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Date: July 6, 2026
Our File: 21-1227

Town of Oakville
Planning Services Department
1225 Trafalgar Road
Oakville, Ontario
L6J 5A6

Attention: **Development Engineering**

Re: **The Remington Group**
275 Polly Drive (Preserve Block 301) Site Plan Application
Functional Servicing and Stormwater Management Conformity Memorandum

Attachments

Attachment #1	Hydraulic Modeling & Capacity Analysis (GeoAdvice, 2017)
Attachment #2	Preserve Phase 3 Subdivision SAN Drainage Plan (DSEL, 2017)
Attachment #3	Preserve Phase 3 Subdivision SAN Design Sheet (DSEL, 2017)
Attachment #4	275 Polly Drive SAN Design Sheet (DSEL, 2026)
Attachment #5	Preserve Phase 3 Subdivision STM Drainage Plan (DSEL, 2017)
Attachment #6	SWM Impact of Proposed Block 301 Design (JFSA, 2026)
Attachment #7	275 Polly Drive Civil Drawing Set (DSEL, 2026)
Attachment #8	Sediment Trap Sizing Calculations (DSEL, 2026)
Attachment #9	MECP Form SS1 (DSEL, 2026)

We are pleased to provide you with the Functional Servicing and Stormwater Management Conformity Memorandum in support of the site plan application for the above referenced site.

The purpose of this memo is to demonstrate that existing water, wastewater, and stormwater servicing installed as part of the Preserve Phase 3 Subdivision (Subdivision) can service 275 Polly Drive (*Site Plan*), and to detail the proposed works associated with the Site Plan.

For ease of drawing reference throughout this Memorandum, the associated engineering drawing set has been included in it' entirety as **Attachment #7**.

Site Plan Description & Conformity with Subdivision Design

The Site Plan has a total area of 0.41 ha and is located east of the intersection of Polly Drive and Carding Mill Trail. The Site Plan is proposed to be developed into 6 single unit detached homes. The site plan area is illustrated in Engineering Drawing 2 (see **Attachment #7**).

During the Subdivision design it was assumed that Site Plan would be a mid-rise condo. The storm, sanitary and water services were sized to accommodate this.

This memorandum will confirm existing servicing capabilities and, if required, will detail servicing revisions required to the Subdivision.

Water Servicing

An existing 300mm watermain on Polly Drive will service the Site Plan via individual water service connections that will be installed as part of the proposed Site Plan works. In total the Site Plan will require six water service connections. These connections will be installed in a vertical trench and backfilled with unshrinkable fill.

The hydraulic watermain analysis approved through the Subdivision assumed a population of 158.4 persons within Block 301. This analysis is provided for reference as **Attachment #1**. The proposed Site Plan projects a total of 3.8 persons per unit, per Halton Region's Equivalent Population criteria (Halton Region Linear Design Manual 2025, Section 2.3.2), resulting in 24 total persons.

The Site Plan does not introduce any revisions to the existing watermain. No dead ends are proposed as part of this Site Plan design.

The proposed Site Plan does not alter the existing watermain within Polly Drive and has reduced the anticipated water demand of Block 301 in comparison to the Subdivision approval. It can be concluded that there is sufficient water pressure and fire flows to accommodate the proposed Site Plan design.

Sanitary Servicing

Sanitary CTRL MH 1A was proposed at the southwestern corner of 275 Polly Drive through the subdivision design. CTRL MH 1A connected to a sanitary sewer within Polly Drive that continues down Erasmum Street. There is no existing sanitary sewer within Polly Drive fronting proposed Site Plan lots 1 to 4.

The subdivision design sheets assumed sanitary flow generation from 56 persons within Block 301. Approved subdivision Drainage Plans and Design Sheets have been included within **Attachments #2 and #3** respectively.

The Site Plan design will be serviced by six individual sanitary connections installed via vertical trench and backfilled with unshrinkable fill. To service Site Plan lots 1 to 4, 54.0m of sanitary sewer and MHs 4090A and 4091A have been proposed within Polly Drive. They will be installed via vertical trench and backfilled with unshrinkable fill. Drawing #5 of the civil engineering drawing set (**Attachment #**7) reflects the sanitary drainage plan information.

The assumed population has been reduced in comparison to the subdivision design from 56 persons to 24 persons, per the criteria in the Halton Region Linear Design Manual 2025,

Section 2.3.2. Considering the reduction in overall flow, it can be confirmed that the subdivision sewer design can accommodate the proposed Site Plan. Updated sanitary design sheets are provided as **Attachment #4**.

New sanitary sewers within Polly Drive have been proposed at a minimum 1.0%. There is not enough flow generation to achieve the Region's requested 0.6 m/s actual velocities within the proposed sewer legs. The proposed sewers are deep enough to ensure 2.0% lateral connections can be achieved, assuming 9-foot basement depths for the units within Lots 1 to 6.

MECP Form SS1 has been completed for the 54.0m of sanitary sewer main proposed within the municipal right-of-way to service the Site Plan and included as **Attachment #9**. The sanitary sewer system designed as part of the Subdivision acquired an MECP ECA (Permit #3453-APNP6K) in July 2017. This sewer system accounted for contributions from the Site Plan as described in the sections above. As such, no Regional Sanitary Design Brief has been prepared for the 54.0m of sewer proposed as part of the Site Plan.

Stormwater Management

The Subdivision design assumed the Site Plan would be located entirely within the SWM Pond 13 catchment and was assigned a 0.9 runoff coefficient (100% impervious). The Site Plan was assumed to provide 100-year capture control within the block, before discharging to the sewer main via STM CTRL MH 1. The Subdivision minor system (sewers), major system (surface conveyance) and SWM Pond 13 were designed using the assumptions above. The Subdivision Storm Drainage Plan has been provided as **Attachment #5**.

The proposed Site Plan contains six single units with a runoff coefficient of 0.70 in alignment with the Town of Oakville's 2023 Development Engineering Guidelines, Table 3.1. Lots 1 to 6 exceed typical single unit lot depths and therefore have additional backyard space in comparison to a typical single unit lot. This is expected to lower the realized RC, therefore 0.70 RC is considered a conservative assumption for Site Plan lots 1-6. Drawing #6 of the civil drawing set (**Attachment #7**) reflects the proposed storm drainage plan information for the Site Plan.

No stormwater connections are required for lots 1 to 6. Lot high points are located at the rear lot limit. Elevations continue downward at a minimum of 2.0% slope until they reach the front of the lot. Sump pumps will be discharged to grade per the detail on civil drawing #8 (**Attachment #7).**

Lot 1 & a small sliver of Lot 2 is proposed to drain to SWM Pond 10. There is a high point on Polly Drive that splits SWM Pond 10 & 13 drainage catchments. To meet lot grading standards for lots 1 and 2, drainage cannot be pulled to the other side of the Polly Drive high point referenced above. As a result, 0.07ha of lot drainage will drain to SWM Pond 10. The remaining 0.34ha will drain to SWM Pond 13, consistent with the Subdivision approvals.

To ensure the minor system, major system and SWM Ponds 10 & 13 could accommodate the revisions from the Site Plan design, JFSA provided a conformance memorandum in **Attachment #6**. Per the conformance memo, the Site Plan design will not have a negative impact on the operation of any SWM infrastructure or facilities approved as part of the Subdivision. As such, no external stormwater works are required as part of the proposed Site Plan.

Sustainability and Environmental Impacts

The Final Consolidated Preserve Environmental Implementation Report & Functional Servicing Study, May 2017 (*EIRFSS*) assumed the Site Plan would not contribute to any PSW drainage and would be required to implement sustainable development requirements based on the proposed Site Plan design. At this time, the Site Plan was assumed to be a future condo building.

The proposed Site Plan is 6 single unit lots that have extra lot depth, therefore providing a minimal footprint in comparison to the assumed condo. Low Impact Development measures will be consistent with what was suggested in the EIRFSS for single unit homes within the Preserve Phase 3 Subdivision. Roof leader disconnects will be provided to ensure clean roof drainage discharges to pervious grass swales.

The Site Plan does not alter any grading outside of the Site Plan extents, and has no drainage discharging to the adjacent NHS/trail.

Siltation and Erosion Controls

Conventional siltation and erosion control measures will be used on the Site Plan. A siltation control fence will be installed around the perimeter of the Site Plan. Mud mats, cutoff swales and a sediment trap will be constructed to contain contaminants. ESC Drawings are included in **Attachment #7**. Sediment trap sizing calculations have been provided in **Attachment #8**.

Conclusions

1. Water and wastewater servicing have been accounted for in the detailed design of Preserve Phase 3 subdivision and provides sufficient capacity for the Preserve Block 301 Site Plan.

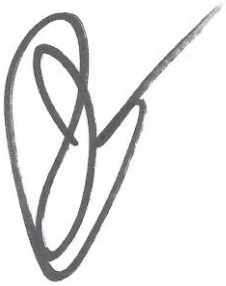
2. Per the conformance memorandum provided by JFSA, the stormwater infrastructure approved in the Preserve Subdivision can accommodate the revised stormwater drainage strategy proposed on Preserve Block 301 through this Site Plan Application

3. Quality, quantity, and erosion controls will be provided for the Site Plan draining to Pond 13 and Pond 10 in accordance with the approved Stormwater Management Report and Pond Design Brief for Pond 13 & Pond 10.

4. An erosion and sediment control strategy will be implemented prior to construction to prevent the transport of sediments off-site.

We trust the above is satisfactory. If we can assist you further, please do not hesitate to call.

Prepared by,
David Schaeffer Engineering Ltd



Jesse Orser, P.Eng.

1227_FSR_275 Polly Drive_Jul0726.doc

Attachment 1 – HYDRAULIC MODELING & CAPACITY ANLAYSIS (GEOADVICE, 2017)

Hydraulic Capacity and Modeling Analysis Preserve Phase 3

Technical Memorandum

Prepared for:
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Submission Date: May 8, 2017

Contact: Mr. Werner de Schaetzen, Ph.D., P.Eng.
Re: Project 2017-011-DSE

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Document History and Version Control

Revision No.	Date	Document Description	Revised By	Reviewed By
R0	March 6, 2017	Draft Submission	Adrien d'Andrade	Werner de Schaetzen
R1	March 7, 2017	Draft Submission	Adrien d'Andrade	Werner de Schaetzen
R2	March 8, 2017	Draft Submission	Adrien d'Andrade	Werner de Schaetzen
R3	March 9, 2017	Final Submission	Adrien d'Andrade	Werner de Schaetzen
R4	May 8, 2017	Final Submission	Adrien d'Andrade	Werner de Schaetzen

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Appendix C Pressure and Flow Modeling Results .....
Appendix D Fire Flow Modeling Results .....

1 Introduction

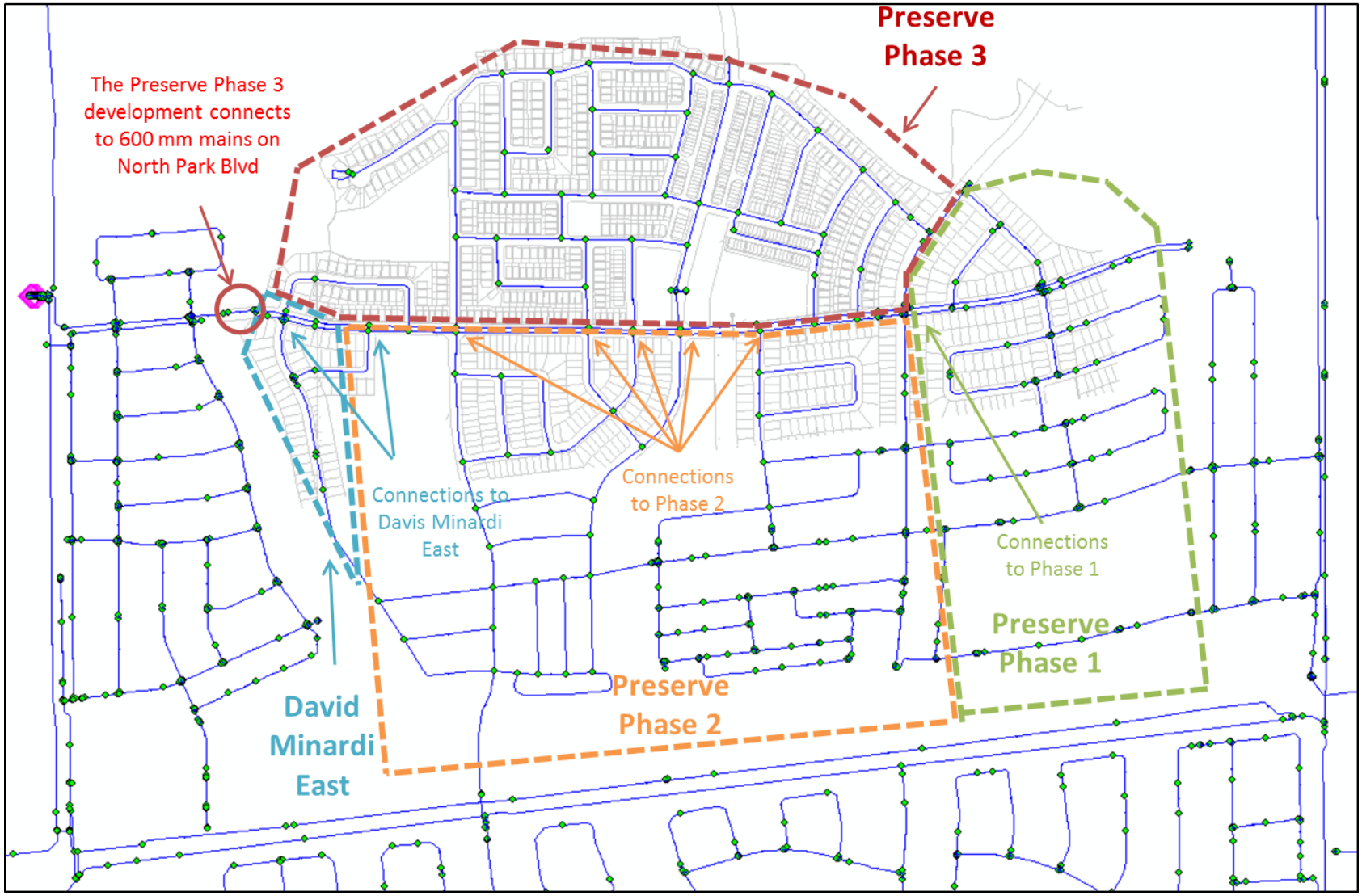
GeoAdvice Engineering Inc. (GeoAdvice) was retained by David Schaeffer Engineering Ltd. to complete the hydraulic modeling of the Preserve Phase 3 (Development) located in the Town of Oakville, Region of Halton (Region).

The Preserve Phase 3 development is located North of Dundas Street West, North of North Park Boulevard between Neyagawa Boulevard and 6th Line in Oakville, ON. The site is shown in **Figure 1.1** on the following page, illustrating the connection points.

This memo describes the assumptions and results of the hydraulic modeling and capacity analysis using the latest Region of Halton InfoWater water model dated on April 27, 2017 (Innovyze Software). InfoWater is a GIS water distribution system modeling and management software application. The development water network was incorporated into the Region model in order to complete the hydraulic and sizing analysis.

The results presented in this memo are based on the analysis of steady state simulations. The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi at the hydrant. No extended period simulations were completed in this analysis to assess the water quality or to assess the hydraulic impact on storage and pumping.

Figure 1.1: Site Layout and Connection Points



2 Demands

2.1 Consumer Demands

Population densities were assigned according to the Region of Halton Design Guidelines. A summary of these tables highlighting relevant data for this development is shown in **Table 2.1** below.

Table 2.1: Region of Halton Demand Factors

Demand Type	Amount	Units
Average Day Demand		
Residential	275	L/c/d
Institutional/School	11,000	L/Ha/d
Commercial	24,750	L/Ha/d
Parks/Urban Square/Open Space	11,000	L/Ha/d
Maximum Daily Demand		
Residential	2.25 x avg. day	L/c/d
Institutional/School	2.25 x avg. day	L/Ha/d
Commercial	2.25 x avg. day	L/Ha/d
Parks/Urban Square/Open Space	2.25 x avg. day	L/Ha/d
Peak Hour Demand		
Residential	4.00 x avg. day	L/c/d
Institutional/School	2.25 x avg. day	L/Ha/d
Commercial	2.25 x avg. day	L/Ha/d
Parks/Urban Square/Open Space	2.25 x avg. day	L/Ha/d

Water demand calculations are shown in **Table 2.2** and **Table 2.3** below. Detailed calculations of demands are shown in **Appendix A**. Demands were grouped and evenly applied to the all model nodes within each group. The locations of nodes do not necessarily represent hydrant locations.

Table 2.2: Residential Water Demand Calculations

Land Use	Population	Average Day Demand	Maximum Day Demand	Peak Hour Demand
Type	**(Cap)**	**(L/s)**	**(L/s)**	**(L/s)**
Residential	2,376.6	7.56	17.02	30.26

Table 2.3: Non-Residential Water Demand Calculations

Land Use	Area	Average Day Demand	Maximum Day Demand	Peak Hour Demand
Type	**(Ha)**	**(L/s)**	**(L/s)**	**(L/s)**
Commercial	0.78	0.22	0.50	0.50
Live/Work	0.13	0.04	0.08	0.08
Urban Square/Open Space	0.38	0.05	0.11	0.11
Total	**1.29**	**0.31**	**0.69**	**0.69**

There is currently not enough information about the non-residential users to calculate specific water demands. As such, the demand was calculated based on the area of the proposed development land for the non-residential blocks. Rates of 11,000 L/Ha/d for urban square and open space blocks and 24,750 L/Ha/d for live/work and commercial blocks were used as per the Region of Halton Water and Wastewater Linear Design Manual.

2.2 Fire Flows

Fire flow demands are typically determined in accordance with the Fire Underwriters Survey's Water Supply for Public fire Protection guideline (1999). FUS calculations are based on the types of building, floor area, number of storeys, construction class, occupancy class and exposure facture. At this time, there is not enough information about the building construction details. Therefore, typical fire flow requirements for various types of developments were assumed as shown in the table below.

Table 2.4: Typical Fire Flow Requirements at 140 kPa (20 psi)

Development Type	Fire Flow (L/s)	Preserve Phase 3
Residential Low-Density	91	Detached Residential
Residential Medium-Density	136	Townhouse and Condominium
Residential High-Density	212	Back to Back Townhouse
Institutional/Commercial	273	Commercial

As more information about the building design becomes available, the fire flow requirements should be recalculated using the Fire Underwriters Survey.

3 Modeling Considerations

3.1 Water Main Configuration

The water main network was laid out based on the pipe network layout prepared by David Schaeffer Engineering and provided to GeoAdvice on February 28, 2017.

3.2 Pressure Requirements

As outlined in the Region of Halton Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 40 psi and 80 psi. The target pressure at any point in the distribution system is 45 psi. Pressure requirements are outlined in **Table 3.1**.

Table 3.1: Region of Halton Pressure Requirements

Demand Condition	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Operating Pressure (maximum daily flow)	275	40		
Peak Hour Demand (minimum allowable pressure)	275	40	-	-
Maximum Fixture Pressure (Ontario Building Code)	-	-	550	80
Maximum Distribution Pressure (Halton)	-	-	690	100
Maximum Day Plus Fire	140	20	-	-

3.3 Elevations

Elevations of the modeled junctions were assigned according to a site grading plan prepared by David Schaeffer Engineering and provided to GeoAdvice on February 27, 2017. Modeled node elevations were assigned according to center line of road or the closest proposed grade. The development is located within Pressure Zone O4 with elevation ranges from 168.8 m to 175.3 m.

3.4 Pipe Characteristics

Pipe diameter and Hazen-Williams C factors were assigned in the model according to the Region of Halton Design Guidelines. Pipe characteristics used for the development are outlined in **Table 3.2** below.

Table 3.2: Model Pipe Characteristics

Nominal Diameter (mm)	Hazen Williams C-Factor (/)
150	100
200	110
300	120

4 Modeling Results

The proposed water mains within the development were sized to be consistent with the WSP report (July 2016) as per David Schaeffer Engineering. The sizes recommended by WSP were validated to confirm they satisfy the greater of maximum day plus fire and peak hour demand. Modeling was carried out for peak hour and maximum day plus fire flow using InfoWater. The proposed water main layout, as well as detailed pipe and junction tables can be found in **Appendix B**.

4.1 System Pressures

The modeling results indicate that the development can be adequately serviced by the proposed water main layout. Modeled service pressures for the development are summarized in **Table 4.1** below. Detailed modeling results can be found in **Appendix C**.

Table 4.1: Summary of Pressures (PHD)

Scenario	Maximum Pressure (psi)	Average Pressure (psi)	Minimum Pressure (psi)
2016 (3A and 3B)	91	87	82
2016 (3A, 3B, and 3C)	91	87	82
2031 (3A, 3B, and 3C)	70	65	60

As outlined in the Region of Halton Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 40 psi and 80 psi. As such, based on the anticipated service pressures, pressure reducing valves may be required for blocks within Zone O4 of the development.

4.2 Available Fire Flows

The minimum allowable pressure under fire flow conditions is 140 kPa (20 psi) at the location of the fire. A summary of available fire flows is shown below in the table below. Detailed fire flow reports can be found in **Appendix D**.

Table 4.2: Summary of Available Fire Flows (MDD + FF)

Scenario	Maximum Available Fire Flow (L/s)	Average Available Fire Flow (L/s)	Minimum Available Fire Flow (L/s)
2016 (3A and 3B)	1,086	583	219
2016 (3A, 3B, and 3C)	1,091	553	176
2031 (3A, 3B, and 3C)	932	453	139

4.3 Residual Pressures

A summary of the residual pressures is shown below in **Table 4.3**.

Table 4.3: Summary of Residual Pressures (MDD + FF)

Scenario	Maximum Residual Pressure (psi)	Average Residual Pressure (psi)	Minimum Residual Pressure (psi)
2016 (3A and 3B)	89	78	43
2016 (3A, 3B, and 3C)	89	78	43
2031 (3A, 3B, and 3C)	66	55	20

As shown in **Table 4.3**, the model predicts that all of the fire flow requirements can be met throughout the development with the proposed water main layout shown in **Appendix B**.

5 Conclusions

The proposed water main network for the Preserve Phase 3 development can deliver all domestic and fire flows as per the Ministry of Environment, Region of Halton, and Fire Underwriters Criteria as follows:

- The service pressures are expected to range between 60 psi and 91 psi, which are within the Region of Halton guidelines for water distribution systems.
- All fire flows are achievable for the development (residual pressures exceed 20 psi).
- Based on the anticipated service pressures exceeding 80 psi, pressure reducing valves will be required for buildings in the development.

Submission

Prepared by:

Adrien d'Andrade, E.I.T.
Hydraulic Modeler / Project Engineer

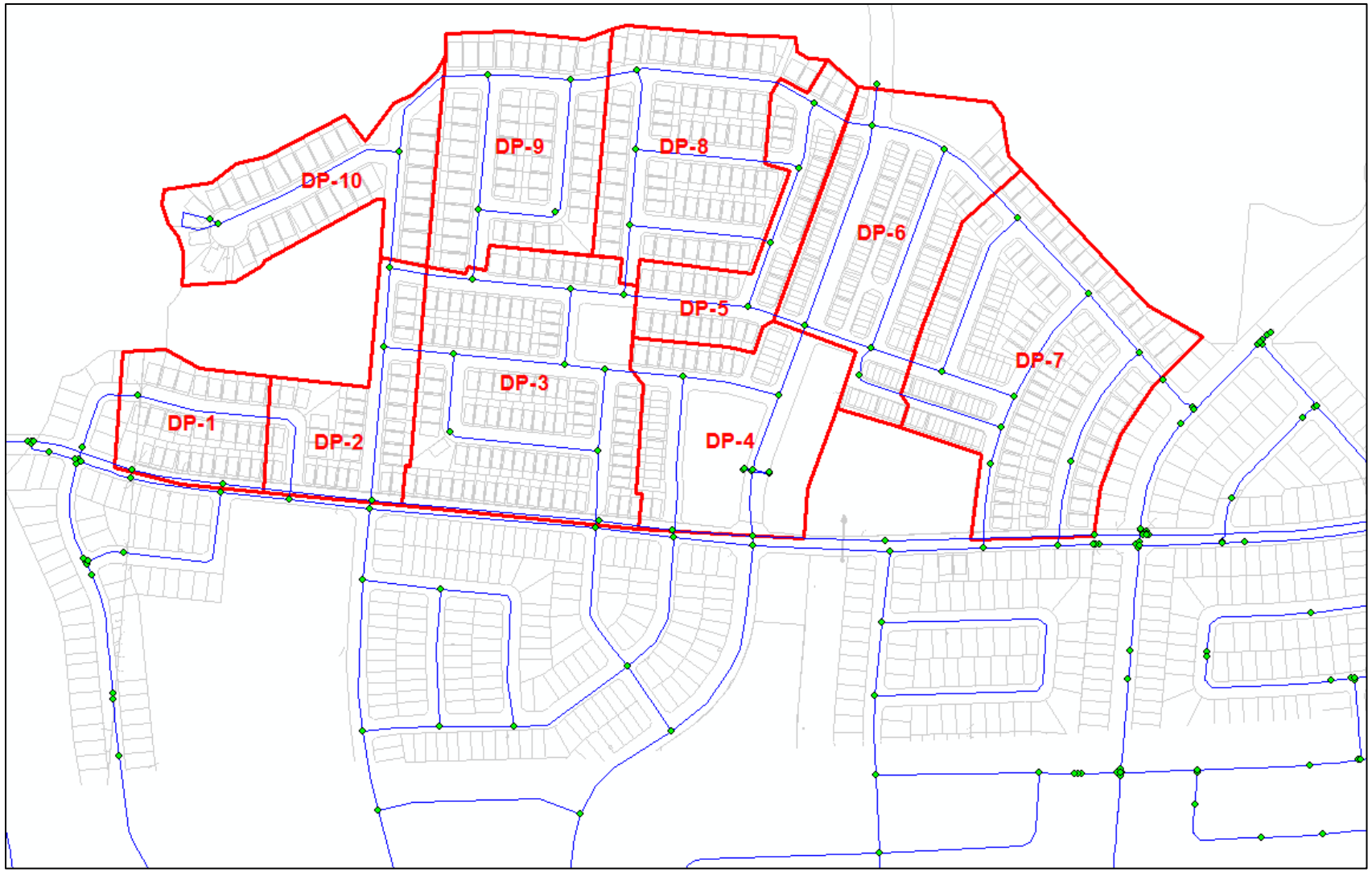
Approved by:



Werner de Schaetzen, Ph.D., P.Eng.
Senior Modeling Review / Project Manager

Appendix A Demand Calculations

Demand Polygons



Project ID: 2017-011-DSE

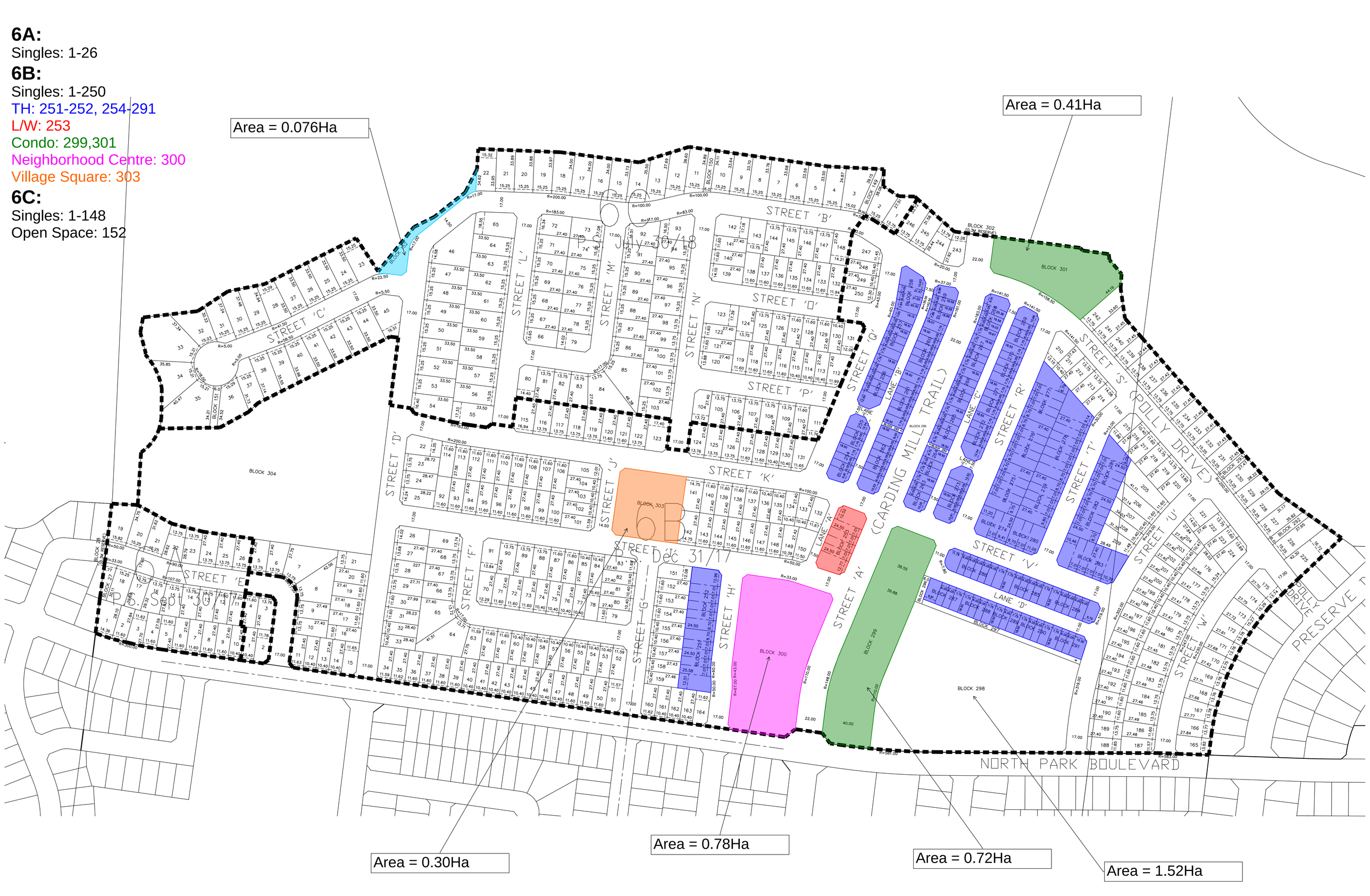
			Population		Average Day Demand			Max Day 2.25 x Avg Day (L/s)	Peak Hour 4.0 x Avg Day (L/s)
Demand Polygon	**Dwelling Type**	**Number of Units**	**Persons per Unit**	**Population**	**L/c/d**	**L/d**	**L/s**		
DP-1	Detached Residential	26	3.472	90.3	275	24,825	0.29	0.65	1.15
DP-2	Detached Residential	35	3.472	121.5	275	33,418	0.39	0.87	1.55
DP-3	Detached Residential	100	3.472	347.2	275	95,480	1.11	2.49	4.42
DP-4	Detached Residential	11	3.472	38.2	275	10,503	0.12	0.27	0.49
	Townhouse	12	2.555	30.7	275	8,432	0.10	0.22	0.39
	Live/Work	6	2.555	15.3	276	4,231	0.05	0.11	0.20
	Condo	110	2.555	281.1	275	77,289	0.89	2.01	3.58
DP-5	Detached Residential	25	3.472	86.8	275	23,870	0.28	0.62	1.11
	Condo	0	2.555	0.0	275	-	0.00	0.00	0.00
DP-6	Detached Residential	7	3.472	24.3	275	6,684	0.08	0.17	0.31
	Townhouse	108	2.555	275.9	275	75,884	0.88	1.98	3.51
	Condo	62	2.555	158.4	275	43,563	0.50	1.13	2.02
DP-7	Detached Residential	72	3.472	250.0	275	68,746	0.80	1.79	3.18
	Townhouse	56	2.555	143.1	275	39,347	0.46	1.02	1.82
DP-8	Detached Residential	68	3.472	236.1	275	64,926	0.75	1.69	3.01
DP-9	Detached Residential	48	3.472	166.7	275	45,830	0.53	1.19	2.12
DP-10	Detached Residential	32	3.472	111.1	275	30,554	0.35	0.80	1.41
Total		**778**		**2,376.6**		**653,580**	**7.56**	**17.02**	**30.26**

					Average Day Demand			Max Day 2.25 x Avg Day (L/s)	Peak Hour 2.25 x Avg Day (L/s)
Demand Polygon	**Dwelling Type**	**Area (ha)**			**L/ha/d**	**L/d**	**L/s**		
DP-3	Urban Square	0.3			11,000	3,300	0.04	0.09	0.09
DP-4	Live/Work	0.13			24,750	3,218	0.04	0.08	0.08
	Commercial	0.78			24,750	19,305	0.22	0.50	0.50
DP-10	Open Space	0.076			11,000	836	0.01	0.02	0.02
Total		**1.29**				**26,659**	**0.31**	**0.69**	**0.69**

6A:
Singles: 1-26

6B:
Singles: 1-250
TH: 251-252, 254-291
L/W: 253
Condo: 299,301
Neighborhood Centre: 300
Village Square: 303

6C:
Singles: 1-148
Open Space: 152



Appendix B Modeling Schematics – Pipe and Junction Tables

Junction IDs



Project ID: 2017-011-DSE

Pipe IDs



Project ID: 2017-011-DSE

Pipe Diameters (mm)



Project ID: 2017-011-DSE

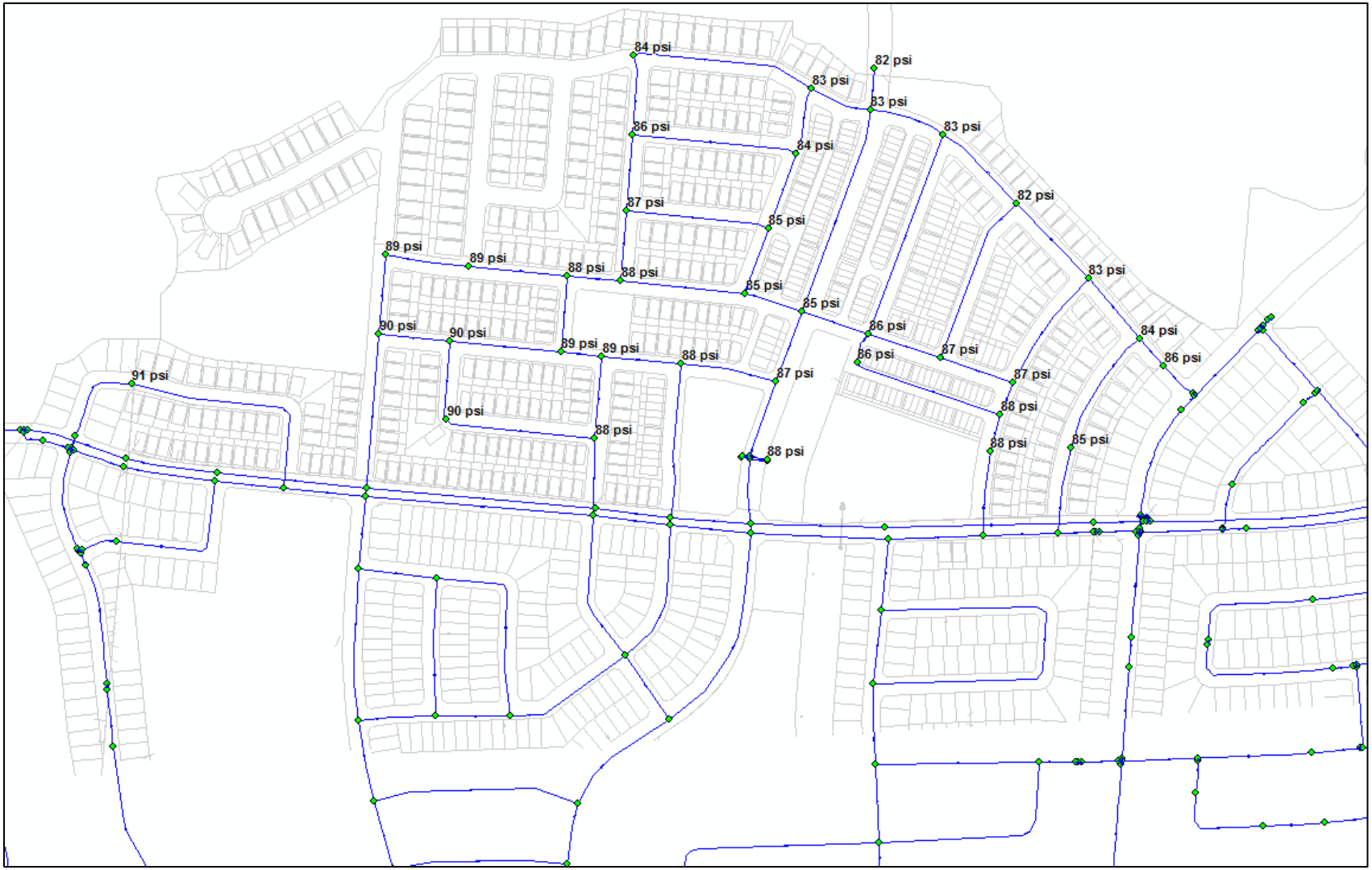
Model Inputs

ID (Char)	From (Char)	To (Char)	Length (m)	Diameter (mm)	Roughness (Double)
GA-P02	WCV255614	GA-J-01	222.8	150	100
GA-P03	WFT-PRSV-8	GA-J-02	153.3	300	120
GA-P04	GA-J-02	GA-J-03	66.4	150	100
GA-P05	GA-J-52	GA-J-04	142.5	150	100
GA-P06	WFT-PRSV-12	GA-J-04	72.6	150	100
GA-P07	GA-J-03	GA-J-05	105.1	150	100
GA-P08	GA-J-05	GA-J-06	38.6	150	100
GA-P09	GA-J-04	GA-J-06	77.5	150	100
GA-P10	GA-J-06	GA-J-07	74.6	150	100
GA-P11	GA-J-07	WFT-PRSV-11	152.6	150	100
GA-P12	GA-J-07	GA-J-08	91.5	150	100
GA-P13	GA-J-08	GA-J-44	74.8	200	110
GA-P14	GA-J-08	GA-J-09	70.3	200	110
GA-P15	GA-J-09	GA-J-10	56.3	300	120
GA-P16	GA-J-10	GA-J-11	118.1	300	120
GA-P17	GA-J-11	GA-J-12	50.0	300	120
GA-P18	GA-J-12	GA-J-13	93.2	300	120
GA-P19	GA-J-13	GA-J-14	79.3	300	120
GA-P20	GA-J-12	GA-J-05	71.8	150	100
GA-P21	GA-J-02	GA-J-14	75.3	300	120
GA-P22	GA-J-15	GA-J-16	75.7	150	100
GA-P23	GA-J-16	GA-J-15	9.4	150	100
GA-P24	GA-J-16	GA-J-17	187.7	200	110
GA-P25	GA-J-14	GA-J-17	109.7	200	110
GA-P26	GA-J-17	GA-J-18	133.2	200	110
GA-P27	GA-J-18	GA-J-19	128.1	150	100
GA-P28	GA-J-13	GA-J-19	65.8	150	100
GA-P29	GA-J-18	GA-J-20	78.1	200	110
GA-P30	GA-J-20	GA-J-53	127.6	150	100
GA-P31	GA-J-20	GA-J-21	63.7	200	110
GA-P32	GA-J-21	GA-J-22	75.5	150	100
GA-P33	GA-J-22	GA-J-23	71.9	150	100
GA-P34	GA-J-23	GA-J-11	66.6	150	100
GA-P35	GA-J-21	GA-J-24	174.0	200	110
GA-P36	GA-J-24	GA-J-25	64.1	150	100
GA-P37	GA-J-25	GA-J-22	155.6	150	100
GA-P38	GA-J-26	GA-J-23	134.9	150	100
GA-P39	GA-J-25	GA-J-26	74.6	150	100
GA-P40	GA-J-26	GA-J-10	64.6	150	100
GA-P41	GA-J-24	GA-J-27	60.0	200	110
GA-P42	GA-J-27	GA-J-09	199.8	300	120
GA-P43	GA-J-09	GA-J-28	65.9	200	110
GA-P44	GA-J-28	GA-J-29	200.2	150	100
GA-P45	GA-J-27	GA-J-29	72.9	300	120
GA-P46	GA-J-27	GA-J-30	39.7	300	120
GA-P47	GA-J-29	GA-J-31	95.5	300	120
GA-P48	GA-J-31	GA-J-32	97.6	300	120
GA-P49	GA-J-32	GA-J-33	74.1	300	120
GA-P50	GA-J-33	WFT301304	34.2	300	120
GA-P51	GA-J-34	GA-J-51	144.4	150	100
GA-P52	GA-J-34	GA-J-35	32.0	200	110
GA-P53	GA-J-35	GA-J-36	71.3	200	110
GA-P54	GA-J-36	GA-J-28	71.7	200	110
GA-P55	GA-J-36	GA-J-31	164.9	150	100
GA-P56	GA-J-35	GA-J-32	121.5	200	110
GA-P57	GA-J-37	GA-J-38	79.8	200	110
GA-P58	GA-J-38	GA-J-34	35.9	200	110
GA-P59	GA-J-50	GA-J-33	123.7	150	100
GA-P61	GA-J-44	GA-J-45	2.1	200	110
GA-P62	GA-J-45	WFT-PRSV-10	69.8	200	110
GA-P63	GA-J-45	GA-J-46	7.6	200	110
GA-P64	GA-J-45	GA-J-47	16.6	200	110
GA-P65	GA-J-44	GA-J-48	7.8	200	110
GA-P66	GA-J-44	GA-J-49	16.3	200	110
GA-P71	GA-J-52	GA-J-03	73.8	150	100
GA-P72	GA-J-19	GA-J-53	75.2	150	100
GA-P73	GA-J-51	GA-J-28	29.4	150	100
GA-P74	GA-J-50	GA-J-54	80.7	150	100

