

BRANTHAVEN MCCRANEY INC.

# MCCRANEY STREET EAST BLOCK E, PLAN M-172 FUNCTIONAL SERVICING REPORT

AUGUST 21, 2020





# MCCRANEY STREET EAST FUNCTIONAL SERVICING REPORT

BRANTHAVEN MCCRANEY INC.

FUNCTIONAL SERVICING REPORT

PROJECT NO.: 10-16058  
DATE: AUGUST 20<sup>TH</sup>, 2020

WSP CANADA GROUP LIMITED  
100 COMMERCE VALLEY DRIVE WEST  
THORNHILL, ON, CANADA L3T 0A1

[WSP.COM](http://WSP.COM)

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# SIGNATURES

PREPARED BY



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Au Lu, P.Eng.  
Project Engineer

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  - B** DOMESTIC WATER DEMAND AND WASTEWATER FLOW CALCULATIONS
  - C** WASTEWATER DRAINAGE PLANS AND DESIGN SHEETS
- 

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DRAWING SS1 -SITE SERVICING PLAN ..... MAP POCKET

# 1 INTRODUCTION

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## 1.1 INTRODUCTION

WSP Canada Group Limited (herein called WSP) has been retained to prepare a Functional Servicing Report to assess the servicing requirements relating to the proposed development at McCraney Street East, Block E Plan M-172 in the Town of Oakville. This report provides the conceptual framework for water distribution, wastewater sewage, and storm drainage for the development of this site. A Stormwater Management Report outlining the proposed stormwater quality and quantity controls on this site has been prepared under a separate cover, also by WSP Canada Group Limited.

In preparation of this report, WSP staff reviewed the available Plan and Profile Drawings from the Region of Halton, as well as the architectural site plans prepared by Kirkor Architects + Planners and a survey prepared by A.T. McLaren Limited.

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## 1.2 SITE DESCRIPTION

The site is a 1.42 ha parcel of land located at the northwest corner of McCraney Street East and Montclair Drive, in the Town of Oakville. In the pre-development condition, the site is primarily occupied by disturbed areas that were cleared of small trees and shrubs, as well as shrubby thicket along the eastern, western and southern property limits. The northern extent of the property consists of woodland associated with the West Morrison Creek valley corridor.

The proposed site development includes a 9-storey residential apartment building with 221 dwelling units, and one (1) storey of below grade parking.

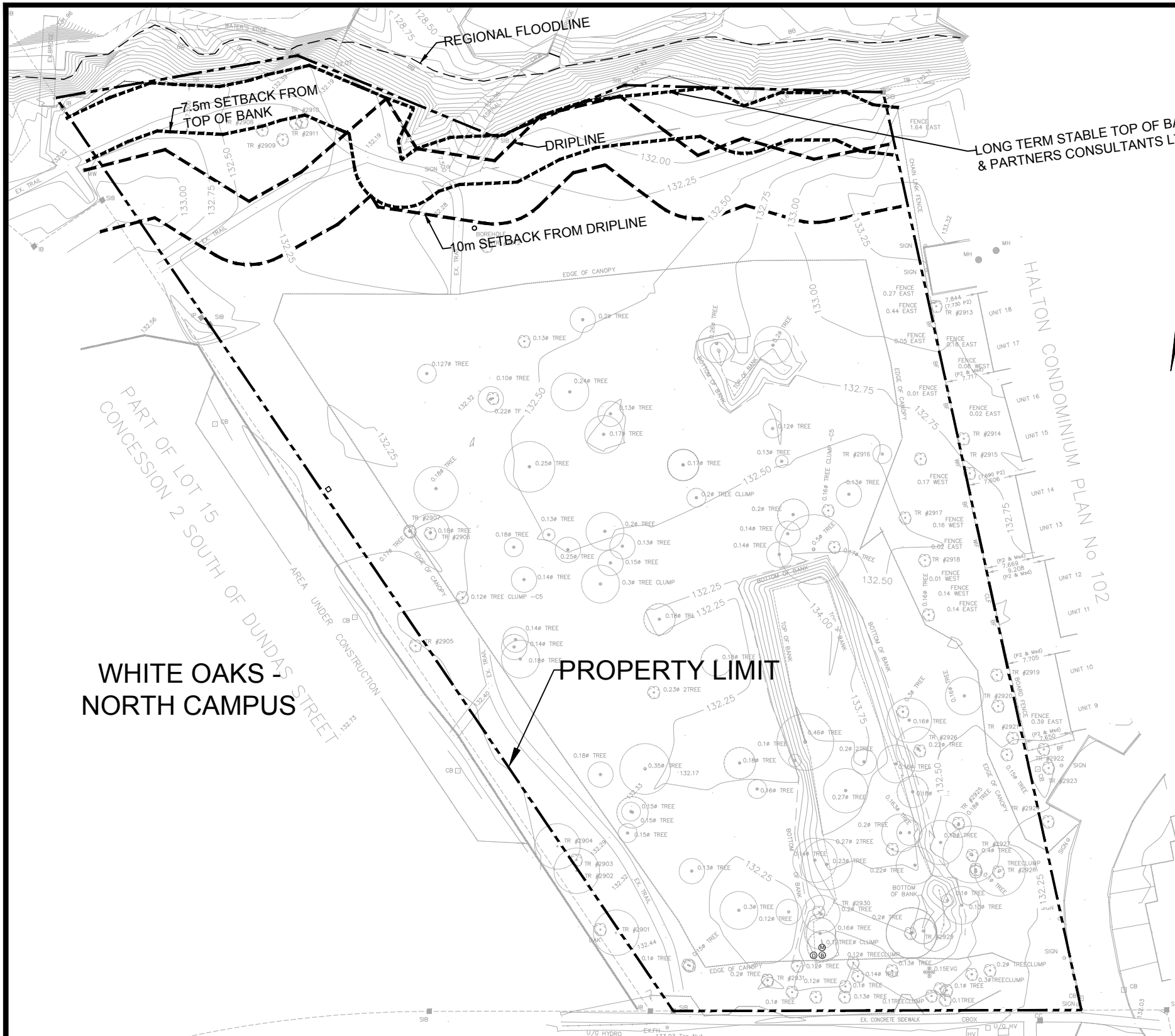
The site will be serviced by existing local municipal sewers and watermains within the adjacent municipal right-of-way. The service connections for the proposed residential building will be extended to the foundation wall and coordinated with the building design team at the detailed design stage. Refer to **Figure 1.1** for the Location Map, **Figure 1.2** for the Existing Conditions and **Figure 1.3** for an illustration of the Site Plan.



FILENAME: X:\DIV\10\10-16058 McCraney\Mun\FSR\FSR\_2017\Fig1-SITE LOCATION.dwg  
 PLOTDATE: May 27, 2019 - 11:15am, a.u.l.u

CLIENT	BRANTHAVEN MCCRANEY INC.
TITLE	MCCRANEY STREET EAST, BLK E, PLAN M-172
<b>LOCATION MAP</b>	

Checked	A.L.	Drawn	10/12 Cad
Date	MAY 2019	Proj. No.	10-16058
Scale	N.T.S.	Figure No.	FIG 1.1



LONG TERM STABLE TOP OF BANK PER SIRATI & PARTNERS CONSULTANTS LTD. REPORT



HALTON CONDOMINIUM PLAN NO 102

EX. RESIDENTIAL

WHITE OAKS NORTH CAMPUS

PROPERTY LIMIT

McCRANEY STREET

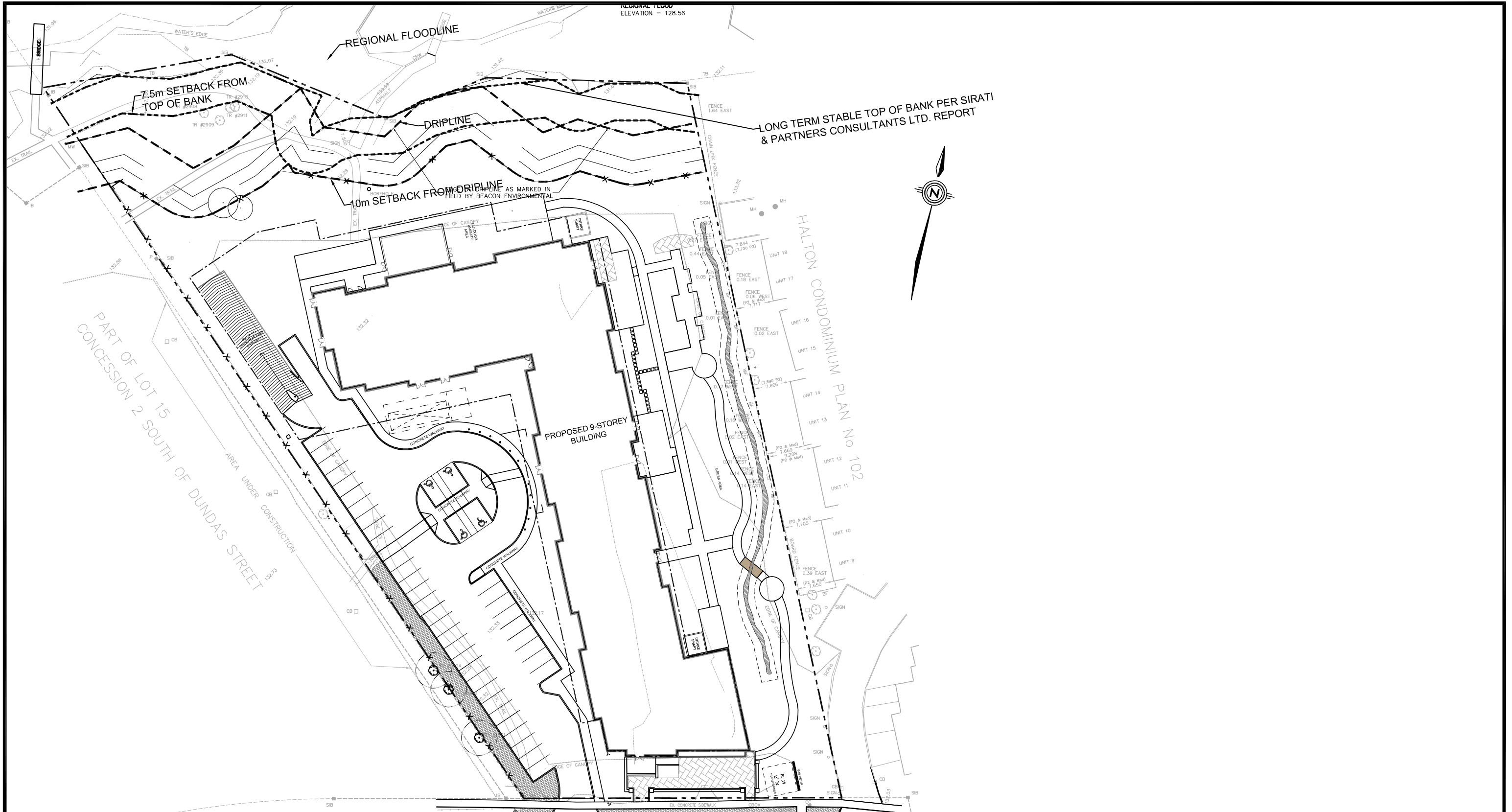
CLIENT BRANTHAVEN McCRANEY INC.

