. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP CONSULTING ENGINEERS MARCH 2009
- SLAB ON GRADE
- WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- PHASE LINE
- OTHER PHASES

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-00, SURVEY DATED JULY 6, 2007 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-2B(PHASE 3), SURVEY DATED JULY 15, 2013.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
11	C.K.S	16-08-23	ISSUED FOR MYLAR PRINTING	
10	T.S.	14-01-08	AS-RECORDED	
9	Z.L.	13-07-30	REVISED AS PER M-PLAN, CITY COMMENTS, AND CUP CIRCULATION	
8	Z.L.	13-04-02	REVISION AS PER MPLAN CHANGE – PHASE 3	
7	Z.L.	12-05-25	REVISION AS PER MPLAN CHANGE	
6	Z.L.	12-05-02	MOE SUBMISSION	
5	Z.L.	12-04-05	5TH SUBMISSION – PHASE 2B, 3, AND 4	
4	Z.L.	10-03-03	4TH SUBMISSION – PHASE 2B, 3, AND 4	
3	Z.L.	08-12-19	3RD SUBMISSION	
2	Z.L.	08-10-17	2ND SUBMISSION	
1	Z.L.	08-06-27	1ST SUBMISSION	

CITY OF OTTAWA

LICENSED PROFESSIONAL ENGINEER A. C. FINNSON 100149736 16-08-23 PROVINCE OF ONTARIO

PROJECT No. 07-309

PLAN AND PROFILE OF
MYKONOS CRESCENT
(STA. 0+161.321 TO STA. 0+293.257)

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MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION
PHASE 3

DSEL
david schaeffer engineering ltd

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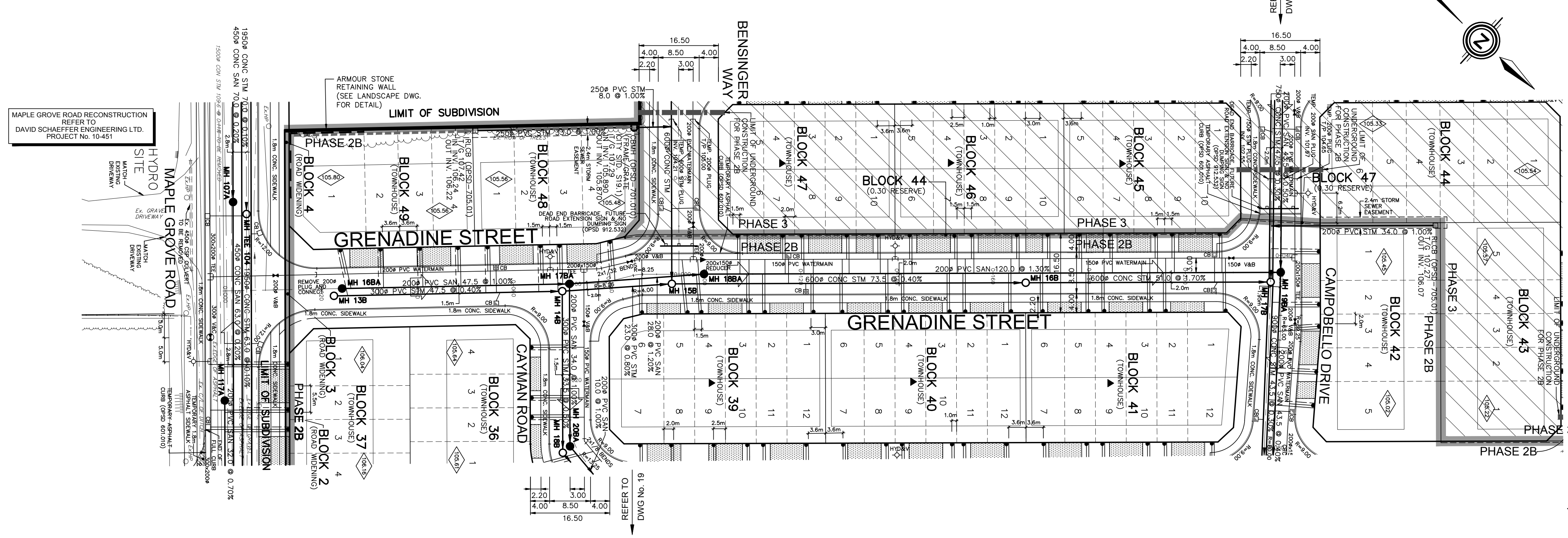
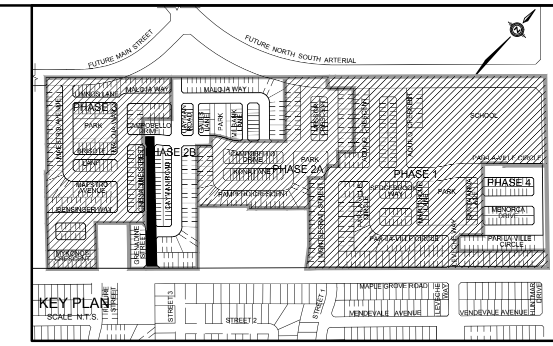
DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		27
SCALE: H1:500 ,V1:50	DATE: JUNE 2008		

14707

PAVEMENT DESIGN

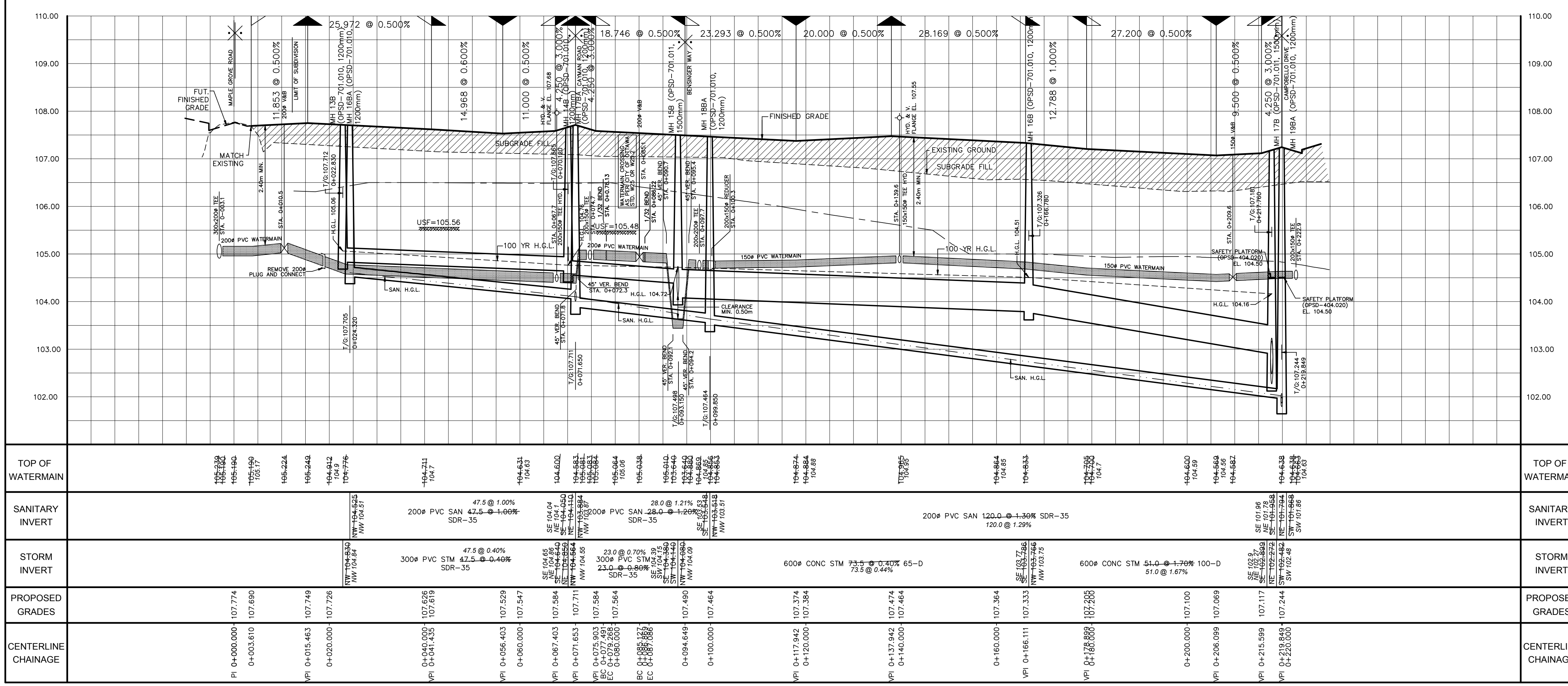
40mm HL-3 OR SUPERPAVE 12.5 ASPHALT CONCRETE
50mm HL-8 SUPERPAVE 19.0 ASPHALT CONCRETE BINDER COURSE
150mm GRANULAR "A" OPSS
400mm MIN. GRANULAR "B" TYPE II





LEGEND

STORM MANHOLE	OVERLAND FLOW DIRECTION
SANITARY MANHOLE	EXTERNAL OVERLAND FLOW DIRECTION
CATCHBASIN MANHOLE	250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
RLCB – TEE SECTION (REFER TO CITY STD. S30)	BUILDING ENVELOPE
SINGLE STORM HOUSE CONNECTION	CLAY SEAL (REFER TO CITY STD. S8, GENERAL NOTES. No.18. 19. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
SINGLE SANITARY HOUSE CONNECTION	INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP CONSULTING ENGINEERS MARCH 2009
WATER CONNECTION	SLAB ON GRADE
HYDRANT	WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
TEE	PHASE LINE
VALVE AND BOX	PHASE 3
VALVE & CHAMBER	
SINGLE/DOUBLE CATCHBASIN	
CATCHBASINS DENOTED AS 100YR INTAKES, WITH STANDARD LEADS UNLESS OTHERWISE NOTED	
CATCHBASINS WITH INLET CONTROL DEVICE TYPE A (Q max = 21.0 l/s)	
CATCHBASINS WITH INLET CONTROL DEVICE TYPE B (Q max = 28.4 l/s)	
CATCHBASINS WITH INLET CONTROL DEVICE TYPE C (Q max = 37.0 l/s)	
CATCHBASINS WITH INLET CONTROL DEVICE TYPE D (Q max = 54.0 l/s)	
LS LIGHT STANDARD	
100.00 MIN. U/S FOOTING ELEVATION	



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-00, SURVEY DATED JULY 6, 2007 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-PH 2B & PH 4, SURVEY DATED JULY 31, 2012.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
10	C.K.S	16-07-20	ISSUED FOR MYLAR PRINTING	
9	T.S.	14-01-08	AS-RECORDED	
8	Z.L.	12-08-02	REVISION AS PER MPLAN CHANGE – PHASE 2B AND 4	
7	Z.L.	12-05-25	REVISION AS PER MPLAN CHANGE	
6	Z.L.	12-05-02	MOE SUBMISSION	
5	Z.L.	12-04-05	5TH SUBMISSION – PHASE 2B, 3, AND 4	
4	Z.L.	10-03-03	4TH SUBMISSION – PHASE 2B, 3, AND 4	
3	Z.L.	08-12-19	3RD SUBMISSION	
2	Z.L.	08-10-17	2ND SUBMISSION	
1	Z.L.	08-06-27	1ST SUBMISSION	

CITY OF OTTAWA

LICENSED PROFESSIONAL ENGINEER
A. C. FINNSON
100149736
16-07-20
PROVINCE OF ONTARIO

PROJECT No. 07-309

PLAN AND PROFILE OF
GRENADINE STREET
(STA. 0+000.000 TO STA. 0+219.849)

MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION

PHASE 2B AND 4

david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		21
SCALE: H1:500 ,V1:50	DATE: JUNE 2008		

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

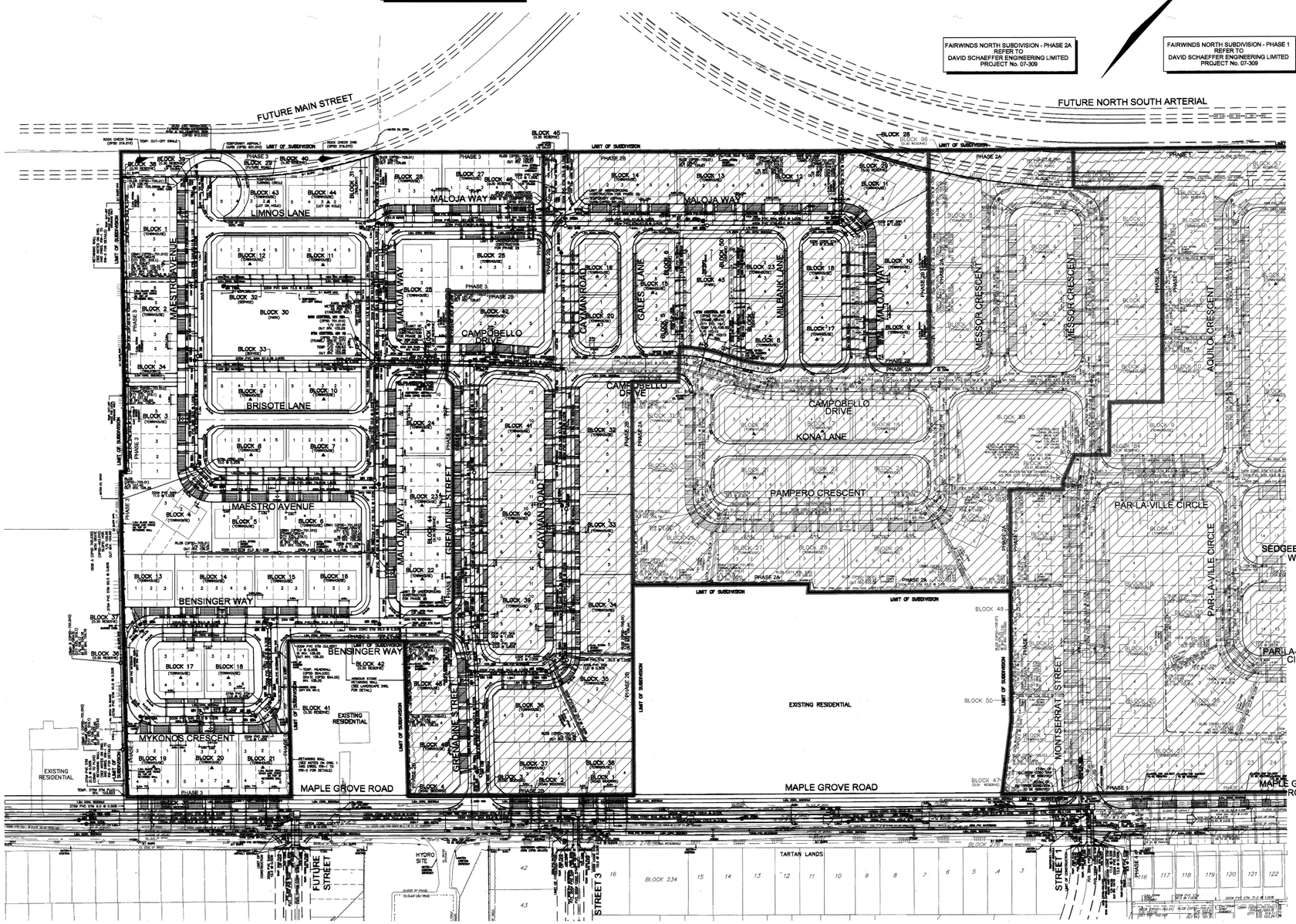
PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

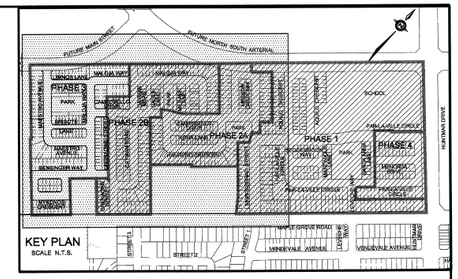
NOTE RE: WATERMAIN
INSULATION REQUIRED FOR WATERMAIN WHERE THE SEPARATION BETWEEN WATERMAIN AND OTHER SERVICES / STRUCTURES IS LESS THAN 1.2m. REFER TO CITY STD. W23 FOR DETAIL

FAIRWINDS NORTH SUBDIVISION - PHASE 2B
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

FAIRWINDS NORTH SUBDIVISION - PHASE 2A
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

FAIRWINDS NORTH SUBDIVISION - PHASE 1
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309





LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- CATCHBASIN MANHOLE
- RLCB – TEE SECTION (REFER TO CITY STD. S30)
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- TEE
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS DENOTED AS 100YR INTAKES, WITH STANDARD LEADS UNLESS OTHERWISE NOTED
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE A (Q max = 21.0 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE B (Q max = 28.4 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE C (Q max = 37.0 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE TYPE D (Q max = 54.0 l/s)
- PHASE LINE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- SLAB ON GRADE
- BUILDING ENVELOPE
- OTHER PHASES

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-00, SURVEY DATED JULY 6, 2007 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-2B(PHASE 3), SURVEY DATED JULY 15, 2013.