ID (Char)	Elevation (m)	ADD (L/s)
GA-J-02	169.70	0.19
GA-J-03	169.95	0.14
GA-J-04	170.80	0.14
GA-J-05	170.50	0.14
GA-J-06	170.70	0.14
GA-J-07	171.07	0.16
GA-J-08	172.10	0.16
GA-J-09	172.97	0.29
GA-J-10	173.00	0.07
GA-J-11	171.34	0.14
GA-J-12	170.90	0.14
GA-J-13	170.45	0.14
GA-J-14	170.25	0.19
GA-J-15	170.75	0.12
GA-J-16	170.70	0.12
GA-J-17	170.80	0.12
GA-J-18	171.78	0.13
GA-J-19	170.58	0.13
GA-J-20	172.72	0.13
GA-J-21	173.67	0.25
GA-J-22	172.20	0.25
GA-J-23	171.50	0.25
GA-J-24	174.50	0.07
GA-J-25	174.11	0.07
GA-J-26	173.60	0.07
GA-J-27	174.93	0.29
GA-J-28	172.60	0.29
GA-J-29	174.75	0.29
GA-J-30	175.33	0.29
GA-J-31	175.10	0.16
GA-J-32	174.50	0.16
GA-J-33	173.85	0.16
GA-J-34	171.43	0.16
GA-J-35	171.70	0.16
GA-J-36	171.99	0.16
GA-J-38	171.00	0.16
GA-J-44	171.30	0.16
GA-J-45	171.10	0.16
GA-J-46	171.30	0.16
GA-J-47	171.30	0.16
GA-J-48	171.30	0.16
GA-J-49	171.30	0.16
GA-J-50	173.12	0.16
GA-J-51	172.35	0.16
GA-J-52	170.08	0.14
GA-J-53	170.08	0.13
WCV255614	168.79	0.29
WFT301304	172.80	0.00

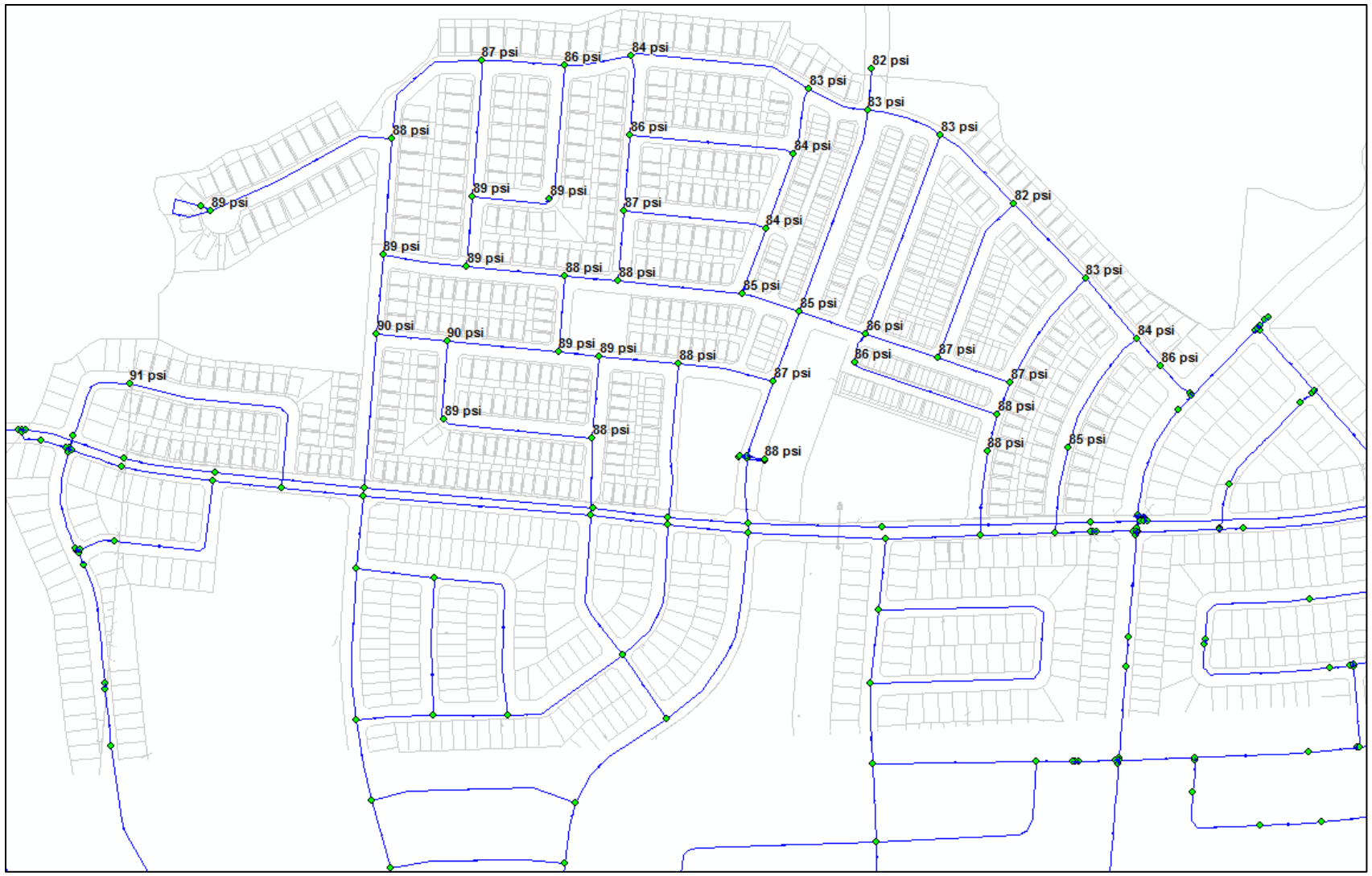
Appendix C Pressure and Flow Modeling Results

PHD Pressure (2016) Phase 3A and 3B



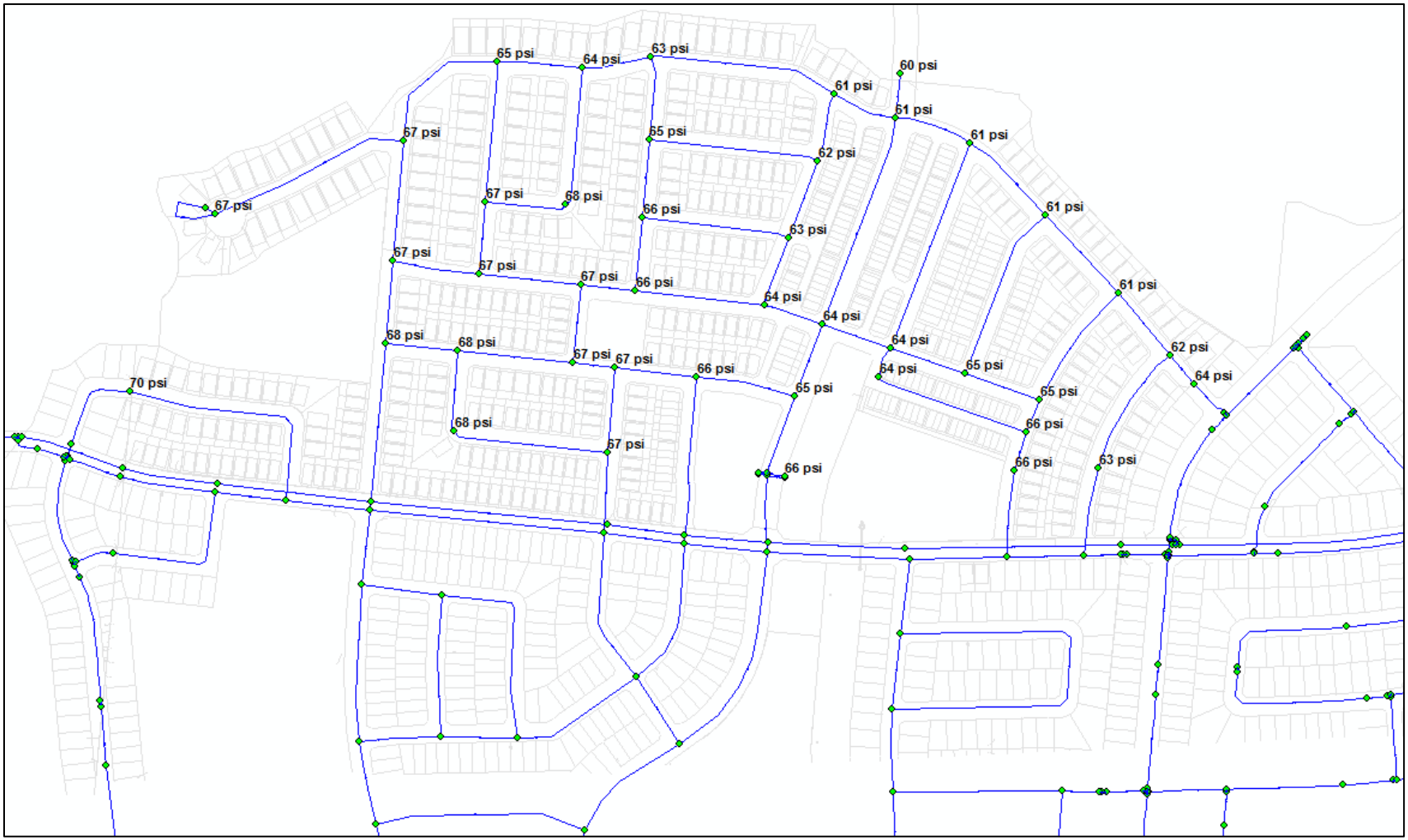
Project ID: 2017-011-DSE

PHD Pressure (2016) Phase 3A, 3B and 3C



Project ID: 2017-011-DSE

PHD Pressure (2031) Phase 3A, 3B and 3C



Project ID: 2017-011-DSE

Peak Hour Demand Modeling Results (2016)
Phase 3A and 3B

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/km)
GA-P02	WCV255614	GA-J-01	222.80	150	100	0.03	0.02	0.00	0.01
GA-P03	WFT-PRSV-8	GA-J-02	153.30	300	120	0.61	0.10	0.01	0.05
GA-P04	GA-J-02	GA-J-03	66.42	150	100	0.09	0.06	0.00	0.07
GA-P05	GA-J-52	GA-J-04	142.53	150	100	-0.04	0.02	0.00	0.01
GA-P06	WFT-PRSV-12	GA-J-04	72.62	150	100	0.14	0.09	0.01	0.15
GA-P07	GA-J-03	GA-J-05	105.10	150	100	0.03	0.02	0.00	0.01
GA-P08	GA-J-05	GA-J-06	38.64	150	100	-0.03	0.02	0.00	0.01
GA-P09	GA-J-04	GA-J-06	77.54	150	100	0.06	0.04	0.00	0.03
GA-P10	GA-J-06	GA-J-07	74.62	150	100	-0.02	0.01	0.00	0.00
GA-P11	GA-J-07	WFT-PRSV-11	152.64	150	100	-0.10	0.07	0.01	0.09
GA-P12	GA-J-07	GA-J-08	91.49	150	100	0.04	0.03	0.00	0.01
GA-P13	GA-J-08	GA-J-44	74.78	200	110	-0.08	0.03	0.00	0.01
GA-P14	GA-J-08	GA-J-09	70.27	200	110	0.06	0.02	0.00	0.01
GA-P15	GA-J-09	GA-J-10	56.31	300	120	-0.05	0.01	0.00	0.00
GA-P16	GA-J-10	GA-J-11	118.12	300	120	-0.15	0.02	0.00	0.00
GA-P17	GA-J-11	GA-J-12	49.99	300	120	-0.29	0.05	0.00	0.01
GA-P18	GA-J-12	GA-J-13	93.22	300	120	-0.33	0.05	0.00	0.02
GA-P19	GA-J-13	GA-J-14	79.28	300	120	-0.38	0.06	0.00	0.02
GA-P20	GA-J-12	GA-J-05	71.76	150	100	-0.01	0.01	0.00	0.00
GA-P21	GA-J-02	GA-J-14	75.32	300	120	0.45	0.07	0.00	0.03
GA-P32	GA-J-21	GA-J-22	75.47	150	100	0.01	0.01	0.00	0.00
GA-P33	GA-J-22	GA-J-23	71.87	150	100	-0.04	0.03	0.00	0.01
GA-P34	GA-J-23	GA-J-11	66.62	150	100	-0.10	0.06	0.00	0.07
GA-P35	GA-J-21	GA-J-24	174.01	200	110	-0.10	0.04	0.00	0.02
GA-P36	GA-J-24	GA-J-25	64.08	150	100	0.04	0.03	0.00	0.01
GA-P37	GA-J-25	GA-J-22	155.63	150	100	0.04	0.02	0.00	0.01
GA-P38	GA-J-26	GA-J-23	134.95	150	100	0.03	0.02	0.00	0.01
GA-P39	GA-J-25	GA-J-26	74.59	150	100	-0.02	0.01	0.00	0.00
GA-P40	GA-J-26	GA-J-10	64.62	150	100	-0.08	0.05	0.00	0.05
GA-P41	GA-J-24	GA-J-27	59.95	200	110	-0.16	0.06	0.00	0.04
GA-P42	GA-J-27	GA-J-09	199.84	300	120	-0.07	0.01	0.00	0.00
GA-P43	GA-J-09	GA-J-28	65.87	200	110	-0.06	0.02	0.00	0.01
GA-P44	GA-J-28	GA-J-29	200.18	150	100	-0.02	0.01	0.00	0.00
GA-P45	GA-J-27	GA-J-29	72.90	300	120	-0.29	0.05	0.00	0.01
GA-P46	GA-J-27	GA-J-30	39.72	300	120	0.10	0.02	0.00	0.00
GA-P47	GA-J-29	GA-J-31	95.54	300	120	-0.41	0.07	0.00	0.03
GA-P48	GA-J-31	GA-J-32	97.60	300	120	-0.49	0.08	0.00	0.04
GA-P49	GA-J-32	GA-J-33	74.12	300	120	-0.65	0.11	0.00	0.06
GA-P50	GA-J-33	WFT301304	34.21	300	120	-0.67	0.11	0.00	0.06
GA-P51	GA-J-34	GA-J-51	144.41	150	100	0.06	0.04	0.01	0.03
GA-P52	GA-J-34	GA-J-35	31.96	200	110	0.11	0.04	0.00	0.02
GA-P53	GA-J-35	GA-J-36	71.29	200	110	0.16	0.06	0.00	0.04
GA-P54	GA-J-36	GA-J-28	71.69	200	110	0.13	0.05	0.00	0.03
GA-P55	GA-J-36	GA-J-31	164.90	150	100	-0.03	0.02	0.00	0.01
GA-P56	GA-J-35	GA-J-32	121.54	200	110	-0.10	0.04	0.00	0.02
GA-P57	GA-J-37	GA-J-38	79.77	200	110	0.28	0.10	0.01	0.11
GA-P58	GA-J-38	GA-J-34	35.95	200	110	0.23	0.08	0.00	0.07
GA-P59	GA-J-50	GA-J-33	123.69	150	100	0.03	0.02	0.00	0.01
GA-P61	GA-J-44	GA-J-45	2.12	200	110	-0.23	0.08	0.00	0.08
GA-P62	GA-J-45	WFT-PRSV-10	69.83	200	110	-0.38	0.14	0.01	0.19
GA-P63	GA-J-45	GA-J-46	7.63	200	110	0.05	0.02	0.00	0.00
GA-P64	GA-J-45	GA-J-47	16.56	200	110	0.05	0.02	0.00	0.00
GA-P65	GA-J-44	GA-J-48	7.83	200	110	0.05	0.02	0.00	0.00
GA-P66	GA-J-44	GA-J-49	16.32	200	110	0.05	0.02	0.00	0.00
GA-P71	GA-J-52	GA-J-03	73.83	150	100	-0.01	0.01	0.00	0.00
GA-P73	GA-J-51	GA-J-28	29.44	150	100	0.01	0.01	0.00	0.00
GA-P74	GA-J-50	GA-J-54	80.70	150	100	-0.09	0.06	0.01	0.06

Peak Hour Demand Modeling Results (2016)
Phase 3A and 3B

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
GA-J-02	0.77	169.7	233	90
GA-J-03	0.56	170.0	233	90
GA-J-04	0.56	170.8	233	89
GA-J-05	0.56	170.5	233	89
GA-J-06	0.56	170.7	233	89
GA-J-07	0.58	171.1	233	88
GA-J-08	0.58	172.1	233	87
GA-J-09	1.17	173.0	233	85
GA-J-10	0.28	173.0	233	85
GA-J-11	0.56	171.3	233	88
GA-J-12	0.56	170.9	233	88
GA-J-13	0.56	170.5	233	89
GA-J-14	0.77	170.3	233	89
GA-J-21	1.00	173.7	233	84
GA-J-22	1.00	172.2	233	86
GA-J-23	1.00	171.5	233	87
GA-J-24	0.28	174.5	233	83
GA-J-25	0.28	174.1	233	84
GA-J-26	0.28	173.6	233	85
GA-J-27	1.17	174.9	233	83
GA-J-28	1.17	172.6	233	86
GA-J-29	1.17	174.8	233	83
GA-J-30	1.17	175.3	233	82
GA-J-31	0.63	175.1	233	82
GA-J-32	0.63	174.5	233	83
GA-J-33	0.63	173.9	233	84
GA-J-34	0.63	171.4	233	88
GA-J-35	0.63	171.7	233	87
GA-J-36	0.63	172.0	233	87
GA-J-38	0.63	171.0	233	88
GA-J-44	0.58	171.3	233	88
GA-J-45	0.58	171.1	233	88
GA-J-46	0.58	171.3	233	88
GA-J-47	0.58	171.3	233	88
GA-J-48	0.58	171.3	233	88
GA-J-49	0.58	171.3	233	88
GA-J-50	0.63	173.1	233	85
GA-J-51	0.58	172.4	233	86
GA-J-52	0.56	170.1	233	90
WCV255614	1.20	168.8	233	91
WFT301304	0.07	172.8	233	86

Peak Hour Demand Modeling Results (2016)
Phase 3A, 3B and 3C

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/km)
GA-P02	WCV255614	GA-J-01	222.80	150	100	0.04	0.03	0.00	0.02
GA-P03	WFT-PRSV-8	GA-J-02	153.30	300	120	0.75	0.12	0.01	0.08
GA-P04	GA-J-02	GA-J-03	66.42	150	100	0.09	0.06	0.00	0.06
GA-P05	GA-J-52	GA-J-04	142.53	150	100	-0.04	0.03	0.00	0.02
GA-P06	WFT-PRSV-12	GA-J-04	72.62	150	100	0.16	0.10	0.01	0.19
GA-P07	GA-J-03	GA-J-05	105.10	150	100	0.03	0.02	0.00	0.01
GA-P08	GA-J-05	GA-J-06	38.64	150	100	-0.05	0.03	0.00	0.02
GA-P09	GA-J-04	GA-J-06	77.54	150	100	0.07	0.04	0.00	0.04
GA-P10	GA-J-06	GA-J-07	74.62	150	100	-0.03	0.02	0.00	0.01
GA-P11	GA-J-07	WFT-PRSV-11	152.64	150	100	-0.12	0.08	0.02	0.10
GA-P12	GA-J-07	GA-J-08	91.49	150	100	0.04	0.02	0.00	0.01
GA-P13	GA-J-08	GA-J-44	74.78	200	110	-0.11	0.04	0.00	0.02
GA-P14	GA-J-08	GA-J-09	70.27	200	110	0.09	0.03	0.00	0.01
GA-P15	GA-J-09	GA-J-10	56.31	300	120	0.08	0.01	0.00	0.00
GA-P16	GA-J-10	GA-J-11	118.12	300	120	-0.02	0.00	0.00	0.00
GA-P17	GA-J-11	GA-J-12	49.99	300	120	-0.17	0.03	0.00	0.00
GA-P18	GA-J-12	GA-J-13	93.22	300	120	-0.18	0.03	0.00	0.01
GA-P19	GA-J-13	GA-J-14	79.28	300	120	-0.33	0.05	0.00	0.02
GA-P20	GA-J-12	GA-J-05	71.76	150	100	-0.03	0.02	0.00	0.01
GA-P21	GA-J-02	GA-J-14	75.32	300	120	0.60	0.10	0.00	0.05
GA-P22	GA-J-15	GA-J-16	75.69	150	100	-0.01	0.01	0.00	0.00
GA-P23	GA-J-16	GA-J-15	9.40	150	100	0.03	0.02	0.00	0.01
GA-P24	GA-J-16	GA-J-17	187.69	200	110	-0.08	0.03	0.00	0.01
GA-P25	GA-J-14	GA-J-17	109.69	200	110	0.20	0.07	0.01	0.06
GA-P26	GA-J-17	GA-J-18	133.18	200	110	0.07	0.03	0.00	0.01
GA-P27	GA-J-18	GA-J-19	128.11	150	100	-0.02	0.01	0.00	0.00
GA-P28	GA-J-13	GA-J-19	65.81	150	100	0.10	0.07	0.01	0.08
GA-P29	GA-J-18	GA-J-20	78.13	200	110	0.05	0.02	0.00	0.00
GA-P30	GA-J-20	GA-J-53	127.61	150	100	0.01	0.01	0.00	0.00
GA-P31	GA-J-20	GA-J-21	63.65	200	110	-0.01	0.00	0.00	0.00
GA-P32	GA-J-21	GA-J-22	75.47	150	100	0.01	0.01	0.00	0.00
GA-P33	GA-J-22	GA-J-23	71.87	150	100	-0.04	0.03	0.00	0.01
GA-P34	GA-J-23	GA-J-11	66.62	150	100	-0.09	0.06	0.00	0.07
GA-P35	GA-J-21	GA-J-24	174.01	200	110	-0.10	0.04	0.00	0.02
GA-P36	GA-J-24	GA-J-25	64.08	150	100	0.04	0.03	0.00	0.02
GA-P37	GA-J-25	GA-J-22	155.63	150	100	0.04	0.03	0.00	0.01
GA-P38	GA-J-26	GA-J-23	134.95	150	100	0.03	0.02	0.00	0.01
GA-P39	GA-J-25	GA-J-26	74.59	150	100	-0.02	0.01	0.00	0.00
GA-P40	GA-J-26	GA-J-10	64.62	150	100	-0.08	0.05	0.00	0.05
GA-P41	GA-J-24	GA-J-27	59.95	200	110	-0.17	0.06	0.00	0.04
GA-P42	GA-J-27	GA-J-09	199.84	300	120	-0.01	0.00	0.00	0.00
GA-P43	GA-J-09	GA-J-28	65.87	200	110	-0.09	0.03	0.00	0.01
GA-P44	GA-J-28	GA-J-29	200.18	150	100	-0.02	0.01	0.00	0.00
GA-P45	GA-J-27	GA-J-29	72.90	300	120	-0.36	0.06	0.00	0.02
GA-P46	GA-J-27	GA-J-30	39.72	300	120	0.10	0.02	0.00	0.00
GA-P47	GA-J-29	GA-J-31	95.54	300	120	-0.48	0.08	0.00	0.04
GA-P48	GA-J-31	GA-J-32	97.60	300	120	-0.56	0.09	0.00	0.05
GA-P49	GA-J-32	GA-J-33	74.12	300	120	-0.73	0.12	0.01	0.08
GA-P50	GA-J-33	WFT301304	34.21	300	120	-0.75	0.12	0.00	0.08
GA-P51	GA-J-34	GA-J-51	144.41	150	100	0.07	0.05	0.01	0.05
GA-P52	GA-J-34	GA-J-35	31.96	200	110	0.12	0.04	0.00	0.02
GA-P53	GA-J-35	GA-J-36	71.29	200	110	0.18	0.07	0.00	0.05
GA-P54	GA-J-36	GA-J-28	71.69	200	110	0.15	0.06	0.00	0.04
GA-P55	GA-J-36	GA-J-31	164.90	150	100	-0.03	0.02	0.00	0.01
GA-P56	GA-J-35	GA-J-32	121.54	200	110	-0.11	0.04	0.00	0.02
GA-P57	GA-J-37	GA-J-38	79.77	200	110	0.30	0.11	0.01	0.13
GA-P58	GA-J-38	GA-J-34	35.95	200	110	0.25	0.09	0.00	0.09
GA-P59	GA-J-50	GA-J-33	123.69	150	100	0.04	0.03	0.00	0.01
GA-P61	GA-J-44	GA-J-45	2.12	200	110	-0.26	0.09	0.00	0.09
GA-P62	GA-J-45	WFT-PRSV-10	69.83	200	110	-0.41	0.15	0.02	0.22
GA-P63	GA-J-45	GA-J-46	7.63	200	110	0.05	0.02	0.00	0.00
GA-P64	GA-J-45	GA-J-47	16.56	200	110	0.05	0.02	0.00	0.00
GA-P65	GA-J-44	GA-J-48	7.83	200	110	0.05	0.02	0.00	0.00
GA-P66	GA-J-44	GA-J-49	16.32	200	110	0.05	0.02	0.00	0.00
GA-P71	GA-J-52	GA-J-03	73.83	150	100	0.00	0.00	0.00	0.00
GA-P72	GA-J-19	GA-J-53	75.20	150	100	0.04	0.02	0.00	0.01
GA-P73	GA-J-51	GA-J-28	29.44	150	100	0.02	0.02	0.00	0.01
GA-P74	GA-J-50	GA-J-54	80.70	150	100	-0.09	0.06	0.01	0.07

Peak Hour Demand Modeling Results (2016)
Phase 3A, 3B and 3C

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
GA-J-02	0.77	169.7	233	90
GA-J-03	0.56	170.0	233	90
GA-J-04	0.56	170.8	233	88
GA-J-05	0.56	170.5	233	89
GA-J-06	0.56	170.7	233	89
GA-J-07	0.58	171.1	233	88
GA-J-08	0.58	172.1	233	87
GA-J-09	1.17	173.0	233	85
GA-J-10	0.28	173.0	233	85
GA-J-11	0.56	171.3	233	88
GA-J-12	0.56	170.9	233	88
GA-J-13	0.56	170.5	233	89
GA-J-14	0.77	170.3	233	89
GA-J-15	0.48	170.8	233	89
GA-J-16	0.48	170.7	233	89
GA-J-17	0.48	170.8	233	88
GA-J-18	0.53	171.8	233	87
GA-J-19	0.53	170.6	233	89
GA-J-20	0.53	172.7	233	86
GA-J-21	1.00	173.7	233	84
GA-J-22	1.00	172.2	233	86
GA-J-23	1.00	171.5	233	87
GA-J-24	0.28	174.5	233	83
GA-J-25	0.28	174.1	233	84
GA-J-26	0.28	173.6	233	84
GA-J-27	1.17	174.9	233	83
GA-J-28	1.17	172.6	233	86
GA-J-29	1.17	174.8	233	83
GA-J-30	1.17	175.3	233	82
GA-J-31	0.63	175.1	233	82
GA-J-32	0.63	174.5	233	83
GA-J-33	0.63	173.9	233	84
GA-J-34	0.63	171.4	233	88
GA-J-35	0.63	171.7	233	87
GA-J-36	0.63	172.0	233	87
GA-J-38	0.63	171.0	233	88
GA-J-44	0.58	171.3	233	88
GA-J-45	0.58	171.1	233	88
GA-J-46	0.58	171.3	233	88
GA-J-47	0.58	171.3	233	88
GA-J-48	0.58	171.3	233	88
GA-J-49	0.58	171.3	233	88
GA-J-50	0.63	173.1	233	85
GA-J-51	0.58	172.4	233	86
GA-J-52	0.56	170.1	233	90
GA-J-53	0.53	170.1	233	89
WCV255614	1.20	168.8	233	91
WFT301304	0.07	172.8	233	86

Peak Hour Demand Modeling Results (2031)
Phase 3A, 3B and 3C

ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/km)
GA-P02	WCV255614	GA-J-01	222.80	150	100	-0.70	0.04	0.01	0.03
GA-P03	WFT-PRSV-8	GA-J-02	153.30	300	120	8.50	0.12	0.01	0.08
GA-P04	GA-J-02	GA-J-03	66.42	150	100	0.94	0.05	0.00	0.05
GA-P05	GA-J-52	GA-J-04	142.53	150	100	-0.57	0.03	0.00	0.02
GA-P06	WFT-PRSV-12	GA-J-04	72.62	150	100	1.93	0.11	0.01	0.20
GA-P07	GA-J-03	GA-J-05	105.10	150	100	0.38	0.02	0.00	0.01
GA-P08	GA-J-05	GA-J-06	38.64	150	100	-0.65	0.04	0.00	0.03
GA-P09	GA-J-04	GA-J-06	77.54	150	100	0.80	0.05	0.00	0.04
GA-P10	GA-J-06	GA-J-07	74.62	150	100	-0.42	0.02	0.00	0.01
GA-P11	GA-J-07	WFT-PRSV-11	152.64	150	100	-1.45	0.08	0.02	0.12
GA-P12	GA-J-07	GA-J-08	91.49	150	100	0.46	0.03	0.00	0.01
GA-P13	GA-J-08	GA-J-44	74.78	200	110	-1.65	0.05	0.00	0.03
GA-P14	GA-J-08	GA-J-09	70.27	200	110	1.52	0.05	0.00	0.03
GA-P15	GA-J-09	GA-J-10	56.31	300	120	0.92	0.01	0.00	0.00
GA-P16	GA-J-10	GA-J-11	118.12	300	120	-0.26	0.00	0.00	0.00
GA-P17	GA-J-11	GA-J-12	49.99	300	120	-1.90	0.03	0.00	0.00
GA-P18	GA-J-12	GA-J-13	93.22	300	120	-1.99	0.03	0.00	0.01
GA-P19	GA-J-13	GA-J-14	79.28	300	120	-3.75	0.05	0.00	0.02
GA-P20	GA-J-12	GA-J-05	71.76	150	100	-0.47	0.03	0.00	0.02
GA-P21	GA-J-02	GA-J-14	75.32	300	120	6.79	0.10	0.00	0.05
GA-P22	GA-J-15	GA-J-16	75.69	150	100	-0.12	0.01	0.00	0.00
GA-P23	GA-J-16	GA-J-15	9.40	150	100	0.36	0.02	0.00	0.01
GA-P24	GA-J-16	GA-J-17	187.69	200	110	-0.96	0.03	0.00	0.01
GA-P25	GA-J-14	GA-J-17	109.69	200	110	2.27	0.07	0.01	0.06
GA-P26	GA-J-17	GA-J-18	133.18	200	110	0.83	0.03	0.00	0.01
GA-P27	GA-J-18	GA-J-19	128.11	150	100	-0.23	0.01	0.00	0.00
GA-P28	GA-J-13	GA-J-19	65.81	150	100	1.19	0.07	0.01	0.08
GA-P29	GA-J-18	GA-J-20	78.13	200	110	0.53	0.02	0.00	0.00
GA-P30	GA-J-20	GA-J-53	127.61	150	100	0.10	0.01	0.00	0.00
GA-P31	GA-J-20	GA-J-21	63.65	200	110	-0.10	0.00	0.00	0.00
GA-P32	GA-J-21	GA-J-22	75.47	150	100	0.10	0.01	0.00	0.00
GA-P33	GA-J-22	GA-J-23	71.87	150	100	-0.46	0.03	0.00	0.01
GA-P34	GA-J-23	GA-J-11	66.62	150	100	-1.08	0.06	0.00	0.07
GA-P35	GA-J-21	GA-J-24	174.01	200	110	-1.20	0.04	0.00	0.02
GA-P36	GA-J-24	GA-J-25	64.08	150	100	0.48	0.03	0.00	0.02
GA-P37	GA-J-25	GA-J-22	155.63	150	100	0.44	0.03	0.00	0.01
GA-P38	GA-J-26	GA-J-23	134.95	150	100	0.38	0.02	0.00	0.01
GA-P39	GA-J-25	GA-J-26	74.59	150	100	-0.24	0.01	0.00	0.00
GA-P40	GA-J-26	GA-J-10	64.62	150	100	-0.90	0.05	0.00	0.05
GA-P41	GA-J-24	GA-J-27	59.95	200	110	-1.95	0.06	0.00	0.04
GA-P42	GA-J-27	GA-J-09	199.84	300	120	-0.47	0.01	0.00	0.00
GA-P43	GA-J-09	GA-J-28	65.87	200	110	-1.04	0.03	0.00	0.01
GA-P44	GA-J-28	GA-J-29	200.18	150	100	-0.14	0.01	0.00	0.00
GA-P45	GA-J-27	GA-J-29	72.90	300	120	-3.81	0.05	0.00	0.02
GA-P46	GA-J-27	GA-J-30	39.72	300	120	1.17	0.02	0.00	0.00
GA-P47	GA-J-29	GA-J-31	95.54	300	120	-5.12	0.07	0.00	0.03
GA-P48	GA-J-31	GA-J-32	97.60	300	120	-5.99	0.08	0.00	0.04
GA-P49	GA-J-32	GA-J-33	74.12	300	120	-7.44	0.11	0.00	0.06
GA-P50	GA-J-33	WFT301304	34.21	300	120	-7.29	0.10	0.00	0.06
GA-P51	GA-J-34	GA-J-51	144.41	150	100	0.90	0.05	0.01	0.05
GA-P52	GA-J-34	GA-J-35	31.96	200	110	1.92	0.06	0.00	0.04
GA-P53	GA-J-35	GA-J-36	71.29	200	110	2.13	0.07	0.00	0.05
GA-P54	GA-J-36	GA-J-28	71.69	200	110	1.74	0.06	0.00	0.03
GA-P55	GA-J-36	GA-J-31	164.90	150	100	-0.24	0.01	0.00	0.00
GA-P56	GA-J-35	GA-J-32	121.54	200	110	-0.83	0.03	0.00	0.01
GA-P57	GA-J-37	GA-J-38	79.77	200	110	4.08	0.13	0.01	0.17
GA-P58	GA-J-38	GA-J-34	35.95	200	110	3.45	0.11	0.00	0.12
GA-P59	GA-J-50	GA-J-33	123.69	150	100	0.78	0.04	0.00	0.04
GA-P61	GA-J-44	GA-J-45	2.12	200	110	-3.40	0.11	0.00	0.12
GA-P62	GA-J-45	WFT-PRSV-10	69.83	200	110	-5.14	0.16	0.02	0.26
GA-P63	GA-J-45	GA-J-46	7.63	200	110	0.58	0.02	0.00	0.00
GA-P64	GA-J-45	GA-J-47	16.56	200	110	0.58	0.02	0.00	0.00
GA-P65	GA-J-44	GA-J-48	7.83	200	110	0.58	0.02	0.00	0.00
GA-P66	GA-J-44	GA-J-49	16.32	200	110	0.58	0.02	0.00	0.00
GA-P71	GA-J-52	GA-J-03	73.83	150	100	0.01	0.00	0.00	0.00
GA-P72	GA-J-19	GA-J-53	75.20	150	100	0.43	0.02	0.00	0.01
GA-P73	GA-J-51	GA-J-28	29.44	150	100	0.32	0.02	0.00	0.01
GA-P74	GA-J-50	GA-J-54	80.70	150	100	-1.40	0.08	0.01	0.11

Peak Hour Demand Modeling Results (2031)
Phase 3A, 3B and 3C

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
GA-J-02	0.77	169.7	218	68
GA-J-03	0.56	169.9	218	68
GA-J-04	0.56	170.8	218	67
GA-J-05	0.56	170.5	218	67
GA-J-06	0.56	170.7	218	67
GA-J-07	0.58	171.1	218	66
GA-J-08	0.58	172.1	218	65
GA-J-09	1.17	173.0	218	64
GA-J-10	0.28	173.0	218	64
GA-J-11	0.56	171.3	218	66
GA-J-12	0.56	170.9	218	67
GA-J-13	0.56	170.5	218	67
GA-J-14	0.77	170.2	218	67
GA-J-15	0.48	170.8	218	67
GA-J-16	0.48	170.7	218	67
GA-J-17	0.48	170.8	218	67
GA-J-18	0.53	171.8	218	65
GA-J-19	0.53	170.6	218	67
GA-J-20	0.53	172.7	218	64
GA-J-21	1.00	173.7	218	63
GA-J-22	1.00	172.2	218	65
GA-J-23	1.00	171.5	218	66
GA-J-24	0.28	174.5	218	61
GA-J-25	0.28	174.1	218	62
GA-J-26	0.28	173.6	218	63
GA-J-27	1.17	174.9	218	61
GA-J-28	1.17	172.6	218	64
GA-J-29	1.17	174.8	218	61
GA-J-30	1.17	175.3	218	60
GA-J-31	0.63	175.1	218	61
GA-J-32	0.63	174.5	218	61
GA-J-33	0.63	173.9	218	62
GA-J-34	0.63	171.4	218	66
GA-J-35	0.63	171.7	218	65
GA-J-36	0.63	172.0	218	65
GA-J-38	0.63	171.0	218	66
GA-J-44	0.58	171.3	218	66
GA-J-45	0.58	171.1	218	66
GA-J-46	0.58	171.3	218	66
GA-J-47	0.58	171.3	218	66
GA-J-48	0.58	171.3	218	66
GA-J-49	0.58	171.3	218	66
GA-J-50	0.63	173.1	218	63
GA-J-51	0.58	172.4	218	64
GA-J-52	0.56	170.1	218	68
GA-J-53	0.53	170.1	218	68
WCV255614	1.19	168.8	218	70
WFT301304	0.06	172.8	218	64

