

**FUNCTIONAL SERVICING &
STORMWATER MANAGEMENT REPORT**

**961 BIG BAY POINT ROAD
RESIDENTIAL DEVELOPMENT
HEWITTS CREEK SECONDARY PLAN
CITY OF BARRIE**

**PREPARED FOR:
961 BIG BAY LTD.**

**PREPARED BY:
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AUGUST 2017

CFCA FILE NO. 1406-4654

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Revision Number	Date	Comments
Rev. 0	August 2017	Issued for Draft Plan Approval

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1.0 INTRODUCTION

C.F. Crozier & Associates Inc. (Crozier) was retained by 961 Big Bay Ltd. to complete a Functional Servicing and Stormwater Management Report in support of a Draft Plan Application (DPA) for a proposed residential development within Hewitt's Creek Secondary Plan Area in the City of Barrie.

The 0.65 hectare (1.61 acre) property is located at 961 Big Bay Point Road, west of 20th Sideroad and east of Price William Way. The property is bounded by Big Bay Point Road to the north, future Miele Developments Inc. residential development to the east, future 1597229 Ontario Inc. residential development to the south, and an existing residential development of detached houses to the west. Figure 1 illustrates the site location.

The initial Draft Plan includes 16 proposed residential lots with minimum 10.5 m (34.5 foot) frontages onto future Street 'A', an 18.0 m right of way, with mirror image residential lots proposed across the street that are part of an adjacent Draft Plan Application. The proposed development Draft Plan has been included as Figure 2.

The purpose of this report is to outline the proposed internal servicing and stormwater management strategies for the subject lands.

2.0 BACKGROUND

The 961 Big Bay Ltd. development lands are located at the northeast limits of the Hewitt's Secondary Plan Area and can be seen in the Overall Development Plan as 'Land Parcel Z' in Figure 3. The development of the subject lands will require coordination with the adjacent landowners in the Hewitt's Developer's Group as there is proposed local infrastructure that will benefit all parties

The proposed draft plan consists of 16 proposed residential lots with minimum 10.5 m frontage onto future Street 'A' on the 0.65 hectare property. The proposed development is one of many parcels in the 652 ha of Hewitt's Secondary Plan, and will be developed during Phase 1 of the development of City of Barrie's annexation lands.

Several documents/plans were reviewed in the course of completing this engineering assessment. As such, the servicing and design considerations contained herein are dependent on the following:

- City of Barrie Secondary Plan, Background Studies & Infrastructure Master Plans, prepared for the City of Barrie
 - Wastewater Treatment Master Plan by Genivar Inc. – October 2013
 - Wastewater Collection Master Plan by AMEC – October 2013
 - Water Supply Master Plan by Genivar Inc. – October 2013
 - Water Storage and Distribution Master Plan by AMEC – October 2013
 - Drainage and Stormwater Management Master Plan by AMEC – October 2013
 - Multi-Modal Active Transportation Master Plan by Genivar Inc. – January 2014
- Section 9.0 of Amendment No. 39 to the City of Barrie Official Plan for Hewitt's Secondary Plan, prepared by the City of Barrie in June 2014
- Subwatershed Impact Study (SIS) Lover's, Hewitt's and Sandy Cove Creeks by R.J. Burnside & Associates Ltd. – September 2016

- Hewitt's Secondary Plan Area Municipal Class Environmental Assessment Study – Schedule C by Hatch Ltd. – June 2017
- Draft Plan of Subdivision Functional Design Review by LEA Consulting Ltd. – May 2017

3.0 SITE DESCRIPTION

The subject development lands consist of a 0.65 hectare (1.61 acre) parcel of land located in the northeast limits of Hewitt's Secondary Plan Area within the annexed lands in the City of Barrie. The existing site consists of a 110-metre long driveway, an existing residential unit and a separate garage. The south end of the site is covered by woodland and the remaining space is covered by lawn. Trees border the east, south and west sides of the property. Beyond the trees to the west, there is an existing residential development of detached houses.

Along the west property line there are two existing double catchbasins that currently capture the drainage from the site.

Under proposed conditions for Hewitt's Secondary Plan Area, areas south and east of the site will be developed into residential areas. Big Bay Point Road, located north of the site, will be expanded to a 34 metre wide R.O.W.

The site is predominantly flat, with a slight depression towards the centre of the lot. On-site soils are classified as Sargent, a gravelly, sandy loam. This soil type is considered Hydrologic Soil Group A (Design Chart 1.08, MTO Drainage Design Manual, 1997).

4.0 ROAD STANDARD

Big Bay Point Road fronting #961 is currently a rural 2 lane road cross-section. A Municipal Class Environmental Assessment (EA) was prepared by Hatch Ltd. to address transportation improvements for Hewitt's Secondary Plan Area. The EA proposes to expand Big Bay Point Road to a 34m R.O.W. at the frontage of the site. Refer to Appendix C for Big Bay Point Road's existing and proposed road elevations excerpt from the EA.

The 16 proposed residential units will front onto an 18.0m wide R.O.W., Street 'A'. Street 'A' is to be designed and constructed by Miele Developments Inc., the owners of the Land Parcel east of the site, prior to the construction of the development at 961 Big Bay Point Road. Street 'A' will be designed per municipal standards and will provide roadway connections to the adjacent residential developments south, east and west of the site. Adequate access for emergency vehicles will be provided on Street 'A'. Preliminary grading for Street 'A' is provided on Figure 8 of Appendix C.

5.0 SANITARY SERVICING

5.1 Sanitary Servicing Context

The Subwatershed Impact Study Prepared by R.J. Burnside proposed sanitary sewers throughout Hewitt's SPA. At the location of 961 Big Bay Point Road, a local sewer is proposed to run north to south and connect to a local trunk sewer that will continue south. At the intersection of Street 'A' and the future extension of

Sovereigns Gate, the trunk sewer will continue west and connect to the existing sanitary sewer system. The connection will be at an invert of 255.53 to a manhole at the eastern most part of the existing Sovereigns Gate, shown as Connection E9 in Figure 15 from the SIS included in Appendix C. There is a 250mm diameter sanitary sewer that continues downstream of this connection point.

The SIS determined the peak flow to E9 to be 15.5 L/s, with a total pipe capacity of 37.6 L/s. Flow from this manhole will continue west into the existing residential development via a 250mm diameter trunk sewer.

A Wastewater Treatment Master Plan was prepared by Genivar Inc. as part of the Infrastructure Master Plan for the Intensification & Annexed Lands for the City of Barrie. This report evaluated different alternatives to address the increase in wastewater flow demand. The existing wastewater treatment plant (WWTP) has a rated capacity of 76,000 m³/day and a peak flow rate of 156,000 m³/day. The proposed annexation would exceed the daily capacity by 4,000 m³/day by the completion of the annexation development in 2031. To address this issue, the City will make improvements to water efficiency, and improve inflow and infiltration control conditions for a maximum potential flow reduction of 5,000 m³/day. A Phase 1 expansion to the tertiary treatment at the Barrie WWTP will be completed to reduce the effluent limits to Lake Simcoe to comply with the Lake Simcoe Phosphorus Reduction Strategy (2010). It is assumed that the City of Barrie will make adequate preparations for the increased flows from the annexation lands prior to completing the proposed development.

5.2 Proposed Servicing

Sanitary flows from the site will be serviced by a local sanitary sewer on Street 'A'. The site has 16 proposed residential units across 0.65 ha, designating the site as a low density residential development as per the City of Barrie Standards.

Preliminary sanitary flows for the site were estimated using the following values, per the City of Barrie Standards:

- Average Flow Rate - 225 L/cap/day
- Infiltration – 0.1 L/s/ha
- Peaking Factor – 4.3 (Harmon)
- Population Density – 3.13 Persons/Unit

Based on these values it is estimated that peak sanitary flow from the site will be 0.63 L/s. Sanitary flows from the site will be directed to proposed local collector and local trunk sewers on Street 'A', which will connect to a 250mm trunk sewer at Connection E9. The local sewer will be designed by others. Refer to Appendix A for sanitary servicing demand calculations and Appendix C for the Proposed Sanitary Sewer Plan.

6.0 POTABLE WATER SERVICING

6.1 Water Servicing Context

R.J. Burnside included a Proposed Water Distribution Plan as Figure 12 of the SIS. A 400mm diameter trunk watermain is proposed along Big Bay Point Road. Per Figure 12, a network of 200mm and 300mm diameter local trunk watermain and local watermain will be provided throughout Hewitt's Secondary Plan Area. Confirmation of the available flows and pressures are required in cooperation with the City to confirm the capacity in this system.

6.2 Proposed Servicing

The site will be serviced by a local watermain that is proposed along Street 'A'. This watermain will connect to the proposed network for Hewitt's SPA via adjacent local watermain and the local trunk watermain running along a collector road east of the site. Individual service connections for each unit will be provided from the local watermain. The exact size of the watermain required in order to provide adequate flows and fire protection will be confirmed with the Town in the detailed design process. Likewise, available pressures expected throughout the proposed development will be confirmed. Fire hydrants and valve spacing will also be determined during detailed design, subject to applicable City Standards.

Preliminary water demands for the site were estimated using the following criteria as specified in the City of Barrie's Guidelines:

- Average Flow Rate - 225 L/cap/day
- Peak Factors: Peak Day/ Peak Hour – 2.75/4.13
- Population Density – 3.13 Persons Per Unit

Based on these values it is estimated that water demands for the site are as follows:

- Average Day – 0.13 L/s
- Max Day – 0.36 L/s
- Peak Hour – 0.54 L/s

Preliminary fire flows required to service the site were determined to be 76 L/s for the residential requirement as per MOE Design Guidelines (2008). The total design flow for the water distribution system is 76.36 L/s. Refer to Appendix A for potable water servicing demand calculations and Appendix C for the Proposed Water Distribution Plan.

7.0 UTILITIES

Amendment OPA No. 39 to the Official Plan of the City of Barrie states that "Prior to approval of development within the Hewitt's Secondary Plan Area, all interested telecommunications providers and required utilities providers shall work with landowner(s) and the City to confirm their plans for services to support the proposed development. The City shall work with the providers to determine appropriate locations for large equipment or cluster sites."

Telephone, gas, cable and hydro are proposed to be available within the future right of ways fronting the development. Coordination for extension of and connection to existing services will be undertaken as development approvals advance.

8.0 STORMWATER MANAGEMENT AND URBAN DRAINAGE

Stormwater management (SWM) for the proposed Plan of Subdivision must comply with the policies and standards of various agencies including the City of Barrie and the Lake Simcoe Region Conservation Authority (LSRCA).

8.1 Stormwater Management Context

The Subwatershed Impact Study prepared by R.J. Burnside outlined the proposed stormwater infrastructure and grading for Hewitt's Secondary Plan Area. The site is located in within catchments 16 and 16a. A proposed stormwater management facility, denoted as SWMF#16, has been designed to provide quality and quantity control for stormwater from Catchment 16. Runoff from this catchment will be routed to SWMF#16 via proposed storm sewers that will be designed to capture flows from the 5-year storm event. The SWM facility will outlet via a proposed storm sewer and will be routed to the existing system at Versailles Crescent. Catchment 16a is proposed to be captured in existing rear yard double ditch inlet catch basins and drain directly to the existing storm sewer system. Refer to Appendix C for Figure 11 from the SIS for the Proposed Storm Sewer Plan.

Per pages 129-130 of the SIS included in Appendix C of this report, the site is located within a Significant Groundwater Recharge Area (SGRA) and is "the most suitable area in Hewitt's Secondary Plan for infiltration LID measures" due to low groundwater levels and a high hydraulic conductivity in the native soil.

8.2 Proposed Site Drainage Conditions

The development will incorporate a "dual" drainage system consisting of storm sewers and catchbasins (minor system) and the use of the roadway and overland flow routes (major system).

Per Figure 11 from the SIS, the site is split into two Catchments; 16 and 16a. Catchment 16 includes the front halves of proposed lots 8 to 16. The minor system flow routes will direct runoff up to the 5 year storm from this portion of the site toward the proposed SWM facility (SWMF#16) located east of the site via the proposed storm sewer in Street 'A'. The SWM facility will provide adequate quantity and quality control for these flows, as it was designed to account for drainage from Catchment 16.

Proposed overland flow routes will direct runoff from Catchment 16 to SWMF#16. Refer to Appendix C for Figure 11 and Figure 8 from the SIS.

The remainder of the site is located within Catchment 16a. This includes the rear halves of proposed lots 8 to 16, as well as lots 1 through 7. Runoff generated in these areas will be directed towards the west property line and will be captured in the existing storm system. There are two existing double ditch inlet catchbains (DICB) located between existing Versailles Cres. lots 381 and 382, and lots 385 and 386, as well as a rear lot catchbasin (RLCB) located between lots 388 and 389. Each double DICB discharges to a 750mm diameter

concrete storm pipe connecting to the existing storm system along Versailles Crescent, providing sufficient capacity to capture flows up to the 100 year storm. Refer to Appendix C for as-built storm sewer drawings of Versailles Crescent.

Per page 92 of the SIS, Catchment 16a can discharge to the storm sewer system without treatment, provided the future peak flows to these inlets do not exceed existing conditions. As the site is located in a SGRA and is the most suitable area for LIDs in Hewitt's SPA, implementation of LIDs will be investigated during the detailed design stage. LIDs located in the rear yards of the proposed lots will be considered to decrease peak flows and provide partial quantity and quality treatment for the runoff produced in Catchment 16a.

The SIS proposed that the outlet pipe for SWMF#16 connect to the existing system at Versailles Crescent. The connection will be made at the existing double DICB located between lots 385 and 386. This portion of the proposed storm sewer system will have capacity to convey and capture flows up to the 100 year storm. The connection will require an easement through 961 Big Bay Point Road between Street 'A' and the existing double DICB at the rear lot line. To accommodate this, a 3m easement will be provided along the property line of proposed lots 9 and 10, increasing the required side yard easement from 1.2m to 1.5m on the side adjacent to the storm pipe.

A hydrologic stormwater model was created using SWMHYMO to analyze and compare pre- and post-development conditions. Rainfall events were modeled using the IDF data provided in the City of Barrie Design Standards. The 4 hour Chicago and 24 hour SCS Type II rainfall distributions were used in the model. It was found that the 4 hour Chicago peak flows represented the worst case scenario for post-development conditions, and were therefore used in establishing stormwater controls. A summary of resultant peak flows is presented in Table 1. Refer to Appendix B for the input parameters, model input and the model output summary.

Table 1: Pre- and Post-Development Drainage Conditions (m³/s)

	25mm	2-year	5-year	10-year	25-year	50-year	100-year	Hurricane Hazel
PRE	0.004	0.013	0.024	0.032	0.045	0.054	0.067	0.057
POST 16	0.011	0.015	0.021	0.025	0.032	0.036	0.043	0.022
POST 16a	0.008	0.012	0.022	0.029	0.042	0.052	0.065	0.053

The larger storm events yield a smaller peak flow to the double DICBs in the post-development condition (Post 16a). There is a slight increase in flow to the DICBs for the more frequent storm events. As mentioned above, LID measures will be considered in the rear yards. This will reduce the peak flows exceeding pre-development conditions to appropriate values.

Design details have been reflected on the General Site Servicing Plan and Preliminary Grading Plan included in this report as Figure 4 and Figure 5, respectively.

9.0 CONCLUSIONS

Based on the foregoing, we conclude the proposed Residential Development in the City of Barrie's annexation lands can be adequately serviced and drained.

1. Access to the site will be provided by way of roadway connections from Street 'A' to the adjacent residential developments to the south, east and west of the site. Each lot will front onto Street 'A'.
2. Existing and proposed sanitary services are in proximity to the site and present suitable servicing conditions for the proposed development. The site will be serviced by a local sewer in Street 'A' that will discharge to a trunk sewer that joins to the existing sanitary system at Connection E9. The site will contribute 0.63 L/s to the system at peak flow conditions.
3. Water services can be provided by way of a proposed trunk watermain on Big Bay Point Road and a local watermain along Street 'A'. Individual service connections to each residential unit will be provided. The design flow for the water distribution system is 76.36 L/s. Confirmation of the existing flow/pressure conditions will be undertaken in conjunction with the City.
4. A stormwater management facility accounting for development of the subject lands has been included as part of the SIS drainage plan for the annexation lands. A storm sewer and catchbasin system is proposed along Street 'A' to provide a connection to the trunk storm sewer to direct flows to the SWM facility. Street 'A' will provide an overland flow route to direct water safely away from the development towards Big Bay Point Road. Remaining flows from the site will be directed to the rear yard double DICBs and will discharge to the existing storm sewer system.

Given the above noted conclusions, we support the development of the subject lands from the perspective of engineering servicing and stormwater management requirements. Should you have any questions regarding the enclosed material, please call the undersigned.