TITLE McCRANEY STREET EAST BLOCK E, PLAN M-172 EXISTING CONDITIONS



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Date	MAY 2019	Proj. No.	10-16058
Scale	1:750	Figure No.	FG. 1.2





LONG TERM STABLE TOP OF BANK PER SIRATI & PARTNERS CONSULTANTS LTD. REPORT

HALTON CONDOMINIUM PLAN No 102

PROPOSED 9-STOREY BUILDING

McCRANEY STREET

CLIENT BRANTHAVEN McCRANEY INC.

TITLE McCRANEY STREET EAST BLOCK E, PLAN M-172

SITE PLAN



Checked	A.L.	Drawn	10/12 Cad
Date	AUG 2020	Proj. No.	10-16058
Scale	1:750	Figure No.	FG. 1.3

# 2 WATER SUPPLY AND APPURTENANCES

## 2.1 EXISTING CONDITIONS

An existing 200mm diameter watermain is located on the north side of McCraney Street East and will provide municipal drinking water and fire protection for the development.

## 2.2 WATER SUPPLY

It is proposed to provide a 150mm diameter fire service and a 100mm domestic service connection to the proposed 10-storey residential apartment building. The services will connect to the existing 200mm diameter watermain on McCraney Street East. The connections are proposed to include valve and boxes at the property line. In addition, a water meter and a double detector check valve will be installed in the mechanical room within the building. The mechanical room will be accessible and provide remote read-out locations for the Region's use in reading the meters. Refer to **Drawing SS1** for proposed water servicing layout.

The estimated domestic water demand has been calculated using the Halton Region Design Criteria and the site statistics provided by the architect. For detailed calculations, see **Appendix B**;

**Table 2.1 Water Demand**

Average Water Consumption Rate	275 litres/person/day
Total Residential GFA	2.507 ha
Population Density	285 people/ha (Apartments over 6-storeys high)
Total Residential Equivalent Population	714 people
Peak Hour Factor	Residential Peak Hour Factor = 4.00
Average Water Demand from Site	2.27 L/s
Peak Hour Water Demand from Site	9.10 L/s
Peak Day Factor	Residential Peak Day Factor = 2.25
Maximum Daily Water Demand from site	5.12 L/s
Fire Flow + Maximum Daily Water Demand from site	106.03 L/s + 5.12 L/s = 111.15 L/s or 1764 USGPM

The estimated fire flow has been calculated using the recommendations of the Fire Underwriters Survey. The fire flow calculation indicates that the recommended fire flow for this proposed development is ~6,362 L/min (~1,679 US GPM). The results of these calculations are included in **Appendix A**.

There are currently three (3) existing hydrants in the vicinity of the proposed development. The first hydrant is located approximately 65m west of the intersection of McCraney Street East and Montclair Drive, on the north side of McCraney Street East. The second hydrant is located approximately 200m west of the same intersection, on the north side of McCraney Street East. The third hydrant is located 45m east of the intersection of McCraney Street East and Montclair Drive, on the north side of McCraney Street East. The proposed water servicing is shown on **Drawing SS1**.

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## 2.3 HYDRANT FLOW TEST

The total water demand for the proposed development is 1,764 US GPM as noted in **Table 2.1**. A hydrant flow test for this site was completed on McCraney Street East. A flow of ~2,813 US GPM was recorded while maintaining a water pressure of 20 psi. The fire flow available exceeds the water demand calculated above. Therefore, we can conclude that the watermain adjacent to the site is adequate to support the domestic and fire water demand of the proposed development. Please refer to **Appendix A** for hydrant flow test results and fire flow calculations.

# 3 WASTEWATER SEWAGE SYSTEM

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## 3.1 EXISTING CONDITIONS

A 250mm diameter wastewater sewer on McCraney Street East will convey wastewater for the development. The McCraney Street East wastewater sewer flows easterly to an easement between Kelsey Court and Kirstie Court, south along the easement, south along Napier Crescent and Newton Road to Ridge Drive, west along Ridge Drive to the intersection of Ridge Drive and Sixth Line.

---

## 3.2 DESIGN PARAMETERS

To calculate the theoretical peak wastewater flows, the following design criteria have been utilized:

- ▶ 275 L/cap/day average day flow generation rate;
- ▶ Single Family Equivalent Population Density: 55 people per hectare;
- ▶ Townhouse Equivalent Population Density: 135 people per hectare;
- ▶ Apartments Equivalent Population Density: 285 people per hectare;
- ▶ Institutional Equivalent Population Density: 40 people per hectare;
- ▶ Peaking Factor;
  - Harmon Formula.
- ▶ Infiltration = 0.286 L/s/ha.

The demand and peaking factors are based on Region of Halton, Water and Wastewater Linear Design Manual, April 2015.

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## 3.3 EXISTING FLOW TO WASTEWATER SEWER

In the pre-development condition, the site is primarily occupied by disturbed areas that were cleared of small trees and shrubs, as well as shrubby thicket along the eastern, western and southern property limits. The northern extent of the property consists of woodland associated with the West Morrison Creek valley corridor. Therefore, the site in its current condition does not convey any flow to the existing wastewater sewers.

---

## 3.4 POST DEVELOPMENT WASTEWATER SEWER FLOW

An estimated post-development wastewater flow to the downstream wastewater sewage system has been calculated based on the Regional Municipality of Halton Water and Wastewater Linear Design Manual and the preliminary site statistics provided by the architect. A summary of the calculations can be found below:

**Table 3.1 Sanitary Flow**

Sewage Generation Rate	275 litres/person/day
Residential Population	714 people

Infiltration	0.286 L/s/ha
Average Residential Flow	2.27 L/s
Peaking Factor	3.89 (Harmon Peaking Factor)
Peak Wastewater Flow from Site	8.85 L/s
Infiltration	0.41 L/s
Peak Flow to Wastewater Sewer System (including Infiltration)	9.26 L/s

Refer to **Appendix B** for site statistics and detailed pre- and post-development flow calculations.

---

### 3.5 DOWNSTREAM WASTEWATER CAPACITY ANALYSIS

WSP has prepared a pre- and post-development downstream wastewater sewer analysis. The analysis includes calculations for the wet weather flow condition, where an infiltration (0.286 L/s/ha) has been added to the calculated wastewater flow. The wastewater flow for the sewershed was calculated using the Region of Halton Water and Wastewater Linear Design Manual as outlined in Section 3.2. The wastewater sewage generation rate from the site outlined in Section 3.4 was applied to the pre-development analysis to form the analysis of the post-development conditions. See Appendix C for the Wastewater Sewer Design Sheets. To facilitate this analysis, a Wastewater Sewer Drainage Area Plan has been created and is located in **Appendix C**.

In the post development condition, the analysis demonstrates that the existing municipal sewer system has adequate capacity to support the addition of 9.26 L/s of flow (including infiltration) from the proposed development without surcharging in any leg. Consequently, WSP Group concludes that the existing municipal sewer can accept the flow from the proposed site and no external sewer improvements are required.

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### 3.6 WASTEWATER SERVICE

It is proposed to service the 10-storey residential building with a 250mm diameter PVC wastewater service connection, the service connection will be connected to the existing 250mm wastewater sewer on McCraney Street East. A control manhole is proposed to be placed immediately inside the property line.

The internal wastewater sewer system within the parking structure will be designed by the mechanical engineer. Proposed wastewater sewers within the site will be designed to meet Ontario Building Code Standards.

# 4 STORM DRAINAGE

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## 4.1 STORMWATER MANAGEMENT REPORT

A Stormwater Management Report for this development has been prepared under a separate cover. It identifies the stormwater quantity and quality controls under which this site will operate to comply with the Town's standards.

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## 4.2 EXISTING CONDITIONS

An existing 1000mm diameter storm sewer is located on the south side McCraney Street East. A 525mm diameter storm sewer connection was previously installed.

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## 4.3 PROPOSED DEVELOPMENT

The site includes paved driveway, and at grade landscape and parking areas. Storm flows from the site will be captured and directed to a storm chamber located by the driveway entrance. An OGS unit is proposed upstream of the chamber to treat run-off from the driveway and parking lot prior to being stored in the chamber.

Roof water will be collected to a below ground cistern located in the parking lot and stored for irrigation. An overflow for the cistern will be connected directly to the storm chamber. The cistern will be equipped with two access hatches.