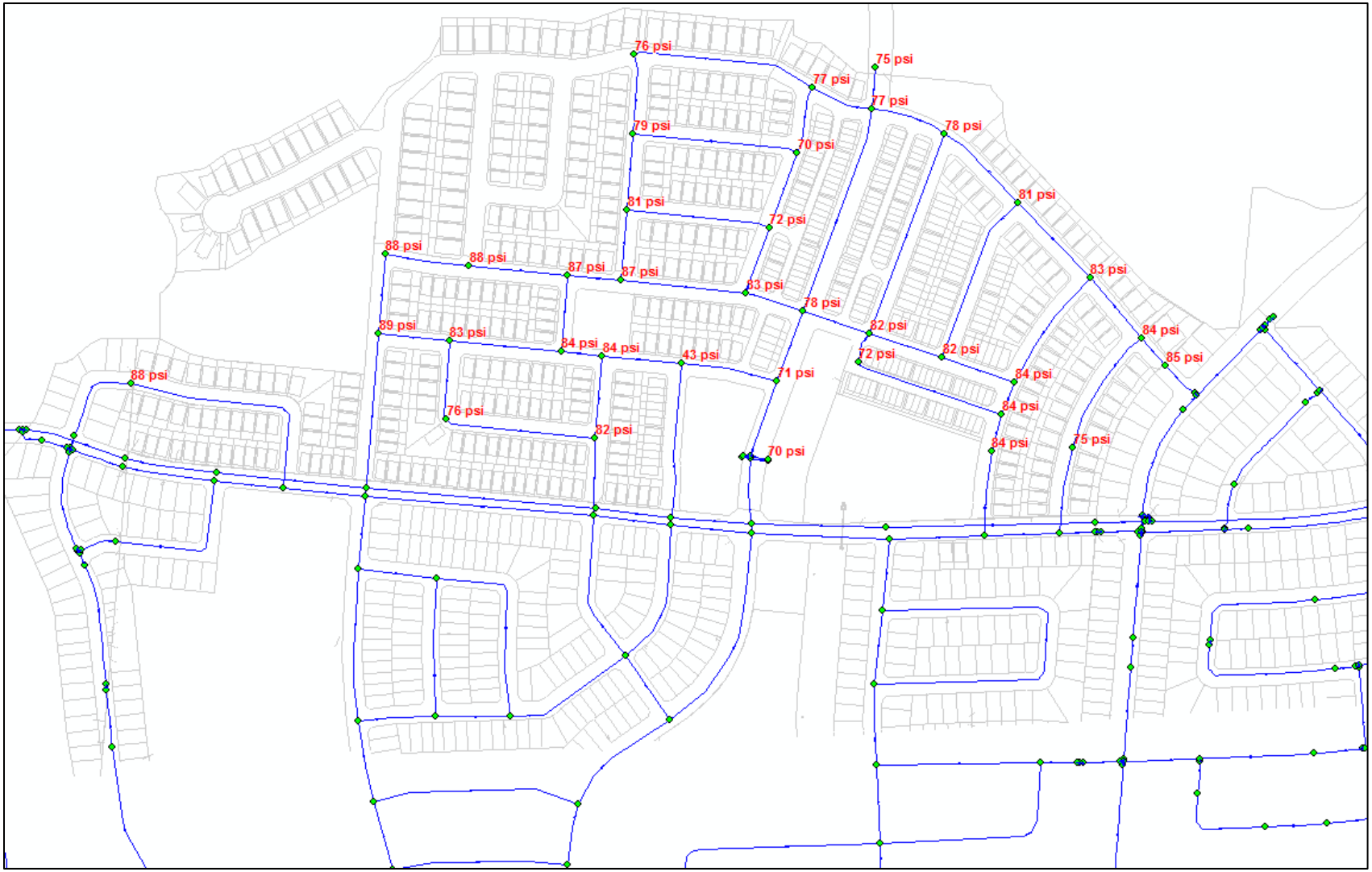
Appendix D Fire Flow Modeling Results

Required Fire Flow (L/s)



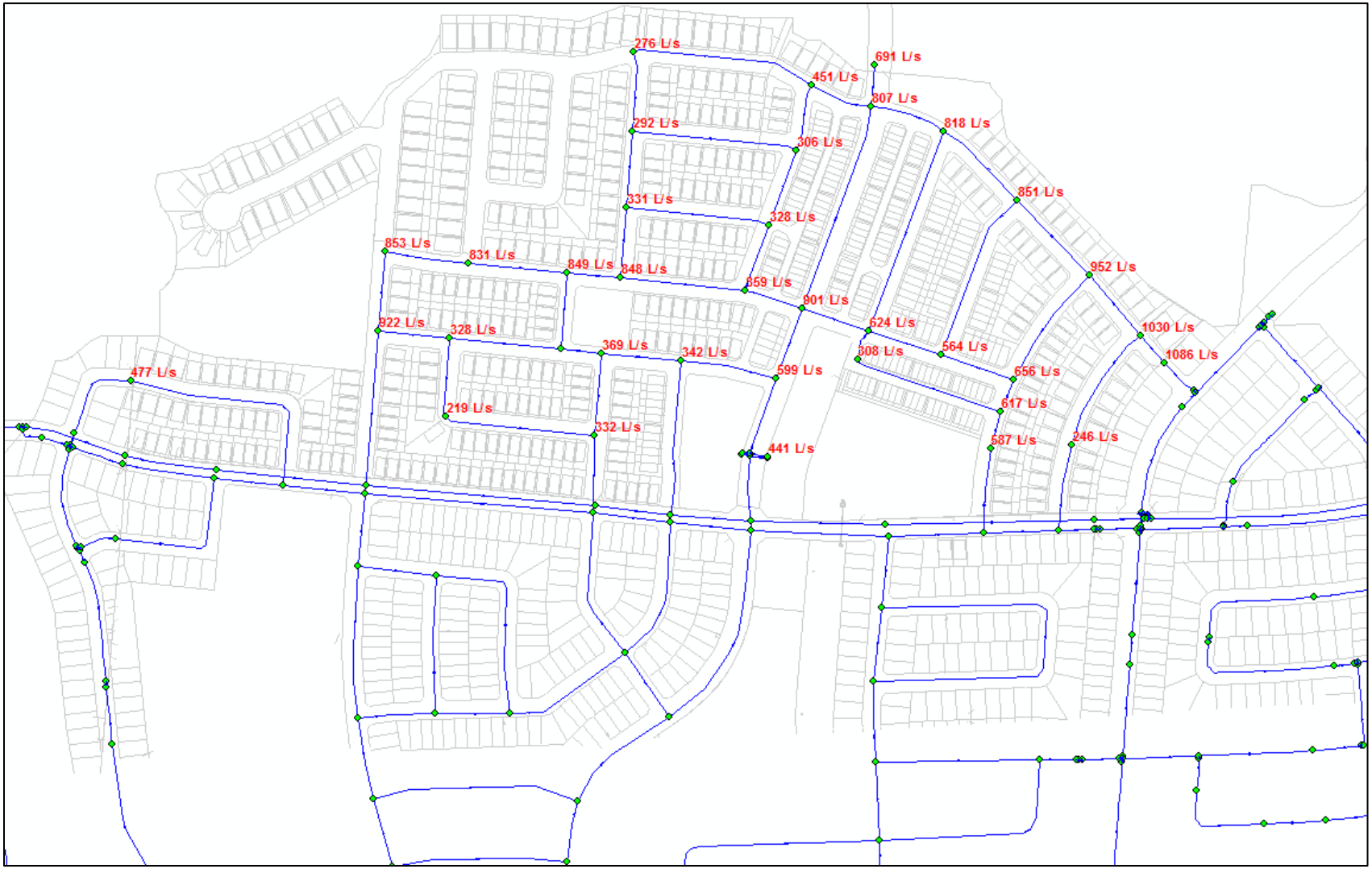
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Residual Pressure (2016) Phase 3A and 3B (MDD + FF)



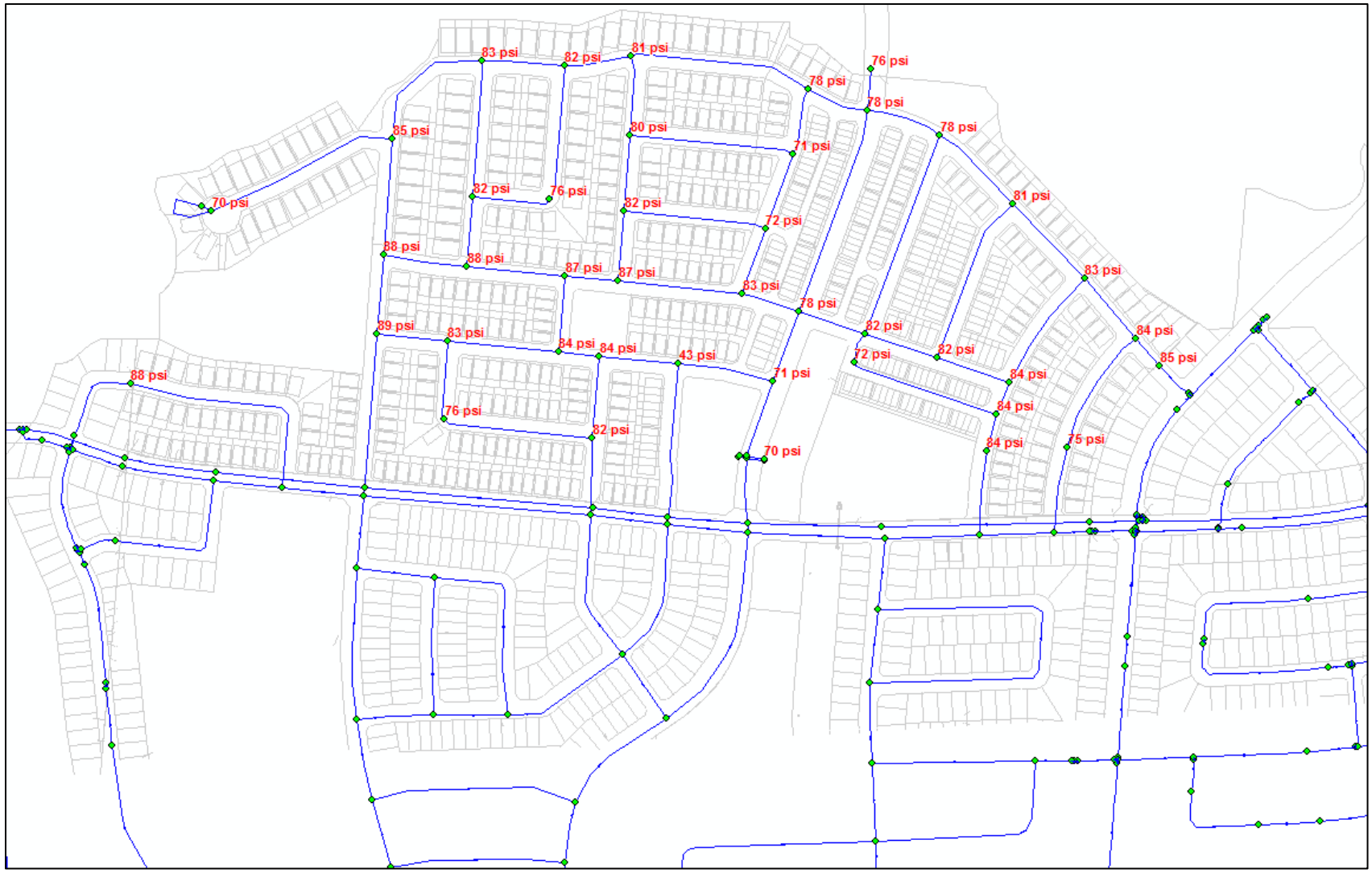
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Available Fire Flow at 20 psi (2016) Phase 3A and 3B (MDD + FF)



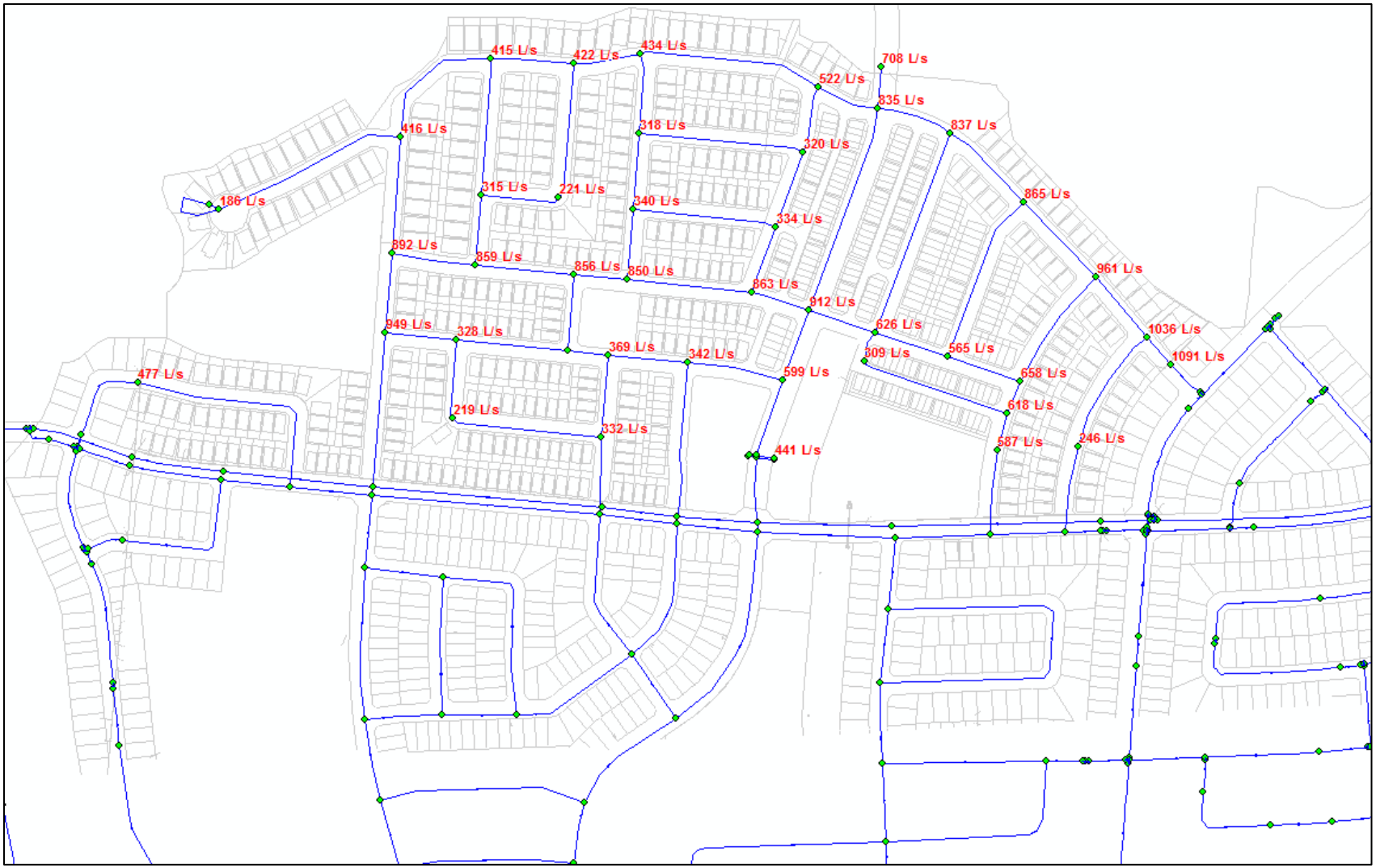
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Residual Pressure (2016) Phase 3A, 3B and 3C (MDD + FF)



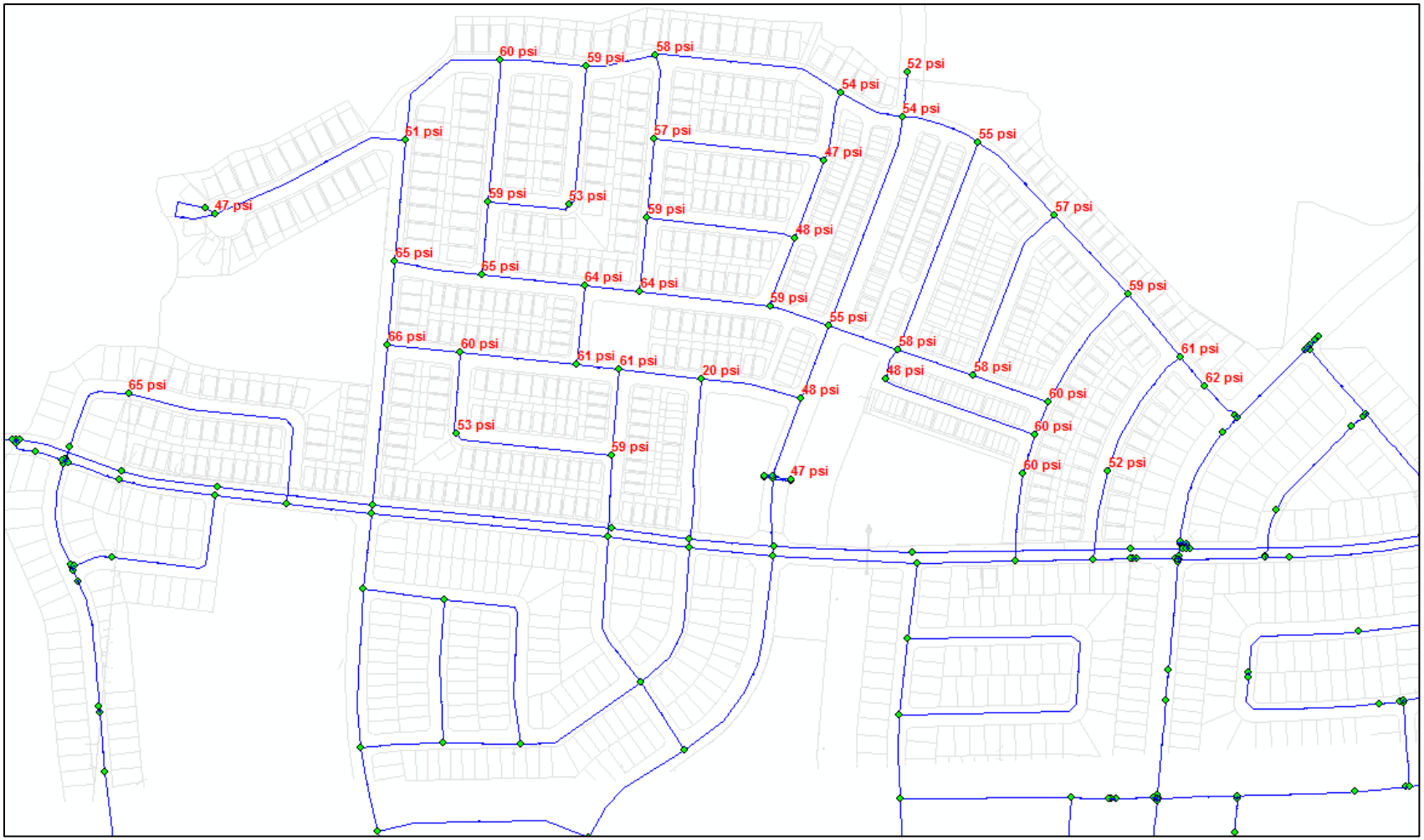
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Available Fire Flow at 20 psi (2016) Phase 3A, 3B and 3C (MDD + FF)



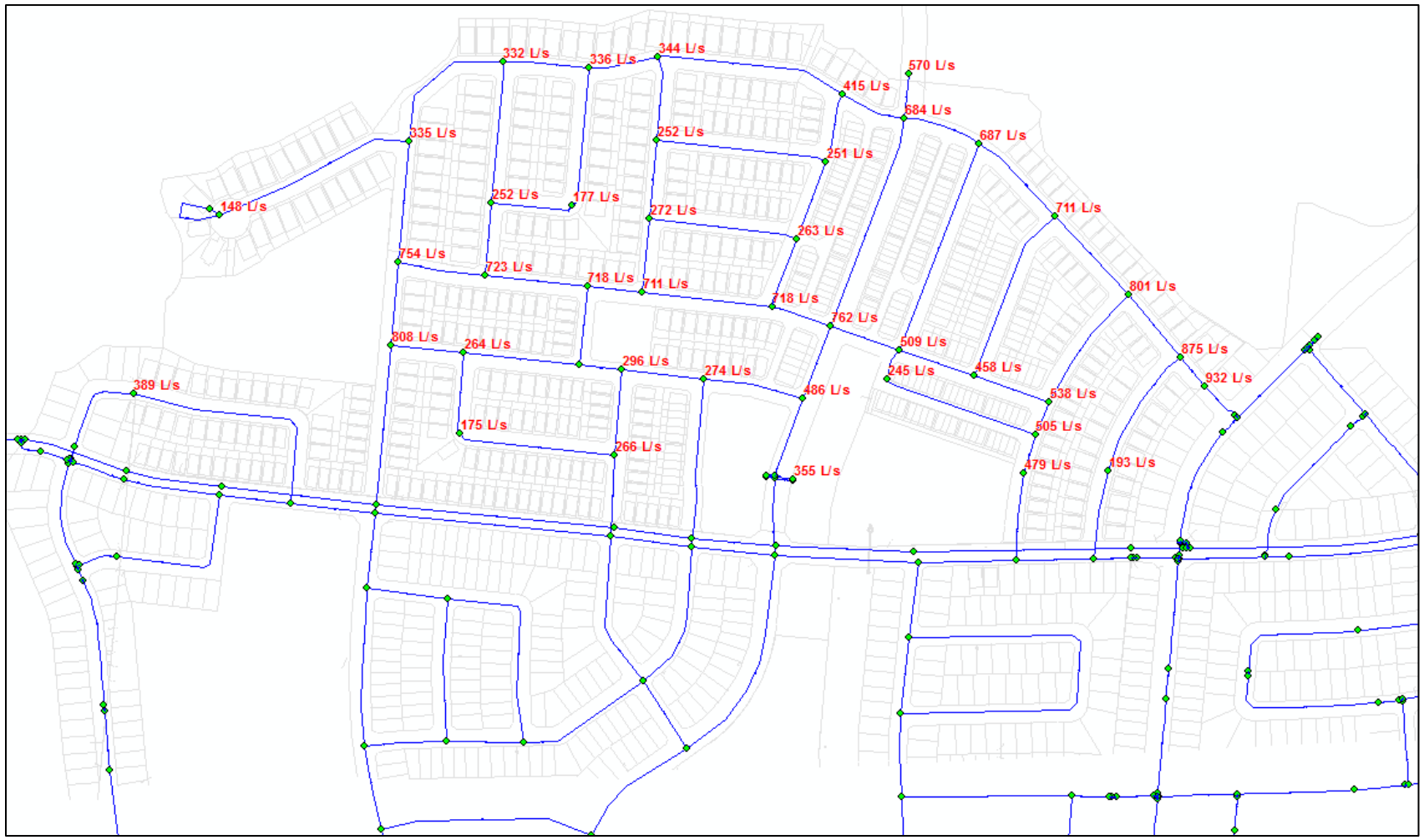
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Residual Pressure (2031) Phase 3A, 3B and 3C (MDD + FF)



Project ID: 2017-011-DSE

Available Fire Flow at 20 psi (2031) Phase 3A, 3B and 3C (MDD + FF)



Project ID: 2017-011-DSE

Fire Flow Modeling Results (2016)
Phase 3A and 3B

ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	FF Demand (L/s)	Residual Pressure (psi)	Available Flow @ 20 psi (L/s)
GA-J-02	0.44	90	233	91	89	922
GA-J-03	0.32	90	233	91	83	328
GA-J-04	0.32	89	233	91	82	332
GA-J-05	0.32	89	233	91	84	377
GA-J-06	0.32	89	233	91	84	369
GA-J-07	0.36	89	233	273	43	342
GA-J-08	0.36	87	233	273	71	599
GA-J-09	0.66	86	233	273	78	901
GA-J-10	0.16	86	233	136	83	859
GA-J-11	0.32	88	233	91	87	848
GA-J-12	0.32	89	233	91	87	849
GA-J-13	0.32	89	233	91	88	831
GA-J-14	0.44	90	233	91	88	853
GA-J-21	0.56	85	233	91	76	276
GA-J-22	0.56	87	233	91	79	292
GA-J-23	0.56	88	233	91	81	331
GA-J-24	0.16	84	233	136	77	451
GA-J-25	0.16	84	233	136	70	306
GA-J-26	0.16	85	233	136	72	328
GA-J-27	0.66	83	233	212	77	807
GA-J-28	0.66	86	233	136	82	624
GA-J-29	0.66	83	233	212	78	818
GA-J-30	0.66	82	233	212	75	691
GA-J-31	0.35	83	233	136	81	851
GA-J-32	0.35	84	233	91	83	952
GA-J-33	0.35	85	233	91	84	1030
GA-J-34	0.35	88	233	136	84	617
GA-J-35	0.35	88	233	136	84	656
GA-J-36	0.35	87	233	136	82	564
GA-J-38	0.35	89	233	136	84	587
GA-J-44	0.36	88	233	273	69	551
GA-J-45	0.36	88	233	273	70	554
GA-J-46	0.36	88	233	273	65	493
GA-J-47	0.36	88	233	212	70	441
GA-J-48	0.36	88	233	273	65	490
GA-J-49	0.36	88	233	212	70	441
GA-J-50	0.35	86	233	91	75	246
GA-J-51	0.36	87	233	136	72	308
GA-J-52	0.32	90	233	91	76	219
WCV255614	0.68	92	233	91	88	477
WFT301304	0.04	86	233	91	85	1086

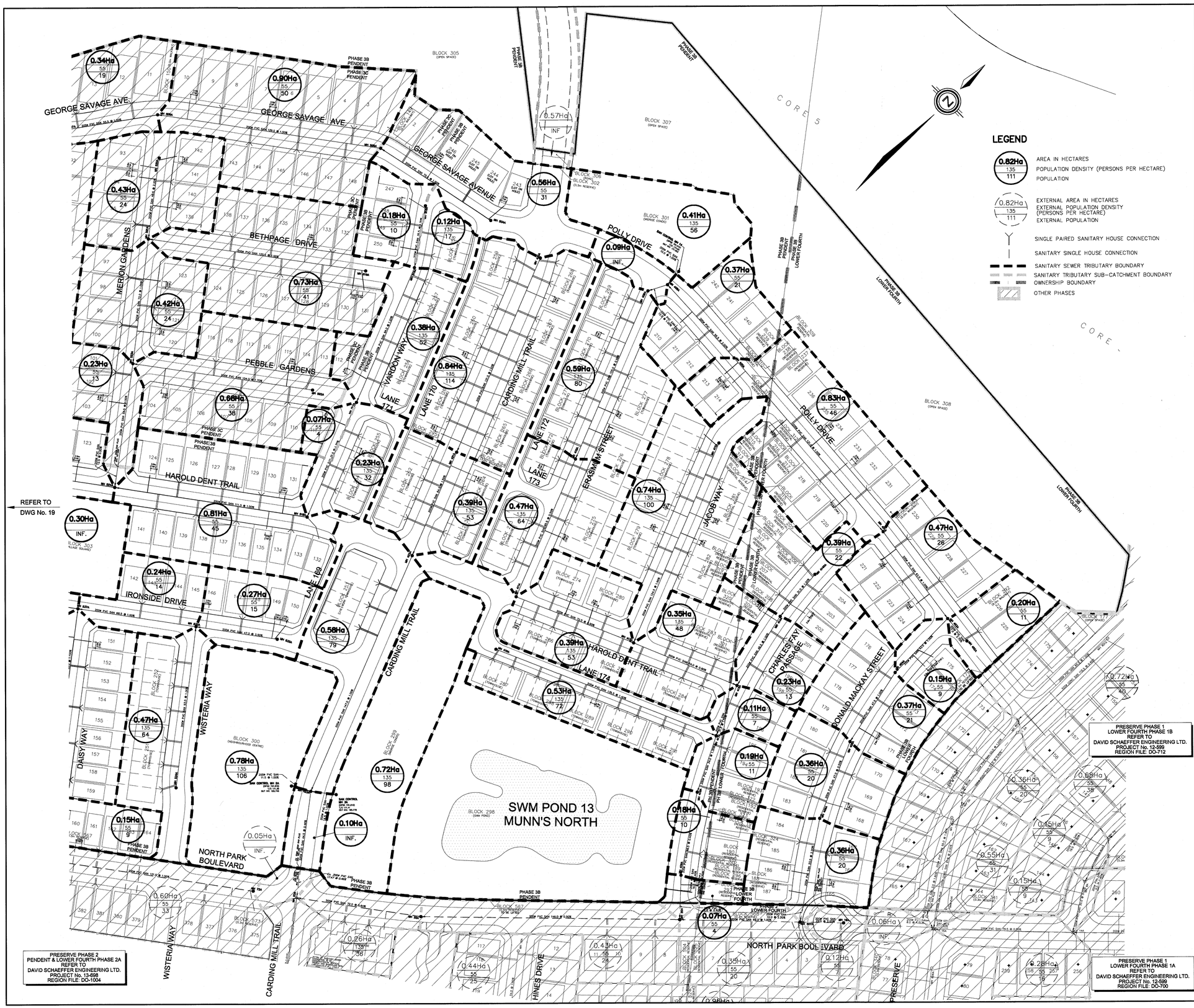
Fire Flow Modeling Results (2016)
Phase 3A, 3B and 3C

ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	FF Demand (L/s)	Residual Pressure (psi)	Available Flow @ 20 psi (L/s)
GA-J-02	0.44	90	233	91	89	949
GA-J-03	0.32	90	233	91	83	328
GA-J-04	0.32	89	233	91	82	332
GA-J-05	0.32	89	233	91	84	377
GA-J-06	0.32	89	233	91	84	369
GA-J-07	0.36	89	233	273	43	342
GA-J-08	0.36	87	233	273	71	599
GA-J-09	0.66	86	233	273	78	912
GA-J-10	0.16	86	233	136	83	863
GA-J-11	0.32	88	233	91	87	850
GA-J-12	0.32	89	233	91	87	856
GA-J-13	0.32	89	233	91	88	859
GA-J-14	0.44	90	233	91	88	892
GA-J-15	0.27	89	233	91	68	176
GA-J-16	0.27	89	233	91	70	186
GA-J-17	0.27	89	233	91	85	416
GA-J-18	0.30	88	233	91	83	415
GA-J-19	0.30	89	233	91	82	315
GA-J-20	0.30	86	233	91	82	422
GA-J-21	0.56	85	233	91	81	434
GA-J-22	0.56	87	233	91	80	318
GA-J-23	0.56	88	233	91	82	340
GA-J-24	0.16	84	233	136	78	522
GA-J-25	0.16	84	233	136	71	320
GA-J-26	0.16	85	233	136	72	334
GA-J-27	0.66	83	233	212	78	835
GA-J-28	0.66	86	233	136	82	626
GA-J-29	0.66	83	233	212	78	837
GA-J-30	0.66	82	233	212	76	708
GA-J-31	0.35	83	233	136	81	865
GA-J-32	0.35	84	233	91	83	961
GA-J-33	0.35	85	233	91	84	1036
GA-J-34	0.35	88	233	136	84	618
GA-J-35	0.35	88	233	136	84	658
GA-J-36	0.35	87	233	136	82	565
GA-J-38	0.35	89	233	136	84	587
GA-J-44	0.36	88	233	273	69	551
GA-J-45	0.36	88	233	273	70	554
GA-J-46	0.36	88	233	273	65	492
GA-J-47	0.36	88	233	212	70	441
GA-J-48	0.36	88	233	273	65	490
GA-J-49	0.36	88	233	212	70	441
GA-J-50	0.35	86	233	91	75	246
GA-J-51	0.36	87	233	136	72	309
GA-J-52	0.32	90	233	91	76	219
GA-J-53	0.30	90	233	91	76	221
WCV255614	0.68	92	233	91	88	477
WFT301304	0.04	86	233	91	85	1091

Fire Flow Modeling Results (2031)
Phase 3A, 3B and 3C

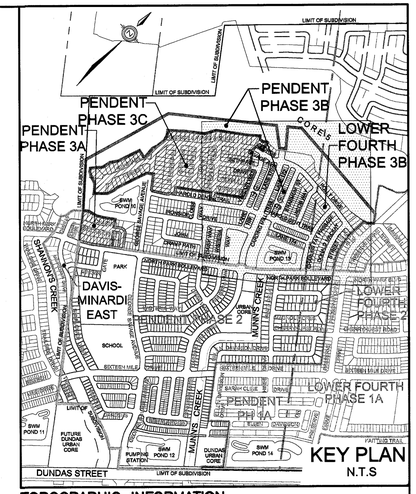
ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	FF Demand (L/s)	Residual Pressure (psi)	Available Flow @ 20 psi (L/s)
GA-J-02	0.44	73	221	91	66	808
GA-J-03	0.32	72	221	91	60	264
GA-J-04	0.32	71	221	91	59	266
GA-J-05	0.32	71	221	91	61	303
GA-J-06	0.32	71	221	91	61	296
GA-J-07	0.36	71	221	273	20	274
GA-J-08	0.36	69	221	273	48	486
GA-J-09	0.66	68	221	273	55	762
GA-J-10	0.16	68	221	136	59	718
GA-J-11	0.32	70	221	91	64	711
GA-J-12	0.32	71	221	91	64	718
GA-J-13	0.32	72	221	91	65	723
GA-J-14	0.44	72	221	91	65	754
GA-J-15	0.27	71	221	91	45	139
GA-J-16	0.27	71	221	91	47	148
GA-J-17	0.27	71	221	91	61	335
GA-J-18	0.30	70	221	91	60	332
GA-J-19	0.30	71	221	91	59	252
GA-J-20	0.30	68	221	91	59	336
GA-J-21	0.56	67	221	91	58	344
GA-J-22	0.56	69	221	91	57	252
GA-J-23	0.56	70	221	91	59	272
GA-J-24	0.16	66	221	136	54	415
GA-J-25	0.16	66	221	136	47	251
GA-J-26	0.16	67	221	136	48	263
GA-J-27	0.66	65	221	212	54	684
GA-J-28	0.66	68	221	136	58	509
GA-J-29	0.66	65	221	212	55	687
GA-J-30	0.66	65	221	212	52	570
GA-J-31	0.35	65	221	136	57	711
GA-J-32	0.35	66	221	91	59	801
GA-J-33	0.35	67	221	91	61	875
GA-J-34	0.35	70	221	136	60	505
GA-J-35	0.35	70	221	136	60	538
GA-J-36	0.35	69	221	136	58	458
GA-J-38	0.35	71	221	136	60	479
GA-J-44	0.36	70	221	273	46	447
GA-J-45	0.36	71	221	273	47	451
GA-J-46	0.36	70	221	273	42	398
GA-J-47	0.36	70	221	212	47	355
GA-J-48	0.36	70	221	273	42	396
GA-J-49	0.36	70	221	212	47	355
GA-J-50	0.35	68	221	91	52	193
GA-J-51	0.36	69	221	136	48	245
GA-J-52	0.32	72	221	91	53	175
GA-J-53	0.30	72	221	91	53	177
WCV255614	0.67	74	221	91	65	389
WFT301304	0.03	68	221	91	62	932

Attachment 2 – PRESERVE PHASE 3 SUBDIVISION SAN DRAINAGE PLAN (DSEL, 2017)



LEGEND

- 0.82Ha / 135 / 111 — AREA IN HECTARES; POPULATION DENSITY (PERSONS PER HECTARE); POPULATION
- (0.82Ha / 135 / 111) — EXTERNAL AREA IN HECTARES; EXTERNAL POPULATION DENSITY (PERSONS PER HECTARE); EXTERNAL POPULATION
- SINGLE PAIRED SANITARY HOUSE CONNECTION
- SANITARY SINGLE HOUSE CONNECTION
- SANITARY SEWER TRIBUTARY BOUNDARY
- SANITARY TRIBUTARY SUB-CATCHMENT BOUNDARY
- OWNERSHIP BOUNDARY
- OTHER PHASES



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD., PROJECT No. 17-077, SURVEY DATED MAY 16, 2017.

BENCHMARK (RPE) No. 00819810049 ELEVATION = 171.671m
S.I.B. WITH BRASS CAP MARKED MTC 008810049 SET IN THE TOWN OF OAKVILLE ON APR 2 1981 FROM THE JCT. OF BURNHAMTHORPE RD AND 4TH LINE, PROCEED SLY ON 4TH LINE FOR 0.4KM, STA IS SET ON ELY SIDE OF 4TH LINE, 6.6M ELY OF C/L OF 4TH LINE, 15.62M W.LY OF NAIL IN 60CM OAK, 9.86M W.LY OF NAIL IN 30CM APPLE, AND 22.28M OF NAIL IN BELL & HYDRO POLE.

BENCHMARK (MMM) No. 00819818108 ELEVATION = 167.059m
ELEVATIONS ARE IN METRES AND ARE DERIVED FROM CONTROL MONUMENT #00819818108, A BRASS TABLET SET IN THE TOP OF THE SOUTHWEST CORNER OF A CONCRETE CULVERT UNDER HWY 5 AND 102m WEST OF THE JUNCTION OF HWY 5 AND TRAFALGAR ROAD WITH AN ELEVATION OF 167.059m.

No.	DATE	BY	REVISIONS	APPROVED
3.	17-08-16	K.M.	FINAL SUBMISSION	
2.	17-06-01	K.M.	2nd SUBMISSION	
1.	17-03-03	K.M.	1st SUBMISSION	

DESIGNED BY:	P.P.	CHECKED BY:	K.M.	DATE JULY 2016
DRAWN BY:	P.P.	CHECKED BY:	K.M.	
SCALE HORIZ. 1:1000	0 10 20 30 40			REFERENCES

APPROVALS

MUNICIPAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT ENGINEERING — DATE

REGIONAL

APPROVAL DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

LEGISLATIVE AND PLANNING SERVICES — DATE Aug 31/17

FIELD NOTES

BELL ☐ HYDRO ☐ GAS ☐ CABLE ☐ TRAFFIC ☐ WATER ☐

STAMP: LICENSED PROFESSIONAL ENGINEER — K. MITIC — 100122349 — 17-08-16 — PROVINCE OF ONTARIO

DSEL david schaeffer engineering ltd
600 Alden Road, Suite 500
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT ENGINEERING

REGION: Halton REGION — The Regional Municipality of Halton

DEVELOPER: LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD.