Respectfully submitted,

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APPENDIX A

Sanitary and Potable Water Design Calculations



File: 1406-4654
Date: 12-Jul-17
Updated 12-Jul-17
By: JE
Check By: RA

961 Big Bay Point Rd - Sanitary Design Criteria

Developed Site Area		0.65	ha
Number of Residential Units			
	Site	16	units
	TOTAL:	16	units
		25	units/ha
Person Per Residential Unit	(Low Density, City of Barrie Standards)	3.13	persons/unit
Residential Population		50	persons
<u>Unit Sewage flows</u>			
Residential	(City of Barrie Standards)	225	L/C-day
Infiltration (typical)		0.1	L/s/ha
<u>Total Design Sewage Flows</u>			
Infiltration/Inflow Residential		0.07	L/s
Average Daily Residential Flow		0.13	L/s
Residential Peak Factor	(Harmon Formula, City of Barrie Standards)	4.3	
Total Peak Daily Flow		0.63	L/sec



File: 1406-4654
Date: 21-Aug-17
Updated: 21-Aug-17
By: JE
Check By: RA

961 Big Bay Point Rd - Water Design Criteria

Developed Site Area	0.65	ha
Number of Residential Units	16	units
Person Per Residential Unit (Low Density, City of Barrie Standards)	3.13	persons/unit
Residential Population	50	persons
<u>Domestic Water Design Flows</u>		
Residential (per City of Barrie Standards)	225	L/C-day
<u>Total Domestic Water Design Flows</u>		
Average Residential Daily Flow (per MOE Design Guidelines 2008)	0.13	L/sec
Max Day Peak Factor (per MOE Design Guidelines 2008)	2.75	
Max Day Demand Flow	0.36	L/sec
Peak Hour Factor (per MOE Design Guidelines 2008)	4.13	
Peak Hour Flow	0.54	L/sec
Fire Flow Demand (per City of Barrie Guidelines)	76	L/sec
Design Flow (Max Day + Fire Flow, per City of Barrie Guidelines)	76.36	L/sec

APPENDIX B

Hydrologic Modeling and Stormwater Management

Hydrologic Input Parameters

Pre-Development (CHICAGO) SWMHYMO Input and Output

Pre-Development (SCS) SWMHYMO Input and Output

Post-Development (CHICAGO) SWMHYMO Input and Output

Post-Development (SCS) SWMHYMO Input and Output



Project Name: 961 Big Bay Ltd.
 Project Number: 1406-4654
 Date: 8/21/2017
 By: JE

D.A. NAME PRE
 D.A. AREA (ha) 0.65

Hydrologic Parameters: CALIB NASHYD Command
Pre Development Drainage Area: Catchment PRE

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Sargent	Stsl	A	100	0.65
				0
				0
				0
Total Area				0.65

Impervious Landuses Present:											
		Roadway		Sidewalk		Driveway		Building		SWMF	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Subtotals
Stsl		98		98	0.06	98	0.03	98		98	Area A*CN
0		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
0		98		98		98		98		98	0 0
Subtotal Area	0		0		0.0562		0.0287		0		
Pervious Landuses Present:											
		Woodland		Meadow		Wetland		Lawn		Cultivated	
Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Subtotals
Stsl	0.20	32	0.00		0.00		0.37	49	0.00		Area A*CN
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
0	0.00		0.00		0.00		0.00		0.00		0.00 0.00
Subtotal Area	0.20		0.00		0.00		0.37		0.00		
Composite Area Calculations										Total Pervious Area	
										Total Impervious Area	
										% Impervious	
										Composite Curve Number	
										Total Area Check	
										0.57	
										0.08	
										13.00%	
										50.3	
										0.65	

Initial Abstraction and Tp Calculations

Initial Abstraction				Composite Runoff Coefficient							
Landuse	IA (mm)	Area (ha)	A * IA	Sargent		0		0		0	
				RC	Area	RC	Area	RC	Area	RC	Area
Woodland	10	0.20	1.95	0.08	0		0		0		0
Meadow	8	0	0		0		0		0		0
Wetland	16	0	0		0		0		0		0
Lawn	5	0.37	1.86	0.10	0		0		0		0
Cultivated	7	0	0		0		0		0		0
Impervious	2	0.08	0.17	0.95	0		0		0		0
Composite IA		0.65	6.11	Composite Runoff Coefficient							0.20

Time to Peak Inputs						Uplands			Bransby Williams		Airport	
Flow Path Description	Length (m)	Drop (m)	Slope (%)	V/S ^{0.5}	Velocity (m/s)	Tc (hr)	Tp (hr)	TOTAL Tp (hr)	Tc (hr)	Tp (hr)	Tc (hr)	Tp (hr)
Sheet	78	1.56	2.00%	2.3	0.33	0.07	0.04	0.04	0.11	0.07	0.43	0.29
Ditch	46	0.92	2.00%	2.3	0.33	0.04	0.03	0.07				

Appropriate calculated time to peak: 0.29 Appropriate Method: Airport



Project Name: 961 Big Bay Ltd.
 Project Number: 1406-4654
 Date: 8/21/2017
 By: JE

D.A. NAME
 D.A. AREA (ha)

POST (16)
 0.17

Hydrologic Parameters: CALIB STANDHYD Command
Post Development Drainage Area: Catchment POST (16)

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Sargent	Stsl	A	100	0.17
				0
				0
				0
Total Area Check				0.17

Impervious Landuses Present:													
	Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals		
	Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
Stsl			98			0.05	98			0.07	98		
0			98				98				98	0	0
0			98				98				98	0	0
0			98				98				98	0	0
Subtotal Area		0			0		0.05			0.07		0	

Pervious Landuses Present:													
	Woodland			Meadow		Wetland		Lawn		Cultivated		Subtotals	
	Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
Stsl		0		0		0		0.06	49	0		0.06	2.75
	0	0		0		0		0		0		0	0
	0	0		0		0		0		0		0	0
	0	0		0		0		0		0		0	0
Subtotal Area		0		0		0		0.06		0			

				Pervious Area Calculations	Total Pervious Area	0.06
					Composite Pervious Curve Number	49
				Impervious Area Calculations	Total Directly Connected Area	0.05
					Total Indirectly Connected Area	0.07
					Total Impervious Area	0.12
					% X imp	27.9
					% T imp	67.8
				Total Area Check		0.17

Initial Abstraction and Tp Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	0.06	0.28
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	2%	20	0.25
Impervious	2.5	2%	20	0.013



Project Name: 961 Big Bay Ltd.
 Project Number: 1406-4654
 Date: 8/21/2017
 By: JE

D.A. NAME POST (16a)
 D.A. AREA (ha) 0.48

Hydrologic Parameters: CALIB STANDHYD Command
Post Development Drainage Area: Catchment POST (16a)

Curve Number Calculation

Soil Types Present:				
Type	ID	Hydrologic Group	% Area	Area
Sargent	Stsl	A	100	0.48
				0
				0
				0
Total Area Check				0.48

Impervious Landuses Present:													
	Roadway		Sidewalk		Driveway		Building		SWMF		Subtotals		
	Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
Stsl			98			0.04	98			0.18	98	0.21	21.06
0			98				98				98	0	0
0			98				98				98	0	0
0			98				98				98	0	0
Subtotal Area		0			0		0.04			0.18		0	

Pervious Landuses Present:													
	Woodland		Meadow		Wetland		Lawn		Cultivated		Subtotals		
	Soils	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area (ha)	CN	Area	A*CN
Stsl		0		0		0		0.26	49	0		0.26	12.94
	0	0		0		0		0		0		0	0
	0	0		0		0		0		0		0	0
	0	0		0		0		0		0		0	0
Subtotal Area		0		0		0		0.26		0			

				Pervious Area Calculations	Total Pervious Area	0.26
					Composite Pervious Curve Number	49
				Impervious Area Calculations	Total Directly Connected Area	0.04
					Total Indirectly Connected Area	0.18
					Total Impervious Area	0.21
					% X imp	7.9
					% T imp	44.9
				Total Area Check		0.48

Initial Abstraction and Tp Calculations

Landuse	IA (mm)	Area (ha)	A * IA
Woodland	10	0	0
Meadow	8	0	0
Wetland	16	0	0
Lawn	5	0.26	1.32
Cultivated	7	0	0

Land Use	IA (mm)	Slope (%)	Travel Length (m)	Manning's n
Pervious	5.0	2%	35	0.25
Impervious	2.5	2%	25	0.013

Soil Map



Legend

Parcels

- Assessment Parcel
- Farm Tax Rated Parcels - Current Year
- Farm Tax Rated Parcels - Previous Year

Live Data

Administrative

- Conservation Authority
- Geographic Township
- Lots
- Ontario Public Sector Region
- Lower or Single Tier Municipality
- Upper Tier or District Municipality

Municipality

- Conservation Reserve
- Enhanced Management Area
- Forest Reserve
- General Use Area
- Protected Area - Far North
- Provincial Park
- Provincial Wildlife Area
- Recommended Conservation Reserve
- Recommended Provincial Park
- Wilderness Area

Environment/Base

- Drain Connection
- ANSI
- NTS 50K Gnd
- Quaternary Watersheds
- Tertiary Watersheds
- Secondary Watersheds
- Soils - Outline

Agricultural Tile Drainage - System Type

- Random
- Systematic

Constructed Drain Type

- Closed/Tiled
- Open or Unknown

Controlled Drainage Class

- Fair
- Good
- Poor

Drain Classification - DFO Class Authorization Type

- A
- B
- C
- D
- E
- F

Crown Land

Primary Land Use Area

- Conservation Reserve
- Enhanced Management Area
- Forest Reserve
- General Use Area
- Protected Area - Far North
- Provincial Park
- Provincial Wildlife Area
- Recommended Conservation Reserve
- Recommended Provincial Park
- Wilderness Area

Soils - CLI

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic Soil
- Unclassified
- Water

Soils - Drainage

- Not Applicable
- Imperfectly Drained
- Moderately Well Drained
- Poorly Drained
- Rapidly Drained
- Variable
- Very Poorly Drained
- Very Rapidly Drained
- Well Drained
- Water

Soils - Hydrologic Soil Group

- A
- B
- C
- D



0 0.7 km



This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

```

00001> 2 Metric units
00002>
00003> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00004> # Date : August 10, 2017
00005> # Modeller : [J.Elder]
00006> # Company : C.F. Crozier & Associates Inc.
00007> # License # : 3737616
00008> #
00009> # Filename : Pre_CHI
00010> # 961 Big Bay - Pre Development - CHI Storms
00011> #
00012>
00013> #
00014> START TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[0]
00015> # [ ] <- storm filename, one per line for NSTORM time
00016> #
00017> %
00018> %
00019> #
00020> #
00021> # 25mm Event (4-hour Chicago)
00022> #
00023> %
00024> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00025> ICASECS=[1],
00026> A=[508.708], B=[6.662], and C=[0.819],
00027> %
00028> #
00029> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00030> DMF=[0](cms), CN=[50.3],
00031> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00032> RAINFALL[ , , ], END=-1
00033> %
00034>
00035>
00036>
00037> #
00038> #
00039> # 2 Year Event (4-hour Chicago)
00040> #
00041> %
00042> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00043> ICASECS=[1],
00044> A=[807.44], B=[6.75], and C=[0.828],
00045> #
00046> #
00047> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00048> DMF=[0](cms), CN=[50.3],
00049> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00050> RAINFALL[ , , ], END=-1
00051> %
00052>
00053>
00054>
00055> #
00056> #
00057> # 5 Year Event (4-hour Chicago)
00058> #
00059> %
00060> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00061> ICASECS=[1],
00062> A=[1135.4], B=[7.5], and C=[0.841],
00063> #
00064> #
00065> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00066> DMF=[0](cms), CN=[50.3],
00067> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00068> RAINFALL[ , , ], END=-1
00069> %
00070>
00071>
00072>
00073> #
00074> #
00075> # 10 Year Event (4-hour Chicago)
00076> #
00077> %
00078> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00079> ICASECS=[1],
00080> A=[1387], B=[7.97], and C=[0.852],
00081> #
00082> #
00083> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00084> DMF=[0](cms), CN=[50.3],
00085> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00086> RAINFALL[ , , ], END=-1
00087> %
00088>
00089>
00090>
00091> #
00092> #
00093> # 25 Year Event (4-hour Chicago)
00094> #
00095> %
00096> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00097> ICASECS=[1],
00098> A=[1076.2], B=[8.30], and C=[0.858],
00099> #
00100> #
00101> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00102> DMF=[0](cms), CN=[50.3],
00103> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00104> RAINFALL[ , , ], END=-1
00105> %
00106>
00107>
00108>
00109> #
00110> #
00111> # 50 Year Event (4-hour Chicago)
00112> #
00113> %
00114> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00115> ICASECS=[1],
00116> A=[1073.1], B=[9.00], and C=[0.868],
00117> #
00118> #
00119> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00120> DMF=[0](cms), CN=[50.3],
00121> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00122> RAINFALL[ , , ], END=-1
00123> %
00124>
00125>
00126>
00127> #
00128> #
00129> # 100 Year Event (4-hour Chicago)
00130> #
00131> %
00132> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00133> ICASECS=[1],
00134> A=[2193.1], B=[9.04], and C=[0.871],
00135> #
00136> #
00137> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00138> DMF=[0](cms), CN=[50.3],
00139> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00140> RAINFALL[ , , ], END=-1
00141> %
00142>
00143>
00144>
00145> #
00146> #

```

```

00147> # Hurricane Hazel Storm (Regional)
00148> #
00149> #
00150> READ STORM STORM_FILENAME=["hazel.stm"]
00151> #
00152> #
00153> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00154> DMF=[0](cms), CN=[50.3],
00155> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00156> RAINFALL[ , , ], END=-1
00157> %
00158>
00159>
00160>
00161>
00162> FINISH
00163>
00164>

```

```

00001> =====
00002>
00003> SSSS W W M M H H Y Y M M 000 222 000 11 77777 =
00004> S W W W M M M H H Y Y M M 0 0 2 0 0 11 7 7
00005> SSSS W W W M M M H H H Y Y M M 0 0 2 0 0 11 7 V
00006> S W W M M M H H Y Y M M 0 0 222 0 0 11 7 A
00007> SSSS W W M M H H Y Y M M 000 2 0 0 11 7 =
00008>
00009> Stormwater Management Hydrologic Model 222 000 11 7 =
00010>
00011>
00012> ***** SWMHYMO Ver4.05.0 *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTTHYMO-83 and OTTHYMO-89 *****
00016>
00017> ***** distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 836-3884 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhyom@jfsa.com *****
00021>
00022>
00023> *****
00024> ***** Licensed user: C.F. Crozier & Associates Inc. *****
00025> ***** Collingwood SERIAL#:3737016 *****
00026> *****
00027> *****
00028> ***** PROGRAM ARRAY DIMENSIONS *****
00029> ***** Maximum value for ID numbers : 11 *****
00030> ***** Max. number of rainfall points: 105408 *****
00031> ***** Max. number of flow points : 105408 *****
00032> *****
00033> *****
00034> *****
00035> ***** S U M M A R Y O U T P U T *****
00036> *****
00037> *****
00038> * RUN DATE: 2017-08-22 TIME: 13:46:38 RUN COUNTER: 000003
00039> *****
00040> * Input File: C:\Working SWMHYMO\Big Bay\Pre_CHI.dat
00041> * Output File: C:\Working SWMHYMO\Big Bay\Pre_CHI.out
00042> * Summary file: C:\Working SWMHYMO\Big Bay\Pre_CHI.sum
00043> * User comments:
00044> 1:
00045> 2:
00046> 3:
00047> *****
00048>
00049> *****
00050> *****
00051> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00052> # Date : August 19, 2017
00053> # Modeler : [J.Elder]
00054> # Company : C.F. Crozier & Associates Inc.
00055> # License # : 3737016
00056> *****
00057> # Filename : Pre_CHI
00058> # 961 Big Bay - Pre Development - CHI Storms
00059> *****
00060> *****
00061> RUN# COMMAND#
00062> R0001:C00001-----
00063> START
00064> [ZERO = .00 hrs on 0]
00065> [METOUT= 2 (1=imperial, 2=metric output)]
00066> [NSTORM= 0 ]
00067> [NRUN = 0001 ]
00068> *****
00069> *****
00070> *****
00071> # 25mm Event (4-hour Chicago)
00072> *****
00073> R0001:C00002-----
00074> CHICAGO STORM
00075> [SDT= 5.00:SDUR= 4.00:PTOT= 24.99]
00076> [A/B/C= 568.700/ 6.662/ .819]
00077> *****
00078> R0001:C00003-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00079> CALIB NASHYD 1.0 01:PRE .65 .002 No_date 1:48 1.32 .053
00080> [CN= 50.3: N= 3.00: Tp= .29]
00081> *****
00082> *****
00083> # 2 Year Event (4-hour Chicago)
00084> *****
00085> R0001:C00004-----
00086> CHICAGO STORM
00087> [SDT= 5.00:SDUR= 4.00:PTOT= 33.76]
00088> [A/B/C= 807.440/ 6.750/ .828]
00089> *****
00090> *****
00091> R0001:C00005-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00092> CALIB NASHYD 1.0 01:PRE .65 .004 No_date 1:46 2.75 .081
00093> [CN= 50.3: N= 3.00: Tp= .29]
00094> *****
00095> *****
00096> # 5 Year Event (4-hour Chicago)
00097> *****
00098> R0001:C00006-----
00099> CHICAGO STORM
00100> [SDT= 5.00:SDUR= 4.00:PTOT= 44.07]
00101> [A/B/C=1135.400/ 7.500/ .841]
00102> *****
00103> *****
00104> R0001:C00007-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00105> CALIB NASHYD 1.0 01:PRE .65 .008 No_date 1:45 4.99 .113
00106> [CN= 50.3: N= 3.00: Tp= .29]
00107> *****
00108> *****
00109> # 10 Year Event (4-hour Chicago)
00110> *****
00111> R0001:C00008-----
00112> CHICAGO STORM
00113> [SDT= 5.00:SDUR= 4.00:PTOT= 50.59]
00114> [A/B/C=1387.000/ 7.970/ .852]
00115> *****
00116> *****
00117> R0001:C00009-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00118> CALIB NASHYD 1.0 01:PRE .65 .011 No_date 1:45 6.70 .132
00119> [CN= 50.3: N= 3.00: Tp= .29]
00120> *****
00121> *****
00122> # 25 Year Event (4-hour Chicago)
00123> *****
00124> R0001:C00010-----
00125> CHICAGO STORM
00126> [SDT= 5.00:SDUR= 4.00:PTOT= 59.08]
00127> [A/B/C=1676.200/ 8.300/ .858]
00128> *****
00129> *****
00130> R0001:C00011-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00131> CALIB NASHYD 1.0 01:PRE .65 .015 No_date 1:44 9.24 .156
00132> [CN= 50.3: N= 3.00: Tp= .29]
00133> *****
00134> *****
00135> # 50 Year Event (4-hour Chicago)
00136> *****
00137> R0001:C00012-----
00138> CHICAGO STORM
00139> [SDT= 5.00:SDUR= 4.00:PTOT= 65.66]
00140> [A/B/C=1973.100/ 9.000/ .868]
00141> *****
00142> *****
00143> R0001:C00013-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00144> CALIB NASHYD 1.0 01:PRE .65 .019 No_date 1:44 11.42 .174
00145> [CN= 50.3: N= 3.00: Tp= .29]
00146> *****