Storm water collected from the landscaped areas at the east side of the building will be collected into the bioswale to promote infiltration. Single and double catchbasins are proposed in the bioswale to serve as an overflow and is discharged to the storm chamber in the parking lot via storm sewers. The overflow of the bioswale is clean water and can discharge directly to the storm chamber without treatment.

The chamber will be sized to reduce the 100-year post-development flows to the 5-year pre-development levels. For detailed storage and storm flow calculations, refer to Stormwater Management Report prepared by WSP under a separate cover.

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## 4.4 MINOR STORM DRAINAGE SYSTEM

All storm flows will be directed to the storm chamber and controlled to an allowable release rate as stated in the Stormwater Management Report prepared by WSP.

A network of storm sewers are proposed in the parking lot and along the front of the building to collect storm drainage and conveyed to the storm chamber for storage. The 100 year water level in the storm chamber is at 131.38m which is above the invert of the proposed connection at the building; therefore, it is recommended that methods be implemented by the designers of the building plumbing and drainage systems to protect against surcharging. These methods may include backwater valves, pumping underground parking structure foundation drains to grade prior to discharging to the cistern, and the use of pressure tight plumbing systems below ground.

A new 300mm diameter storm connection is proposed at the southwest portion of the site, which will connect to the existing 1000mm diameter storm sewer on McCraney Street East. A control manhole is proposed to be placed immediately inside the property line and will be accessible at grade.

The new storm connection and storm sewers within the site will be designed to the standards and specifications of the Town of Oakville. Refer to **Drawing SS1** for the proposed storm sewer layout.

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## 4.5 MAJOR STORM DRAINAGE SYSTEM

All storm flows will be collected by on site catch basins connected to the storm sewer system and directed into the storm chamber. The flow will be controlled by a 120mm orifice plate and released to the Town's storm sewer. The total flow released from the proposed development at 100 year storm event is 45.2 L/s which accounts for external areas. The allowable release rate into the municipal storm sewer is 47 L/s. Since all storm flows, up to 100-year storm events, will be reduced to 5 year pre-development levels, the existing storm sewer system will not be adversely affected by the post-development condition. Therefore, WSP concludes that no downstream sewer improvements are required as a result of this development. Refer to the Stormwater Management Report prepared under a separate cover for stormwater management calculation details.

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## 4.6 GROUNDWATER DISCHARGE

The foundation and underfloor drains will direct intercepted flows to a sump pit outfitted with a sump pump system to pump flows to the cistern, then to the storm chamber and ultimately to municipal sewer. Per the "Supplemental Hydrogeological Considerations No. 2"), the infiltration rate into the foundation perimeter is expected to be low and intermittent. As a result, the foundation drain flow is not accounted for in the stormwater management calculations and a Permit To Take Water (PTTW) is not required.

# 5 CONCLUSIONS

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## 5.1 WATER

The proposed development will be serviced by a 150mm diameter fire and 100mm diameter domestic water service connection. The services will connect to the existing 200mm diameter watermain on McCraney Street East. All internal plumbing will meet Ontario Building Code standards. Sizing and location of the proposed water services to the proposed building has been coordinated with the mechanical consultant. Hydrant flow test indicates there is sufficient supply to accommodate the proposed development.

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## 5.2 WASTEWATER

The building will be serviced through the mechanical system, which will be connected to the existing 250mm diameter wastewater service connection. The existing wastewater service connection is connected to the existing 250mm diameter wastewater sewer on McCraney Street East. A control manhole is proposed to be placed immediately inside the property line. The receiving wastewater sewer has the capacity to accept the increase in wastewater flow from the site without surcharging in any leg, and therefore the development will not have any negative impact on the downstream receiving wastewater sewers.

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## 5.3 STORM

Roof water will be collected to the cistern, and stormwater from the parking lot and landscape areas will be discharged to storm chamber in the parking lot. The outlet to the storm chamber will be a 300mm diameter storm sewer. Flows are controlled to the 5 year flow rate with a 120mm orifice plate at the control manhole which is proposed to be placed immediately inside the property line. The proposed 300mm diameter storm service connection downstream of the control manhole is to be connected to the existing 1000mm storm sewer on McCraney Street East.

The proposed development will control the flow coming from the site to the McCraney Street East sewer to a 5-year pre-development release rate during all storms up to, and including, the 100-year event. Therefore, WSP has concluded that there will be no negative impacts to the existing storm sewer system as a result of this development.

The 100 year water level in the storm chamber is at 131.38m which is above the invert of the proposed connection at the building; therefore, it is recommended that backwater valves, pumping underground parking structure foundation drains to grade prior to discharging to the cistern, and/or the use of pressure tight plumbing systems below ground to hydraulically isolate the building from the storm chamber and cistern.



# APPENDIX

## **A** FUS CALCULATIONS AND HYDRANT FLOW TEST RESULTS

## APPENDIX A

### FIRE FLOW CALCULATIONS

Project: MCCRANEY STREET EAST, BLOCK E, PLAN M-172  
Job No.: 10-16058

Fire flow required for a given area based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (1999)

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

where

F = Fire flow in Litres per minute (Lpm)  
C = coefficient related to the type of construction  
A = total floor area in square metres

#### Calculations per FUS

- Estimate of Fire Flow*  
C = 0.6 for fire resistive construction  
A = 4401 m<sup>2</sup> (largest GFA plus 25% of GFA for two immediately adjoining floors)<sup>1</sup>

$$F = 9,357 \text{ Lpm}$$

- Occupancy Reduction*  
15% reduction for "Non-Combustible" Occupancy

$$\begin{aligned} 15\% \text{ reduction of } 9357 \text{ Lpm} &= 1,404 \text{ Lpm} \\ F = 9357 - 1404 &= 7,953 \text{ Lpm} \end{aligned}$$

- Sprinkler Reduction*  
30% reduction for NFPA Sprinkler System

$$\begin{aligned} 30\% \text{ reduction of } 7953 \text{ Lpm} &= 2,386 \text{ Lpm} \\ F = 7953 - 2386 &= 5,567 \text{ Lpm} \end{aligned}$$

- Separation Charge*

Face	Distance (m)	Charge
West Side	45+	0%
East Side	30	10%
North Side	45+	0%
South Side	45+	0%
	Total	10%

of 7,953 = 795 Lpm

$$\begin{aligned} F &= 5567 + 795 \\ F &= 6,362 \text{ Lpm} && (2,000 \text{ Lpm} < F < 45,000 \text{ Lpm}; \text{ OK}) \\ F &= 1,679 \text{ US GPM} \end{aligned}$$

#### Notes

**SimplexGrinnell**

2400 Skymark, Ave.  
Mississauga, ON  
L4W 5K5

**GENERAL INFORMATION:**

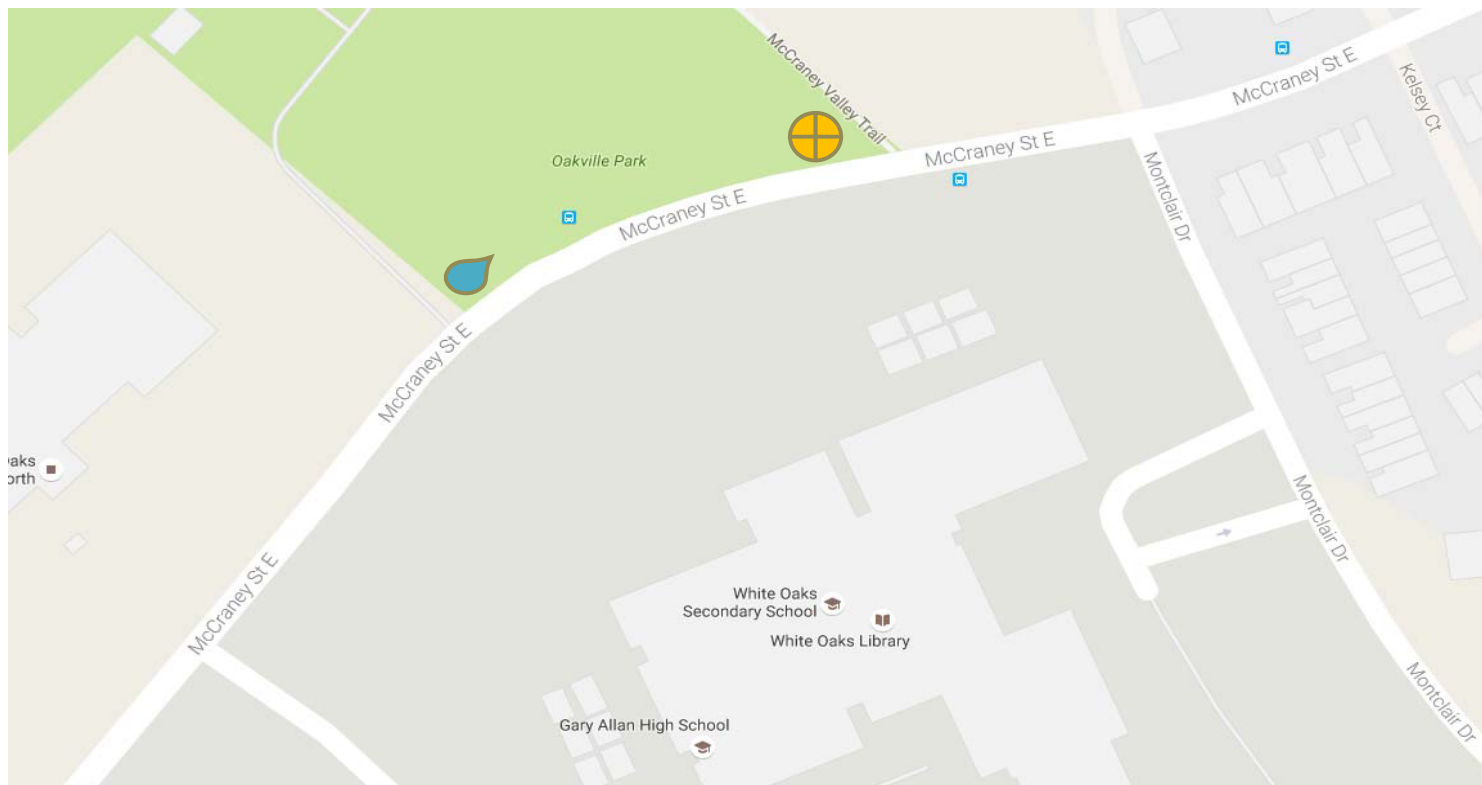
PROJECT NUMBER | 004008.57  
PROJECT NAME | Branthaven Development Corp  
ADDRESS | Block 'E' McCraney Street East  
CITY | Oakville, ON  
TESTED BY | S.MISTRY & A.ABADEER