DEVELOPMENT MANAGER: mattamyHOMES

PROJECT: PRESERVE PHASE 3B PENDENT & LOWER FOURTH 24T-15003

TITLE: # SANITARY DRAINAGE PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
SD-590.6	DO-1032
PROJECT NO. 14-744	SHEET 20 OF 104

Attachment 3 – PRESERVE PHASE 3 SAN DESIGN SHEET (DSEL, 2017)

DAVID SCHAEFFER ENGINEERING LTD.
500 ALDEN ROAD, SUITE 500
MARKHAM, ONTARIO
L3R 0E7
TEL: (905) 475-3080
FAX: (905) 475-3081

THE REGIONAL MUNICIPALITY OF HALTON

SANITARY SEWER DESIGN

PRESERVE Phase 3B

Note: To be conservative, industrial Kav is considered to be 1

Single Family 95 pph
Semi-detached 103 pph
Townhouse 135 pph
Commercial 90 pph
Schools 40 pph

n (PVC) 0.013
n (Conc) 0.013

I/I(Res (I/F) 0.286 L/s/Ha

SHEET No. 1 OF 4
LOCATION: Preserve Phase 3
PROJECT No.: 14-744
DATE: May, 2017
DESIGNED BY: L.S.
CHECKED BY: K.M.

STREET	MANHOLE FROM	MANHOLE TO	LENGTH (m)	TRIBUTARY AREA HECTARE INCREMENT SINGLE/T.	SEMI	TOWNHOUSE	COMMERC	SCHOOL	I/FLT	TOTAL	POPULATION TRIBUTARY INCREMENT SINGLE/T.	SEMI	TOWNHOUSE	COMMERC	SCHOOL	TOTAL	AVG. m3/s INC.	AVG. m3/s TOTAL	PEAKING FACTOR	MAX m3/s	INF. m3/s	MAX FLOW EXP.	SEWER SIZE	SLOPE	Q m3/s	VEL (m/s) FULL	VEL (m/s) ACT.	PIPE TYPE	PIPE CLASS	REMARKS
Phase 3B CARDING MILL TRAIL																														
	420A	421A	121.0				0.84				0.84			114			114	0.0034	0.0034	4.23	0.0015	0.0002	0.0018	200	1.10	0.034	1.09	0.55	PVC	SDR-35	
	421A	422A	64.0				0.39				1.23			53			167	0.0052	0.0086	4.16	0.0022	0.0004	0.0026	200	1.60	0.040	1.28	0.69	PVC	SDR-35	
	422A	425A	147.0				0.58				1.81			79			246	0.0033	0.0098	4.11	0.0032	0.0005	0.0037	200	1.00	0.033	1.04	0.69	PVC	SDR-35	
Contribution From BLOCK 300 (NEIGHBOURHOOD CENTRE) Pipe CONTROL MH 2A - 423A			11.8				0.78				0.78			106			106	0.0023	0.0023	4.24	0.0014	0.0002	0.0017	200	1.00	0.033	1.04	0.54	PVC	SDR-35	
Contribution From BLOCK 299 (MORISE CONDO), Pipe CONTROL MH 3A - 423A			14.8				0.72				0.72			88			88	0.0023	0.0023	4.25	0.0013	0.0002	0.0015	200	1.00	0.033	1.04	0.54	PVC	SDR-35	
From External										0.05	3.36						460														
	423A	*EX. PLUG*	44.5							0.10	3.46						460	0.0000	0.0014	4.00	0.0057	0.0010	0.0067	200	0.46	0.022	0.71	0.61	PVC	SDR-35	
	EX. PLUG	*EX. 23A*	17.47								3.46						460	0.0000	0.0014	4.00	0.0057	0.0010	0.0067	200	0.46	0.022	0.71	0.61	PVC	SDR-35	
To EXISTING Phase 2 CARDING MILL TRAIL , Pipe EX. 23A - EX. 24A											3.46						460														
JACOB WAY																														
	412A	413A	124.6				0.74				0.74			100			100	0.0003	0.0039	4.24	0.0013	0.0002	0.0016	200	1.90	0.045	1.44	0.51	PVC	SDR-35	
To HAROLD DENT TRAIL - EAST OF CARDING MILL TRAIL , Pipe 413A - 415A											0.74						100														
POLLY DRIVE																														
	406A	401A	131.0	0.83							0.83	46					46	0.0001	0.0001	4.32	0.0008	0.0002	0.0009	200	1.00	0.033	1.04	0.44	PVC	SDR-35	
	401A	405A	82.0	0.47							1.30	26					72	0.0001	0.0002	4.28	0.0010	0.0004	0.0014	200	1.00	0.033	1.04	0.49	PVC	SDR-35	
To DONALD MACKAY STREET , Pipe 405A - 404A											1.30						72														
	403A	408A	86.8	0.37							0.37	21					21	0.0001	0.0001	4.36	0.0003	0.0001	0.0004	200	2.00	0.046	1.48	0.33	PVC	SDR-35	
To ERASMUM STREET , Pipe 408A - 408A											0.37						21														
	402A	403A	17.0	0.20							0.20	11					11	0.0000	0.0000	4.41	0.0002	0.0001	0.0002	200	2.70	0.054	1.72	0.0033	PVC	SDR-35	
To DONALD MACKAY STREET , Pipe 403A - 404A											0.20						11														
ERASMUM STREET																														
Contribution From POLLY DRIVE, Pipe 400A - 408A											0.37						21														
Contribution From BLOCK 301 (MORISE CONDO), Pipe CONTROL MH 1A - 408A			10.0				0.41				0.41			88			88	0.0032	0.0032	4.30	0.0038	0.0001	0.0039	200	1.50	0.033	1.04	0.44	PVC	SDR-35	
	408A	408A	12.0							0.09	0.87						77	0.0000	0.0032	4.27	0.0010	0.0002	0.0013	200	1.00	0.033	1.04	0.49	PVC	SDR-35	
	408A	416A	108.0				0.89				1.46			80			157	0.0033	0.0065	4.18	0.0021	0.0004	0.0025	200	0.80	0.031	0.99	0.59	PVC	SDR-35	
	410A	411A	86.5				0.47				1.93			64			221	0.0002	0.0067	4.15	0.0029	0.0006	0.0035	200	0.50	0.023	0.74	0.53	PVC	SDR-35	
To HAROLD DENT TRAIL - EAST OF CARDING MILL TRAIL , Pipe 411A - 413A											1.93						221														
HAROLD DENT TRAIL - EAST OF CARDING MILL TRAIL																														
Contribution From ERASMUM STREET, Pipe 410A - 411A											1.93						221														
	411A	413A	72.5				0.39				2.32			53			274	0.0002	0.0069	4.09	0.0036	0.0007	0.0042	200	0.90	0.031	0.99	0.69	PVC	SDR-35	
Contribution From JACOB WAY, Pipe 413A - 413A											0.74						100														
	413A	415A	64.0				0.35				3.41			48			422	0.0002	0.0213	4.01	0.0064	0.0010	0.0084	200	0.80	0.029	0.93	0.74	PVC	SDR-35	
To Phase 3B CHARLES FAY PASSAGE , Pipe 416A - 417A											3.41						422														
LANE 174																														
	416A	417A	136.5				0.53				0.53			72			72	0.0002	0.0002	4.28	0.0010	0.0002	0.0011	200	1.40	0.039	1.24	0.52	PVC	SDR-35	
To Phase 3B CHARLES FAY PASSAGE , Pipe 417A - 416A											0.53						72														
Phase 3B DONALD MACKAY STREET																														
Contribution From POLLY DRIVE, Pipe 401A - 403A											1.30						72														
Contribution From POLLY DRIVE, Pipe 402A - 403A											0.20						11														
	403A	404A	43.0	0.16							1.66	9					92	0.0005	0.0038	4.26	0.0012	0.0005	0.0017	200	1.00	0.033	1.04	0.64	PVC	SDR-35	
	404A	408A	47.8	0.37							2.02	21					113	0.0001	0.0034	4.23	0.0015	0.0006	0.0021	200	1.00	0.033	1.04	0.57	PVC	SDR-35	
	405A	408A	47.0	0.36							2.38	20					133	0.0001	0.0034	4.21	0.0018	0.0007	0.0025	200	0.90	0.023	0.74	0.48	PVC	SDR-35	
	408A	Plug	66.9	0.36							2.74	20					153	0.0001	0.0035	4.19	0.0020	0.0008	0.0028	200	2.20	0.049	1.55	0.64	PVC	SDR-35	
To Phase 2 DONALD MACKAY STREET, Pipe Plug - 407A											2.74						153														

DAVID SCHAEFFER ENGINEERING LTD.
500 ALDEN ROAD, SUITE 500
MARKHAM, ONTARIO
L3R 0E7
TEL: (905) 475-3080
FAX: (905) 475-3081

THE REGIONAL MUNICIPALITY OF HALTON

SANITARY SEWER DESIGN

PRESERVE Phase 3B

Note: To be conservative, industrial Kav is considered to be 1

Single Family 80 pph
Semi-detached 100 pph
Townhouse 135 pph
Commercial 90 pph
Village Square 0 pph

n (PVC) 0.013
n (Conc) 0.013

I/I(Res (I/F) 0.286 L/s/Ha

SHEET No. 2 OF 4
LOCATION: Preserve Phase 3
PROJECT No.: 14-744
DATE: May, 2017
DESIGNED BY: L.S.
CHECKED BY: K.M.

STREET	MANHOLE FROM	MANHOLE TO	LENGTH (m)	TRIBUTARY AREA HECTARE INCREMENT SINGLE/T.	SEMI	TOWNHOUSE	COMMERC	SCHOOL	I/FLT	TOTAL	POPULATION TRIBUTARY INCREMENT SINGLE/T.	SEMI	TOWNHOUSE	COMMERC	SCHOOL	TOTAL	AVG. m3/s INC.	AVG. m3/s TOTAL	PEAKING FACTOR	MAX m3/s	INF. m3/s	MAX FLOW EXP.	SEWER SIZE	SLOPE	Q m3/s	VEL (m/s) FULL	VEL (m/s) ACT.	PIPE TYPE	PIPE CLASS	REMARKS
Phase 3 DONALD MACKAY STREET																														
Contribution From Phase 3B GEORGE SAVAGE AVENUE, Pipe 405A - Plug											2.74						153														
	Plug	407A	10.0								2.74						153	0.0000	0.0065	4.19	0.0030	0.0006	0.0036	200	2.20	0.049	1.55	0.84	PVC	SDR-35	
To Phase 2 NORTH PARK BOULEVARD, Pipe 407A - 20A											2.74						153														
Phase 3G CHARLES FAY PASSAGE																														
	414SA	414A	31.0	0.39							0.39	22					22	0.0001	0.0001	4.37	0.0003	0.0001	0.0004	200	1.20	0.036	1.14	0.30	PVC	SDR-35	
	414A	415A	48.5	0.23							0.62	13					35	0.0000	0.0001	4.34	0.0005	0.0002	0.0007	200	1.00	0.033	1.04	0.38	PVC	SDR-35	
Contribution From HAROLD DENT TRAIL - EAST OF CARDING MILL TRAIL, Pipe 413A - 415A											3.41						422														
	415A	417A	31.5	0.11							4.14	7					464	0.0000	0.0015	3.99	0.0059	0.0012	0.0071	200	1.80	0.040	1.28	0.96	PVC	SDR-35	
Contribution From LANE 174, Pipe 416A - 417A											0.53						72														
	417A	418A	34.0	0.18							4.85	11					547	0.0020	0.0017	3.95	0.0069	0.0014	0.0083	200	1.30	0.037	1.19	0.96	PVC	SDR-35	
	418A	418A	48.5	0.14							5.00	8					555	0.0020	0.0018	3.95	0.0070	0.0014	0.0084	200	0.40	0.021	0.66	0.52	PVC	SDR-35	
	418A	Plug	18.0	0.12							5.12	7					562	0.0020	0.0018	3.95	0.0071	0.0015	0.0085	200	0.40	0.021	0.66	0.52	PVC	SDR-35	
To Phase 2 CHARLES FAY PASSAGE, Pipe Plug - 25A											5.12						562														
Phase 3 CHARLES FAY PASSAGE																														
Contribution From Phase 3B CHARLES FAY PASSAGE, Pipe Plug 418A - Plug											5.12						562														
	PLUG	20A	9.8								5.12						562	0.0000	0.0018	3.95	0.0071	0.0015	0.0085	200	0.40	0.021	0.66	0.52	PVC	SDR-35	
To Phase 2 NORTH PARK BOULEVARD , Pipe 20A - 22A											5.12						562														
VARDEN WAY																														
	515A	516A	35.5	0.18		0.12					0.30	10		17			27	0.0001	0.0001	4.36	0.0004	0.0001	0.0005	200	1.30	0.037	1.19	0.31	PVC	SDR-35	
	516A	517A	84.0			0.36					0.66			52			79	0.0002	0.0003	4.27	0.0011	0.0002	0.0013	200	1.20	0.036	1.14	0.54	PVC	SDR-35	
	517A	516A	71.5			0.23					0.83			34			113	0.0001	0.0004	4.23	0.0015	0.0003	0.0018	200	1.30	0.037	1.19	0.61	PVC	SDR-35	
To HAROLD DENT TRAIL - WEST OF CARDING MILL TRAIL , Pipe 516A - 524A											0.83						113														
Phase 3E MERION GARDENS																														
Contribution From Phase 3C MERION GARDENS, Pipe 523A - Plug											2.63						142														
	Plug	524A	12.5								2.63						142	0.0000	0.0005	4.20	0.0019	0.0007	0.0026	200	0.90	0.023	0.74	0.48	PVC	SDR-35	
To HAROLD DENT TRAIL - WEST OF CARDING MILL TRAIL , Pipe 524A - 525A											2.63						142														
Phase 3B BUNNINGDALE GARDENS																														
Contribution From Phase 3C BUNNINGDALE GARDENS, Pipe 528A - Plug											5.39						267														
	Plug	529A	12.0								5.39						267	0.0000	0.0008	4.10	0.0035	0.0015	0.0050	200	0.90	0.023	0.74	0.89	PVC	SDR-35	
To HAROLD DENT TRAIL - WEST OF CARDING MILL TRAIL , Pipe 529A - 530A											5.39						267														
HAROLD DENT TRAIL - WEST OF CARDING MILL TRAIL																														
Contribution From VARDEN WAY, Pipe 517A - 516A											0.83						113														
	516A	524A	111.5	0.81							1.74	45					158	0.0001	0.0009	4.18	0.0021	0.0006	0.0026	200	1.00	0.033	1.04	0.81	PVC	SDR-35	
Contribution From Phase 3B MERION GARDENS, Pipe Plug - 524A											2.63						142														
	524A	529A	143.5	0.71							4.38	40					340	0.0001	0.0011	4.05	0.0044	0.0014	0.0058	200	0.60	0.025	0.81	0.65	PVC	SDR-35	
Contribution From Phase 3B BUNNINGDALE GARDENS, Pipe Plug - 529A											5.39						267														
	529A	530A	36.0	0.19							10.96	11					618	0.0000	0.0020	3.93	0.0077	0.0030	0.0108	200	0.50	0.023	0.74	0.71	PVC	SDR-35	
	530A	531A	37.8	0.10							10.86	6					624	0.0000	0.0020	3.92	0.0078	0.0030	0.0108	200	0.90	0.031	0.99	0.90	PVC	SDR-35	
	531A	532A	16.5						0.01		10.87						624	0.0000	0.0020	3.92	0.0078	0.0031	0.0108	200	4.00	0.066	2.09	1.53	PVC	SDR-35	
To Phase 3B GEORGE SAVAGE AVENUE , Pipe 532A - 544A											10.87						624														
JOHN CRAMP PATH																														
	540A	541A	104.0	0.60							0.60	44					44	0.0001	0.0001	4.33	0.0008	0.0002	0.0008	200	1.00	0.033	1.04	0.44	PVC	SDR-35	
	541A	542A	11.0	0.10							0.93	5					60	0.0000	0.0002	4.31	0.0007	0.0002	0.0009	200	1.00	0.033	1.04	0.44	PVC	SDR-35	
	542A	543A	68.0	0.33							1.23	19					69	0.0001	0.0002	4.28	0.0009	0.0004	0.0013	200	1.00	0.033	1.04	0.48	PVC	SDR-35	
To IRONSIDE DRIVE , Pipe 543A - 544A											1.23						69														

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.; JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD., PROJECT No. 17-077, SURVEY DATED MAY 16, 2017.

BENCHMARK (RPE) No. 00819810049 ELEVATION = 171.671m
S.I.B. WITH BRASS CAP MARKED MTC 00819810049 SET IN THE TOWN OF OAKVILLE ON APR 2 1981 FROM THE JCT. OF BURNHAMTHORPE RD AND 4TH LINE, PROCEED SLY ON 4TH LINE FOR 0.4KM, STA IS SET ON ELY SIDE OF 4TH LINE, 6.6M ELY OF C/L OF 4TH LINE, 15.62M W.Y OF NAIL IN 60CM OAK, 3.86M W.Y OF NAIL IN 30CM APPLE, AND 22.28M OF NAIL IN BELL & HYDRO POLE.

BENCHMARK (MMM) No. 00819818108 ELEVATION = 167.059m
ELEVATIONS ARE IN METRES AND ARE DERIVED FROM CONTROL MONUMENT #00819818108, A BRASS TABLET SET IN THE TOP OF THE SOUTHWEST CORNER OF A CONCRETE CULVERT UNDER HWY 5 AND 102m WEST OF THE JUNCTION OF HWY 5 AND TRAFALGAR ROAD WITH AN ELEVATION OF 167.059m.

No.	DATE	BY	REVISIONS	APPROVED
3.	17-08-16	K.M.	FINAL SUBMISSION	
2.	17-06-01	K.M.	2nd SUBMISSION	
1.	17-03-03	K.M.	1st SUBMISSION	

DESIGNED BY: P.P. CHECKED BY: K.M.
DRAWN BY: P.P. CHECKED BY: K.M.
DATE: JULY 2016
SCALE: HORIZ. 1:1000 (0 10 20 30 40)
REFERENCES

APPROVALS

MUNICIPAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFIATIONS

MANAGER OF DEVELOPMENT ENGINEERING — DATE

FIELD NOTES

BELL ☐ HYDRO ☐
GAS ☐ CABLE ☐
TRAFFIC ☐ WATER ☐

REGIONAL

APPROVAL DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

LEGISLATIVE AND PLANNING SERVICES — DATE Aug 31/17

STAMP: LICENSED PROFESSIONAL ENGINEER K. MITIC 100122349 17-08-16 PROVINCE OF ONTARIO

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www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT ENGINEERING

REGION: Halton REGION — The Regional Municipality of Halton

DEVELOPER: LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD.

DEVELOPMENT MANAGER: mattamyHOMES

PROJECT: PRESERVE PHASE 3B PENDENT & LOWER FOURTH 24T-15003

TITLE: SANITARY SEWER DESIGN SHEETS

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MUNICIPAL FILE NO. SD-590.6
REGIONAL FILE NO. DO-1032
PROJECT NO. 14-744
SHEET 22 OF 104

Attachment 4 – PRESERVE BLOCK 301 SAN DESIGN SHEET (DSEL, 2026)

SANITARY SEWER CALCULATION SHEET

LOCATION					RESIDENTIAL							COMMERCIAL/INTITUTIONAL/INDUSTRIAL					DESIGN FLOW					PIPE						
STREET		FROM MH	TO MH	PHASE	AREA (Ha)	UNITS	DENSITY (pp/unit)	DENSITY (pp/Ha)	POP.	CUMULATIVE AREA (Ha)	CUMULATIVE POP	AREA (Ha)	DENSITY (pp/Ha)	EQUIV. POP.	CUMULATIVE AREA (Ha)	CUMULATIVE POP	PEAK FACTOR	RES. FLOW (L/s)	C / I / I FLOW (L/s)	INF. FLOW (L/s)	TOTAL FLOW (L/s)	DIST (m)	DIA (mm)	SLOPE (%)	FLOW (FULL) (l/s)	CAP (RATIO) (%)	VELOCITY (FULL) (m/s)	VELOCITY (ACT.) (m/s)
POLLY DRIVE																											
		4090A	4091A		0.24	4	3.80		16	0.24	16			0	0.00	0	4.39	0.17		0.07	0.24	41.0	200	1.00	32.80	0.01	1.04	0.30
		4091A	*Ex. 409A*		0.17	2	3.80		8	0.41	24			0	0.00	0	4.37	0.26		0.11	0.38	13.0	200	1.00	32.80	0.01	1.04	0.35

DESIGN PARAMETERS

Detached =	95	PPHa	3.80	Ppu	Average Daily Flow =	215.00	L/p/da
Semi =	165	PPHa	3.80	Ppu	Average Non-Res Daily Flow =	185.00	L/p/da
Townhouse =	260	PPHa	2.90	Ppu	Inf =	0.28	L/s/Ha
Stacked Townhouse =	420	PPHa	2.90	Ppu			
Condo	600	PPHa	1.70	Ppu	Nconc =	0.013	
Park/Institutional =	50	PPHa			NPvc =	0.013	
Commercial =	105	PPHa					

PRESERVE BLOCK 301

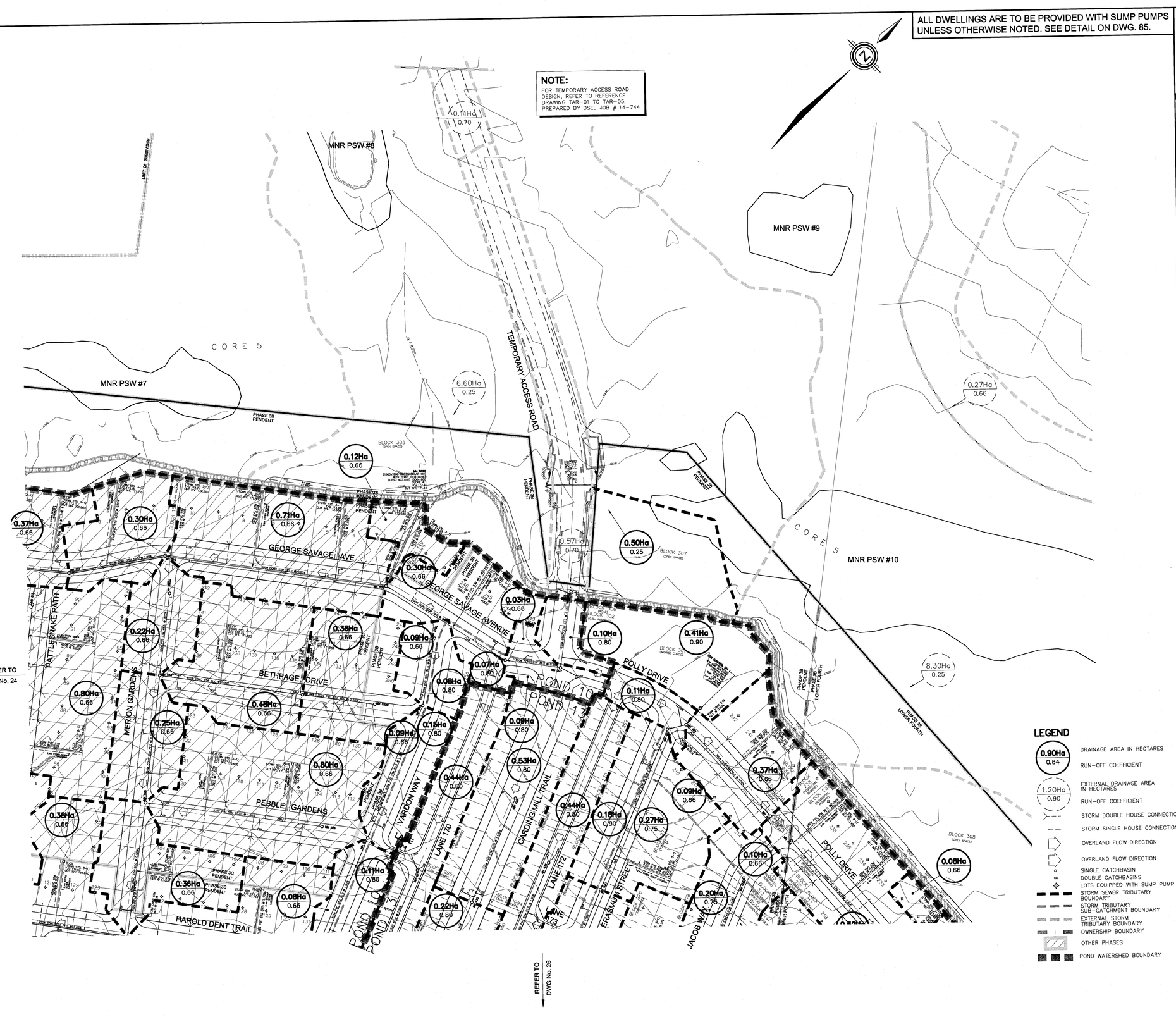
TOWN OF OAKVILLE

Project No.:	Date:	Sheet No.	1
21-1227	**Jul 2026**	of	**1**

Attachment 5 – PRESERVE PHASE 3 SUBDIVISION STM DRAIANGE PLAN (DSEL, 2017)

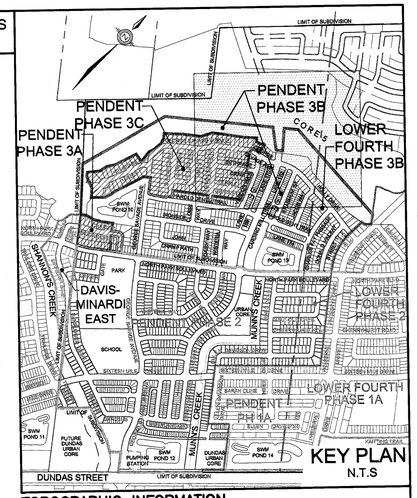
ALL DWELLINGS ARE TO BE PROVIDED WITH SUMP PUMPS UNLESS OTHERWISE NOTED. SEE DETAIL ON DWG. 85.

NOTE:
FOR TEMPORARY ACCESS ROAD DESIGN, REFER TO REFERENCE DRAWING TAR-01 TO TAR-05. PREPARED BY DSEL JOB # 14-744



LEGEND

- 0.90Ha / 0.64 — DRAINAGE AREA IN HECTARES / RUN-OFF COEFFICIENT
- 1.20Ha / 0.90 — EXTERNAL DRAINAGE AREA IN HECTARES / RUN-OFF COEFFICIENT
- STORM DOUBLE HOUSE CONNECTION
- STORM SINGLE HOUSE CONNECTION
- OVERLAND FLOW DIRECTION
- OVERLAND FLOW DIRECTION
- SINGLE CATCHBASIN
- DOUBLE CATCHBASINS
- LOTS EQUIPPED WITH SUMP PUMP
- STORM SEWER TRIBUTARY BOUNDARY
- STORM TRIBUTARY SUB-CATCHMENT BOUNDARY
- EXTERNAL STORM TRIBUTARY BOUNDARY
- OWNERSHIP BOUNDARY
- OTHER PHASES
- POND WATERSHED BOUNDARY



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD., PROJECT No. 17-077, SURVEY DATED MAY 16, 2017.

BENCHMARK (RPE) No. 008198100049 ELEVATION = 171.671m
S.I.B. WITH BRASS CAP MARKED MTC 008810049 SET IN THE TOWN OF OAKVILLE ON APR 2 1981 FROM THE JCT. OF BURNHAMTHORPE RD AND 4TH LINE, PROCEED SLY ON 4TH LINE FOR 0.4KM. STA IS SET ON ELY SIDE OF 4TH LINE, 6.6M ELY OF C/L OF 4TH LINE, 15.62M WLY OF NAIL IN 60CM OAK, 9.86M WLY OF NAIL IN 30CM APPLE, AND 22.28M OF NAIL IN BELL & HYDRO POLE.

BENCHMARK (MNM) No. 008198108 ELEVATION = 167.059m
ELEVATIONS ARE IN METRES AND ARE DERIVED FROM CONTROL MONUMENT #008198108, A BRASS TABLET SET IN THE TOP OF THE SOUTHWEST CORNER OF A CONCRETE CULVERT UNDER HWY 5 AND 102m WEST OF THE JUNCTION OF HWY 5 AND TRAFALGAR ROAD WITH AN ELEVATION OF 167.059m.

No.	DATE	BY	REVISIONS	APPROVED
3.	17-08-16	K.M.	FINAL SUBMISSION	
2.	17-06-01	K.M.	2nd SUBMISSION	
1.	17-03-03	K.M.	1st SUBMISSION	

DESIGNED BY: P.P. CHECKED BY: K.M. DATE: JULY 2016
DRAWN BY: P.P. CHECKED BY: K.M.
SCALE HORIZ. 1:1000 0 10 20 30 40
REFERENCES

APPROVALS

MUNICIPAL
APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS
MANAGER OF DEVELOPMENT ENGINEERING — DATE 24/Aug/17

FIELD NOTES

BELL ☐ HYDRO ☐ GAS ☐ CABLE ☐ TRAFFIC ☐ WATER ☐

REGIONAL
APPROVAL DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY
LEGISLATIVE AND PLANNING SERVICES — DATE

STAMP: LICENSED PROFESSIONAL ENGINEER — K. MITIC 100122349 — 17-08-16 — PROVINCE OF ONTARIO

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MUNICIPALITY: OAKVILLE DEVELOPMENT ENGINEERING
REGION: Halton Region — The Regional Municipality of Halton
DEVELOPER: LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD.
DEVELOPMENT MANAGER: mattamyHOMES
PROJECT: PRESERVE PHASE 3B PENDENT & LOWER FOURTH 24T-15003

TITLE: STORM DRAINAGE PLAN

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MUNICIPAL FILE NO. SD-590.6
REGIONAL FILE NO. DO-1032
PROJECT NO. 14-744
SHEET 25 OF 104

Attachment 6 – SWM IMPACT OF PROPOSED BLOCK 301 DESIGN (JFSA, 2026)

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52 Springbrook Drive,
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T 613-836-3884 F 613-836-0332

jfsa.com

May 04, 2026 Project Number: 643

David Schaeffer Engineering Ltd.
600 Alden Road, Suite 606
Markham, ON
L3R 0E7

Attention: **Brian Betts, P.Eng**

Subject: **Phase 3 of the Preserve Lands - Impact of Proposed Block 301 Design**

Introduction

As requested by your office, we have evaluated, based on the available information as described below, the impact of the latest proposed design for Block 301 on the Stormwater Management (SWM) measures documented in the August 2017 ***Stormwater Management Report for Phase 3 of the Preserve Lands***, the May 2017 ***Design Brief for Stormwater Management Pond 10 for Phase 3 of the Preserve Lands***, and the May 2017 ***Design Brief for Stormwater Management Pond 13 for Phase 3 of the Preserve Lands*** (and November 1, 2017 ***Addendum*** for the as-built ponds).

Note that this memo follows the May 29, 2023 ***Phase 3 of the Preserve Lands / Impact of Proposed Neighbourhood Centre Block 300 Design*** memo, which included updated drainage areas and operating characteristics for Ponds 10 and 13, evaluated in reference to the May 2017 ***Design Briefs*** (and November 1, 2017 ***Addendums*** for the as-built ponds).

The proposed drainage plan for Block 301 and surrounding areas is presented in ***Attachment A***. Other drainage areas to Ponds 10 and 13 are as modelled in the May 2023 ***Block 300*** memo. Block 301 is located in Phase 3 of the Preserve Lands, north of Polly Drive and east of Carding Mill Trail. Block 301 has a drainage area of 0.41 ha at 71% imperviousness.

0.070 ha of Block 301 drains directly overland to Carding Mill Trail and Polly Drive and ultimately to Pond 10, with no minor system capture within Block 301. Similarly, 0.338 ha of Block 301 drains directly overland to Polly Drive and ultimately to Pond 13, with no minor system capture within Block 301.

Quality, erosion and quantity control treatment for Block 301 is provided by SWM Pond 13, which discharges to Munn's Creek, and by SWM Pond 10, which discharges to Shannon's Creek.

For comparison, Block 301 was modelled in the August 2017 ***SWM Report*** at 99% imperviousness, with on-site minor system capture to MH 402 (and ultimately to Pond 13) limited to the 5-year Rational Method flow (0.117 m^3/s total), and excess major system flows draining directly overland to Pond 13.

The DDSWMM / SWMHYMO / XPSWMM models submitted with the May 2023 ***Block 300*** memo were updated to reflect the latest design of Block 301, and assess the impact on the performance of the downstream major and minor systems within the Preserve lands. As the drainage areas and percent imperviousness to Pond 13 have not increased from the May 2023 ***Block 300*** memo, it may be concluded that the latest proposed design of Block 301 will not have a negative impact on the operation of Pond 13. The impact of the added 0.070 ha of drainage area from Block 301 to Pond 10 is assessed below.

Major System Performance

Within Block 301 and in the surrounding subdivision, the depth of water at the gutter will not exceed the maximum allowable value of 30 cm during the 100-year Chicago storm (refer to ***Calculation Sheet C-1A*** of ***Attachment C***, where the calculated maximum was 17.3 cm). Furthermore, it was determined that, for the 100-year storm and for all major system segments, the product of the depth of water (m) at the gutter multiplied by the velocity of flow (m/s) will not exceed the maximum allowable 0.65 m^2/s (refer to ***Calculation Sheet C-1A*** of ***Attachment C***, where the calculated maximum was 0.224 $m^{2/}s$).

The maximum 100-year results for a critical location within the subdivision, on Lane 174 where the 6.0 m wide road slopes to one side (i.e. no road crown), are presented in ***Calculation Sheet C-1B*** of ***Attachment C***. As presented in ***Calculation Sheet C-1B*** of ***Attachment C***, flow depth and depth x velocity requirements are also satisfied at this location (14.7 cm and 0.210 m^2/s calculated maximums).

The curb cuts and downstream overland flow routes to Ponds 10 and 13 are sufficiently sized to convey the updated 100-year flows to the ponds, as shown in ***Calculation Sheets C-2A*** to ***C-2E*** of ***Attachment C***.

A 100-year intake is located on Carding Mill Trail downstream of a portion of Block 301 draining overland to the road, just north of the intersection of Carding Mill Trail with North Park Boulevard. The 100-year intake is required as per the August 2017 ***SWM Report*** due to grading constraints, as the spill elevation for the low point at this location is 30 cm above the catchbasin grate elevation. As shown in ***Calculation Sheet C-3A*** of ***Attachment C*** the catchbasin grates and lead pipes are sufficient to safely capture the 100-year flows at these locations, even under 40% blockage of catchbasin grates.

Minor System Performance

To provide flexibility for the mechanical design on Block 300 in the May 2023 memo (and Block 299 per the September 20, 2021 ***Phase 3 of the Preserve Lands / Impact of Proposed Condo Block 299 Design*** memo), a sensitivity test of 100-year minor system capture on the 0.63 ha area of Block 300 and 0.50 ha area of Block 299 serviced by internal storm networks was considered. This scenario would be more critical for the minor system hydraulic gradeline analysis, and has been carried forward in the current analysis to account for any uncertainty associated with the on-site minor system capture rates.

The minor system was analyzed for both free outfall and restrictive downstream conditions. Restrictive downstream conditions for Pond 10 were set at 166.25 m as per the Regional water level at Shannon's Creek cross-section 3800, as per the January 2016 ***Hydraulic Analysis of Shannon's Creek North of Dundas Street***. As this water level is below the permanent pool elevation, Pond 10 was modelled under free outfall conditions only. Restrictive downstream conditions for Pond 13 were set at 167.37 m as per the Regional water level at Munn's Creek cross-section 6749, as per the March 2016 ***Hydraulic Analysis of Munn's Creek North of Dundas Street***.

An XPSWMM model schematic and hydraulic simulation results are presented in Attachment B for the 100-year 24-hour Chicago storm. The 100-year flow will surcharge most parts of the minor system; however, for this analysis this is not critical since residential units with basements will be protected by sump pumps.

It may therefore be concluded based on the information available that the latest proposed design for Block 301 does not have a negative impact on the performance of the major and minor system for the downstream subdivision, as per the August 2017 ***Stormwater Management Report for Phase 3 of the Preserve Lands***.

As noted previously, the latest proposed design for Block 301 does not have a negative impact on the performance of Pond 13, as the drainage area and imperviousness has not increased from the May 2023 ***Block 300*** memo. The performance of Pond 10 with the added 0.070 ha contribution from Block 301 is presented below.

Pond 10 Performance

The operation of the SWM Facility was analyzed using the updated DDSWMM / SWMHYMO / XPSWMM models for the 2- to 100-year 24-hour Chicago design storms and the Regional event, in accordance with the May 2017 ***Design Brief*** and November 1, 2017 ***Addendum***. Note that no changes to the pond design have been made in the model subsequent to the November 1, 2017 ***Addendum***. The operating characteristics of the SWM Facility are summarized below in Table 2 for free outfall conditions.

Table 1: Summary of SWM Facility 10 Operating Characteristics (Free Outfall Conditions)

Pond Component	Pond Inflow [1] (m^3/s)	Lower Elevation (m)	Upper Elevation (m)	Allowable Release Rate [2] (m^3/s)	Pond Release Rate (m^3/s)	Volume Used [3] (m^3)
Permanent Pool	N/A	164.800	166.330	N/A	N/A	9671
Quality Control	N/A	166.330	166.434	N/A	0.014	1287
Extended Detention	N/A	166.434	166.510	N/A	0.021	2045
2yr/24hr Chicago	2.998	166.330	166.855	0.159	0.104	5701
5yr/24hr Chicago	4.644	166.855	167.043	0.254	0.185	7839
10yr/24hr Chicago	5.704	167.043	167.167	0.318	0.250	9287
25yr/24hr Chicago	7.554	167.167	167.334	0.413	0.333	11306
50yr/24hr Chicago	8.837	167.334	167.458	0.476	0.387	12851
100yr/24hr Chicago	10.014	167.458	167.575	0.508	0.430	14335
Regional	4.047	167.575	168.831	1.429	1.221	32319

[1] Pond inflow taken as a direct summation of major and minor flows to pond.
[2] Refer to Tables D-1, D-2 and D-8 of Attachment D for target release rates and volumes.
[3] Volumes are active storage only for all SWM facility components except the permanent pool.

With the as-built pond controls presented in Table D-5 of Attachment D, the above DDSWMM / SWMHYMO / XPSWMM results show that the actual provided release rates meet the targets established in the May 2017 ***Design Brief***. Note that the maximum Regional water level in the pond is 168.831 m; 3.1 cm higher than that reported in the November 1, 2017 ***Addendum***. A 0.3 m freeboard above this Regional pond level is provided to the top of berm around the pond and to all adjacent lots.

The SWM facility has been equipped with two sediment forebays in order to improve the pollutant removal by allowing the larger particles to settle out prior to entering the main cell of the SWM facility. Calculations for the minimum dispersion length, settling length and average velocity have been included in ***Calculation Sheets D-2*** and ***D-3*** of ***Attachment D***. The forebays have minimum length to width ratios of 2:1, and the total forebay area does not exceed one third of the permanent pool area, in accordance with the requirements of the ***SWMP Design Manual***. The average velocity of 0.17 m/s in the east forebay does not quite meet the average velocity requirement of 0.15 m/s for the 10-year design storm; however, this is consistent with the approved May 2017 ***Design Brief*** and November 1, 2017 ***Addendum***, and no changes to the forebay design are proposed.

The SWM facility has a permanent pool volume of 9,671 m^3, which is greater than the minimum permanent pool volume of 4,012 m^3 required by the ***SWMP Design Manual*** for enhanced protection for a wet pond for the 32.170 ha drainage area at 45% imperviousness, as calculated in ***Tables D-1*** and ***D-2*** of ***Attachment D***.