```

```

00147> *****
00148> # 100 Year Event (4-hour Chicago)
00149> *****
00150> R0001:C00014-----
00151> CHICAGO STORM
00152> [SDT= 5.00:SDUR= 4.00:PTOT= 71.77]
00153> [A/B/C=2193.100/ 9.040/ .871]
00154> *****
00155> *****
00156> R0001:C00015-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00157> CALIB NASHYD 1.0 01:PRE .65 .023 No_date 1:44 13.62 .190
00158> [CN= 50.3: N= 3.00: Tp= .29]
00159> *****
00160> *****
00161> # Hurricane Hazel Storm (Regional)
00162> *****
00163> *****
00164> R0001:C00016-----
00165> READ STORM
00166> Filename = hazel.stm
00167> Comment = Hurricane Hazel
00168> [SDT=60.00:SDUR= 12.00:PTOT= 212.00]
00169> *****
00170> *****
00171> R0001:C00017-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00172> CALIB NASHYD 1.0 01:PRE .65 .055 No_date 10:00 92.79 .438
00173> [CN= 50.3: N= 3.00: Tp= .29]
00174> R0001:C00018-----
00175> FINISH
00176> *****
00177> *****
00178> WARNINGS / ERRORS / NOTES
00179> *****
00180> Simulation ended on 2017-08-22 at 13:46:38
00181> *****
00182> *****

```

```

00001> 2 Metric units
00002> "*****
00003> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00004> # Date : August 10, 2017
00005> # Modeller : [J.Elder]
00006> # Company : C.F. Crozier & Associates Inc.
00007> # License # : 3737616
00008> "*****
00009> # Filename : Pre_SCS
00010> # 961 Big Bay - Pre Development - SCS Storms
00011> "*****
00012>
00013> "*****
00014> START TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[0]
00015> # [ ] <- storm filename, one per line for NSTORM time
00016> "*****
00017> "%-----|-----|
00018> "%-----|-----|
00019> "%-----|-----|
00020>
00021> "*****
00022> # 2yr SCS Storm (24hr)
00023> "*****
00024> #
00025> MASS STORM PTOTAL=[45.60](mm), CSDT=[1](min),
00026> CURVE_FILENAME=["SCS24HII.mst"]
00027> "*****
00028> #
00029> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00030> DMF=[0](cms), CN=[50.3],
00031> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00032> RAINFALL[ , , ], END=-1
00033> "%-----|-----|
00034>
00035>
00036> "*****
00037> "*****
00038> # 5yr SCS Storm (24hr)
00039> "*****
00040> #
00041> MASS STORM PTOTAL=[62.4](mm), CSDT=[1](min),
00042> CURVE_FILENAME=["SCS24HII.mst"]
00043> "*****
00044> #
00045> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00046> DMF=[0](cms), CN=[50.3],
00047> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00048> RAINFALL[ , , ], END=-1
00049> "%-----|-----|
00050>
00051>
00052> "*****
00053> "*****
00054> # 10yr SCS Storm (24hr)
00055> "*****
00056> #
00057> MASS STORM PTOTAL=[72.0](mm), CSDT=[1](min),
00058> CURVE_FILENAME=["SCS24HII.mst"]
00059> "*****
00060> #
00061> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00062> DMF=[0](cms), CN=[50.3],
00063> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00064> RAINFALL[ , , ], END=-1
00065> "%-----|-----|
00066>
00067>
00068> "*****
00069> "*****
00070> # 25yr SCS Storm (24hr)
00071> "*****
00072> #
00073> MASS STORM PTOTAL=[86.4](mm), CSDT=[1](min),
00074> CURVE_FILENAME=["SCS24HII.mst"]
00075> "*****
00076> #
00077> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00078> DMF=[0](cms), CN=[50.3],
00079> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00080> RAINFALL[ , , ], END=-1
00081> "%-----|-----|
00082>
00083>
00084> "*****
00085> "*****
00086> # 50yr SCS Storm (24hr)
00087> "*****
00088> #
00089> MASS STORM PTOTAL=[96.0](mm), CSDT=[1](min),
00090> CURVE_FILENAME=["SCS24HII.mst"]
00091> "*****
00092> #
00093> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00094> DMF=[0](cms), CN=[50.3],
00095> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00096> RAINFALL[ , , ], END=-1
00097> "%-----|-----|
00098>
00099>
00100> "*****
00101> "*****
00102> # 100yr SCS Storm (24hr)
00103> "*****
00104> #
00105> MASS STORM PTOTAL=[108.0](mm), CSDT=[1](min),
00106> CURVE_FILENAME=["SCS24HII.mst"]
00107> "*****
00108> #
00109> CALIB NASHYD ID=[1], NHYD=["PRE"], DT[1](min), AREA=[0.653](ha),
00110> DMF=[0](cms), CN=[50.3],
00111> IA=[6.1](mm), N=[3], TP[0.29](hrs),
00112> RAINFALL[ , , ], END=-1
00113> "%-----|-----|
00114>
00115>
00116> FINISH

```

```

00001> =====
00002>
00003> SSSS W W M M H H Y Y M M O O 222 000 11 77777 =
00004> S W W M M M H H Y Y M M O O 2 0 0 11 7 7
00005> SSSS W W M M M H H H Y Y M M O O 2 0 0 11 7 V
00006> S W W M M H H Y Y M M O O 222 0 0 11 7 A
00007> SSSS W W M M H H Y Y M M O O 2 0 0 11 7 =
00008>
00009> StormWater Management Hydrologic Model
00010>
00011>
00012> ***** SWMHYMO Ver4.05.0 *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HMO and its successors *****
00015> ***** CTHYMO-83 and CTHYMO-89 *****
00016>
00017> ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 836-3884 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhymo@jfsa.com *****
00021>
00022>
00023>
00024> ***** Licensed user: C.F. Crozier & Associates Inc. *****
00025> ***** Collingwood SERIAL#:3737016 *****
00026>
00027>
00028> *****
00029> ***** PROGRAM ARRAY DIMENSIONS *****
00030> ***** Maximum value for ID numbers : 11 *****
00031> ***** Max. number of rainfall points: 105408 *****
00032> ***** Max. number of flow points : 105408 *****
00033>
00034>
00035>
00036> ***** S U M M A R Y O U T P U T *****
00037>
00038> * RUN DATE: 2017-08-22 TIME: 13:46:44 RUN COUNTER: 000004
00039>
00040> * Input file: C:\Working SWMHYMO\Big Bay\Pre_SCS.dat
00041> * Output file: C:\Working SWMHYMO\Big Bay\Pre_SCS.out
00042> * Summary file: C:\Working SWMHYMO\Big Bay\Pre_SCS.sum
00043> * User comments:
00044> * 1:
00045> * 2:
00046> * 3:
00047>
00048>
00049>
00050> *****
00051> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00052> # Date : August 10, 2017
00053> # Modeler : [J.F. Sabourin]
00054> # Company : C.F. Crozier & Associates Inc.
00055> # License # : 3737016
00056> *****
00057> # Filename : Pre_SCS
00058> # 961 Big Bay - Pre Development - SCS Storms
00059> *****
00060>
00061> RUN#:COMMAND#
00062> R0001:C00001-----
00063> START
00064> [ZERO = .00 hrs on 0]
00065> [METOUT= 2 (1=imperial, 2=metric output)]
00066> [NSTORM= 0 ]
00067> [NRUN = 0001 ]
00068> *****
00069>
00070>
00071> # 2yr SCS Storm (24hr)
00072> *****
00073>
00074> R0001:C00002-----
00075> MASS STORM
00076> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00077> Comment = 24 hour SCS II storm mass curve
00078> [SDT= 1.00:SDUR= 24.00:PTOT= 45.60]
00079> *****
00080>
00081> R0001:C00003-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00082> CALIB NASHYD 1.0 01:PRE .65 .006 No_date 12:25 5.37 .118
00083> [CN= 50.3: N= 3.00: Tp= .29]
00084> *****
00085>
00086> # 5yr SCS Storm (24hr)
00087> *****
00088>
00089> R0001:C00004-----
00090> MASS STORM
00091> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00092> Comment = 24 hour SCS II storm mass curve
00093> [SDT= 1.00:SDUR= 24.00:PTOT= 62.40]
00094> *****
00095>
00096> R0001:C00005-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00097> CALIB NASHYD 1.0 01:PRE .65 .012 No_date 12:25 10.32 .165
00098> [CN= 50.3: N= 3.00: Tp= .29]
00099> *****
00100>
00101> # 10yr SCS Storm (24hr)
00102> *****
00103>
00104> R0001:C00006-----
00105> MASS STORM
00106> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00107> Comment = 24 hour SCS II storm mass curve
00108> [SDT= 1.00:SDUR= 24.00:PTOT= 72.00]
00109> *****
00110>
00111> R0001:C00007-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00112> CALIB NASHYD 1.0 01:PRE .65 .016 No_date 12:24 13.71 .190
00113> [CN= 50.3: N= 3.00: Tp= .29]
00114> *****
00115>
00116> # 25yr SCS Storm (24hr)
00117> *****
00118>
00119> R0001:C00008-----
00120> MASS STORM
00121> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00122> Comment = 24 hour SCS II storm mass curve
00123> [SDT= 1.00:SDUR= 24.00:PTOT= 86.40]
00124> *****
00125>
00126> R0001:C00009-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00127> CALIB NASHYD 1.0 01:PRE .65 .023 No_date 12:24 19.47 .225
00128> [CN= 50.3: N= 3.00: Tp= .29]
00129> *****
00130>
00131> # 50yr SCS Storm (24hr)
00132> *****
00133>
00134> R0001:C00010-----
00135> MASS STORM
00136> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00137> Comment = 24 hour SCS II storm mass curve
00138> [SDT= 1.00:SDUR= 24.00:PTOT= 96.00]
00139> *****
00140>
00141> R0001:C00011-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00142> CALIB NASHYD 1.0 01:PRE .65 .028 No_date 12:24 23.71 .247
00143> [CN= 50.3: N= 3.00: Tp= .29]
00144> *****
00145>
00146> # 100yr SCS Storm (24hr)

```

```

00147> #*****
00148> #*****
00149> R0001:C00012-----
00150> MASS STORM
00151> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00152> Comment = 24 hour SCS II storm mass curve
00153> [SDT= 1.00:SDUR= 24.00:PTOT= 108.00]
00154> #*****
00155> #*****
00156> R0001:C00013-----DTmin-ID:NHYD-----AREAha-QPEAKcms-TpeakDate_hh:mm---RVmm-R.C.
00157> CALIB NASHYD 1.0 01:PRE .65 .036 No_date 12:24 29.43 .272
00158> [CN= 50.3: N= 3.00: Tp= .29]
00159> R0001:C00014-----
00160> FINISH
00161>
00162>
00163> WARNINGS / ERRORS / NOTES
00164>
00165> Simulation ended on 2017-08-22 at 13:46:45
00166>
00167>

```

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00001> 2 Metric units
00002> #
00003> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00004> # Date : August 10, 2017
00005> # Modeller : [J.Elder]
00006> # Company : C.F. Crozier & Associates Inc.
00007> # License # : 373016
00008> #
00009> # Filename : Post_CHI
00010> # 961 Big Bay - Post Development - CHI Storms
00011> #
00012> #
00013> #*****
00014> START TZERO=[0.0] METOUT=[2], NSTORM=[0], NRUN=[0]
00015> % [ ] <- storm filename one per line for NSTORM time
00016> #*****
00017> #-----
00018> %-----
00019> #-----
00020> #-----
00021> # 25mm Event (4-hour Chicago)
00022> #-----
00023> %-----
00024> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00025> ICASECS=[1],
00026> A=[508.708], B=[6.662], and C=[0.819],
00027> #*****
00028> #-----
00029> #-----
00030> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00031> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00032> LOSS=[2] SCS Procedure: CN=[49],
00033> Pervious areas:
00034> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00035> MNP=[0.25], SCP=[0](min),
00036> Impervious areas:
00037> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00038> MNI=[0.013], SCI=[0](min),
00039> RAINFALL=[ , , -1](mm/hr)
00040> #-----
00041> #-----
00042> #-----
00043> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00044> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00045> LOSS=[2] SCS Procedure: CN=[49],
00046> Pervious areas:
00047> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00048> MNP=[0.25], SCP=[0](min),
00049> Impervious areas:
00050> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00051> MNI=[0.013], SCI=[0](min),
00052> RAINFALL=[ , , -1](mm/hr)
00053> #-----
00054> #-----
00055> #-----
00056> #-----
00057> #-----
00058> #-----
00059> # 2 Year Event (4-hour Chicago)
00060> #-----
00061> %-----
00062> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00063> ICASECS=[1],
00064> A=[807.44], B=[6.75], and C=[0.828],
00065> #*****
00066> #-----
00067> #-----
00068> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00069> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00070> LOSS=[2] SCS Procedure: CN=[49],
00071> Pervious areas:
00072> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00073> MNP=[0.25], SCP=[0](min),
00074> Impervious areas:
00075> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00076> MNI=[0.013], SCI=[0](min),
00077> RAINFALL=[ , , -1](mm/hr)
00078> #-----
00079> #-----
00080> #-----
00081> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00082> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00083> LOSS=[2] SCS Procedure: CN=[49],
00084> Pervious areas:
00085> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00086> MNP=[0.25], SCP=[0](min),
00087> Impervious areas:
00088> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00089> MNI=[0.013], SCI=[0](min),
00090> RAINFALL=[ , , -1](mm/hr)
00091> #-----
00092> #-----
00093> #-----
00094> #-----
00095> #-----
00096> #-----
00097> # 5 Year Event (4-hour Chicago)
00098> #-----
00099> %-----
00100> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00101> ICASECS=[1],
00102> A=[1135.4], B=[7.5], and C=[0.841],
00103> #*****
00104> #-----
00105> #-----
00106> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00107> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00108> LOSS=[2] SCS Procedure: CN=[49],
00109> Pervious areas:
00110> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00111> MNP=[0.25], SCP=[0](min),
00112> Impervious areas:
00113> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00114> MNI=[0.013], SCI=[0](min),
00115> RAINFALL=[ , , -1](mm/hr)
00116> #-----
00117> #-----
00118> #-----
00119> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00120> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00121> LOSS=[2] SCS Procedure: CN=[49],
00122> Pervious areas:
00123> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00124> MNP=[0.25], SCP=[0](min),
00125> Impervious areas:
00126> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00127> MNI=[0.013], SCI=[0](min),
00128> RAINFALL=[ , , -1](mm/hr)
00129> #-----
00130> #-----
00131> #-----
00132> #-----
00133> #-----
00134> #-----
00135> # 10 Year Event (4-hour Chicago)
00136> #-----
00137> %-----
00138> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00139> ICASECS=[1],
00140> A=[1387], B=[7.97], and C=[0.852],
00141> #*****
00142> #-----
00143> #-----
00144> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00145> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00146> LOSS=[2] SCS Procedure: CN=[49],

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Pervious areas:
IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
MNP=[0.25], SCP=[0](min),
Impervious areas:
IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
MNI=[0.013], SCI=[0](min),
RAINFALL=[ , , -1](mm/hr)
00154> #-----
00155> #-----
00156> #-----
00157> #-----
00158> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00159> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00160> LOSS=[2] SCS Procedure: CN=[49],
00161> Pervious areas:
00162> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00163> MNP=[0.25], SCP=[0](min),
00164> Impervious areas:
00165> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00166> MNI=[0.013], SCI=[0](min),
00167> RAINFALL=[ , , -1](mm/hr)
00168> #-----
00169> #-----
00170> #-----
00171> #-----
00172> #-----
00173> # 25 Year Event (4-hour Chicago)
00174> #-----
00175> #-----
00176> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00177> ICASECS=[1],
00178> A=[1676.2], B=[8.30], and C=[0.858],
00179> #*****
00180> #-----
00181> #-----
00182> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00183> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00184> LOSS=[2] SCS Procedure: CN=[49],
00185> Pervious areas:
00186> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00187> MNP=[0.25], SCP=[0](min),
00188> Impervious areas:
00189> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00190> MNI=[0.013], SCI=[0](min),
00191> RAINFALL=[ , , -1](mm/hr)
00192> #-----
00193> #-----
00194> #-----
00195> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00196> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00197> LOSS=[2] SCS Procedure: CN=[49],
00198> Pervious areas:
00199> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00200> MNP=[0.25], SCP=[0](min),
00201> Impervious areas:
00202> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00203> MNI=[0.013], SCI=[0](min),
00204> RAINFALL=[ , , -1](mm/hr)
00205> #-----
00206> #-----
00207> #-----
00208> #-----
00209> #-----
00210> #-----
00211> # 50 Year Event (4-hour Chicago)
00212> #-----
00213> #-----
00214> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00215> ICASECS=[1],
00216> A=[1973.1], B=[9.00], and C=[0.868],
00217> #*****
00218> #-----
00219> #-----
00220> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00221> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00222> LOSS=[2] SCS Procedure: CN=[49],
00223> Pervious areas:
00224> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00225> MNP=[0.25], SCP=[0](min),
00226> Impervious areas:
00227> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00228> MNI=[0.013], SCI=[0](min),
00229> RAINFALL=[ , , -1](mm/hr)
00230> #-----
00231> #-----
00232> #-----
00233> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00234> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00235> LOSS=[2] SCS Procedure: CN=[49],
00236> Pervious areas:
00237> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00238> MNP=[0.25], SCP=[0](min),
00239> Impervious areas:
00240> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00241> MNI=[0.013], SCI=[0](min),
00242> RAINFALL=[ , , -1](mm/hr)
00243> #-----
00244> #-----
00245> #-----
00246> #-----
00247> #-----
00248> #-----
00249> #-----
00250> # 100 Year Event (4-hour Chicago)
00251> #-----
00252> CHICAGO STORM UNITS=[2], TD=[4](hrs), TPRAT=[0.333], CSDT=[5](min),
00253> ICASECS=[1],
00254> A=[2193.1], B=[9.04], and C=[0.871],
00255> #*****
00256> #-----
00257> #-----
00258> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.174](ha),
00259> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00260> LOSS=[2] SCS Procedure: CN=[49],
00261> Pervious areas:
00262> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00263> MNP=[0.25], SCP=[0](min),
00264> Impervious areas:
00265> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00266> MNI=[0.013], SCI=[0](min),
00267> RAINFALL=[ , , -1](mm/hr)
00268> #-----
00269> #-----
00270> #-----
00271> CALIB STANDHYD ID=[1], NHVD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00272> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00273> LOSS=[2] SCS Procedure: CN=[49],
00274> Pervious areas:
00275> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00276> MNP=[0.25], SCP=[0](min),
00277> Impervious areas:
00278> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00279> MNI=[0.013], SCI=[0](min),
00280> RAINFALL=[ , , -1](mm/hr)
00281> #-----
00282> #-----
00283> #-----
00284> #-----
00285> #-----
00286> #-----
00287> #-----
00288> #-----
00289> #-----
00290> READ STORM STORM_FILENAME=["hazel.stm"]
00291> #-----
00292> #-----

```