DATE | **14-09-2016**  
TIME | **11:00 AM**

**SYSTEM DATA:**

MAIN SIZE / MATERIAL | **8"**  
CONFIGURATION | **Looped**

**HYDRANT LOCATIONS:**



LEGEND:



Gauge Hydrant



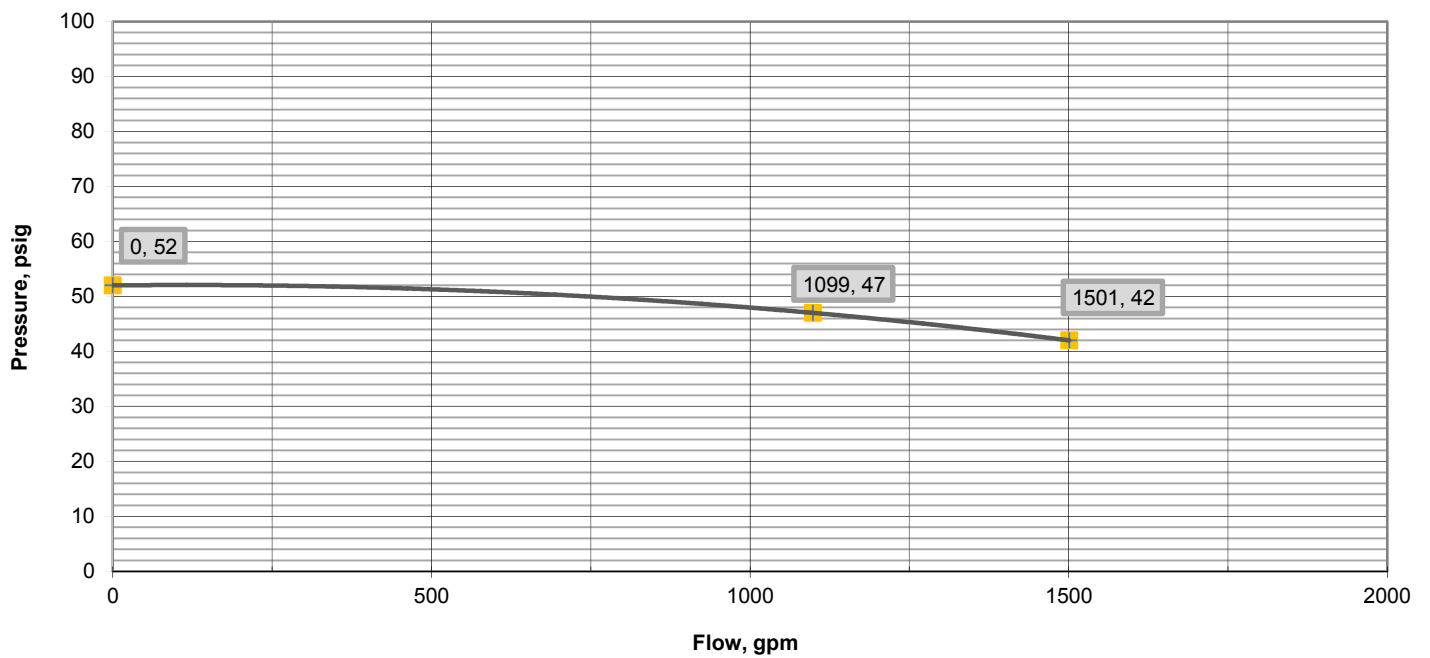
Flowing Hydrant

## TEST RESULTS:

Test #	Number of Outlets	Orifice Size (in)	Pitot Reading (psig)	Equivlnt Flow (usgpm)	Total Flow (usgpm)	Projected flow at 20psi (usgpm)	Gauge Pressure (psig)	Discharge Coef'nt
<b>Static</b>	N/A	N/A	N/A	N/A	<b>0</b>	N/A	<b>52</b>	N/A
<b>1</b>	1	2.47	45	1099	<b>1099</b>	2994	<b>47</b>	0.9
<b>2</b>	2	2.47	21	751	<b>1501</b>	2813	<b>42</b>	0.9

**Note:**

Projected flow at 20 psi per NFPA 291. Actual flow may vary.



# APPENDIX

# B

## DOMESTIC WATER DEMAND AND WASTEWATER FLOW CALCULATIONS

## DOMESTIC WATER DEMANDS

**Project:** MCCRANEY STREET EAST, BLOCK E, PLAN M-172  
**Job No.:** 10-16058

### Proposed Water Demands

Unit Type	GFA (ha)	Occupancy Rate p/ha	Equivalent Population (given)	Per Capita Flow (L/cap/day)	Average Daily Demand (L/s)	Peak Hour		Max Day	
						Peaking Factor	Demand (L/s)	Peaking Factor	Demand (L/s)
Residential	2.507	285	714	275	2.27	4.00	9.10	2.25	5.12
<b>TOTAL</b>	<b>2.507</b>		<b>714</b>		<b>2.27</b>		<b>9.10</b>		<b>5.12</b>

#### Notes:

1. Per capita flow and peaking factor are as per the Region of Halton Water and Wastewater Linear Design Manual.
2. Unit Counts and Floor Areas are per Architectural drawings

# WASTEWATER FLOW GENERATION

Project: MCCRANEY STREET EAST, BLOCK E, PLAN M-172  
 Job No.: 10-16058

## Proposed Sanitary Flows

Total Site Area: 1.42 ha

Unit Type	GFA (ha)	Occupancy Rate (p/ha)	Equivalent Population	Per Capita Flow (L/cap/day)	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration 0.286 L/s/ha (L/s)	Peak Flow + Infiltration (L/s)
Condominium	2.507	285	714	275	2.27	3.89	8.85	0.41	9.26
<b>TOTAL</b>			<b>714</b>		<b>2.27</b>	<b>3.89</b>	<b>8.85</b>	<b>0.41</b>	<b>9.26</b>

Proposed Peak Sanitary Flow as a Result of Re-development =	9.26 L/s
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### Notes:

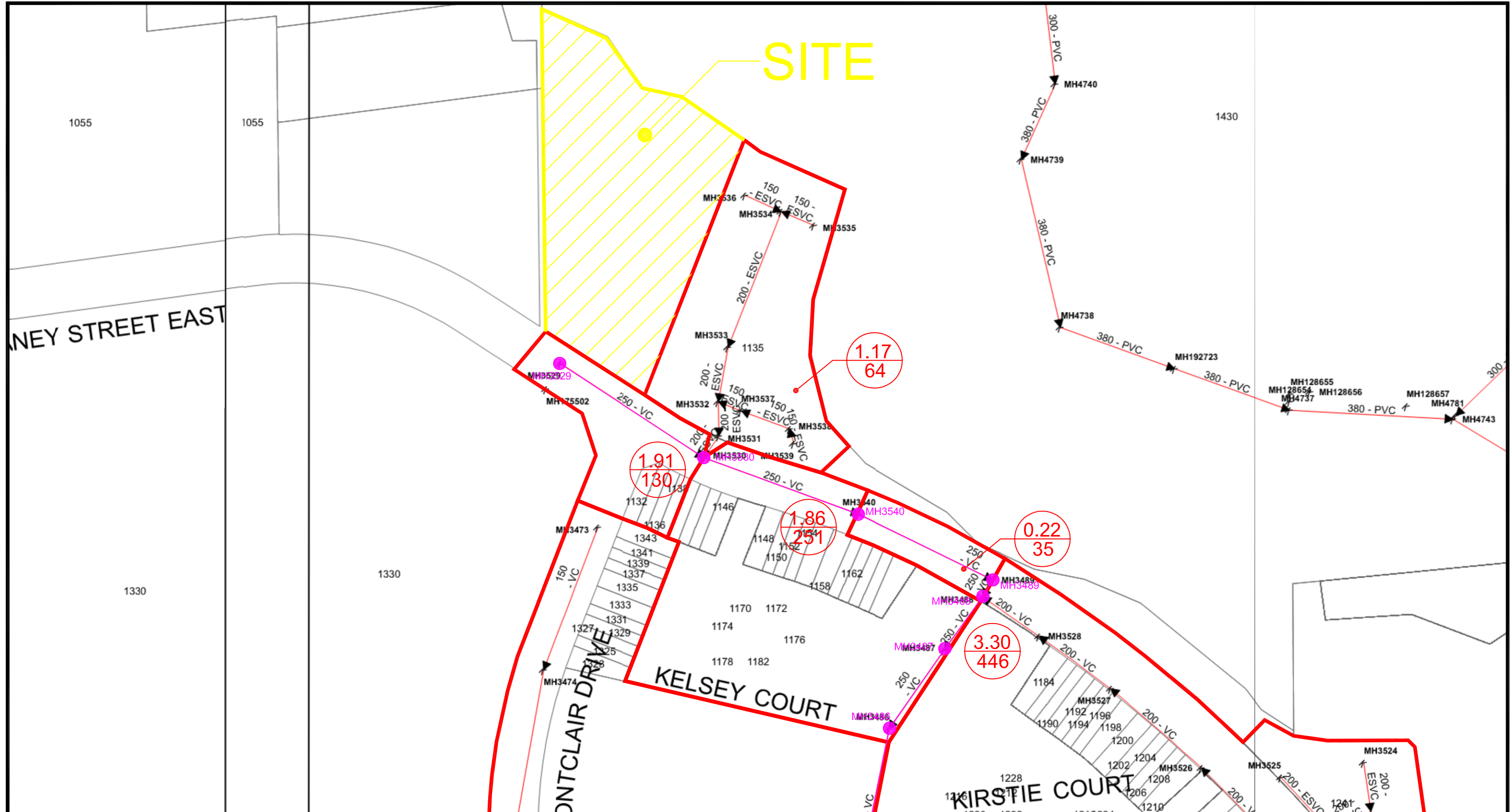
1. Per capita flow and peaking factor are as per the Region of Halton Water and Wastewater Linear Design Manual.
2. Unit Counts and Floor Areas are per Architectural drawing

