URBANTECH®

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

DRAFT PLAN OF SUBDIVISION

5080, 5054 & 5034 NINTH LINE

CITY OF MISSISSAUGA

REGION OF PEEL

PREPARED FOR
YOUR HOME DEVELOPMENTS

Urbantech File No.: 19-607

1st SUBMISSION – SEPTEMBER 2021

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1 INTRODUCTION

1.1. BACKGROUND

This report provides functional servicing design and stormwater management information in support of the draft plan application for the proposed residential development located at 5080, 5054 & 5034 Ninth Line, hereafter referred to as the subject property.

The development concepts contained in this report are an extension of the information contained within the following reports:

- Ninth Line South Urban Design Study by NAK Design Strategies (2019)
- Ninth Line Lands Scoped Subwatershed Study by Wood (2018)
- Ninth Line Lands: Servicing Strategy Report by Region of Peel (2016)

This study presents the recommended stormwater management and municipal servicing scheme for the development of the subject property. This report is also applicable for any future revisions to the site plan, assuming the revisions are minor and in general conformance with the concepts outlined herein.

The information presented in this report conforms to the following guidelines:

- City of Mississauga T&W Development Requirements
- Region of Peel Public Works Design, Specifications & Procedures Manual
- Stormwater Management Planning and Design Manual by the Ministry of Environment (MOE)

1.2. SUBJECT PROPERTY

The subject property is approximately 5.82 ha in size including the MTO buffer and 14m setback, and 4.95 ha not including these features. The site currently consists mainly of agricultural land with a residential property. The site is bounded by a proposed development to the north (5150 Ninth Line (City File 21T-M19006), Ninth Line to the east, a holdout property to the northeast, existing residential to the south (4087 Eglinton Ave. west), and Highway 407 ETR to the west.

1.3. LAND USE

The proposed land use consists of primarily mid-rise residential (6 buildings, 6-12 storeys tall with 24 back-to-back townhouses and 1,222 apartment units) with supporting roads and amenity spaces. A public right-of-way is proposed to connect the future residential to the north and existing residential to the south to Ninth Line.

2 GRADING & ROADS

The site grading design considers the following objectives and constraints:

- Conform to City of Mississauga grading criteria
- Match existing boundary conditions
- Minimize cut and fill operations and work towards a balanced site
- Provide overland flow conveyance for major storm conditions
- Provide minimum cover on proposed servicing

Two (2) public 20m right-of-ways are proposed in accordance with City standard 2211.070 which will bisect the site in half and connect to Ninth Line. The north-south public road ('Viola Desmond Drive') is a continuation of the alignment and elevations provided through the draft plan and subdivision application for 5150 Ninth Line, currently in review. The east-west public road ('Mahoney Gate') will provide a connection to Ninth Line. Prior to completion of the Ninth Line EA and road widening (estimated construction date of 2023), Mahoney Gate will match into the existing pavement and curbs. Viola Desmond Drive may be extended south through 4087 Eglinton Ave. west to the south, through a future development application.

The public roads of the subject site divide the property into 3 distinct areas. The largest of which is west of Viola Desmond Drive and is subdivided into two blocks known as Block 1 (1.22 ha) and 2 (1.40 ha). Block 3 (1.03 ha) is located in the southeast corner, bounded by Viola Desmond Drive to the west, Ninth Line to the east, Mahoney Gate to the north, and the future development to the south. As per preliminary discussions with the City, the 4th block located north of Mahoney Gate (0.45 ha) is a dedicated park block.

Typical condo roads will feature 7m wide pavement and are sized sufficiently to convey overland flow for major storm conditions. Where on street parking is required, wider pavement is proposed to accommodate two travel lanes in addition to a parking lane.

A 13.35 m wide buffer has been applied for the future 407 transitway corridor, and an additional 14m wide setback is provided between those lands and the subject site. The proposed centreline for the future 407 transitway has been placed within the 13.35 m buffer as per plan and profile by Parsons IBI Group, dated November 20, 2019. A ditch system to self-contain MTO drainage has been provided within the 14 m setback, and elevations along the boundary with the subject site serve as a high-point.

Refer to **Drawings C201** and **C202**, "*Site Grading,*" for additional grading details.

3 STORM SERVICING AND STORMWATER MANAGEMENT

3.1. PCSWMM MODELLING APPROACH

A PCSWMM model was selected to provide an evaluation of the existing target flows, system performance and the impact of post-development conditions on the existing storm infrastructure on Ninth Line. The model used was based on the approved model prepared for the proposed development to the north (5150 Ninth Line). The PCSWMM model assumes that all flows will be captured into the minor system. A dual drainage model will be created at detailed design to separate the minor and major system flows.

PCSWMM includes several hydrology methods to simulate rainfall-runoff responses. The hydrology method selected for this study is the Rainfall/Runoff process simulation with dynamic flow routing for the hydraulic component (i.e. pipes / overland flow). The 12 Hour SCS Type II design storm distribution with twelve-minute time steps was considered appropriate to use for the site since this was the storm that was used in the Ninth Line Lands Scoped Subwatershed Study. The City of Mississauga intensity-duration-frequency (IDF) curves were used to develop the design storm time series. Refer to **Section 3.2** and **Section 3.3** for further information used in establishing existing and proposed subcatchment, major and minor system characteristics.

The PCSWMM model setup / parameters used for this project are similar to the approved model used for the Mattamy lands to the north. The model for the subject lands has been appended to the Mattamy model for consistency and since the Mattamy lands drain to the same ultimate outlet (i.e., major and minor system) on Ninth Line.

3.2. EXISTING STORM DRAINAGE

The site is within the Credit Valley Conservation Authority jurisdiction, within the Sawmill Creek Subwatershed. There are no regulated features on the subject lands.

Existing drainage patterns for the subject property are shown on **Drawing C301**, "*Existing Storm Drainage*." The majority of the property drains to the existing storm sewers on Ninth Line via several existing culverts, street catchbasins and ditch inlet catchbasins. The Ninth Line storm sewers appear to be adequately sized to convey the 10-year storm event from the contributing areas. The south portion of the subject property drains southwards overland to an existing storm sewer at Eglinton Avenue (total catchment area to Eglinton is approximately 4.62 ha).

As noted above, a PCSWMM model was created to simulate the various return period event flows from the site including the external areas and Ninth Line ROW. The summary of flows was provided at three locations. Refer to **Appendix A** for PCSWMM Plan.

The infiltration model used in the PCSWMM was the SCS curve number (CN) approach. Model parameters were based on available land use / soil information and measurements. The following table provides the PCSWMM model input for the existing conditions simulation.

Existing Conditions Model Parameters

Area Description	PCSWMM ID	Area [ha]	Surface slope [%]	Soil Group	Land Use	Curve Number	Initial Abstractions Pervious/ impervious [mm]	Runoff Coefficient
Existing drainage on 5080 Ninth Line to north DICB	S4	2.04	1.5	C	Meadow / Residential	82	5	0.25
Existing drainage 5080 and 5054 Ninth Line to south DICB	S5	3.97	1.5	C	Meadow / Residential	82	5	0.25
Existing drainage 5054 and 5034 Ninth Line to Eglinton	S6	4.62	0.8	C	Agricultural / Residential	80	5	0.25

Based on the existing conditions model results, the following are provided in tables below based on the subject areas contribution to each existing area.

PCSWMM ID	Total Drainage Area [ha]	Total 100 Year 12 hr SCS Type II Flow [m^3/s]	Unitary Flow Rate [$m^3/s/ha$]	Site Area Contribution [ha]	100 Year 12 hr SCS Type II Flow from Site [m^3/s]
S4	2.04	0.19	0.093	0.81	0.075
S5	3.97	0.26	0.065	3.11	0.204
S6	4.62	0.27	0.058	1.03	0.06
Total:				**4.95**	**0.339**

The validity of the existing conditions model was assessed through comparison to the existing studies for the subject lands. The Ninth Line Lands Scoped Subwatershed Study by Wood (2018) established the following criteria for new pre-development flow targets in the Sawmill Creek watershed (for the overall Ninth Line study area between Ninth Line and Highway 407). Please refer to the excerpt from the SWS below:

Table 2.2.2 Stormwater Management Facility Sizing Criteria for Flood Control – Sixteen Mile Creek Watershed		
Quantity Component	**Cumulative Unitary Volume[1.] (m^3/impervious ha)**	Unitary Discharge (m^3/s/ha)
Sawmill Creek Subwatershed		
5 Year	500	0.015
100 Year	800	0.050

While the subwatershed study flows are generally calculated using continuous modelling and frequency analysis (and are typically lower than event-based modelling), it was found that the existing conditions unit rates calculated based on the existing PCSWMM model were generally higher than the subwatershed study results. This is due to a more detailed subcatchment discretization (more, smaller catchments = lower time to peak = higher flows) compared to the typically generalized, larger catchments used in the SWS study model.

3.3. PROPOSED STORM SERVICING

The storm drainage concept for the site has been designed to maintain flows and contributing drainage areas to the existing outlets on the site where possible and meet the existing targets established in the preceding section. Storm sewers for the subject lands have been sized according to the City of Mississauga sewer design criteria (10-year storm).

Three sub-surface tanks are proposed to control the post-development flows from the site plan areas to acceptable rates such that the total flow to Ninth Line is not exceeded. Block 1 will outlet to MH1, Block 2 will outlet to MH4, and Block 3 will outlet to MH7. Since all the receiving manhole inverts are higher than the proposed bottom of the tanks, the stormwater will be pumped. The tank will be designed large enough to have enough capacity to hold and pump stormwater to the superpipes on Viola Desmond Drive and Mahoney Gate before being released to existing storm sewer on Ninth Line. Quality control will be provided by an oil-grit separator.

The proposed public ROW through the subject lands cannot be controlled by the proposed tank due to ownership issues; therefore, the public ROW will have separate quantity control via a superpipe, which will drain directly to the Ninth Line storm sewer. Water quality and quantity controls (oil-grit separator) will be provided independently from the site plan area for the public ROW.

3.4. STORM WATER MANAGEMENT

The following section describes the SWM criteria applicable to the subject lands.

Water Balance / Recharge

The City of Mississauga requires retention of the first 5 mm of runoff to promote water balance and erosion control. Based on the 4.95 ha site are, approximately 248 m^3 should be infiltrated/retained on site. As the majority of the site plan areas are full coverage with underground parking there will be limited opportunities for infiltration on site. Filtration is permitted where retention (via infiltration or re-use) is not feasible.

The following hierarchy of retention / reuse / filtration will be considered:

Target	Description
Capability to retain 5mm	Not possible for the majority of the site - the majority of site dominated by underground parking and infiltration is not feasible. Runoff volume captured in landscaped areas will ultimately drain to the underground parking structure via area drains and be captured into the stormwater tanks. If green roofs were to be implemented – precipitation falling directly on the green roof areas will be temporarily retained in the soil and provided with an opportunity for evapotranspiration. Runoff from the uncontrolled areas will discharge over the landscaped boulevard areas. Full retention was assumed for these areas.
Capability to reuse 5mm	Opportunities for re-use runoff, including irrigation and mechanical uses.
Capability to filter 5mm	Water from the site plan areas, where possible, will be directed to LIDs for filtration prior to entering the underground storage tanks. These features will have sufficient storage to temporarily retain and filter the 5mm storm from the contributing area.

Quality Control

Stormwater quality control for the future development within the Ninth Line Lands is required to control runoff to an "Enhanced" standard of treatment.

Oil/grit separators are proposed to provide quality treatment for the subject lands. The optimal placement (i.e. multiple units upstream of the storage tank or one large unit downstream) must be determined with the oil/grit separator suppliers. Furthermore, the tank itself may have pre-treatment cells for ease of maintenance and additional TSS removal. However, assuming the entire private site plan area and public ROW discharges to a single O/GS at MH 10 (approximately 4.95 ha including), an STC-750 or equivalent would be required as shown on **Drawing C101 Servicing Plan**.

Quantity Control

The Ninth Line Lands Scoped Subwatershed Study by Wood (2018) established the following quantity control criteria for stormwater management.

Table 2.2.2 Stormwater Management Facility Sizing Criteria for Flood Control – Sixteen Mile Creek Watershed		
Quantity Component	**Cumulative Unitary Volume[1.] (m^3/impervious ha)**	Unitary Discharge (m^3/s/ha)
Sawmill Creek Subwatershed		
5 Year	500	0.015
100 Year	800	0.050

The post-development model simulates the proposed drainage strategy including three storage tanks, super pipes, and public ROW.

It is recognized that the subwatershed study targets may be conservative and that modified release rates and storage targets may be considered if the subwatershed study model verification demonstrates indicates that there is additional capacity for the subject lands.

Table below "Proposed Conditions Model Parameters…" describes the post-development model catchments.

Proposed Conditions Model Parameters and Storage/Flow Targets

Area Location	Area [ha]	Surface slope [%]	Soil Group	Land Use	Curve Number	Initial Abstractions Pervious/ impervious [mm]	Flow Target [m^3/s]		Storage Target [m^3]	
							5-Year	100-Year	5-Year	100-Year
Block 1	1.22	0.5	C	99% IMP	80	5 /1	0.0183	0.061	610	976
Block 2	1.4	0.5	C	99% IMP	80	5 / 1	0.021	0.07	700	1120
Block 3	1.03	0.5	C	99% IMP	80	5 / 1	0.015	0.052	515	824
Park	0.45	1.0	C	7% IMP	80	5 / 1	-	-	-	-
Public ROW	0.85	0.5	C	65% IMP	80	5 / 1	0.0128	0.0425	276	442

The following storage elements were simulated based on the 5-year and 100-year release rates and storage targets:

Underground storage tank – Block 1

Discharge [m^3/s]	Depth [m]	Area [m^2]	Volume [m^3]
0	0	152.5	0.0
0.0183	4	152.5	610
0.061	6.4	152.5	976

Underground storage tank – Block 2

Discharge [m^3/s]	Depth [m]	Area [m^2]	Volume [m^3]
0	0	175	0.0
0.021	4	175	700
0.07	6.4	175	1120

Underground storage tank – Block 3

Discharge [m^3/s]	Depth [m]	Area [m^2]	Volume [m^3]
0	0	128.75	0.0
0.01545	4	128.75	515
0.0515	6.4	128.75	824

The underground storage tanks are within the private / site plan portion of the development and will pump to a 300 mm pipe which connects to the Viola Desmond Drive "Superpipe" in the public ROW. The public ROW storage can be provided via a "superpipe" size 1.2 m with orifice pipe size 300 mm. This pipe discharges to Ninth Line sewer.