```

00293> *#-----|-----
00294> *#-----|-----Catchment 16 - To SWMF-----|
00295> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00296> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00297> LOSS=[2] SCS Procedure: CN=[49],
00298> Pervious areas:
00299> IAPer=[5](mm), SLPP=[2](%), LGP=[20](m),
00300> MNP=[0.25], SCP=[0](min),
00301> Impervious areas:
00302> IAImp=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00303> MNI=[0.013], SCI=[0](min),
00304> RAINFALL=[ , , -1](mm/hr)
00305> *#-----|-----
00306> *#-----|-----Catchment 16a - To DIGB-----|
00307> *#-----|-----
00308> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00309> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00310> LOSS=[2] SCS Procedure: CN=[49],
00311> Pervious areas:
00312> IAPer=[5](mm), SLPP=[2](%), LGP=[35](m),
00313> MNP=[0.25], SCP=[0](min),
00314> Impervious areas:
00315> IAImp=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00316> MNI=[0.013], SCI=[0](min),
00317> RAINFALL=[ , , -1](mm/hr)
00318> *#-----|-----
00319>
00320>
00321>
00322>
00323> FINISH
00324>

```

```

00001> =====
00002>
00003> SSSS W W W M M H H Y Y M M 000 222 900 11 77777 =
00004> S W W W M M M H H Y Y M M M 0 0 2 0 0 11 7 7
00005> SSSS W W W M M M H H H H Y Y M M M 0 0 2 0 0 11 7 V
00006> S W W W M M H H Y Y M M 0 0 222 0 0 11 7 A
00007> SSSS W W W M M H H Y Y M M 000 2 0 0 11 7 =
00008>
00009> Stormwater Management Hydrologic Model
00010> 222 900 11 7 =
00011>
00012> ***** SWMHYMO Ver4.05.0 *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTHYMO-83 and OTHYMO-89 *****
00016>
00017> ***** distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 836-3884 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhyom@jfsa.com *****
00021>
00022>
00023> *****
00024> ***** Licensed user: C.F. Crozier & Associates Inc. *****
00025> ***** Collingwood SERIAL#:3737016 *****
00026> *****
00027>
00028> *****
00029> ***** PROGRAM ARRAY DIMENSIONS *****
00030> ***** Maximum value for ID numbers : 11 *****
00031> ***** Max. number of rainfall points: 105408 *****
00032> ***** Max. number of flow points : 105408 *****
00033> *****
00034>
00035> *****
00036> ***** S U M M A R Y O U T P U T *****
00037> *****
00038> ***** RUN DATE: 2017-08-22 TIME: 13:46:17 RUN COUNTER: 000001 *****
00039> *****
00040> ***** Input file: C:\Working SWMHYMO\Big Bay\Post_CHI.dat *****
00041> ***** Output file: C:\Working SWMHYMO\Big Bay\Post_CHI.out *****
00042> ***** Summary file: C:\Working SWMHYMO\Big Bay\Post_CHI.sum *****
00043> ***** User comments: *****
00044> ***** 1: *****
00045> ***** 2: *****
00046> ***** 3: *****
00047> *****
00048>
00049>
00050> *****
00051> ***** # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654] *****
00052> ***** # Date : August 19, 2017 *****
00053> ***** # Modeler : [J.Elder] *****
00054> ***** # Company : C.F. Crozier & Associates Inc. *****
00055> ***** # License # : 3737016 *****
00056> ***** *****
00057> ***** # Filename : Post_CHI *****
00058> ***** # 961 Big Bay - Post Development - CHI Storms *****
00059> ***** *****
00060> *****
00061> ***** RUN# COMMAND# *****
00062> R0001:C00001 *****
00063> ***** START *****
00064> ***** [ZERO = .00 hrs on 0] *****
00065> ***** [METOUT= 2 (1=imperial, 2=metric output)] *****
00066> ***** [NSTORM= 0] *****
00067> ***** [NRUN = 0001] *****
00068> ***** *****
00069> *****
00070> *****
00071> ***** 25mm Event (4-hour Chicago) *****
00072> *****
00073> R0001:C00002 *****
00074> ***** CHICAGO STORM *****
00075> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 24.99] *****
00076> ***** [A/B/C= 500.700/ 6.62/ 819] *****
00077> ***** *****
00078> *****
00079> ***** Catchment 16 - To SWMP *****
00080> R0001:C00003 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00081> CALIB STANDHYD 1.0 01:Post16 .17 .011 No_date 1:20 8.92 .357
00082> [XIMP= 28;TIMP=.68]
00083> [LOSS= 2 :CN= 49.0]
00084> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00085> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00086> *****
00087> ***** Catchment 16a - To DICBs *****
00088> *****
00089> R0001:C00004 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00090> CALIB STANDHYD 1.0 01:Post16a .48 .008 No_date 1:20 4.25 .178
00091> [XIMP= 28;TIMP=.45]
00092> [LOSS= 2 :CN= 49.0]
00093> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00094> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00095> *****
00096> *****
00097> ***** 2 Year Event (4-hour Chicago) *****
00098> *****
00099> *****
00100> R0001:C00005 *****
00101> ***** CHICAGO STORM *****
00102> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 33.76] *****
00103> ***** [A/B/C= 807.440/ 7.750/ 828] *****
00104> ***** *****
00105> ***** Catchment 16 - To SWMP *****
00106> R0001:C00006 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00107> CALIB STANDHYD 1.0 01:Post16 .17 .015 No_date 1:20 13.51 .400
00108> [XIMP= 28;TIMP=.68]
00109> [LOSS= 2 :CN= 49.0]
00110> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00111> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00112> *****
00113> *****
00114> ***** Catchment 16a - To DICBs *****
00115> *****
00116> R0001:C00007 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00117> CALIB STANDHYD 1.0 01:Post16a .48 .012 No_date 1:20 7.08 .218
00118> [XIMP= 28;TIMP=.45]
00119> [LOSS= 2 :CN= 49.0]
00120> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00121> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00122> *****
00123> *****
00124> ***** 5 Year Event (4-hour Chicago) *****
00125> *****
00126> *****
00127> R0001:C00008 *****
00128> ***** CHICAGO STORM *****
00129> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 44.07] *****
00130> ***** [A/B/C= 1135.400/ 8.41] *****
00131> ***** *****
00132> ***** Catchment 16 - To SWMP *****
00133> R0001:C00009 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00134> CALIB STANDHYD 1.0 01:Post16 .17 .021 No_date 1:20 19.49 .442
00135> [XIMP= 28;TIMP=.68]
00136> [LOSS= 2 :CN= 49.0]
00137> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00138> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00139> *****
00140> *****
00141> ***** Catchment 16a - To DICBs *****
00142> *****
00143> R0001:C00010 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00144> CALIB STANDHYD 1.0 01:Post16a .48 .017 No_date 1:20 11.09 .252
00145> [XIMP= 28;TIMP=.45]
00146> [LOSS= 2 :CN= 49.0]

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00147> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00148> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00149> *****
00150> ***** Catchment 16 - To SWMP *****
00151> ***** 10 Year Event (4-hour Chicago) *****
00152> *****
00153> *****
00154> R0001:C00011 *****
00155> ***** CHICAGO STORM *****
00156> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 50.59] *****
00157> ***** [A/B/C= 1387.000/ 7.970/ .852] *****
00158> ***** *****
00159> ***** Catchment 16 - To SWMP *****
00160> *****
00161> R0001:C00012 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00162> CALIB STANDHYD 1.0 01:Post16 .17 .025 No_date 1:20 23.55 .465
00163> [XIMP= 28;TIMP=.68]
00164> [LOSS= 2 :CN= 49.0]
00165> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00166> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00167> *****
00168> *****
00169> *****
00170> R0001:C00013 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00171> CALIB STANDHYD 1.0 01:Post16a .48 .021 No_date 1:20 13.94 .276
00172> [XIMP= 28;TIMP=.45]
00173> [LOSS= 2 :CN= 49.0]
00174> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00175> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00176> *****
00177> *****
00178> ***** 25 Year Event (4-hour Chicago) *****
00179> *****
00180> *****
00181> R0001:C00014 *****
00182> ***** CHICAGO STORM *****
00183> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 59.08] *****
00184> ***** [A/B/C= 1676.200/ 8.390/ .858] *****
00185> ***** *****
00186> ***** Catchment 16 - To SWMP *****
00187> *****
00188> R0001:C00015 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00189> CALIB STANDHYD 1.0 01:Post16 .17 .032 No_date 1:20 29.11 .493
00190> [XIMP= 28;TIMP=.68]
00191> [LOSS= 2 :CN= 49.0]
00192> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00193> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00194> *****
00195> *****
00196> *****
00197> R0001:C00016 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00198> CALIB STANDHYD 1.0 01:Post16a .48 .029 No_date 1:30 17.99 .305
00199> [XIMP= 28;TIMP=.45]
00200> [LOSS= 2 :CN= 49.0]
00201> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00202> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00203> *****
00204> *****
00205> ***** 50 Year Event (4-hour Chicago) *****
00206> *****
00207> *****
00208> R0001:C00017 *****
00209> ***** CHICAGO STORM *****
00210> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 65.66] *****
00211> ***** [A/B/C= 1973.100/ 9.090/ .868] *****
00212> ***** *****
00213> ***** Catchment 16 - To SWMP *****
00214> *****
00215> R0001:C00018 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00216> CALIB STANDHYD 1.0 01:Post16 .17 .036 No_date 1:20 33.60 .512
00217> [XIMP= 28;TIMP=.68]
00218> [LOSS= 2 :CN= 49.0]
00219> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00220> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00221> *****
00222> *****
00223> *****
00224> R0001:C00019 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00225> CALIB STANDHYD 1.0 01:Post16a .48 .038 No_date 1:25 21.37 .325
00226> [XIMP= 28;TIMP=.45]
00227> [LOSS= 2 :CN= 49.0]
00228> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00229> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00230> *****
00231> *****
00232> ***** 100 Year Event (4-hour Chicago) *****
00233> *****
00234> *****
00235> R0001:C00020 *****
00236> ***** CHICAGO STORM *****
00237> ***** [SDT= 5.00;SDUR= 4.00;PTOT= 71.77] *****
00238> ***** [A/B/C= 2193.100/ 9.040/ .871] *****
00239> ***** *****
00240> ***** Catchment 16 - To SWMP *****
00241> *****
00242> R0001:C00021 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00243> CALIB STANDHYD 1.0 01:Post16 .17 .043 No_date 1:20 37.91 .528
00244> [XIMP= 28;TIMP=.68]
00245> [LOSS= 2 :CN= 49.0]
00246> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00247> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00248> *****
00249> *****
00250> *****
00251> R0001:C00022 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00252> CALIB STANDHYD 1.0 01:Post16a .48 .045 No_date 1:25 24.67 .344
00253> [XIMP= 28;TIMP=.45]
00254> [LOSS= 2 :CN= 49.0]
00255> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00256> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
00257> *****
00258> *****
00259> *****
00260> *****
00261> *****
00262> *****
00263> R0001:C00023 *****
00264> ***** READ STORM *****
00265> ***** Filename = hazel.stm *****
00266> ***** Comment = Hurricane Hazel *****
00267> ***** [SDT=60.00;SDUR= 12.00;PTOT= 212.00] *****
00268> ***** *****
00269> *****
00270> *****
00271> ***** Catchment 16 - To SWMP *****
00272> *****
00273> R0001:C00024 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00274> CALIB STANDHYD 1.0 01:Post16 .17 .022 No_date 10:00 155.20 .732
00275> [XIMP= 28;TIMP=.68]
00276> [LOSS= 2 :CN= 49.0]
00277> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 20. :MNP=.250;SCP= .0]
00278> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 20. :MNI=.013;SCI= .0]
00279> *****
00280> *****
00281> *****
00282> R0001:C00025 ***** DTmin-ID:NHYD ***** AREAH-QPEAKcms-TpeakDate.hh:mm RVmm-R.C.
00283> CALIB STANDHYD 1.0 01:Post16a .48 .053 No_date 10:00 126.11 .595
00284> [XIMP= 28;TIMP=.45]
00285> [LOSS= 2 :CN= 49.0]
00286> [Pervious area: IAPER= 5.00;SLPP=2.00;LGP= 35. :MNP=.250;SCP= .0]
00287> [Impervious area: IAIMP= 2.50;SLPI=2.00;LGI= 25. :MNI=.013;SCI= .0]
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00870> *****
00871> *****
00872> *****
00873> *****
00874> *****
00875> *****
00876> *****
00877> *****
00878> *****
00879&gt
```

00293> -----
00294> Simulation ended on 2017-08-22 at 13:46:17
00295> -----
00296>

```

00001> 2 Metric units
00002> #
00003> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00004> # Date : August 10, 2017
00005> # Modeller : [J.Elnder]
00006> # Company : C.F. Crozier & Associates Inc.
00007> # License # : 3737616
00008> #
00009> # Filename : Post_SCS
00010> # 961 Big Bay - Post Development - SCS Storms
00011> #
00012> #
00013> #
00014> START TZERO=[0.0] METOUT=[2] NSTORM=[0] NRUN=[0]
00015> % [ ] <- storm filename one per line for NSTORM time
00016> #
00017> %
00018> %
00019> #
00020> #
00021> #
00022> # 2yr SCS Storm (24hr)
00023> #
00024> #
00025> MASS STORM PTOTAL=[45.60](mm), CSDT=[1](min),
00026> CURVE_FILENAME=["SCS24HII.mst"]
00027> #
00028> #
00029> # -----Catchment 16 - To SWMF-----
00030> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00031> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00032> LOSS=[2] SCS Procedure: CN=[49],
00033> Pervious areas:
00034> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00035> MNP=[0.25], SCP=[0](min),
00036> Impervious areas:
00037> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00038> MNI=[0.013], SCI=[0](min),
00039> RAINFALL=[ , , -1](mm/hr)
00040> #
00041> # -----Catchment 16a - To DICBS-----
00042> #
00043> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00044> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00045> LOSS=[2] SCS Procedure: CN=[49],
00046> Pervious areas:
00047> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00048> MNP=[0.25], SCP=[0](min),
00049> Impervious areas:
00050> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00051> MNI=[0.013], SCI=[0](min),
00052> RAINFALL=[ , , -1](mm/hr)
00053> #
00054> #
00055> #
00056> # 5yr SCS Storm (24hr)
00057> #
00058> #
00059> #
00060> MASS STORM PTOTAL=[62.4](mm), CSDT=[1](min),
00061> CURVE_FILENAME=["SCS24HII.mst"]
00062> #
00063> #
00064> # -----Catchment 16 - To SWMF-----
00065> #
00066> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00067> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00068> LOSS=[2] SCS Procedure: CN=[49],
00069> Pervious areas:
00070> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00071> MNP=[0.25], SCP=[0](min),
00072> Impervious areas:
00073> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00074> MNI=[0.013], SCI=[0](min),
00075> RAINFALL=[ , , -1](mm/hr)
00076> #
00077> # -----Catchment 16a - To DICBS-----
00078> #
00079> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00080> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00081> LOSS=[2] SCS Procedure: CN=[49],
00082> Pervious areas:
00083> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00084> MNP=[0.25], SCP=[0](min),
00085> Impervious areas:
00086> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00087> MNI=[0.013], SCI=[0](min),
00088> RAINFALL=[ , , -1](mm/hr)
00089> #
00090> #
00091> #
00092> # 10yr SCS Storm (24hr)
00093> #
00094> #
00095> #
00096> #
00097> MASS STORM PTOTAL=[72.0](mm), CSDT=[1](min),
00098> CURVE_FILENAME=["SCS24HII.mst"]
00099> #
00100> #
00101> # -----Catchment 16 - To SWMF-----
00102> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00103> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00104> LOSS=[2] SCS Procedure: CN=[49],
00105> Pervious areas:
00106> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00107> MNP=[0.25], SCP=[0](min),
00108> Impervious areas:
00109> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00110> MNI=[0.013], SCI=[0](min),
00111> RAINFALL=[ , , -1](mm/hr)
00112> #
00113> # -----Catchment 16a - To DICBS-----
00114> #
00115> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00116> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00117> LOSS=[2] SCS Procedure: CN=[49],
00118> Pervious areas:
00119> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00120> MNP=[0.25], SCP=[0](min),
00121> Impervious areas:
00122> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00123> MNI=[0.013], SCI=[0](min),
00124> RAINFALL=[ , , -1](mm/hr)
00125> #
00126> #
00127> #
00128> # 25yr SCS Storm (24hr)
00129> #
00130> #
00131> #
00132> #
00133> MASS STORM PTOTAL=[86.4](mm), CSDT=[5](min),
00134> CURVE_FILENAME=["SCS24HII.mst"]
00135> #
00136> #
00137> # -----Catchment 16 - To SWMF-----
00138> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00139> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00140> LOSS=[2] SCS Procedure: CN=[49],
00141> Pervious areas:
00142> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00143> MNP=[0.25], SCP=[0](min),
00144> Impervious areas:
00145> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00146> MNI=[0.013], SCI=[0](min),