# APPENDIX

# C

## WASTEWATER DRAINAGE PLANS AND DESIGN SHEETS





SITE

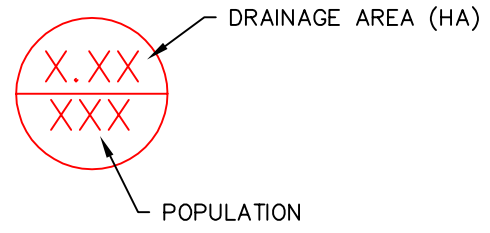
MCCRANEY STREET EAST

ONTCLAIR DRIVE

KELSEY COURT

KIRSTIE COURT

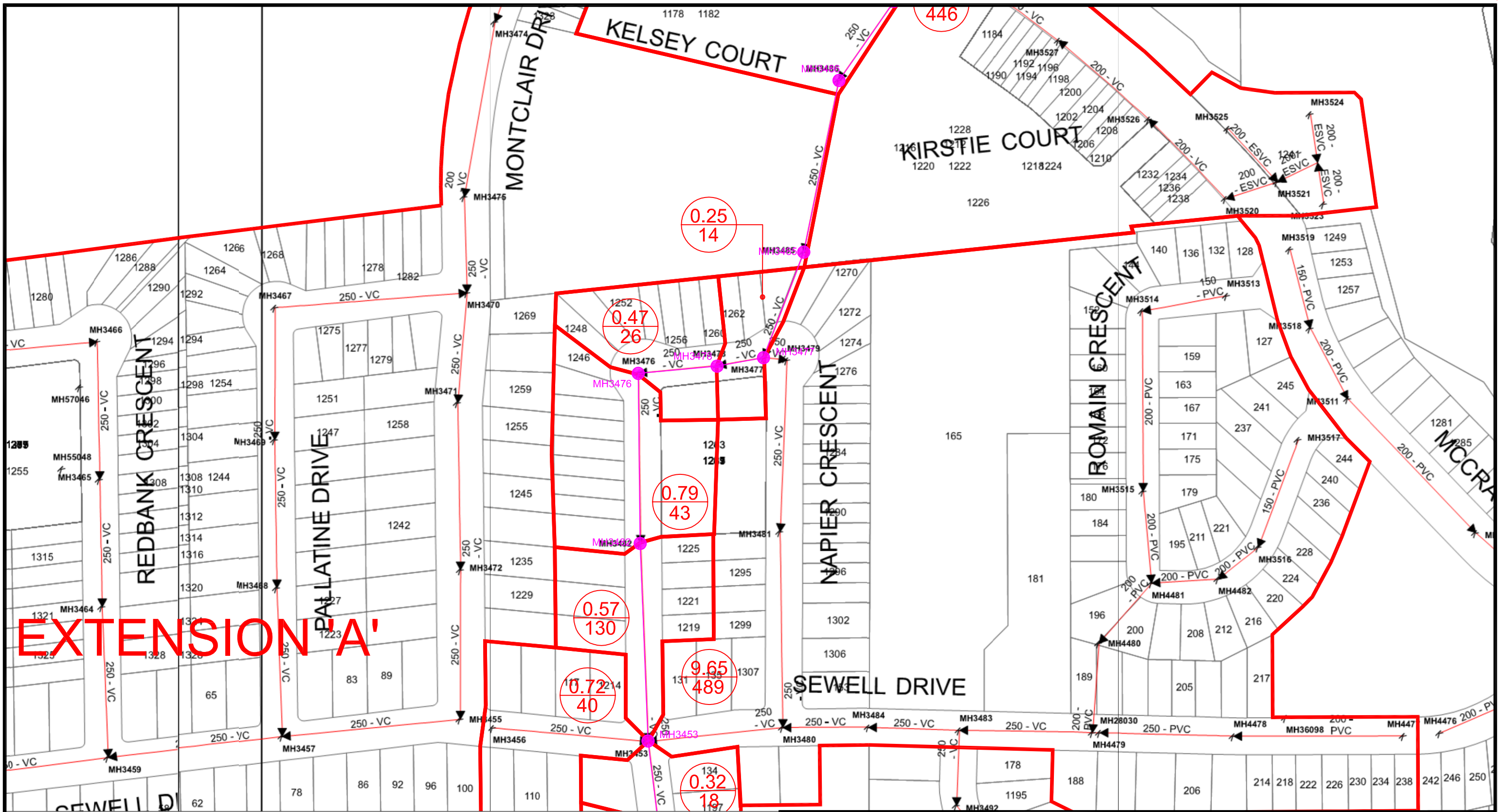
LEGEND:



- DRAINAGE AREA BOUNDARY
- SANITARY SEWER
- SANITARY MANHOLE

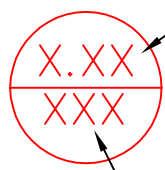
CLIENT	BRANTHAVEN MCCRANEY INC.		
TITLE	MCCRANEY STREET EAST, BLOCK E, PLAN M-172		
	WASTEWATER DRAINAGE PLAN		
Checked	A.L.	Drawn	10/12 Cad
Date	AUG. 2018	Proj. No.	10-16058
Scale	N.T.S.	Figure No.	D-1





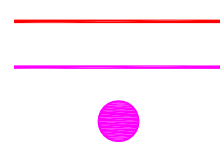
**EXTENSION 'A'**

LEGEND:



DRAINAGE AREA (HA)

POPULATION



DRAINAGE AREA BOUNDARY

SANITARY SEWER

SANITARY MANHOLE

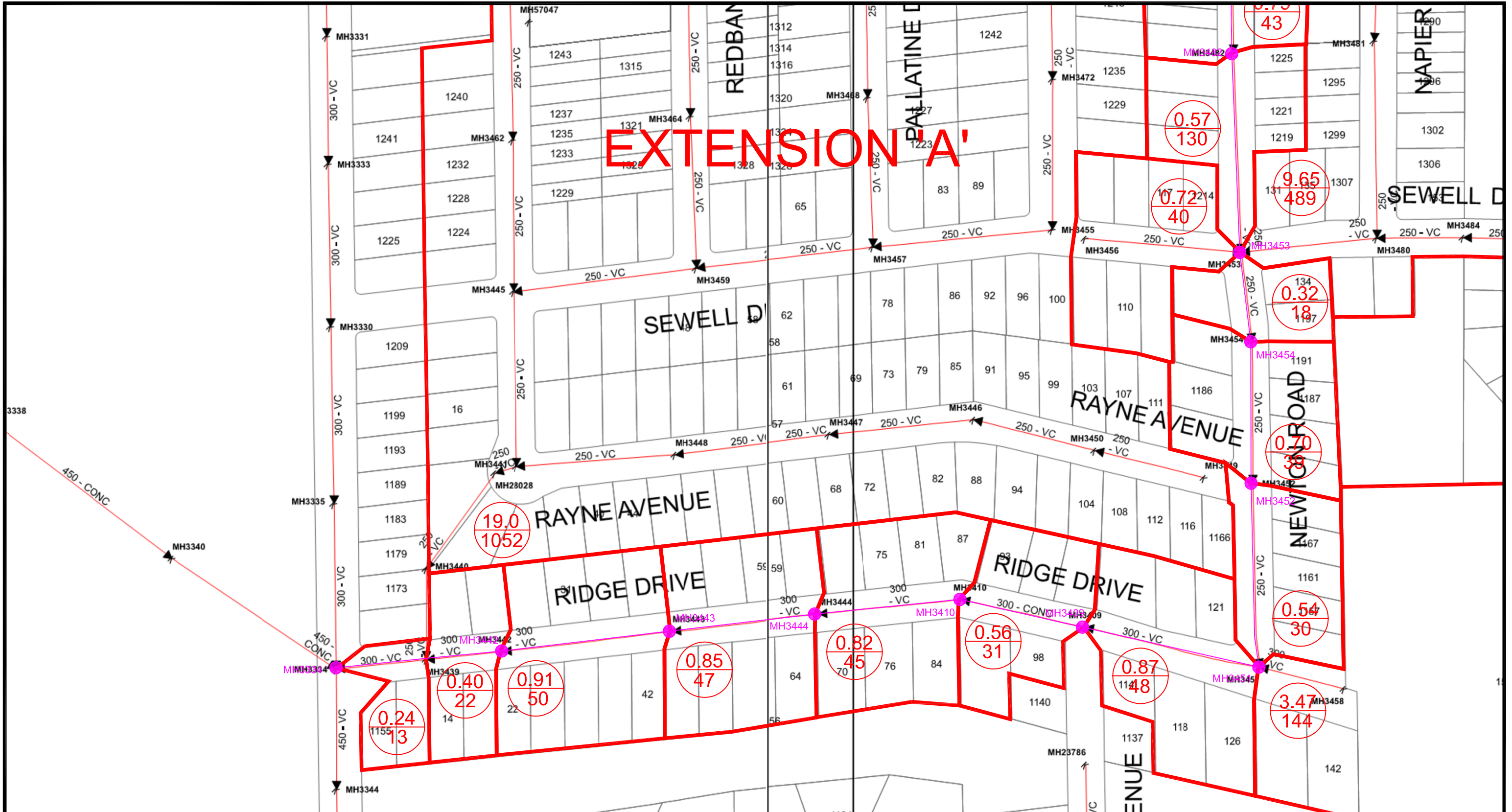
CLIENT BRANTHAVEN MCCRANEY INC.