"Superpipe" Storage (public ROW)

Upstream MH No.	Downstream MH No.	Diameter [m]	Pipe Length [m^2]	Volume [m^3]
5	6	1.2	81.6	92.3
6	3	1.2	46	52
2	3	1.2	97.1	109.8
3	8	1.2	71.4	80.8
			Total:	**334.9**

As shown in Proposed Conditions Model Parameters and Storage/Flow Targets table, 442 m^3 is the required volume from the SWS; however, the PCSWMM model has indicated that through the use of the super pipe with the reduced storage and the 300 mm orifice, the 100-year release target for the site is met at the outlet.

The site tank storage and super pipe capacity will be verified with the Wood model.

Preliminary analysis indicates that the SWS targets for quantity control can be met
Below is the summary of existing storm sewer manholes and their proposed corresponding areas.

Existing vs. Proposed Summary

Design Event	Existing Peak Flow [m^3/s]	Existing HGL Elevation [m]	Proposed Peak Flow [m^3/s]	Proposed HGL Elevation [m]
100yr 12h SCS Type II	0.279*	-	0.241	186.5
Existing MH6 (In pipe and on surface)				
100yr 12h SCS Type II	1.732	184.7	1.672	184.83
Existing MH7 (In pipe and on surface)				
100yr 12h SCS Type II	1.524	184.09	1.487	184.19

*Approximate flows from the site entering the storm Sewer on Ninth Line

The proposed conditions results indicate that the total flow for the major and minor system flows are not exceeded downstream of the site. There is a slight increase in the proposed HGL; however, this will likely be reduced when a dual drainage model is created at detailed design to separate the minor and major system flows from the subject property.

Erosion Control

The Ninth Line Lands Scoped Subwatershed Study by Wood (2020) established criteria for erosion control based on the 25mm 4-hour storm. The total volume of rainfall simulated is 25.34 mm.

The SWS established the following targets for erosion control.

Table 2.6.1 Stormwater Management Facility Sizing Criteria for Erosion Control for Ninth Line Lands – Sawmill Creek Subwatershed		
Quantity Component	**Cumulative Unitary Volume (m^3/impervious ha)**	**Unitary Discharge ($m^3/s/ha$)**
Erosion	275	0.002

Using the above table, the discharge rate for the 4.95 ha site is 0.0099 m^3/s. The below table shows the modelling result for the site's existing and proposed conditions.

PCSWMM ID	Total Drainage Area [ha]	Total 25 mm Flow [m^3/s]	Unitary Flow Rate [$m^3/s/ha$]	Site Area Contribution [ha]	25 mm Flow from Site [m^3/s]
S4	2.04	0.01	0.005	0.81	0.004
S5	3.97	0.06	0.015	3.11	0.047
S6	4.62	0.06	0.013	1.03	0.013
Total Existing:				**4.95**	**0.064**
Total Proposed at MH11:				**4.95**	**0.062**

Targets specified in the SWS by Wood are not realistic for the site of this size. However, as shown in Water Balance Recharge section of the report, the 5 mm City of Mississauga T&W Developments Manual Requirements will be targeted, which will provide sufficient erosion control.

Based on the results provided in the above table, the existing and proposed flows are almost identical, therefore the combination of site pervious areas and controls in place meet erosion control targets.

4 SANITARY SERVICING

4.1. EXISTING SANITARY SERVICING

The subject lands fall within Erin Centre and Motorway Sewersheds of the West Trunk System which ultimately discharges to the Clarkson Water Pollution Control Plant. Existing wastewater infrastructure in and around the subject lands is outlined below:

- 1050 mm sanitary trunk sewer on Ninth Line from Erin Centre Boulevard north to Britannia Road West
- 900 mm sanitary sewer on Erin Centre Boulevard
- Proposed 375 mm sanitary sewer from Erin Centre Boulevard to Viola Desmond Drive in the 5150 Ninth Line development
- Proposed sanitary plug at the north end of Viola Desmond Drive to the 375 mm sanitary sewer in the 5150 Ninth Line development
- Local sewers within subdivisions east of Ninth Line

As outlined in the Region's *Ninth Line Lands Servicing Strategy Report*, the Clarkson WPCP is anticipated to be expanded in the future and the existing 900 mm trunk sewer on Erin Centre Boulevard is adequately sized to handle projected flows from the subject property. Therefore, it is assumed that there are no downstream sanitary capacity issues associated with the development of the subject property.

4.2. PROPOSED SANITARY SERVICING

The neighbouring property to the north has proposed a new sanitary sewer on Ninth Line to provide an outlet for their property and the subject lands to the existing 900 mm sanitary sewer at Erin Centre Boulevard. The 5150 Ninth Line development has also provided a plug at the north end of Viola Desmond Drive for the subject property to connect to.

Sanitary sewers are proposed within the ROW's to provide Block's 1, 2, and 3 with service connections for their proposed development concepts. Manholes have been provided at the property lines within the private blocks to serve as outlets for sanitary sewage flow.

Population densities of 3.50 people per unit for low-rise/townhouses and 2.70 people per unit for high-rise/apartments have been assumed based on marketing and demographic info for the area. Note these densities result in higher projected populations than the Region standard densities based on land area (175 people per hectare for townhouses and 475 people per hectare for apartments).

Refer to **Drawing C303**, "*Sanitary Drainage Plan*," for further details. Sanitary design calculations are included in **Appendix A**.

5 WATER DISTRIBUTION

5.1. EXISTING WATER SERVICING

A 400 mm trunk watermain exists within the east boulevard Ninth Line that will supply the proposed development through the construction of new water infrastructure. This watermain is within Pressure Zone 4W of the Region's water distribution system servicing elevations between 166.3m and 198.1m. Pressure Zone 4W is supplied by the Streetsville High-Lift Pumping Station and the Meadowvale North Low-Lift Pumping Station.

As outlined in the Region's Ninth Line Lands Servicing Strategy Report, the need to expand existing water distribution infrastructure in the area of Ninth Line is currently under review.

5.2. PROPOSED WATER SERVICING

A 300 mm watermain is proposed within the future Viola Desmond Drive, connected to a stub provided by the 5150 Ninth Line development application currently in review. This watermain will connect to the existing Pressure Zone 4W 400 mm watermain on Ninth Line. Blocks 1,2, and 3 are provided with 150 mm dia. domestic and 200 mm dia. fireline water services as per region of peel standard drawing 1-8-3. Refer to **Site Servicing Plan C101** in **Appendix B** for further details.

Hydrants are placed at 70m intervals along Viola Desmond Drive and Mahoney Gate as per Region of Peel criteria. Hydrant testing and water modelling will be conducted as part of the detailed engineering design to confirm adequate fire flow is available.

6 EROSION AND SEDIMENT CONTROL

The erosion and sediment control plan for the site will be designed in conformance with the City of Mississauga guidelines and Credit Valley Conservation Authority. The following erosion and sediment control measures will be installed and maintained during construction:

- A temporary sediment control fence will be placed prior to grading
- Temporary sediment traps will be provided at each outlet
- Gravel mud mats will be provided at construction vehicle access points to minimize off-site tracking of sediments
- All temporary erosion and sediment control measures will be routinely inspected and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.

7 CONCLUSION

The proposed residential development at 5080, 5054, and 5034 Ninth Line, which includes 24 back-to-back townhouses and 1,222 apartment units, can be adequately serviced via the existing storm, sanitary and water distribution infrastructure and does not adversely impact any of the surrounding infrastructure or properties.

Stormwater quantity control for the private development is provided by underground storage tanks within private blocks. Stormwater quantity control for the public road is provided by a “superpipe” within the proposed right-of-way.

Water balance feasibility has been discussed and will be detailed in future applications. Water quality control is provided via oil/grit separators treating the site plan blocks and public ROW.

Sanitary servicing is provided by connecting to the plug on the north end of Viola Desmond Drive, which conveys the proposed trunk on Ninth Line to the existing 900mm trunk sewer on Erin Centre Boulevard, ultimately draining to the Clarkson Water Pollution Control Plant.

Water servicing is provided by connecting to the plug on the north end of Viola Desmond Drive and a looped connection to the existing Pressure Zone 4W 400mm watermain on Ninth Line.

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APPENDIX A

DESIGN CALCULATIONS

Sanitary Sewer Design Sheet
Storm Sewer Design Sheet
Stormceptor Sizing Report
PCSWMM Output

urbantech

SANITARY SEWER DESIGN SHEET

5080 NINTH LINE

CITY OF MISSISSAUGA, REGION OF PEEL

PROJECT DETAILS

Project No: 19-607
Date: 8-Sep-21
Designed by: B.J.
Checked by: D.Z.

DESIGN CRITERIA

Min. Flow =	13	l/s			
Min Diameter =	250	mm	Avg. Domestic Flow =	302.8	l/c/d
Mannings 'n'=	0.013		Infiltration =	0.200	l/s/ha
Min. Velocity =	0.75	m/s	Max. Peaking Factor =	4.00	
Max. Velocity =	3.50	m/s	Min. Peaking Factor=	1.50	
			Domestic Sewage flow for < 1000 ppl = 0.013m^3/s		
Factor of Safety =	15	%	(Region of Peel Std. 2-5-2)		

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	RESIDENTIAL AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	COMMERCIAL/INDUSTRIAL/INSTITUTIONAL AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	FLOW CALCULATIONS INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	MIN. RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	PIPE DATA SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
1687 E LOWER BASE LINE	0	1A	1.50	1.50	405	0	2.7	1094	1094	0.00	0.00	0	0.000	0	0	0.3	1094	3.77	14.5	14.5	0.0	0.0	14.8	0.00	0	0.0	0.00	0.00	0%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	0	1A	0.35	0.35	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.1	0	0.00	0.0	0.0	0.0	0.0	0.1	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	1A	2A	0.00	1.85	0	0	0	0	1094	0.00	0.00	0	0.000	0	0	0.4	1094	3.77	14.5	14.5	0.0	0.0	14.8	0.50	375	124.0	1.12	0.75	12%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
BLOCK 2	3A	2A	1.40	1.40	525	0	2.7	1418	1418	0.00	0.00	0	0.000	0	0	0.3	1418	3.70	18.4	18.4	0.0	0.0	18.7	2.00	375	248.0	2.25	1.32	8%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	2A	4A	0.00	3.25	0	0	0	0	2512	0.00	0.00	0	0.000	0	0	0.7	2512	3.51	30.9	30.9	0.0	0.0	31.5	0.30	375	96.0	0.87	0.76	33%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
BLOCK 3	5A	4A	1.03	1.03	309	0	2.7	835	835	0.00	0.00	0	0.000	0	0	0.2	835	3.85	11.3	13.0	0.0	0.0	13.2	2.00	375	248.0	2.25	1.17	5%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	4A	6A	0.00	4.28	0	0	0	0	3347	0.00	0.00	0	0.000	0	0	0.9	3347	3.40	39.9	39.9	0.0	0.0	40.8	0.30	375	96.0	0.87	0.81	42%
VIOLA DESMOND DRIVE	0	6A	0.30	0.30	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.1	0	0.00	0.0	0.0	0.0	0.0	0.1	0.00	0	0.0	0.00	0.00	0%
BLOCK 4 - PARK	0	6A	0.45	0.45	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.1	0	0.00	0.0	0.0	0.0	0.0	0.1	0.00	0	0.0	0.00	0.00	0%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	6A	7A	0.00	5.03	0	0	0	0	3347	0.00	0.00	0	0.000	0	0	1.0	3347	3.40	39.9	39.9	0.0	0.0	40.9	0.30	375	96.0	0.87	0.81	43%
5104 NINTH LINE	0	7A	0.77	0.77	29	0	3.5	102	102	0.00	0.00	0	0.000	0	0	0.2	102	4.00	1.4	13.0	0.0	0.0	13.2	0.00	0	0.0	0.00	0.00	0%
BLOCK 1 - TOWNHOUSE	0	8A			24	0	3.5	84	84	0.00	0.00	0	0.000	0	0	0.0	84	4.00	1.2	13.0	0.0	0.0	13.0	0.00	0	0.0	0.00	0.00	0%
BLOCK 1 - HIGH DENSITY	8A	7A	1.22	1.22	412	0	2.7	1113	1197	0.00	0.00	0	0.000	0	0	0.2	1197	3.75	15.7	15.7	0.0	0.0	16.0	2.00	300	136.8	1.93	1.30	12%
0	0	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0	0.000	0	0	0.0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.00	0.00	0%
VIOLA DESMOND DRIVE	7A	EX.17A	0.00	7.02	0	0	0	0	4646	0.00	0.00	0	0.000	0	0	1.4	4646	3.27	53.3	53.3	0.0	0.0	54.7	0.30	375	96.0	0.87	0.88	57%
CEC ROAD "C"		EX.17A	3.00	3.00	129		3.5	452	452							0.6	452	4.00	6.3	13.0			13.6	1.00	250	59.5	1.21	0.96	23%
VIOLA DESMOND DRIVE	EX.17A	EX.18A	0.11	10.13					5098							2.0	5098	3.24	57.8	57.8			59.9	0.30	375	96.0	0.87	0.90	62%
VIOLA DESMOND DRIVE	EX.18A	EX.19A	0.07	10.20	2		3.5	7	5105							2.0	5105	3.24	57.9	57.9			59.9	0.30	375	96.0	0.87	0.90	62%
VIOLA DESMOND DRIVE	EX.19A	EX.20A	0.31	10.51	9		3.5	32	5137							2.1	5137	3.23	58.2	58.2			60.3	0.30	375	96.0	0.87	0.90	63%
CEC ROAD "A"		EX.20A	0.57	0.57	25		3.5	88	88							0.1	88	4.00	1.2	13.0			13.1	0.50	250	42.0	0.86	0.75	31%
VIOLA DESMOND DRIVE	EX.20A	EX.1T	0.15	11.23	4		3.5	14	5239							2.2	5239	3.23	59.2	59.2			61.5	0.30	375	96.0	0.87	0.90	64%
NINTH LINE	EX.1T	EX.2T		11.23					5239							2.2	5239	3.23	59.2	59.2			61.5	0.30	375	96.0	0.87	0.90	64%
5170 NINTH LINE	FUT	EX.2T	0.73	0.73	27		3.5	95	95							0.1	95	4.00	1.3	13.0			13.1	1.00	250	59.5	1.21	0.96	22%
NINTH LINE	EX.2T	EX.3T		11.96					5334							2.4	5334	3.22	60.2	60.2			62.6	0.30	375	96.0	0.87	0.91	65%