BENCH MARK No. 0011988U502
TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
9	Z.L.	13-07-30	REVISED AS PER M-PLAN, CITY COMMENTS, AND CUP CIRCULATION	
8	Z.L.	13-04-02	REVISION AS PER MPLAN CHANGE – PHASE 3	
7	Z.L.	12-05-25	REVISION AS PER MPLAN CHANGE	
6	Z.L.	12-05-02	MOE SUBMISSION	
5	Z.L.	12-04-05	5TH SUBMISSION – PHASES 2B, 3, AND 4	
4	Z.L.	10-03-03	4TH SUBMISSION – PHASES 2B, 3, AND 4	
3	Z.L.	08-12-19	3RD SUBMISSION	
2	Z.L.	08-10-17	2ND SUBMISSION	
1	Z.L.	08-06-27	1ST SUBMISSION	

Ottawa CITY OF OTTAWA

MAPLE GROVE ROAD RECONSTRUCTION
REFER TO
DAVID SCHAEFFER ENGINEERING LTD.
PROJECT No. 10-451

Reviewed By
Development Review Branch
Signed: [signature]
Date: Oct. 11, 2013

PROJECT No. 07-309

PROFESSIONAL ENGINEER Z. LI 18-07-30 PROVINCE OF ONTARIO

GENERAL PLAN

© DSEL

MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION
PHASE 3

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		2
SCALE: 1:1000	DATE: JUNE 2008		

D07-16-90-0014

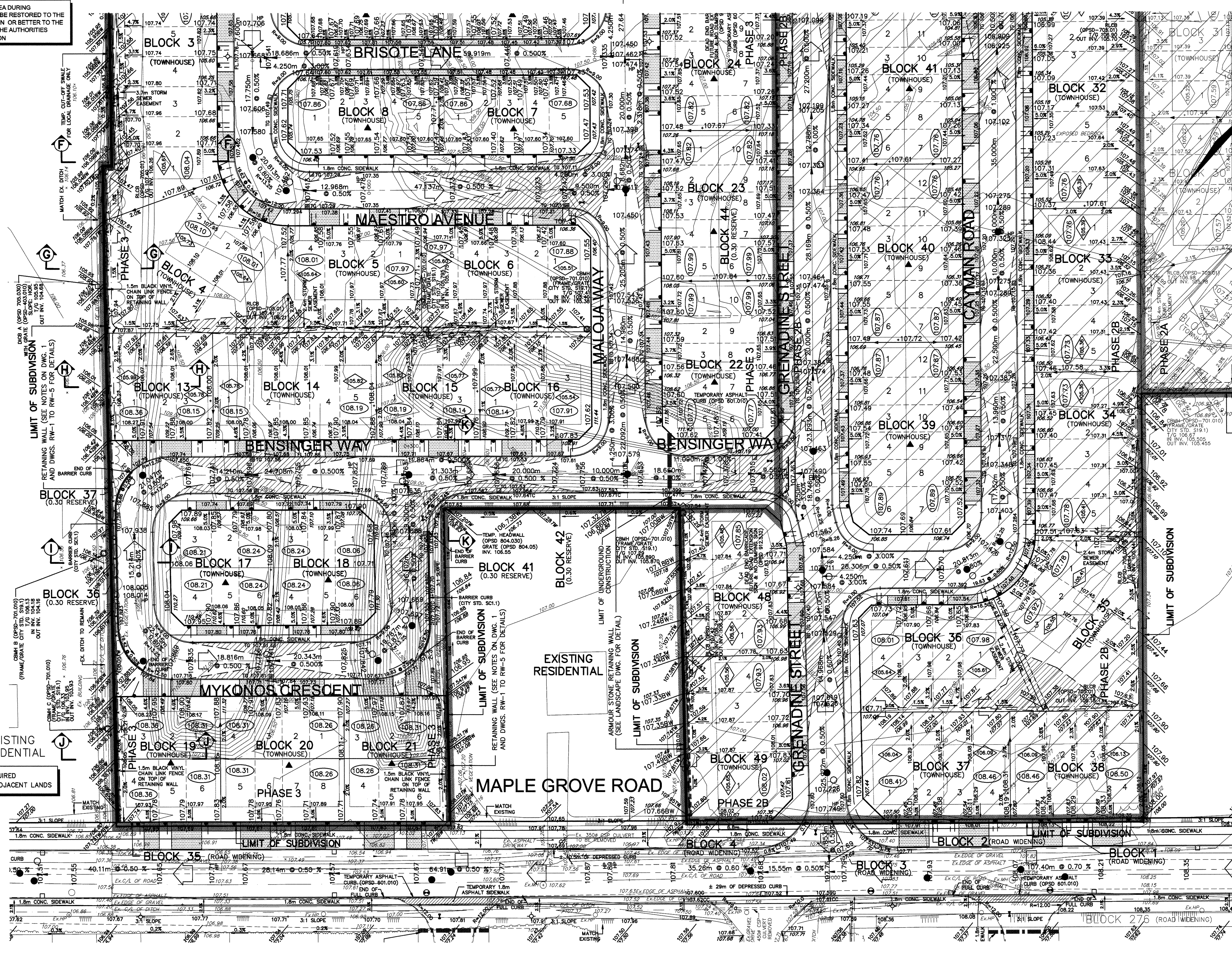
14707

NOTE:
TEMPORARY CUT-OFF SWALE (SIDES AND BOTTOM) TO BE PLACED WITH TOPSOIL, SEED AND MULCH MIXTURE

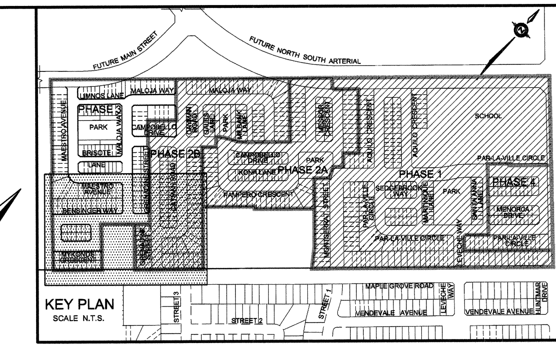
ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

FAIRWINDS NORTH SUBDIVISION - PHASE 2B
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

FAIRWINDS NORTH SUBDIVISION - PHASE 2A
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309



PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS



LEGEND

103.45	PROPOSED ELEVATION
102.73	EXISTING ELEVATION
103.00	EXISTING CONTOUR ELEVATION
	SWALE
	BUILDING ENVELOPE
92.52	U/S FOOTING ELEVATION
94.89	SPECIFIED LOT GRADE
	STORM MANHOLE
	SANITARY MANHOLE
	CATCHBASIN MANHOLE
	RLCB – TEE SECTION (REFER TO CITY STD. S30)
	SINGLE/REARLOT CATCHBASIN
	DOUBLE CATCHBASIN
	CATCHBASINS DENOTED AS 100YR INTAKES, WITH STANDARD LEADS UNLESS OTHERWISE NOTED
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE A (Q max = 21.0 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE B (Q max = 28.4 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE C (Q max = 37.0 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE D (Q max = 54.0 l/s)
FL.94.57	HYDRANT WITH FLANGE ELEVATION
	VALVE & CHAMBER
	VALVE & BOX
	3:1 MAXIMUM SLOPE
L.O.	LOOKOUT LOTS
TF	TOP OF ACOUSTIC FENCE ELEVATION
	250ø PVC PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
	WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
	PROPOSED OVERLAND FLOW DIRECTION
	REAR YARD OVERLAND FLOW DIRECTION
	EXTERNAL OVERLAND FLOW DIRECTION
	PAVED DRIVEWAY 3.5m WIDE (SINGLE–TOWNHOUSE) 4.0m WIDE (SINGLE) 6.0m WIDE (DOUBLE)
	SINGLE STORM HOUSE CONNECTION
	SINGLE SANITARY HOUSE CONNECTION
	WATER CONNECTION
102.16	HIGH POINT
	SLAB ON GRADE
	PONDING AREA
	PHASE LINE
	OTHER PHASES

Reviewed By Development Review Branch
Signed: [signature]
Date: MAY 14, 2013

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06–10–561–00–00, SURVEY DATED JULY 6, 2007 AND PROJECT No. 06–10–561–01–00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M–PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06–10–561–00–2B(PHASE 3), SURVEY DATED FEBRUARY 27, 2013.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
9	Z.L.	13–04–02	REVISION AS PER MPLAN CHANGE – PHASE 3	
8	Z.L.	12–05–25	REVISION AS PER MPLAN CHANGE	
7	Z.L.	12–05–02	MOE SUBMISSION	
6	Z.L.	12–04–05	5TH SUBMISSION – PHASES 2B, 3, AND 4	
5	Z.L.	12–01–31	GRADING REVISION ALONG WEST LIMIT	
4	Z.L.	10–03–03	4TH SUBMISSION – PHASES 2B, 3, AND 4	
3	Z.L.	08–12–19	3RD SUBMISSION	
2	Z.L.	08–10–17	2ND SUBMISSION	
1	Z.L.	08–06–27	1ST SUBMISSION	

Ottawa CITY OF OTTAWA

PROJECT No. 07–309

LICENSED PROFESSIONAL ENGINEER Z. LI 13-04-02 PROVINCE OF ONTARIO

GRADING PLAN

MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION
PHASE 3

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: I.V./J.Y.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: I.V.	CHECKED BY: Z.L.		4
SCALE: 1:500	DATE: JUNE 2008		

NOTE:
FOR CROSS SECTIONS F–F, G–G, H–H, I–I, AND J–J REFER TO DRAWING No.39

NOTE:
FOR CROSS SECTION K–K REFER TO DRAWING No.26

MAPLE GROVE ROAD RECONSTRUCTION
REFER TO
DAVID SCHAEFFER ENGINEERING LTD.
PROJECT No. 10-451

NOTE RE: PERFORATED PIPE
PERFORATED PIPE IS REQUIRED FOR SWALE SLOPE LESS THAN 1.5%. REFER TO CITY STD. S29, S30 FOR REAR YARD TRENCH AND PIPE DETAIL ONLY

NOTE:
ALL SWALES SHALL BE 0.15m DEEP WITH 3:1 SIDE SLOPES UNLESS OTHERWISE INDICATED

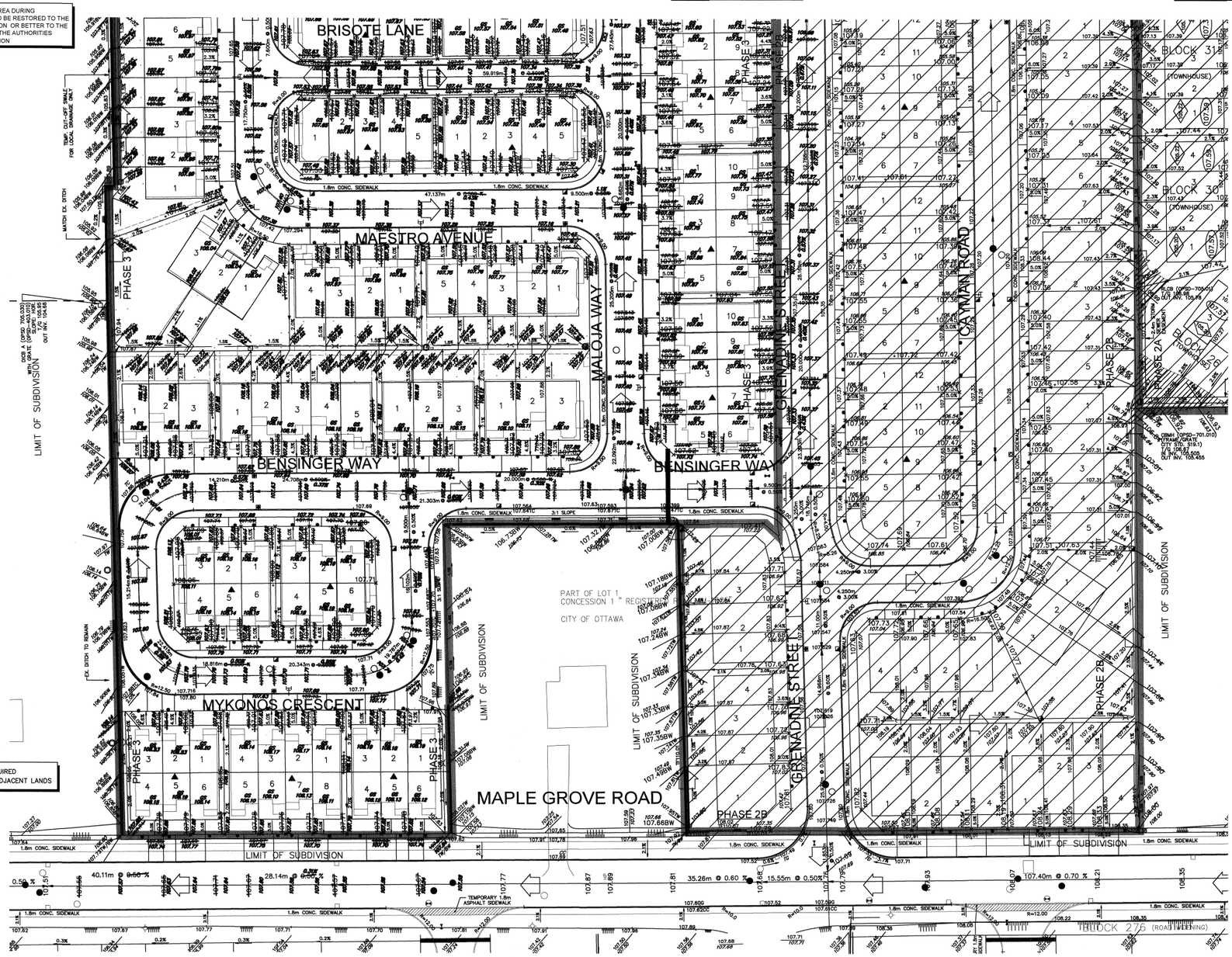
K:\07309\Phases2B_3_4\Subm7_Ph3\Grading\03_04_309grad.dwg, 02/04/2013 1:04:03 PM, hpan, 1:25.4

14707

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

FAIRWINDS NORTH SUBDIVISION - PHASE 2B
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

FAIRWINDS NORTH SUBDIVISION - PHASE 2A
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309



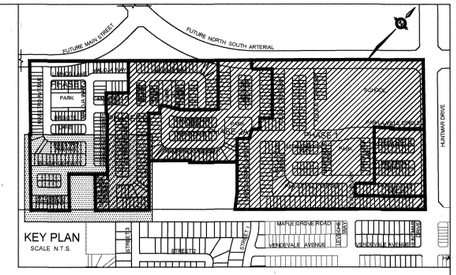
PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

NOTE:
FOR CROSS SECTIONS F-F, G-G, H-H, I-I, AND J-J REFER TO DRAWING No.39

NOTE:
FOR CROSS SECTION K-K REFER TO DRAWING No.26

MAPLE GROVE ROAD RECONSTRUCTION
REFER TO
DAVID SCHAEFFER ENGINEERING LTD.
PROJECT No. 10-451

NOTE:
ALL SWALES SHALL BE 0.15m DEEP WITH 3:1 SIDE SLOPES UNLESS OTHERWISE INDICATED



LEGEND

103.45	PROPOSED ELEVATION
102.73	EXISTING ELEVATION
103.00	EXISTING CONTOUR ELEVATION
	SWALE
92.52 / 94.89	BUILDING ENVELOPE; U/S FOOTING ELEVATION; SPECIFIED LOT GRADE
	STORM MANHOLE
	SANITARY MANHOLE
	CATCHBASIN MANHOLE
	RLCB – TEE SECTION (REFER TO CITY STD. S30)
	SINGLE/REARLOT CATCHBASIN
	DOUBLE CATCHBASIN
	CATCHBASINS DENOTED AS 100YR INTAKES, WITH STANDARD LEADS UNLESS OTHERWISE NOTED
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE A (Q max = 21.0 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE B (Q max = 28.4 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE C (Q max = 37.0 l/s)
	CATCHBASINS WITH INLET CONTROL DEVICE TYPE D (Q max = 54.0 l/s)
FL.94.57	HYDRANT WITH FLANGE ELEVATION
	VALVE & CHAMBER
	VALVE & BOX
	3:1 MAXIMUM SLOPE
L.O.	LOOKOUT LOTS
TF	TOP OF ACOUSTIC FENCE ELEVATION
	250ø PVC PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
	WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
	1.5m HIGH BLACK VINYL CHAIN LINK FENCE
	PROPOSED OVERLAND FLOW DIRECTION
	REAR YARD OVERLAND FLOW DIRECTION
	EXTERNAL OVERLAND FLOW DIRECTION
	PAVED DRIVEWAY: 3.5m WIDE (SINGLE–TOWNHOUSE); 4.0m WIDE (SINGLE); 6.0m WIDE (DOUBLE)
	SINGLE STORM HOUSE CONNECTION
	SINGLE SANITARY HOUSE CONNECTION
	WATER CONNECTION
102.16	HIGH POINT
	SLAB ON GRADE
	PONDING AREA
	PHASE LINE
	OTHER PHASES

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 06-10-561-00-00, SURVEY DATED JULY 6, 2007 AND
PROJECT No. 06-10-561-01-00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 06-10-561-00-2B(PHASE 3), SURVEY DATED JULY 15, 2013.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
12	C.K.S	16-08-23	ISSUED FOR MYLAR PRINTING	
11	C.K.S	16-01-14	AS RECORDED INFORMATION ADDED BY J.D BARNES	
10	Z.L.	13-07-30	REVISED AS PER M-PLAN, CITY COMMENTS, AND CUP CIRCULATION	
9	Z.L.	13-04-02	REVISION AS PER MPLAN CHANGE – PHASE 3	
8	Z.L.	12-05-25	REVISION AS PER MPLAN CHANGE	
7	Z.L.	12-05-02	MOE SUBMISSION	
6	Z.L.	12-04-05	5TH SUBMISSION – PHASES 2B, 3, AND 4	
5	Z.L.	12-01-31	GRADING REVISION ALONG WEST LIMIT	
4	Z.L.	10-03-03	4TH SUBMISSION – PHASES 2B, 3, AND 4	
3	Z.L.	08-12-19	3RD SUBMISSION	
2	Z.L.	08-10-17	2ND SUBMISSION	
1	Z.L.	08-06-27	1ST SUBMISSION	

Ottawa CITY OF OTTAWA

PROJECT No. 07-309

LICENCED PROFESSIONAL ENGINEER
A. C. FINNSON
100149736
16-08-23
PROVINCE OF ONTARIO

GRADING PLAN

© DSEL

MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION
PHASE 3

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david schaeffer engineering ltd
SMART SUBDIVISIONS™
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Stittsville, ON K2S 1E9
Tel. (613) 836-0856
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DRAWN BY: I.V./J.Y.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: I.V.	CHECKED BY: Z.L.		4
SCALE: 1:500	DATE: JUNE 2008		

14707

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm GRANULAR "A" CRUSHED STONE
600mm GRANULAR "B" TYPE II