TITLE MCCRANEY STREET EAST, BLOCK E, PLAN M-172

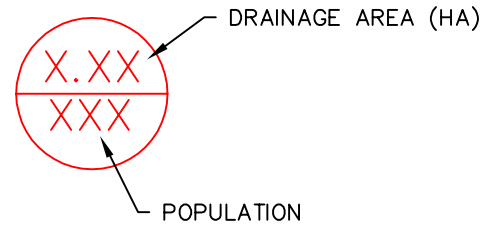
WASTEWATER DRAINAGE PLAN



Checked	A.L.	Drawn	10/12 Cad
Date	AUG. 2018	Proj. No.	10-16058
Scale	N.T.S.	Figure No.	D-2



**LEGEND:**



CLIENT	BRANTHAVEN MCCRANEY INC.	
TITLE	MCCRANEY STREET EAST, BLOCK E, PLAN M-172	
	WASTEWATER DRAINAGE PLAN	

Checked	A.L.	Drawn 10/12 Cad
Date	AUG. 2018	Proj. No. 10-16058
Scale	N.T.S.	Figure No. C-3

Appendix C - Pre-Development Downstream Sanitary Sewer Analysis

DESIGN COEFFICIENTS and CONTRIBUTIONS			
Institutional	40	p/ha	
Apartments	285	p/ha	
SF Homes	55	p/ha	
Townhouse	135	p/ha	
Flow Rate from Existing Residential Land Use	275	l/cap/day	
Flow Rate from Existing Non-Res Land Use	11000	l/ha/day	
Infiltration Allowance	0.286	L/s/ha	

PROJECT No.:	10-16058
PROJECT NAME:	McCraney Street E, Block E, Plan M-172
LOCATION:	McCraney Street E
DATE:	16-Jan-18
DESIGNED BY:	A.L
CHECKED BY:	M.E

Street Name	MH to MH		Area (ha)					Incremental Non-Res Population (ha)	Accumulated Non-Res Population	Cummulative Total Area (ha)	Incremental Residential Population	Accumulated Residential Population	Residential Peaking Factor (Harmon)	Total Peak Residential Flow (l/s)	Comm/Industrial Flow (l/s)	Infiltration (l/s)	Peak Flow + Infiltration (l/s)	Type of Pipe Factor (n)	Pipe Dia. (mm)	Sewer Grade (%)	Capacity at Grade (l/s)	Flow as % of Full Capacity	Velocity at Minimum Grade (m/s)
			Apartment	Institutional	Townhouse	Single Family Homes	Total Area (For Infiltration)																
MCCRANEY ST E	MH3529	MH3530	0.00	0.00	1.42	0.00	1.42	0	0	1.42	192	192	4.15	2.54	0.00	0.41	2.94	0.013	250	0.50	42.0	7.0	0.857
MONTCLAIR DRIVE	NORTH	MH3530	0.00	0.00	0.00	1.17	1.17	0	0	1.17	64	64	4.29	0.88	0.00	0.33	1.21	---	---	---	---	---	---
MCCRANEY ST E	MH3530	MH3540	0.00	0.00	1.86	0.00	1.86	0	0	4.45	251	507	3.97	6.41	0.00	1.27	7.68	0.013	250	0.50	42.0	18.3	0.857
MCCRANEY ST E	MH3540	MH3489	0.00	0.00	0.22	0.00	0.22	0	0	4.67	30	537	3.96	6.76	0.00	1.34	8.10	0.013	250	0.50	42.0	19.3	0.857
EASEMENT	MH3489	MH3488	0.00	0.00	0.00	0.00	0.00	0	0	4.67	0	537	3.96	6.76	0.00	1.34	8.10	0.013	250	0.50	42.0	19.3	0.857
MCCRANEY ST E	EAST	MH3488	0.00	0.00	3.30	0.00	3.30	0	0	3.30	446	446	4.00	5.67	0.00	0.94	6.61	---	---	---	---	---	---
EASEMENT	MH3488	MH3487	0.00	0.00	0.00	0.00	0.00	0	0	7.97	0	982	3.80	11.90	0.00	2.28	14.18	0.013	250	0.58	45.3	31.3	0.923
EASEMENT	MH3487	MH3486	0.00	0.00	0.00	0.00	0.00	0	0	7.97	0	982	3.80	11.90	0.00	2.28	14.18	0.013	250	0.58	45.3	31.3	0.923
EASEMENT	MH3486	MH3485	0.00	0.00	0.00	0.00	0.00	0	0	7.97	0	982	3.80	11.90	0.00	2.28	14.18	0.013	250	0.58	45.3	31.3	0.923
EASEMENT	MH3485	MH3477	0.00	0.00	0.00	0.00	0.00	0	0	7.97	0	982	3.80	11.90	0.00	2.28	14.18	0.013	250	0.58	45.3	31.3	0.923
NAPIER CRESCENT	MH3477	MH3478	0.00	0.00	0.00	0.25	0.25	0	0	8.22	14	996	3.80	12.05	0.00	2.35	14.40	0.013	250	0.75	51.5	28.0	1.049
NAPIER CRESCENT	MH3478	MH3476	0.00	0.00	0.00	0.47	0.47	0	0	8.69	26	1022	3.79	12.34	0.00	2.49	14.83	0.013	250	0.75	51.5	28.8	1.049
NAPIER CRESCENT	MH3476	MH3482	0.00	0.00	0.00	0.79	0.79	0	0	9.48	43	1065	3.78	12.83	0.00	2.71	15.54	0.013	250	0.75	51.5	30.2	1.049
NAPIER CRESCENT	MH3482	MH3453	0.00	0.00	0.00	0.57	0.57	0	0	10.05	31	1097	3.77	13.17	0.00	2.87	16.05	0.013	250	0.75	51.5	31.2	1.049
SEWELL DRIVE	WEST	MH3453	0.00	0.00	0.00	0.72	0.72	0	0	0.72	40	40	4.33	0.55	0.00	0.21	0.75	---	---	---	---	---	---
SEWELL DRIVE	EAST	MH3453	0.00	2.76	0.00	6.89	9.65	110	110	9.65	379	379	4.03	4.86	0.35	2.76	7.98	---	---	---	---	---	---
NEWTON ROAD	MH3453	MH3454	0.00	0.00	0.00	0.32	0.32	0	110	20.74	18	1533	3.67	17.92	0.35	5.93	24.20	0.013	250	0.58	45.3	53.4	0.923
NEWTON ROAD	MH3454	MH3452	0.00	0.00	0.00	0.70	0.70	0	110	21.44	39	1571	3.66	18.33	0.35	6.13	24.81	0.013	250	0.58	45.3	54.8	0.923
NEWTON ROAD	MH3452	MH3451	0.00	0.00	0.00	0.54	0.54	0	110	21.98	30	1601	3.66	18.65	0.35	6.29	25.28	0.013	250	0.58	45.3	55.8	0.923
RIDGE DRIVE	MH3458	MH3451	0.00	3.17	0.00	0.30	3.47	127	127	3.47	17	17	4.39	0.23	0.40	0.99	1.63	---	---	---	---	---	---
RIDGE DRIVE	MH3451	MH3409	0.00	0.00	0.00	0.87	0.87	0	237	26.32	48	1665	3.65	19.33	0.75	7.53	27.61	0.013	300	0.70	80.9	34.1	1.145
RIDGE DRIVE	MH3409	MH3410	0.00	0.00	0.00	0.56	0.56	0	237	26.88	31	1696	3.64	19.65	0.75	7.69	28.10	0.013	300	0.70	80.9	34.7	1.145
RIDGE DRIVE	MH3410	MH3444	0.00	0.00	0.00	0.82	0.82	0	237	27.70	45	1741	3.63	20.13	0.75	7.92	28.81	0.013	300	0.70	80.9	35.6	1.145
RIDGE DRIVE	MH3444	MH3443	0.00	0.00	0.00	0.85	0.85	0	237	28.55	47	1788	3.62	20.62	0.75	8.17	29.54	0.013	300	1.65	124.2	23.8	1.757

Appendix C - Pre-Development Downstream Sanitary Sewer Analysis

DESIGN COEFFICIENTS and CONTRIBUTIONS			
Institutional	40	p/ha	
Apartments	285	p/ha	
SF Homes	55	p/ha	
Townhouse	135	p/ha	
Flow Rate from Existing Residential Land Use	275	l/cap/day	
Flow Rate from Existing Non-Res Land Use	11000	l/ha/day	
Infiltration Allowance	0.286	L/s/ha	

PROJECT No.: 10-16058

PROJECT NAME: McCraney Street E, Block E, Plan M-172

LOCATION: McCraney Street E

DATE: 16-Jan-18

DESIGNED BY: A.L

CHECKED BY: M.E

Street Name	MH to MH		Area (ha)					Incremental Non-Res Population (ha)	Accumulated Non-Res Population	Cummulative Total Area (ha)	Incremental Residential Population	Accumulated Residential Population	Residential Peaking Factor (Harmon)	Total Peak Residential Flow (l/s)	Comm/Industrial Flow (l/s)	Infiltration (l/s)	Peak Flow + Infiltration (l/s)	Type of Pipe Factor (n)	Pipe Dia. (mm)	Sewer Grade (%)	Capacity at Grade (l/s)	Flow as % of Full Capacity	Velocity at Minimum Grade (m/s)
			Apartment	Institutional	Townhouse	Single Family Homes	Total Area (For Infiltration)																
RIDGE DRIVE	MH3443	MH3442	0.00	0.00	0.00	0.91	0.91	0	237	29.46	50	1838	3.61	21.14	0.75	8.43	30.32	0.013	300	1.65	124.2	24.4	1.757
RIDGE DRIVE	MH3442	MH3439	0.00	0.00	0.00	0.40	0.40	0	237	29.86	22	1860	3.61	21.37	0.75	8.54	30.67	0.013	300	0.45	64.9	47.3	0.918
EXTENSION 'A'	NORTH	MH3439	0.00	2.22	0.50	16.28	19.00	89	89	19.00	963	963	3.81	11.68	0.28	5.43	17.40	---	---	---	---	---	---
RIDGE DRIVE	MH3439	MH3334	0.00	0.00	0.00	0.24	0.24	0	326	49.10	13	2836	3.46	31.26	1.04	14.04	46.34	0.013	300	0.45	64.9	71.4	0.918