Urbantech Consulting, A Division of Leighton-Zec Ltd.
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STORM SEWER DESIGN SHEET

10 Year Storm

5080 NINTH LINE

CITY OF MISSISSAUGA

PROJECT DETAILS

Project No: 19-607
Date: 8-Sep-21
Designed by: B.J.
Checked by: DZ

DESIGN CRITERIA

Min. Diameter =	300	mm	Rainfall Intensity =	A / (Tc+B)^c
Mannings 'n'=	0.013			
Starting Tc =	15	min	A =	1010
			B =	4.6
Factor of Safety =	15	%	c =	0.78

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
BLOCK 1	TANK	1					307.2		0.059	0.059	0.059									
BLOCK 1	1	2					99.2			0.059	0.059	12.7	0.50	300	0.068	0.97	15.00	0.22	15.22	86%
VIOLA DESMOND DR.		2	0.30	0.65	0.20	0.20														
VIOLA DESMOND DR.	2	3				0.20	98.3	0.053		0.059	0.112	97.1	0.50	1200	2.757	2.44	15.22	0.66	15.88	4%
BLOCK 2	TANK	4					307.2		0.056	0.056	0.056									
BLOCK 2	4	5					99.2			0.056	0.056	12.5	0.50	300	0.068	0.97	15.00	0.22	15.22	82%
VIOLA DESMOND DR.		5	0.35	0.65	0.23	0.23														
VIOLA DESMOND DR.	5	6				0.23	98.3	0.062		0.056	0.118	81.6	0.25	1200	1.949	1.72	15.22	0.79	16.00	6%
BLOCK 3	TANK	7					307.2		0.035	0.035	0.035									
BLOCK 3	7	6					99.2			0.035	0.035	8.9	0.50	300	0.068	0.97	15.00	0.15	15.15	51%
VIOLA DESMOND DR.	6	3				0.23	95.4	0.060		0.091	0.151	46.0	0.25	1200	1.949	1.72	16.00	0.44	16.45	8%
MAHONEY GATE		3	0.20	0.65	0.13	0.13														
MAHONEY GATE	3	9				0.55	93.8	0.144		0.150	0.294	71.4	0.25	1200	1.949	1.72	16.45	0.69	17.14	15%
PARK	8	9	0.45	0.25	0.11	0.11	99.2	0.031			0.031	9.5	1.00	300	0.097	1.37	15.00	0.12	15.12	32%
MAHONEY GATE	9	10				0.67	91.5	0.169		0.150	0.319	19.2	0.25	1200	1.949	1.72	17.14	0.19	17.33	16%
MAHONEY GATE	10	11 (OGS)				0.67	90.9	0.168		0.150	0.318	3.3	0.50	300	0.068	0.97	17.33	0.06	17.38	
MAHONEY GATE	11 (OGS)	12				0.67	90.7	0.168		0.150	0.318	22.3	0.50	300	0.068	0.97	17.38	0.38	17.77	464%

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Detailed Stormceptor Sizing Report – Your Home Developments

Project Information & Location			
Project Name	Your Home Developments	**Project Number**	46249
City	Mississauga	**State/ Province**	Ontario
Country	Canada	**Date**	8/27/2021
Designer Information		**EOR Information (optional)**	
Name	Janna Ormond	**Name**	
Company	Urbantech	**Company**	
Phone #	289-887-3057	**Phone #**	
Email	jannaormond@urbantech.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	
Recommended Stormceptor Model	STC 750
Target TSS Removal (%)	80.0
TSS Removal (%) Provided	81
PSD	Fine Distribution
Rainfall Station	TORONTO PEARSON AP

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 300	40
STC 750	81
STC 1000	86
STC 1500	85
STC 2000	87
STC 3000	87
STC 4000	89
STC 5000	89
STC 6000	91
STC 9000	93
STC 10000	93
STC 14000	95
StormceptorMAX	Custom

Stormceptor
The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology
Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:
• Site parameters
• Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
• Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
• TSS load
• Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Ontario	**Total Number of Rainfall Events**	4669
Rainfall Station Name	TORONTO PEARSON AP	**Total Rainfall (mm)**	24214.8
Station ID #	8733	**Average Annual Rainfall (mm)**	605.4
Coordinates	43°41'N, 79°38'W	**Total Evaporation (mm)**	2657.4
Elevation (ft)	562	**Total Infiltration (mm)**	3814.7
Years of Rainfall Data	44	**Total Rainfall that is Runoff (mm)**	17742.7

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (ha)	4.95
Imperviousness %	84.00

Up Stream Storage	
Storage (ha-m)	Discharge (cms)
0.000	0.000
0.329	0.062
0.329	0.150
0.329	0.244

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	
Water Quality Flow Rate (L/s)	

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cms)	

Design Details	
Stormceptor Inlet Invert Elev (m)	
Stormceptor Outlet Invert Elev (m)	
Stormceptor Rim Elev (m)	
Normal Water Level Elevation (m)	
Pipe Diameter (mm)	
Pipe Material	
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	

Site Details

Drainage Area

Total Area (ha)	4.95
Imperviousness %	84.00

Surface Characteristics

Width (m)	445.00
Slope %	2
Impervious Depression Storage (mm)	0.508
Pervious Depression Storage (mm)	5.08
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (mm/hr)	61.98
Min. Infiltration Rate (mm/hr)	10.16
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (mm/day)	2.54

Dry Weather Flow

Dry Weather Flow (lps)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

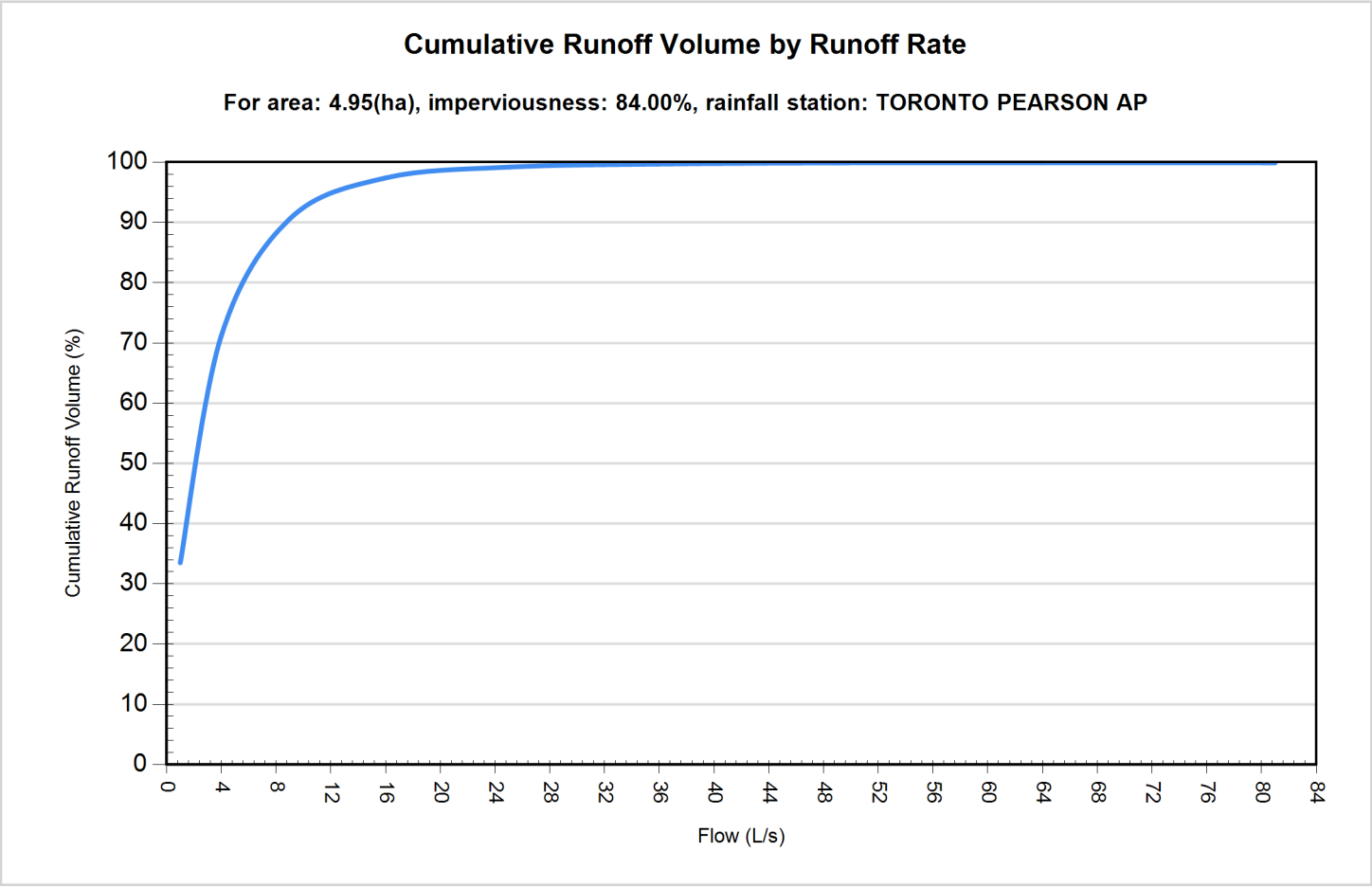
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

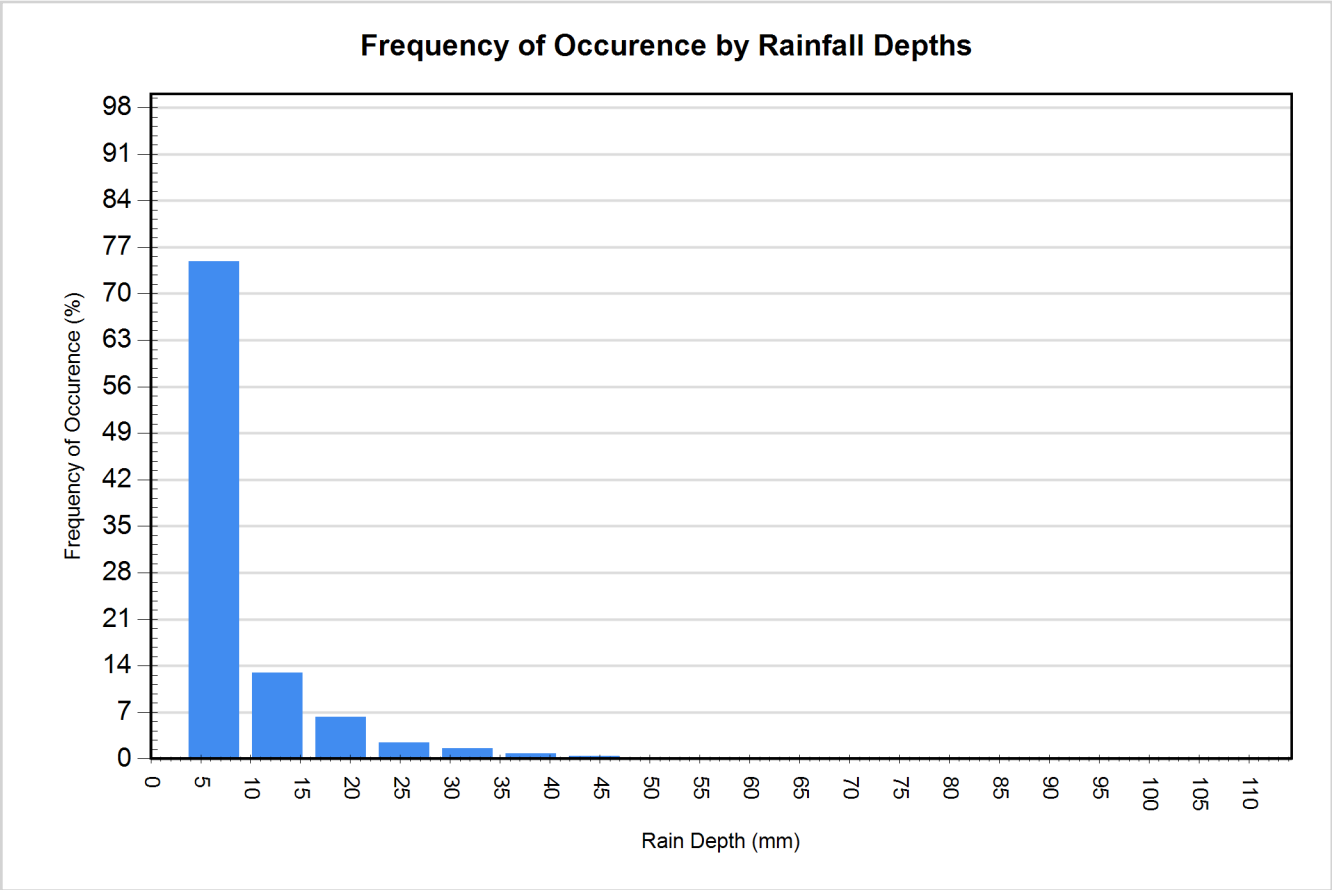
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (L/s)	Runoff Volume (m³)	Volume Over (m³)	Cumulative Runoff Volume (%)
1	298502	596660	33.5
4	635422	259567	71.2
9	807908	83990	90.6
16	868674	23447	97.4
25	884941	7129	99.2
36	889609	2472	99.7
49	890856	1217	99.9
64	891038	1035	99.9
81	891064	1010	99.9



Rainfall Event Analysis				
Rainfall Depth (mm)	No. of Events	Percentage of Total Events (%)	Total Volume (mm)	Percentage of Annual Volume (%)
6.35	3499	74.9	6076	25.1
12.70	606	13.0	5524	22.8
19.05	293	6.3	4579	18.9
25.40	119	2.5	2585	10.7
31.75	73	1.6	2068	8.5
38.10	37	0.8	1281	5.3
44.45	19	0.4	764	3.2
50.80	10	0.2	470	1.9
57.15	2	0.0	108	0.4
63.50	4	0.1	235	1.0
69.85	3	0.1	205	0.8
76.20	2	0.0	145	0.6
82.55	1	0.0	80	0.3
88.90	0	0.0	0	0.0
95.25	1	0.0	95	0.4
101.60	0	0.0	0	0.0
107.95	0	0.0	0	0.0