The required quality control volume of 1,287 m^3 (40 m^3/ha) for the 32.170 ha drainage area is contained within the extended detention volume at an elevation of 166.434 m, as calculated in ***Tables D-1*** to ***D-4*** of ***Attachment D***. The provided extended detention volume of 2,045 m^3 exceeds the required volume of 1,287 m^3.

In the event of a blockage or a storm greater than the Regional event, a 6.0 m wide emergency overflow weir has been provided for the pond at a crest elevation of 169.15 m. Assuming 100% blockage of the quality and quantity controls at the drop inlet structure, the maximum Regional water level in the pond is 169.531 m. The elevations of the top of berm and all lots adjacent to the pond are above this Regional pond level, and thus the water is contained within the pond and no homes will be flooded.

The 6.0 m wide emergency spillway downstream of the emergency overflow weir would convey the 2.226 m^3/s Regional outflow over the weir under 100% blockage at a flow depth of 22.4 cm and a velocity of 1.66 m/s for a 2.0% slope, and a flow depth of 9.5 cm and a velocity of 3.92 m/s for a 33.3% slope. Calculations are provided in Calculation Sheet D-1 of Attachment D.

Yours truly,
JFSA Canada Inc.





Laura Pipkins, P.Eng.
Senior Water Resources Engineer

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

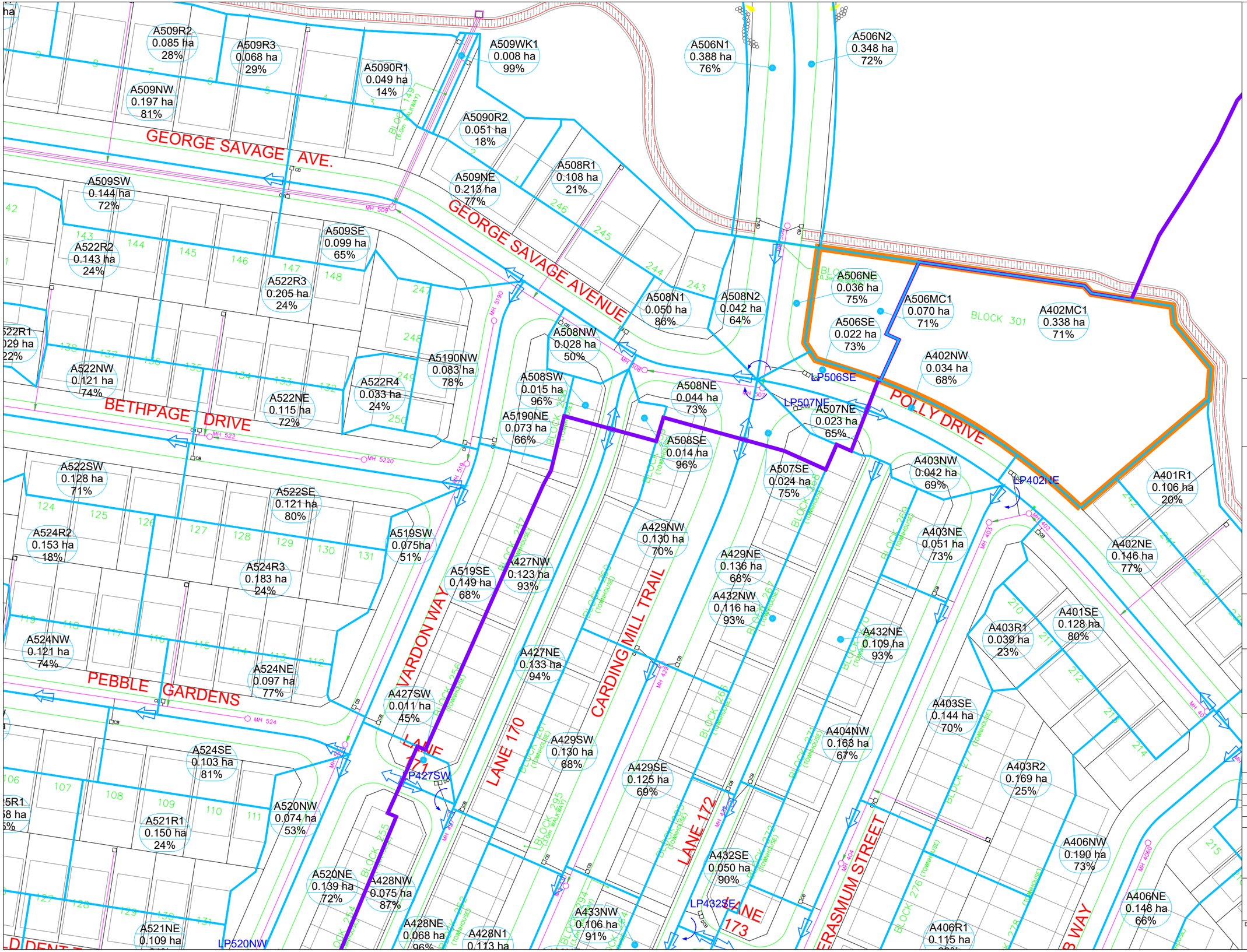
Attachment A: Major System Drainage Plan
Attachment B: XPSWMM Model Schematic; Pipe Data and Hydraulic Simulation Results
Attachment C: Major System Calculation Sheets
Attachment D: Pond 10 Controls – Quality, Extended Detention and Quantity

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Attachment A

Major System Drainage Plan



JFSA CANADA INC.
WATER RESOURCE ENGINEERING, ENVIRONMENTAL MANAGEMENT AND LAND PLANNING CONSULTANTS

CLIENT :

DSEL
david schaeffer engineering ltd
600 ALDEN ROAD., SUITE 606
MARKHAM, ONTARIO., L3R 0E7
(905) 475-3080

PROJECT :

PHASE 3 OF THE PRESERVE LANDS
NEIGHBOURHOOD CENTRE BLOCK 301

	BY	DATE	DESCRIPTION	BY

PROPOSED MAJOR SYSTEM

FIGURE A-1

DESIGNED:	
DRAWN:	LP
VERIFIED:	JFS
APPROVED:	JFS
DATE	PROJECT No.
Apr/26	643-07

DRAWING REF.
643-07\202602 Block 301\Design\CAD \JFSA Figures.dwg

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Attachment B

XPSWMM Model Schematic

Pipe Data and Hydraulic Simulation Results

Figure B-1: XPSWMM MODEL SCHEMATIC

JFSA Water Resources and Environmental Consultants

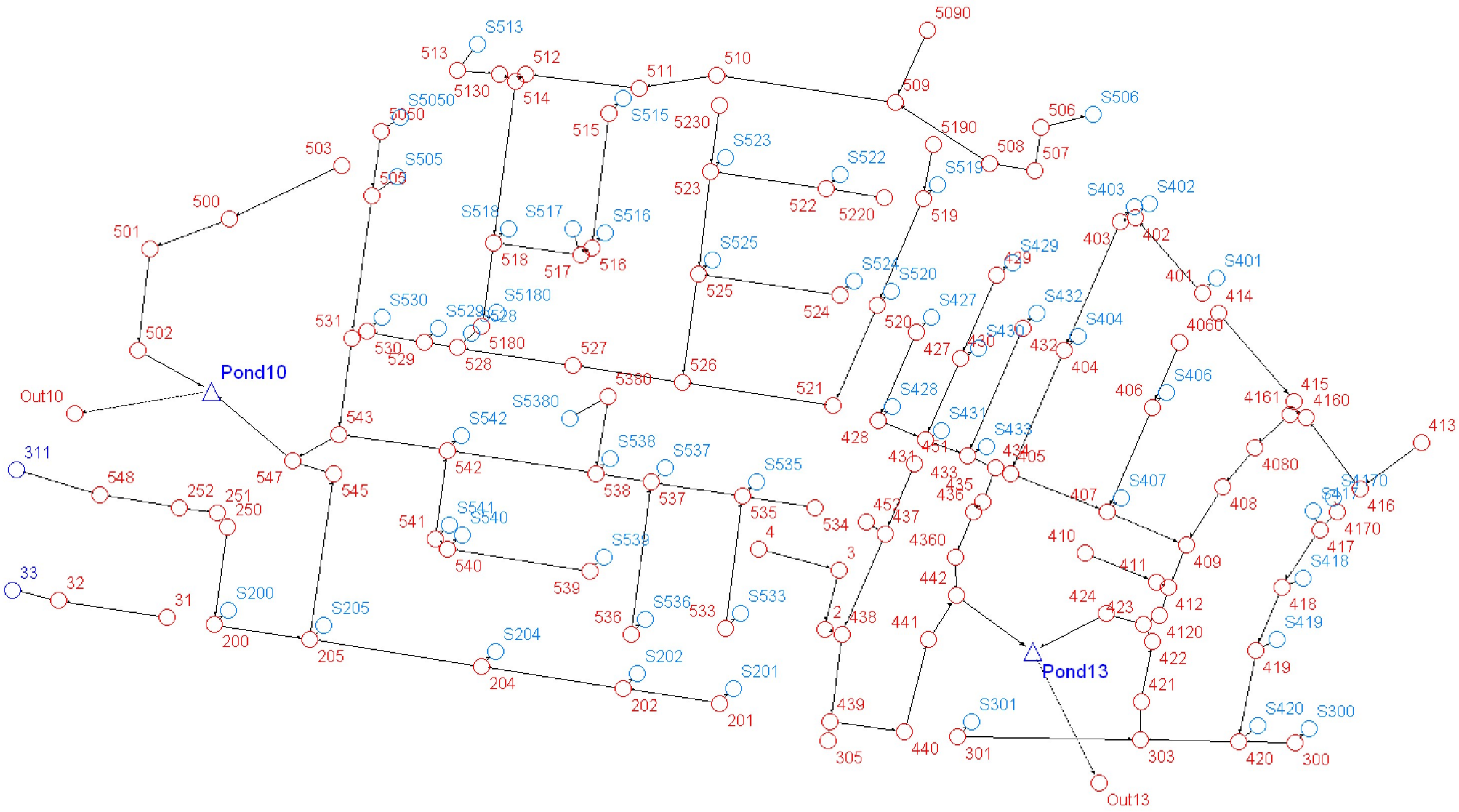


Table B-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Free Outfall Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
31	32	168.316	166.404	300	76.5	2.5	0.013	170.472	168.817	2.163	0.153	0.08	0.5	-0.143	7.950	168.473	166.561	1.999
32	33	166.329	165.570	375	33.0	2.3	0.013	168.817	168.143	2.408	0.266	0.18	0.7	-0.143	7.950	166.561	165.801	2.256
200	205	167.989	167.787	450	67.5	0.3	0.013	170.673	170.525	0.982	0.156	0.17	1.1	1.807	7.950	170.246	170.000	0.427
200	S200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
201	202	169.302	168.964	375	67.5	0.5	0.013	171.796	171.457	1.123	0.124	0.17	1.4	1.948	7.883	171.625	171.152	0.171
201	S201	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A	7.933	N/A	N/A	N/A
202	204	168.889	168.389	450	100.0	0.5	0.013	171.457	170.957	1.268	0.202	0.18	0.9	1.813	7.900	171.152	170.863	0.305
202	S202	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
204	205	168.314	167.712	525	120.5	0.5	0.013	170.957	170.525	1.405	0.304	0.45	1.5	2.024	7.900	170.863	170.000	0.094
204	S204	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.21	N/A	N/A	7.933	N/A	N/A	N/A
205	545	167.474	166.961	750	116.5	0.4	0.013	170.525	169.711	1.672	0.738	1.03	1.4	1.776	7.933	170.000	168.746	0.525
205	S205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
250	200	168.411	168.069	375	68.5	0.5	0.013	170.448	170.673	1.123	0.124	0.12	0.9	1.616	7.883	170.402	170.246	0.046
251	250	168.544	168.486	300	11.5	0.5	0.013	170.542	170.448	0.967	0.068	-0.16	-2.4	1.263	7.933	170.107	170.402	0.435
252	251	168.726	168.594	300	26.5	0.5	0.013	170.696	170.542	0.967	0.068	-0.16	-2.4	0.523	7.933	169.549	170.107	1.147
252	548	168.622	167.614	300	56.0	1.8	0.013	170.696	169.806	1.835	0.130	0.13	1.0	0.627	7.950	169.549	168.503	1.147
300	420	170.512	169.537	300	39.0	2.5	0.013	173.052	172.400	2.163	0.153	0.03	0.2	1.411	8.100	172.223	172.211	0.829
300	S300	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
301	303	168.397	168.079	525	127.0	0.3	0.013	170.717	170.856	0.993	0.215	0.25	1.1	1.479	7.933	170.401	169.932	0.316
301	S301	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	7.933	N/A	N/A	N/A
303	421	167.854	167.789	750	26.0	0.3	0.013	170.856	170.666	1.260	0.557	0.71	1.3	1.328	7.917	169.932	169.818	0.924
305	439	168.867	168.799	300	13.5	0.5	0.013	170.779	170.882	0.967	0.068	0.13	1.9	0.373	7.933	169.540	169.069	1.239
401	402	172.911	172.416	300	70.0	1.0	0.013	175.511	175.031	1.368	0.097	0.07	0.7	1.904	7.933	175.115	174.759	0.396
401	S401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.933	N/A	N/A	N/A
402	403	172.266	172.182	450	10.5	0.8	0.013	175.031	174.917	1.603	0.255	0.28	1.1	2.043	7.933	174.759	174.585	0.272
402	S402	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	N/A	N/A	7.933	N/A	N/A	N/A
403	404	172.107	171.229	525	97.5	0.9	0.013	174.917	173.967	1.885	0.408	0.38	0.9	1.953	7.933	174.585	173.841	0.332
403	S403	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	7.933	N/A	N/A	N/A
404	405	171.170	170.048	525	93.5	1.2	0.013	173.967	172.627	2.176	0.471	0.60	1.3	2.146	7.933	173.841	171.938	0.126
404	S404	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	7.933	N/A	N/A	N/A
405	407	169.968	169.461	600	72.5	0.7	0.013	172.627	172.336	1.817	0.514	0.62	1.2	1.370	7.933	171.938	171.373	0.689
406	407	170.796	169.611	450	79.0	1.5	0.013	173.548	172.336	2.196	0.349	0.47	1.3	2.183	7.917	173.429	171.373	0.119
406	S406	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	7.933	N/A	N/A	N/A
407	409	169.236	168.998	825	59.5	0.4	0.013	172.336	171.591	1.698	0.908	1.38	1.5	1.312	7.933	171.373	170.740	0.963
407	S407	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
408	409	169.227	168.823	1050	47.5	0.9	0.013	172.897	171.591	2.907	2.518	2.37	0.9	0.851	8.017	171.128	170.740	1.769
409	412	168.773	168.261	1050	32.0	1.6	0.013	171.591	171.364	3.989	3.454	3.51	1.0	0.917	8.017	170.740	170.183	0.851
410	411	169.737	169.149	300	53.5	1.1	0.013	171.873	171.292	1.435	0.101	0.04	0.4	0.542	7.917	170.579	170.549	1.294
411	412	168.999	168.684	300	9.5	3.5	0.013	171.292	171.364	2.559	0.181	0.14	0.8	1.250	7.950	170.549	170.183	0.743

Table B-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Free Outfall Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
412	4120	168.211	167.875	1050	21.0	1.6	0.013	171.364	171.081	3.989	3.454	3.69	1.1	0.922	8.017	170.183	169.441	1.181
413	416	172.211	171.158	825	54.0	2.0	0.013	174.090	173.865	3.750	2.004	2.12	1.1	2.127	8.017	175.163	172.968	N/A
414	415	172.756	171.156	300	80.0	2.0	0.013	175.071	174.565	1.935	0.137	0.14	1.0	-0.035	7.950	173.021	172.020	2.050
415	4161	171.076	170.838	300	9.5	2.5	0.013	174.565	174.263	2.163	0.153	0.14	0.9	0.644	7.950	172.020	171.887	2.545
416	4160	171.008	170.383	975	62.5	1.0	0.013	173.865	174.436	3.002	2.241	2.15	1.0	0.985	8.017	172.968	172.226	0.897
417	418	171.443	171.203	375	48.0	0.5	0.013	173.908	173.672	1.123	0.124	0.08	0.6	1.718	7.950	173.536	173.407	0.372
417	S417	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.933	N/A	N/A	N/A
418	419	171.153	170.678	375	47.5	1.0	0.013	173.672	173.380	1.587	0.175	0.11	0.6	1.879	8.133	173.407	173.320	0.265
418	S418	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.07	N/A	N/A	7.933	N/A	N/A	N/A
419	420	170.628	169.467	375	64.5	1.8	0.013	173.380	172.400	2.130	0.235	0.27	1.1	2.317	8.083	173.320	172.211	0.060
419	S419	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	N/A	7.933	N/A	N/A	N/A
420	303	169.387	168.154	450	68.5	1.8	0.013	172.400	170.856	2.405	0.383	0.49	1.3	2.374	7.917	172.211	169.932	0.189
420	S420	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.12	N/A	N/A	7.933	N/A	N/A	N/A
421	422	167.769	167.640	750	43.0	0.3	0.013	170.666	170.809	1.380	0.610	1.35	2.2	1.299	7.933	169.818	169.076	0.848
422	423	167.590	167.550	750	13.5	0.3	0.013	170.809	170.948	1.380	0.610	1.35	2.2	0.737	7.933	169.077	168.808	1.732
423	424	167.175	167.077	1500	28.0	0.4	0.013	170.948	171.000	2.367	4.182	4.77	1.1	0.133	8.000	168.808	168.564	2.140
424	Pond13	167.077	167.040	1500	10.5	0.4	0.013	171.000	171.000	2.367	4.182	4.77	1.1	-0.013	8.000	168.564	168.561	2.436
427	428	171.694	170.421	300	67.0	1.9	0.013	173.914	173.326	1.886	0.133	0.07	0.5	1.609	7.900	173.603	173.238	0.311
427	S427	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
428	431	170.341	170.075	375	35.5	0.8	0.013	173.326	173.299	1.375	0.152	0.26	1.7	2.522	7.883	173.238	172.982	0.088
428	S428	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.23	N/A	N/A	7.933	N/A	N/A	N/A
429	430	171.830	171.132	375	63.5	1.1	0.013	174.426	173.728	1.665	0.184	0.11	0.6	1.428	7.933	173.633	173.381	0.793
429	S429	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
430	431	171.112	170.075	375	61.0	1.7	0.013	173.728	173.299	2.070	0.229	0.13	0.6	1.894	7.933	173.381	172.982	0.347
430	S430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.933	N/A	N/A	N/A
431	433	169.922	169.676	525	31.5	0.8	0.013	173.299	173.078	1.755	0.380	0.37	1.0	2.535	8.050	172.982	172.823	0.317
431	S431	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
432	433	171.724	169.881	300	97.0	1.9	0.013	174.172	173.078	1.886	0.133	0.10	0.7	1.800	7.933	173.824	172.823	0.348
432	S432	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.933	N/A	N/A	N/A
433	434	169.656	169.355	525	21.5	1.4	0.013	173.078	172.525	2.351	0.509	0.67	1.3	2.642	8.000	172.823	171.856	0.255
433	S433	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.07	N/A	N/A	7.933	N/A	N/A	N/A
434	435	169.275	168.911	525	26.0	1.4	0.013	172.525	172.325	2.351	0.509	0.67	1.3	2.056	8.000	171.856	171.285	0.669
435	436	168.861	168.726	525	9.0	1.5	0.013	172.325	172.554	2.433	0.527	0.81	1.5	1.899	7.933	171.285	170.909	1.040
436	4360	168.676	168.174	525	33.5	1.5	0.013	172.554	171.778	2.433	0.527	0.80	1.5	1.708	7.933	170.909	169.669	1.645
437	438	169.721	169.037	375	76.0	0.9	0.013	172.072	171.193	1.506	0.166	0.24	1.4	0.696	7.950	170.792	169.399	1.280
438	439	168.587	168.279	825	61.5	0.5	0.013	171.193	170.882	1.899	1.015	0.85	0.8	-0.013	7.950	169.399	168.994	1.794
439	440	168.199	167.965	900	52.0	0.5	0.013	170.882	170.617	1.909	1.214	0.98	0.8	-0.105	7.950	168.994	168.634	1.888
440	441	167.869	167.601	900	67.0	0.4	0.013	170.617	170.881	1.800	1.145	0.95	0.8	-0.135	7.967	168.634	168.562	1.983
441	442	167.531	167.351	900	36.0	0.5	0.013	170.881	171.000	2.012	1.280	1.22	1.0	0.131	7.967	168.562	168.562	2.319

Table B-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Free Outfall Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
442	Pond13	167.051	167.030	1200	8.5	0.3	0.013	171.000	171.000	1.724	1.949	2.00	1.0	0.310	7.967	168.561	168.561	2.439
500	501	168.241	167.710	450	59.0	0.9	0.013	171.689	170.837	1.701	0.270	0.10	0.4	-0.229	8.033	168.462	168.317	3.227
501	502	167.660	166.666	450	71.0	1.4	0.013	170.837	169.650	2.121	0.337	0.33	1.0	0.207	7.983	168.317	167.581	2.520
502	Pond10	166.586	166.320	450	20.5	1.3	0.013	169.650	169.650	2.044	0.325	0.33	1.0	0.545	7.967	167.581	167.575	2.069
503	500	168.723	168.291	450	86.5	0.5	0.013	170.806	171.689	1.268	0.202	0.08	0.4	-0.255	8.050	168.918	168.484	1.888
505	531	168.277	167.777	525	100.0	0.5	0.013	171.063	170.173	1.405	0.304	0.42	1.4	1.725	7.917	170.527	169.720	0.536
505	S505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
506	507	172.543	172.371	450	30.5	0.4	0.013	175.578	174.928	1.134	0.180	0.33	1.8	2.261	8.000	175.254	174.625	0.324
506	S506	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	8.017	N/A	N/A	N/A
507	508	172.291	172.102	450	31.5	0.6	0.013	174.928	174.689	1.389	0.221	0.34	1.6	1.884	8.000	174.625	174.182	0.303
508	509	172.027	171.632	525	79.0	0.5	0.013	174.689	174.232	1.405	0.304	0.43	1.4	1.630	8.000	174.182	173.431	0.507
509	510	171.257	170.195	900	125.0	0.9	0.013	174.232	173.626	2.624	1.669	1.50	0.9	1.274	8.017	173.431	172.545	0.801
510	511	170.141	169.591	900	55.0	1.0	0.013	173.626	172.917	2.846	1.810	1.53	0.8	1.504	8.033	172.545	172.131	1.081
511	512	169.504	168.669	900	79.5	1.1	0.013	172.917	171.893	2.916	1.855	1.62	0.9	1.727	8.017	172.131	171.406	0.786
512	514	168.519	168.477	1050	8.5	0.5	0.013	171.893	171.582	2.230	1.931	1.66	0.9	1.837	8.033	171.406	171.302	0.487
513	5130	169.437	169.287	300	30.0	0.5	0.013	171.762	171.689	0.967	0.068	0.09	1.3	1.712	7.967	171.449	171.393	0.313
513	S513	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	8.000	N/A	N/A	N/A
514	518	168.427	167.803	1050	113.5	0.6	0.013	171.582	170.871	2.339	2.025	1.89	0.9	1.825	8.017	171.302	170.748	0.280
515	516	170.051	168.633	375	94.5	1.5	0.013	172.602	171.402	1.944	0.215	0.19	0.9	1.867	7.933	172.293	171.222	0.309
515	S515	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
516	517	168.583	168.455	375	8.5	1.5	0.013	171.402	171.306	1.944	0.215	0.13	0.6	2.264	8.083	171.222	171.194	0.180
516	S516	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.12	N/A	N/A	7.933	N/A	N/A	N/A
517	518	168.305	168.000	525	61.0	0.5	0.013	171.306	170.871	1.405	0.304	0.54	1.8	2.364	7.917	171.194	170.748	0.112
517	S517	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	7.967	N/A	N/A	N/A
518	5180	167.653	167.448	1200	58.5	0.4	0.013	170.871	170.666	2.039	2.307	2.13	0.9	1.895	8.067	170.748	170.539	0.123
518	S518	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	N/A	N/A	8.000	N/A	N/A	N/A
519	520	172.081	170.954	300	80.5	1.4	0.013	174.504	173.978	1.619	0.114	0.08	0.7	1.792	7.950	174.173	173.704	0.331
519	S519	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.950	N/A	N/A	N/A
520	521	170.879	170.119	375	76.0	1.0	0.013	173.978	172.956	1.587	0.175	0.22	1.2	2.449	7.983	173.703	172.480	0.275
520	S520	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	N/A	N/A	7.950	N/A	N/A	N/A
521	526	170.039	168.862	450	107.0	1.1	0.013	172.956	171.356	1.880	0.299	0.32	1.1	1.991	7.950	172.480	171.306	0.476
522	523	170.494	169.684	450	81.0	1.0	0.013	173.257	172.509	1.793	0.285	0.38	1.3	2.090	7.900	173.034	172.091	0.223
522	S522	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.31	N/A	N/A	7.933	N/A	N/A	N/A
523	525	169.604	169.172	525	72.0	0.6	0.013	172.509	171.932	1.539	0.333	0.35	1.1	1.962	7.900	172.091	171.735	0.418
523	S523	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
524	525	170.672	169.322	375	100.0	1.4	0.013	173.229	171.932	1.844	0.204	0.28	1.3	2.144	7.883	173.191	171.735	0.038
524	S524	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.27	N/A	N/A	7.933	N/A	N/A	N/A
525	526	169.022	168.642	675	76.0	0.5	0.013	171.932	171.356	1.661	0.594	0.91	1.5	2.038	7.900	171.735	171.306	0.197
525	S525	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.30	N/A	N/A	7.950	N/A	N/A	N/A

Table B-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Free Outfall Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
526	527	168.562	168.061	750	77.0	0.7	0.013	171.356	170.796	2.032	0.898	1.14	1.3	1.995	7.917	171.307	170.721	0.049
527	528	167.911	167.668	900	81.0	0.3	0.013	170.796	170.756	1.559	0.992	1.32	1.3	1.910	7.917	170.721	170.365	0.075
528	529	167.218	167.136	1350	23.5	0.4	0.013	170.756	170.634	2.206	3.158	3.46	1.1	1.797	8.067	170.365	170.267	0.391
528	S528	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	8.000	N/A	N/A	N/A
529	530	167.136	166.994	1350	40.5	0.4	0.013	170.634	170.473	2.206	3.158	3.86	1.2	1.781	8.033	170.267	169.967	0.367
529	S529	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	8.000	N/A	N/A	N/A
530	531	166.994	166.952	1350	12.0	0.4	0.013	170.473	170.173	2.206	3.158	3.86	1.2	1.623	8.033	169.967	169.720	0.506
530	S530	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
531	543	166.802	166.634	1500	67.0	0.3	0.013	170.173	169.688	2.000	3.534	4.21	1.2	1.418	8.033	169.720	169.296	0.453
533	535	169.027	168.657	375	92.5	0.4	0.013	171.636	171.372	1.004	0.111	0.19	1.7	2.043	7.900	171.445	171.012	0.191
533	S533	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.13	N/A	N/A	7.933	N/A	N/A	N/A
534	535	170.262	168.732	300	51.0	3.0	0.013	172.421	171.372	2.370	0.167	0.07	0.4	0.713	7.950	171.275	171.012	1.146
535	537	168.507	168.185	525	64.5	0.5	0.013	171.372	170.980	1.405	0.304	0.34	1.1	1.980	7.933	171.012	170.661	0.360
535	S535	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	7.950	N/A	N/A	N/A
536	537	168.611	168.185	525	106.5	0.4	0.013	171.348	170.980	1.256	0.272	0.44	1.6	2.051	7.900	171.187	170.661	0.161
536	S536	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.40	N/A	N/A	7.933	N/A	N/A	N/A
537	538	168.035	167.859	675	39.0	0.5	0.013	170.980	170.846	1.576	0.564	0.69	1.2	1.951	7.917	170.661	170.449	0.319
537	S537	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.950	N/A	N/A	N/A
538	542	167.709	167.427	825	104.5	0.3	0.013	170.846	170.262	1.395	0.746	1.06	1.4	1.915	7.917	170.449	169.968	0.397
538	S538	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
539	540	168.699	168.199	450	100.0	0.5	0.013	171.105	170.538	1.268	0.202	0.15	0.7	1.643	7.933	170.792	170.429	0.313
539	S539	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.933	N/A	N/A	N/A
540	541	168.149	168.088	450	11.0	0.6	0.013	170.538	170.437	1.329	0.211	0.14	0.6	1.830	8.083	170.429	170.430	0.109
540	S540	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	N/A	N/A	7.950	N/A	N/A	N/A
541	542	168.008	167.727	525	62.5	0.5	0.013	170.437	170.262	1.333	0.288	0.44	1.5	1.897	7.917	170.430	169.968	0.007
541	S541	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.29	N/A	N/A	7.950	N/A	N/A	N/A
542	543	167.277	167.109	975	76.5	0.2	0.013	170.262	169.688	1.408	1.051	2.03	1.9	1.716	7.917	169.968	169.296	0.294
542	S542	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	7.967	N/A	N/A	N/A
543	547	166.584	166.436	1500	37.0	0.4	0.013	169.688	169.650	2.530	4.471	6.64	1.5	1.212	8.000	169.296	168.454	0.392
545	547	166.875	166.755	750	30.0	0.4	0.013	169.711	169.650	1.594	0.704	1.02	1.4	1.121	7.950	168.746	168.454	0.965
547	Pond10	166.380	166.320	1500	12.0	0.5	0.013	169.650	169.650	2.829	4.998	7.58	1.5	0.574	7.967	168.454	167.694	1.196
548	311	167.564	166.100	300	61.0	2.4	0.013	169.806	168.584	2.119	0.150	0.18	1.2	0.639	7.950	168.503	166.400	1.303
4060	406	171.975	170.946	300	49.0	2.1	0.013	174.259	173.548	1.982	0.140	-0.06	-0.4	1.219	7.900	173.494	173.429	0.765
4080	408	169.722	169.302	975	35.0	1.2	0.013	173.589	172.897	3.288	2.455	2.31	0.9	0.827	8.017	171.524	171.128	2.065
4120	423	167.825	167.625	1050	12.5	1.6	0.013	171.081	170.948	3.989	3.454	3.69	1.1	0.566	8.017	169.441	168.808	1.640
4160	4161	170.333	170.213	975	12.0	1.0	0.013	174.436	174.263	3.002	2.241	2.15	1.0	0.918	8.017	172.226	171.887	2.210
4161	4080	170.163	169.772	975	34.0	1.2	0.013	174.263	173.589	3.219	2.403	2.25	0.9	0.749	8.017	171.887	171.524	2.376
4170	417	171.603	171.518	300	17.0	0.5	0.013	173.993	173.908	0.967	0.068	0.02	0.3	1.700	7.917	173.603	173.536	0.390
4170	S4170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A

Table B-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Free Outfall Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
4360	442	168.124	167.726	525	26.5	1.5	0.013	171.778	171.000	2.433	0.527	0.80	1.5	1.020	7.933	169.669	168.561	2.109
5050	505	168.742	168.427	375	45.0	0.7	0.013	171.289	171.063	1.328	0.147	0.35	2.4	2.160	7.900	171.277	170.527	0.012
5050	S5050	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.26	N/A	N/A	7.950	N/A	N/A	N/A
5090	509	171.640	171.337	900	55.0	0.6	0.013	173.460	174.232	2.110	1.343	0.90	0.7	1.118	8.183	173.658	173.431	N/A
5130	514	169.237	169.177	300	12.0	0.5	0.013	171.689	171.582	0.967	0.068	0.13	1.8	1.856	7.933	171.393	171.302	0.296
5180	528	167.448	167.368	1200	23.0	0.4	0.013	170.666	170.756	2.039	2.307	2.45	1.1	1.891	8.067	170.539	170.365	0.127
5180	S5180	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	N/A	N/A	8.000	N/A	N/A	N/A
5190	519	172.323	172.131	300	38.5	0.5	0.013	174.332	174.504	0.967	0.068	0.04	0.6	1.643	7.950	174.266	174.173	0.066
5220	522	171.464	170.644	300	41.0	2.0	0.013	173.520	173.257	1.935	0.137	-0.04	-0.3	1.304	7.883	173.068	173.034	0.452
5230	523	170.759	169.829	300	46.5	2.0	0.013	173.173	172.509	1.935	0.137	-0.04	-0.3	1.057	7.900	172.116	172.091	1.057
5380	538	168.504	168.234	300	54.0	0.5	0.013	171.028	170.846	0.967	0.068	0.18	2.6	2.171	7.883	170.975	170.449	0.053
5380	S5380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	N/A	7.933	N/A	N/A	N/A
Pond10	Out10	N/A	N/A	N/A	N/A	N/A	N/A	169.650	169.650	N/A	N/A	0.43	N/A	N/A	9.450	167.575	166.300	2.075
Pond13	Out13	N/A	N/A	N/A	N/A	N/A	N/A	171.000	171.000	N/A	N/A	0.60	N/A	N/A	9.167	168.561	166.980	2.439
451	437	170.688	169.796	300	52.5	1.7	0.013	172.941	172.072	1.784	0.126	0.02	0.1	-0.176	7.967	170.812	170.792	2.129
452	437	169.874	169.796	300	15.5	0.5	0.013	171.977	172.072	0.967	0.068	0.18	2.7	1.527	7.950	171.701	170.792	0.276
4	3	169.280	169.104	375	58.5	0.3	0.013	171.050	171.480	0.869	0.096	0.09	0.9	0.296	7.933	169.951	169.760	1.099
3	2	169.024	168.918	450	42.5	0.3	0.013	171.480	171.350	0.896	0.143	0.12	0.8	0.286	7.950	169.760	169.645	1.720
2	438	168.850	168.757	525	12.4	0.8	0.013	171.350	171.193	1.720	0.372	0.37	1.0	0.270	7.933	169.645	169.399	1.705

Note: [1] A negative surcharge implies that the pipe is not flowing full

Table B-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Restrictive Downstream Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
31	32	168.316	166.404	300	76.5	2.5	0.013	170.472	168.817	2.163	0.153	0.08	0.5	-0.143	7.950	168.473	166.561	1.999
32	33	166.329	165.570	375	33.0	2.3	0.013	168.817	168.143	2.408	0.266	0.18	0.7	-0.143	7.950	166.561	165.801	2.256
200	205	167.989	167.787	450	67.5	0.3	0.013	170.673	170.525	0.982	0.156	0.17	1.1	1.803	7.950	170.242	169.992	0.431
200	S200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
201	202	169.302	168.964	375	67.5	0.5	0.013	171.796	171.457	1.123	0.124	0.17	1.4	1.948	7.883	171.625	171.152	0.171
201	S201	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A	7.933	N/A	N/A	N/A
202	204	168.889	168.389	450	100.0	0.5	0.013	171.457	170.957	1.268	0.202	0.18	0.9	1.813	7.900	171.152	170.862	0.305
202	S202	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
204	205	168.314	167.712	525	120.5	0.5	0.013	170.957	170.525	1.405	0.304	0.45	1.5	2.023	7.900	170.862	169.992	0.095
204	S204	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.21	N/A	N/A	7.933	N/A	N/A	N/A
205	545	167.474	166.961	750	116.5	0.4	0.013	170.525	169.711	1.672	0.738	1.04	1.4	1.768	7.933	169.992	168.741	0.533
205	S205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
250	200	168.411	168.069	375	68.5	0.5	0.013	170.448	170.673	1.123	0.124	0.12	0.9	1.615	7.883	170.401	170.242	0.047
251	250	168.544	168.486	300	11.5	0.5	0.013	170.542	170.448	0.967	0.068	-0.17	-2.4	1.261	7.933	170.105	170.401	0.437
252	251	168.726	168.594	300	26.5	0.5	0.013	170.696	170.542	0.967	0.068	-0.16	-2.4	0.522	7.933	169.548	170.105	1.148
252	548	168.622	167.614	300	56.0	1.8	0.013	170.696	169.806	1.835	0.130	0.13	1.0	0.626	7.950	169.548	168.502	1.148
300	420	170.512	169.537	300	39.0	2.5	0.013	173.052	172.400	2.163	0.153	0.03	0.2	1.411	8.100	172.223	172.211	0.829
300	S300	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
301	303	168.397	168.079	525	127.0	0.3	0.013	170.717	170.856	0.993	0.215	0.25	1.1	1.479	7.933	170.401	169.934	0.316
301	S301	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	7.933	N/A	N/A	N/A
303	421	167.854	167.789	750	26.0	0.3	0.013	170.856	170.666	1.260	0.557	0.71	1.3	1.330	7.917	169.934	169.819	0.922
305	439	168.867	168.799	300	13.5	0.5	0.013	170.779	170.882	0.967	0.068	0.13	1.9	0.373	7.933	169.540	169.069	1.239
401	402	172.911	172.416	300	70.0	1.0	0.013	175.511	175.031	1.368	0.097	0.06	0.6	1.955	7.950	175.166	174.821	0.345
401	S401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	7.917	N/A	N/A	N/A
402	403	172.266	172.182	450	10.5	0.8	0.013	175.031	174.917	1.603	0.255	0.30	1.2	2.105	7.933	174.821	174.614	0.210
402	S402	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.11	N/A	N/A	7.933	N/A	N/A	N/A
403	404	172.107	171.229	525	97.5	0.9	0.013	174.917	173.967	1.885	0.408	0.39	1.0	1.982	7.933	174.614	173.849	0.303
403	S403	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
404	405	171.170	170.048	525	93.5	1.2	0.013	173.967	172.627	2.176	0.471	0.61	1.3	2.154	7.917	173.849	171.951	0.118
404	S404	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	N/A	N/A	7.933	N/A	N/A	N/A
405	407	169.968	169.461	600	72.5	0.7	0.013	172.627	172.336	1.817	0.514	0.62	1.2	1.383	7.917	171.951	171.380	0.676
406	407	170.796	169.611	450	79.0	1.5	0.013	173.548	172.336	2.196	0.349	0.47	1.3	2.190	7.917	173.436	171.380	0.112
406	S406	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	7.933	N/A	N/A	N/A
407	409	169.236	168.998	825	59.5	0.4	0.013	172.336	171.591	1.698	0.908	1.38	1.5	1.319	7.933	171.380	170.745	0.956
407	S407	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
408	409	169.227	168.823	1050	47.5	0.9	0.013	172.897	171.591	2.907	2.518	2.37	0.9	0.856	8.017	171.133	170.745	1.764
409	412	168.773	168.261	1050	32.0	1.6	0.013	171.591	171.364	3.989	3.454	3.51	1.0	0.922	8.017	170.745	170.186	0.846
410	411	169.737	169.149	300	53.5	1.1	0.013	171.873	171.292	1.435	0.101	0.04	0.4	0.547	7.917	170.584	170.553	1.289
411	412	168.999	168.684	300	9.5	3.5	0.013	171.292	171.364	2.559	0.181	0.14	0.8	1.254	7.950	170.553	170.186	0.739