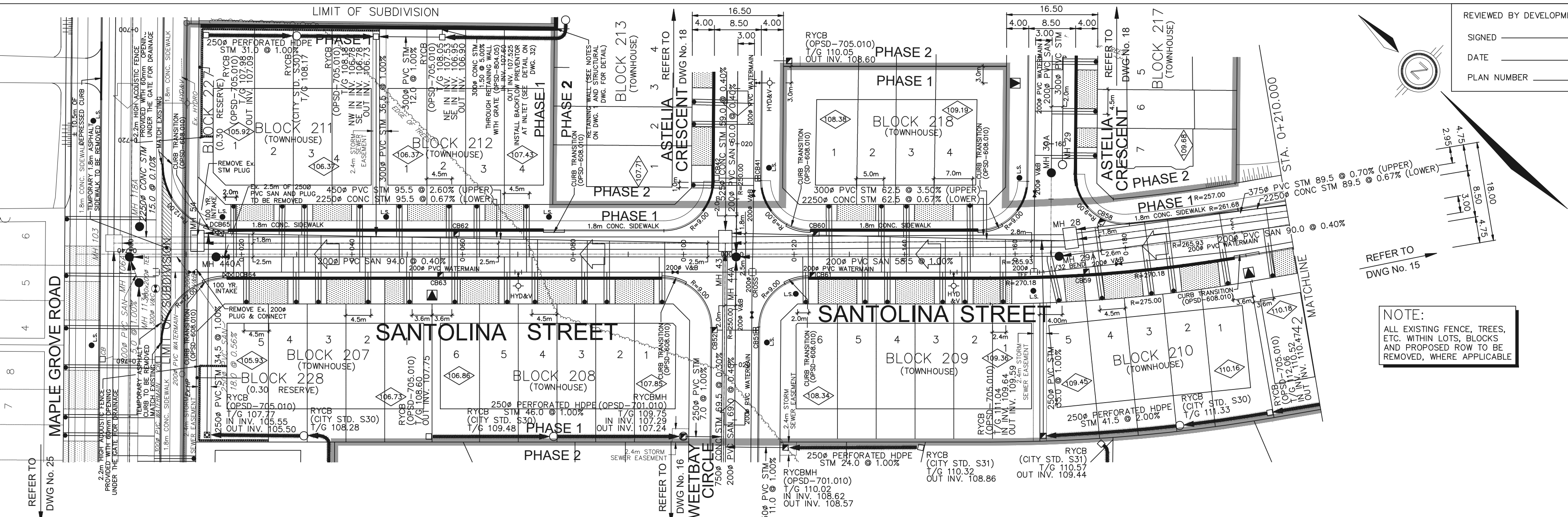
NOTE RE: MH 103

A 0.85m DIAMETER ORIFICE IS TO BE INSTALLED AT THE OUTLET OF MH 103 TO THE DOWNSTREAM OF THE SYSTEM UPON THE COMPLETION OF THE STORM SYSTEM CONNECTED TO INTERIM POND 4 PRIOR TO THE DEVELOPMENT OF FAIRWINDS WEST AND POOLE CREEK VILLAGE TO THE SATISFACTION OF CITY OF OTTAWA

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

FOR ENLARGED INTERSECTION DETAIL OF SANTOLINA STREET AND Ex. MAPLE GROVE STREET, REFER TO DWG. No.35

FAIRWINDS NORTH SUBDIVISION
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT No. 07-309

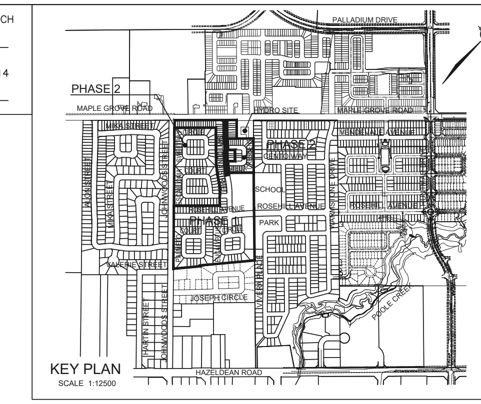


REVIEWED BY DEVELOPMENT REVIEW BRANCH

SIGNED ______

DATE ______ 2014

PLAN NUMBER ______



NOTE:

ALL EXISTING FENCE, TREES, ETC. WITHIN LOTS, BLOCKS AND PROPOSED ROW TO BE REMOVED, WHERE APPLICABLE

LEGEND

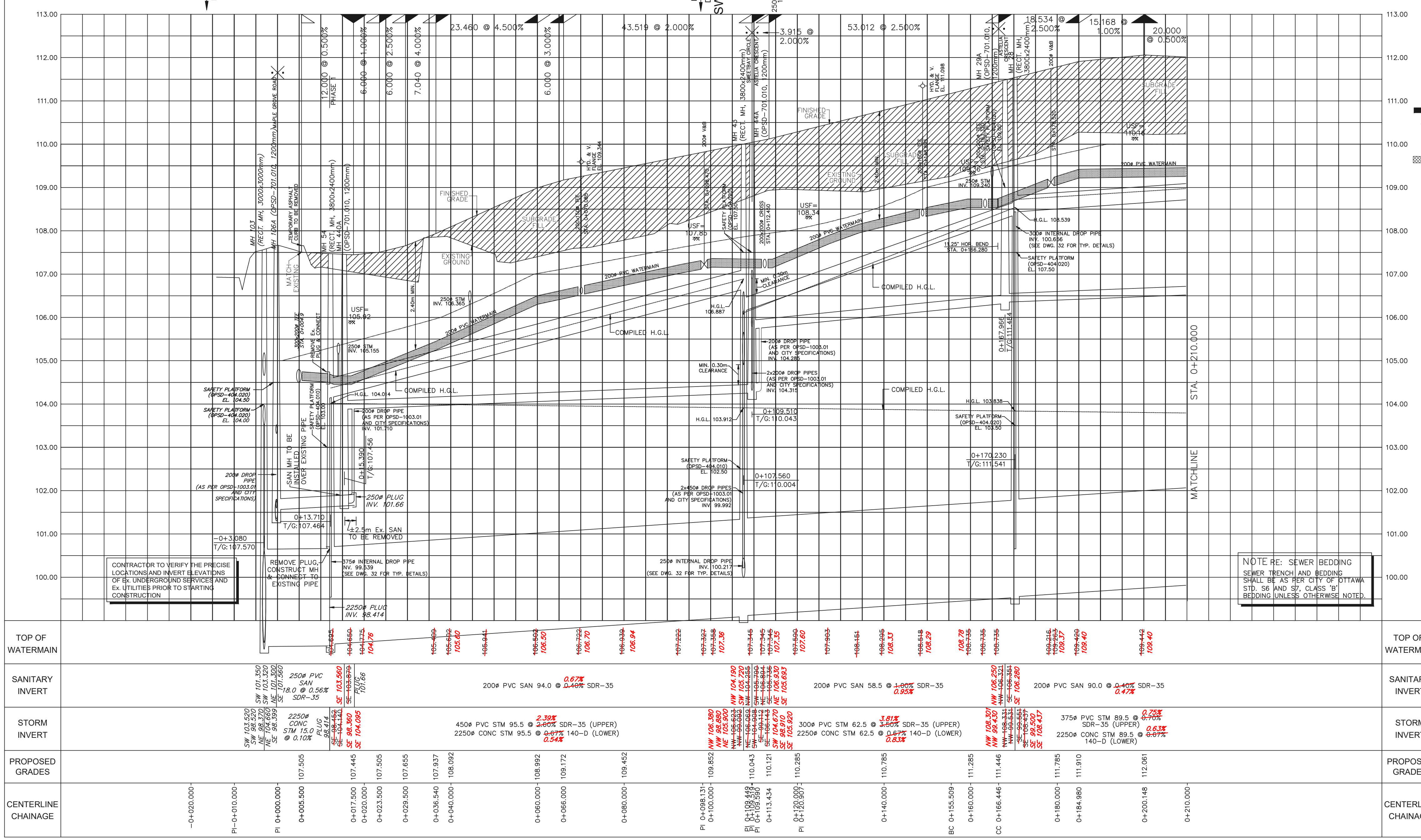
- STORM MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE IN OTHER PHASES
- CATCHBASIN MANHOLE
- SANITARY MANHOLE IN OTHER PHASES
- RYCB
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST A (Q max = 19.9 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST B (Q max = 28.4 l/s)
- CACHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST C (Q max = 35.5 l/s
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST D (Q max = 50.1 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST E (Q max = 69.1 l/s)
- PHASE LINE
- 92.52 U/S FOOTING ELEVATION
- UNITS EQUIPPED WITH PRESSURE REDUCE VALVE
- EXISTING CURB AND SIDEWALK TO BE REMOVED AND REPLACED WITH LENGTH NOTED. SEE NOTES ON DWG. 1
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- 2.2m ACOUSTIC FENCE UNLESS OTHERWISE NOTED (SEE LANDSCAPE DWG. FOR DETAILS)
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- BUILDING ENVELOPE
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- BARRIER CURB (STD. SC1.1) WITH DEPRESSED SECTION
- MOUNTABLE CURB (STD. SC1.3)
- TRANSFORMER
- L.S. LIGHT STANDARD
- INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN OCTOBER 2013
- ~~XX.XX~~ 109.68 ASBUILT ELEVATIONS

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-628-00, SURVEY DATED NOVEMBER, 2013.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 6-10-628-00, SURVEY DATED OCTOBER 17, 2014.



BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
7	C.K.S	16-01-28	AS BUILT SERVICING INFORMATION ADDED	
6	Z.L.	15-02-25	REVISED BLOCKS 213, 215 AND 217 AS PER MPLAN CHANGE	
5	Z.L.	14-11-18	REVISED AS PER CITY'S COMMENTS	
4	Z.L.	14-10-24	4th SUBMISSION	
3	Z.L.	14-08-20	3rd SUBMISSION	
2	Z.L.	14-04-16	2nd SUBMISSION	
1	Z.L.	13-11-25	1st SUBMISSION	

CITY OF OTTAWA

AS-BUILT

PROJECT No. 13-696

This drawing has been updated by DSEL to represent the 'as-built' condition of the infrastructure constructed. The information contained herein has been provided by third parties. Although the information is believed to correctly reflect conditions at the time of certification, DSEL provides no warranty as to the currency, accuracy or completeness of the information shown. There may have been changes to the infrastructure represented since the completion of the subject development and others intending to reference this information are advised to obtain independent third party confirmation of its accuracy prior to its use.

PLAN AND PROFILE OF SANTOLINA STREET

(STA. 0+000.000 TO STA. 0+210.000)

MATTAMY (FAIRWINDS WEST) LIMITED

FAIRWINDS WEST

david schaeffer engineering ltd
SMART SUBDIVISIONS™
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: C.M./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		14
SCALE: H1:500 ,V1:50	DATE: OCTOBER 2013		

PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE WEAR COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE UPPER BINDER COURSE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE LOWER BINDER COURSE
150mm GRANULAR "A" CRUSHED STONE OPSS
600mm GRANULAR "B" TYPE II OPSS

NOTE RE: WATERMAIN / WATER SERVICE

1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.5m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W38 FOR DETAIL

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

FAIRWINDS NORTH SUBDIVISION REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 07-309

FOR ENLARGED INTERSECTION DETAIL OF SANTOLINA STREET AND Ex. MAPLE GROVE STREET, REFER TO DWG. No.35

REVIEWED BY DEVELOPMENT REVIEW BRANCH

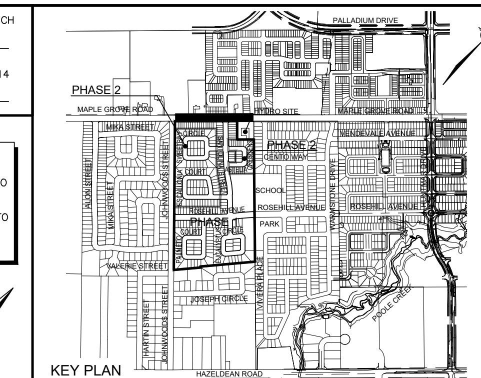
SIGNED ______________________

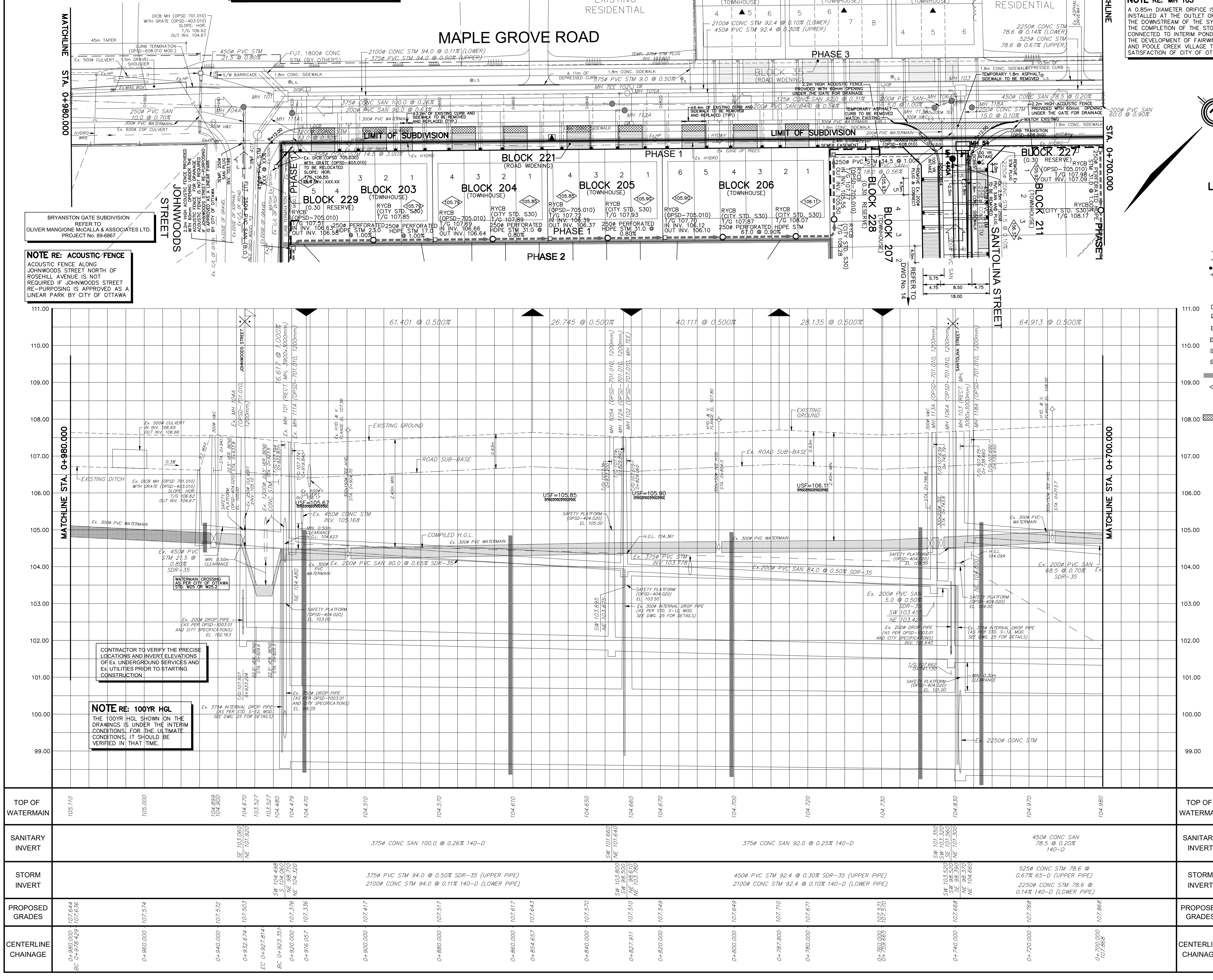
DATE ______________________ 2014

PLAN NUMBER ______________________

NOTE RE: MH 103

A 0.85m DIAMETER ORIFICE IS TO BE INSTALLED AT THE OUTLET OF MH 103 TO THE DOWNSTREAM OF THE SYSTEM UPON THE COMPLETION OF THE STORM SYSTEM CONNECTED TO INTERIM POND 4 PRIOR TO THE DEVELOPMENT OF FAIRWINDS WEST AND POOLE CREEK VILLAGE TO THE SATISFACTION OF CITY OF OTTAWA


KEY PLAN
SCALE 1:12500



LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE IN OTHER PHASES
- CATCHBASIN MANHOLE
- SANITARY MANHOLE IN OTHER PHASES
- RYCB
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE WATER CONNECTION
- HYDRANT
- TEE
- VALVE AND BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST A (Q max = 19.9 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST B (Q max = 28.4 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST C (Q max = 35.5 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST D (Q max = 50.1 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST E (Q max = 69.1 l/s)
- PHASE LINE
- U/S FOOTING ELEVATION
- UNITS EQUIPPED WITH PRESSURE REDUCE VALVE
- EXISTING CURB AND SIDEWALK TO BE REMOVED AND REPLACED WITH LENGTH NOTED. SEE NOTES ON DWG. 1
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- 2.2m ACOUSTIC FENCE UNLESS OTHERWISE NOTED (SEE LANDSCAPE DWG. FOR DETAILS)
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- BUILDING ENVELOPE
- CLAY SEAL (REFER TO GENERAL NOTES. No.18. ON DWG. No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- BARRIER CURB (STD. SC1.1) WITH DEPRESSED SECTION
- MOUNTABLE CURB (STD. SC1.3)
- TRANSFORMER
- LIGHT STANDARD
- INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN OCTOBER 2013
- XXX.XX 100.975 AS BUILT ELEVATIONS

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-628-00, SURVEY DATED NOVEMBER, 2013.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 6-10-628-00, SURVEY DATED OCTOBER 17, 2014.

NO ASBUILT INFORMATION ADDED

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
6	C.K.S	17-01-05	AS BUILT SERVICING INFORMATION ADDED	
5	Z.L.	14-11-18	REVISED AS PER CITY'S COMMENTS	
4	Z.L.	14-10-24	4th SUBMISSION	
3	Z.L.	14-08-20	3rd SUBMISSION	
2	Z.L.	14-04-16	2nd SUBMISSION	
1	Z.L.	13-11-25	1st SUBMISSION	

CITY OF OTTAWA

AS-BUILT

PROJECT No. 13-696

This drawing has been updated by DSEL to represent the 'as-built' condition of the infrastructure constructed. The information contained herein has been provided by third parties. Although the information is believed to correctly reflect conditions at the time of certification, DSEL provides no warranty as to the currency, accuracy or completeness of the information shown. There may have been changes to the infrastructure represented since the completion of the subject development and others intending to reference this information are advised to obtain independent third party confirmation of its accuracy prior to its use.