For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications

PCSWMM Report

Existing

Model Ninth Line-CN-existing SCS 12hr 100 year.inp

Urbantech Consulting

September 10, 2021

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Summary 1: Model inventory

Name	Ninth Line-CN-existing SCS 12hr 100 year
Raingages	7
Subcatchments	14
Aquifers	0
Snowpacks	0
RDII hydrographs	0
Junction nodes	18
Outfall nodes	1
Flow divider nodes	0
Storage unit nodes	0
Conduit links	17
Pump links	0
Orifice links	0
Weir links	1
Outlet links	8
Treatment units	0
Transects	3
Control rules	0
Pollutants	0
Land Uses	0
Control Curves	1
Diversion Curves	0
Pump Curves	0
Rating Curves	18
Shape Curves	0
Storage Curves	0
Tidal Curves	0
Weir Curves	0
Time Series	18
Time Patterns	0

Summary 2: Runoff quantity continuity

Name	Ninth Line-CN-existing SCS 12hr 100 year
Initial LID storage (mm)	n/a
Initial snow cover (mm)	n/a
Total precipitation (mm)	103.434
Outfall runon (mm)	n/a
Evaporation loss (mm)	0.000
Infiltration loss (mm)	41.212
Surface runoff (mm)	58.465
LID drainage (mm)	n/a
Snow removed (mm)	n/a
Final snow cover (mm)	n/a
Final storage (mm)	3.760
Continuity error (%)	-0.002

Table 1: Conduits

Name	Inlet Node	Outlet Node	Length (m)	Roughness	Inlet Elev. (m)	Outlet Elev. (m)	Geom1 (m)	Max. |Flow| (m^3/s)	Max. Unit Flow ($m^3/s/ha$)
C1	EX_STM_MH3	J-S7	45.938	0.013	190.09	189.4	0.45	0.086	0.023
C2	EX_STM_MH1	EX_STM_MH2	119.7	0.013	191.7	191.1	0.45	0.016	0.032
C3	EX_STM_MH2	EX_STM_MH3	120.9	0.013	191	190.24	0.45	0.066	0.076
C4	EX_STM_MH4	EX_MH1	120.271	0.013	187.61	185.69	0.525	0.296	0.062
C5	EX_MH1	EX_STM_MH5	129.527	0.013	185.47	184.77	0.75	0.601	0.039
C6	EX_STM_MH5	EX_STM_MH6	120	0.013	184.77	184.14	0.75	1.217	0.068
C7	EX_STM_MH6	EX_STM_MH7	120.73	0.013	184.03	183.5	1.05	1.164	0.043
C8	EX_STM_MH7	J9_COM	58.11	0.013	183.4	183.1	1.05	1.252	0.047
C1-S7	J-S7minor	J-S7	19.069	0.013	191.55	189.55	0.3	0.154	0.061
C9	J-S7	EX_STM_MH4	73.462	0.013	189.4	187.685	0.45	0.239	0.064
C1-S	EX_STM_MH3-S	EX_STM_MH4-S	102.072	0.013	192.5	190.81	0	0.337	0.09
C3-S	EX_STM_MH2-S	EX_STM_MH3-S	123.528	0.013	193	192.5	0	0.264	0.305
C2-S	EX_STM_MH1-S	EX_STM_MH2-S	112.503	0.013	193.95	193	0	0.176	0.351
C4-S	EX_STM_MH4-S	EX_MH1-S	126.051	0.013	190.81	188.64	0	0.622	0.131
C5-S	EX_MH1-S	EX_STM_MH5-S	138.918	0.013	188.64	187.3	0	1.214	0.079
C6-S	EX_STM_MH5-S	EX_STM_MH6-S	119.324	0.013	187.3	187.6	0	0.487	0.027
C7-S	EX_STM_MH7-S	EX_STM_MH6-S	118.588	0.013	187.621	187.6	0	0.165	0.036

Table 2A: Subcatchments

Name	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Curve Number
S1	SCSTYPEII_12hr_100	EX_MH1-S	10.25	410	250	2.5	5	0.011	0.25	74
S5	SCSTYPEII_12hr_100	EX_STM_MH6-S	3.97	94.524	420	1.7	10	0.011	0.25	74
S4	SCSTYPEII_12hr_100	EX_STM_MH5-S	2.04	102	200	1.5	5	0.011	0.25	82
S2	SCSTYPEII_12hr_100	EX_STM_MH4-S	0.35	35	100	1.5	85	0.011	0.25	74
S3	SCSTYPEII_12hr_100	EX_STM_MH4-S	0.29	29	100	1.5	60	0.011	0.25	74
S7	SCSTYPEII_12hr_100	J-S7minor	2.51	100.4	250	1	3	0.011	0.25	74
S6_ROW1	SCSTYPEII_12hr_100	EX_STM_MH1-S	0.5011	100.22	50	1.8	95	0.011	0.25	74
S6_ROW2	SCSTYPEII_12hr_100	EX_STM_MH2-S	0.364343	72.869	50	1.8	95	0.011	0.25	74
S6_ROW3	SCSTYPEII_12hr_100	EX_STM_MH3-S	0.365688	73.138	50	1.8	95	0.011	0.25	74
S6_ROW4	SCSTYPEII_12hr_100	EX_STM_MH4-S	0.360277	72.055	50	1.8	95	0.011	0.25	74
S6_ROW5	SCSTYPEII_12hr_100	EX_MH1-S	0.3728	74.56	50	1.8	95	0.011	0.25	74
S6_ROW6	SCSTYPEII_12hr_100	EX_STM_MH5-S	0.4227	84.54	50	1	95	0.011	0.25	80
S6_ROW7	SCSTYPEII_12hr_100	EX_STM_MH6-S	0.4492	89.84	50	1	95	0.011	0.25	80
S6	SCSTYPEII_12hr_100	EX_STM_MH7-S	4.62	81.338	568	0.8	10	0.011	0.25	80

Table 2B: Subcatchments

Name	Groundwater	Precipitation (mm)	Runon (mm)	Evaporation (mm)	Infiltration (mm)	Runoff Depth (mm)	Peak Runoff (m^3/s)	Runoff Coefficient
S1	NO	103.43	0	0	50.5	50.2	0.73	0.485
S5	NO	103.43	0	0	47.84	51.45	0.26	0.497
S4	NO	103.43	0	0	37.27	61.82	0.19	0.598
S2	NO	103.43	0	0	7.84	94.77	0.13	0.916
S3	NO	103.43	0	0	21.12	81.36	0.09	0.787
S7	NO	103.43	0	0	51.57	47.97	0.12	0.464
S6_ROW1	NO	103.43	0	0	2.59	100.07	0.19	0.968
S6_ROW2	NO	103.43	0	0	2.59	100.07	0.14	0.968
S6_ROW3	NO	103.43	0	0	2.59	100.07	0.14	0.968
S6_ROW4	NO	103.43	0	0	2.59	100.07	0.14	0.968
S6_ROW5	NO	103.43	0	0	2.59	100.07	0.14	0.968
S6_ROW6	NO	103.43	0	0	2.14	100.5	0.16	0.972
S6_ROW7	NO	103.43	0	0	2.14	100.5	0.17	0.972
S6	NO	103.43	0	0	38.6	57.25	0.27	0.553

PCSWMM Report

Proposed

Model YHD-Post Development - 100-year.inp

Urbantech Consulting

September 10, 2021

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Summary 1: Model inventory

Name	YHD-Post Development - 100-year	YHD-Post Development - 100-year
Raingages	7	8
Subcatchments	37	37
Aquifers	0	0
Snowpacks	0	0
RDII hydrographs	0	0
Junction nodes	79	78
Outfall nodes	1	1
Flow divider nodes	0	0
Storage unit nodes	8	8
Conduit links	80	78
Pump links	1	1
Orifice links	1	2
Weir links	1	1
Outlet links	32	32
Treatment units	0	0
Transects	3	3
Control rules	0	0
Pollutants	0	0
Land Uses	0	0
Control Curves	0	0
Diversion Curves	0	0
Pump Curves	1	1
Rating Curves	26	26
Shape Curves	0	0
Storage Curves	3	3
Tidal Curves	0	0
Weir Curves	0	0
Time Series	7	8
Time Patterns	0	0

Summary 2: Runoff quantity continuity

Name	YHD-Post Development - 100-year	YHD-Post Development - 100-year
Initial LID storage (mm)	n/a	n/a
Initial snow cover (mm)	n/a	n/a
Total precipitation (mm)	103.434	103.434
Outfall runon (mm)	n/a	n/a
Evaporation loss (mm)	0.000	0.000
Infiltration loss (mm)	32.707	31.239
Surface runoff (mm)	69.673	71.159
LID drainage (mm)	n/a	n/a
Snow removed (mm)	n/a	n/a
Final snow cover (mm)	n/a	n/a
Final storage (mm)	1.066	1.049
Continuity error (%)	-0.012	-0.013