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00147> # RAINFALL=[ , , -1](mm/hr)
00148> #
00149> # -----Catchment 16a - To DICBS-----
00150> #
00151> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00152> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00153> LOSS=[2] SCS Procedure: CN=[49],
00154> Pervious areas:
00155> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00156> MNP=[0.25], SCP=[0](min),
00157> Impervious areas:
00158> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00159> MNI=[0.013], SCI=[0](min),
00160> RAINFALL=[ , , -1](mm/hr)
00161> #
00162> #
00163> #
00164> # 50yr SCS Storm (24hr)
00165> #
00166> #
00167> #
00168> #
00169> MASS STORM PTOTAL=[96.0](mm), CSDT=[1](min),
00170> CURVE_FILENAME=["SCS24HII.mst"]
00171> #
00172> #
00173> # -----Catchment 16 - To SWMF-----
00174> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00175> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00176> LOSS=[2] SCS Procedure: CN=[49],
00177> Pervious areas:
00178> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00179> MNP=[0.25], SCP=[0](min),
00180> Impervious areas:
00181> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00182> MNI=[0.013], SCI=[0](min),
00183> RAINFALL=[ , , -1](mm/hr)
00184> #
00185> # -----Catchment 16a - To DICBS-----
00186> #
00187> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00188> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00189> LOSS=[2] SCS Procedure: CN=[49],
00190> Pervious areas:
00191> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00192> MNP=[0.25], SCP=[0](min),
00193> Impervious areas:
00194> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00195> MNI=[0.013], SCI=[0](min),
00196> RAINFALL=[ , , -1](mm/hr)
00197> #
00198> #
00199> #
00200> # 100yr SCS Storm (24hr)
00201> #
00202> #
00203> #
00204> #
00205> MASS STORM PTOTAL=[108.0](mm), CSDT=[1](min),
00206> CURVE_FILENAME=["SCS24HII.mst"]
00207> #
00208> #
00209> # -----Catchment 16 - To SWMF-----
00210> CALIB STANDHYD ID=[1], NHYD=["Post16"], DT=[1](min), AREA=[0.174](ha),
00211> XIMP=[0.279], TIMP=[0.678], DWF=[0](cms),
00212> LOSS=[2] SCS Procedure: CN=[49],
00213> Pervious areas:
00214> IAPER=[5](mm), SLPP=[2](%), LGP=[20](m),
00215> MNP=[0.25], SCP=[0](min),
00216> Impervious areas:
00217> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[20](m),
00218> MNI=[0.013], SCI=[0](min),
00219> RAINFALL=[ , , -1](mm/hr)
00220> #
00221> # -----Catchment 16a - To DICBS-----
00222> #
00223> CALIB STANDHYD ID=[1], NHYD=["Post16a"], DT=[1](min), AREA=[0.479](ha),
00224> XIMP=[0.079], TIMP=[0.449], DWF=[0](cms),
00225> LOSS=[2] SCS Procedure: CN=[49],
00226> Pervious areas:
00227> IAPER=[5](mm), SLPP=[2](%), LGP=[35](m),
00228> MNP=[0.25], SCP=[0](min),
00229> Impervious areas:
00230> IAIMP=[2.5](mm), SLPI=[2](%), LGI=[25](m),
00231> MNI=[0.013], SCI=[0](min),
00232> RAINFALL=[ , , -1](mm/hr)
00233> #
00234> #
00235> #
00236> FINISH

```

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00001> =====
00002>
00003> SSSS W W W M M H H Y Y M M 000 222 000 11 77777 =
00004> S W W W M M M H H Y Y M M M 0 0 2 0 0 11 7 7
00005> SSSS W W W M M M H H Y Y M M M 0 0 2 0 0 11 7 V
00006> S W W M M H H Y M M 0 0 222 0 0 11 7 A
00007> SSSS W W M M H H Y M M 000 2 0 0 11 7 =
00008>
00009> StormWater Management Hydrologic Model
00010>
00011>
00012> ***** SWMHYMO Ver4.05.0 *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTTHYMO-83 and OTTHYMO-89 *****
00016>
00017> ***** distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 836-3884 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhyom@fsa.com *****
00021>
00022>
00023> ***** Licensed user: C.F. Crozier & Associates Inc. *****
00024> ***** Collingwood SERIAL#:3737016 *****
00025> *****
00026>
00027>
00028> ***** PROGRAM ARRAY DIMENSIONS *****
00029> ***** Maximum value for ID numbers : 11 *****
00030> ***** Max. number of rainfall points: 105408 *****
00031> ***** Max. number of flow points : 105408 *****
00032> *****
00033> *****
00034>
00035>
00036> ***** S U M M A R Y O U T P U T *****
00037>
00038> ***** RUN DATE: 2017-08-22 TIME: 13:46:29 RUN COUNTER: 000002 *****
00039>
00040> * Input File: C:\Working SWMHYMO\Big Bay\Post_SCS.dat
00041> * Output File: C:\Working SWMHYMO\Big Bay\Post_SCS.out
00042> * Summary File: C:\Working SWMHYMO\Big Bay\Post_SCS.sum
00043> * User comments:
00044> * 1:
00045> * 2:
00046> * 3:
00047>
00048>
00049>
00050> *****
00051> # Project Name: [961 Big Bay Ltd.] Project Number: [1406-4654]
00052> # Date : August 19, 2017
00053> # Modeler : [J.Elder]
00054> # Company : C.F. Crozier & Associates Inc.
00055> # License # : 3737016
00056> *****
00057> # Filename : Post_SCS
00058> # 961 Big Bay - Post Development - SCS Storms
00059> *****
00060>
00061> RUN# COMMAND#
00062> R0001:C00001-----
00063> START
00064> [ZERO = .00 hrs on 0]
00065> [METOUT= 2 (1=imperial, 2=metric output)]
00066> [NSTORM= 0]
00067> [NRUN = 0001]
00068> *****
00069>
00070>
00071> #
00072> ***** 2yr SCS Storm (24hr) *****
00073>
00074> R0001:C00002-----
00075> MASS STORM
00076> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00077> Comment = 24 hour SCS II storm mass curve
00078> [SDT= 1.00:SDUR= 24.00:PTOT= 45.00]
00079> *****
00080>
00081> #----- Catchment 16 - To SWMF-----
00082> R0001:C00003-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00083> CALIB STANDHYD 1.0 01:Post16 .17 .011 No_date 12:12 20.42 .448
00084> [XIMP=.08:TIMP=.45]
00085> [LOSS= 2 :CN= 49.0]
00086> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00087> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00088> #----- Catchment 16a - To DIBCS-----
00089> #----- Catchment 16a - To DIBCS-----
00090> *****
00091> R0001:C00004-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00092> CALIB STANDHYD 1.0 01:Post16a .48 .011 No_date 12:12 11.73 .257
00093> [XIMP=.08:TIMP=.45]
00094> [LOSS= 2 :CN= 49.0]
00095> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
00096> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00097> #----- Catchment 16a - To DIBCS-----
00098> *****
00099>
00100> #
00101> ***** 5yr SCS Storm (24hr) *****
00102>
00103> R0001:C00005-----
00104> MASS STORM
00105> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00106> Comment = 24 hour SCS II storm mass curve
00107> [SDT= 1.00:SDUR= 24.00:PTOT= 62.40]
00108> *****
00109>
00110> #----- Catchment 16 - To SWMF-----
00111> R0001:C00006-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00112> CALIB STANDHYD 1.0 01:Post16 .17 .017 No_date 12:12 31.35 .502
00113> [XIMP=.08:TIMP=.68]
00114> [LOSS= 2 :CN= 49.0]
00115> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00116> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 20.:MNI=.013:SCI=.0]
00117> #----- Catchment 16a - To DIBCS-----
00118> *****
00119>
00120> R0001:C00007-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00121> CALIB STANDHYD 1.0 01:Post16a .48 .022 No_date 12:12 19.67 .315
00122> [XIMP=.08:TIMP=.45]
00123> [LOSS= 2 :CN= 49.0]
00124> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
00125> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00126> #----- Catchment 16a - To DIBCS-----
00127> *****
00128>
00129> #
00130> ***** 10yr SCS Storm (24hr) *****
00131>
00132> R0001:C00008-----
00133> MASS STORM
00134> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00135> Comment = 24 hour SCS II storm mass curve
00136> [SDT= 1.00:SDUR= 24.00:PTOT= 72.00]
00137> *****
00138>
00139> #----- Catchment 16 - To SWMF-----
00140> R0001:C00009-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00141> CALIB STANDHYD 1.0 01:Post16 .17 .021 No_date 12:12 38.07 .529
00142> [XIMP=.08:TIMP=.68]
00143> [LOSS= 2 :CN= 49.0]
00144> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00145> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 20.:MNI=.013:SCI=.0]
00146> #-----

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00147> #----- Catchment 16a - To DIBCS-----
00148>
00149> R0001:C00010-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00150> CALIB STANDHYD 1.0 01:Post16a .48 .029 No_date 12:12 24.80 .344
00151> [XIMP=.08:TIMP=.45]
00152> [LOSS= 2 :CN= 49.0]
00153> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
00154> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00155> #----- Catchment 16a - To DIBCS-----
00156> *****
00157>
00158> #
00159> ***** 25yr SCS Storm (24hr) *****
00160>
00161> R0001:C00011-----
00162> MASS STORM
00163> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00164> Comment = 24 hour SCS II storm mass curve
00165> [SDT= 1.00:SDUR= 24.00:PTOT= 86.40]
00166> *****
00167>
00168> #----- Catchment 16 - To SWMF-----
00169> R0001:C00012-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00170> CALIB STANDHYD 1.0 01:Post16 .17 .028 No_date 12:12 48.66 .563
00171> [XIMP=.08:TIMP=.68]
00172> [LOSS= 2 :CN= 49.0]
00173> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00174> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 20.:MNI=.013:SCI=.0]
00175> #----- Catchment 16a - To DIBCS-----
00176> *****
00177>
00178> R0001:C00013-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00179> CALIB STANDHYD 1.0 01:Post16a .48 .042 No_date 12:12 33.15 .384
00180> [XIMP=.08:TIMP=.45]
00181> [LOSS= 2 :CN= 49.0]
00182> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
00183> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00184> #----- Catchment 16 - To SWMF-----
00185> *****
00186>
00187> #
00188> ***** 50yr SCS Storm (24hr) *****
00189>
00190> R0001:C00014-----
00191> MASS STORM
00192> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00193> Comment = 24 hour SCS II storm mass curve
00194> [SDT= 1.00:SDUR= 24.00:PTOT= 96.00]
00195> *****
00196>
00197> #----- Catchment 16 - To SWMF-----
00198> R0001:C00015-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00199> CALIB STANDHYD 1.0 01:Post16 .17 .032 No_date 12:12 56.01 .563
00200> [XIMP=.08:TIMP=.68]
00201> [LOSS= 2 :CN= 49.0]
00202> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00203> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 20.:MNI=.013:SCI=.0]
00204> #----- Catchment 16a - To DIBCS-----
00205> *****
00206>
00207> R0001:C00016-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00208> CALIB STANDHYD 1.0 01:Post16a .48 .052 No_date 12:12 39.10 .407
00209> [XIMP=.08:TIMP=.45]
00210> [LOSS= 2 :CN= 49.0]
00211> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
00212> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00213> #----- Catchment 16a - To DIBCS-----
00214> *****
00215>
00216> #
00217> ***** 100yr SCS Storm (24hr) *****
00218>
00219> R0001:C00017-----
00220> MASS STORM
00221> Filename = C:\Working SWMHYMO\Big Bay\SCS24HII.mst
00222> Comment = 24 hour SCS II storm mass curve
00223> [SDT= 1.00:SDUR= 24.00:PTOT= 108.00]
00224> *****
00225>
00226> #----- Catchment 16 - To SWMF-----
00227> R0001:C00018-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00228> CALIB STANDHYD 1.0 01:Post16 .17 .038 No_date 12:12 65.47 .606
00229> [XIMP=.08:TIMP=.68]
00230> [LOSS= 2 :CN= 49.0]
00231> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 20.:MNP=.250:SCP=.0]
00232> [Impervious area: IAIMP= 2.50:SLPI=2.00:LGI= 25.:MNI=.013:SCI=.0]
00233> #----- Catchment 16a - To DIBCS-----
00234> *****
00235>
00236> R0001:C00019-----DTmin-ID:NHYD-----AREAh-QPEAKcms-TpeakDate_hh:mm-----RVmm-R.C.
00237> CALIB STANDHYD 1.0 01:Post16a .48 .065 No_date 12:12 46.92 .434
00238> [XIMP=.08:TIMP=.45]
00239> [LOSS= 2 :CN= 49.0]
00240> [Pervious area: IAPER= 5.00:SLPP=2.00:LGP= 35.:MNP=.250:SCP=.0]
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00242> #----- Catchment 16a - To DIBCS-----
00243> *****
00244>
00245> FINISH
00246>
00247>
00248>
00249>
00250>
00251>

```

APPENDIX C

Relevant Report Excerpts

Hewitt's Secondary Plan Area Municipal Class Environmental Assessment – Hatch Ltd.

Big Bay Point Road Proposed Elevations

Subwatershed Impact Study – R.J. Burnside & Associates

Figure 8	Proposed Condition Grading Plan
Figure 11	Proposed Storm Sewer Plan
Figure 12	Proposed Water Distribution Plan
Figure 15	Proposed Sanitary Sewer Plan
Pages 92-93	Catchment 16 & 16a/SWMF #16
Pages 129-130	LID Considerations – Catchment 16 & 16a
Pages 173-174	Recommendations – Catchment 16 & 16a
As-Built Drawing	Versailles Crescent – Storm Drainage Plan
As-Built Drawing	Versailles Crescent – Storm Drainage Profile

Plan view of the proposed collector road, showing the alignment, cross-section locations (B1, M1, B2), and surrounding features like Big Bay Point Road and Street W.

[illegible]

The diagram illustrates a typical cross-section of a 3-lane road with a multi-use path. The road is oriented North-South, with North on the left and South on the right. The total Right-of-Way (ROW) is 27.0 meters. The cross-section includes a 0.5m rounding on the North side, a 2.8m curb, a 0.5m boulevard, a 3.5m lane, a 4.0m median, a 3.5m lane, a 0.5m curb, a 2.8m boulevard, a 3.0m multi-use trail, and a 1.2m ROW on the South side. The road is divided into three lanes: a left turn lane, a through lane, and a right turn lane. The median is 4.0m wide. The multi-use path is 3.0m wide. The road is shown with a 2.0% grade. The diagram also shows a 0.5m rounding on the North side, a 2.8m curb, a 0.5m boulevard, a 3.5m lane, a 4.0m median, a 3.5m lane, a 0.5m curb, a 2.8m boulevard, a 3.0m multi-use trail, and a 1.2m ROW on the South side. The road is shown with a 2.0% grade. The diagram also shows a 0.5m rounding on the North side, a 2.8m curb, a 0.5m boulevard, a 3.5m lane, a 4.0m median, a 3.5m lane, a 0.5m curb, a 2.8m boulevard, a 3.0m multi-use trail, and a 1.2m ROW on the South side. The road is shown with a 2.0% grade.

TYPICAL CROSS SECTION
3 LANES WITH MULTI USE PATH TWO WAY LEFT TURN LANE MEDIAN
DRAFT - NOT FOR CONSTRUCTION

	EXISTING CONTOURS		PROPOSED PROPERTY ACQUISITION
	EXISTING PROPERTY BOUNDARY		LINEAR LID
	PROPOSED DEVELOPMENTS		CENTRALIZED LID
	PROPOSED 2031 R.O.W.		RAISED MEDIAN
	PROPOSED 2051 R.O.W.		GRADING LIMITS

Profile view of the proposed watermain showing elevation versus stationing. The profile includes a proposed watermain line, a proposed collector line, and a proposed road line. Key features include a McCormick Gate, a Proposed Collector 11, and a Proposed Road. The profile shows a grade break at STA 0+00 and another at STA 8+97.58. The watermain is shown with a 0.97% grade, and the collector line has a 0.54% grade. The road has a -0.54% grade. The profile also shows vertical curves with K values of 36 and 16. The elevation ranges from 240 to 275 feet, and the stationing ranges from 0+000 to 0+698.



BURNSIDE

**Hewitt's Secondary Plan Area
Subwatershed Impact Study
Lover's, Hewitt's and
Sandy Cove Creeks**

**Hewitt's Landowner's Group
c/o Bratty and Partners
7501 Keele Street, Suite 200
Vaughan ON L4K 1Y2**

**R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301
Barrie ON L4N 8J6 CANADA**

in partnership with:



**Azimuth Environmental Consulting Inc.
642 Welham Road
Barrie ON L4N 9A1 CANADA**

**September 2016
300032860.0000**

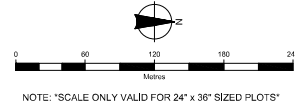


LEGEND

- STAKED NHS LIMITS (2015)
- NHS BUFFER LIMITS
- CoB GENERATED BUFFER LIMITS (2013)
- 2031 BOUNDARY
- EXISTING 100 YR FLOOD LIMITS
- EXISTING REGIONAL FLOOD LIMITS
- PROPOSED 100 YR FLOOD LIMITS
- PROPOSED REGIONAL FLOOD LIMITS

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1691369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOOD LINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.