PLAN AND PROFILE OF
MAPLE GROVE ROAD
(STA. 0+700.000 TO STA. 0+980.000)

MATTAMY (FAIRWINDS WEST) LIMITED

FAIRWINDS WEST

david schaeffer engineering ltd
SMART SUBDIVISIONS™
120 Iber Road, Unit 103
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DESIGNED BY: K.M.	CHECKED BY: Z.L.		25
SCALE: H1:500 ,V1:50	DATE: OCTOBER 2013		

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Stittsville, Ontario K2S 1E9
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www.DSEL.ca

DESIGN BRIEF

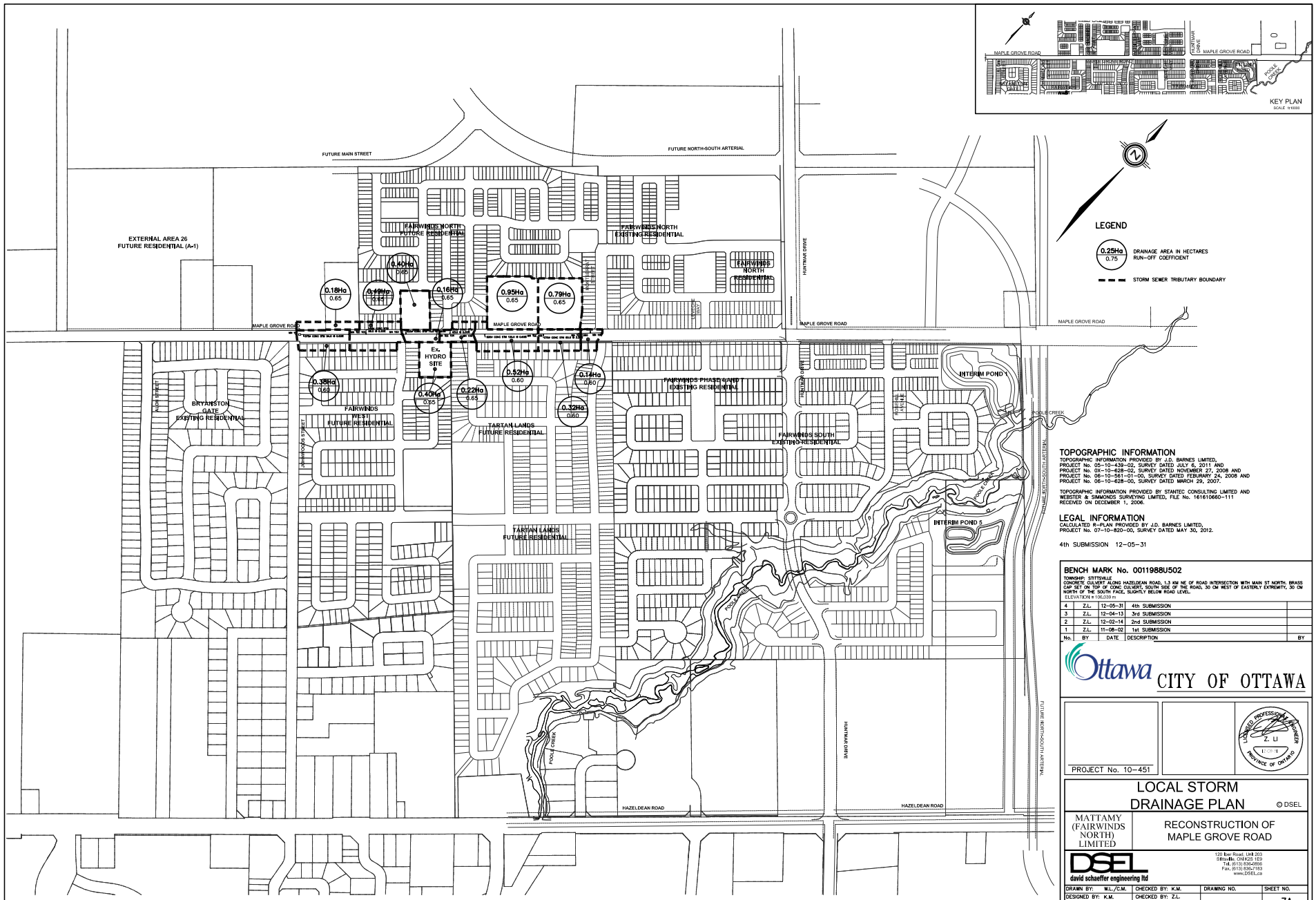
FOR THE

RECONSTRUCTION OF MAPLE GROVE ROAD MATTAMY HOMES

CITY OF OTTAWA

PROJECT NO.: 10-451

MAY 31, 2012
REVISION 4, 4TH SUBMISSION



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 05-10-439-02, SURVEY DATED JULY 6, 2011 AND
PROJECT No. 09-10-628-02, SURVEY DATED NOVEMBER 27, 2008 AND
PROJECT No. 06-10-561-01-00, SURVEY DATED FEBURARY 24, 2008 AND
PROJECT No. 06-10-628-00, SURVEY DATED MARCH 29, 2007.

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC CONSULTING LIMITED AND
WEBSTER & SIMMONDS SURVEYING LIMITED, FILE No. 161610660-111
RECEIVED ON DECEMBER 1, 2006.

LEGAL INFORMATION

CALCULATED R-PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 07-10-820-00, SURVEY DATED MAY 30, 2012.

4th SUBMISSION 12-05-31

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH; BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
4	Z.L.	12-05-31	4th SUBMISSION	
3	Z.L.	12-04-13	3rd SUBMISSION	
2	Z.L.	12-02-14	2nd SUBMISSION	
1	Z.L.	11-08-02	1st SUBMISSION	

CITY OF OTTAWA

PROJECT No. 10-451

LICENSED PROFESSIONAL ENGINEER
Z. LI
PROVINCE OF ONTARIO

LOCAL STORM DRAINAGE PLAN

MATTAMY (FAIRWINDS NORTH) LIMITED

RECONSTRUCTION OF MAPLE GROVE ROAD

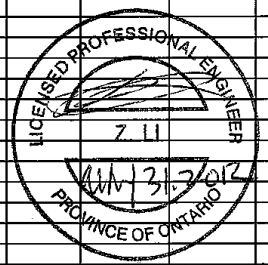
DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ONK2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: W.L./C.M.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		7A
SCALE: 1:3000	DATE: JULY 2011		

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Manning 0.013 Return Frequency

	LOCATION		AREA (Ha)										FLOW					SEWER DATA								
			R= 0.38		R= 0.45		R= 0.60		R= 0.61		R= 0.65		Indiv.	Accum.	Time of	Rainfall	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	A	No.	A	No.	A	No.	A	No.	A	No.	2.78 AC	2.78 AC	Conc.	Intensity	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min.)	Q/Q full
MAPLE GROVE ROAD																										
											0.18		0.33	0.33												
	101	102					0.38						0.63	0.96	10.00	104.19	100	375	375	PVC	0.50	94.0	124	1.12	1.40	0.81
	102	103									0.49		0.89	0.89	10.00	104.19	92	450	450	PVC	0.30	99.0	156	0.98	1.68	0.59
											0.40		0.72	0.72												
											0.40		0.72	1.45												
	103	104									0.16		0.29	1.73	10.00	104.19	181	525	525	CONC	0.60	70.0	333	1.54	0.76	0.54
	104	105									0.22		0.40	0.40	10.00	104.19	41	300	300	PVC	0.30	63.0	53	0.75	1.40	0.78
											0.95		1.72	1.72												
	105	106					0.52						0.87	2.58	10.00	104.19	269	525	525	CONC	0.60	120.0	333	1.54	1.30	0.81
											0.79		1.43	1.43												
	106	1060					0.32						0.53	1.96	10.00	104.19	204	375	375	PVC	3.20	80.0	314	2.84	0.47	0.65
	1060	107					0.14						0.23	0.23	10.00	104.19	24	375	375	PVC	2.50	43.0	277	2.51	0.29	0.09



Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: K.M.
Checked: Z.L.
Dwg. Reference: Local Storm Drainage Plan, Dwg No.7A

PROJECT: RECONSTRUCTION OF MAPLE GROVE ROAD
LOCATION: City of Ottawa
File Ref: 10-451
Date: May, 2012
Sheet No. 1 of 1

david schaeffer engineering ltd
SMART SUBDIVISIONS™

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Stittsville, Ontario K2S 1E9
Tel. (613) 836-0856
Fax (613) 836-7183
www.DSEL.ca

DESIGN BRIEF

FOR

FAIRWINDS NORTH PHASE 2B AND 4

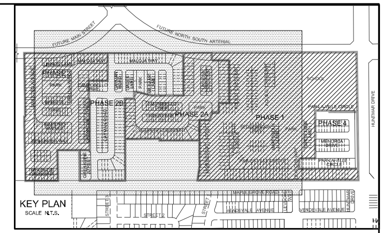
MATTAMY HOMES

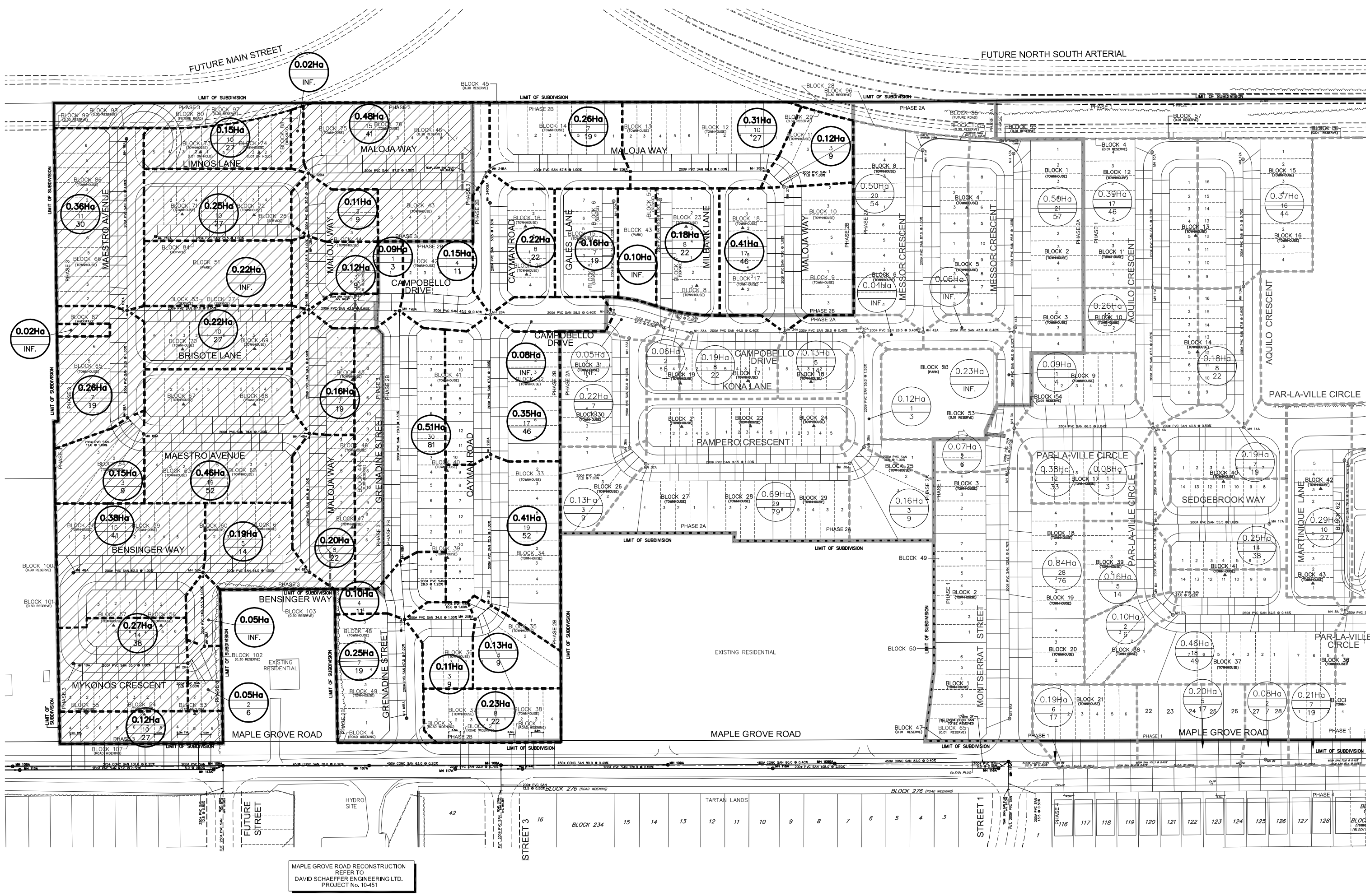
CITY OF OTTAWA

PROJECT NO.: 07-309

AUGUST 2, 2012
REVISION 5, 5TH SUBMISSION

KEY PLAN
SCALE N.T.S.





LEGEND

- DRANAGE AREA IN HECTARES (0.82Ha)
- NUMBER OF UNITS (20)
- POPULATION (3.4 PERSON PER UNIT FOR SINGLE HOUSE) (2.7 PERSON PER UNIT FOR TOWNHOUSE) (111)
- EXTERNAL DRANAGE AREA IN HECTARES (0.20Ha)
- POPULATION (INF.)
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- SANITARY SINGLE HOUSE CONNECTION
- SANITARY SEWER TRIBUTARY BOUNDARY
- PHASE LINE
- PHASE 3

REFER TO DWG No. 64

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-00, SURVEY DATED JULY 6, 2007 AND PROJECT No. 06-10-561-01-00, SURVEY DATED FEBRUARY 24, 2009.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 06-10-561-00-2B & PH 4, SURVEY DATED JULY 31, 2012.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
8	Z.L.	12-08-02	REVISION AS PER MPLAN CHANGE – PHASE 2B AND 4	
7	Z.L.	12-05-25	REVISION AS PER MPLAN CHANGE	
6	Z.L.	12-05-02	MOE SUBMISSION	
5	Z.L.	12-04-05	5TH SUBMISSION – PHASES 2B, 3, AND 4	
4	Z.L.	10-03-03	4TH SUBMISSION – PHASES 2B, 3, AND 4	
3	Z.L.	08-12-19	3RD SUBMISSION	
2	Z.L.	08-10-17	2ND SUBMISSION	
1	Z.L.	08-06-27	1ST SUBMISSION	

CITY OF OTTAWA

PROJECT No. 07-309

LICENSED PROFESSIONAL ENGINEER
Z. LI
12-08-02
PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

MATTAMY (FAIRWINDS NORTH) LIMITED

FAIRWINDS NORTH SUBDIVISION

PHASE 2B AND 4

david schaeffer engineering ltd
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Fax. (613) 836-7183
www.DSEL.ca

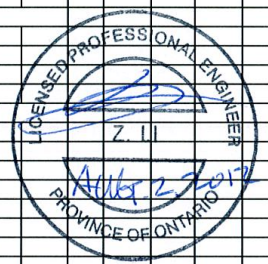
DRAWN BY: P.P./W.L.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		6
SCALE: 1:1000	DATE: JUNE 2008		

K:\07309\Phases2B_3_4\Tributary\06_06A_309san.dwg, 8/2/2012 6:26:20 PM, hpan, H.P.

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Manning 0.013 Return Frequency = 5 years

Location	From Node	To Node	AREA (Ha) R= 0.25 A	No.	R= 0.27 A	No.	R= 0.50 A	No.	R= 0.64 A	No.	R= 0.90 A	No.	R= 0.57 A	No.	R= 0.69 A	No.	R= 0.80 A	No.	R= 0.84 A	No.	FLOW Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc.	Rainfall Intensity	Peak Flow Q (l/s)	SEWER DATA DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min.)	RATIO Q/Q full
Phase 3																																		
Bensinger Way																																		
	4B	5B													0.14	5			0.14	4	0.60	0.60	10.00	104.19	62	366.42	375	PVC	0.60	63.5	128	1.21	0.87	0.49
To Bensinger Way, Pipe 5B-15B																						0.60	10.87											
Mykonos Crescent																																		
	1B	2B																	0.26	1	0.61	0.61	10.00	104.19	63	299.36	300	PVC	0.60	24.5	74	1.06	0.39	0.85
	2B	3B																	0.06	2	0.14	0.75	10.39	102.20	76	366.42	375	PVC	0.30	11.0	90	0.86	0.21	0.85
	3B	5B																	0.05	3	0.12	0.86	10.60	101.13	87	447.87	450	PVC	0.30	32.5	154	0.98	0.55	0.57
To Bensinger Way, Pipe 5B-15B																						0.86	11.15											
Bensinger Way																																		
Contribution From Bensinger Way, Pipe 4-5																					0.60	0.60	10.87											
Contribution From Mykonos Crescent, Pipe 3-5																					0.86	1.46	11.15											
	5B	15B	0.40	7											0.28	6					0.82	2.27	11.15	98.47	224	610.00	600	CONC	0.20	98.0	287	0.98	1.66	0.78
To Grenadine Street, Pipe 15B-16B																						2.27	12.82											
Maestro Avenue																																		
	6B	7B													0.50	34	0.14	35			1.27	1.27	10.00	104.19	132	686.00	675	CONC	0.30	85.5	481	1.30	1.10	0.28
	7B	8B													0.12	33	0.08	32			0.41	1.68	11.10	98.74	166	686.00	675	CONC	0.20	52.0	392	1.06	0.82	0.42
	8B	9B													0.05	24					0.10	1.77	11.91	95.07	169	686.00	675	CONC	0.20	10.0	392	1.06	0.16	0.43
	9B	10B													0.15	25	0.10	26			0.51	2.28	12.07	94.40	216	686.00	675	CONC	0.20	76.5	392	1.06	1.20	0.55
To Maloja Way, Pipe 10B-12B																						2.28	13.27											



Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.76 m/sec

Designed:	K.M.
Checked:	Z.L.
Dwg. Reference:	Storm Drainage Plan, Dwg No. 7, 7A
PROJECT:	Fairwinds North Subdivision PHASES 2B, 3, 4
LOCATION:	City of Ottawa
File Ref:	07-309
Date:	August, 2012
Sheet No.	1 of 4

david schaeffer engineering ltd
SMART SUBDIVISIONS™

JFSA Water Resources and Environmental Consultants

DESIGN BRIEF

FOR

POND 4

KANATA WEST

MATTAMY HOMES

CITY OF OTTAWA

PROJECT NO.: 12-644

AUGUST 9, 2013

REVISED DECEMBER 10, 2014

4TH SUBMISSION

Note that while a normal level of protection will be provided by Pond 4 prior to discharge to the Carp River in accordance with the ***KWMSS***, enhanced protection (80% TSS removal) is required for those flows discharging to Poole Creek via the diversion pipe. This is provided by a weir control installed at the diversion pipe outlet to direct the full "first flush" flows - in this case, the 25 mm storm flows - to Pond 4 for treatment. This approach is supported by MVCA as per the correspondence presented in ***Appendix H***.