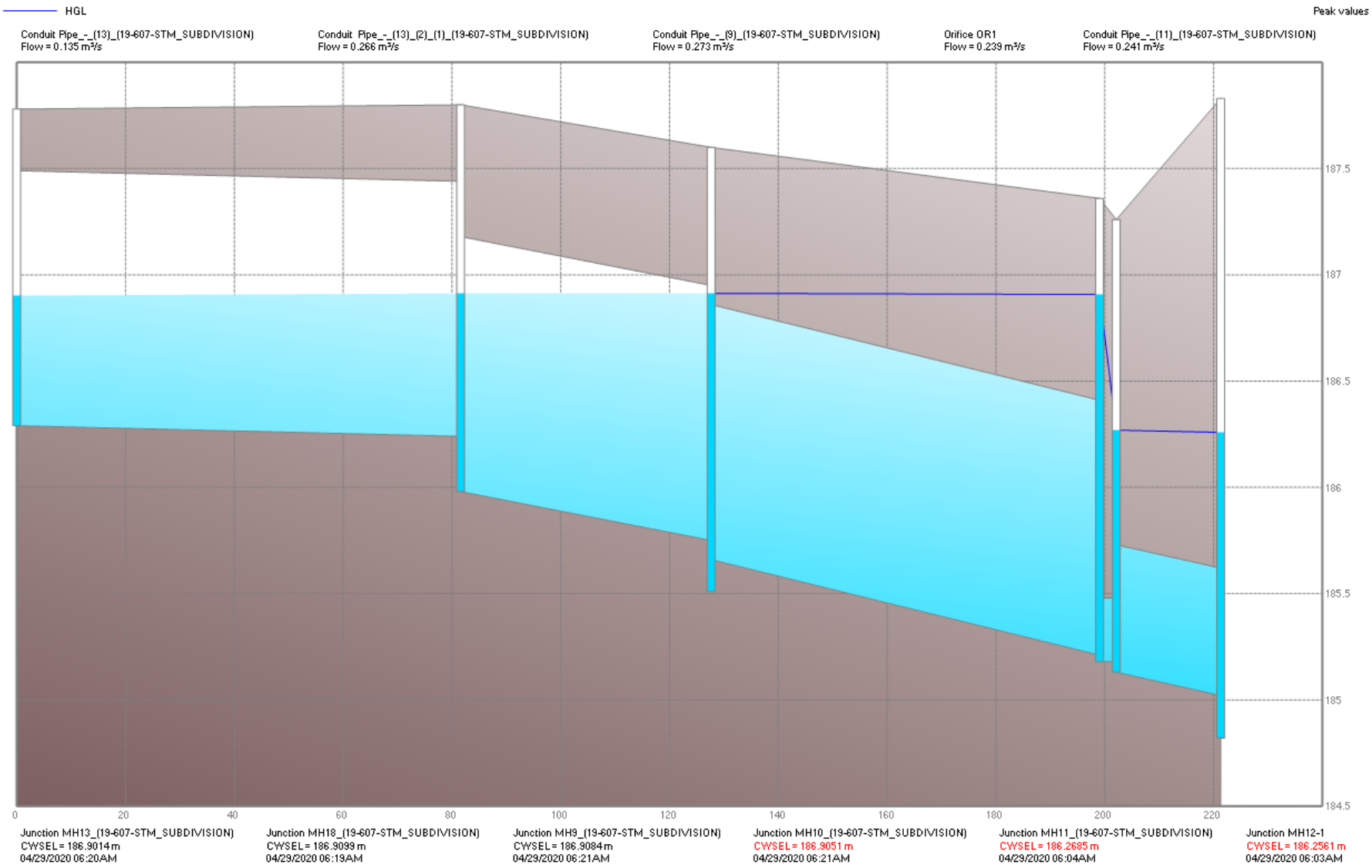


Figure 1: Node MH13_(19-607-STM_SUBDIVISION) to Node MH12-1

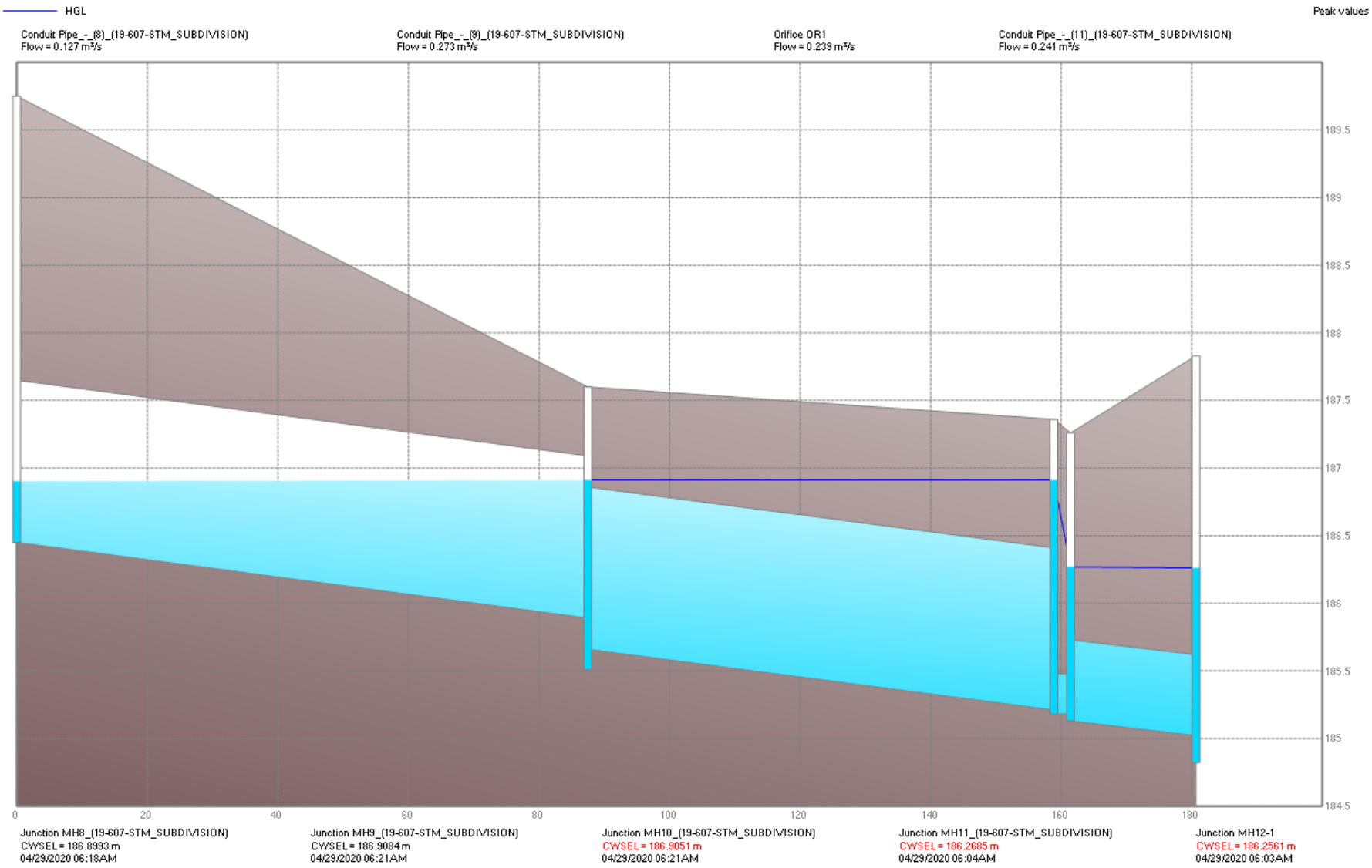


Figure 2: Node MH8_(19-607-STM_SUBDIVISION) to Node MH12-1

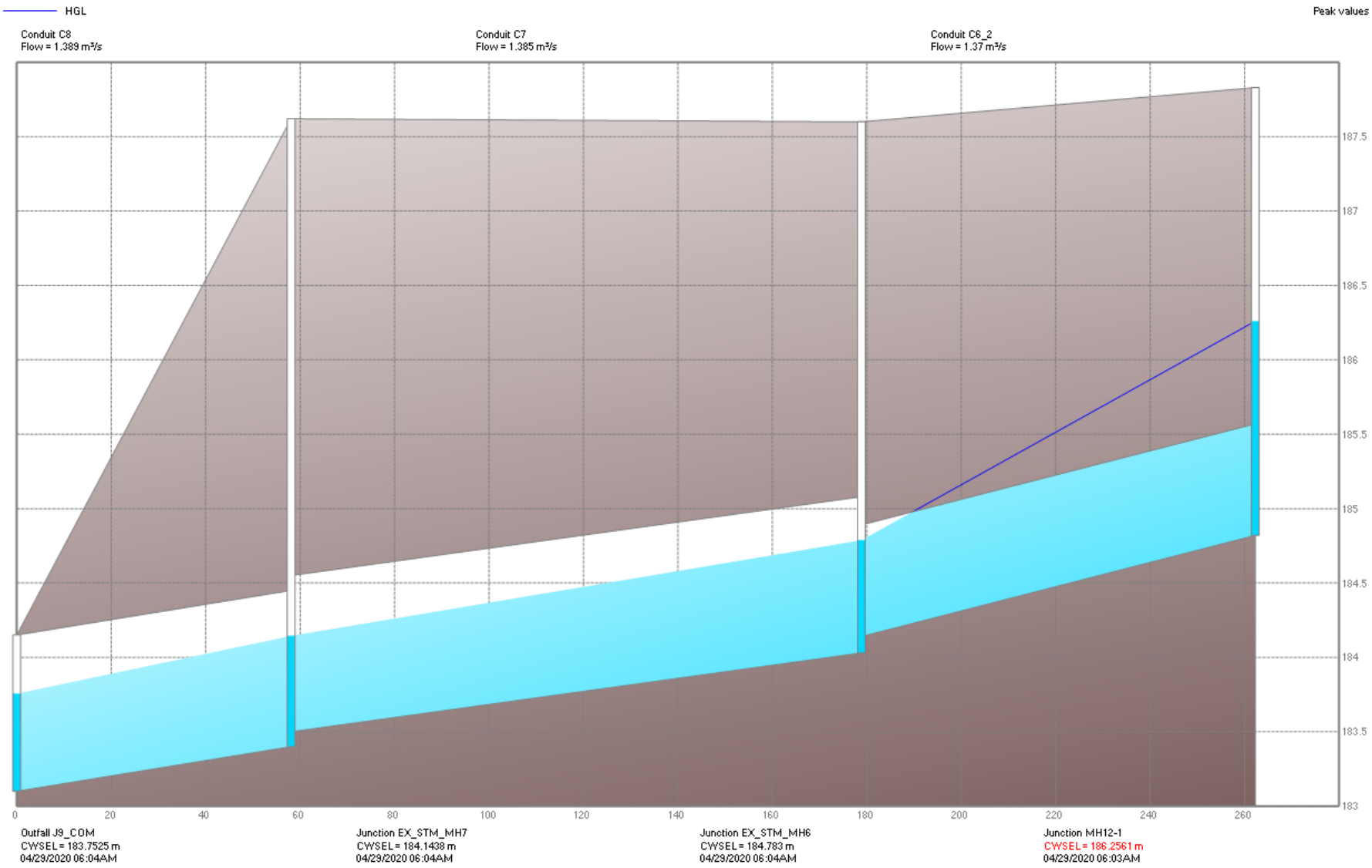


Figure 3: Node J9_COM to Node MH12-1

Table 1A: Conduits

Name	Inlet Node	Outlet Node	Length (m)	Roughness	Inlet Elev. (m)
C1	EX_STM_MH3	J-S7	45.925	0.013	190.09
C2	EX_STM_MH1	EX_STM_MH2	119.07	0.013	191.7
C3	EX_STM_MH2	EX_STM_MH3	120.946	0.013	191
C4	EX_STM_MH4	EX-MH20	67.502	0.013	187.61
C5	EX_MH1	J-S1	14.698	0.013	185.47
C7	EX_STM_MH6	EX_STM_MH7	120.761	0.013	184.03
C8	EX_STM_MH7	J9_COM	58.115	0.013	183.4
C1-S7	J-S7minor	J-S7	19.076	0.013	191.55
C9	J-S7	EX_STM_MH4	73.449	0.013	189.4
C13	J-S1	EX_STM_MH5	114.818	0.013	185.39
C1-S	EX_STM_MH3-S	EX_STM_MH4-S	102.072	0.015	192.5
C3-S	EX_STM_MH2-S	EX_STM_MH3-S	123.528	0.015	193
C2-S	EX_STM_MH1-S	EX_STM_MH2-S	112.503	0.015	193.95
C4-S	EX_STM_MH4-S	EX-MH20-S	71.751	0.015	190.81
C5-S	EX_MH1-S	EX_STM_MH-5-S	132.111	0.015	188.64
C6-S	EX_STM_MH-5-S	EX_STM_MH6-S	119.324	0.015	187.3
C7-S	EX_STM_MH7-S	EX_STM_MH6-S	118.588	0.015	187.621
C17	EX-MH20	EX_MH1	52.749	0.013	186.23
Pipe_-_(116)	MH_C1	MH_C2	93.974	0.013	188.604
Pipe_-_(117)	MH_C2	MH_C3	18.001	0.013	188.074
Pipe_-_(119)	MH_C3	MH_C4	79.923	0.013	187.924
Pipe_-_(120)	MH_C4	TEE1	31.393	0.013	187.494
Pipe_-_(64)	MH1	MH2	16.289	0.011	188.553
Pipe_-_(65)	MH2	MH3	48.4	0.011	188.412
Pipe_-_(67)	MH13	MH10	39.109	0.013	187.322
Pipe_-_(69)	MH10	MH15	13.081	0.011	186.901

Table 1A: Conduits (continued...)

Name	Inlet Node	Outlet Node	Length (m)	Roughness	Inlet Elev. (m)
Pipe_-_(70)	MH15	STM_TANK	8.003	0.011	186.746
Pipe_-_(71)	MH3	MH4	39.401	0.011	188.08
Pipe_-_(72)	MH4	MH8	6.693	0.013	187.583
Pipe_-_(73)	MH8	MH9	44.948	0.011	187.52
Pipe_-_(74)	MH5	MH7	30.872	0.011	188.74
Pipe_-_(75)	MH7	MH4	86.902	0.011	188.281
Pipe_-_(76)	MH17	MH18	11.624	0.013	187.163
Pipe_-_(79)	MH21	MH22	69.241	0.011	186.587
Pipe_-_(85)	MH11	CBMH12	88.405	0.011	188.566
Pipe_-_(86)	CBMH12	MH13	42.095	0.011	187.607
Pipe_-_(73)_(1)	MH9	MH10	57.85	0.011	187.265
Pipe_-_(66)_(1)	MH14	MH13	64.661	0.011	187.795
Pipe_-_(125)	MH22	MH23	24.962	0.011	186.22
Pipe_-_(126)	MH16	MH17	13	0.013	188.5
Pipe_-_(127)	MH23	MH24	27.152	0.011	186.03
Pipe_-_(128)	MH24	MH25	14.224	0.011	185.861
Pipe_-_(129)	MH25	EX_MH1	10.903	0.011	185.744
Pipe_-_(64)-S	MH1-S	MH2-S	16.289	0.015	192.08
Pipe_-_(65)-S	MH2-S	MH3-S	48.4	0.015	191.95
Pipe_-_(71)-S	MH3-S	MH4-S	39.401	0.015	191.32
Pipe_-_(73)_(1)-S	MH10-S	MH9-S	57.85	0.015	190.62
Pipe_-_(72)-S	MH4-S	MH8-S	6.693	0.015	190.93
Pipe_-_(73)-S	MH8-S	MH9-S	44.948	0.015	190.82
Pipe_-_(66)_(1)-S	MH14-S	MH13-S	64.661	0.015	190.97
Pipe_-_(67)-S	MH13-S	MH10-S	38.445	0.015	190.7
Pipe_-_(86)-S	CBMH12-S	MH13-S	42.095	0.015	190.8

Table 1A: Conduits (continued...)

Name	Inlet Node	Outlet Node	Length (m)	Roughness	Inlet Elev. (m)
Pipe_-_(85)-S	MH11-S	CBMH12-S	88.405	0.015	191.57
Pipe_-_(76)-S	MH17-S	MH18-S	11.624	0.015	190.35
Pipe_-_(77)-S	MH18-S	MH19-S	108.082	0.015	190.21
Pipe_-_(79)-S	MH21-S	MH22-S	69.241	0.015	190.57
Pipe_-_(125)-S	MH22-S	MH23-S	24.962	0.015	189.43
Pipe_-_(74)-S	MH5-S	MH7-S	30.872	0.015	191.75
Pipe_-_(75)-S	MH7-S	MH4-S	86.638	0.015	191.32
Pipe_-_(77)_1	MH18	TEE1	43.944	0.013	187.074
Pipe_-_(77)_2	TEE1	MH19	64.168	0.013	186.964
Pipe_-_(127)-S	MH23-S	MH24-S	30.018	0.01	189.4
C10	MH24-S	EX_MH1-S	38.27	0.015	189
C11	EX-MH20-S	EX_MH1-S	61.099	0.015	189.75
C12	Dummy	EX-MH20-S	30.398	0.015	189.76
C14	Dummy	MH19-S	6.051	0.015	189.76
C15	MH6	MH7	45.163	0.011	188.5
C15-S	MH6-S	MH7-S	44.125	0.01	191.54
Pipe_-_(8)_(19-607-STM_SUBDIVISION)	MH8_(19-607-STM_SUBDIVISION)	MH9_(19-607-STM_SUBDIVISION)	87.471	0.01	186.19
Pipe_-_(9)_(19-607-STM_SUBDIVISION)	MH9_(19-607-STM_SUBDIVISION)	MH10_(19-607-STM_SUBDIVISION)	71.4	0.01	185.66
Pipe_-_(11)_(19-607-STM_SUBDIVISION)	MH11_(19-607-STM_SUBDIVISION)	MH12-1	19.2	0.01	185.13
Pipe_-_(13)_(19-607-STM_SUBDIVISION)	MH13_(19-607-STM_SUBDIVISION)	MH18_(19-607-STM_SUBDIVISION)	81.6	0.01	186.29
Pipe_-_(13)_(2)_(1)_(19-607-STM_SUBDIVISION)	MH18_(19-607-STM_SUBDIVISION)	MH9_(19-607-STM_SUBDIVISION)	46.046	0.01	185.98
Pipe_-_(16)_(19-607-STM_SUBDIVISION)	MH20_(19-607-STM_SUBDIVISION)	MH8_(19-607-STM_SUBDIVISION)	12.7	0.01	186.59
Pipe_-_(17)_(19-607-STM_SUBDIVISION)	MH21_(19-607-STM_SUBDIVISION)	MH13_(19-607-STM_SUBDIVISION)	12.5	0.01	186.5
Pipe_-_(18)_(19-607-STM_SUBDIVISION)	MH22_(19-607-STM_SUBDIVISION)	MH18_(19-607-STM_SUBDIVISION)	8.878	0.01	186.11
C6_1	EX_STM_MH5	MH12-1	27.133	0.013	184.77
C6_2	Mh12-1	EX_STM_MH6	83.392	0.013	184.615

Table 1B: Conduits

Name	Outlet Elev. (m)	Geom1 (m)	Max. |Flow| (m^3/s)	Max. Unit Flow ($m^3/s/ha$)
C1	189.4	0.45	0.076	0.02
C2	191.1	0.45	0.014	0.028
C3	190.24	0.45	0.058	0.067
C4	186.23	0.525	0.27	0.06
C5	185.39	0.75	0.568	0.036
C7	183.5	1.05	1.385	0.061
C8	183.1	1.05	1.389	0.061
C1-S7	189.55	0.3	0.155	0.062
C9	187.681	0.45	0.228	0.061
C13	184.77	0.75	0.568	0.036
C1-S	190.81	0	0.298	0.08
C3-S	192.5	0	0.227	0.262
C2-S	193	0	0.157	0.314
C4-S	188.64	0	0.483	0.108
C5-S	187.3	0	0.583	0.108
C6-S	187.6	0	0.142	0.021
C7-S	187.6	0	0.009	0
C17	185.7	0.525	0.503	0.034
Pipe_-_(116)	188.134	0.675	0.29	0.045
Pipe_-_(117)	187.984	0.675	0.294	0.045
Pipe_-_(119)	187.524	0.675	0.301	0.047
Pipe_-_(120)	187.339	0.675	0.303	0.047
Pipe_-_(64)	188.472	0.375	0.056	0.166
Pipe_-_(65)	188.17	0.375	0.059	0.175
Pipe_-_(67)	187.126	0.525	0.248	0.203
Pipe_-_(69)	186.836	0.75	1.173	0.384

Table 1B: Conduits (continued...)