Appendix C - Post-Development Downstream Sanitary Sewer Analysis

DESIGN COEFFICIENTS and CONTRIBUTIONS			
Institutional	40	p/ha	
Apartments	285	p/ha	
SF Homes	55	p/ha	
Townhouse	135	p/ha	
Flow Rate from Existing Residential Land Use	275	l/cap/day	
Flow Rate from Existing Non-Res Land Use	11000	l/ha/day	
Infiltration Allowance	0.286	L/s/ha	

PROJECT No.: 10-16058

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PROJECT NAME: McCraney Street E, Block E, Plan M-172

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LOCATION: McCraney Street E

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DATE: 20-Aug-20

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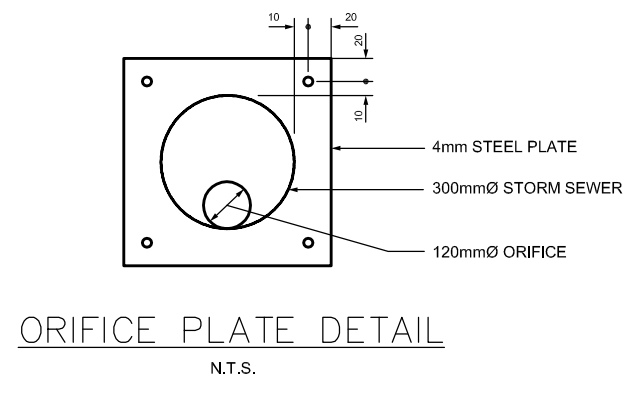
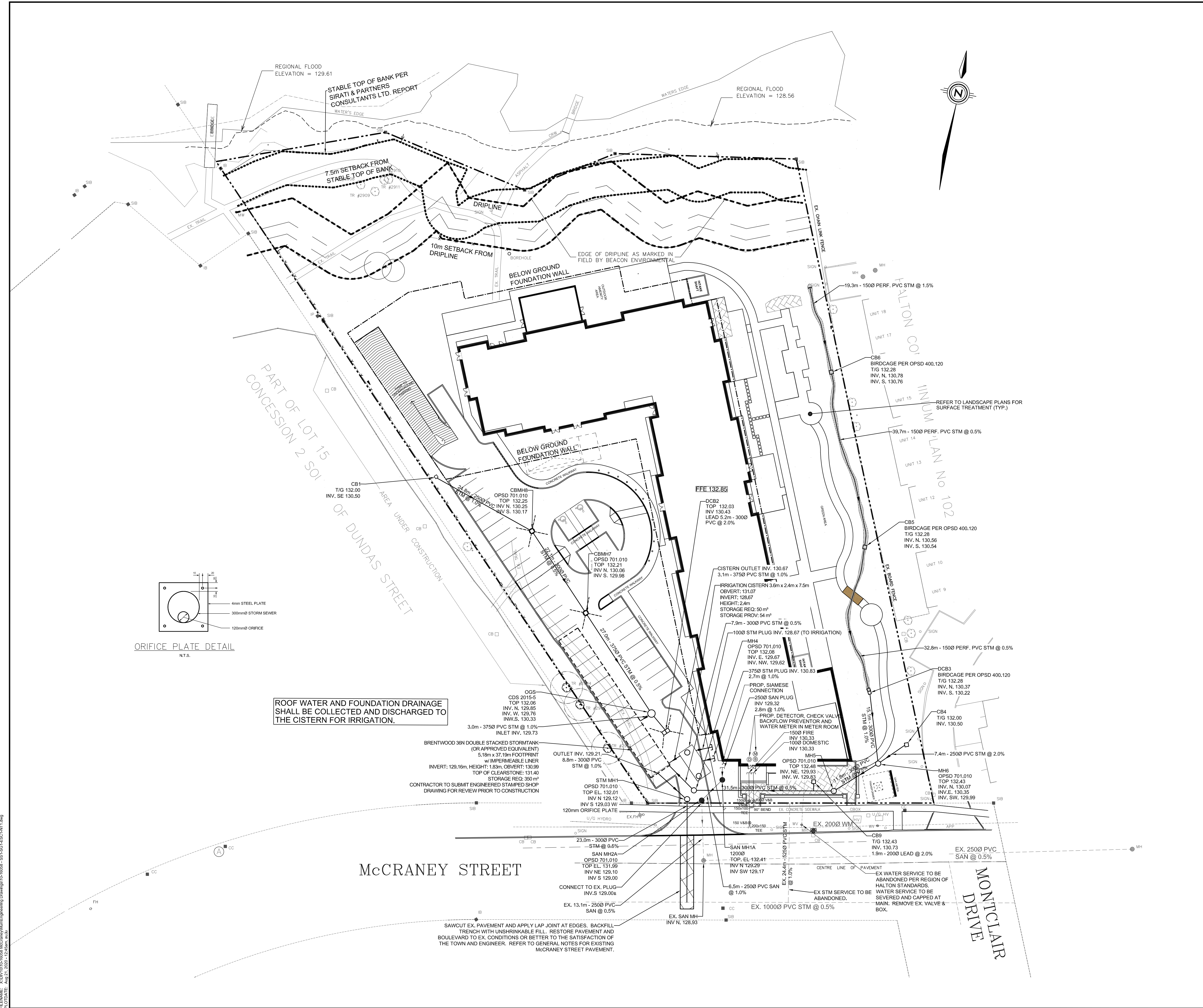
DESIGNED BY: A.L

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CHECKED BY: M.E

Street Name	MH to MH	Area (ha)					Incremental Non-Res Population (ha)	Accumulated Non-Res Population	Cummulative Total Area (ha)	Incremental Residential Population	Accumulated Residential Population	Residential Peaking Factor (Harmon)	Total Peak Residential Flow (l/s)	Comm/Industrial Flow (l/s)	Infiltration (l/s)	Peak Flow + Infiltration (l/s)	Type of Pipe Factor (n)	Pipe Dia. (mm)	Sewer Grade (%)	Capacity at Grade (l/s)	Flow as % of Full Capacity	Velocity at Minimum Grade (m/s)	
		Apartment	Institutional	Townhouse	Single Family Homes	Total Area																	
<b>SITE</b>	<b>PLUG</b>	<b>MH3529</b>	<b>2.507</b>	<b>0</b>	<b>0.00</b>	<b>0.00</b>	<b>2.51</b>	<b>0</b>	<b>0</b>	<b>2.51</b>	<b>714</b>	<b>714</b>	<b>3.89</b>	<b>8.85</b>	<b>0.00</b>	<b>0.41</b>	<b>9.25</b>	<b>0.013</b>	<b>250</b>	<b>0.50</b>	<b>42.0</b>	<b>22.0</b>	<b>0.857</b>
MCCRANEY ST E	MH3529	MH3530	0.00	0.00	1.42	0.00	1.42	0	0	3.93	192	906	3.83	11.04	0.00	1.12	12.16	0.013	250	0.50	42.0	28.9	0.857
MONTCLAIR DRIVE	NORTH	MH3530	0.00	0.00	0.00	1.17	1.17	0	0	1.17	64	64	4.29	0.88	0.00	0.33	1.21	---	---	---	---	---	---
MCCRANEY ST E	MH3530	MH3540	0.00	0.00	1.86	0.00	1.86	0	0	6.96	251	1222	3.74	14.55	0.00	1.99	16.54	0.013	250	0.50	42.0	39.3	0.857
MCCRANEY ST E	MH3540	MH3489	0.00	0.00	0.22	0.00	0.22	0	0	7.18	30	1251	3.74	14.88	0.00	2.05	16.93	0.013	250	0.50	42.0	40.3	0.857
EASEMENT	MH3489	MH3488	0.00	0.00	0.00	0.00	0.00	0	0	7.18	0	1251	3.74	14.88	0.00	2.05	16.93	0.013	250	0.50	42.0	40.3	0.857
MCCRANEY ST E	EAST	MH3488	0.00	0.00	3.30	0.00	3.30	0	0	3.30	446	446	4.00	5.67	0.00	0.94	6.61	---	---	---	---	---	---
EASEMENT	MH3488	MH3487	0.00	0.00	0.00	0.00	0.00	0	0	10.48	0	1697	3.64	19.66	0.00	3.00	22.66	0.013	250	0.58	45.3	50.0	0.923
EASEMENT	MH3487	MH3486	0.00	0.00	0.00	0.00	0.00	0	0	10.48	0	1697	3.64	19.66	0.00	3.00	22.66	0.013	250	0.58	45.3	50.0	0.923
EASEMENT	MH3486	MH3485	0.00	0.00	0.00	0.00	0.00	0	0	10.48	0	1697	3.64	19.66	0.00	3.00	22.66	0.013	250	0.58	45.3	50.0	0.923
EASEMENT	MH3485	MH3477	0.00	0.00	0.00	0.00	0.00	0	0	10.48	0	1697	3.64	19.66	0.00	3.00	22.66	0.013	250	0.58	45.3	50.0	0.923
NAPIER CRESCENT	MH3477	MH3478	0.00	0.00	0.00	0.25	0.25	0	0	10.73	14	1711	3.64	19.81	0.00	3.07	22.87	0.013	250	0.75	51.5	44.4	1.049
NAPIER CRESCENT	MH3478	MH3476	0.00	0.00	0.00	0.47	0.47	0	0	11.20	26	1736	3.63	20.08	0.00	3.20	23.28	0.013	250	0.75	51.5	45.2	1.049
NAPIER CRESCENT	MH3476	MH3482	0.00	0.00	0.00	0.79	0.79	0	0	11.99	43	1780	3.62	20.53	0.00	3.43	23.96	0.013	250	0.75	51.5	46.5	1.049
NAPIER CRESCENT	MH3482	MH3453	0.00	0.00	0.00	0.57	0.57	0	0	12.56	31	1811	3.62	20.86	0.00	3.59	24.45	0.013	250	0.75	51.5	47.5	1.049
SEWELL DRIVE	WEST	MH3453	0.00	0.00	0.00	0.72	0.72	0	0	0.72	40	40	4.33	0.55	0.00	0.21	0.75	---	---	---	---	---	---
SEWELL DRIVE	EAST	MH3453	0.00	2.76	0.00	6.89	9.65	110	110	9.65	379	379	4.03	4.86	0.35	2.76	7.98	---	---	---	---	---	---
NEWTON ROAD	MH3453	MH3454	0.00	0.00	0.00	0.32	0.32	0	110	23.25	18	2247	3.55	25.36	0.35	6.65	32.36	0.013	250	0.58	45.3	71.5	0.923
NEWTON ROAD	MH3454	MH3452	0.00	0.00	0.00	0.70	0.70	0	110	23.95	39	2286	3.54	25.76	0.35	6.85	32.96	0.013	250	0.58	45.3	72.8	0.923
NEWTON ROAD	MH3452	MH3451	0.00	0.00	0.00	0.54	0.54	0	110	24.49	30	2316	3.54	26.06	0.35	7.00	33.41	0.013	250	0.58	45.3	73.8	0.923
RIDGE DRIVE	MH3458	MH3451	0.00	3.17	0.00	0.30	3.47	127	127	3.47	17	17	4.39	0.23	0.40	0.99	1.63	---	---	---	---	---	---
RIDGE DRIVE	MH3451	MH3409	0.00	0.00	0.00	0.87	0.87	0	237	28.83	48	2380	3.53	26.71	0.75	8.24	35.71	0.013	300	0.70	80.9	44.1	1.145
RIDGE DRIVE	MH3409	MH3410	0.00	0.00	0.00	0.56	0.56	0	237	29.39	31	2411	3.52	27.02	0.75	8.40	36.18	0.013	300	0.70	80.9	44.7	1.145
RIDGE DRIVE	MH3410	MH3444	0.00	0.00	0.00	0.82	0.82	0	237	30.21	45	2456	3.51	27.47	0.75	8.64	36.87	0.013	300	0.70	80.9	45.6	1.145