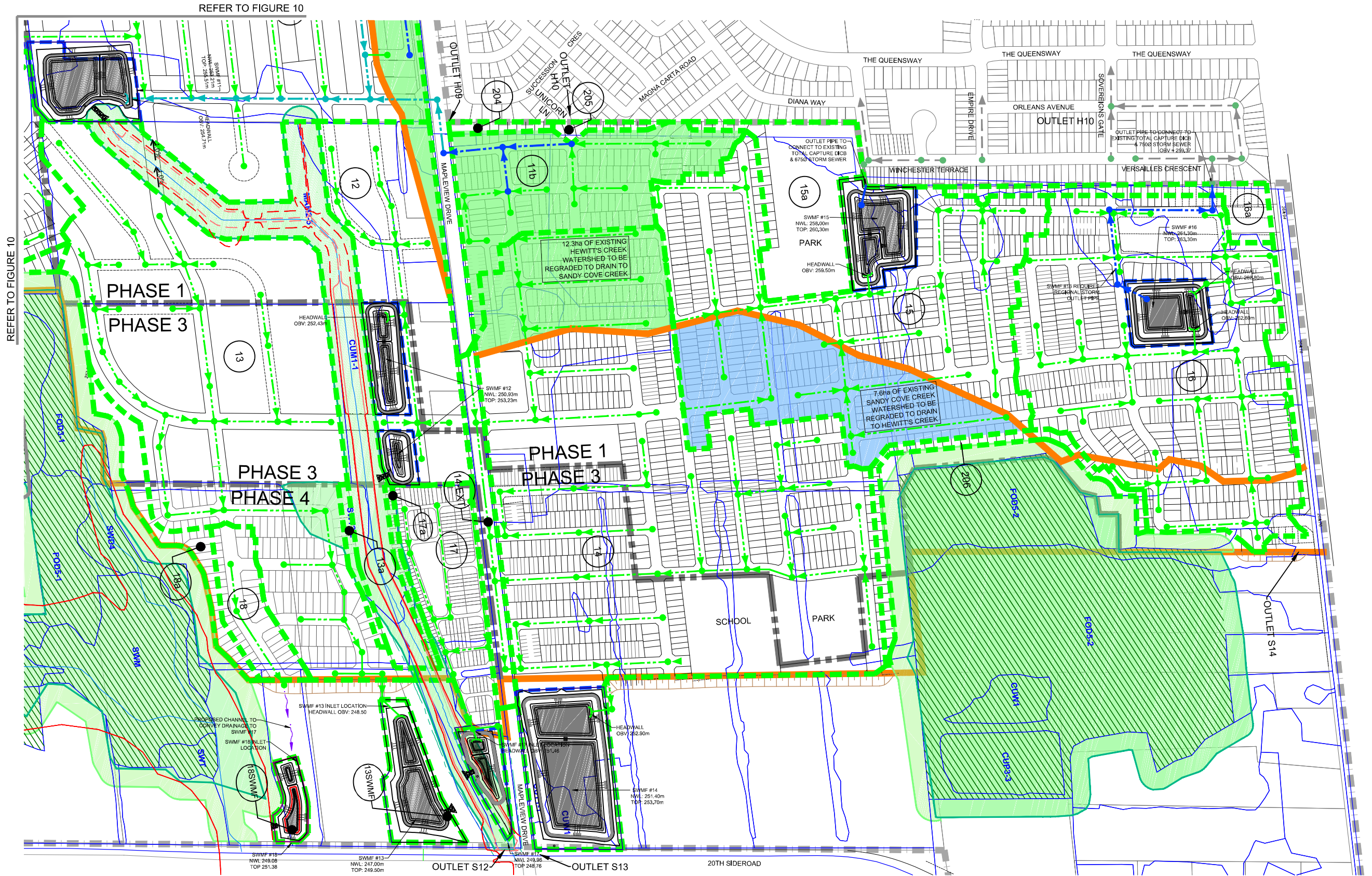
- 263.99 EXISTING ELEVATION
- 263.99 PROPOSED ELEVATION
- PROPOSED OVERLAND FLOW ROUTE



BURNSIDE

HEWITT'S CREEK LANDOWNERS
GROUP INC.

Figure Title			
HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY PROPOSED CONDITION GRADING PLAN (3 OF 3)			
Drawn	Checked	Date	Figure No. FIG 8
AD	CC	16/09/07	
Scale H 1:3,000 *	Project No. 300032860		

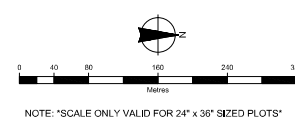


LEGEND

- NHS LIMITS
- NHS BUFFER LIMITS
- 100 YEAR CAPTURE AREA
- 2031 PHASE LIMITS
- EXISTING 100 YR FLOOD LIMITS
- EXISTING REGIONAL FLOOD LIMITS
- PROPOSED 100 YR FLOOD LIMITS
- PROPOSED REGIONAL FLOOD LIMITS
- PROPOSED DRAINAGE BOUNDARY
- ORIGINAL WATERSHED BOUNDARY

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1091369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOODLINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.

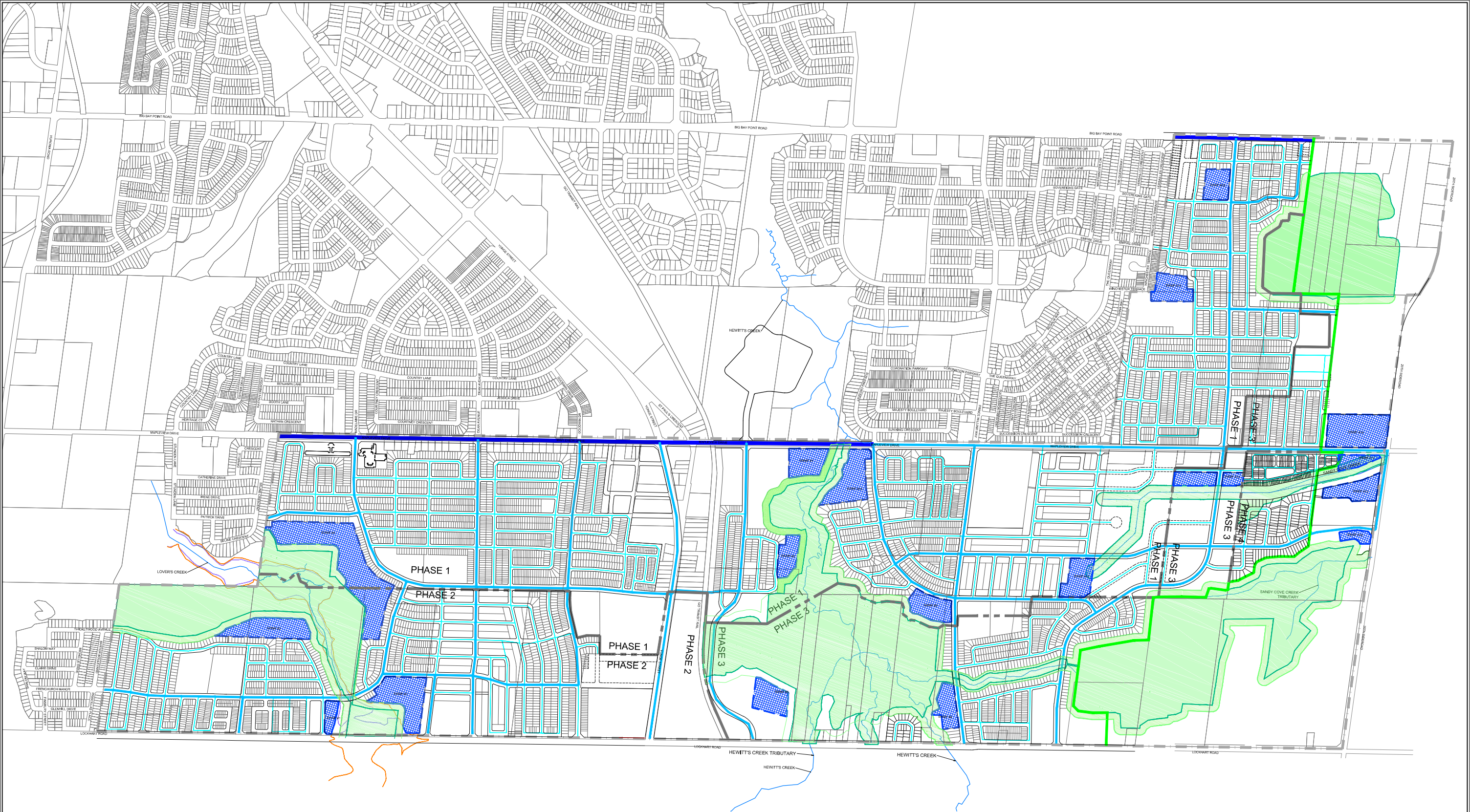
- FLOW DIRECTION
- STORM SEWER SYSTEM
- 100 YR CAPTURE SEWER, MANHOLE
- 100YR CONVEYANCE SYSTEM WITH 5YR CAPTURE
- 5 YR CAPTURE SEWER, MANHOLE
- EXISTING STORM SEWER, MANHOLE



HEWITT'S CREEK LANDOWNERS GROUP INC.

HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY PROPOSED STORM SEWER PLAN (3 OF 3)

Client	Drawn	Checked	Date	Figure No.
HEWITT'S CREEK LANDOWNERS GROUP INC.	BH	CC	16/09/07	FIG 11
	Scale	Project No.		
	H 1:3,000	300032860		



LEGEND

- | | | | |
|--|----------------------------|--|--|
| | DC TRUNK WATERMAIN | | 2031 PHASE LINE |
| | LOCAL TRUNK WATERMAIN | | PHASING LIMITS |
| | LOCAL WATERMAIN | | LIMIT OF HEWITT'S CREEK SECONDARY PLAN |
| | SURVEYED NHS LIMITS (2015) | | STAKED 2015 NHS LIMITS |
| | NHS BUFFER LIMITS | | NHS BUFFER LIMITS |

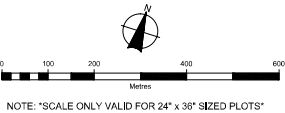
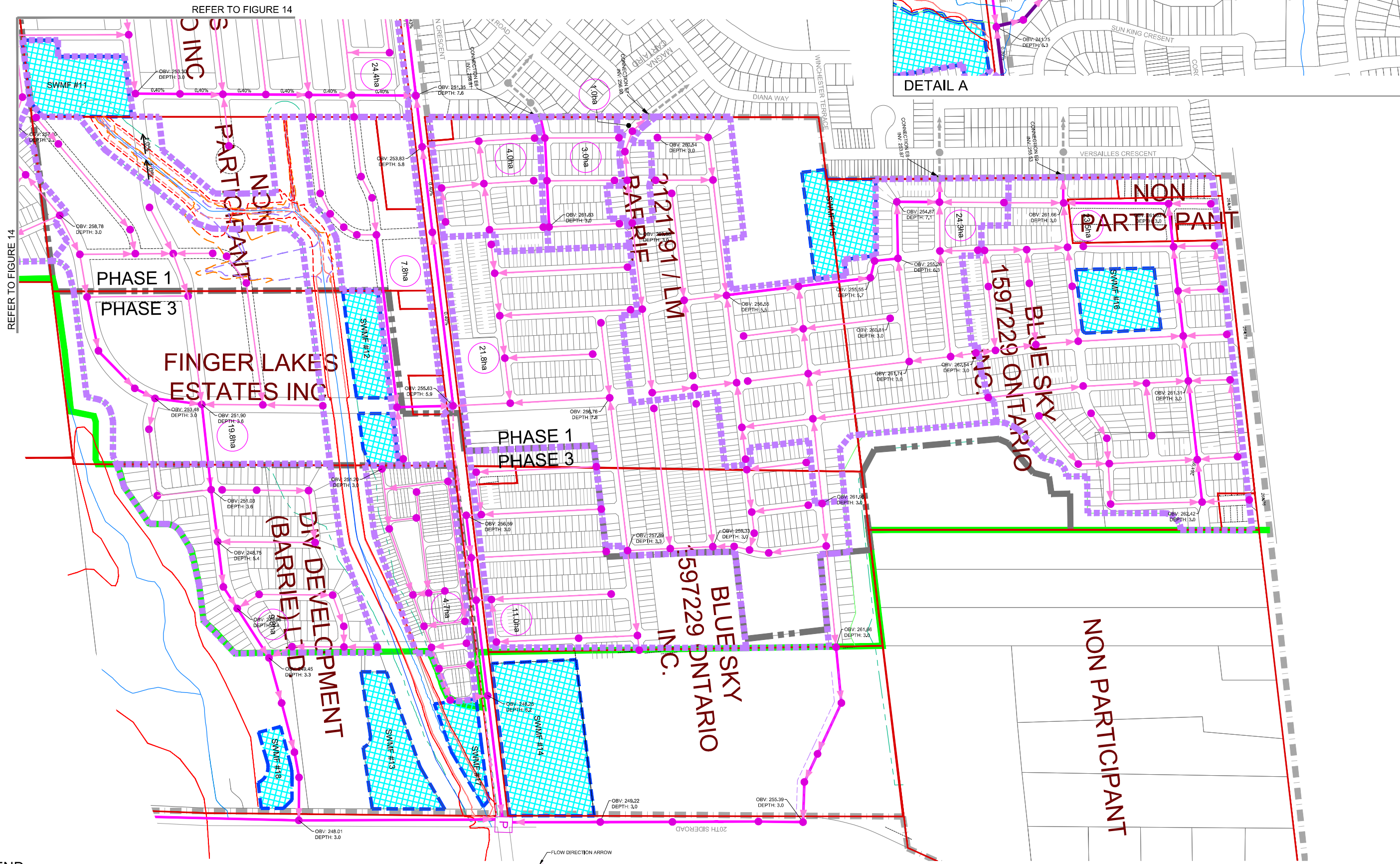


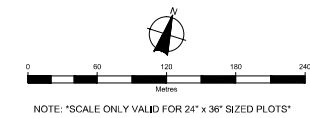
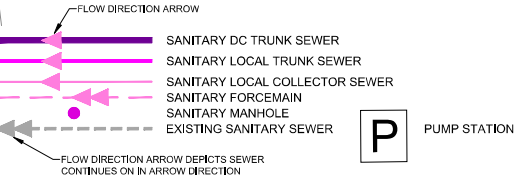
	Figure 18b: HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY PROPOSED WATER DISTRIBUTION PLAN			Figure No.
	Client:	Drawn:	Checked:	
	HEWITT'S CREEK LANDOWNERS GROUP INC.	AQ	BH	
	Date:	15/01/28	Project No.:	
	Scale:	H 1:4,000'	300032860	FIG 12



LEGEND

- SURVEYED NHS LIMIT (2015)
- NHS BUFFER LIMIT
- 2031 PHASE LIMITS
- DEV. LIMITS
- PHASING LIMITS
- 2031 PHASE LIMITS
- EXISTING 100 YR FLOOD LIMITS
- EXISTING REGIONAL FLOOD LIMITS
- PROPOSED 100 YR FLOOD LIMITS
- PROPOSED REGIONAL FLOOD LIMITS
- PROPOSED DRAINAGE BOUNDARY

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1091369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOODLINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.



BURNSIDE

HEWITT'S CREEK LANDOWNERS GROUP INC.

Figure Title
**HEWITT'S SECONDARY PLAN AREA
SUBWATERSHED IMPACT STUDY
PROPOSED SANITARY SEWER PLAN (3 OF 3)**

Client	Drawn	Checked	Date	Figure No.
HEWITT'S CREEK LANDOWNERS GROUP INC.	BH	CC	16/09/07	FIG 15
	Scale		Project No.	
	H 1:3,000"		300032860	

Subwatershed Impact Study Lover's, Hewitt's and Sandy Cove Creeks
September 2016

proposed condition, drain to Sandy Cove Creek. The goal was to keep the net difference to less than 2% between the existing and proposed catchment boundaries.

Catchment 15A cannot be graded to drain into SWMF #15, however there is sufficient volume and area in the facility to accommodate (compensate) for the flow that bypasses.

SWMF#15 is currently proposed to be oriented in an east-west direction largely due to the grading constraints of the park block and the location of the piped outlet on Winchester Terrace.

This SWMF within the block is currently larger than required and there is potential to reconfigure this SWMF as a constructed wetland which have a lower storage volume requirement compared to a wet pond, provide better temperature mitigation, have a lower length to width requirement and would provide for a higher level of quality control and TP removal rates.

In addition, with the implementation of LID within the park block there could be significant reduction in the size of this facility, however due to the configuration of the block it may not be possible to provide additional development lots.

Catchment 16 & 16A/SWMF #16

SWMF#16 is proposed to be located on the west side of the Phase 1 Blue Sky lands, south of Big Bay Point Road, and east of the "Hamptons on Big Bay Point Road" development. This facility is one of two (the second being SWMF#15) which is designed to discharge into existing storm sewer infrastructure in the adjacent "Hamptons on Big Bay Point Road" development. The discharge point is to be to an existing set of DCB located in a 3.0 m easement between Lots 385 and 386 located on Versailles Crescent. Please refer to Appendix D1 for the details on the proposed connection, which is a 750 mm dia. pipe at 0.95% at an invert of 258.62. There are also several other potential connection points including single RLCB between Lots 394/395, 391/392, 388/389 and 378/379, as well as a second larger-capacity connection point between Lots 381/382. The rear yards of the lots along the western edge of the Catchment can be directed without treatment to these structures provided the existing condition peak discharge is not exceeded.

The majority of the catchment area consists of residential development and a small park block located at the east edge of the catchment (highest elevation). The catchment also includes a portion of land in the northwest corner, which is currently a non-participating owner.

The location of SWMF#16 has been dictated by the limits of the participating landowner. A more appropriate location appears to be the northwest corner of the site within the non-participating owner lands adjacent to the Hampton on Big Bay development and the

outlet that has been designed and provided there. The final location, design and configuration of the SWMF may change based on negotiations with this land owner.

Assuming the block is not going to be moved at this stage of design, the size of the block is currently slightly larger than required and there may be some potential to reconfigure this SWMF. Implementation of LID within the catchment could also provide an opportunity to shrink the facility within the block or reconfigure the shape.

Catchment 203 – Discharge to Mapleview Drive at Yonge Street

In the pre-development condition approximately 31.39 ha of mixed use drainage area was identified as contributing flow to the Yonge Street/Mapleview Drive storm sewer system. The flow was collected at the intersection of Yonge Street and Mapleview or at the intersection of the railway track and Mapleview and directed east through an oil/grit separator out to Hewitt's Creek. Please refer to Table 9 for the pre development peak flows for this area.

In the post development condition the contributing area has been reduced to 16.07 ha, and the proposed land use has not dramatically changed and therefore the post development peak flows are less than pre development.

Additional controls may be required for individual site plans to meet overall infiltration or quality control targets.

Catchment 204 – Discharge to Mapleview Drive at Maplecort Development

In the pre-development condition approximately 6.54 ha of undeveloped drainage area was identified as contributing flow to the Mapleview Drive ROW. The flow discharges to the north side of Mapleview Drive and is directed west through an oil/grit separator out to Hewitt's Creek. Please refer to Table 9 for the pre development peak flows for this area.

In the post-development condition the contributing area has been reduced to 0.29 ha, which, despite an increase in impervious % has resulted in a drastic decrease in flows. A total additional 0.40 cms of flow could be discharged in this location in the 100 year event while still meeting the pre development targets.

Catchment 205 – Discharge to Maplecort Development at Unicorn Lane

In the pre-development condition approximately 1.8 ha of undeveloped drainage area was identified as contributing flow to the Unicorn Lane storm sewer system. The flow was collected via a DICB and directed east through the SWMF for quality and quantity control. Please refer to Table 9 for the pre development peak flows for this area.