Table B-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Restrictive Downstream Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
412	4120	168.211	167.875	1050	21.0	1.6	0.013	171.364	171.081	3.989	3.454	3.69	1.1	0.925	8.017	170.186	169.444	1.178
413	416	172.211	171.158	825	54.0	2.0	0.013	174.090	173.865	3.750	2.004	2.12	1.1	2.131	8.017	175.167	172.972	N/A
414	415	172.756	171.156	300	80.0	2.0	0.013	175.071	174.565	1.935	0.137	0.14	1.0	-0.035	7.950	173.021	172.024	2.050
415	4161	171.076	170.838	300	9.5	2.5	0.013	174.565	174.263	2.163	0.153	0.14	0.9	0.648	7.950	172.024	171.892	2.541
416	4160	171.008	170.383	975	62.5	1.0	0.013	173.865	174.436	3.002	2.241	2.15	1.0	0.989	8.017	172.972	172.231	0.893
417	418	171.443	171.203	375	48.0	0.5	0.013	173.908	173.672	1.123	0.124	0.08	0.6	1.719	7.950	173.537	173.407	0.371
417	S417	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.933	N/A	N/A	N/A
418	419	171.153	170.678	375	47.5	1.0	0.013	173.672	173.380	1.587	0.175	0.11	0.6	1.879	8.133	173.407	173.320	0.265
418	S418	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.07	N/A	N/A	7.933	N/A	N/A	N/A
419	420	170.628	169.467	375	64.5	1.8	0.013	173.380	172.400	2.130	0.235	0.27	1.1	2.317	8.083	173.320	172.211	0.060
419	S419	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	N/A	7.933	N/A	N/A	N/A
420	303	169.387	168.154	450	68.5	1.8	0.013	172.400	170.856	2.405	0.383	0.49	1.3	2.374	7.917	172.211	169.934	0.189
420	S420	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.12	N/A	N/A	7.933	N/A	N/A	N/A
421	422	167.769	167.640	750	43.0	0.3	0.013	170.666	170.809	1.380	0.610	1.35	2.2	1.300	7.933	169.819	169.077	0.847
422	423	167.590	167.550	750	13.5	0.3	0.013	170.809	170.948	1.380	0.610	1.35	2.2	0.737	7.933	169.077	168.809	1.732
423	424	167.175	167.077	1500	28.0	0.4	0.013	170.948	171.000	2.367	4.182	4.78	1.1	0.134	8.000	168.809	168.583	2.139
424	Pond13	167.077	167.040	1500	10.5	0.4	0.013	171.000	171.000	2.367	4.182	4.78	1.1	0.006	8.000	168.583	168.581	2.417
427	428	171.694	170.421	300	67.0	1.9	0.013	173.914	173.326	1.886	0.133	0.07	0.5	1.609	7.900	173.603	173.238	0.311
427	S427	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
428	431	170.341	170.075	375	35.5	0.8	0.013	173.326	173.299	1.375	0.152	0.26	1.7	2.522	7.883	173.238	172.982	0.088
428	S428	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.23	N/A	N/A	7.933	N/A	N/A	N/A
429	430	171.830	171.132	375	63.5	1.1	0.013	174.426	173.728	1.665	0.184	0.11	0.6	1.428	7.933	173.633	173.381	0.793
429	S429	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
430	431	171.112	170.075	375	61.0	1.7	0.013	173.728	173.299	2.070	0.229	0.13	0.6	1.894	7.933	173.381	172.982	0.347
430	S430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.933	N/A	N/A	N/A
431	433	169.922	169.676	525	31.5	0.8	0.013	173.299	173.078	1.755	0.380	0.37	1.0	2.535	8.050	172.982	172.823	0.317
431	S431	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
432	433	171.724	169.881	300	97.0	1.9	0.013	174.172	173.078	1.886	0.133	0.10	0.7	1.800	7.933	173.824	172.823	0.348
432	S432	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.933	N/A	N/A	N/A
433	434	169.656	169.355	525	21.5	1.4	0.013	173.078	172.525	2.351	0.509	0.67	1.3	2.642	8.000	172.823	171.857	0.255
433	S433	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.07	N/A	N/A	7.933	N/A	N/A	N/A
434	435	169.275	168.911	525	26.0	1.4	0.013	172.525	172.325	2.351	0.509	0.67	1.3	2.057	8.000	171.857	171.286	0.668
435	436	168.861	168.726	525	9.0	1.5	0.013	172.325	172.554	2.433	0.527	0.80	1.5	1.900	7.933	171.286	170.910	1.039
436	4360	168.676	168.174	525	33.5	1.5	0.013	172.554	171.778	2.433	0.527	0.80	1.5	1.709	7.933	170.910	169.669	1.644
437	438	169.721	169.037	375	76.0	0.9	0.013	172.072	171.193	1.506	0.166	0.24	1.4	0.697	7.950	170.793	169.399	1.279
438	439	168.587	168.279	825	61.5	0.5	0.013	171.193	170.882	1.899	1.015	0.85	0.8	-0.013	7.950	169.399	168.994	1.794
439	440	168.199	167.965	900	52.0	0.5	0.013	170.882	170.617	1.909	1.214	0.98	0.8	-0.105	7.950	168.994	168.634	1.888
440	441	167.869	167.601	900	67.0	0.4	0.013	170.617	170.881	1.800	1.145	0.95	0.8	-0.135	7.967	168.634	168.581	1.983
441	442	167.531	167.351	900	36.0	0.5	0.013	170.881	171.000	2.012	1.280	1.22	1.0	0.150	7.967	168.581	168.582	2.300

Table B-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Restrictive Downstream Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
442	Pond13	167.051	167.030	1200	8.5	0.3	0.013	171.000	171.000	1.724	1.949	2.00	1.0	0.330	7.967	168.581	168.581	2.419
500	501	168.241	167.710	450	59.0	0.9	0.013	171.689	170.837	1.701	0.270	0.10	0.4	-0.229	8.033	168.462	168.317	3.227
501	502	167.660	166.666	450	71.0	1.4	0.013	170.837	169.650	2.121	0.337	0.33	1.0	0.207	7.983	168.317	167.576	2.520
502	Pond10	166.586	166.320	450	20.5	1.3	0.013	169.650	169.650	2.044	0.325	0.33	1.0	0.540	7.967	167.576	167.571	2.074
503	500	168.723	168.291	450	86.5	0.5	0.013	170.806	171.689	1.268	0.202	0.08	0.4	-0.255	8.050	168.918	168.484	1.888
505	531	168.277	167.777	525	100.0	0.5	0.013	171.063	170.173	1.405	0.304	0.42	1.4	1.724	7.917	170.526	169.707	0.537
505	S505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
506	507	172.543	172.371	450	30.5	0.4	0.013	175.578	174.928	1.134	0.180	0.32	1.8	2.212	8.017	175.205	174.593	0.373
506	S506	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	8.017	N/A	N/A	N/A
507	508	172.291	172.102	450	31.5	0.6	0.013	174.928	174.689	1.389	0.221	0.33	1.5	1.852	8.033	174.593	174.159	0.335
508	509	172.027	171.632	525	79.0	0.5	0.013	174.689	174.232	1.405	0.304	0.42	1.4	1.607	8.033	174.159	173.421	0.530
509	510	171.257	170.195	900	125.0	0.9	0.013	174.232	173.626	2.624	1.669	1.49	0.9	1.264	8.033	173.421	172.538	0.811
510	511	170.141	169.591	900	55.0	1.0	0.013	173.626	172.917	2.846	1.810	1.53	0.8	1.497	8.033	172.538	172.125	1.088
511	512	169.504	168.669	900	79.5	1.1	0.013	172.917	171.893	2.916	1.855	1.61	0.9	1.721	8.033	172.125	171.394	0.792
512	514	168.519	168.477	1050	8.5	0.5	0.013	171.893	171.582	2.230	1.931	1.66	0.9	1.825	8.033	171.394	171.292	0.499
513	5130	169.437	169.287	300	30.0	0.5	0.013	171.762	171.689	0.967	0.068	0.09	1.3	1.708	7.950	171.445	171.374	0.317
513	S513	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	8.000	N/A	N/A	N/A
514	518	168.427	167.803	1050	113.5	0.6	0.013	171.582	170.871	2.339	2.025	1.88	0.9	1.815	8.033	171.292	170.741	0.290
515	516	170.051	168.633	375	94.5	1.5	0.013	172.602	171.402	1.944	0.215	0.19	0.9	1.866	7.933	172.292	171.221	0.310
515	S515	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	N/A	7.933	N/A	N/A	N/A
516	517	168.583	168.455	375	8.5	1.5	0.013	171.402	171.306	1.944	0.215	0.13	0.6	2.263	7.917	171.221	171.194	0.181
516	S516	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.12	N/A	N/A	7.967	N/A	N/A	N/A
517	518	168.305	168.000	525	61.0	0.5	0.013	171.306	170.871	1.405	0.304	0.55	1.8	2.364	7.917	171.194	170.741	0.112
517	S517	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	7.967	N/A	N/A	N/A
518	5180	167.653	167.448	1200	58.5	0.4	0.013	170.871	170.666	2.039	2.307	2.11	0.9	1.888	8.067	170.741	170.533	0.130
518	S518	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	8.017	N/A	N/A	N/A
519	520	172.081	170.954	300	80.5	1.4	0.013	174.504	173.978	1.619	0.114	0.08	0.7	1.791	7.950	174.172	173.704	0.332
519	S519	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.950	N/A	N/A	N/A
520	521	170.879	170.119	375	76.0	1.0	0.013	173.978	172.956	1.587	0.175	0.22	1.2	2.450	7.983	173.704	172.477	0.274
520	S520	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.05	N/A	N/A	7.950	N/A	N/A	N/A
521	526	170.039	168.862	450	107.0	1.1	0.013	172.956	171.356	1.880	0.299	0.32	1.1	1.988	7.950	172.477	171.302	0.479
522	523	170.494	169.684	450	81.0	1.0	0.013	173.257	172.509	1.793	0.285	0.38	1.3	2.087	7.900	173.031	172.089	0.226
522	S522	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.31	N/A	N/A	7.933	N/A	N/A	N/A
523	525	169.604	169.172	525	72.0	0.6	0.013	172.509	171.932	1.539	0.333	0.35	1.1	1.960	7.900	172.089	171.733	0.420
523	S523	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
524	525	170.672	169.322	375	100.0	1.4	0.013	173.229	171.932	1.844	0.204	0.28	1.3	2.142	7.883	173.189	171.733	0.040
524	S524	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.27	N/A	N/A	7.933	N/A	N/A	N/A
525	526	169.022	168.642	675	76.0	0.5	0.013	171.932	171.356	1.661	0.594	0.91	1.5	2.036	7.900	171.733	171.302	0.199
525	S525	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.30	N/A	N/A	7.950	N/A	N/A	N/A

Table B-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Restrictive Downstream Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
526	527	168.562	168.061	750	77.0	0.7	0.013	171.356	170.796	2.032	0.898	1.14	1.3	1.990	7.917	171.302	170.711	0.054
527	528	167.911	167.668	900	81.0	0.3	0.013	170.796	170.756	1.559	0.992	1.32	1.3	1.900	7.917	170.711	170.359	0.085
528	529	167.218	167.136	1350	23.5	0.4	0.013	170.756	170.634	2.206	3.158	3.46	1.1	1.791	8.067	170.359	170.261	0.397
528	S528	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	8.000	N/A	N/A	N/A
529	530	167.136	166.994	1350	40.5	0.4	0.013	170.634	170.473	2.206	3.158	3.86	1.2	1.775	8.033	170.261	169.961	0.373
529	S529	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	8.000	N/A	N/A	N/A
530	531	166.994	166.952	1350	12.0	0.4	0.013	170.473	170.173	2.206	3.158	3.86	1.2	1.617	8.033	169.961	169.707	0.512
530	S530	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A
531	543	166.802	166.634	1500	67.0	0.3	0.013	170.173	169.688	2.000	3.534	4.21	1.2	1.405	8.033	169.707	169.293	0.466
533	535	169.027	168.657	375	92.5	0.4	0.013	171.636	171.372	1.004	0.111	0.19	1.7	2.044	7.900	171.446	171.010	0.190
533	S533	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.13	N/A	N/A	7.933	N/A	N/A	N/A
534	535	170.262	168.732	300	51.0	3.0	0.013	172.421	171.372	2.370	0.167	0.07	0.4	0.716	7.950	171.278	171.010	1.143
535	537	168.507	168.185	525	64.5	0.5	0.013	171.372	170.980	1.405	0.304	0.34	1.1	1.978	7.933	171.010	170.657	0.362
535	S535	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	7.950	N/A	N/A	N/A
536	537	168.611	168.185	525	106.5	0.4	0.013	171.348	170.980	1.256	0.272	0.44	1.6	2.050	7.900	171.186	170.657	0.162
536	S536	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.40	N/A	N/A	7.933	N/A	N/A	N/A
537	538	168.035	167.859	675	39.0	0.5	0.013	170.980	170.846	1.576	0.564	0.70	1.2	1.947	7.917	170.657	170.447	0.323
537	S537	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	7.950	N/A	N/A	N/A
538	542	167.709	167.427	825	104.5	0.3	0.013	170.846	170.262	1.395	0.746	1.06	1.4	1.913	7.917	170.447	169.964	0.399
538	S538	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.950	N/A	N/A	N/A
539	540	168.699	168.199	450	100.0	0.5	0.013	171.105	170.538	1.268	0.202	0.15	0.7	1.640	7.933	170.789	170.424	0.316
539	S539	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	7.933	N/A	N/A	N/A
540	541	168.149	168.088	450	11.0	0.6	0.013	170.538	170.437	1.329	0.211	0.14	0.6	1.825	8.083	170.424	170.425	0.114
540	S540	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	N/A	N/A	7.950	N/A	N/A	N/A
541	542	168.008	167.727	525	62.5	0.5	0.013	170.437	170.262	1.333	0.288	0.44	1.5	1.892	7.917	170.425	169.964	0.012
541	S541	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.29	N/A	N/A	7.950	N/A	N/A	N/A
542	543	167.277	167.109	975	76.5	0.2	0.013	170.262	169.688	1.408	1.051	2.03	1.9	1.712	7.917	169.964	169.293	0.298
542	S542	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	7.967	N/A	N/A	N/A
543	547	166.584	166.436	1500	37.0	0.4	0.013	169.688	169.650	2.530	4.471	6.63	1.5	1.208	8.000	169.292	168.452	0.396
545	547	166.875	166.755	750	30.0	0.4	0.013	169.711	169.650	1.594	0.704	1.02	1.4	1.116	7.950	168.741	168.452	0.970
547	Pond10	166.380	166.320	1500	12.0	0.5	0.013	169.650	169.650	2.829	4.998	7.58	1.5	0.572	7.967	168.452	167.693	1.198
548	311	167.564	166.100	300	61.0	2.4	0.013	169.806	168.584	2.119	0.150	0.18	1.2	0.638	7.950	168.502	166.400	1.304
4060	406	171.975	170.946	300	49.0	2.1	0.013	174.259	173.548	1.982	0.140	-0.06	-0.4	1.211	7.900	173.486	173.436	0.773
4080	408	169.722	169.302	975	35.0	1.2	0.013	173.589	172.897	3.288	2.455	2.31	0.9	0.832	8.017	171.529	171.133	2.060
4120	423	167.825	167.625	1050	12.5	1.6	0.013	171.081	170.948	3.989	3.454	3.69	1.1	0.569	8.017	169.444	168.809	1.637
4160	4161	170.333	170.213	975	12.0	1.0	0.013	174.436	174.263	3.002	2.241	2.15	1.0	0.923	8.017	172.231	171.892	2.205
4161	4080	170.163	169.772	975	34.0	1.2	0.013	174.263	173.589	3.219	2.403	2.25	0.9	0.754	8.017	171.892	171.529	2.371
4170	417	171.603	171.518	300	17.0	0.5	0.013	173.993	173.908	0.967	0.068	0.02	0.3	1.700	7.917	173.603	173.537	0.390
4170	S4170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	0.000	N/A	N/A	N/A

Table B-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour Chicago Storm (Restrictive Downstream Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Freeboard U/S HGL and MH Cover (m)
4360	442	168.124	167.726	525	26.5	1.5	0.013	171.778	171.000	2.433	0.527	0.80	1.5	1.020	7.933	169.669	168.581	2.109
5050	505	168.742	168.427	375	45.0	0.7	0.013	171.289	171.063	1.328	0.147	0.35	2.4	2.157	7.900	171.274	170.526	0.015
5050	S5050	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.27	N/A	N/A	7.950	N/A	N/A	N/A
5090	509	171.640	171.337	900	55.0	0.6	0.013	173.460	174.232	2.110	1.343	0.90	0.7	1.106	8.183	173.646	173.421	N/A
5130	514	169.237	169.177	300	12.0	0.5	0.013	171.689	171.582	0.967	0.068	0.13	1.9	1.837	7.933	171.374	171.292	0.315
5180	528	167.448	167.368	1200	23.0	0.4	0.013	170.666	170.756	2.039	2.307	2.44	1.1	1.885	8.067	170.533	170.359	0.133
5180	S5180	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	8.000	N/A	N/A	N/A
5190	519	172.323	172.131	300	38.5	0.5	0.013	174.332	174.504	0.967	0.068	0.04	0.6	1.646	7.950	174.269	174.172	0.063
5220	522	171.464	170.644	300	41.0	2.0	0.013	173.520	173.257	1.935	0.137	-0.04	-0.3	1.304	7.883	173.068	173.031	0.452
5230	523	170.759	169.829	300	46.5	2.0	0.013	173.173	172.509	1.935	0.137	-0.04	-0.3	1.055	7.900	172.114	172.089	1.059
5380	538	168.504	168.234	300	54.0	0.5	0.013	171.028	170.846	0.967	0.068	0.18	2.6	2.169	7.883	170.973	170.447	0.055
5380	S5380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	N/A	7.933	N/A	N/A	N/A
Pond10	Out10	N/A	N/A	N/A	N/A	N/A	N/A	169.650	169.650	N/A	N/A	0.43	N/A	N/A	9.467	167.571	166.300	2.079
Pond13	Out13	N/A	N/A	N/A	N/A	N/A	N/A	171.000	171.000	N/A	N/A	0.59	N/A	N/A	9.183	168.581	166.980	2.419
451	437	170.688	169.796	300	52.5	1.7	0.013	172.941	172.072	1.784	0.126	0.02	0.1	-0.175	7.967	170.813	170.793	2.128
452	437	169.874	169.796	300	15.5	0.5	0.013	171.977	172.072	0.967	0.068	0.18	2.7	1.529	7.950	171.703	170.793	0.274
4	3	169.280	169.104	375	58.5	0.3	0.013	171.050	171.480	0.869	0.096	0.09	0.9	0.296	7.933	169.951	169.760	1.099
3	2	169.024	168.918	450	42.5	0.3	0.013	171.480	171.350	0.896	0.143	0.12	0.8	0.286	7.950	169.760	169.646	1.720
2	438	168.850	168.757	525	12.4	0.8	0.013	171.350	171.193	1.720	0.372	0.37	1.0	0.271	7.933	169.646	169.399	1.704

Note: [1] A negative surcharge implies that the pipe is not flowing full

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Attachment C

Major System Calculation Sheets

Calculation Sheet C-1A: Flow Depth and Spread at Location with Highest Peak Flow on a Typical Street

Sub-catchment(s)		A529NE and A529SE	Comment
Location		Harold Dent Trail	8.5 m wide road
Q_{A529NE}		1.084	
Q_{A529SE}		0.149	
$Q_{combined}$ [2]		1.233	for 100-year event
Tr	(m)	4.250	8.5 m wide road
So	(m/m)	0.005	
W	(m)	0.000	
Sw	(m/m)	0.000	
T	(m)	5.771	
Sx	(m/m)	0.03	
n_{road}		0.013	
dc	(m)	0.15	
Se	(m/m)	0.025	
$n_{shoulder}$		0.025	
dw	(m)	0.000	
Ts	(m)	5.771	
ds	(m)	0.173	
d	(m)	0.173	
d_{crown}	(m)	**0.127**	
dd	(m)	**0.046**	dd < 0.15 m, the max. depth over road crown of an arterial road
de	(m)	**0.023**	
Te	**(m)**	**0.925**	Flow is contained within ROW
$Q_{area(A+B)}$	(m^3/s)	0.000	
$Q_{area(B)}$	(m^3/s)	0.000	
$Q_{area(A)}$	(m^3/s)	0.000	
$Q_{area(B+C+D)}$	(m^3/s)	0.633	
$Q_{area(D)}$	(m^3/s)	0.018	
$Q_{area(B+C)}$	(m^3/s)	0.615	
$Q_{area(E)}$	(m^3/s)	0.002	
$Q_{area(A+B+C+E)}$	(m^3/s)	0.616	
$Q_{two\ sides}$	**(m^3/s)**	**1.233**	
d_{Flow} [3]	(m)	0.173	d_{flow} < 0.30 m, the maximum allowable depth of flow
$A_{flow\ two\ sides}$	(m^2)	0.951	
v	(m/s)	1.296	
v×d	**(m^2/s)**	**0.224**	v×d < 0.65 m^2/s

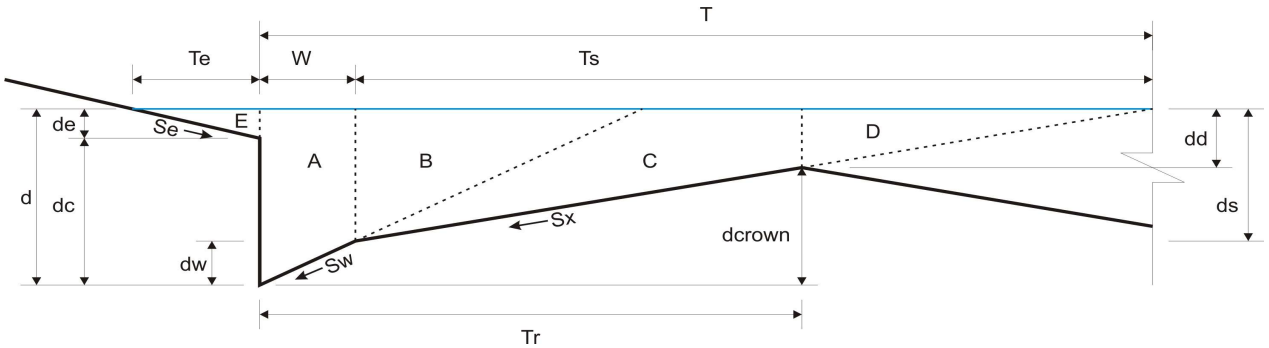
Notes:

[1] 100-year flow from DDSWMM model (Chicago storm).

[2] The computations assume that the total incoming flow is equally divided on both sides on the road.

[3] Computations based on methodology described in MTO Drainage Management Manual, 1997, Ch.4, pp. 59-60.

So is the longitudinal road slope



Equations:

$Q_{area(A+B)} = 0.375 \times So^{0.5} \times d^{2.667} / (n_{road} \times Sw)$

$Q_{area(B)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sw)$

$Q_{area(B+C+D)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sx)$

$Q_{area(D)} = 0.375 \times So^{0.5} \times (dd)^{2.667} / (n_{road} \times Sx)$

$Q_{area(E)} = 0.375 \times So^{0.5} \times (de)^{2.667} / (n_{shoulder} \times Se)$

Calculation Sheet C-1B: Flow Depth and Spread at Location with Highest Peak Flow on Lane 174

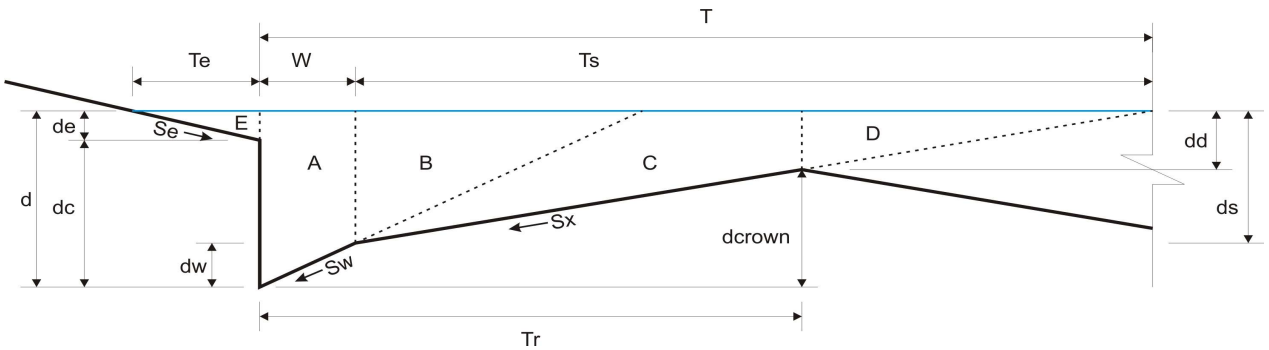
Sub-catchment(s)		A435NE	Comment
Location		Lane 174	6.0 m wide road, sloped to the west side (no crown)
Q_{A434NE}		0.748	for 100-year event
Tr	(m)	6.000	6.0 m wide road, sloped to the west side (no crown)
So	(m/m)	0.0075	
W	(m)	0.000	
Sw	(m/m)	0.000	
T	(m)	7.373	
Sx	(m/m)	0.02	
n_{road}		0.013	
dc	(m)	0.15	
Se	(m/m)	0.027	
$n_{shoulder}$		0.025	
dw	(m)	0.000	
Ts	(m)	7.373	
ds	(m)	0.147	
d	(m)	0.147	
d_{crown}	(m)	**0.120**	
dd	(m)	**0.027**	dd < 0.121 m, the maximum allowable depth of flow at the east side of the road
de	(m)	**0.000**	
Te	**(m)**	**0.000**	Flow is contained within ROW
$Q_{area(A+B)}$	(m^3/s)	0.000	
$Q_{area(B)}$	(m^3/s)	0.000	
$Q_{area(A)}$	(m^3/s)	0.000	
$Q_{area(B+C+D)}$	(m^3/s)	0.758	
$Q_{area(D)}$	(m^3/s)	0.009	
$Q_{area(B+C)}$	(m^3/s)	0.749	
$Q_{area(E)}$	(m^3/s)	0.000	
$Q_{area(A+B+C+E)}$	(m^3/s)	0.749	
Q_{total}	**(m^3/s)**	**0.749**	
d_{Flow} [2]	(m)	0.147	d_{flow} < 0.164 m, the maximum allowable depth of flow at the west side of the road
A_{flow}	(m^2)	0.525	
v	(m/s)	1.427	
v×d	**(m^2/s)**	**0.210**	v×d < 0.65 m^2/s

Notes:

[1] 100-year flow from DDSWMM model (Chicago storm).

[2] Computations based on methodology described in MTO Drainage Management Manual, 1997, Ch.4, pp. 59-60.

So is the longitudinal road slope



Equations:

$Q_{area(A+B)} = 0.375 \times So^{0.5} \times d^{2.667} / (n_{road} \times Sw)$

$Q_{area(B)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sw)$

$Q_{area(B+C+D)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sx)$

$Q_{area(D)} = 0.375 \times So^{0.5} \times (dd)^{2.667} / (n_{road} \times Sx)$

$Q_{area(E)} = 0.375 \times So^{0.5} \times (de)^{2.667} / (n_{shoulder} \times Se)$

CALCULATION SHEET C-2A: REQUIRED CAPACITY OF OVERLAND FLOW ROUTE

NORTH OVERLAND FLOW ROUTE FROM SPYGLASS GREEN TO POND 10 - CURB CUT WEIR

Approaching flow =	0.132	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	3	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.256	m	(0.15 m + 0.025×4.25 m = 0.256 m for flow contained within RW)
Average head of water over curb cut =	0.206	m	(0.15 m + 0.025×4.25 m - 0.05 m = 0.206 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	0.517	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (0.517 m^3/s) is higher than the computed overland flow (0.132 m^3/s)

OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.088**	m	**0.030**
n =	0.03		0.03
Channel width =	3	m	3
A (area of flow) =	0.264	m^2	0.091
wetted perimeter =	3.176	m	3.061
R (hydraulic radius) =	0.083	m	0.030
S (slope) =	0.010	m/m	0.333
Q (flow) =	0.168	m^3/s	0.168
velocity =	0.64	m/s	1.85

CALCULATION SHEET C-2B: REQUIRED CAPACITY OF OVERLAND FLOW ROUTE

EAST OVERLAND FLOW ROUTE FROM GEORGE SAVAGE AVENUE TO POND 10 - CURB CUT WEIR

Approaching flow =	1.204	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	10	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.256	m	(0.15 m + 0.025×4.25 m = 0.256 m for flow contained within RW)
Average head of water over curb cut =	0.206	m	(0.15 m + 0.025×4.25 m - 0.05 m = 0.206 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	1.723	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (1.723 m^3/s) is higher than the computed overland flow (1.204 m^3/s)

OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.212**	m	**0.065**
n =	0.03		0.03
Channel width =	6	m	6
A (area of flow) =	1.271	m^2	0.392
wetted perimeter =	6.424	m	6.131
R (hydraulic radius) =	0.198	m	0.064
S (slope) =	0.007	m/m	0.333
Q (flow) =	1.204	m^3/s	1.204
velocity =	0.95	m/s	3.07

CALCULATION SHEET C-2A: REQUIRED CAPACITY OF OVERLAND FLOW ROUTE

NORTH OVERLAND FLOW ROUTE FROM LANE 174 TO POND 13 - CURB CUT WEIR

Approaching flow =	0.598	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	13	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.164	m	(0.075 m + 0.027×3.30 m = 0.164 m for flow contained within RW)
Average head of water over curb cut =	0.114	m	(0.075 m + 0.027×3.30 m - 0.05 m = 0.114 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	0.922	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (0.922 m^3/s) is higher than the computed overland flow (0.598 m^3/s)

OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.199**	m	**0.043**
n =	0.03		0.03
Channel width =	4	m	6
A (area of flow) =	0.795	m^2	0.257
wetted perimeter =	4.397	m	6.086
R (hydraulic radius) =	0.181	m	0.042
S (slope) =	0.005	m/m	0.333
Q (flow) =	0.599	m^3/s	0.599
velocity =	0.75	m/s	2.33

CALCULATION SHEET C-2D: REQUIRED CAPACITY OF OVERLAND FLOW ROUTE

EAST OVERLAND FLOW ROUTE FROM CHARLES FAY PASSAGE TO POND 13 - CURB CUT WEIR

Approaching flow =	0.369	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	3	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.256	m	(0.15 m + 0.025×4.25 m = 0.256 m for flow contained within RW)
Average head of water over curb cut =	0.206	m	(0.15 m + 0.025×4.25 m - 0.05 m = 0.206 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	0.517	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (0.517 m^3/s) is higher than the computed overland flow (0.369 m^3/s)

OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.160**	m	**0.049**
n =	0.03		0.03
Channel width =	3	m	3
A (area of flow) =	0.480	m^2	0.147
wetted perimeter =	3.320	m	3.098
R (hydraulic radius) =	0.145	m	0.047
S (slope) =	0.007	m/m	0.333
Q (flow) =	0.369	m^3/s	0.369
velocity =	0.77	m/s	2.52

CALCULATION SHEET C-2E: REQUIRED CAPACITY OF OVERLAND FLOW ROUTE

SOUTH OVERLAND FLOW ROUTE FROM NORTH PARK BOULEVARD TO MUNN'S CREEK - CURB CUT WEIR

Approaching flow =	0.146	m^3/s	for 100-yr event (on MAJ road segment) (with 100% blockage of grates)
Curb cut width =	14	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.269	m	(0.15 m + 0.025×4.75 m = 0.269 m for flow contained within RW)
Average head of water over curb cut =	0.219	m	(0.15 m + 0.025×4.75 m - 0.05 m = 0.219 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	2.636	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (2.636 m^3/s) is higher than the computed overland flow (0.146 m^3/s)

OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.051**	m	**0.018**
n =	0.03		0.03
Channel width =	6	m	6
A (area of flow) =	0.307	m^2	0.110
wetted perimeter =	6.102	m	6.037
R (hydraulic radius) =	0.050	m	0.018
S (slope) =	0.011	m/m	0.333
Q (flow) =	0.146	m^3/s	0.146
velocity =	0.48	m/s	1.33

Calculation Sheet C-3A: Required Grate and Lead Pipe at 100-Year Intake

MAJOR SYSTEM SEGMENT : A438NE (CARDING MILL TRAIL)

Max. Depth Above Crown = 0.150 m

Max. Allowable Depth at Gutter = 0.256 m

Type of Grates : TWIN OPSD 400.01

$Q_{approach\ 100\text{-}yr}$ LP438NE = 152 L/s

Scenario: No Blockage

Location	No. of DCBs	Maximum All.Head (m)	Maximum Capture (L/s)	Dia. Of Lead Pipe (m)	Head on Lead Pipe (m)	Capacity of Single Lead Pipe (L/s)	No. of Lead Pipes	Max Flow by Lead Pipe (L/s)	Capacity of All Lead Pipes (L/s)	
Block 299	1	0.256	331	300	1.456	310	1	152	310	
			331	> 152					310	> 152

Scenario: 40% Blockage

Location	No. of DCBs	Maximum All.Head (m)	Maximum Capture (L/s)	Dia. Of Lead Pipe (m)	Head on Lead Pipe (m)	Capacity of Single Lead Pipe (L/s)	No. of Lead Pipes	Max Flow by Lead Pipe (L/s)	Capacity of All Lead Pipes (L/s)	
Block 299	1	0.256	199	300	1.456	310	1	152	310	
			199	> 152					310	> 152

MAJOR SYSTEM SEGMENT : A438NW (CARDING MILL TRAIL)

Max. Depth Above Crown = 0.150 m

Max. Allowable Depth at Gutter = 0.256 m

Type of Grates : TWIN OPSD 400.01

$Q_{approach\ 100\text{-}yr}$ LP438NW = 196 L/s

Scenario: No Blockage

Location	No. of DCBs	Maximum All.Head (m)	Maximum Capture (L/s)	Dia. Of Lead Pipe (m)	Head on Lead Pipe (m)	Capacity of Single Lead Pipe (L/s)	No. of Lead Pipes	Max Flow by Lead Pipe (L/s)	Capacity of All Lead Pipes (L/s)	
Block 300	1	0.256	331	300	1.456	310	2	98	620	
			331	> 196					620	> 196

Scenario: 40% Blockage

Location	No. of DCBs	Maximum All.Head (m)	Maximum Capture (L/s)	Dia. Of Lead Pipe (m)	Head on Lead Pipe (m)	Capacity of Single Lead Pipe (L/s)	No. of Lead Pipes	Max Flow by Lead Pipe (L/s)	Capacity of All Lead Pipes (L/s)	
Block 300	1	0.256	199	300	1.456	310	2	98	620	
			199	> 196					620	> 196

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Attachment D

Pond 10 Controls – Quality, Extended Detention and Quantity

Table D-1: Criteria for Required Storage Volumes

Pond	Area [1] (ha)	Imperviousness (%)	Storage Volume for Impervious Level [2] (m^3/ha)
N/A	N/A	35	140
SWM Facility	32.170	45	165.00
N/A	N/A	55	190

[1] Refer to Tables D-6 and D-7 for drainage areas to SWM Facility.

[2] Protection Level for Wet Pond: Enhanced 80% long-term S.S. removal.
SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table D-2: Required Storage Volumes for SWM Facility

Pond Component	Required Volume (m^3)	Provided Volume [4] (m^3)	Volume Ratio	Provided Area [5] (m^2)	Provided Elevation (m)
Permanent Pool (PP) [1]	4021	9671	2.40	9282	166.330
Quality Control [2]	1287	1287	1.00	N/A	166.434
Extended Detention [3]	1287	2045	1.59	N/A	166.510
Forebay (20% PP)	804	N/A	N/A	1347	166.330
PP - Forebay	3217	N/A	N/A	2051	166.330
			Area Ratio (%) [6] =	15	

[1] Required PP volume based on Table D-1 (165.00 - 40 = 125.00 m^3/ha).

[2] Required quality control volume based on 40 m^3/ha.

[3] Required extended detention volume based on 40 m^3/ha as per the downstream erosion analysis (refer to Tables D-3 and D-4).

[4] Provided volume based on stage-storage curve and extended detention (refer to Tables D-3 and D-4).

[5] Based on grading plan provided by DSEL (refer to Figure 2).

[6] As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

Table D-3: Extended Detention Parameters for SWM Facility

Permanent Pool Parameters			Quality Orifice Parameters		
Area (C3)	9281.60	m^2	Diameter	0.170	m
Volume	9671.10	m^3			
PP Elev	166.330	m	Area	0.023	m^2
QC Elev	166.434	m	Invert	166.300	m
h (m)	0.104	m	C_o	0.62	

Notes:
- C3 is the intercept from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- h is the maximum water elevation above the orifice (m).

Table D-4: Extended Detention Drawdown Time for SWM Facility

Elev.	Active Storage			C2	Drawdown Time	Drawdown Time	Flow	Demarkation
(m)	V (m^3)	A (m^2)	depth (m)	(m^2/m)	(h)	(days)	(m^3/s)	Point
166.330	**0.00**	**9281.60**	**0.00**				**0.000**	**PP Elev**
166.350	469.90	9452.30	0.02	8535	11.75	0.49	0.005	
166.400	946.40	9659.40	0.07	5397	22.15	0.92	0.010	
166.434	**1287.00**	**9788.46**	**0.10**	**4867**	**27.14**	**1.13**	**0.014**	**QC Elev**
166.450	1445.20	9848.40	0.12	4723	29.19	1.22	0.015	
166.500	1943.50	10057.10	0.17	4562	35.00	1.46	0.020	
166.510	**2045.10**	**10094.62**	**0.18**	**4517**	**36.06**	**1.50**	**0.021**	**Ext. Det.**
166.550	2451.50	10244.70	0.22	4378	*40.49*	*1.69*	0.031	
166.600	2976.40	10422.30	0.27	4225	*44.00*	*1.83*	0.044	
166.650	3487.60	10581.60	0.32	4063	*47.01*	*1.96*	0.057	
166.700	4004.90	10687.60	0.37	3800	*49.04*	*2.04*	0.069	
166.750	4535.90	10799.70	0.42	3615	*51.22*	*2.13*	0.081	
166.800	5084.70	10953.70	0.47	3558	*52.75*	*2.20*	0.093	
166.850	5644.70	11082.60	0.52	3463	*54.57*	*2.27*	0.103	
166.900	6200.30	11199.00	0.57	3364	*55.78*	*2.32*	0.112	
166.910	**6313.98**	**11227.06**	**0.58**	**3354**	**56.30**	**2.35**	**0.113**	
166.950	6768.70	11339.30	0.62	3319	*57.06*	*2.38*	0.135	
167.000	7338.10	11464.10	0.67	3257	*58.36*	*2.43*	0.162	
167.050	7917.30	11592.30	0.72	3209	*59.03*	*2.46*	0.189	
167.100	8496.40	11713.80	0.77	3159	*60.07*	*2.50*	0.215	
167.150	9085.80	11835.80	0.82	3115	*60.54*	*2.52*	0.241	
167.200	9680.40	11958.00	0.87	3076	*61.44*	*2.56*	0.266	
167.250	10282.20	12082.00	0.92	3044	*61.79*	*2.57*	0.292	
167.300	10891.20	12205.50	0.97	3014	*62.59*	*2.61*	0.317	
167.350	11505.10	12331.90	1.02	2990	*62.87*	*2.62*	0.341	
167.400	12127.20	12453.50	1.07	2964	*63.60*	*2.65*	0.363	
167.450	12750.80	12580.00	1.12	2945	*63.82*	*2.66*	0.384	
167.500	13379.20	12700.50	1.17	2922	*64.51*	*2.69*	0.403	
167.550	14015.50	12812.40	1.22	2894	*64.70*	*2.70*	0.421	
167.600	14659.40	12929.90	1.27	2873	*65.35*	*2.72*	0.439	
167.650	15309.40	13052.70	1.32	2857	*65.52*	*2.73*	0.455	
167.700	15965.20	13171.00	1.37	2839	*66.15*	*2.76*	0.472	
167.750	16626.90	13290.80	1.42	2823	*66.29*	*2.76*	0.487	
167.800	**17294.50**	**13409.80**	**1.47**	**2808**	***66.91***	***2.79***	**0.502**	
167.850	17972.80	13529.80	1.52	2795	*67.02*	*2.79*	0.543	

Table D-4: Extended Detention Drawdown Time for SWM Facility

Elev.	Active Storage			C2	Drawdown Time	Drawdown Time	Flow	Demarkation
(m)	V (m^3)	A (m^2)	depth (m)	(m^2/m)	(h)	(days)	(m^3/s)	Point
167.900	18662.40	13649.50	1.57	2782	*67.61*	*2.82*	0.585	
167.950	19350.10	13768.80	1.62	2770	*67.67*	*2.82*	0.625	
168.000	20053.10	13892.60	1.67	2761	*68.23*	*2.84*	0.666	
168.050	20754.90	14010.40	1.72	2749	*68.26*	*2.84*	0.706	
168.100	21475.90	14128.70	1.77	2738	*68.79*	*2.87*	0.745	
168.150	22218.70	14255.10	1.82	2733	*68.80*	*2.87*	0.785	
168.200	22991.60	14384.60	1.87	2729	*69.32*	*2.89*	0.824	
168.250	23681.70	14509.50	1.92	2723	*69.30*	*2.89*	0.863	
168.300	24438.70	14622.70	1.97	2711	*69.79*	*2.91*	0.901	

Notes:

C2 is the slope coefficient from the area-depth linear regression.