Additionally, as requested by MVCA and in accordance with ***KWMSS*** requirements, baseflow augmentation will be provided by a 200 mm diameter circular vertical orifice controlling the first 0.2 m of active storage volume (greater than or equal to 10% of the 100-year active storage). A summary of the required Pond 4 characteristics is provided in ***Table 2***.

2.3 Proposed Deviations from the Master Servicing Study

The Pond 4 design contains deviations from the ***KWMSS***. Firstly, an interim (partially-constructed) pond was introduced to support the development of the drainage areas to the south trunk sewer, prior to construction of the north trunk sewer and developments. The size of the ultimate conditions (fully constructed) pond, servicing the north and south developments, was increased to account for the recently updated October 2012 *City of Ottawa Sewer Design Guidelines*, wherein those development lands serviced by the north trunk under ultimate conditions are to have 5-year minor system capture rates, and 10-year capture rates on arterial roads (contrary to the more restrictive capture rates specified in the ***KWMSS***). A summary of deviations in both interim and ultimate conditions inlet pipe dimensions and flows is presented in ***Table 1A***.

Table 1A
KWMSS Deviations – Inlet Pipe Dimensions and Flows

Item	KWMSS	Current Design Interim	Current Design Ultimate
South Trunk Inlet Pipe Dimensions	2550 mm @ 0.3% slope	2550 mm @ 0.3% slope	2550 mm @ 0.3% slope
North Trunk Inlet Pipe Dimensions	2250 mm @ 0.4% slope	N/A	To be resized at a future design stage
South Trunk Inlet Pipe Downstream Invert	91.26 m	91.503 m	91.777 m
North Trunk Inlet Pipe Downstream Invert	91.22 m	N/A	To be resized at a future design stage
10-Year, 12-hour SCS			
South Trunk Inflow to Pond	12.372 m^3/s	11.804 m^3/s	11.804 m^3/s
North Trunk Inflow to Pond	7.337 m^3/s	N/A	10.734 m^3/s
Major Inflow to Pond	1.682 m^3/s	4.965 m^3/s	0.520 m^3/s
100-Year, 12-hour SCS			
South Trunk Inflow to Pond	14.320 m^3/s	15.245 m^3/s	15.245 m^3/s
North Trunk Inflow to Pond	7.680 m^3/s	N/A	16.631 m^3/s
Major Inflow to Pond	3.570 m^3/s	8.424 m^3/s	0.760 m^3/s

The ***KWMSS*** Pond 4 outlet controls consist of a 350 mm diameter quality control orifice at an invert of 93.20 m, and a 30 m long broad-crested quantity control weir at an invert of 94.20 m. Although the ***KWMSS*** specifies a requirement for a baseflow augmentation volume equal to or

4, Proposed Fairwinds Residential Development – Maple Grove Road - Ottawa (Paterson Group, August 2014) provided in ***Appendix J***. Summary sheets for borehole and test pit investigations are also included in ***Appendix J***.

The conclusion of the geotechnical review is that the proposed stormwater management pond is acceptable from a geotechnical perspective. Specifically:

- The natural undisturbed clay deposit will serve as a clay liner for the pond. Where silty sand or sandy silt is encountered along the pond side walls or bottom, consideration should be given to subexcavating the pervious soil and replacing it with suitable clay from the pond excavation.

- The proposed excavation side slopes, varying between 5H:1V and 3H:1V, are considered to be stable in the long term.

- The proposed concrete structures (e.g. headwalls, outlet structures, etc.) can be founded within the firm silty clay, but geotechnical field confirmation must be completed before pouring concrete footings or placing granular materials for these structures.

- The interim conditions east forebay inlet will be removed during construction of the ultimate pond, and should be backfilled with a workable, brown silty clay fill placed in maximum 300 mm loose lifts and compacted using several passes of a sheepsfoot roller. The pond sidewall should be reinstated in the same manner. It is further recommended that the granular thickness below the proposed access pathway be thickened to 500 mm of a Granular A or Granular B Type II, compacted to at least 98% of its SPMDD.

- Portions of the proposed storm sewer will require 50 mm to 100 mm thick rigid insulation in order to provide sufficient frost protections.

12.0 THERMAL MITIGATION

Thermal mitigation is not a concern for the proposed SWM facility, given that the allowable outflow temperature for the Carp River is 30^{o} Celsius. Nonetheless, thermal mitigation measures will be provided at the SWM facility by the application of effective shading with landscape material and increased riparian vegetation along the permanent pool.

13.0 WATER BALANCE

In accordance with the ***KWMSS***, post-development infiltration on the pond block is not intended to compensate for decreases in infiltration on upstream areas; each development is required to provide its own pre- versus post-development water balance.

14.0 EROSION AND SEDIMENT CONTROL

An erosion and sediment control strategy will be implemented at the detailed design stage. The erosion and sediment control strategy will include the following:

```
01336> 0       'AHS1'          'M104SW'        66      9       2       1       12      'MG103'         0
01337> * Maple Grove Road Extension
01338> 0       'M101NE'        'LM101NW'       59      22      0       1       0       'X'             0
01339> 1       'M101NW'        'LM101NW'       27      22      0       1       0       'X'             0
01340> 1       'LM101NW'       'LM101SW'       10      22      2       1       140.5   'MG101a'        0
01341> 0       'M101SE'        'LM101SW'       59      22      0       1       0       'X'             0
01342> 0       'M101SW'        'LM101SW'       27      22      0       1       0       'X'             0
01343> 1       'LM101SW'       'MLPovf'        10      22      2       1       140.5   'MG101a'        0
01344> 0       'M101W1'        'LM101W1'       440     24      0       1       0       'X'             0
01345> 0       'M101W2'        'LM101W1'       440     24      0       1       0       'X'             0
01346> * Existing Maple Grove Road, with roadside ditch storage accounted for
01347> 1       'LM101W1'       'M101NW'        10      1       1       35      0       'MG101'         0
01348> 0       'M102N1'        'LM102N1'       27      22      0       1       0       'X'             0
01349> 1       'LM102N1'       'LM102S1'       10      22      2       1       97.5    'MG102a'        0
01350> 0       'M102N2'        'LM102N1'       62      22      0       1       0       'X'             0
01351> 0       'M102NE'        'LM102NW'       41      22      0       1       0       'X'             0
01352> 0       'M102NW'        'LM102NW'       29      22      0       1       0       'X'             0
01353> 1       'LM102NW'       'LM102SW'       10      22      2       1       97.5    'MG102a'        0
01354> 0       'M102S1'        'LM102S1'       45      22      0       1       0       'X'             0
01355> 1       'LM102S1'       'MLPovf'        10      22      2       1       97.5    'MG102a'        0
01356> 0       'M102S2'        'LM102S1'       44      22      0       1       0       'X'             0
01357> 0       'M102SE'        'LM102SW'       41      22      0       1       0       'X'             0
01358> 0       'M102SW'        'LM102SW'       29      22      0       1       0       'X'             0
01359> 1       'LM102SW'       'MLPovf'        10      22      2       1       97.5    'MG102a'        0
01360> 0       'M104E1'        'M104NE'        75      22      2       4       97.5    'MG104a'        0
01361> 0       'M104E2'        'M104SE'        35      22      2       4       97.5    'MG104a'        0
01362> 1       'M104NE'        'LM104NW'       21      22      0       1       0       'X'             0
01363> 0       'M104NW'        'LM104NW'       41      22      0       1       0       'X'             0
01364> 1       'LM104NW'       'LM104SW'       10      22      2       1       97.5    'MG104a'        0
01365> 0       'M104SE'        'LM104SW'       41      22      0       1       0       'X'             0
01366> 0       'M104SW'        'LM104SW'       38      22      0       1       0       'X'             0
01367> * Assume 30 cm max ponding (1.5 m head over lead pipe) to capture 100-year flow at low point
01368> 1       'LM104SW'       'MLPovf'        10      22      2       1       109     'MG104a'        0
01369> 0       'M105NE'        'M104E1'        54      22      2       4       97.5    'MG105a'        0
01370> 0       'M105SE'        'M104E2'        76      22      2       4       97.5    'MG105a'        0
01371> 0       'M1060NE'       'M174K-N'       58      23      0       1       0       'X'             0
01372> 0       'M1060SE'       'M174K-S'       79      23      2       5       97.5    'MG1060a'       0
01373> 0       'M106NW'        'M1060NE'       76      23      2       5       97.5    'MG106a'        0
01374> 0       'M106SW'        'M1060SE'       71      23      2       5       97.5    'MG106a'        0
01375> 0       'M174H-N'       '74A1N'         86      22      2       4       97.5    '174H'          0
01376> 0       'M174H-S'       '52-B1S'        70      22      2       4       97.5    '174H'          0
01377> 0       'M174I-E'       'M174H-N'       76      25      2       5       97.5    '174I'          0
01378> 0       'M174I-N'       'M174I-E'       59      22      0       1       0       'X'             0
01379> 0       'M174I-S'       'M174I-W'       65      22      0       1       0       'X'             0
01380> 0       'M174I-W'       'M174H-S'       74      25      2       5       97.5    '174I'          0
01381> 0       'M174J-N'       'M174I-N'       59      22      2       4       97.5    '174J'          0
01382> 0       'M174J-S'       'M174I-S'       73      22      2       4       97.5    '174J'          0
01383> 0       'M174K-N'       'M174J-N'       94      25      2       5       97.5    '174K'          0
01384> 0       'M174K-S'       'M174J-S'       58      25      2       5       97.5    '174K'          0
01385> * No major system overflow from low points on Maple Grove Road
01386> 1       'MLPovf'        'PCreek1i'      10      1       0       1       0       'X'             0
01387> * Tartan Lands rearyards draining into Fairwinds South
01388> 0       'T116R1'        'A116R1'        33      12      0       1       0       'X'             0
01389> 0       'T116R2'        'A116R2'        46      12      0       1       0       'X'             0
01390> 0       'T128R4'        'A128R4'        45      12      0       1       0       'X'             0
01391> 0       'T128R5'        '4                      1       'X
01392> 0       'T128R6'        '4                      1       'X
01393>         44R1'           2                       1       'X
01394>         ********                **
01395>         CONDITIO                *
01396>         ********                **
01397>         ture of                 from Bryanston Gate
01398> 1       BGout'          'M101W2'        10      1       2       1       0       'N4A02i'        1
01399> * Ultimate Conditions - Replace interim pond block with residential development
01400> * Assume 5-year capture (per DDSWMM) and 50 cu.m./ha storage (as per MSS)
01401> 0       'POND-1R'       'PCreek2A'      200     15      1       46      0       '181'           0
01402> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions (5-yr DD Capt.)
01403> 0       'WEXT1'         'M102N2'        75      9       2       1       32      'MG103'         0
01404> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions (5-yr DD Capt.)
01405> 0       'WEXT2'         'M105NE'        100     9       2       1       73.5    'MG105'         0
01406> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions (5-yr DD Capt.)
01407> 0       'WEXT3'         'M106NW'        95      9       2       1       61      'MG106'         0
01408> *
01409> ENDMJR
01410> ENDMJRS
01411> *
01412> *  Infiltration Parameters
01413> *  -----------------------
01414> *
01415> *   Maximum       Minimum
01416> *   Infiltration  Infiltration  Decay
01417> *   Rate          Rate          Rate
01418> *   (mm/hr)       (mm/hr)       (s^-1)
01419> *   INFMAX        INFMIN        DECAY
01420>     76.2          13.2          0.00115
01421> *
01422> *  Unit Area Flow Data
01423> *  (None)
01424> ENDUAH
```

Major System Segment

Downstream Major System Segment

Section Length

Section Type

Max Inlet Capacity

Receiving Inlet

Number Inlets

Inlet Type

```
01781> ***********************************
01782> * ULTIMATE CONDITIONS (ULT POND 4) *
01783> ***********************************
01784> * Ultimate Conditions - Replace interim pond block with residential development
01785> * Assume C=0.60 (as per MSS)
01786> 'PND-1'          'PND-1R'         1.74    57      0.013   0.25    0.02    410     1.57    4.67    0
01787> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions
01788> 'WEXT1'          'WEXT1'          0.404   64      0.013   0.25    0.02    150     1.57    4.67    0
01789> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions
01790> 'WEXT2'          'WEXT2'          0.952   64      0.013   0.25    0.02    200     1.57    4.67    0
01791> * Existing residential lots to be developed at 64% imperviousness under ultimate conditions
01792> 'WEXT3'          'WEXT3'          0.788   64      0.013   0.25    0.02    190     1.57    4.67    0
01793> *
01794> ENDSUB1
01795> ENDSUB2
01796> ENDSUB3
```

Slope (m/m)