Name	Outlet Elev. (m)	Geom1 (m)	Max. |Flow| (m^3/s)	Max. Unit Flow ($m^3/s/ha$)
Pipe_-_(70)	186.71	0.75	1.126	0.368
Pipe_-_(71)	187.883	0.375	0.073	0.171
Pipe_-_(72)	187.55	0.675	0.405	0.278
Pipe_-_(73)	187.295	0.675	0.384	0.216
Pipe_-_(74)	188.431	0.3	0.029	0.081
Pipe_-_(75)	188.029	0.45	0.06	0.102
Pipe_-_(76)	187.134	1.2	0.211	0.067
Pipe_-_(79)	186.31	0.45	0.049	0.172
Pipe_-_(85)	187.682	0.375	0.071	0.447
Pipe_-_(86)	187.397	0.45	0.081	0.149
Pipe_-_(73)_(1)	186.976	0.675	0.459	0.15
Pipe_-_(66)_(1)	187.472	0.375	0.132	0.334
Pipe_-_(125)	186.12	0.45	0.081	0.19
Pipe_-_(126)	188.3	0.25	0.012	0.004
Pipe_-_(127)	185.921	0.45	0.073	0.172
Pipe_-_(128)	185.804	0.45	0.062	0.119
Pipe_-_(129)	185.7	0.45	0.062	0.119
Pipe_-_(64)-S	191.95	0	0.089	0.264
Pipe_-_(65)-S	191.32	0	0.078	0.232
Pipe_-_(71)-S	190.93	0	0.097	0.227
Pipe_-_(73)_(1)-S	190.59	0	0.281	0.22
Pipe_-_(72)-S	190.82	0	0.334	0.229
Pipe_-_(73)-S	190.59	0	0.394	0.222
Pipe_-_(66)_(1)-S	190.7	0	0.091	0.23
Pipe_-_(67)-S	190.62	0	0.255	0.209
Pipe_-_(86)-S	190.7	0	0.145	0.267

Table 1B: Conduits (continued...)

Name	Outlet Elev. (m)	Geom1 (m)	Max. |Flow| (m^3/s)	Max. Unit Flow ($m^3/s/ha$)
Pipe_-_(85)-S	190.8	0	0.008	0.05
Pipe_-_(76)-S	190.21	0	0.012	0.124
Pipe_-_(77)-S	189.63	0	0.219	0.253
Pipe_-_(79)-S	189.43	0	0.082	0.287
Pipe_-_(125)-S	189.4	0	0.106	0.249
Pipe_-_(74)-S	191.32	0	0.085	0.236
Pipe_-_(75)-S	191.11	0	0.107	0.183
Pipe_-_(77)_1	186.964	1.2	0.674	0.172
Pipe_-_(77)_2	186.804	1.2	1.321	0.127
Pipe_-_(127)-S	189	0	0.081	0.19
C10	188.64	0	0.1	0.192
C11	188.64	0	0.478	0.107
C12	189.75	0	0.018	0
C14	189.63	0	0.022	0
C15	188.281	0.3	0.049	0.447
C15-S	191.32	0	0.023	0.21
Pipe_-_(8)_(19-607-STM_SUBDIVISION)	185.89	1.2	0.129	0.085
Pipe_-_(9)_(19-607-STM_SUBDIVISION)	185.21	1.2	0.276	0.061
Pipe_-_(11)_(19-607-STM_SUBDIVISION)	185.02	0.6	0.241	0.049
Pipe_-_(13)_(19-607-STM_SUBDIVISION)	186.24	1.2	0.137	0.078
Pipe_-_(13)_(2)_(1)_(19-607-STM_SUBDIVISION)	185.75	1.2	0.266	0.096
Pipe_-_(16)_(19-607-STM_SUBDIVISION)	186.53	0.3	0.043	0.035
Pipe_-_(17)_(19-607-STM_SUBDIVISION)	186.44	0.3	0.049	0.035
Pipe_-_(18)_(19-607-STM_SUBDIVISION)	186.07	0.3	0.041	0.04
C6_1	184.615	0.75	1.246	0.073
C6_2	184.14	0.75	1.37	0.062

Table 2A: Subcatchments

Name	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Curve Number	Groundwater
S6_ROW1	12HSCS_COM_100yr	EX_STM_MH1-S	0.500471	135.262	37	1.8	70	0.011	0.25	74	NO
S6_ROW2	12HSCS_COM_100yr	EX_STM_MH2-S	0.364343	36.434	100.001	1.8	70	0.011	0.25	74	NO
S6_ROW3	12HSCS_COM_100yr	EX_STM_MH3-S	0.365688	36.569	99.999	1.8	70	0.011	0.25	74	NO
S6_ROW4	12HSCS_COM_100yr	EX_STM_MH4-S	0.360277	36.028	99.999	1.8	70	0.011	0.25	74	NO
S6_ROW5	12HSCS_COM_100yr	EX_MH1-S	0.3908	39.08	100	1.8	70	0.011	0.25	74	NO
Ext.2	12HSCS_COM_100yr	MH_C1	6.4662	461.871	140	0.5	0	0.011	0.25	74	NO
Ext.5	12HSCS_COM_100yr	EX_STM_MH-5-S	0.8375	70.037	119.58	3	20	0.011	0.25	74	NO
S6_ROW6	12HSCS_COM_100yr	EX_STM_MH-5-S	0.5283	105.66	50	1	70	0.011	0.25	80	NO
S6_ROW7	12HSCS_COM_100yr	EX_STM_MH6-S	0.5125	102.5	50	1	70	0.011	0.25	80	NO
S3	12HSCS_COM_100yr	MH5-S	0.1114	40	27.85	1.5	10	0.011	0.25	74	NO
S4	12HSCS_COM_100yr	MH7-S	0.1162	61.973	18.75	1.5	50	0.011	0.25	80	NO
Ext.1_1	12HSCS_COM_100yr	J-S7minor	2.51	125.5	200	1	3	0.011	0.25	74	NO
Ext.1_2	12HSCS_COM_100yr	EX_STM_MH4-S	0.3743	46.788	79.999	1	75	0.011	0.25	74	NO
S1	12HSCS_COM_100yr	MH11-S	0.1589	16.099	98.702	0.5	10	0.011	0.25	74	NO
S2	12HSCS_COM_100yr	CBMH12-S	0.3846	22.624	169.996	0.5	65	0.011	0.25	74	NO
S5	12HSCS_COM_100yr	MH1-S	0.3368	39.717	84.8	0.5	65	0.011	0.25	74	NO
S6	12HSCS_COM_100yr	MH5-S	0.2487	21.44	115.998	0.5	65	0.011	0.25	74	NO
S9	12HSCS_COM_100yr	MH14-S	0.3954	39.54	100	0.5	65	0.011	0.25	74	NO
S11	12HSCS_COM_100yr	MH13-S	0.1254	38.585	32.5	0.5	65	0.011	0.25	74	NO
S12	12HSCS_COM_100yr	MH13-S	0.1564	38.146	41	0.5	65	0.011	0.25	74	NO
S13	12HSCS_COM_100yr	MH10-S	0.0587	36.688	16	0.5	65	0.011	0.25	74	NO
S14	12HSCS_COM_100yr	MH21-S	0.2854	41.422	68.901	0.5	65	0.011	0.25	74	NO
S15	12HSCS_COM_100yr	MH22-S	0.1398	30.181	46.321	0.5	65	0.011	0.25	74	NO
S16	12HSCS_COM_100yr	MH24-S	0.0943	17.659	53.401	0.5	65	0.011	0.25	74	NO
S17	12HSCS_COM_100yr	MH18-S	0.7683	64.025	120	0.5	65	0.011	0.25	74	NO
S18	12HSCS_COM_100yr	MH17-S	0.097	9.7	100	0.5	25	0.011	0.25	74	NO
S8_1	12HSCS_COM_100yr	MH8-S	0.321	25.639	125.2	0.5	65	0.011	0.25	74	NO

Table 2A: Subcatchments (continued...)

Name	Rain Gage	Outlet	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Curve Number	Groundwater
S8_2	12HSCS_COM_100yr	MH3-S	0.0906	7.236	125.207	0.5	65	0.011	0.25	74	NO
S7	12HSCS_COM_100yr	MH6-S	0.1096	24.181	45.325	0.5	65	0.011	0.25	74	NO
S8	12HSCS_COM_100yr	MH4-S	0.4421	104.947	42.126	0.5	65	0.011	0.25	74	NO
Block_2	12HSCS_COM_100yr	SU2	1.4	140	100	0.5	99	0.013	0.25	80	NO
Block_1	12HSCS_COM_100yr	SU1	1.22	122	100	0.5	99	0.013	0.25	80	NO
Park	12HSCS_COM_100yr	MH10_(19-607-STM_SUBDIVISION)	0.45	52.972	84.951	1	0	0.013	0.25	80	NO
Block_3	12HSCS_COM_100yr	SU3	1.03	103	100	0.5	99	0.013	0.25	80	NO
S10_2	12HSCS_COM_100yr	MH8_(19-607-STM_SUBDIVISION)	0.3	30	100	0.5	65	0.013	0.25	80	NO
S10_3	12HSCS_COM_100yr	MH13_(19-607-STM_SUBDIVISION)	0.35	35	100	0.5	65	0.013	0.25	80	NO
S10_4	12HSCS_COM_100yr	MH9_(19-607-STM_SUBDIVISION)	0.2	20	100	0.5	65	0.013	0.25	80	NO

Table 2B: Subcatchments

Name	Precipitation (mm)	Runon (mm)	Evaporation (mm)	Infiltration (mm)	Runoff Depth (mm)	Peak Runoff (m^3/s)	Runoff Coefficient
S6_ROW1	103.43	0	0	15.64	86.93	0.17	0.84
S6_ROW2	103.43	0	0	15.77	86.79	0.12	0.839
S6_ROW3	103.43	0	0	15.77	86.79	0.12	0.839
S6_ROW4	103.43	0	0	15.77	86.79	0.12	0.839
S6_ROW5	103.43	0	0	15.77	86.79	0.13	0.839
Ext.2	103.43	0	0	55.36	46.81	0.28	0.453
Ext.5	103.43	0	0	42.6	59.68	0.14	0.577
S6_ROW6	103.43	0	0	13.11	89.45	0.18	0.865
S6_ROW7	103.43	0	0	13.11	89.45	0.18	0.865
S3	103.43	0	0	47.26	54.97	0.02	0.531
S4	103.43	0	0	21.75	80.72	0.04	0.78
Ext.1_1	103.43	0	0	53.65	48.54	0.14	0.469

Table 2B: Subcatchments (continued...)

Name	Precipitation (mm)	Runon (mm)	Evaporation (mm)	Infiltration (mm)	Runoff Depth (mm)	Peak Runoff (m^3/s)	Runoff Coefficient
Ext.1_2	103.43	0	0	13.12	89.45	0.13	0.865
S1	103.43	0	0	48.95	53.28	0.02	0.515
S2	103.43	0	0	18.82	83.7	0.11	0.809
S5	103.43	0	0	18.55	83.97	0.1	0.812
S6	103.43	0	0	18.65	83.87	0.07	0.811
S9	103.43	0	0	18.6	83.92	0.12	0.811
S11	103.43	0	0	18.34	84.2	0.04	0.814
S12	103.43	0	0	18.38	84.15	0.05	0.814
S13	103.43	0	0	18.25	84.3	0.02	0.815
S14	103.43	0	0	18.49	84.03	0.09	0.812
S15	103.43	0	0	18.4	84.13	0.04	0.813
S16	103.43	0	0	18.43	84.1	0.03	0.813
S17	103.43	0	0	18.66	83.85	0.22	0.811
S18	103.43	0	0	40.58	61.73	0.01	0.597
S8_1	103.43	0	0	18.68	83.84	0.09	0.811
S8_2	103.43	0	0	18.68	83.84	0.03	0.811
S7	103.43	0	0	18.4	84.13	0.03	0.813
S8	103.43	0	0	18.38	84.15	0.14	0.814
Block_2	103.43	0	0	0.43	102.26	0.53	0.989
Block_1	103.43	0	0	0.43	102.26	0.46	0.989
Park	103.43	0	0	44.93	57.25	0.05	0.553
Block_3	103.43	0	0	0.43	102.26	0.39	0.989
S10_2	103.43	0	0	15.57	86.95	0.09	0.841
S10_3	103.43	0	0	15.57	86.95	0.11	0.841
S10_4	103.43	0	0	15.57	86.95	0.06	0.841

Table 3A: Storages

Name	Inflows	Invert Elev. (m)	Rim Elev. (m)	Depth (m)	Initial Depth (m)	Surcharge Depth (m)	Storage Curve	Baseline (m^3/s)	Time Series	Average Value (m^3/s)	Hydrograph	Sewershed Area (ha)	Avg. Depth (m)	Max. Depth (m)	Max. HGL (m)	Rep. Max. Depth (m)
SU1	NO	186.59	192.99	6.4	0	0	TABULAR	0		0		0	1.1	5.27	191.86	5.27
SU2	NO	186.5	192.9	6.4	0	0	TABULAR	0		0		0	1.1	5.27	191.77	5.27
SU3	NO	186.11	192.51	6.4	0	0	TABULAR	0		0		0	1.1	5.27	191.38	5.27