PP Elev indicates the elevation of the permanent pool.

QC Elev indicates the elevation of the storage volume required by MOE for quality control.

Ext Det indicates the elevation of extended detention provided based on 40 m^3/ha as per the downstream erosion analysis.

Orifice selected to provide the minimum drawdown time between 24 to 48 hours for the extended detention volume.

Drawdown time calculated based on MOE Equation 4.11 up to the Ext Det elevation, then based on incremental volume and average outflow.

Table D-5: Stage-Storage-Outflow Curve for SWM Facility

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4		Emergency Spillway		
			Vertical Circ. Orifice		Vertical Circ. Orifice		Vertical Circ. Orifice		Vertical Circ. Orifice		Sharp-Crested Weir		Broad-Crested Weir		
			Dia (m)	0.170	Dia (m)	0.250	Dia (m)	0.400	Dia (m)	0.500	L (m)	6.600	L (m)	6.000	
			Area (m^2)	0.023	Area (m^2)	0.049	Area (m^2)	0.126	Area (m^2)	0.196	C_w	1.800	C_w	1.580	
			Invert (m)	166.30	Invert (m)	166.51	Invert (m)	166.91	Invert (m)	167.80	Invert (m)	169.21	Invert (m)	169.15	
			C_o	0.62	C_o	0.62	C_o	0.62	C_o	0.62	n contr.	0	n contr.	0	
			Q @ D	0.018	Q @ D	0.048	Q @ D	0.154	Q @ D	0.270	1.8mx1.5m drop inlet				
Elevation	Active Sto.	Demarkation Points	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Outflow
(m)	(m^3)		(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m^3/s)
166.300	**0**	**PP Elev**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
166.350	470		0.050	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
166.400	946		0.100	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
166.434	**1287**	**QC Elev**	**0.134**	**0.014**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.014**
166.450	1445		0.150	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
166.500	1944		0.200	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
166.510	**2045**	**Ext. Det.**	**0.210**	**0.021**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.021**
166.550	2452		0.250	0.024	0.040	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
166.600	2976		0.300	0.027	0.090	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
166.650	3488		0.350	0.030	0.140	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057
166.700	4005		0.400	0.033	0.190	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069
166.750	4536		0.450	0.035	0.240	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081
166.800	5085		0.500	0.038	0.290	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093
166.850	5645		0.550	0.040	0.340	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103
166.900	6200		0.600	0.042	0.390	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.112
166.910	**6314**		**0.610**	**0.043**	**0.400**	**0.071**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.113**
166.950	6769		0.650	0.044	0.440	0.076	0.040	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.135
167.000	7338		0.700	0.046	0.490	0.081	0.090	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.162
167.050	7917		0.750	0.048	0.540	0.087	0.140	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.189
167.100	8496		0.800	0.050	0.590	0.092	0.190	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.215
167.150	9086		0.850	0.051	0.640	0.097	0.240	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.241
167.200	9680		0.900	0.053	0.690	0.101	0.290	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.266
167.250	10282		0.950	0.055	0.740	0.106	0.340	0.131	0.000	0.000	0.000	0.000	0.000	0.000	0.292
167.300	10891		1.000	0.056	0.790	0.110	0.390	0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.317
167.350	11505		1.050	0.058	0.840	0.114	0.440	0.169	0.000	0.000	0.000	0.000	0.000	0.000	0.341
167.400	12127		1.100	0.059	0.890	0.118	0.490	0.186	0.000	0.000	0.000	0.000	0.000	0.000	0.363
167.450	12751		1.150	0.061	0.940	0.122	0.540	0.201	0.000	0.000	0.000	0.000	0.000	0.000	0.384
167.500	13379		1.200	0.062	0.990	0.125	0.590	0.216	0.000	0.000	0.000	0.000	0.000	0.000	0.403
167.550	14016		1.250	0.063	1.040	0.129	0.640	0.229	0.000	0.000	0.000	0.000	0.000	0.000	0.421
167.600	14659		1.300	0.065	1.090	0.132	0.690	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.439
167.650	15309		1.350	0.066	1.140	0.136	0.740	0.254	0.000	0.000	0.000	0.000	0.000	0.000	0.455
167.700	15965		1.400	0.067	1.190	0.139	0.790	0.265	0.000	0.000	0.000	0.000	0.000	0.000	0.472
167.750	16627		1.450	0.069	1.240	0.142	0.840	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.487
167.800	**17295**		**1.500**	**0.070**	**1.290**	**0.146**	**0.890**	**0.287**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.502**
167.850	17973		1.550	0.071	1.340	0.149	0.940	0.297	0.050	0.027	0.000	0.000	0.000	0.000	0.543
167.900	18662		1.600	0.072	1.390	0.152	0.990	0.307	0.100	0.054	0.000	0.000	0.000	0.000	0.585
167.950	19350		1.650	0.073	1.440	0.155	1.040	0.316	0.150	0.081	0.000	0.000	0.000	0.000	0.625
168.000	20053		1.700	0.075	1.490	0.157	1.090	0.326	0.200	0.108	0.000	0.000	0.000	0.000	0.666
168.050	20755		1.750	0.076	1.540	0.160	1.140	0.335	0.250	0.135	0.000	0.000	0.000	0.000	0.706

Table D-5: Stage-Storage-Outflow Curve for SWM Facility

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4		Emergency Spillway		
			Vertical Circ. Orifice		Vertical Circ. Orifice		Vertical Circ. Orifice		Vertical Circ. Orifice		Sharp-Crested Weir		Broad-Crested Weir		
			Dia (m)	0.170	Dia (m)	0.250	Dia (m)	0.400	Dia (m)	0.500	L (m)	6.600	L (m)	6.000	
			Area (m^2)	0.023	Area (m^2)	0.049	Area (m^2)	0.126	Area (m^2)	0.196	C_w	1.800	C_w	1.580	
			Invert (m)	166.30	Invert (m)	166.51	Invert (m)	166.91	Invert (m)	167.80	Invert (m)	169.21	Invert (m)	169.15	
			C_o	0.62	C_o	0.62	C_o	0.62	C_o	0.62	n contr.	0	n contr.	0	
			Q @ D	0.018	Q @ D	0.048	Q @ D	0.154	Q @ D	0.270	1.8mx1.5m drop inlet				
Elevation	Active Sto.	Demarkation Points	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Outflow
(m)	(m^3)		(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m^3/s)
168.100	21476		1.800	0.077	1.590	0.163	1.190	0.343	0.300	0.162	0.000	0.000	0.000	0.000	0.745
168.150	22219		1.850	0.078	1.640	0.166	1.240	0.352	0.350	0.189	0.000	0.000	0.000	0.000	0.785
168.200	22992		1.900	0.079	1.690	0.169	1.290	0.360	0.400	0.216	0.000	0.000	0.000	0.000	0.824
168.250	23682		1.950	0.080	1.740	0.171	1.340	0.368	0.450	0.243	0.000	0.000	0.000	0.000	0.863
168.300	24439		2.000	0.081	1.790	0.174	1.390	0.376	0.500	0.270	0.000	0.000	0.000	0.000	0.901
168.350	25066		2.050	0.082	1.840	0.177	1.440	0.384	0.550	0.295	0.000	0.000	0.000	0.000	0.938
168.400	25762		2.100	0.083	1.890	0.179	1.490	0.392	0.600	0.319	0.000	0.000	0.000	0.000	0.973
168.450	26428		2.150	0.084	1.940	0.182	1.540	0.399	0.650	0.341	0.000	0.000	0.000	0.000	1.007
168.500	27191		2.200	0.085	1.990	0.184	1.590	0.407	0.700	0.362	0.000	0.000	0.000	0.000	1.038
168.550	27958		2.250	0.086	2.040	0.187	1.640	0.414	0.750	0.381	0.000	0.000	0.000	0.000	1.068
168.600	28723		2.300	0.087	2.090	0.189	1.690	0.421	0.800	0.400	0.000	0.000	0.000	0.000	1.097
168.650	29450		2.350	0.088	2.140	0.191	1.740	0.428	0.850	0.418	0.000	0.000	0.000	0.000	1.126
168.700	30243		2.400	0.089	2.190	0.194	1.790	0.435	0.900	0.435	0.000	0.000	0.000	0.000	1.153
168.750	31021		2.450	0.090	2.240	0.196	1.840	0.442	0.950	0.451	0.000	0.000	0.000	0.000	1.179
168.800	31826		2.500	0.091	2.290	0.198	1.890	0.449	1.000	0.467	0.000	0.000	0.000	0.000	1.205
168.850	32611		2.550	0.092	2.340	0.201	1.940	0.455	1.050	0.482	0.000	0.000	0.000	0.000	1.230
168.900	33408		2.600	0.093	2.390	0.203	1.990	0.462	1.100	0.497	0.000	0.000	0.000	0.000	1.255
168.950	34207		2.650	0.094	2.440	0.205	2.040	0.468	1.150	0.512	0.000	0.000	0.000	0.000	1.279
169.000	35138		2.700	0.095	2.490	0.207	2.090	0.474	1.200	0.526	0.000	0.000	0.000	0.000	1.302
169.050	36127		2.750	0.096	2.540	0.209	2.140	0.481	1.250	0.539	0.000	0.000	0.000	0.000	1.325
169.100	36885		2.800	0.097	2.590	0.212	2.190	0.487	1.300	0.553	0.000	0.000	0.000	0.000	1.348
169.150	**37715**	**Ovf Elev**	**2.850**	**0.098**	**2.640**	**0.214**	**2.240**	**0.493**	**1.350**	**0.566**	**0.000**	**0.000**	**0.000**	**0.000**	**1.370**
169.200			2.900	0.098	2.690	0.216	2.290	0.499	1.400	0.578	0.000	0.000	0.050	0.106	1.498
169.210			**2.910**	**0.099**	**2.700**	**0.216**	**2.300**	**0.500**	**1.410**	**0.581**	**0.000**	**0.000**	**0.060**	**0.139**	**1.535**
169.250			2.950	0.099	2.740	0.218	2.340	0.505	1.450	0.591	0.040	0.095	0.100	0.300	1.808
169.300			3.000	0.100	2.790	0.220	2.390	0.511	1.500	0.603	0.090	0.321	0.150	0.551	2.305
169.350			3.050	0.101	2.840	0.222	2.440	0.517	1.550	0.615	0.140	0.622	0.200	0.848	2.925
169.400			3.100	0.102	2.890	0.224	2.490	0.522	1.600	0.627	0.190	0.984	0.250	1.185	3.644
169.450			3.150	0.103	2.940	0.226	2.540	0.528	1.650	0.638	0.240	1.397	0.300	1.558	4.449
169.500			3.200	0.104	2.990	0.228	2.590	0.534	1.700	0.649	0.290	1.855	0.350	1.963	5.333
169.550			3.250	0.104	3.040	0.230	2.640	0.539	1.750	0.660	0.340	2.355	0.400	2.398	6.288
169.600			3.300	0.105	3.090	0.232	2.690	0.545	1.800	0.671	0.390	2.893	0.450	2.862	7.308
169.650		**Top of Berm**	**3.350**	**0.106**	**3.140**	**0.234**	**2.740**	**0.550**	**1.850**	**0.682**	**0.440**	**3.467**	**0.500**	**3.352**	**8.391**

Notes : PP Elev indicates the elevation of the permanent pool.

QC Elev indicates the elevation of the storage volume required by MOE for quality control.

Ext Det indicates the elevation of extended detention provided based on 40 m^3/ha as per the downstream erosion analysis.

Ovf Elev indicates the elevation of the emergency spillway provided above the Regional water level.

Top of Berm indicates the elevation at the top of the berm.

Head losses for reverse grade pipe included in quality control outflow calculations.

Storage (ha·m)
0.000
0.047
0.095
0.129
0.145
0.194
0.205
0.245
0.298
0.349
0.400
0.454
0.508
0.564
0.620
0.631
0.677
0.734
0.792
0.850
0.909
0.968
1.028
1.089
1.151
1.213
1.275
1.338
1.402
1.466
1.531
1.597
1.663
1.729
1.797
1.866
1.935
2.005
2.075

Storage (ha·m)
2.148
2.222
2.299
2.368
2.444
2.507
2.576
2.643
2.719
2.796
2.872
2.945
3.024
3.102
3.183
3.261
3.341
3.421
3.514
3.613
3.689
3.771
0.000
0.000
0.000
0.000
0.000
0.000
0.000
0.000
0.000
0.000
0.000

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
to SWM Facility 12 (Preserve Phase 2)			
A031R1	0.129	24	3.096
A031R2	0.063	23	1.449
A031SE	0.007	71	0.497
A032NE	0.169	79	13.351
A032R1	0.136	22	2.992
A032SE	0.138	80	11.040
A033NE	0.158	67	10.586
A033R1	0.192	22	4.224
A033SE	0.119	77	9.163
A311NE	0.073	78	5.694
A311R1	0.105	17	1.785
A311SE	0.064	78	4.992
A548NE	0.165	78	12.870
A548SE	0.176	80	14.080
to Proposed SWM Facility 10			
A200N2	0.036	100	3.600
A200N3	0.054	78	4.212
A200NW	0.016	81	1.296
A200S1	0.035	69	2.415
A200S2	0.035	69	2.415
A200SE	0.018	67	1.206
A200SW	0.045	67	3.015
A201E1	0.016	69	1.104
A201E2	0.019	84	1.596
A201E3	0.028	99	2.772
A201N1	0.105	79	8.295
A201NE	0.041	85	3.485
A201NW	0.120	78	9.360
A201S1	0.057	63	3.591
A201S2	0.071	61	4.331
A201SE	0.070	59	4.130
A201SW	0.056	64	3.584
A202NE	0.137	77	10.549
A202SE	0.137	80	10.960
A204N1	0.108	81	8.748
A204NE	0.136	76	10.336
A204NW	0.031	84	2.604
A204S1	0.061	77	4.697
A204S2	0.101	62	6.262
A204SE	0.136	75	10.200
A204SW	0.031	84	2.604
A205N1	0.029	79	2.291
A205N2	0.030	80	2.400
A205R1	0.137	18	2.466
A205R2	0.124	24	2.976
A205R3	0.025	24	0.600
A205R4	0.100	24	2.400
A205R5	0.143	13	1.859
A205R6	0.029	22	0.638
A205S1	0.040	68	2.720
A205S2	0.039	64	2.496
A250NE	0.202	72	14.544
A250NW	0.113	68	7.684

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
A250R1	0.035	24	0.840
A250SW	0.054	78	4.212
A500NE	0.171	84	14.364
A500SE	0.122	79	9.638
A501NE	0.358	84	30.072
A501SE	0.144	83	11.952
A501WK1	0.082	23	1.886
A503OS1	0.381	7	2.667
A5050NE	0.190	62	11.780
A5050NW	0.075	69	5.175
A5050R1	0.198	28	5.544
A5050SE	0.170	82	13.940
A5050SW	0.110	80	8.800
A505R1	0.194	28	5.432
A505SE	0.155	79	12.245
A505SW	0.108	56	6.048
A506MC1	0.070	71	4.970
A506N1	0.388	76	29.488
A506N2	0.348	72	25.056
A506NE	0.036	75	2.700
A506SE	0.022	73	1.606
A507NE	0.023	65	1.495
A507SE	0.024	75	1.800
A508N1	0.050	86	4.300
A508N2	0.042	64	2.688
A508NE	0.044	73	3.212
A508NW	0.028	50	1.400
A508R1	0.108	21	2.268
A508SE	0.014	96	1.344
A508SW	0.015	96	1.440
A5090R1	0.049	14	0.686
A5090R2	0.051	18	0.918
A509NE	0.213	77	16.401
A509NW	0.197	81	15.957
A509R1	0.060	28	1.680
A509R2	0.085	28	2.380
A509R3	0.068	29	1.972
A509SE	0.099	65	6.435
A509SW	0.144	72	10.368
A509WK1	0.008	99	0.792
A510R1	0.090	26	2.340
A511NE	0.178	76	13.528
A511R1	0.067	27	1.809
A511R2	0.032	23	0.736
A511SE	0.075	49	3.675
A512NE	0.172	80	13.760
A513NE	0.124	77	9.548
A513OS1	0.030	7	0.210
A513R1	0.065	27	1.755
A513SE	0.044	50	2.200
A514NE	0.066	56	3.696
A514R1	0.108	27	2.916
A514R2	0.199	25	4.975
A514R3	0.108	27	2.916

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
A514SE	0.052	85	4.420
A514SW	0.208	82	17.056
A515NE	0.182	81	14.742
A515NW	0.177	80	14.160
A515R1	0.145	25	3.625
A515R2	0.242	25	6.050
A517NE	0.122	61	7.442
A517NW	0.162	79	12.798
A517R1	0.109	25	2.725
A517SE	0.215	75	16.125
A5180NE	0.082	54	4.428
A5180NW	0.188	81	15.228
A5180SE	0.106	82	8.692
A518R1	0.122	24	2.928
A5190NE	0.073	66	4.818
A5190NW	0.083	78	6.474
A519SE	0.149	68	10.132
A519SW	0.075	51	3.825
A520NE	0.139	72	10.008
A520NW	0.074	53	3.922
A521NE	0.109	81	8.829
A521R1	0.150	24	3.600
A521SE	0.155	78	12.090
A522N1	0.115	82	9.430
A522NE	0.115	72	8.280
A522NW	0.121	74	8.954
A522R1	0.029	22	0.638
A522R2	0.143	24	3.432
A522R3	0.205	24	4.920
A522R4	0.033	24	0.792
A522SE	0.121	80	9.680
A522SW	0.128	71	9.088
A523NW	0.178	80	14.240
A524N1	0.109	83	9.047
A524NE	0.097	77	7.469
A524NW	0.121	74	8.954
A524R1	0.029	24	0.696
A524R2	0.153	18	2.754
A524R3	0.183	24	4.392
A524SE	0.103	81	8.343
A524SW	0.115	79	9.085
A525NE	0.074	54	3.996
A525NW	0.199	72	14.328
A525R1	0.158	25	3.950
A525SE	0.087	79	6.873
A526R1	0.174	16	2.784
A526SE	0.119	76	9.044
A527NE	0.147	80	11.760
A527R1	0.122	20	2.440
A527SE	0.137	73	10.001
A529NE	0.083	54	4.482
A529NW	0.068	80	5.440
A529R1	0.065	27	1.755
A529SE	0.164	74	12.136

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
A533N1	0.063	82	5.166
A533S1	0.095	82	7.790
A533S2	0.066	76	5.016
A533SE	0.077	78	6.006
A533SW	0.113	74	8.362
A534R1	0.174	24	4.176
A535NE	0.199	81	16.119
A535R1	0.173	24	4.152
A535R2	0.111	26	2.886
A536N1	0.065	57	3.705
A536NE	0.171	79	13.509
A536NW	0.113	79	8.927
A536R1	0.108	24	2.592
A536R2	0.021	21	0.441
A536R3	0.114	24	2.736
A536R4	0.125	25	3.125
A536S1	0.033	61	2.013
A536S2	0.046	65	2.990
A536SE	0.029	83	2.407
A536SW	0.016	50	0.800
A536W1	0.088	68	5.984
A536W2	0.104	79	8.216
A536W3	0.017	65	1.105
A537PK1	0.295	29	8.555
A5380NE	0.046	76	3.496
A5380NW	0.113	79	8.927
A5380SE	0.048	71	3.408
A538NE	0.126	74	9.324
A538R1	0.130	24	3.120
A538R2	0.148	23	3.404
A538R3	0.028	29	0.812
A538R4	0.136	24	3.264
A538R5	0.091	23	2.093
A538SE	0.153	73	11.169
A539NE	0.144	78	11.232
A539R1	0.137	23	3.151
A539R2	0.089	24	2.136
A539SE	0.131	80	10.480
A540R1	0.179	18	3.222
A541NE	0.092	79	7.268
A541R1	0.120	24	2.880
A541SE	0.091	54	4.914
A541SW	0.194	75	14.550
A542NE	0.173	71	12.283
A542NW	0.114	82	9.348
A542R1	0.150	23	3.450
A542R2	0.094	25	2.350
A542SE	0.073	55	4.015
A543NE	0.171	78	13.338
A543NW	0.080	69	5.520
A543SW	0.140	79	11.060
AP10R1	0.301	26	7.826
AP10R2	0.302	19	5.738
APND10	2.276	45	102.420

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
fSWd	1.069	61	65.209
fSWu	6.999	7	48.993
Minor to SWM Facility 13, Major to SWM Facilty 10			
A002AD1	0.070	99	6.930
A002AD2	0.064	99	6.336
A002TD1	0.003	99	0.297
A002TD2	0.002	99	0.198
A004PL1	0.169	99	16.731
to Proposed SWM Facility 13			
A002AS1	0.002	99	0.198
A002AS2	0.002	99	0.198
A002RF1	0.268	99	26.532
A003PL1	0.053	99	5.247
A300R1	0.048	25	1.200
A301N1	0.045	71	3.195
A301N2	0.018	72	1.296
A301N3	0.003	67	0.201
A301NE	0.038	66	2.508
A301NW	0.065	86	5.590
A301R1	0.165	24	3.960
A301S1	0.060	55	3.300
A301S2	0.039	87	3.393
A301SE	0.045	60	2.700
A301SW	0.051	67	3.417
A305NE	0.026	69	1.794
A305NW	0.071	76	5.396
A305R1	0.031	23	0.713
A305SE	0.045	73	3.285
A305SW	0.068	60	4.080
A401R1	0.106	20	2.120
A401SE	0.128	80	10.240
A402MC1	0.338	71	23.998
A402NE	0.146	77	11.242
A402NW	0.034	68	2.312
A403NE	0.051	73	3.723
A403NW	0.042	69	2.898
A403R1	0.039	23	0.897
A403R2	0.169	25	4.225
A403SE	0.144	71	10.224
A404NW	0.163	67	10.921
A404SE	0.189	79	14.931
A404SW	0.130	68	8.840
A405SE	0.103	70	7.210
A406NE	0.148	66	9.768
A406NW	0.190	73	13.870
A406R1	0.115	28	3.220
A406R2	0.149	27	4.023
A406R3	0.229	19	4.351
A406R4	0.132	23	3.036
A406R5	0.026	25	0.650
A406S1	0.103	80	8.240
A406SE	0.100	78	7.800
A406SW	0.130	72	9.360
A407NE	0.059	64	3.776

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
A407NW	0.108	86	9.288
A407SW	0.120	71	8.520
A4080NW	0.116	76	8.816
A4080R1	0.140	24	3.360
A4080R2	0.040	24	0.960
A408NE	0.110	69	7.590
A408R1	0.015	17	0.255
A408R2	0.031	21	0.651
A408R3	0.134	23	3.082
A409NW	0.129	78	10.062
A410NE	0.064	95	6.080
A410NW	0.106	92	9.752
A411NE	0.025	64	1.600
A411NW	0.153	95	14.535
A412R1	0.145	23	3.335
A413NE	0.081	75	6.075
A413NW	0.147	76	11.172
A413R1	0.036	15	0.540
A413R2	0.097	16	1.552
A413WK1	0.011	99	1.089
A414NE	0.197	81	15.957
A414R1	0.066	24	1.584
A414R2	0.066	24	1.584
A414R3	0.058	25	1.450
A414SE	0.147	81	11.907
A416R1	0.087	22	1.914
A416SW	0.105	82	8.610
A4170NW	0.058	83	4.814
A4170R1	0.012	29	0.348
A4170SW	0.034	62	2.108
A417NW	0.150	74	11.100
A417R1	0.057	25	1.425
A417R2	0.027	19	0.513
A418NE	0.187	75	14.025
A418R1	0.059	24	1.416
A419NE	0.101	76	7.676
A419NW	0.191	77	14.707
A419R1	0.060	23	1.380
A419SE	0.044	59	2.596
A419SW	0.025	88	2.200
A420NE	0.058	57	3.306
A420R1	0.101	23	2.323
A420R2	0.194	24	4.656
A420S1	0.121	77	9.317
A420SE	0.099	83	8.217
A420SW	0.066	76	5.016
A421NE	0.130	76	9.880
A421NW	0.055	65	3.575
A421R1	0.192	23	4.416
A421S1	0.021	57	1.197
A421SE	0.089	82	7.298
A421SW	0.038	76	2.888
A427NE	0.133	94	12.502
A427NW	0.123	93	11.439

Table D-6 : Drainage Area to SWM Facility

Segment ID [1]	Area (ha)	Imperviousness (%)	Area x Imp.
A427SW	0.011	45	0.495
A428N1	0.113	73	8.249
A428NE	0.068	96	6.528
A428NW	0.075	87	6.525
A428SE	0.044	64	2.816
A428SW	0.055	73	4.015
A429NE	0.136	68	9.248
A429NW	0.130	70	9.100
A429SE	0.125	69	8.625
A429SW	0.130	68	8.840
A430NE	0.078	67	5.226
A431NE	0.040	68	2.720
A431SE	0.020	65	1.300
A432NE	0.109	93	10.137
A432NW	0.116	93	10.788
A432SE	0.050	90	4.500
A433NE	0.058	93	5.394
A433NW	0.106	91	9.646
A433SE	0.038	66	2.508
A433SW	0.056	83	4.648
A435NE	0.061	72	4.392
A435SE	0.054	89	4.806
A437SE	0.093	99	9.207
A437SW	0.084	99	8.316
A438NE	0.101	99	9.999
A438NW	0.105	99	10.395
A438SE	0.038	99	3.762
A438SW	0.047	99	4.653
A441MC1	0.441	99	43.659
A441MC2	0.059	99	5.841
A441MC3	0.103	36	3.708
A451NE	0.094	99	9.306
A452N1	0.138	63	8.694
A452NE	0.061	98	5.978
A452NW	0.035	43	1.505
A452SE	0.049	71	3.479
A452SW	0.061	83	5.063
AP13R1	0.135	34	4.590
APND13	1.594	37	58.978
fMW13d	2.137	58	123.917
fMW13u	6.768	7	47.376
fMWd	0.242	65	15.730
fMWu	3.306	7	23.142
Rearyards to Shannon's Creek (Grass Only)			
APSWR1	0.240	7	1.680
APSWR2	0.061	7	0.427
APSWR3	0.048	7	0.336
Total	**61.150**	**44**	**2679.228**

[1] Refer to Figure 2

Weighted Average Imperviousness = S(Area x Imp) / Total Area = 2679.228 / 61.15 = 44 %

Table D-7 : Summary of Total Drainage Area

Land Use [1]	Area (ha)	Imperviousness (%)	Area x Imp.
To SWM Facility 12 (Preserve Phase 2)	1.694	57	95.819
To Proposed SWM Facility 10	32.170	45	1450.934
Minor to SWM Facililty 13, Major to SWM Facility 10	0.308	99	30.492
To Proposed SWM Facility 13	26.629	41	1099.540
Rearyards to Shannon's Creek (Grass Only)	0.349	7	2.443
Total	61.150	44	2679.228

[1] Refer to Figure 2

Weighted Average Imperviousness = S(Area x Imp) / Total Area = 2679.228 / 61.15 = 44 %

Table D-8 : Allowable Release Rates for Proposed SWM Facility

Event	Unit Release Rate [1] ($m^3/s/ha$)	Target Release Rate [2] (m^3/s)
2yr/24hr Chicago	0.005	0.159
5yr/24hr Chicago	0.008	0.254
10yr/24hr Chicago	0.010	0.318
25yr/24hr Chicago	0.013	0.413
50yr/24hr Chicago	0.015	0.476
100yr/24hr Chicago	0.016	0.508
Regional	0.045	1.429

[1] Unit release rates as per the "Revised Target Unit Area Peak Flow Rate 07.06.27" table for Shannon's Creek at Dundas Street West.

[2] Target release rate based on post-development drainage area of 31.754 ha to SWM Facility from the May 2017 *Design Brief*.

CALCULATION SHEET D-1: CONTROLS

Quality Control 1			Quantity Control 1			Quantity Control 2			Quantity Control 3		
Vertical Circular Orifice			Vertical Circular Orifice			Vertical Circular Orifice			Vertical Circular Orifice		
Diameter	(m)	0.170	Diameter	(m)	0.250	Diameter	(m)	0.400	Diameter	(m)	0.500
A_o	(m^2)	0.023	A_o	(m^2)	0.049	A_o	(m^2)	0.126	A_o	(m^2)	0.196
invert	(m)	166.30	invert	(m)	166.510	invert	(m)	166.910	invert	(m)	167.800
C_o		0.62	C_o		0.62	C_o		0.62	C_o		0.62
Reg Water Level	(m)	168.831	Reg Water Level	(m)	168.831	Reg Water Level	(m)	168.831	Reg Water Level	(m)	168.831
Head of Water	(m)	2.531	Head of Water	(m)	2.321	Head of Water	(m)	1.921	Head of Water	(m)	1.031
Q_0	(m^3/s)	0.097	Q_0	(m^3/s)	0.200	Q_0	(m^3/s)	0.453	Q_0	(m^3/s)	0.477
Orifice Equation:			Orifice Equation:			Orifice Equation:			Orifice Equation:		
$Q_o = C_o A_o (2gh)^{0.5}$			$Q_o = C_o A_o (2gh)^{0.5}$			$Q_o = C_o A_o (2gh)^{0.5}$			$Q_o = C_o A_o (2gh)^{0.5}$		
Not including reverse pipe losses											
Q_o *is the orifice flow*			Q_o *is the orifice flow*			Q_o *is the orifice flow*			Q_o *is the orifice flow*		
C_o *is the orifice coefficient*			C_o *is the orifice coefficient*			C_o *is the orifice coefficient*			C_o *is the orifice coefficient*		
A_o *is the orifice flow area*			A_o *is the orifice flow area*			A_o *is the orifice flow area*			A_o *is the orifice flow area*		
g is the gravitational constant			*g is the gravitational constant*			*g is the gravitational constant*			*g is the gravitational constant*		
h is the head of water			*h is the head of water*			*h is the head of water*			*h is the head of water*		

Quantity Control 4			Emergency Overflow		
Sharp-Crested Weir			Broad Crested Weir		
L	(m)	6.600	L	(m)	6.000
C_w		1.80	C_w		1.58
Invert	(m)	169.21	Invert	(m)	169.150
n		0	n		0
Reg Water Level	(m)	169.531	Max Water Level	(m)	169.531
Head of Water	(m)	0.321	Head of Water	(m)	0.381
$Q_{w\ (100\%\ Blockage)}$	(m^3/s)	2.157	$Q_{w\ (100\%\ Blockage)}$	(m^3/s)	2.226
Note:			Note: Sloping Sides of weir are		
1.8m x 1.5m precast box			not considered in weir capacity		
			(underestimated capacity)		
Weir Equation:			Weir Equation:		
$Qw = C_w (L-0.1nh) h^{1.5}$			$Qw = C_w (L-0.1nh) h^{1.5}$		
Qw is the weir flow			*Qw is the weir flow*		
Cw is the weir coefficient			*Cw is the weir coefficient*		
L is the weir length			*L is the weir length*		
h is the weir height			*h is the weir height*		
n is the # of side contractions			*n is the # of side contractions*		

Spillway velocity - min slope			Spillway velocity - max slope		
Restangular Channel Equation:			Restangular Channel Equation:		
$Q = 1/n \times AR^{2/3} S^{1/2}$			$Q = 1/n \times AR^{2/3} S^{1/2}$		
normal depth	(m)	0.224	normal depth	(m)	0.095
n (roughness coef.)		0.03	n (roughness coef.)		0.03
W (width)	(m)	6.000	W (width)	(m)	6.000
A (area of flow)	(m^2)	1.344	A (area of flow)	(m^2)	0.568
p (wetted perimeter)	(m)	6.448	p (wetted perimeter)	(m)	6.189
R (hydraulic radius)	(m)	0.208	R (hydraulic radius)	(m)	0.092
S (slope)	(m/m)	0.020	S (slope)	(m/m)	0.333
Q (flow)	(m^3/s)	2.226	Q (flow)	(m^3/s)	2.226
v (velocity)	(m/s)	1.66	v (velocity)	(m/s)	3.92

CALCULATION SHEET D-2: FOREBAY SIZING FOR SWM FACILITY

PHASE 3 OF THE PRESERVE LANDS
SWM Pond 10
Town of Oakville
Calculation of East Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{min} = \left(\frac{r\,Q_p}{V_s}\right)^{0.5}$$

where:
- r = length to width ratio, at the invert of the inlet pipe.
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:

r =	2.86		(63 m / 22 m)
Q_p =	0.021	m^3/s	(at elevation 166.51 m)
V_s =	0.0003	m/s	

L_{min} = 14.08 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Table B-5 of Appendix B)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{min} = \frac{8\,Q}{d\,V_f}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour Chicago Storm)
- d = depth of pond during peak 10-year inflow (8h:00min)
- V_f = desired final velocity

Input:

Q =	4.854	m^3/s
d =	1.83	m
Vf =	0.5	m/s

L_{min} = 42.44 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required	42.44 m	
Length of Forebay Provided	**63.00 m**	(at elevation 166.33 m)

Average Forebay Velocity

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

$$V_{avg} = \frac{Q}{d\,W_{avg}}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour Chicago Storm)
- d = depth of pond during peak 10-year inflow (8h:00min)
- W_{avg} = average width of forebay

Input:

Q =	4.854	m^3/s	
d =	1.83	m	
W_{avg} =	16	m	(9 m bottom, 22 m permanent pool)

V = 0.17 m/s > 0.15 m/s

CALCULATION SHEET D-3: FOREBAY SIZING FOR SWM FACILITY

PHASE 3 OF THE PRESERVE LANDS
SWM Pond 10
Town of Oakville
Calculation of West Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{min} = \left(\frac{r\,Q_p}{V_s}\right)^{0.5}$$

where:
- r = length to width ratio, at the invert of the inlet pipe.
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:

r =	2.47		(47 m / 19 m)
Q_p =	0.021	m^3/s	(at elevation 166.51 m)
V_s =	0.0003	m/s	

L_{min} = 13.08 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Table B-5 of Appendix B)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{min} = \frac{8\,Q}{d\,V_f}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour Chicago Storm)
- d = depth of pond during peak 10-year inflow (8h:00min)
- V_f = desired final velocity

Input:

Q =	0.284	m^3/s
d =	1.83	m
Vf =	0.5	m/s

L_{min} = 2.48 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required	13.08 m	
Length of Forebay Provided	**47.00 m**	(at elevation 166.33 m)

Average Forebay Velocity

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

$$V_{avg} = \frac{Q}{d\,W_{avg}}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour Chicago Storm)
- d = depth of pond during peak 10-year inflow (8h:00min)
- W_{avg} = average width of forebay

Input:

Q =	0.284	m^3/s	
d =	1.83	m	
W_{avg} =	12	m	(5 m bottom, 19 m permanent pool)

V = 0.01 m/s < 0.15 m/s

Attachment 7 – 275 POLLY DRIVE CIVIL DRAWING SET (DSEL, 2026)

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON. THESE STANDARDS SHALL CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT", (THE ACT). THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
3. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
4. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
5. THE SUPPORT AND PROTECTION OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
6. ALL DIMENSIONS ARE IN METERS EXCEPT FOR PIPES / SEWERS WHICH ARE IN MILLIMETERS.
7. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
8. ALL CONSTRUCTION SIGNING MUST CONFORM TO THE M.T.O., ONTARIO TRAFFIC MANUAL, BOOK 7 (LATEST AMENDMENT).
9. NO BLASTING PERMITTED WITHOUT THE PRIOR WRITTEN APPROVAL BY THE MUNICIPAL DIRECTOR OF ENGINEERING, THE REGIONAL COMMISSIONER OF PUBLIC WORKS OR DESIGNATE
10. EXISTING WELLS AND PRIVATE SEWAGE DISPOSAL SYSTEMS SHALL BE DECOMMISSIONED BY THE CONTRACTOR IN ACCORDANCE WITH M.O.E. REQUIREMENTS.
11. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL BY THE MUNICIPAL DIRECTOR OF ENGINEERING, THE REGIONAL COMMISSIONER OF PUBLIC WORKS OR DESIGNATE HAS BEEN OBTAINED. ALL WATERMAIN AND WASTEWATER MAIN APPURTENANCES, MATERIALS, AND COMPONENTS SHALL COMPLY WITH THE REGION'S LATEST APPROVED MANUFACTURER'S PRODUCT LISTS FOR WATER AND WASTEWATER SYSTEMS
12. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH, AS SPECIFIED BY OPSD, IS EXCEEDED.
13. ALL SEWERS, SHALL BE INSTALLED WITH LASER AND CHECKED PRIOR TO BACKFILLING.
14. PRIOR TO THE COMMENCEMENT OF SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL. THE CONTRACTOR SHALL MAINTAIN ALL WORKS UNTIL SERVICING CONSTRUCTION IS COMPLETED TO THE SATISFACTION OF THE ENGINEER.
15. ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS SHOWN HEREIN SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTORS EXPENSE. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 150mm OF TOPSOIL AND NO. 1 NURSERY SOD TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. ALL DISTURBED GRASS AND VEGETATION COVERED AREAS WITHIN THE NHS SHALL BE RESTORED WITH A NATIVE SEED MIX TO THE SATISFACTION OF CONSERVATION HALTON.
16. FOR RECOMMENDATION OF SEWER INSTALLATION IN SHALE, REFER TO CONSOLIDATED GEOTECHNICAL INVESTIGATION REPORT PREPARED BY AMEC AMERICAS LIMITED, REPORT NO. TT53094, DATED SEPTEMBER 18, 2007 FOR DETAIL.
17. FOR TRENCH BACKFILL, THE ON-SITE INORGANIC SOILS ARE GENERALLY SUITABLE FOR TRENCH BACKFILL. IN THE ZONE WITHIN 1.0m BELOW THE ROAD SUBGRADE, THE BACKFILL SHOULD BE COMPACTED TO AT LEAST 98% OF ITS MAXIMUM STANDARD PROCTOR DRY DENSITY, WITH THE MOISTURE CONTENT 2% TO 3% DRIER THAN THE OPTIMUM. IN THE LOWER ZONE, A 95% OR + STANDARD PROCTOR COMPACTION IS CONSIDERED TO BE ADEQUATE; HOWEVER, THE MATERIAL MUST BE COMPACTED ON THE WET SIDE OF THE OPTIMUM.
18. PLEASE REFER TO GEOTECHNICAL INVESTIGATION REPORT AND GEOTECHNICAL CONSULTANT'S RECOMMENDATIONS FOR USE OF SHALE AS BACKFILL.
19. ALL PIPE/CULVERT/SECTION SIZES REFER TO INSIDE DIMENSIONS.
20. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE SHOULD BE NOTIFIED IMMEDIATELY.
21. ALL BOREHOLES SHOWN ON THE DRAWING ARE FOR INFORMATION ONLY. REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY AMEC AMERICAS LIMITED, REPORT NO. TT53094, DATED SEPTEMBER 18, 2007 FOR DETAIL.
22. PROTECTIVE MEASURES SHALL BE EMPLOYED FOR TREE PROTECTION, AS PER THE LOCAL CITY/TOWN AND REGION STANDARDS.