Subwatershed Impact Study Lover's, Hewitt's and Sandy Cove Creeks
September 2016

Table 21 LID Considerations – Catchment 16 & 16a

Catchment ID	16	16A
Catchment Area	21.34	1.55
Impervious %	57%	25%
Dominant Soil Type	Sand	Sand
Effective Soil Type	Sand	Sand
Hydraulic Conductivity	235.6 mm/hr	235.6 mm/hr
LSRCA Hydarulic Conductivity ^A	94.24 mm/hr	94.24 mm/hr
25 mm Runoff Volume (m ³)	3031	95
Required Infiltration Storage Volume^B		
25 mm Runoff (m ³)	1400	50
12.5 mm Runoff (m ³)	800	30
5 mm Runoff (m ³)	250	10
Recommended Infiltration Target		
	25 mm	25 mm
Recommended Filtration Target		
	0	0
LID Opportunities		
Park Block (m ²)	None	None
School/Community Centre (m ²)	None	None
Accessible NHS Buffer (Linear m)	None	None
ROW (Linear m)	4057	71
Pervious Area available for Additional Topsoil (m ²)	91762	11625
SWM Control	SWMF 16	Compensation in SWMF 16
Discharge Point	Versailles Crescent	Versailles Crescent
Notes		
^A LSRCA Factor of Safety Required = 2.5 (Divide measured Hydraulic Conductivity by 2.5)		
^B Assumes 24 hr drawdown, 1.0 m tall stone trench with bottom set at 1.2 m below grade, 0.4 void ratio		

Catchment 16 & 16a have characteristics that result in it being the most suitable area in the Hewitt's Secondary Plan for infiltration LID measures. Hydraulic conductivity is high and groundwater is low. However, the entire catchment is within a SGRA, and therefore the quality of drainage to be infiltrated must be considered, particularly for LIDs within ROW. Unfortunately there are no park or school blocks, open spaces or NHS buffers that can be utilized for LID. The following are the LID recommendations for this catchment:

- 25 mm target should be pursued at detailed design for the implementation of infiltration LID measures.

Subwatershed Impact Study Lover's, Hewitt's and Sandy Cove Creeks
September 2016

- If the entirety of 25 mm infiltration cannot be implemented at detailed design due to refined soils information or other reasons, the remainder of the target is to be achieved through filtration and attenuation measures.
- Due to the presence of SGRA, infiltration LIDs within ROW must consider water quality issues including the potential for pre-treatment. Use of CB inserts and deepened sumps where ROW infiltration measures are to be implemented.
- Consider the use of 3rd pipe roof drainage clean water exfiltration in SGRA areas where pre-treatment is not feasible or cost prohibitive.
- LIDs are to be provided to achieve groundwater balance volumes as outlined in Section 4.6.3 to the extent possible.
- Additional topsoil depths of 300 mm, as outlined in Section 5.5.2.1, on all of the proposed lots within this area could provide some level of infiltration and peak flow reduction, however there is currently no credit for this method.

- d) A 5 mm infiltration target should be pursued at detailed design with an additional 20 mm filtration target.
- e) Infiltration/filtration LID to be provided within the ROW, NHS buffer and on pervious areas of private lots where possible.
- f) NHS areas adjacent to south and north side of Sandy Cove Creek to be re-designated for development.

25. Catchment 14/14EXT

- a) Provide an end-of-pipe SWMF within Catchment 14 to provide quality and quantity controls as per LSRCA and City standards. Specific SWMF characteristics and precise location to be determined at Draft Plan and detailed design stage. Conveyance of pre-2031 flows to be conveyed across post 2031 lands in coordination with the land owner.
- b) A 12.5 mm infiltration target should be pursued at detailed design with an additional 12.5 mm filtration target.
- c) External drainage area (14-EXT) to provide stand-alone TP removal measures and infiltration/filtration LID to LSRCA standards.
- d) Infiltration/filtration LID to be provided within the ROW, park block, school block, and on pervious areas of private lots where possible.

26. Catchment 15/15A

- a) Provide an end-of-pipe SWMF within Catchment 15 to provide quality and quantity controls as per LSRCA and City standards. Specific SWMF characteristics and precise location to be determined at Draft Plan and detailed design stage. Overcompensation for runoff from Catchment 15A bypassing the SWMF to be provided in SWMF#15.
- b) Outlet from SWMF to connect to existing storm sewer on Winchester Terrace
- c) A 12.5 mm infiltration target should be pursued at detailed design with an additional 12.5 mm filtration target.
- d) Infiltration/filtration LID to be provided within the ROW, park block, and on pervious areas of private lots where possible.

27. Catchment 16 /16A

- a) Provide an end-of-pipe SWMF within Catchment 16 to provide quality and quantity controls as per LSRCA and City standards. Specific SWMF

Subwatershed Impact Study Lover's, Hewitt's and Sandy Cove Creeks
September 2016

characteristics and precise location to be determined at Draft Plan and detailed design stage. Overcompensation for runoff from Catchment 16A bypassing the SWMF to be provided in SWMF#16.

- b) 100 year storm outlet from SWMF to connect to existing storm sewer on Versailles Crescent.
- c) A 25 mm infiltration target should be pursued at detailed design.
- d) Infiltration LID to be provided within the ROW and on pervious areas of private lots where possible.

28. Catchment 17

- a) Provide an end-of-pipe SWMF within Catchment 17 to provide quality and quantity controls as per LSRCA and City standards. Specific SWMF characteristics and precise location to be determined at Draft Plan and detailed design stage.
- b) A 12.5 mm infiltration target should be pursued at detailed design with an additional 12.5 mm filtration target.
- c) Infiltration LID to be provided within the ROW, within NHS buffers and on pervious areas of private lots where possible.
- d) SWMF#17 to be located within post-2031 development lands but will service pre-2031 development. Sufficient area to be provided to ensure the SWMF can be expanded to accommodate additional development within the Dorsay lands post-2031.
- e) Additional floodplain analysis for relocation of eastern portion of Sandy Cove Creek corridor to be completed.

29. Catchment 18/18A

- a) Provide an end-of-pipe SWMF within Catchment 18 to provide quality and quantity controls as per LSRCA and City standards. Specific SWMF characteristics and precise location to be determined at Draft Plan and detailed design stage. Overcompensation for runoff bypassing SWMF (Catchment 18a) to be provided in SWMF#18.
- b) A 12.5 mm infiltration target should be pursued at detailed design with an additional 12.5 mm filtration target.

DRAINAGE AREA (Ha)
RUN-OFF COEFFICIENT

DRAINAGE BOUNDARY AREA

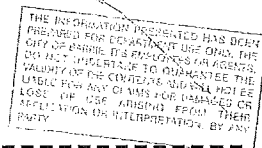
OVERLAND FLOW ROUTE

0.28
0.50

EXTERNAL DRAINAGE AREA (Ha)
RUN-OFF COEFFICIENT

EXTERNAL DRAINAGE BOUNDARY AREA

KEY PLAN



No.	REVISIONS	DATE	BY
1	THIRD SUBMISSION	NOV. 9/04	D.G.
2	MYLARS ISSUED TO CITY FOR SIGNING	JAN. 14/05	D.G.

CITY OF BARRIE
APPROVED
DATE: Mar. 20/05
R. Forward
for Director of Engineering

Engineers Planners Project Managers
Vaughan Ontario (905) 738-3939

HAMPSTONS ON BIG BAY POINT ROAD

STORM DRAINAGE PLAN

PART 1

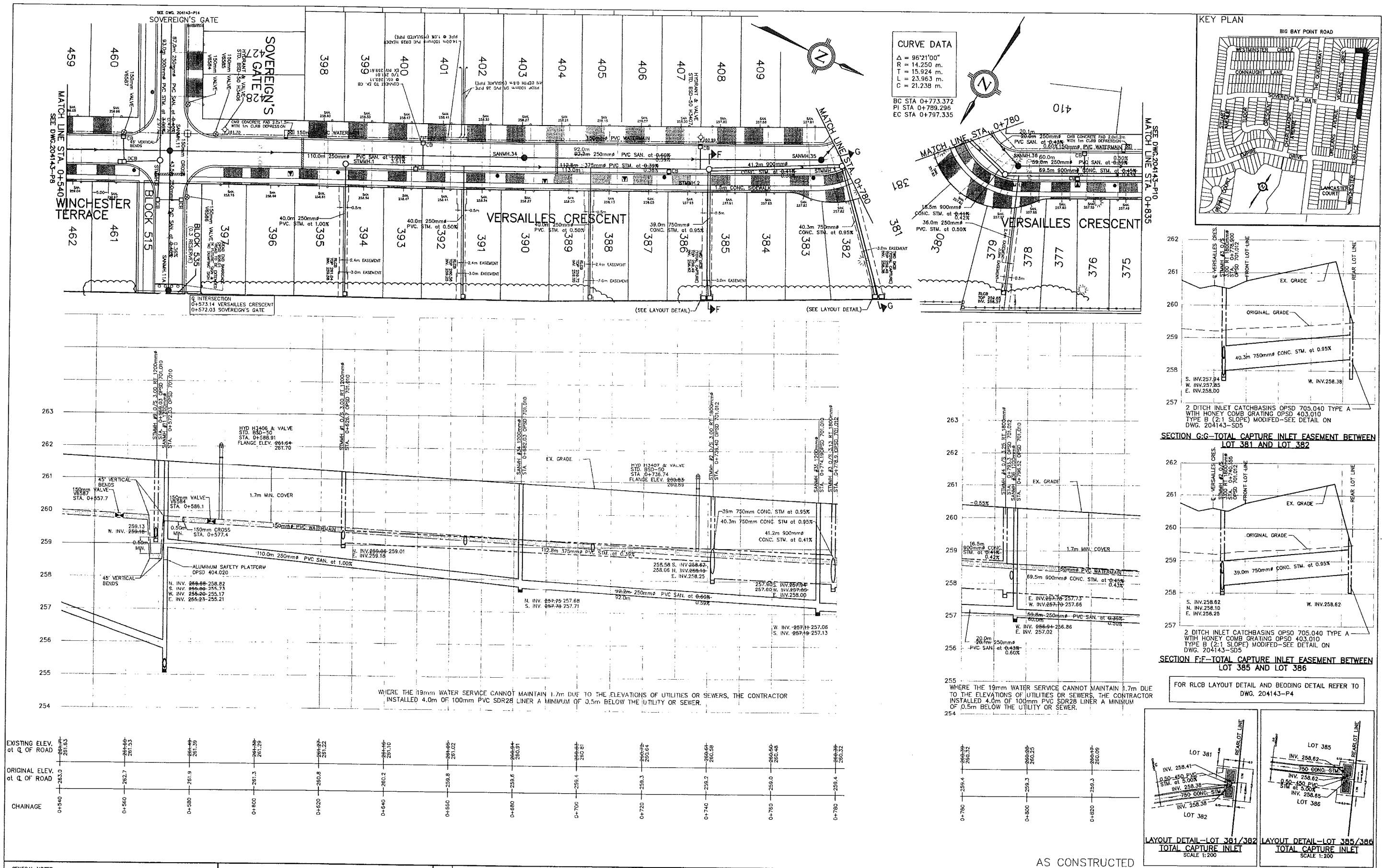
ENGINEERING DEPARTMENT

DESIGN	M.M.	SCALE	HOR.	1:1000	VERT.
--------	------	-------	------	--------	-------

DRAWN	J.M.M./M.L.	REVIEWED	D.G.	DRAWN
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DATE	AUGUST 2004	SHEET No.	2
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DRAWING No.
204143-4

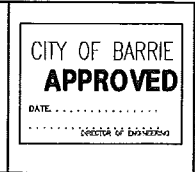


GENERAL NOTES

FOR GENERAL NOTES REFER TO DRAWING 204143-1
 FOR BENCHMARK REFER TO DRAWING 204143-1

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No.	REVISIONS	DATE	BY
1	THIRD SUBMISSION	NOV. 9/04	D.G.
2	MYLARS ISSUED TO CITY FOR SIGNING	JAN. 14/05	D.G.
3	AS CONSTRUCTED - PHASE 3	JULY 20/15	R.J.



ORIGINALLY SIGNED AND SEALED BY
 D.A. GRUGOVAC, P.ENG. OF
 EMC GROUP LIMITED
 JANUARY 14, 2005

EMC GROUP LIMITED
 Engineers Planners Project Managers
 Vaughan Ontario (905) 738-3939

HAMPTONS ON BIG BAY POINT ROAD
 WINCHESTER TER./VERSAILLES CRES.
 STA. 0+540 TO STA 0+835

CITY of BARRIE
 ENGINEERING DEPARTMENT

DESIGN: SCALE HOR. 1:500 VERT. 1:50
 DRAWN: REVIEWED: D.G.
 DATE: AUGUST 2004 SHEET No. 204143-PP-9

2015-303-011

FIGURES

- Figure 1: Site Location Plan
- Figure 2: Draft Plan
- Figure 3: Hewitt's Secondary Plan Overall Development Plan
- Figure 4: General Site Servicing Plan
- Figure 5: Preliminary Grading Plan



SUBJECT LANDS

Legend



= SUBJECT LANDS

Project

**961 BIG BAY LTD.
CITY OF BARRIE**

Drawing

SITE LOCATION

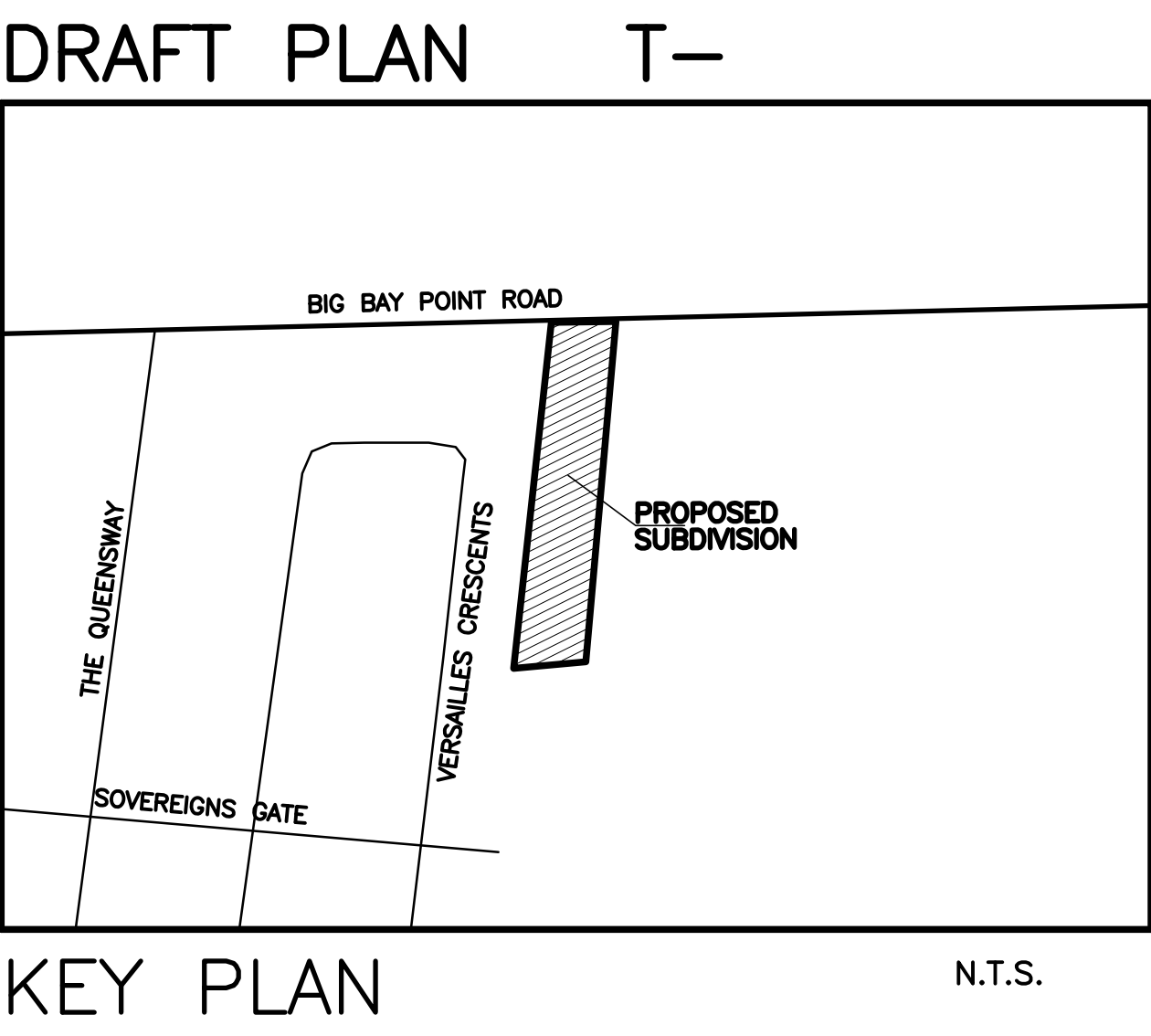
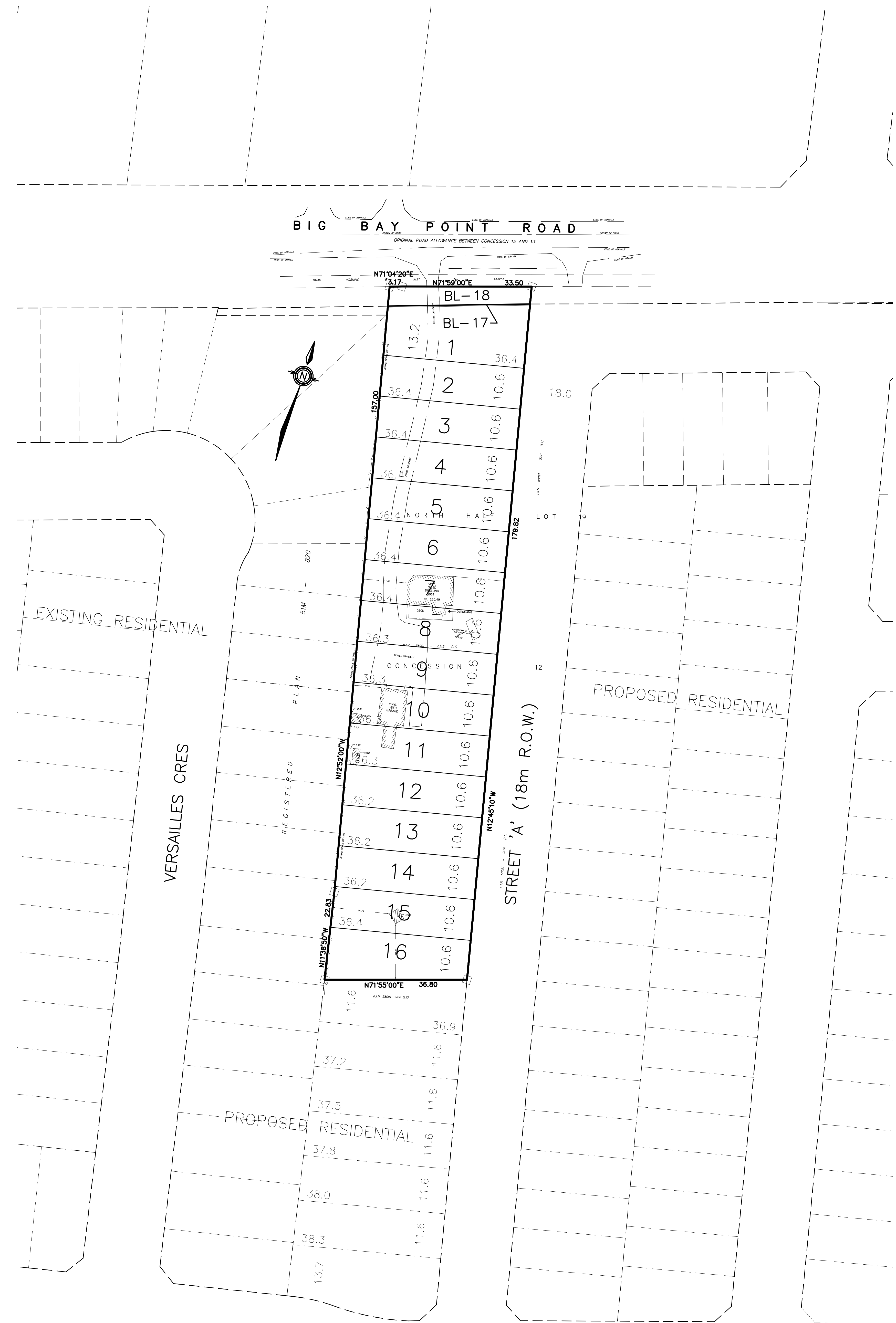