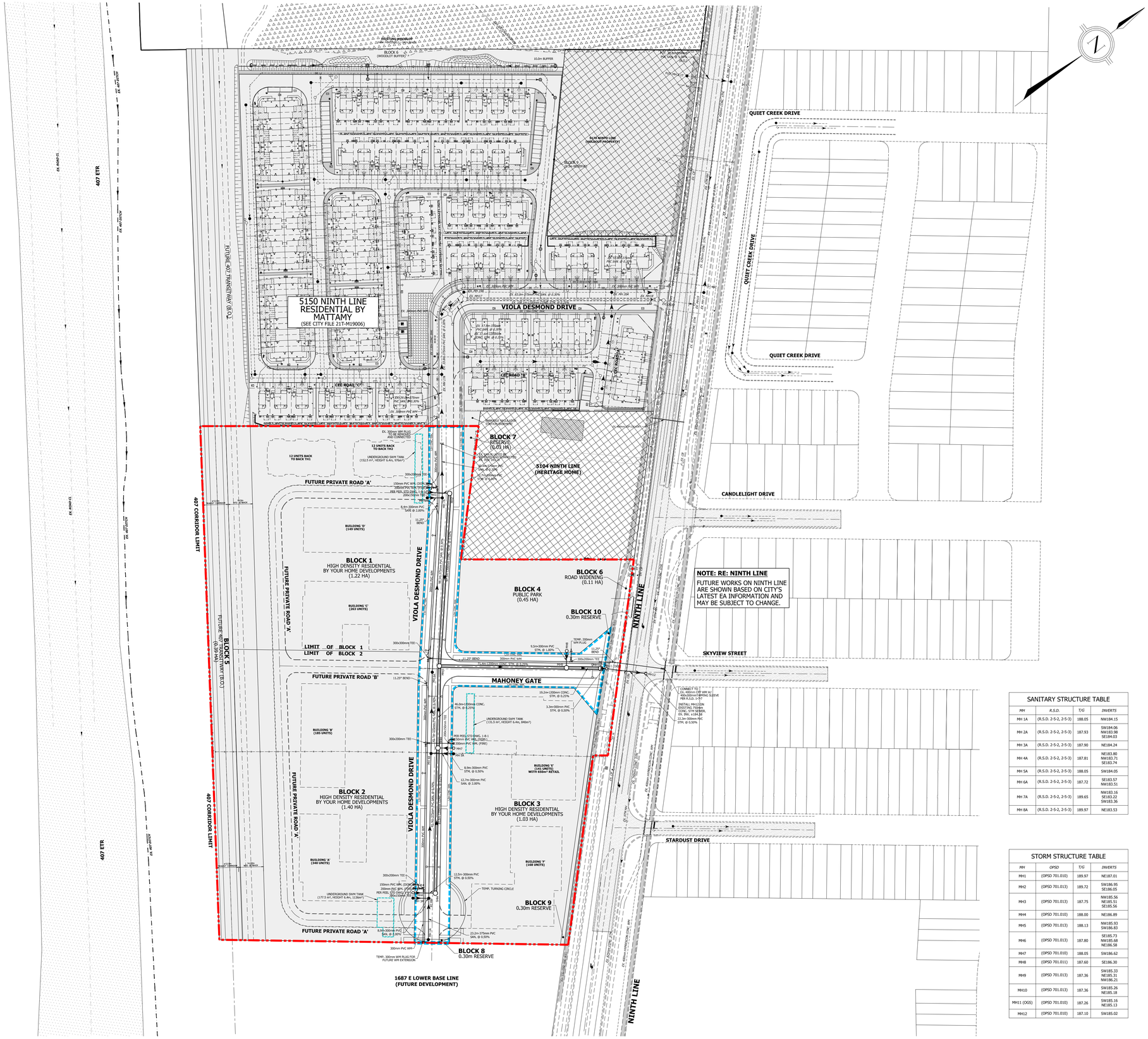
Table 3B: Storages

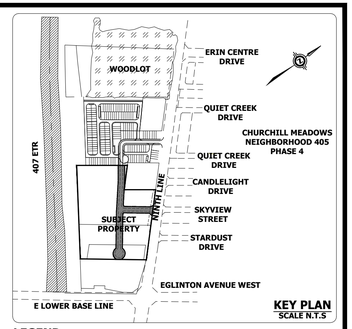
Name	Max. Lat. Inflow (m^3/s)	Max. Total Inflow (m^3/s)	Max. Volume (1000 m^3)	Max. Percent Full (%)	Max. Outflow (m^3/s)	Contributing Area (ha)	Contributing Imp. Area (ha)	Max. Unit Flow ($m^3/s/ha$)
SU1	0.465	0.465	0.804	82	0.041	1.22	1.208	0.381
SU2	0.533	0.533	0.923	82	0.047	1.4	1.386	0.381
SU3	0.392	0.392	0.679	82	0.035	1.03	1.02	0.381

APPENDIX B

DRAWINGS

- C101 – Site Servicing Plan
- C201 – Grading Plan Part 1
- C202 – Grading Plan Part 2
- C301 – Existing Storm Drainage Plan
- C302 – Storm Drainage Plan
- C303 – Sanitary Drainage Plan





KEY PLAN
SCALE N.T.S

LEGEND

- STORM SEWER AND MANHOLE
- SANITARY SEWER AND MANHOLE
- WATERMAIN SEWER
- EXISTING STORM SEWER AND MANHOLE
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING WATERMAIN
- EXISTING WATER SERVICE CONNECTION
- EXISTING DOUBLE STORM/ EXISTING SANITARY SERVICE CONNECTION
- EXISTING SINGLE STORM/ EXISTING SANITARY SERVICE CONNECTION
- SINGLE CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT & VALVE
- VALVE AND BOX
- MUNICIPAL / FREEHOLD / EXTERNAL WORKS
- LIMIT OF PROPOSED R.O.W.
- LIMIT OF PROPERTY

LOCAL BENCHMARK:
LOCAL BENCHMARK NO. 075033001 BRASS CAP IN CONCRETE CYLINGER, 9 METRES ON THE EAST SIDE OF THE CENTRELINE OF NINTH LINE, 14 METRES NORTH OF THE CENTRELINE OF ROADSIDE WAY. ELEVATION = 193.804 METRES

SANITARY STRUCTURE TABLE

MH	R.S.D.	T/G	INVERTS
MH 1A	(R.S.D. 2-5-2, 2-5-3)	188.05	NW184.15
MH 2A	(R.S.D. 2-5-2, 2-5-3)	187.93	SW184.06 NW183.98 SE184.03
MH 3A	(R.S.D. 2-5-2, 2-5-3)	187.90	NE184.24
MH 4A	(R.S.D. 2-5-2, 2-5-3)	187.81	NE183.80 NW183.71 SE183.74
MH 5A	(R.S.D. 2-5-2, 2-5-3)	188.05	SW184.05
MH 6A	(R.S.D. 2-5-2, 2-5-3)	187.72	SE183.57 NW183.51
MH 7A	(R.S.D. 2-5-2, 2-5-3)	189.65	NW183.16 SE183.22 SW183.36
MH 8A	(R.S.D. 2-5-2, 2-5-3)	189.97	NE183.53

STORM STRUCTURE TABLE

MH	OPSD	T/G	INVERTS
MH1	(OPSD 701.010)	189.97	NE187.01
MH2	(OPSD 701.013)	189.72	SW186.95 SE186.05
MH3	(OPSD 701.013)	187.75	NW185.56 NE185.51 SE185.56
MH4	(OPSD 701.010)	188.00	NE186.89
MH5	(OPSD 701.013)	188.13	NW185.93 SW186.83
MH6	(OPSD 701.013)	187.80	SE185.73 NW185.68 NE186.58
MH7	(OPSD 701.010)	188.05	SW186.62
MH8	(OPSD 701.011)	187.60	SE186.30
MH9	(OPSD 701.013)	187.36	SW185.33 NE185.31 NW186.21
MH10	(OPSD 701.013)	187.36	SW185.26 NE185.18
MH11 (OGS)	(OPSD 701.010)	187.26	SW185.16 NE185.13
MH12	(OPSD 701.010)	187.10	SW185.02

No.	REVISION	DATE	BY
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SERVICING PLAN

PROJECT #: 19-607
SITE PLAN FILE NO.: ######
SUBDIVISION FILE NO.: #####
CITY FILE NO.: ######
REGION FILE NO.: ######

DRAWING: **C-101**

DESIGNED: B.J. | CHECKED: B.J.
DRAWN: J.M. | DATE: SEPT. 2021
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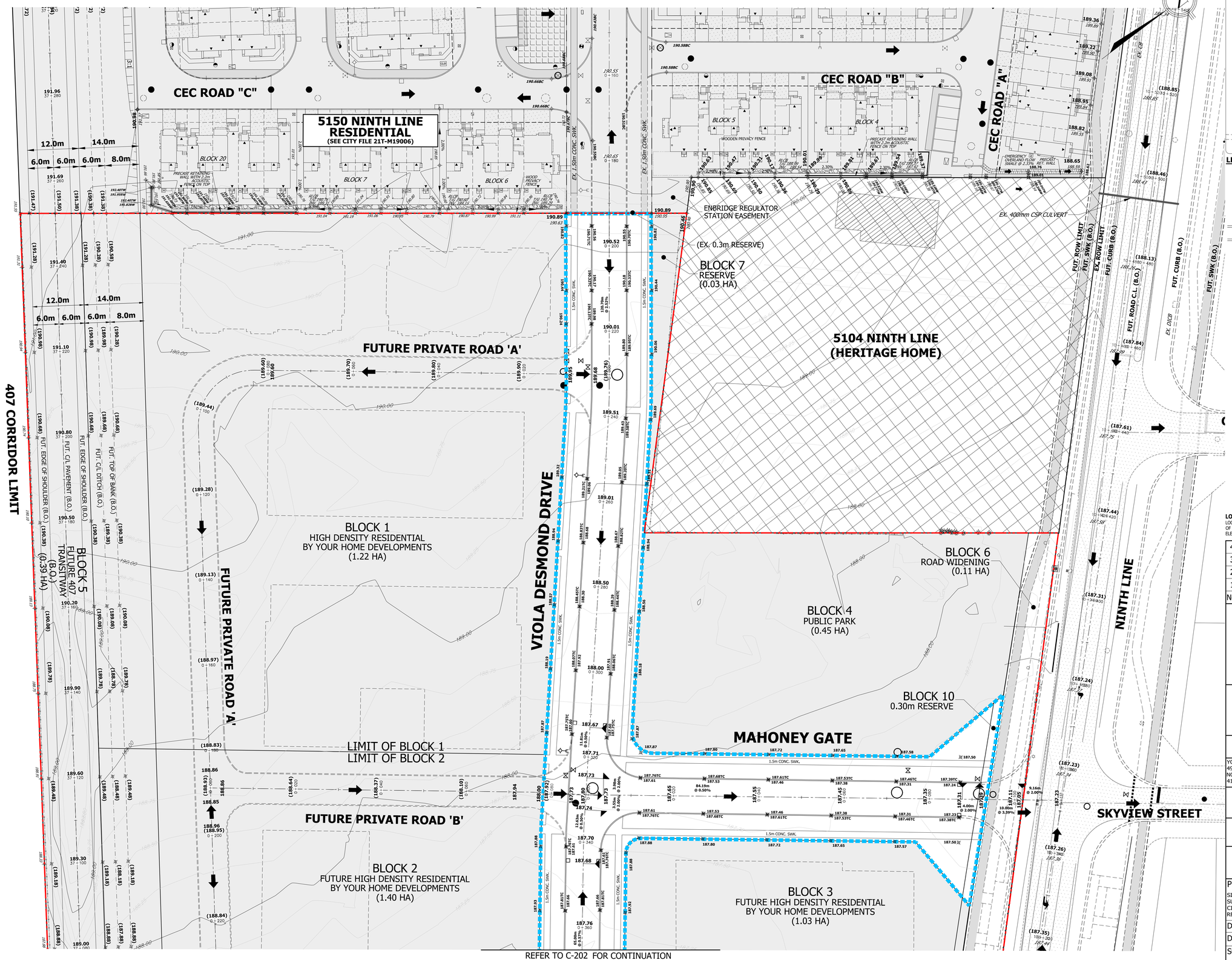

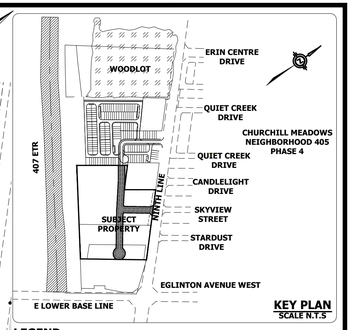

KEY PLAN
SCALE N.T.S

LEGEND

- EXISTING CONTOUR AND ELEVATION
- EXISTING ELEVATION
- PROPOSED ELEVATION
- FUTURE ELEVATION
- TOP/BOTTOM OF CURB ELEVATION
- STANDARD CURB AND GUTTER
- FUTURE CURB AND GUTTER
- STORM MANHOLE
- SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- SINGLE CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT & VALVE
- VALVE & BOX
- PROPOSED OVERLAND FLOW DIRECTION
- LIMIT OF PROPOSED R.O.W.
- LIMIT OF PROPERTY
- EXTERNAL / FREEHOLD / EXISTING WORKS

LOCAL BENCHMARK:
LOCAL BENCHMARK NO. 075033001 BRASS CAP IN CONCRETE CYLINGER, 9 METRES ON THE EAST SIDE OF THE CENTRELINE OF NINTH LINE, 14 METRES NORTH OF THE CENTRELINE OF ROADSIDE WAY. ELEVATION = 193.804 METRES

No.	REVISION	DATE	BY
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GRADING PLAN

PROJECT #:	19-607	DRAWING:	C-201
SITE PLAN FILE No.: ######			
SUBDIVISION FILE No.: #####			
CITY FILE No.: ######			
REGION FILE No.: ######			
DESIGNED:	B.J.	CHECKED:	B.J.
DRAWN:	J.M.	DATE:	SEPT. 2021
SCALE:	1:400		

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REFER TO C-201 FOR CONTINUATION

BLOCK 1
FUTURE HIGH DENSITY RESIDENTIAL
BY YOUR HOME DEVELOPMENTS
(1.22 HA)

BLOCK 2
HIGH DENSITY RESIDENTIAL
BY YOUR HOME DEVELOPMENTS
(1.40 HA)

BLOCK 3
FUTURE HIGH DENSITY RESIDENTIAL
BY YOUR HOME DEVELOPMENTS
(1.03 HA)

BLOCK 4
PUBLIC PARK
(0.45 HA)

BLOCK 5
FUTURE 407
TRANSITWAY
(B.O.)
(0.39 HA)

BLOCK 8
0.30m RESERVE

BLOCK 9
0.30m RESERVE

BLOCK 10
0.30m RESERVE

LIMIT OF BLOCK 1
LIMIT OF BLOCK 2

MAHONEY GATE

VIOLA DESMOND DRIVE

FUTURE PRIVATE ROAD 'A'

FUTURE PRIVATE ROAD 'B'

SKYVIEW STREET

STARDUST DRIVE

NINTH LINE

407 CORRIDOR LIMIT

1687 E LOWER BASE LINE
(FUTURE DEVELOPMENT)

TEMP. TURNING CIRCLE

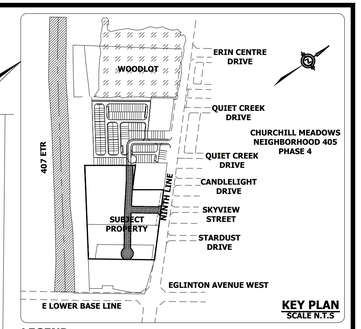
FUT. ROW LIMIT

EX. ROW LIMIT

FUT. ROAD C.L. (B.O.)