Area Width

Depression storage for Imperv & Perv Surface

Area ID Number

Major System ID Number

Area

Imperviousness

Manning C for Impervious Surfaces

Manning C for Pervious Surfaces

FIGURE A-1: ULTIMATE CONDITIONS XPSWMM MODEL SCHEMATIC

JFSA Water Resources and Environmental Consultants

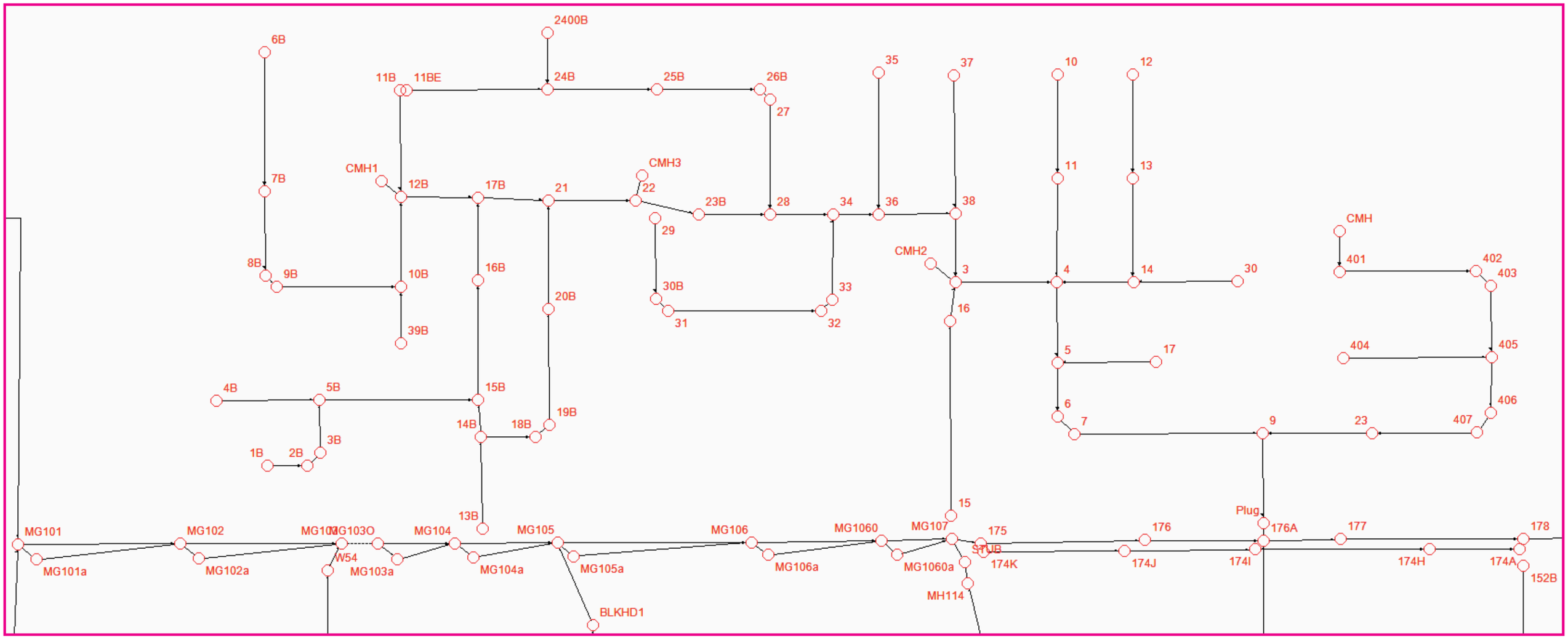
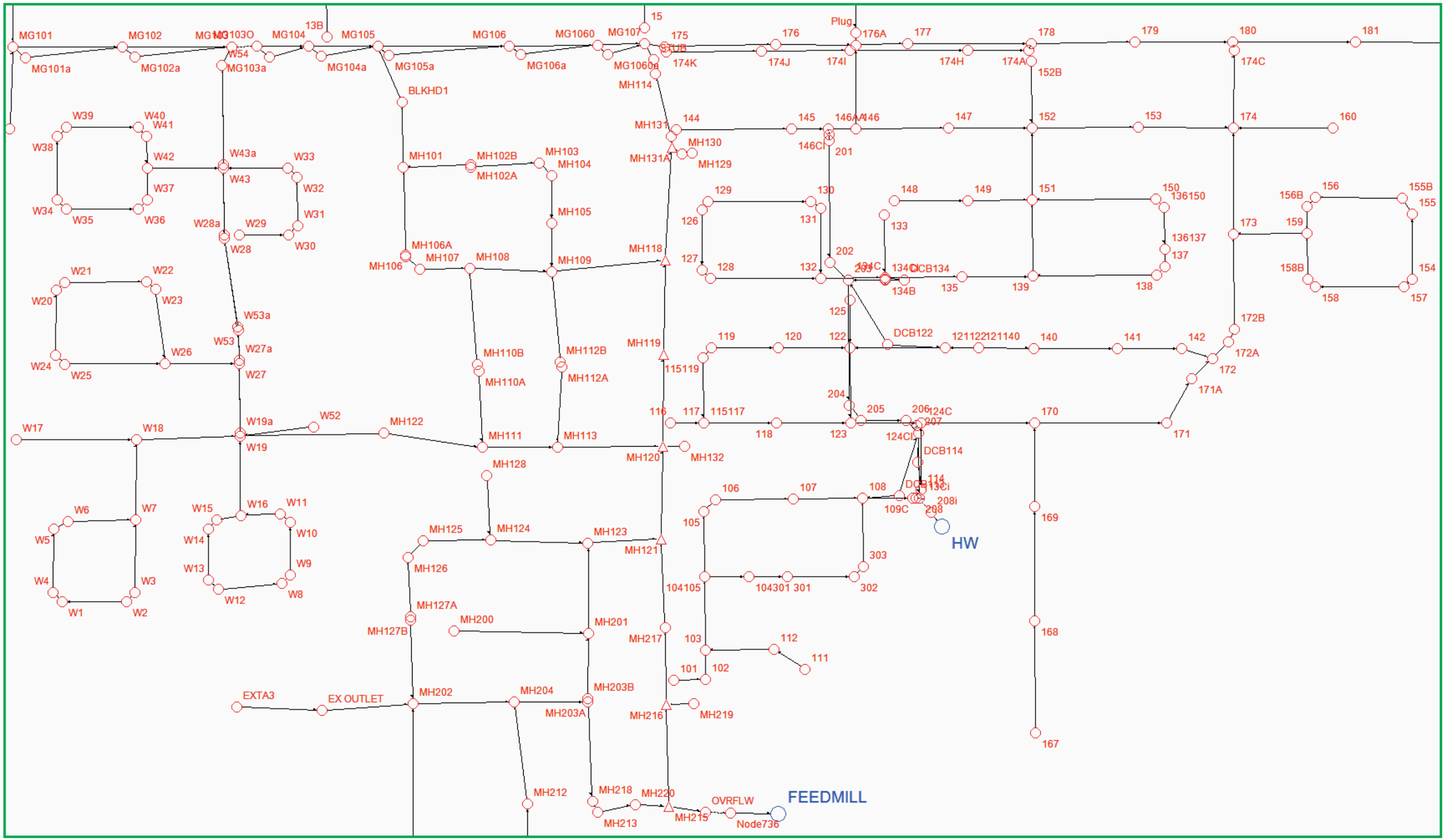
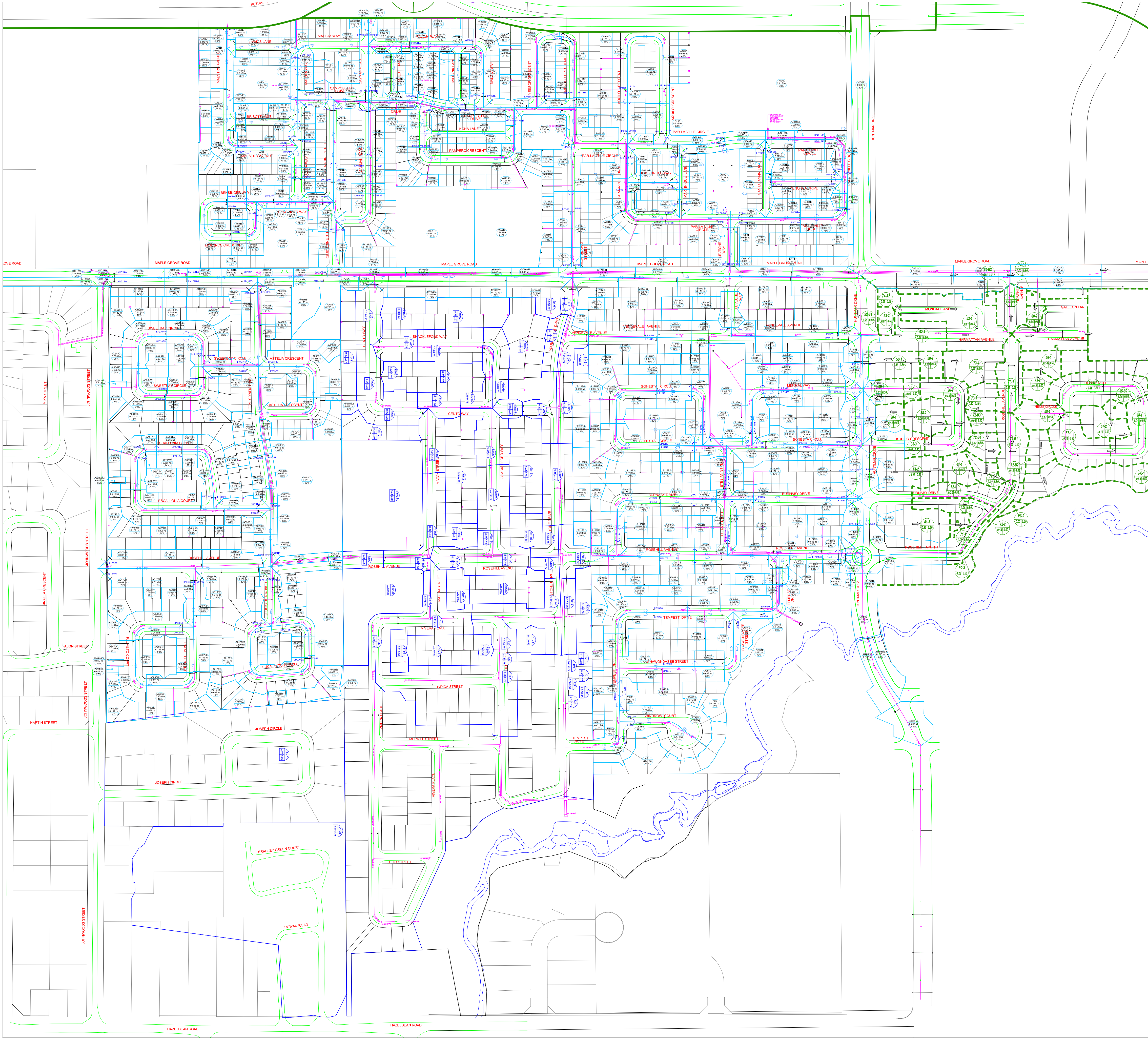


FIGURE A-1: ULTIMATE CONDITIONS XPSWMM MODEL SCHEMATIC

JFSA Water Resources and Environmental Consultants





LEGEND :

- JFSA DRAINAGE AREA BOUNDARY
- EXT2 / 0.026 ha / 56% — DRAINAGE AREA ID; DRAINAGE AREA (HA); TOTAL IMPERVIOUSNESS
- MAJOR SYSTEM FLOW DIRECTION
- FIRST DIRECTION OF EXCESS MAJOR SYSTEM FLOW AT LOW POINT
- LPEXT2 — LOW POINT
- STANTEC DRAINAGE AREA BOUNDARY (FAIRWINDS SOUTH PHASE 1)
- 57-2 / 0.18 / 0.50 — DRAINAGE AREA ID; RUNOFF COEFFICIENT; DRAINAGE AREA (HA)
- MAJOR SYSTEM FLOW DIRECTION
- IBI GROUP DRAINAGE AREA BOUNDARY (POOLE CREEK VILLAGE)
- S111B / 0.07 / 0.76 — DRAINAGE AREA ID; RUNOFF COEFFICIENT; DRAINAGE AREA (HA)
- MAJOR SYSTEM FLOW DIRECTION

SCALE : 0 20 40 60 80 m

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT : DSEL
120 IBER ROAD, SUITE 203
OTTAWA, ONTARIO K2S 1E9
(613) 836-0856

PROJECT :
Kanata West Community
Pond 4

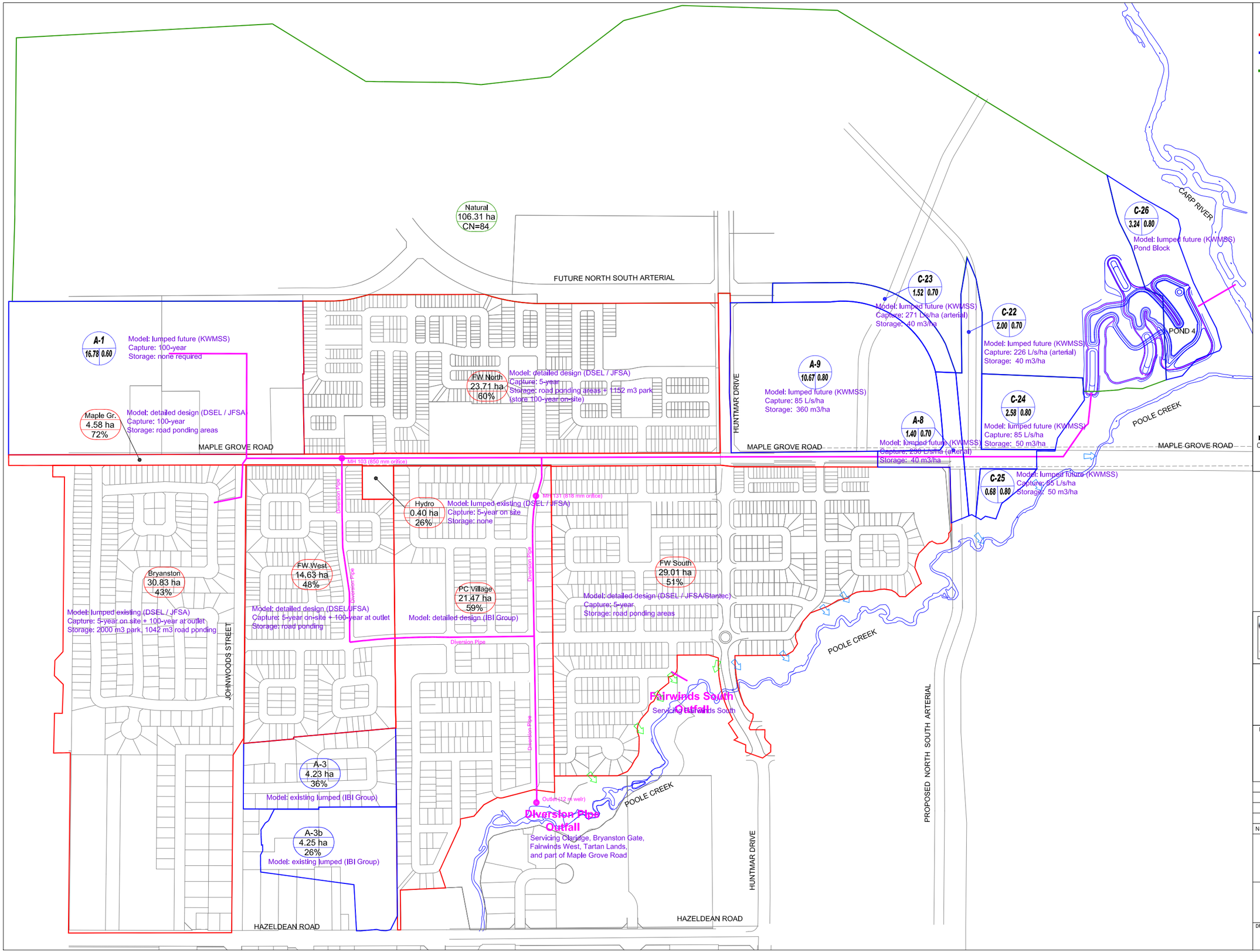
No.	BY	DATE	DESCRIPTION	BY

Detailed Drainage Area to SWM Facility

FIGURE G-1

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS
DATE	PROJECT No.
Dec/14	631-07

DRAWING REF.
631-07\Design\Pond Exp\201412\
CAD\JFSA Fairwinds Global.dwg



LEGEND :

- INTERIM DRAINAGE AREA (S TRUNK, DETAILED)
- INTERIM DRAINAGE AREA (S TRUNK, LUMPED)
- INTERIM NATURAL DRAINAGE AREA (LUMPED)

Hydro / 0.40 ha / 26% — DRAINAGE AREA ID; DRAINAGE AREA (HA); TOTAL IMPERVIOUSNESS

C-23 / 1.52 / 0.70 — KWMSS DRAINAGE AREA ID; RUNOFF COEFFICIENT; DRAINAGE AREA (HA)

- TRUNK SEWER
- MAJOR SYSTEM OUTFALL TO POOLE CREEK UPSTREAM OF HUNTMAR (PC1 / PCreek1)
- MAJOR SYSTEM OUTFALL TO POOLE CREEK DOWNSTREAM OF HUNTMAR (PC2 / PCreek2)

SCALE :

0 100 200 300 400 m

J.F. Sabourin & Associates Inc.
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GATINEAU (819) 243-6858

CLIENT :

DSEL
david schaeffer engineering ltd
120 IBER ROAD, SUITE 203
OTTAWA, ONTARIO K2S 1E9
(613) 836-0856

PROJECT :

Kanata West Community Pond 4

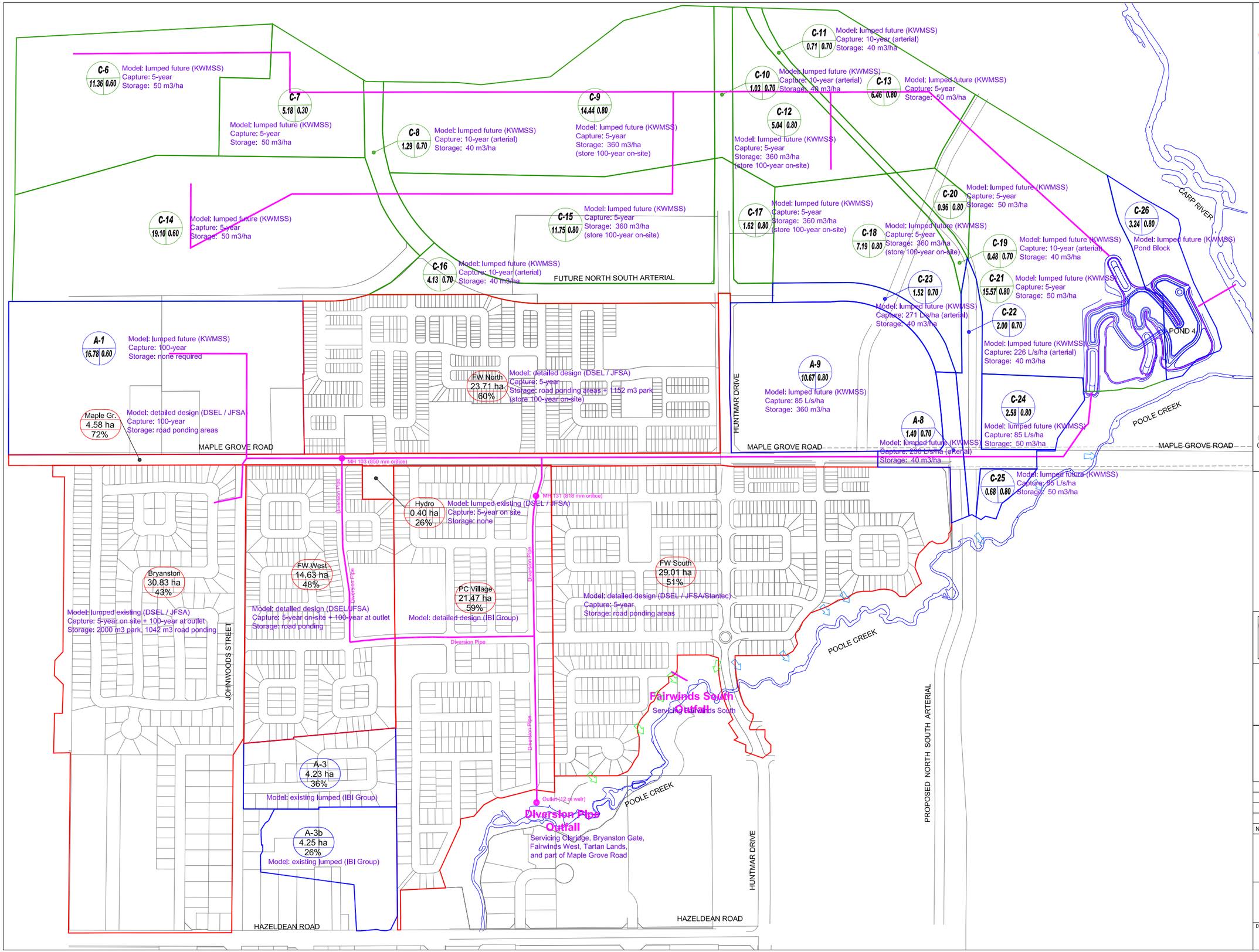
No.	BY	DATE	DESCRIPTION	BY

Proposed Interim Conditions Drainage Area to SWM Facility

FIGURE 2

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS
DATE	PROJECT No.
Dec/14	631-07

DRAWING REF.
631-07\Design\Pond Exp\201412\CAD\JFSA Fairwinds Global.dwg



LEGEND :

- INTERIM DRAINAGE AREA (S TRUNK, DETAILED)
- INTERIM DRAINAGE AREA (S TRUNK, LUMPED)
- ULTIMATE DRAINAGE AREA (N TRUNK, LUMPED)

Hydro 0.40 ha 26%
- DRAINAGE AREA ID
- DRAINAGE AREA (HA)
- TOTAL IMPERVIOUSNESS

C-23 1.52 0.70
- KWMSS DRAINAGE AREA ID
- RUNOFF COEFFICIENT
- DRAINAGE AREA (HA)

SCALE :

0 100 200 300 400 m

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PROJECT :

Kanata West Community
Pond 4

No.	BY	DATE	DESCRIPTION	BY

Proposed Ultimate Conditions Drainage Area to SWM Facility

FIGURE 3

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS

DRAWING REF.
631-07\Design\Pond Exp\201412\CAD\JFSA Fairwinds Global.dwg

DATE	PROJECT No.
Dec/14	631-07

KANATA WEST

MASTER SERVICING STUDY

Volume 1 of 2

JUNE 16, 2006

Reference # 1604-00406

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1505 Laperriere Ave.
Suite 100
Ottawa, Ontario
KIZ 7T1

Cumming Cockburn Limited/IBI
1770 Woodward Drive
Ottawa, Ontario
K2C 0P8

Stantec

CCL Cumming Cockburn Limited

IBI GROUP

Natural Environment (NE) 20%

All three alternatives will have essentially the same impact on the natural environment. Alternative I has a minor increased impact due to the number of ponds (8) and there location within the KWCP.