**CROZIER
& ASSOCIATES**
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Drawn By	J.E.	Design By	J.E.	Project	1406-4654
Scale	N.T.S.	Date	08/18/2017	Check By	
					Drawing FIGURE 1

DRAFT PLAN OF SUBDIVISION
PART OF NORTH HALF LOT 19, CONCESSION 12
(GEOGRAPHIC TOWNSHIP OF INNISFIL
CITY OF BARRIE
COUNTY OF SIMCOE



SECTION 51, PLANNING ACT,
ADDITIONAL INFORMATION

- A. AS SHOWN ON DRAFT PLAN
- B. AS SHOWN ON DRAFT PLAN
- C. AS SHOWN ON DRAFT PLAN
- D. SEE SCHEDULE OF LAND USE
- E. AS SHOWN ON DRAFT PLAN
- F. AS SHOWN ON DRAFT PLAN
- G. AS SHOWN ON DRAFT PLAN
- H. MUNICIPAL PIPED WATER AVAILABLE AT TIME OF DEVELOPMENT
- I. CLAY-LOAM
- J. AS SHOWN ON DRAFT PLAN
- K. SANITARY AND STORM SEWERS, GARBAGE COLLECTION, FIRE PROTECTION
- L. AS SHOWN ON DRAFT PLAN

SURVEYOR’S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AS SHOWN ON THIS PLAN, AND THEIR RELATIONSHIP TO THE ADJACENT LAND ARE ACCURATELY AND CORRECTLY SHOWN.

DATE -----, 2017 RUDY MAK OLS

OWNER’S CERTIFICATE

I AUTHORIZE KLM PLANNING PARTNERS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF BARRIE FOR APPROVAL.

OWNER
961 BIG BAY LTD.

200 BRADWICK DRIVE
CONCORD, ONT
L4K 1K8
NICK MELATTI
A.S.O.

SCHEDULE OF LAND USE

TOTAL AREA OF LAND TO BE SUBDIVIDED = 0.653±Ha. (1.613±Acs)

LOTS FOR DETACHED DWELLINGS	BLOCKS	LOTS	UNITS	±Ha.	±Acs.
LOTS 1-16		16	16	0.632	1.562
MIN. LOT FRONTAGE=10.0m. MIN LOT AREA=360.0sq.m.					
SUBTOTAL		16	16	0.632	1.562
BLOCK 17 - 0.3m. RESERVE	1			0.001	0.002
BLOCK 18 - ROAD WIDENING	1			0.020	0.049
TOTAL	2	16	16	0.653	1.613

Figure 2

NOTE — ELEVATIONS RELATED TO CANADIAN GEODETIC DATUM

PROJECT No. P-2803
SCALE 1:500 MAY 10, 2017
(2803DES2) X-REF: (2803MAS & 2803TOPO)
KLM DWG. No. - 17:1
64 JARDIN DRIVE - UNIT 1B, CONCORD, ONTARIO L4K 3P3
PLANNING PARTNERS INC. TEL: (905)669-4055 FAX: (905)669-0097 design@klmplanning.com
Planning • Design • Development

2000200400M

SCALE = 1:5000 (AO)

A. BEMP HOLDINGS 1 INC.

B. BEMP HOLDINGS 2 INC.

C. VAN DER HAYDEN

D. LOCKHART INNISFIL INVESTMENTS LTD.

E. LOCKHART INNISFIL INVESTMENTS (II) LTD.

F. LOCKMAPLE INNISFIL INVESTMENTS LTD.

G. MYRTLE BERNICE IRVING

H. RAINSONG LAND DEVELOPMENT INC.

I. CRISDAWN CONSTRUCTION INC. (WEST OF EP)

J. CRISDAWN CONSTRUCTION INC. (SOUTH)

K. CRISDAWN CONSTRUCTION INC. (SOUTH)

L. 2303757 ONTARIO INC. (CAMPBELL)

M. 1091369 ONTARIO INC. (BULUT)

N. FINGER LAKES ESTATES INC.

O. 1597229 ONTARIO INC. (BLUE SKY NORTH)

P. 1597229 ONTARIO INC. (BLUE SKY EAST)

Q. 2121191 ONTARIO INC. (LM BARRIE)

R. SOBEY'S

S. DORSEY DEVELOPMENT

AA. MIELE DEVELOPMENTS INC.

Y. MAPLEVIEW SOUTH (INNISFIL) LTD.

Z. 961 BIG BAY LTD.

2031 DEVELOPMENT PLAN

JONES

CONSULTING GROUP LTD.

PLANNERS & ENGINEERS

229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0B5

Phone: (705) 764-2281 Fax: (705) 764-2286

www.jonesconsulting.com

Date Issued: November 16, 2016

Checked By: RD

Project No.: EAS-11118

Drawn By: m.c.r.

Drawing Name: EAS-11118-DevPlan-16-11-16.dwg

Subject Lands

City of Barrie Secondary Plan 2031 Boundary

Natural Heritage System including Buffer

Phase 1-3 Non-Participating Landowners

Phase Line and Number

Phase 1 Properties Expected to Immediately Proceed

Unit Count is an estimate only based on Secondary Plan Density permissions

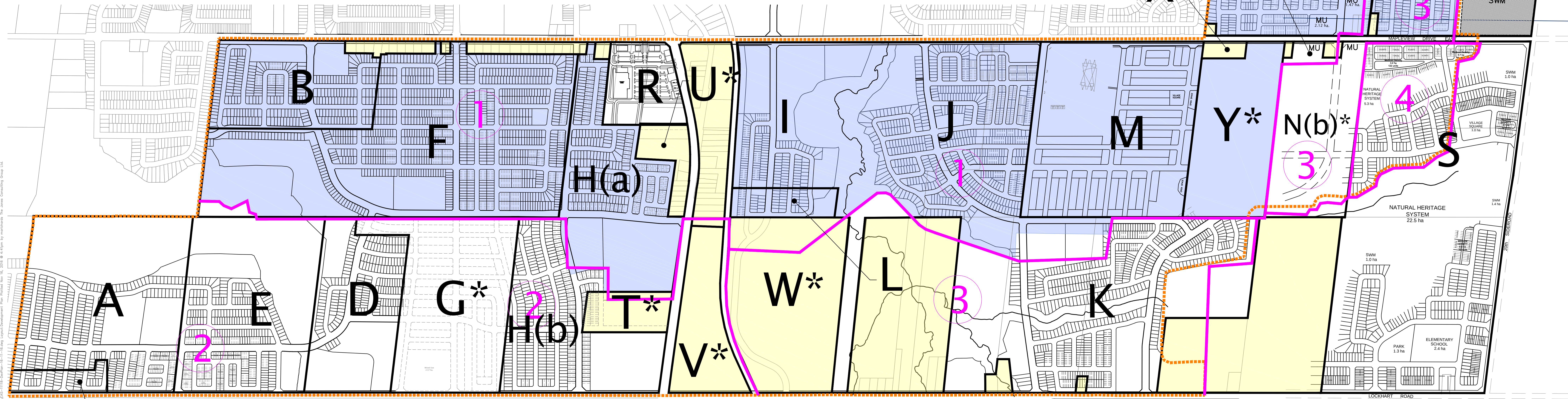
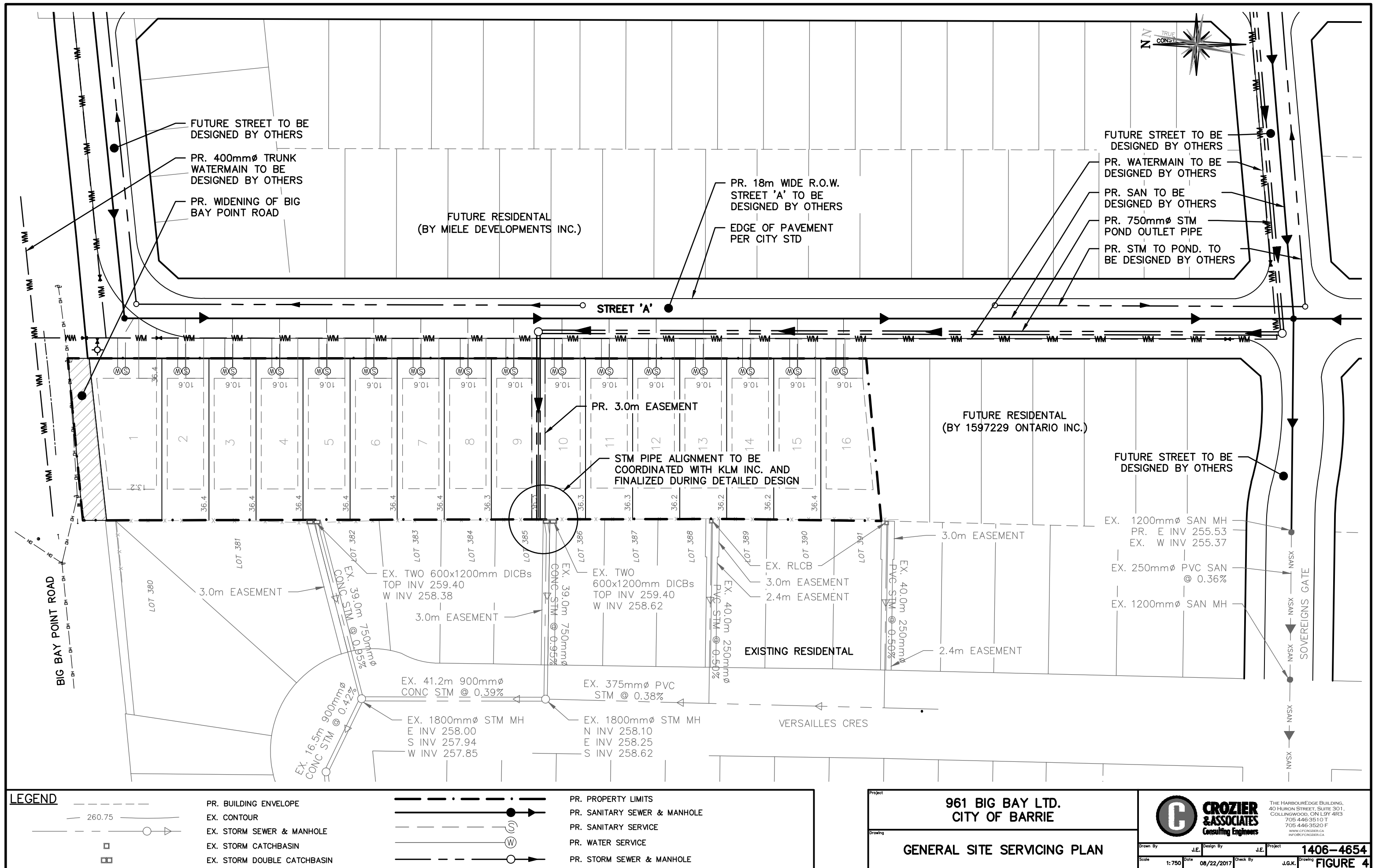
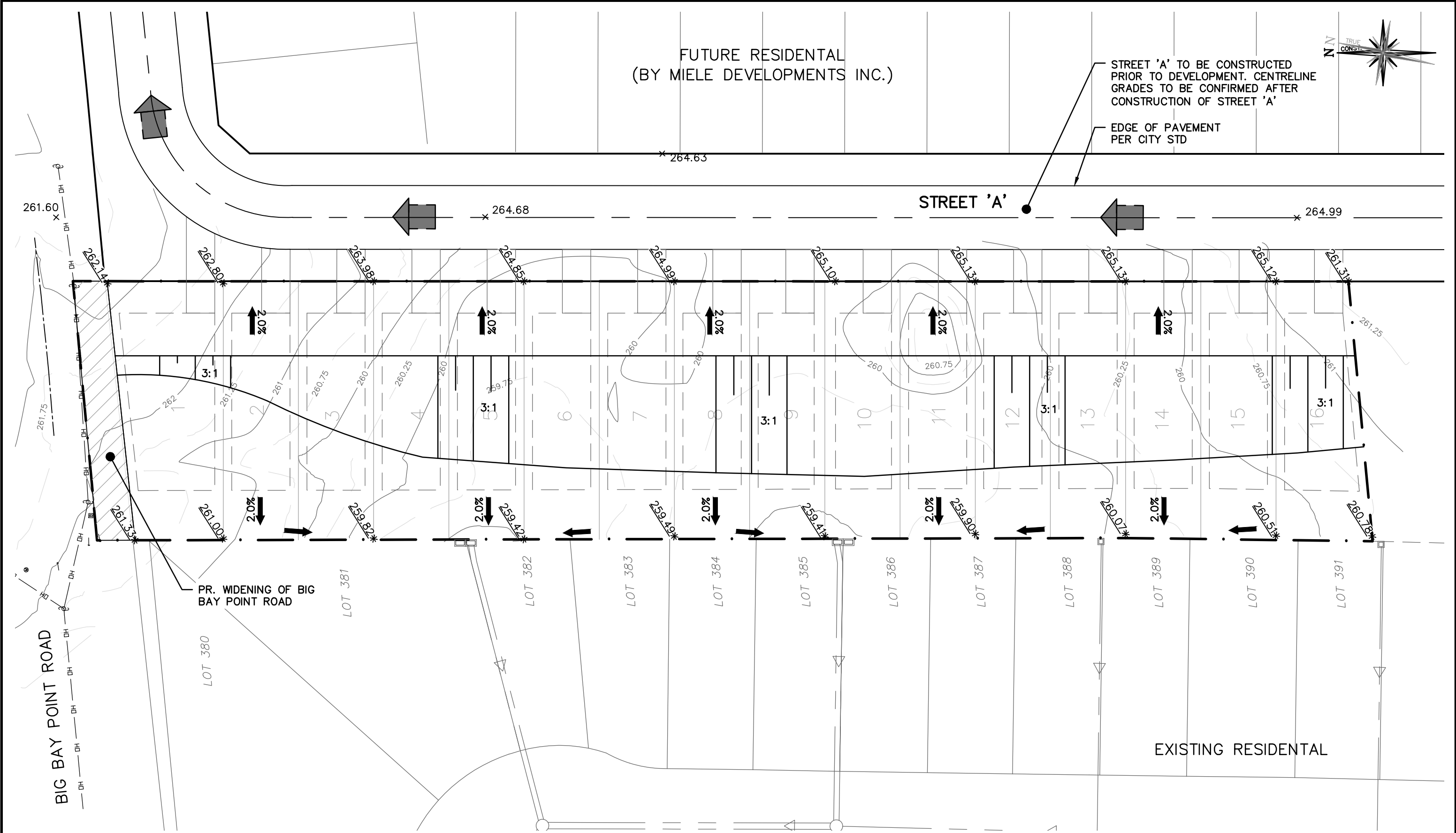


Figure 3





LEGEND

- 260.75
- EX. CONTOUR
- EX. STORM SEWER & MANHOLE
- EX. STORM CATCHBASIN
- EX. STORM DOUBLE CATCHBASIN
- PR. PROPERTY LIMITS

- PR. ELEVATION (MATCH EX. ELEVATION)
- PR. DRAINAGE DIRECTION
- OVERLAND FLOW DIRECTION
- PROPOSED ELEVATION

- PR. BUILDING ENVELOPE

Project

961 BIG BAY LTD.
CITY OF BARRIE

Drawing

PRELIMINARY GRADING PLAN

CROZIER & ASSOCIATES
Consulting Engineers

THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CROZIER.CA
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Drawn By J.E. Design By J.E. Project 1406-4654

Scale 1:500 Date 08/22/2017 Check By J.G.K. Drawing **FIGURE 5**