FUT. ROW LIMIT
FUT. SWK (B.O.)
FUT. CYCLE TRACK (B.O.)
FUT. CURB (B.O.)

12.0m
14.0m
6.0m
6.0m
6.0m
8.0m



KEY PLAN
SCALE N.T.S

LEGEND

- EXISTING CONTOUR AND ELEVATION
- EXISTING ELEVATION
- PROPOSED ELEVATION
- FUTURE ELEVATION
- TOP/BOTTOM OF CURB ELEVATION
- STANDARD CURB AND GUTTER
- FUTURE CURB AND GUTTER
- STORM MANHOLE
- SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- SINGLE CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT & VALVE
- VALVE & BOX
- PROPOSED OVERLAND FLOW DIRECTION
- LIMIT OF PROPOSED R.O.W.
- LIMIT OF PROPERTY
- EXTERNAL / FREEHOLD / EXISTING WORKS

LOCAL BENCHMARK:
LOCAL BENCHMARK NO. 075033001 BRASS CAP IN CONCRETE CYLINGER, 9 METRES ON THE EAST SIDE OF THE CENTRELINE OF NINTH LINE, 14 METRES NORTH OF THE CENTRELINE OF ROADSIDE WAY.
ELEVATION = 193.804 METRES

No.	REVISION	DATE	BY
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GRADING PLAN

PROJECT #:	19-607	DRAWING:	C-202
SITE PLAN FILE No.: ###### SUBDIVISION FILE No.: ##### CITY FILE No.: ###### REGION FILE No.: ######			
DESIGNED:	B.J.	CHECKED:	B.J.
DRAWN:	J.M.	DATE:	SEPT. 2021
SCALE:	1:400		

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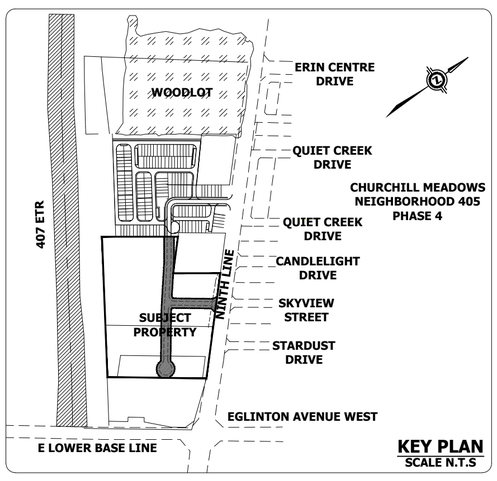

KEY PLAN
SCALE N.T.S

LEGEND

- SUBJECT PROPERTY
- NON-PARTICIPATING LAND OWNERS
- WETLAND
- 256.00 EXISTING CONTOUR
- 2.50ha / 50% — DRAINAGE AREA (ha) / IMPERVIOUSNESS
- EXISTING STORM SEWER AND MANHOLE
- EXISTING OVERLAND FLOW DIRECTION
- EXISTING DRAINAGE BOUNDARY

LOCAL BENCHMARK:
LOCAL BENCHMARK NO. 075033001 BRASS CAP IN CONCRETE CYLINGER, 9 METRES ON THE EAST SIDE OF THE CENTRELINE OF NINTH LINE, 14 METRES NORTH OF THE CENTRELINE OF ROADSIDE WAY. ELEVATION = 193.804 METRES

No.	REVISION	DATE	BY
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EXISTING STORM DRAINAGE PLAN

PROJECT #: 19-607	DRAWING: C-301
SITE PLAN FILE No.: ###### SUBDIVISION FILE No.: ##### CITY FILE No.: ###### REGION FILE No.: ######	
DESIGNED: B.J.	CHECKED: B.J.
DRAWN: J.M.	DATE: JULY 2021
SCALE: 1:1250	12.5m 0m 12.5m 25m 50m

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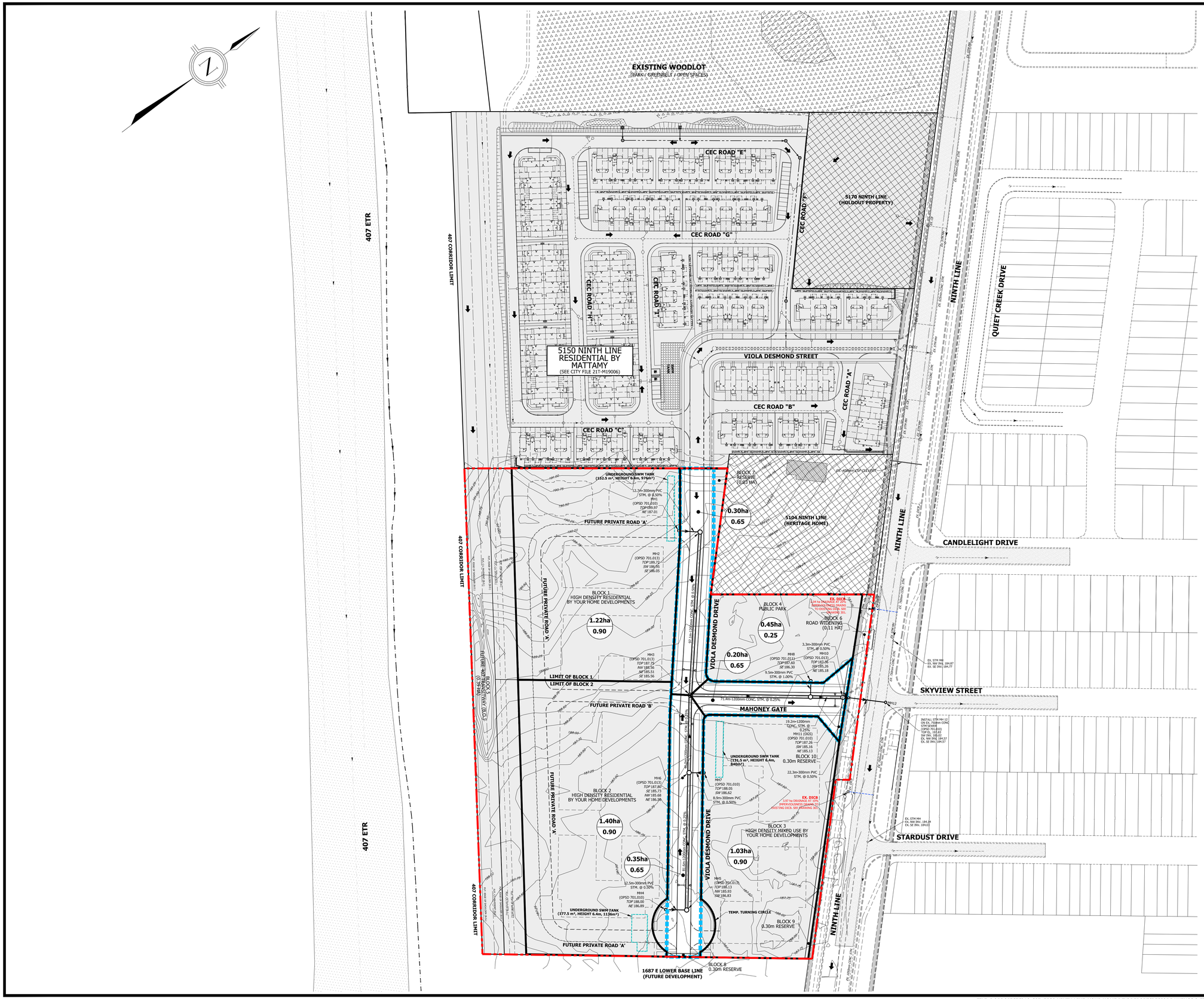

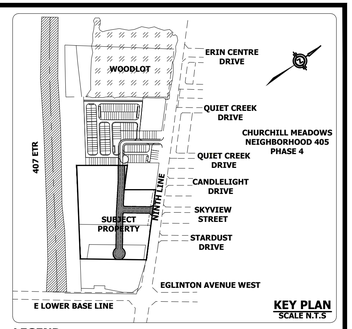

KEY PLAN
SCALE N.T.S

LEGEND

- 87.00 — EXISTING CONTOUR AND ELEVATION
- STORM SEWER AND MANHOLE
- EXISTING STORM SEWER AND MANHOLE
- SINGLE CATCHBASIN
- DOUBLE CATCHBASIN
- 0.25 / 0.90 — PROPOSED DRAINAGE AREA (ha) FOR MINOR SYSTEM (5 YEAR) FLOW; PROPOSED RUNOFF COEFFICIENT
- MINOR SYSTEM DRAINAGE AREA BOUNDARY
- PROPOSED OVERLAND FLOW DIRECTION
- LIMIT OF PROPOSED R.O.W.
- LIMIT OF PROPERTY
- MUNICIPAL / FREEHOLD / EXTERNAL WORKS

LOCAL BENCHMARK:
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ELEVATION = 193.804 METRES

No.	REVISION	DATE	BY
5			
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STORM DRAINAGE PLAN

PROJECT #: 19-607
SITE PLAN FILE No.: ######
SUBDIVISION FILE No.: #####
CITY FILE No.: ######
REGION FILE No.: ######

DRAWING: **C-302**

DESIGNED:	B.J.	CHECKED:	B.J.
DRAWN:	J.M.	DATE:	SEPT. 2021
SCALE:	1:1000		

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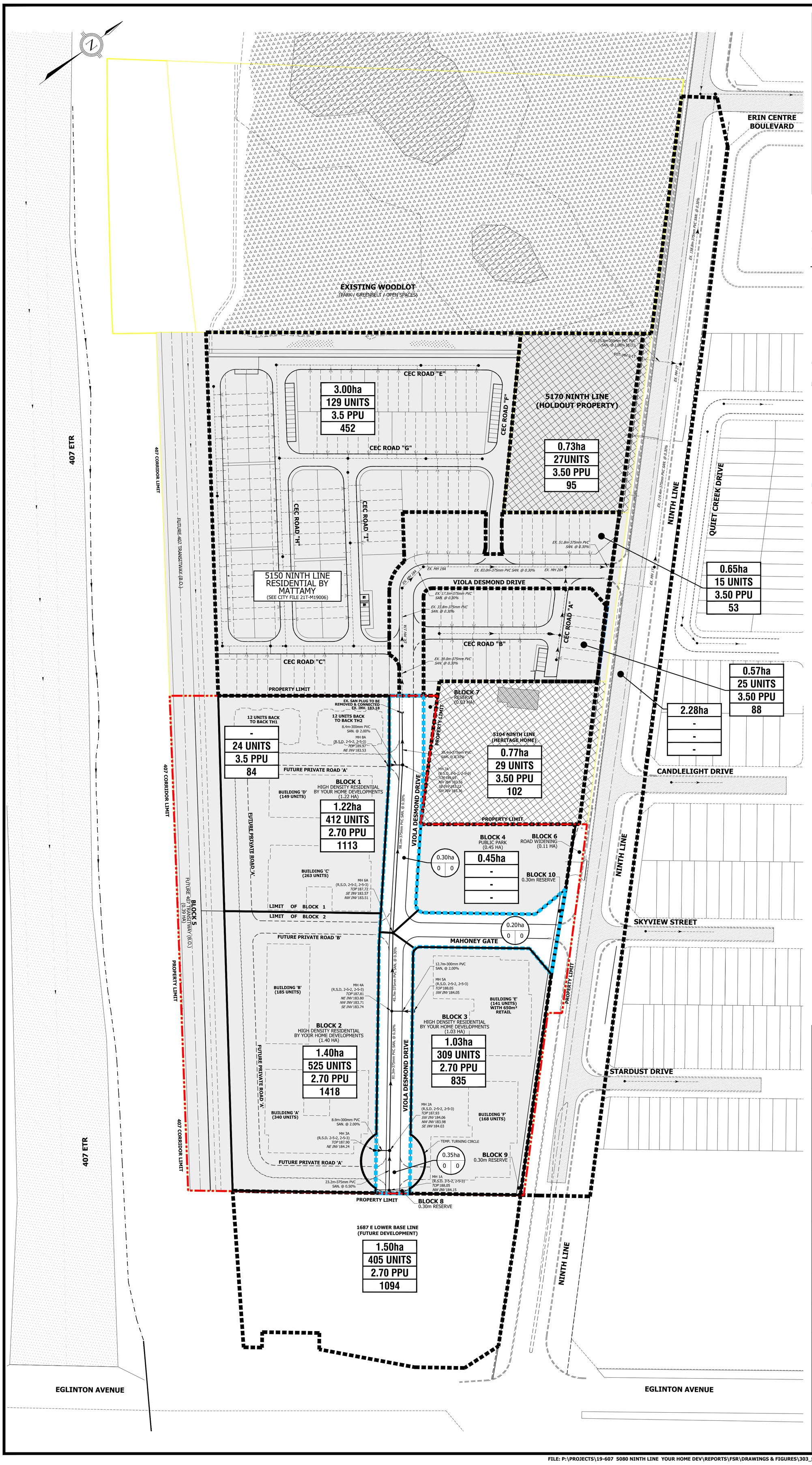

LOCAL BENCHMARK:
LOCAL BENCHMARK NO. 075033001 BRASS CAP IN CONCRETE CYLINGER, 9 METRES ON THE EAST SIDE OF THE CENTRELINE OF NINTH LINE, 14 METRES NORTH OF THE CENTRELINE OF ROADSIDE WAY. ELEVATION = 193.804 METRES

No.	REVISION	DATE	BY
4			
3			
2			
1			

REGISTERED PROFESSIONAL ENGINEER
B.JACKSON
100210382
SEPT. 10, 2021
PROVINCE OF ONTARIO

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416-745-6686

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Working for you

MISSISSAUGA

SANITARY DRAINAGE PLAN

PROJECT #:	19-607	DRAWING:	C-303
SITE PLAN FILE No.: ######			
SUBDIVISION FILE No.: #####			
CITY FILE No.: ######			
REGION FILE No.: ######			
DESIGNED:	B.J.	CHECKED:	B.J.
DRAWN:	J.M.	DATE:	SEPT. 2021
SCALE:	1:1000		

FILE: P:\PROJECTS\19-607 5080 NINTH LINE YOUR HOME DEV\REPORTS\FSR\DRAWINGS & FIGURES\303_SANITARY DRAINAGE.DWG REVISED BY [JMAN] ON September 10, 2021 AT 10:49 AM