5.5.2 Selection of Stormwater Management Alternatives

Based on the above evaluation, Alternative III is selected as the preferred stormwater management alternative. This option offers the greatest amount of flexibility for phasing opportunities while providing an economical servicing solution that meets the objectives of the Carp River Watershed/Subwatershed Study.

5.6 Best Management Practices

The Carp River Watershed/Subwatershed Study (Robinson Consultants, November 2004) proposes target infiltration rates of 104 mm/yr and 73 mm/yr for areas of moderate and low recharge, respectively, within the KWCP. To meet the identified infiltration targets suggested the following best management practices (BMP's) were recommended and are shown on Figures 7.3.3 through 7.3.7 in Appendix 3.4.

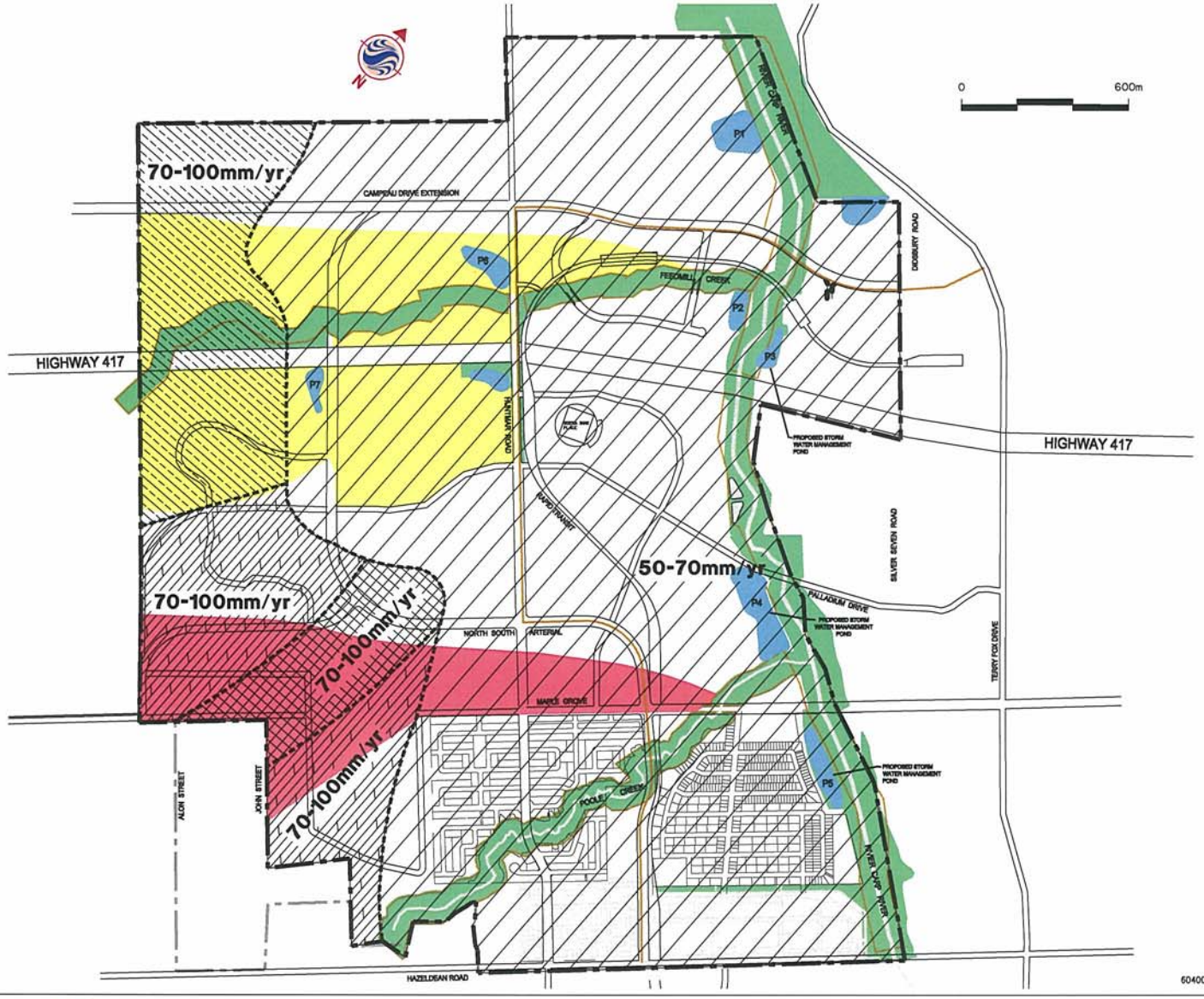
- Subsurface Infiltration;
- Biofilters;
- Wet ponds; and
- Dry ponds.

A water balance and subsurface hydrogeological investigation at the detailed design stage will dictate which of the proposed BMPs will be selected for specific developments.

Given the establishment of the dominant soil associations that exist in the Study area **(see Figure 5.4)**, and considering the extent of the poorly draining soils within the nearly flat topography, it is apparent that drainage in the Study area is primarily governed by the characteristics of the poorly draining silty clay to clay soils underlying all but a small percentage of the Study area. As a result, the establishment of the infiltration rates of the soils can be simplified to reflect the silty clay to clay soils and the till material over bedrock. Table 5.6 below summarizes the anticipated infiltration rates of these two principal soil groups, based on soil characteristics and borehole data regarding degree of compaction.

Table 5.6 -Summary of Infiltration Rates of Principal Soil Groups

Soil Groups	Estimated Infiltration Rates [1] (mm/yr)	Percent of Annual Rainfall Infiltrated
Castor, Dalhousie, North Gower (silty clay to clay)	50-70 mm/yr	5-7
Anstruther, Farmington, Nepean (sandy loams to till)	70-100 mm/yr	7-11



INFILTRATION TARGETS

	SOIL TYPE	RECHARGE
	FINE SAND	MODERATE
	PALEOZOIC BEDROCK	MODERATE
	TILL	MODERATE
	CLAY	LOW

- Kanata-West Concept Plan Boundary
- Area Tributary To Feedmill Creek (Existing Conditions)
- Area Tributary To Maple Grove Ditch System and Poole Creek (Existing Conditions)
- OPEN SPACE

NOTE:
SOIL TYPES AND RECHARGE POTENTIAL FROM CARP RIVER WATERSHED/SUBWATERSHED STUDY BY ROBINSON CONSULTANTS INC. 2004.
TARGET INFILTRATION RATES OBTAINED FROM ENVIRONMENTAL FACT SHEETS FROM 2004 REPORT.

Stantec

CCL/IBI

MAY 2006

FIG. 5.4

area of extensive employment between Feedmill Creek and Campeau Drive. Normal and 100yr water levels in the pond are 92.70 and 93.96, respectively.

- Pond 2 is proposed just upstream of the confluence of Feedmill Creek and the Carp River on the south bank and will service future extensive employment and high profile employment lands between Feedmill Creek and Highway 417. Normal and 100yr water levels in the pond are 93.25 and 94.23, respectively.

- Pond 3 is proposed on the north bank or the Carp River between the future transitway and Highway 417. It will service low density business park and community retail lands between Didsbury Road and the Carp River. Normal and 100yr water levels in the pond are 92.90 and 94.20, respectively.

- Pond 4 adjacent to the Carp River is proposed just upstream of Palladium Drive and downstream of the Poole Creek confluence with the Carp River and will service a mixed use area bound by Pool Creek, Palladium Drive and the Kanata West Community Boundary. Normal and 100yr water levels in the pond are 93.25 and 94.74, respectively.

- Pond 5 is proposed upstream of the confluence of Poole Creek and the Carp River along the south-west bank of the Carp River. Pond 5 will service residential and retail developments between Poole Creek, the Carp River and Hazeldean Road. Normal and 100yr water levels in the pond are 93.44 and 94.94, respectively.

- Pond 6 is to be located north-east of Feedmill Creek at the intersection with Huntmar Road and will service business park and extensive employment developments. Normal and 100yr water levels in the pond are 98.00 and 98.94, respectively.

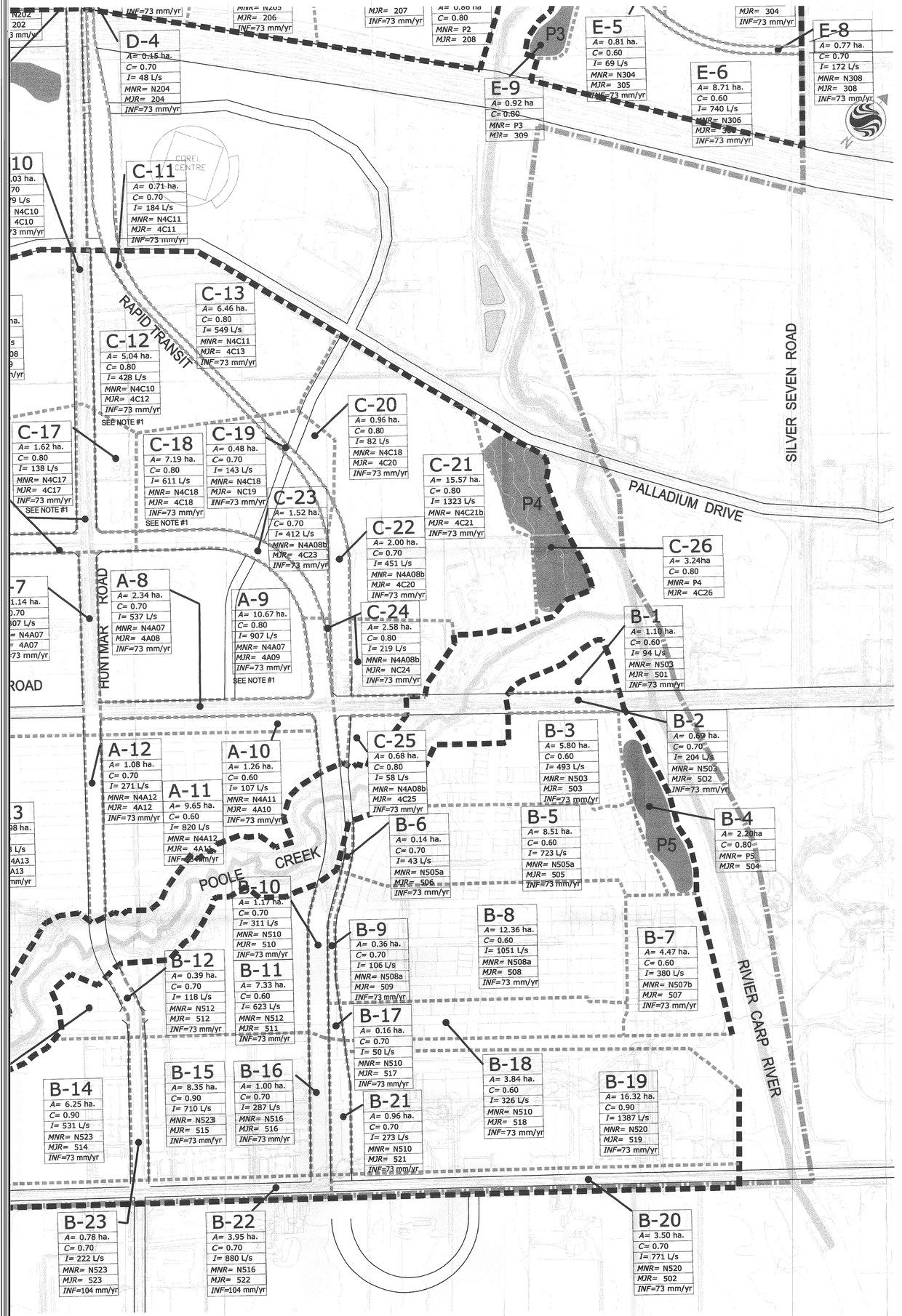
- Pond 7 is proposed south of Highway 417 and west of the future north-south arterial and will service business park and extensive employment lands. Normal and 100yr water levels in the pond are 102.20 and 102.92, respectively.

It is noted that additional post development modeling was completed with CH2MHill in order to create an overall post development model. For this separate analysis, a dynamic downstream water level was used and iterated until convergence was observed. In order to maintain the conservative nature of the HGL assessment, the results above reflect a static downstream water level equal in elevation to the 100yr MVC floodplain obtained from the 1983 analysis.

5.13 Stormwater Implementation

- All developments are to be designed in accordance with the City of Ottawa Sewer Design Guidelines, First Edition, November 2004.

- Ipex inlet control devices, or an equivalent restrictor which reproduces the same stage-storage-discharge curve, shall be used to restrict runoff to 85L/s/ha and provide 50m^3/ha of major system storage, with the exception of arterial roadways where inlets shall be sized for the peak 10 yr release rate.



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Legend

- KANATA–WEST CONCEPT PLAN BOUNDARY
- POND DRAINAGE BOUNDARY
- STORM SEWER DRAINAGE LIMIT

A-1	
A= 72.31 ha.	DRAINAGE AREA IDENTIFICATION
C= 0.60	AREA IN HECTARES
I= 246 L/s	RUNOFF COEFFICIENT
MNR= N4A01	100yr. INLET CAPACITY (L/s)
MJR= 4A01	MINOR SYSTEM NODE NUMBER
INF=73 mm/yr	MAJOR SYSTEM SEGMENT NUMBER
	INFILTRATION

Notes

* REFER TO FIGURE 3.2 IN KANATA WEST MASTER SERVICING STUDY FOR FURTHER INFILTRATION DETAILS

1. THOSE AREAS WHICH ARE COMPLETELY SURROUNDED BY ARTERIAL ROADWAYS (SPECIFICALLY AREAS A-9, C-9, C-12, C-15, C-17, C-18) MUST PROVIDE SURFACE STORAGE IN THE AMOUNT OF 350m³/ha, OR IN SUFFICIENT QUANTITY TO DEMONSTRATE COMPLETE CONTAINMENT OF THE 100yr EVENT. (i.e. NO MAJOR SYSTEM FLOW IN THE 1:100yr EVENT)

CCL/IBI Consulting Engineers Limited
1770 WOODWARD DR., OTTAWA (613)225-1311

2	REVISED FOR DEC.21/05 SUBMISSION	GBU	SJP	DEC.21/05
1	REVISED AS PER CITY COMMENTS (Sept.16/05)	GBU	MAF	OCT.28/05
Revision		By	Appd.	Date

File Name: 160400406		LTM	MAF	AUG./05
		Dwn.	Chkd.	Dsgn. Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

STORM DRAINAGE AREA PLAN
SOUTH PONDS

Project No.	Scale	Sheet	Revision
60400406	1:3000 (0 30 90 150m)	3 of 7	2

Drawing No.
ST-PS

Appendix G – Checklist

GENERAL CONTENT		RESPONSE
☐	Executive Summary (for larger reports only).	Not included
☒	Date and revision number of the report.	Date of report provided
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Page 1, and Appendix A
☒	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.	Section 2 of report
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	In Appendix E
☐	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	No Master Servicing Studies.
☒	Statement of objectives and servicing criteria.	Section 1 of report
☒	Identification of existing and proposed infrastructure available in the immediate area.	Section 2 & 3 of report
☐	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).	Not applicable
☐	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.	Not applicable
☐	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.	Not applicable
☐	Proposed phasing of the development, if applicable.	Not applicable
☐	Reference to geotechnical studies and recommendations concerning servicing.	Not applicable
☒	All preliminary and formal site plan submissions should have the following information: Metric scale North arrow (including construction North) Key plan name and contact information of applicant and property owner Property limits including bearings and dimensions Existing and proposed structures and parking areas Easements, road widening and rights-of-way Adjacent street names	Functional Report, Civil and Architectural Plans provided all this information.
DEVELOPMENT SERVICING REPORT: WATER		**RESPONSE**
☐	Confirm consistency with Master Servicing Study, if available Availability of public infrastructure to service proposed development Identification of system constraints	Not applicable
☒	Identify boundary conditions	Section 4.5
☒	Confirmation of adequate domestic supply and pressure	Section 4.2
☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 4.2
☒	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.	Section 4.2 & Table B-5 Appendix B
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	Not applicable
☒	Address reliability requirements such as appropriate location of shut-off valves Check on the necessity of a pressure zone boundary modification.	Section 4.2, Drawing C100
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 4.4 & Table B-1, Table B-2, Appendix B
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 4.2

☐	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.	Not applicable
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Table B-1 Appendix B
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Not applicable
DEVELOPMENT SERVICING REPORT: WASTEWATER		**RESPONSE**
☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 5.1
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Not applicable
☒	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.	Section 5.2
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2
☐	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)	Not applicable
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Table C-1 in Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.2
☐	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).	Not applicable
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Not applicable
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	Not applicable
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	Not applicable
☐	Special considerations such as contamination, corrosive environment etc.	Not applicable
DEVELOPMENT SERVICING REPORT: STORMWATER CHECKLIST		**RESPONSE**
☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6
☐	Analysis of available capacity in existing public infrastructure.	Not applicable
☐	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Site is too small to be considered
☐	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.	Not Applicable
☐	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Not Applicable
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.2 & 6.3
☐	Set-back from private sewage disposal systems. Watercourse and hazard lands setbacks.	Not Applicable
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix E
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Not Applicable
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 6.9 & Table D-5 of Appendix D

☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Not Applicable
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 6.6, 6.8 & Table D-1 & D-4 of Appendix D
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	Not Applicable
☒	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.8
☐	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.	Not Applicable
☐	Identification of potential impacts to receiving watercourses Identification of municipal drains and related approval requirements.	Not Applicable
☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.9
☒	100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading and Erosion and Sediment Plan
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Not Applicable
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7
☐	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.	Not Applicable – No requirements from Conservation Authority
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	See geotechnical report
☒	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 each approval. The approval and permitting shall include but not be limited to the following:	Appendix E
☐	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 theAct.	Not Applicable
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	Not Applicable
☐	Changes to Municipal Drains.	Not Applicable
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Not Applicable
CONCLUSION CHECKLIST		**RESPONSE**
☒	Clearly stated conclusions and recommendations	In Section 8
☒	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.	Appendix E
☒	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Signed and stamped