ROOF WATER AND FOUNDATION DRAINAGE SHALL BE COLLECTED AND DISCHARGED TO THE CISTERN FOR IRRIGATION.

BRENTWOOD 36N DOUBLE STACKED STORM TANK (OR APPROVED EQUIVALENT) 5.18m x 3.19m FOOTPRINT w/ IMPERMEABLE LINER w/ IMPERMEABLE LINER INVERT: 129.16m, HEIGHT: 1.53m, OVERT: 130.99 TOP OF CLEARSTONE: 131.40 STORAGE REQ: 350 m³ CONTRACTOR TO SUBMIT ENGINEER STAMPED SHOP DRAWING FOR REVIEW PRIOR TO CONSTRUCTION

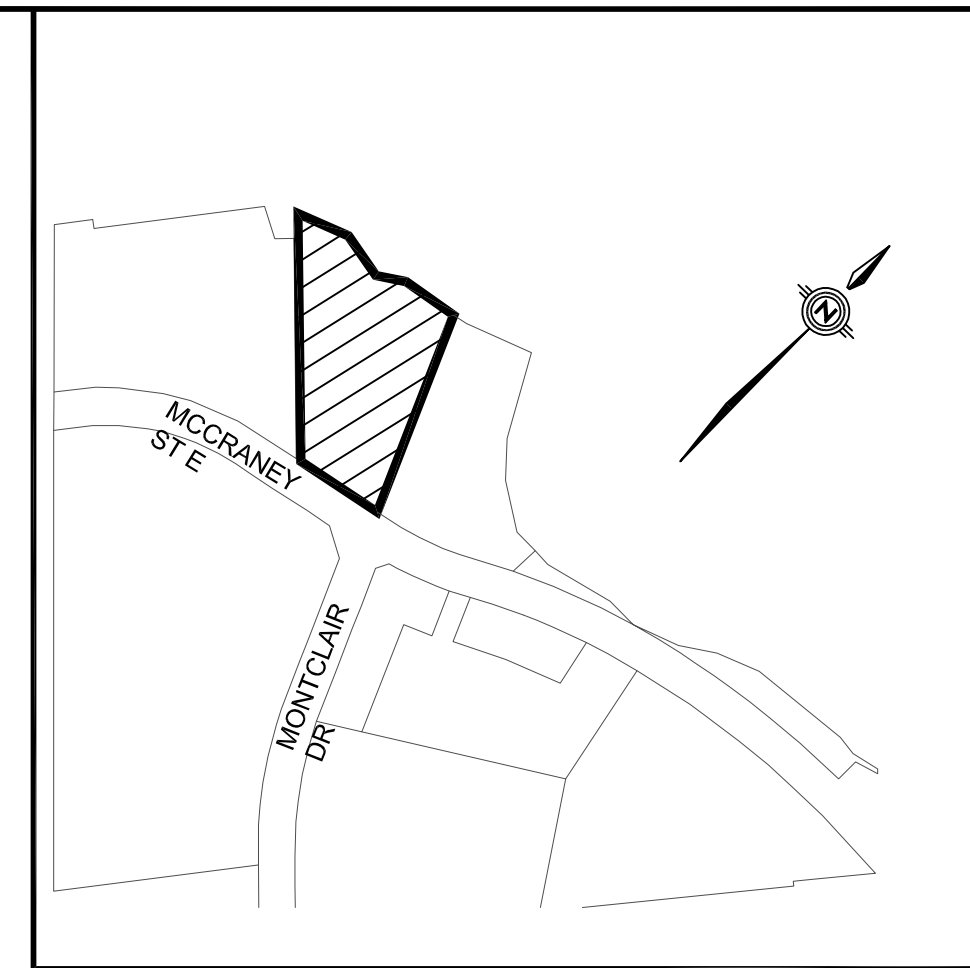
STORM MANHOLE (M1) OPSD 701.010 TOP EL. 132.01 INV. N. 129.12 INV. S. 129.03 W. 120mm ORIFICE PLATE

OUTLET INV. 129.21 8.8m - 3000 PVC STM @ 1.0%

CONNECT TO EX. PLUG INV. S. 129.00±

EX. 13.1m - 2500 PVC SAN @ 0.5%

SAWCUT EX. PAVEMENT AND APPLY LAP JOINT AT EDGES. BACKFILL TRENCH WITH UNSHRINKABLE FILL. RESTORE PAVEMENT AND BOULEVARD TO EX. CONDITIONS OR BETTER TO THE SATISFACTION OF THE TOWN AND ENGINEER. REFER TO GENERAL NOTES FOR EXISTING McCRANEY STREET PAVEMENT.



KEY PLAN N.T.S.

**LEGEND**

---	PROPERTY LINE
□	EXISTING CATCHBASIN
---	EXISTING SEWERS
●	EXISTING SANITARY MANHOLE
□	PROPOSED CATCHBASIN
—○—	PROP. STORM SEWER
—●—	PROP. SANITARY SEWER
⊗	VALVE & BOX

ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.  
DRAWINGS ARE NOT DIGITALLY CORRECT. LAYOUT TO BE COMPLETED BY OFFSETS.  
BENCHMARKS  
00819818108  
CONCRETE CULVERT UNDER HWY 5, 102.0M WEST OF THE JCT OF HWY 54 AND TRAFALGAR RD IN OAKVILLE, AND 25.0 M SOUTH OF CENTRELINE OF HWY 5. TABLE IS SET VERTICALLY IN TOP SOUTH END OF CULVERT, 1.00 M NORTH OF SOUTH END OF CULVERT AND 1.10 M EAST OF WEST FACE OF CULVERT ELEVATION = 167.059

No	Date	By
5.	08/21/2020	M.E. RE-ISSUED FOR SPA
4.	10/09/2019	M.E. ISSUED FOR FOURTH SUBMISSION
3.	07/16/2019	M.E. ISSUED FOR THIRD SUBMISSION
2.	21/09/2018	M.E. ISSUED FOR SECOND SUBMISSION
1.	15/01/2018	M.E. ISSUED FOR FIRST SUBMISSION

Design	A.L.	Ch'kd	M.E.	Date
Drawn	CAD 10/12	Ch'kd	A.L.	JANUARY 15/ 2018

Scale 1:400  
References

**APPROVALS**

Municipal	Field Notes
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS SIGNED MANAGER OF DEVELOPMENT SERVICES DATE	Stamp
Regional DESIGN OF SANITARY & WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATION APPROVAL FROM AREA MUNICIPALITY. SIGNED COMMISSIONER OF PLANNING AND PUBLIC WORKS DATE	Stamp

CONSULTANT

MUNICIPALITY

Regional Municipality of Halton

TOWN OF OAKVILLE

TITLE  
BRANTHAVEN McCRANEY INC.  
McCRANEY STREET EAST  
BLOCK E, PLAN M-172  
SITE SERVICING PLAN

Municipal Drawing No	Regional Drawing No
MMM File No 10-16058	Drawing No SS1

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