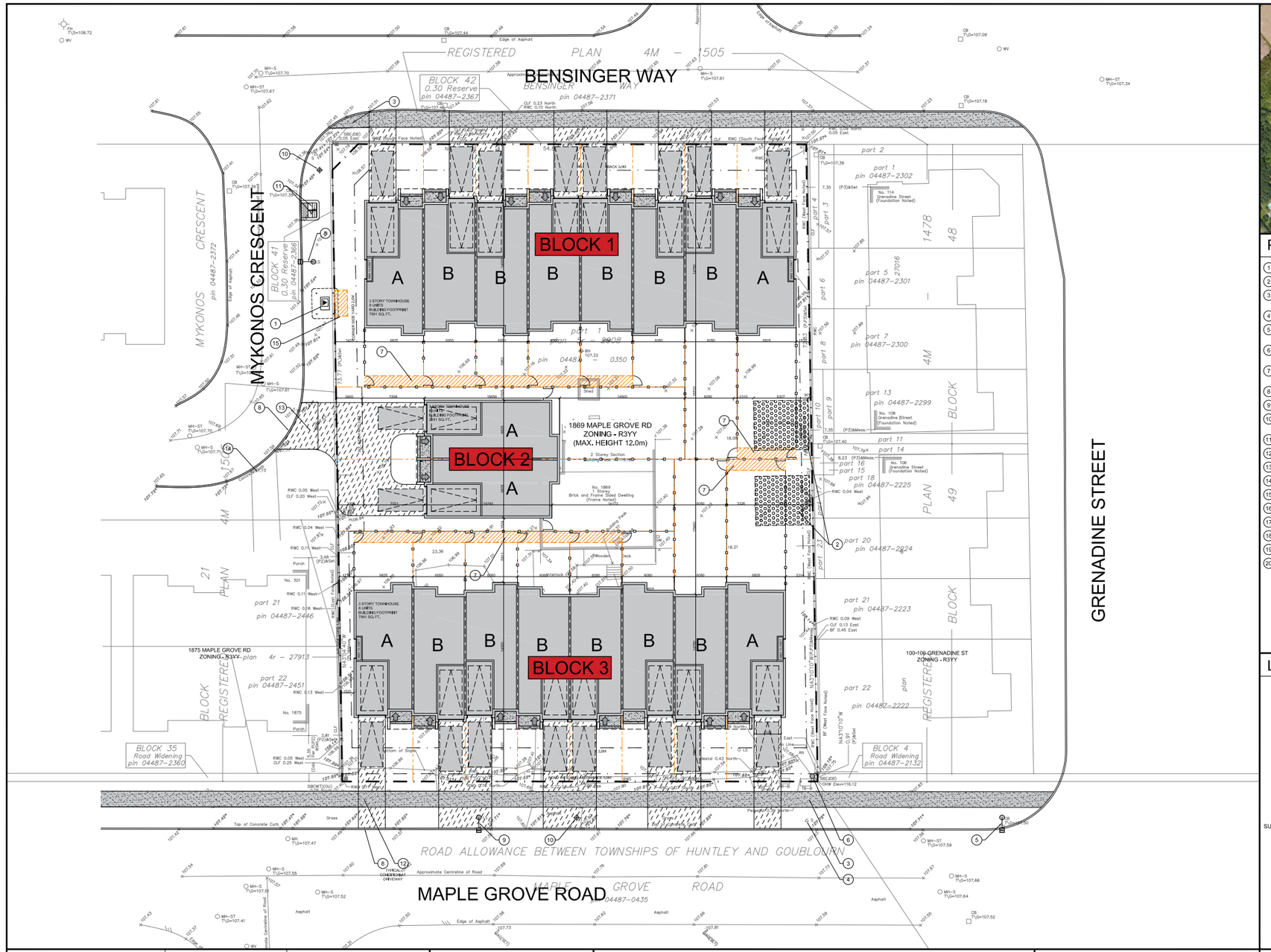
Appendix H – Drawings

Architectural Site Plan Drawings

- Site Plan, SP-00
- Topo Survey

Engineering Drawings (included separately)

- Notes and Legend, C001
- Site Servicing Plan, C002
- Site Grading Plan, C003
- Storm Drainage Plan, C004.
- Sanitary Drainage Plan, C005
- Erosion and Sediment Control Plan, C006
- Details Page, C007



IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

- (00) INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
- (00) INDICATES ASSEMBLE TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDUAL.
- (00) INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- (000) INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- 00 / TITLE / SCALE — DETAIL NUMBER, DETAIL REFERENCE PAGE, DETAIL CROSS REFERENCE PAGE

PROJECT NOTES

1. TRANSFORMER
2. STORM WATER MANAGEMENT TANK
3. CONCRETE SIDEWALK BUILT TO CITY OF OTTAWA STANDARDS
4. BUS STOP TO POTENTIALLY BE RELOCATED
5. EXISTING LIGHT STANDARD
6. EXISTING UTILITY POLE
7. 1300mm WIDE REAR YARD ACCESS EASEMENT (TO BE CONFIRMED ON SURVEY DRAWING)
8. 150mm WIDE MOUNTABLE CURB
9. EXISTING LIGHT STANDARD TO BE RELOCATED
10. NEW FIRE HYDRANT (EXACT LOCATION TO BE CONFIRMED BY CIVIL ENGINEER)
11. COMMON MAIL BOXES
12. PROVIDE DEPRESSED SIDEWALK
13. SHARED DRIVEWAY (REQUIRES JUMA)
14. NEIGHBORING DRIVEWAY
15. HYDRO ONE EASEMENT (1.5m X 3.0m)
16. RESERVED
17. RESERVED
18. RESERVED
19. RESERVED
20. RESERVED

GENERAL NOTES:

A. REFER TO TYPICAL ASSEMBLIES SHEET FOR WALL, PARTITION, ROOF CEILING & FLOOR TYPES.

B. FOR DOOR TYPES AND HARDWARE REQUIREMENTS REFER TO DOOR SCHEDULE ON A900 SERIES.

C. ALL INTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD

D. ALL EXTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD

E. ALL EXTERIOR WALLS ARE TO BE TYPE 'W1' UNLESS NOTED OTHER WISE.

F. ALL INTERIOR PARTITIONS ARE TO BE TYPE 'P1' UNLESS NOTED OTHER WISE.

G. ALL REINFORCED CONCRETE SUSPENDED SLABS, COLUMNS & BEAMS HAVE A MIN. FRR OF 1.5 HRS (AS DETERMINED BY OBC SB-2) UNLESS OTHERWISE STATED.

LEGEND

- UNIT ENTRY POINT
- GEODETIC ELEVATION MARKER
- TOP OF CURB MARKER
- FIRE HYDRANT
- UTILITY POLE
- LIGHT STANDARD
- PROPERTY LINE
- SETBACK LINE
- SUBDIVIDED PROPERTY LINE
- EASEMENT OUTLINE
- NEW PRIVACY FENCE (SEE LANDSCAPE PLAN)
- PROPOSED BUILDING OUTLINE
- NEW PRIVATE DRIVEWAY
- PUBLIC SIDEWALKS

PROJECT DEVELOPER

GNCR DEVELOPMENTS

Konaklar Mh. Akasyalı Sk.
No:26 34330
Beşiktaş İstanbul Turkey

PHONE: +90 212 212 60 60
FAX: +90 212 284 82 77

CIVIL ENGINEER

EXP SERVICES INC.

2650 QUEENSVIEW DRIVE
SUITE 100
OTTAWA, ONTARIO
K2B 8H6

PHONE: 613 688 1899

TRAFFIC ENGINEER

EXP SERVICES INC.

2650 QUEENSVIEW DRIVE
SUITE 100
OTTAWA, ONTARIO
K2B 8H6

PHONE: 613 688 1899

LANDSCAPE ARCHITECT

JAMES B. LENNOX AND ASSOCIATES INC

3332 CARLING AVE.
OTTAWA, ONTARIO, CANADA
K2H 5A8

PHONE: 613 722 5168
FAX: 1 866 343 3942

SURVEYOR

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, CANADA
K2E 7S6

PHONE: 613 727 0850
FAX: 613 727 1079

SITE INFORMATION

ZONING	DR
MAX BUILDING HEIGHT	11.0 M.
LOT AREA	4,051.7 SQ. M.
1169 MAPLE GROVE RD STITTSVILLE, ONTARIO, CANADA K2S 1B9	

RE-ZONE TO	R3YY
MAX BUILDING HEIGHT	12.0 M.
LOT AREA	4,051.7 SQ. M.
1169 MAPLE GROVE RD STITTSVILLE, ONTARIO, CANADA K2S 1B9	

SITE AREA	
TOTAL SITE AREA	4,051.7 SQ. M.

RESIDENTIAL UNITS

TRADITIONAL TOWNHOUSES:	16
SEMI-DETACHED HOUSES:	2
TOTAL UNITS:	18

DEVELOPMENT STATISTICS

SITE SETBACKS (R3YY)	REQUIRED	PROVIDED
FRONT YARD (MAPLE GROVE ROAD)	3,0m	3,0m
CORNER SIDE YARD (MYKONOS CRESCENT)	2,5m	2,5m
TYPICAL INTERIOR SIDE YARD	1,2m	1,2m
REAR YARD (BENSINGER WAY)	6,0m	3,0m

BUILDING FOOTPRINTS		# OF UNITS	TOTAL AREA
BLOCK 1	-	8	7,588 SQFT
BLOCK 2	-	2	2,082 SQFT
BLOCK 3	-	8	7,588 SQFT
TOTAL	-		17,258 SQFT (1,603.3 SQM)

BUILDING STATISTICS	AREA	# OF UNITS	TOTAL UNIT AREA
TRADITIONAL TOWN TYPE A -	2,414 SQFT	4	9,656 SQFT
TRADITIONAL TOWN TYPE B -	2,145 SQFT	12	25,740 SQFT
SEMI-DETACHED TYPE A -	2,610 SQFT	2	5,220 SQFT
TOTAL -		18	40,616 SQFT (3,773.4 SQM)

PARKING	REQUIRED	PROVIDED
TRADITIONAL TOWNS		
RESIDENTIAL:	1,0 PER DWELLING	
VISITOR:	0,2 PER DWELLING	
SEMI-DETACHED TOWNS		
RESIDENTIAL:	1,0 PER DWELLING	
VISITOR:	0,2 PER DWELLING	
PARKING	**REQUIRED**	**PROVIDED**
TRADITIONAL TOWNS		
RESIDENTIAL:	16	16
VISITOR:	3,2	16
SEMI-DETACHED TOWNS		
RESIDENTIAL:	2	2
VISITOR:	0,4	2
TOTAL:	21,6	36

*REQUIRED BICYCLE PARKING PROVIDED IN GARAGE

SITE COVERAGE

SPACE		AREA (sq.m.)
BUILDING FOOTPRINT	-	1,603,3
PARKING LOT	-	0,0
SIDEWALKS	-	0,0
DRIVEWAYS	-	398,3
TOTAL	-	2001,6
LOT AREA		
1869 MAPLE GROVE ROAD	-	4,051.7
LANDSCAPE SPACE	-	2,050.1
TOTAL LANDSCAPE SPACE (%)	-	50,6

ADDITIONAL NOTES

1. DEDICATED SNOW STORAGE WILL NOT BE PROVIDED ON THIS SITE - AS ALL UNITS FRONT ONTO PUBLIC STREETS, STREET SNOW REMOVAL WILL BE THE RESPONSIBILITY OF THE CITY OF OTTAWA.

2. AS ALL UNITS FRONT ONTO PUBLIC STREETS, ALL UNITS SHOULD BE ELIGIBLE FOR CITY GARBAGE COLLECTION.

3. BLOCK 2 WILL REQUIRE A JOINT USE MAINTENANCE AGREEMENT GIVEN THE SHARED DRIVEWAY

4. EXISTING BUILDING TO BE DEMOLISHED PRIOR TO CONSTRUCTION

No.	DESCRIPTION	DATE
13	ISSUED FOR COORDINATION	21-07-2020
12	ISSUED FOR COORDINATION	17-06-2020
11	ISSUED FOR TOWN HALL	11-06-2020
10	ISSUED FOR TOWN HALL	05-06-2020
9	ISSUED FOR PLAN OF SUBDIVISION	14-04-2020
8	ISSUED FOR PLAN OF SUBDIVISION	08-04-2020

REVISIONS:

ARCHITECT SEAL: ONTARIO ASSOCIATION OF ARCHITECTS — RODERICK LAHEY — LICENCE 4175 — SEAL DATE STAMP DATE

NORTH ARROW:

CLIENT: LATITUDE Homes

ARCHITECT:
rla/architecture
roderick lahey architect inc.
56 beech street, ottawa, ontario K1S 3J6
t. 613.724.9932 f. 613.724.1209 rlaarchitecture.ca

PROJECT TITLE:

1869 MAPLE GROVE ROAD

OTTAWA ONTARIO

SHEET TITLE:

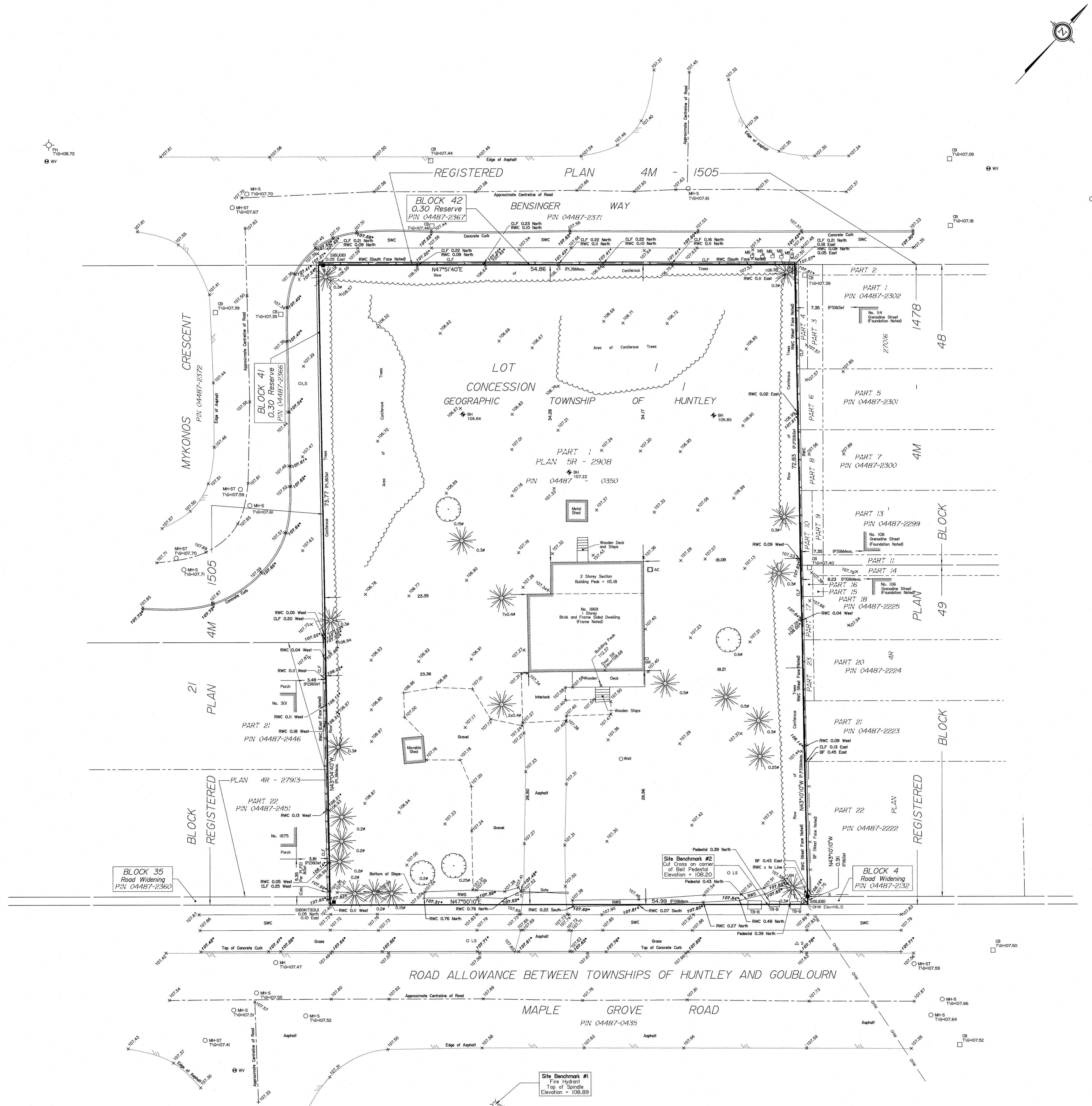
SITE PLAN

DRAWN:	CHECKED:
L.M.	R.V.
SCALE: 1:200	SHEET No. SP-00
PROJECT No. 1921	

D07-XX-XXX-XXXX

PLOT DATE: Tuesday, July 21, 2020

Plan No.: #XXXXX



SURVEYOR'S REAL PROPERTY REPORT

PART 1 Plan of

PART OF LOT 1
CONCESSION 1
GEOGRAPHIC TOWNSHIP OF HUNTLEY
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 200

8.0 6.0 4.0 2.0 0 4 8 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 20th day of December, 2019.

Dec 24/19
Date

T. Hartwick
Ontario Land Surveyor

PART 2
THIS PLAN MUST BE READ IN CONJUNCTION WITH SURVEY REPORT DATED: December 24th, 2019

Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
(WIT)	"	Witness
(OU)	"	Origin Unknown
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(PL)	"	Registered Plan 4M-1505
(P)	"	Registered Plan 4M-1478
(P1)	"	Plan 4R-22948
(P2)	"	Plan 4R-27913
(P3)	"	Plan 4R-27016
	"	Deciduous Tree
	"	Coniferous Tree
FH	"	Fire Hydrant
WV	"	Water Valve
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
MH	"	Maintenance Hole (Unidentified)
OHW	"	Overhead Wires
CB	"	Catch Basin
BH	"	Borehole
GM	"	Gas Meter
TB-B	"	Bell Terminal Box
S	"	Sign
CLF	"	Chain Link Fence
BF	"	Board Fence
	"	Gate
UP	"	Utility Pole
AN	"	Anchor
LS	"	Light Standard
AC	"	Air Conditioner
C/L	"	Centreline
Ø	"	Diameter
RWS	"	Stone Retaining Wall
RWC	"	Concrete Retaining Wall
SWC	"	Concrete Sidewalk
+ 65.00	"	Location of Elevations
+ 65.00*	"	Top of Concrete Curb and Retaining Wall
MB	"	Mail Box

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2104127
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
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Ontario Land Surveyors

Job No. 20061-19 C Zayoun PtLt1 C1 HU D D2 | AR