STORM NOTES:

1. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2 (LATEST AMENDMENT). ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1 (LATEST AMENDMENT). PIPE SHALL BE JOINTED WITH STD. RUBBER GASKETS AS PER CSA A257.3 (LATEST AMENDMENT).
2. ALL PVC STORM SEWER PIPE SHALL BE SDR 35 IN ACCORDANCE WITH OPSS MUNI 1841 (LATEST AMENDMENT), AND ASTM D-3034 (LATEST AMENDMENT), UNLESS OTHERWISE SPECIFIED.
3. WHERE APPLICABLE, ALL STORM LATERALS SHALL BE PVC SDR 28, WHITE IN COLOR AND MARKED WITH A 50mm x 100mm WOODEN MARKER EXTENDING FROM THE INVERT TO 1.0m ABOVE GROUND LEVEL, PLACED AT THE ENDS OF EACH RESIDENTIAL CONNECTION (STREET LINE). THE TOP 0.5m OF THE MARKERS ARE TO BE PAINTED WHITE. RESIDENTIAL CONNECTIONS SHALL BE 2.0m MINIMUM AND 3.0m MAXIMUM BELOW FINISHED GRADE AT STREET LINE. ALL CONNECTIONS SHALL BE 150mm DIA.
4. STORM MANHOLE FRAME AND COVERS TO BE AS PER OPSD 401.010 TYPE "A" UNLESS OTHERWISE SPECIFIED.
5. STORM SEWER MANHOLES SHALL BE BENCHED IN ACCORDANCE WITH OPSD 701.021.
6. SAFETY GRATINGS SHALL BE PROVIDED IN ALL MANHOLES WHEN THE DEPTH OF THE MANHOLE EXCEEDS FIVE (5) METERS, AS PER OPSD-404.020.
7. SINGLE CATCHBASINS SHALL BE IN ACCORDANCE WITH OPSD 705.010 AND DOUBLE CATCHBASINS AS PER OPSD 705.020. RLCB SHALL BE IN ACCORDANCE WITH TOWN OF OAKVILLE STD. 3-1. FRAMES AND GRATES SHALL BE AS PER OPSD 400.110 IN ROAD AND TOWN OF OAKVILLE STD. 5-2 IN REAR YARDS, PARKS AND OPEN SPACE. CATCHBASINS INSTALLED IN REAR YARDS AND PARKS TO BE SUMPLESS.
8. CATCHBASIN LEADS SHALL BE 250mm DIA. FOR SINGLE AND 300mm DIA. FOR DOUBLE CATCHBASINS UNLESS OTHERWISE NOTED, WITH A MINIMUM SLOPE OF 1.0%.
9. CONTRACTOR SHALL ENSURE THAT CATCHBASINS ARE INSTALLED AT THE LOW POINT OF SAG CURB WORKS.
10. ALL CATCHBASINS CONSTRUCTED IN FILL AREAS SHALL BE SUPPORTED WITH 15 MPa CONCRETE TO UNDISTURBED GROUND.
11. BEDDING MATERIAL TO BE PROVIDED AS PER FOLLOWS, UNLESS OTHERWISE NOTED:

i) FOR PVC STORM PIPE, OPSD-802.010, TYPE 1 OR 2 SOILS, GRANULAR "A" OR EQUIVALENT
ii) FOR CONCRETE STORM PIPE, OPSD-802.030, CLASS "B", GRANULAR "A" OR EQUIVALENT, WITH GRANULAR "A" COVER
FOR BEDDING MATERIAL IN SHALE EXCAVATION, REFER TO GEOTECHNICAL REPORT FOR RECOMMENDATIONS. WHERE WATER-BEARING SILTS AND SANDS ARE PRESENT, THE PIPE JOINTS SHOULD BE LEAK-PROOF, OR WRAPPED WITH AN APPROPRIATE WATERPROOF MEMBRANE.

12. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED IN DRAWINGS. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH AT HIS OWN EXPENSE AND SHALL ALSO BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
13. APPROVED BACKFILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH OPSS 401, 402, AND 403. COMPACTION SOIL DENSITY TESTING SHALL BE CARRIED OUT TO ENSURE ADEQUATE COMPACTION AND STABILITY OF FILL AND TEST RESULTS SHALL BE SUBMITTED TO THE TOWN OF OAKVILLE.
14. ROOF WATER DOWNSPOUTS MUST SPILL ONTO GROUND VIA SPLASH PADS.
15. ALL SEWERS TO BE INSTALLED BY LASER.
16. STORM PIPES TO BE CONNECTED OBVERT TO OBVERT WHEN DOWNSTREAM PIPE SIZE IS LARGER, OR EQUAL, TO UPSTREAM PIPE.
17. ALL SEWERS ARE TO HAVE AN UNDISTURBED BASE.

SANITARY NOTES:

1. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE REGION OF HALTON.
2. ALL SANITARY MAINLINE SEWERS ARE TO BE PVC DR 35 (IN GREEN COLOUR) CONFORMING TO CSA B182.2, OPSS 1841, OPSD 806.040 AND 806.060 OR LATEST AMENDMENT UNLESS OTHERWISE NOTED
3. FOR SANITARY LATERALS, A 2.0% MINIMUM GRADE IS TO BE PROVIDED. THE COVER AT THE PROPERTY LINE SHALL BE 3.15m FOR DETACHED HOUSES AND TOWNHOUSES. WHERE THIS IS NOT ACHIEVABLE, THE SANITARY LATERAL SHALL BE INSTALLED AT THE MINIMUM 2.0% GRADE. IN NO CASE SHOULD THE COVER BE LESS TAHN 2.5m AT THE PROPERTY LINE.
4. ALL SANITARY LATERALS ARE TO BE PVC DR28, GREEN IN COLOUR, AND MARKED WITH A "2x4", EXTENDING FROM THE INVERT TO 1.0 m ABOVE GRADE PAINTED GREEN. SINGLE CONNECTIONS FOR RESIDENTIAL UNITS SHALL BE 125 mm DIA. ALL RESIDENTIAL SANITARY CONNECTIONS SHOULD BE EXTENDED 1.5m INTO LOTS/BLOCKS HORIZONTALLY.
5. SANITARY MANHOLE FRAME AND COVERS TO BE AS PER OPSD 401.010 TYPE "A" AND TO BE CAST WITH THE WORDS "DANGER" AND "SANITARY". MANHOLE COVER TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT. THE TOTAL DEPTH OF ADJUSTMENT UNITS ARE TO BE A MINIMUM OF 150mm TO A MAXIMUM OF 300mm.
6. ALL MANHOLES ARE TO BE WATERPROOFED AND TESTED TO CONFIRM THAT THEY ARE WATER TIGHT. WATERPROOFING SHALL BE INSTALLED ON THE EXTERIOR OF ALL MANHOLES. WATERPROOFING SHALL BE A NON-TOXIC, NON-FLAMMABLE, FAST CURING MATERIAL TO ANSI/NSF STANDARD 61 – BARRIER MATERIALS.
7. DROP STRUCTURES SHALL BE PROVIDED WHERE THE DIFFERENCE IN ELEVATION IS GREATER THAN 1.2m IN ACCORDANCE WITH OPSD 1003.020.
8. SANITARY SEWER MANHOLES SHALL BE BENCHED TO THE PIPE OBVERT, OTHERWISE IN ACCORDANCE WITH OPSD 701.021.
9. BEDDING MATERIAL FOR PVC SANITARY PIPE SHOULD BE IN ACCORDANCE WITH OPSD-802.010, TYPE 1 OR 2 SOILS, GRANULAR "A' OR EQUIVALENT; FOR CONCRETE SANITARY PIPE, OPSD-802.030, CLASS "B", GRANULAR "A" OR EQUIVALENT, WITH GRANULAR "A" COVER. FOR BEDDING MATERIAL IN SHALE EXCAVATION, REFER TO GEOTECHNICAL REPORT FOR RECOMMENDATIONS. WHERE WATER-BEARING SILTS AND SANDS ARE PRESENT, THE PIPE JOINTS SHOULD BE LEAK-PROOF, OR WRAPPED WITH AN APPROPRIATE WATERPROOF MEMBRANE.
10. THE SANITARY SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED. ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH MAY BE REQUIRED (AT THE CONTRACTORS OWN EXPENSE) WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED. ADDITIONALLY THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE AND BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
11. APPROVED BACKFILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH OPSS 401, 402, AND 403. COMPACTION SOIL DENSITY TESTING SHALL BE CARRIED OUT TO ENSURE ADEQUATE COMPACTION AND STABILITY OF FILL AND TEST RESULTS SHALL BE SUBMITTED TO TOWN OF OAKVILLE AND THE REGION OF HALTON.
12. CONNECTION RISERS ARE REQUIRED WHERE THE SEWER MAIN IS 4.5m DEEP, IN ACCORDANCE WITH OPSD 1006.010

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED ACCORDING TO THE APPROVED PLANS PRIOR TO COMMENCEMENT OF ANY EARTH MOVING WORK ON THE SITE AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED WITH THE INTENDED GROUND COVER.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER AND CLEANED PERIODICALLY BY THE CONTRACTOR, AS REQUIRED.
3. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS' NOTICE.
4. ALL CONSTRUCTION VEHICLES SHALL EXIT THE SITE VIA THE TEMPORARY CONSTRUCTION ACCESS.
5. ALL TOPSOIL STOCKPILES SHALL BE SURROUNDED WITH SEDIMENTATION CONTROL FENCING. IF TOPSOIL STOCKPILE REMAINS UNTOUCHED FOR MORE THAN 30 DAYS, THE STOCKPILE SHALL BE SEEDED.
6. AREAS THAT HAVE BEEN STRIPPED AND SIT BARE FOR MORE THAN 45 DAYS, SHOULD BE RESEEDED.
7. SEDIMENT WHICH COLLECTS IN THE TEMPORARY SEDIMENT CONTROL FACILITIES WILL BE REMOVED WHEN FACILITY IS HALF FULL.
8. SILT CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZIED AND REVEGETATED.
9. CONTRACTOR TO INSTALL AND MAINTAIN MUD MAT AT CONSTRUCTION ACCESS IN ORDER TO PREVENT MUD TRACKING ONTO ADJACENT ROADS. MUD MAT TO BE MINIMUM 50.0m LONG AND 10.0m WIDE. THE MUD MATT SHOULD BE A MINIMUM OF 300mm THICK, THE PAD SHOULD BE UNDERLAIN WITH A GEOTEXTILE (OR GRADED AGGREGATE FILTER) AND CONSIST OF 50mm DIAMETER CLEAR STONE FOR THE FIRST 10m (EXTENDING FROM THE STREET) AND THE REMAINDER OF THE LENGTH TO CONSIST OF 150mm DIAMETER CLEAR STONE.
10. ALL REAR LOT CATCHBASINS TO BE EQUIPPED WITH SEDIMENT TRAP.
11. ALL STREET CATCHBASINS TO BE PROVIDED WITH TERRAFIX 270R OR APPROVED EQUIVALENT UNDER GRATE, TO BE KEPT IN PLACE UNTIL SITE IS STABILIZED.
12. CONTRACTOR TO CLEAN ADJACENT ROADS ON A REGULAR BASIS OF THE SATISFACTION OF THE AFFECTED AUTHORITY.
13. SEDIMENT BASIN TO BE CONSTRUCTED UNDER THE SUPERVISION OF THE PROJECT GEOTECHNICAL CONSULTANT.
14. THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND/OR REPAIR OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
15. WASH DOWN AREA TO BE PROVIDED DURING CONSTRUCTION AS REQUIRED.ALL CONCRETE WASH WATER STATIONS ARE TO BE LOCATED AT LEAST 50 METERS FROM THE NHS/ JC-31.
16. EQUIPMENT AND MACHINERY SHALL NOT ENTER OR CROSS ANY WATERCOURSES FOR ANY REASON AND CONCRETE WASH WATER STATIONS SHALL BE LOCATED AT LEAST 50 METERS AWAY FROM ALL WATERCOURSES.
17. ALL DITCHES ON REGIONAL ROADWAYS ARE TO HAVE SILT CONTROL MEASURES PROVIDED AND MAINTAINED AS DIRECTED BY THE REGION OF HALTON.
18. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS." THE GENERAL CONTRACTOR SHALL BE DESIGNATED AS THE CONSTRUCTOR AS IN THE ACT.
19. ALL WORKS TO BE IN ACCORDANCE WITH THE TOWN OF OAKVILLE'S BY-LAW #2023-047.
20. CONCRETE WASH WATER STATIONS SHALL BE LOCATED AT LEAST 50m AWAY FROM ALL WATERCOURSES AND PONDS.
21. DURING CONSTRUCTION THE FREQUENCY FOR EROSION AND SEDIMENT CONTROL INSPECTIONS BY THE PROJECT ENVIRONMENTAL CONSULTANT SHOULD BE COMPLETED AS FOLLOWS:
    A. ON A WEEKLY BASIS.
    B. PRIOR TO PREDICTED SIGNIFICANT RAINFALL OR SNOWMELT EVENTS.
    C. SUBSEQUENT TO SIGNIFICANT RAIN EVENTS OR SNOWMELTS.
    D. DAILY DURING EXTENDED RAIN OR SNOWMELT PERIODS.
    E. DURING INACTIVE CONSTRUCTION PERIODS, WHERE THE SITE IS LEFT ALONE FOR 30 DAYS OR LONGER, A MONTHLY INSPECTION CAN BE CONDUCTED.
22. WHERE A SITE REQUIRES DEWATERING AND WHERE THE EXPELLED WATER CAN BE FREELY RELEASED TO A SUITABLE RECEIVER, THE EXPELLED WATER SHALL BE TREATED TO CAPTURE SUSPENDED PARTICLES GREATER THAN 40 MICRON IN SIZE. THE CAPTURED SEDIMENT SHALL BE DISPOSED OF PROPERLY PER MOECC GUIDELINES. THE CLEAN EXPELLED WATER SHALL FREELY RELEASE TO A SUITABLE RECEIVER THAT DOES NOT CREATE DOWNSTREAM ISSUES INCLUDING BUT NOT LIMITED TO EROSION, FLOODING – NUISANCE OR OTHERWISE, INTERFERENCE ISSUES, ETC.
23. EXISTING STORM SEWER AND DRAINAGE DITCHES ADJACENT TO THE WORKS SHALL BE PROTECTED AT ALL TIMES FROM THE ENTRY OF SEDIMENT/SILT THAT MAY MIGRATE FROM THE SITE. FOR STORM SEWERS: ALL INLETS (REAR LOT CATCH BASINS, ROAD CATCH BASINS, PIPE INLETS, ETC.) MUST BE SECURED/FITTED WITH SILTATION CONTROL MEASURES. FOR DRAINAGE DITCHES: THE INSTALLATION OF ROCK CHECK DAMS, SILTATION FENCE, SEDIMENT CONTAINMENT DEVICES MUST BE INSTALLED TO TRAP AND CONTAIN SEDIMENT.

WATER NOTES:

1. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE REGION OF HALTON.
2. WATERMAIN MATERIAL AND FITTINGS ARE TO BE PVC DR-18 CL-235 AS PER AWWA C-900, C-905 & C-907.
3. A SOLID 10 GAUGE TWU COPPER WIRE SHALL BE INSTALLED ALONG THE TOP OF THE NON-METALLIC PIPE, STRAPPED TO THE PIPE AT 6 m INTERVALS. THE WIRE SHALL BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW PVC WATERMAIN. JOINTS IN THE WIRE BETWEEN VALVES ARE NOT PERMITTED. AT EACH VALVE, A LOOP OF WIRE IS TO BE BROUGHT UP OUTSIDE THE VALVE BOX TO THE TOP OF THE BOX AS PER HALTON STANDARD DRAWING RH 406.010.
4. ALL WATER SERVICES ARE TO BE 25mm DIA. TYPE K SOFT COPPER FOR RESIDENTIAL DWELLINGS AND 25mm DIA. TYPE K SOFT COPPER FOR INDUSTRIAL AND COMMERCIAL PREMISES AS PER OPSD 1104.010 AND 1104.020 UNLESS OTHERWISE SPECIFIED. WATER SERVICES SHALL BE MARKED WITH A "2x4", EXTENDING FROM THE INVERT TO 1.0 m ABOVE GRADE PAINTED BLUE. ALL WATER SERVICES SHALL BE PROVIDED WITH A MAIN STOP, CURB STOP AND SERVICE BOX AT THE PROPERTY LINE. VALVE BOX STEM EXTENSION RODS ARE TO BE USED ON WATER SERVICES UP TO AND INCLUDING 25 mm.
5. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS AND BLOW-OFFS REQUIRED FOR TESTING THE WATERMAIN.
6. MAXIMUM ALLOWABLE PIPE JOINT DEFLECTION OF THE WATERMAIN SHALL BE 50% OF THE MANUFACTURER'S SPECIFICATIONS. PIPE BARREL DEFLECTION IS STRICTLY PROHIBITED.
7. CORROSION PROTECTION IS REQUIRED FOR ALL METALLIC PIPE, VALVES, FITTINGS, SERVICES AND HYDRANTS. ALL SACRIFICIAL ANODES SHALL CONFORM TO ASTM B-418 TYPE II AND SHALL BE MADE OF HIGH GRADE ELECTROLYTIC ZINC, 99.99% PURE.
8. VALVE CHAMBER AND COVERS TO BE AS PER OPSD 402.010 AND TO BE CAST WITH THE WORDS "DANGER" AND "WATER". COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT
9. WATERMAIN BEDDING SHALL BE IN ACCORDANCE WITH OPSD 802.010, 802.013 OR 802.014 UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER TO THE SATISFACTION OF THE REGION OF HALTON, WITH A MINIMUM REQUIREMENT OF GRANULAR "A" BEDDING CONFORMING TO OPSS MUNI. 401. FOR BEDDING MATERIAL IN SHALE EXCAVATION, REFER TO GEOTECHNICAL RECOMMENDATIONS.
10. APPROVED BACKFILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH OPSS 401, 402, AND 403. COMPACTION SOIL DENSITY TESTING SHALL BE CARRIED OUT TO ENSURE ADEQUATE COMPACTION AND STABILITY OF FILL AND TEST RESULTS SHALL BE SUBMITTED TO THE TOWN OF OAKVILLE AND REGION OF HALTON.
11. WATERMAIN AND WATER SERVICES INSTALLED WITHIN 2.5 m FROM A CATCHBASIN OR MANHOLE SHALL BE INSULATED TO THE SATISFACTION OF THE REGION OF HALTON.
12. WATERMAINS AND WATER SERVICES SHALL BE INSTALLED WITH A MINIMUM DEPTH OF COVER OF 1.7 METERS.
13. WATERMAINS SHALL BE LAID WITH AT LEAST 2.5m HORIZONTAL SEPARATION FROM ANY SEWERS OR SEWER MANHOLES. UNDER UNUSUAL CONDITIONS, WHERE CONGESTION WITH OTHER UTILITIES WILL PREVENT A CLEAR HORIZONTAL SEPARATION OF 2.5m, A WATERMAIN MAY BE LAID CLOSER TO A SEWER, PROVIDED THAT THE VERTICAL SEPARATION OF THE SEWER IS AT LEAST 0.5m BELOW THE WATERMAIN. ALL DISTANCES SHALL BE MEASURED FROM THE NEAREST EDGES OR OUTSIDE SURFACES, WHERE NEITHER HORIZONTAL OR VERTICAL CLEARANCE CAN BE PHYSICALLY ACHIEVED, WHERE APPLICABLE, THE SEWER MAIN SHALL BE CONSTRUCTED WITH JOINTS THAT ARE EQUIVALENT TO WATERMAIN STANDARDS OF CONSTRUCTION.
14. MINIMUM SEPARATION/CLEARANCE SHALL BE 150mm WHERE WATERMAINS CROSS OVER MAINLINE SEWERS AND LATERALS AND 500mm WHERE THE WATERMAIN CROSSES UNDER (THE DISTANCE SHALL BE MEASURED FROM THE NEAREST EDGES OR OUTSIDE SURFACES). IF THE MINIMUM COVER OF THE WATERMAIN OR WATER SERVICE CONNECTION CANNOT BE OBTAINED AS A RESULT OF THE WATERMAIN OR WATER SERVICE CONNECTION CROSSING ABOVE THE SEWER, THE WATERMAIN OR WATER SERVICE CONNECTION SHALL BE CONSTRUCTED UNDER THE SEWER OR INSULATED FOR ITS ENTIRE LENGTH USING PRE-INSULATED PIPE UNTIL THE MINIMUM DEPTH (1.7m) IS OBTAINED. WHEN CROSSING OVER A STORM SEWER THE STORM SEWER MUST ALSO BE INSULATED WITH MINIMUM 100mm EXTRUDED FOAM (HI 100) INSULATION, REFER TO HALTON REGION STANDARD DRAWING RH 408.020 & 408.030.
15. ALL SERVICES TAPPING TO EXISTING MAINS ARE TO BE DONE BY THE REGIONAL FORCES. CONNECTIONS ARE NOT TO BE MADE TO THE EXISTING MAIN UNTIL THE NEW MAIN IS COMPLETED, TESTED, SWABBED AND DISINFECTED.
16. NO WATERMAIN OR APPURTENANCE SHALL BE PLACED ON PREVIOUSLY EXCAVATED SOIL UNLESS PROPER ENGINEERED SUPPORT IS IN PLACE TO THE SATISFACTION OF THE REGION AND THE PROJECT GEOTECHNICAL ENGINEER.
17. REGIONAL MUNICIPALITY OF HALTON APPROVED MECHANICAL RESTRAINT JOINTS ARE TO BE USED ON ALL BENDS, ALL PIPES AND FITTINGS IN FILL SECTIONS, ALL VALVE CHAMBERS, AND ALL PLUGS, CAPS, HYDRANTS, TEES, BRANCH CONNECTIONS, LINE VALVES AND HORIZONTAL BENDS WHERE DISTURBED SOIL IS ENCOUNTERED.
18. MINIMUM COVER OVER HYDRANT LATERAL SHALL BE 1.7m. IF A HYDRANT MAIN VALVE SEAT EXCEEDS 1.7m, A SUITABLE HYDRANT BOTTOM EXTENSION MUST BE USED AND PLACED BETWEEN BOOT AND HYDRANT BARREL – REFER TO HALTON REGION STANDARD DRAWING RH 407.010
19. ALL HYDRANTS REQUIRE STORZ PUMPER CONNECTIONS
    1) TWO (2) 63.5 mm (2 1/2") WITH CSA STANDARD THREAD, 63.5 mm I.D., 79.4 mm O.D., 5 THREADS PER 25 mm, 31.75 mm SQUARE OPERATING NUT; AND
    2) ONE (1) 100 mm (4") STORZ PUMPER CONNECTION AS PER CAN/ULC #S-520, 31.75 mm SQAURE OPERATING NUT, AND STORZ CAP PAINTED GLOSS BLACK
20. HYDRANTS SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C502 AND SHALL HAVE STEAMER PORTS AS PER REGION STANDARD SPECIFICATIONS. ALL HYDRANTS SHALL BE INSTALLED AS PER OPSD 1105.010, AS AMENDED BY THE REGION OF HALTON STANDARD DRAWING RH 407.010.
21. FIRE HYDRANTS SHALL BE INSTALLED WITH BREAK-OFF FLANGE SET 0mm TO 50mm ABOVE FINISHED GRADE. ALL HYDRANT LATERALS SHALL HAVE A 150mm SECONDARY VALVE, VALVE BOX AND ANCHOR TEE.
22. MINIMUM SEPARATION DISTANCE FROM THE EDGE OF DRIVEWAY TO THE FACE OF THE FIRE HYDRANT SHALL BE 1.0m.
23. VALVE CHAMBER SHALL BE PRECAST CONCRETE CHAMBER AS PER REGION STD. RH.402.020, OR RH.402.080. THREE VALVES ARE REQUIRED AT A TEE INTERSECTION AND FOUR VALVES ARE REQUIRED AT A CROSS INTERSECTION UNLESS OTHERWISE NOTED.
24. LINE VALVES SHALL BE THE SAME SIZE AS WATERMAIN COMPLETED WITH VALVE BOX AND EXTENSION.
25. RESILIENT SEAT GATE VALVES CONFORMING TO AWWA C509 OR C515 (LATEST REVISION) MAY BE USED FOR WATERMAINS 400mm DIA. AND SMALLER. RESILIENT SEAT GATE VALVES CONFORMING TO AWWA C515 (LATEST REVISION) SHALL BE USED FOR WATERMAINS LARGER THAN 400mm.
26. CATCH BASIN LEADS TO BE INSTALLED UNDER WATERMAIN WITH MINIMUM 0.15m CLEARANCE WHERE CROSSING WATERMAIN.
27. ALL WATERMAINS WILL BE SUBJECT TO PRESSURE TESTING AND FIRE FLOW TESTING AS DIRECTED BY HALTON REGION.
28. ALL WATER CUSTOMERS SUPPLIED BY A WATERMAIN TO BE SHUT DOWN SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 48 HOURS IN ADVANCE OF THE SHUT DOWN AS PER REGION OF HALTON SPECIFICATIONS. NOTIFICATION SHALL TAKE PLACE UNDER THE ENGINEER'S DIRECTION.
29. WATER SERVICE CURB BOXES ARE TO HAVE STAINLESS STEEL RODS AND STAINLESS STEEL COTTER PINS.
30. WATER SERVICES CROSSINGS SEWERS ≥600mm TO BE PREINSULATED AS REQUIRED AS PER LDM 2.6.6.(b)iii; 2.9.17. AND RH 408.020.
31. ALL LOTS TO BE PROVIDED WITH PRESSURE REDUCING VALVES REFER TO WATERMAIN REPORT BY GEOADVICE FOR DETAIL.
32. AIR RELEASE VALVES TO BE INSTALLED AS PER HALTON STANDARD DRAWINGS RH.404.010, RH.404.011, AND RH.404.012.

ROADWORK NOTES:

1. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. ROAD SUBDRAINS SHALL BE IN ACCORDANCE WITH TOWN OF OAKVILLE STD. 6-2.
3. ALL CURB AND GUTTER SHALL BE IN ACCORDANCE WITH OPSD 600.040 AND TOWN OF OAKVILLE STD. 6-1 (TWO STAGE CURB), TWO STAGE FRONTING RESIDENTIAL LOTS/UNITS UNLESS OTHERWISE NOTED. OPSD 600.060 MODIFIED TO TWO STAGE SHALL BE PROVIDED FOR LANEWAYS. CURB DEPRESSIONS ARE REQUIRED AT EACH DRIVEWAY APRON AND AT EACH INTERSECTION AND PEDESTRIAN CROSSING TO ACCOMMODATE WHEELCHAIR ACCESS RAMP, EXCEPT WHERE OPSD 600.060 IS APPLIED.
4. MINIMUM CURB GRADE TO BE 0.5% INCLUDING ON CUL-DE-SAC BULBS AND OUTSIDE ROAD ELBOWS.
5. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH OPSD 310.010 AND OPSD 310.030.
6. MAXIMUM DRIVEWAY SLOPE NOT TO EXCEED 7%.
7. PRIOR TO PLACEMENT OF GRANULAR MATERIAL, THE SUBGRADE MATERIAL MUST BE PROOF-ROLLED IN THE PRESENCE OF THE TOWN'S REPRESENTATIVES AND GEOTECHNICAL CONSULTANT.
8. CONCRETE WALKWAY SHALL BE IN ACCORDANCE WITH TOWN OF OAKVILLE STD. 6-4,
9. PAVEMENT DESIGN TYPE

LOCAL ROADS AND LANEWAYS – 17.0m ROW (POLLY DRIVE)
- 40mm HL-3 ASPHALT CONCRETE
- 50mm HL-8 ASPHALT CONCRETE
- 150mm GRANULAR "A" BASE
- 350mm GRANULAR "B" SUB-BASE

RESIDENTIAL DRIVEWAY
- 75mm OF HL-3A CONFORMING TO OPSS
- 150mm OF 19mm CRUSHER-RUN LIMESTONE

RESIDENTIAL DRIVEWAY APRON BETWEEN SIDEWALK AND CURB (TOWN STD. 10-3)
- 180mm CONCRETE-32MPA, TYPE C2
- 150mm OF 19mm CRUSHER-RUN LIMESTONE

GEOTECHNICAL REPORT/MEMO:

REFER TO:
- CONSOLIDATED REPORT ON GEOTECHNICAL INVESTIGATION NO. TT53094, DATED SEPTEMBER 18, 2007 BY AMEC AMERICAS LIMITED.

INFORMATION PRESENTED ON THESE DRAWINGS HAS BEEN INTERPOLATED FROM THE GEOTECHNICAL REPORTS AND ACCURACY IS NOT GUARANTEED. CONTRACTORS ARE ADVISED TO READ THE GEOTECHNICAL REPORTS AND ASSUME THEIR OWN CONCLUSIONS. GEOTECHNICAL CONSULTANT MAY PROPOSE A MODIFIED BEDDING TO ADDRESS WET CONDITIONS TO THE SATISFACTION OF THE TOWN.

SUMP PUMP NOTES:

1. ALL DWELLINGS SHALL BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED, TO THE SATISFACTION OF THE TOWN OF OAKVILLE. SEE DETAIL ON DWG. 8.
2. SPLASH PADS SHALL BE PROVIDED AT THE SUMP PUMP OUTLET WHERE DISCHARGE IS TO GRADE.

ENGINEERED / TRENCH BACK FILL:

ALL ENGINEERED FILL AND TRENCH BACK FILL SHOULD BE PREPARED ACCORDING TO THE RECOMMENDATIONS PROVIDED IN GEOTECHNICAL REPORT. PLACEMENT OF ENGINEERED FILL, PIPE BEDDING AND BACKFILL OF TRENCHES SHOULD BE INSPECTED BY A GEOTECHNICAL ENGINEER, INCLUDING FOUNDATION SUBGRADE, SLOPES AND EXCAVATIONS.

SEE CONSOLIDATED REPORT ON GEOTECHNICAL INVESTIGATION NO. TT53094, DATED SEPTEMBER 18, 2007 BY AMEC AMERICAS LIMITED.

GRADING NOTES:

1. DRIVEWAYS SHALL BE GRADED AT MINIMUM OF 1.0% AND MAXIMUM OF 7.0% SLOPE.
2. ALL DOWNSPOUTS SHALL DISCHARGE ONTO APPROVED SODDED AREAS USING SPLASH PADS FOR EROSION CONTROL.
3. ALL YARD SURFACES FRONT AND REAR SHALL HAVE A MINIMUM SLOPE OF 2.0%.
4. REAR YARDS ARE TO HAVE A MAXIMUM GRADE OF 5.0% FOR A MINIMUM APRON LENGTH OF 5.0m DISTANCE FROM THE REAR FACE OF THE DWELLING. ALL YARDS TO BE SODDED WITH 300mm THICK TOPSOIL.
5. THERE SHALL BE A 0.6m WIDE PATH AT A 2.0% SLOPE AWAY FROM THE FOUNDATION AROUND ONE SIDE OF THE BUILDING.
6. ALL AREAS BEYOND THE PLAN OF SUBDIVISION, WHICH ARE DISTURBED DURING CONSTRUCTION, SHALL BE RESTORED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
7. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY CULTURE SHOULD BE NOTIFIED IMMEDIATELY.
8. PRIOR TO THE COMMENCEMENT OF SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL. THE CONTRACTOR SHALL MAINTAIN ALL WORKS UNTIL SERVICING CONSTRUCTION IS COMPLETED TO THE SATISFACTION OF THE ENGINEER AND THE TOWN OF OAKVILLE.
9. SILT CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZED AND REVEGETATED.
10. BUILDINGS DENOTED AS REQUIRING ENGINEERED FILL (E.F) ARE ESTIMATED IN RELATION TO THE TOPOGRAPHIC SURVEY INFORMATION NOTED ON THE DRAWINGS, AND ARE PROVIDED FOR REFERENCE ONLY. FINAL E.F REQUIREMENTS ARE TO BE DETERMINED ONSITE BY PROJECT GEOTECHNICAL CONSULTANT. E.F SHOWN ON THE PLANS INDICATE THAT FILL IS REQUIRED, BELOW AND UP TO 0.5m ABOVE THE ASSUMED UNDER SIDE OF FOOTING WITHIN THE BUILDING ENVELOPE.

SPILLS CONTROL NOTES:

1. ALL CONSTRUCTION ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF DEBRIS, SEDIMENTS, OR OTHER DELETERIOUS PRODUCTS TO ANY ENVIRONMENTALLY SENSITIVE AREAS.
2. ALL CONSTRUCTION EQUIPMENT SHALL BE REFUELED, MAINTAINED AND STORED NO LESS THAN 30 METERS FROM WATERCOURSES, STREAM, CREEKS, WOODLOTS, WETLANDS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
3. ALL CONTRACTORS MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS, MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
4. IN THE EVENT OF A LEAK, DISCHARGE, OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL, OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
    a. IMMEDIATELY NOTIFY THE MINISTRY OF ENVIRONMENT (SPILL ACTION CENTER) AT 1-800-268-6060.
    b. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
    c. RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
    d. ADDITIONALLY, IMMEDIATELY NOTIFY THE TOWN OF THE INCIDENT.

LIST OF DRAWINGS

No.	DRAWINGS	DESCRIPTION
1	GENERAL NOTES	
2	ABOVEGROUND GENERAL PLAN	
3	UNDERGROUND GENERAL PLAN	
4	GRADING PLAN	
5	SANITARY DRAINAGE PLAN	
6	STORM DRAINAGE PLAN	
7	POLLY DRIVE	STA. 0+-000.000 TO STA. 0+105.000
8	DETAIL SHEET	.
CUP-1	COMPOSITE UTILITY PLAN	
ESC-1	EROSION & SEDIMENT CONTROL PLAN	
ESC-2	EROSION & SEDIMENT CONTROL DETAILS	

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 00819818114 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 1.1 M SOUTH OF NORTH RIGHT-OF -WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

DATE: JULY 2026

SCALE

REFERENCES

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS DATE

STAMP

LICENSED PROFESSIONAL ENGINEER
Kaya Yuan
C. YUAN
100598347
2026-07-06
PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY

OAKVILLE
DEVELOPMENT SERVICES

REGION

The Regional Municipality of Halton

DEVELOPER

REMINGTON GROUP

PROJECT

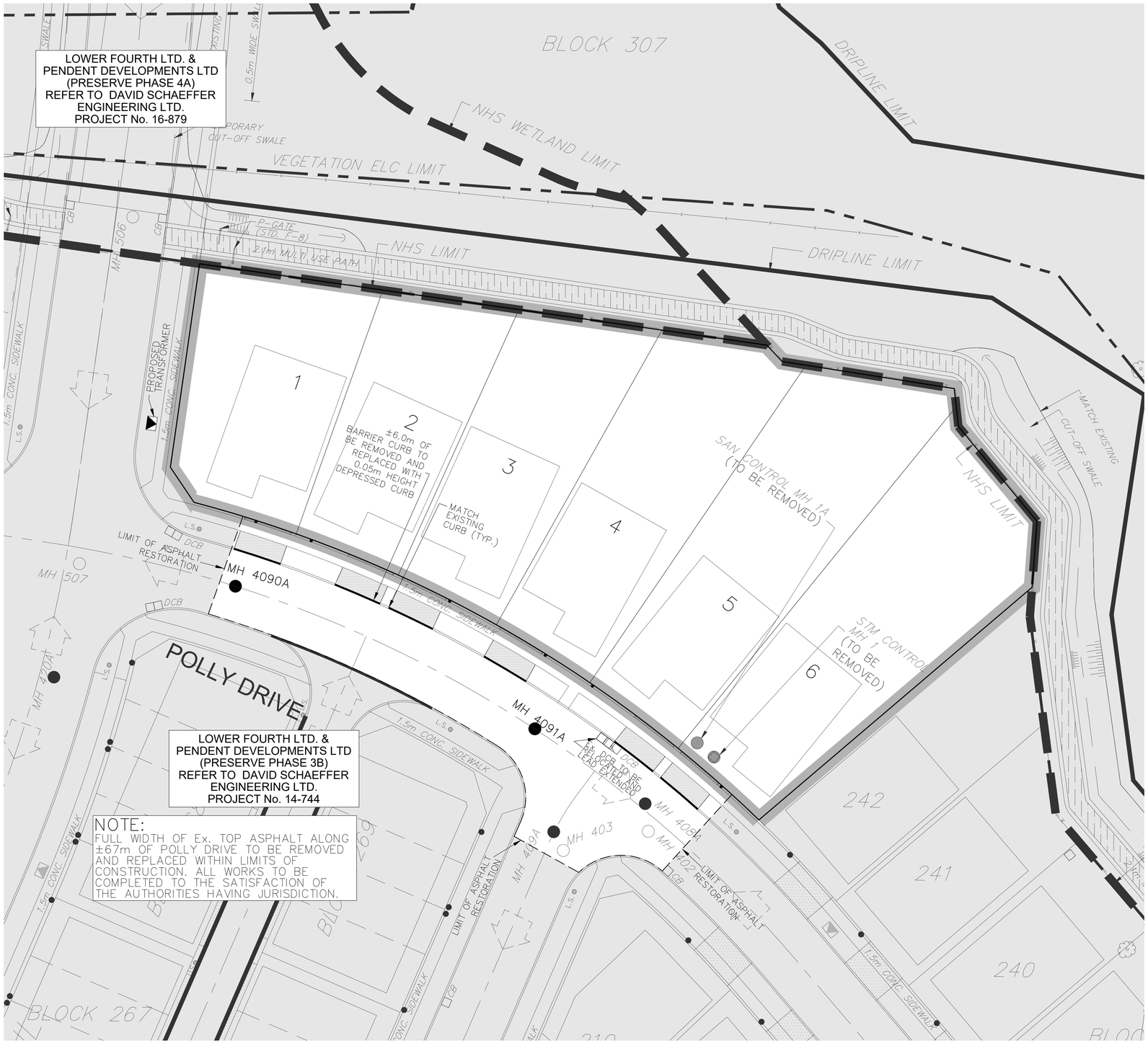
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(275 POLLY DRIVE)

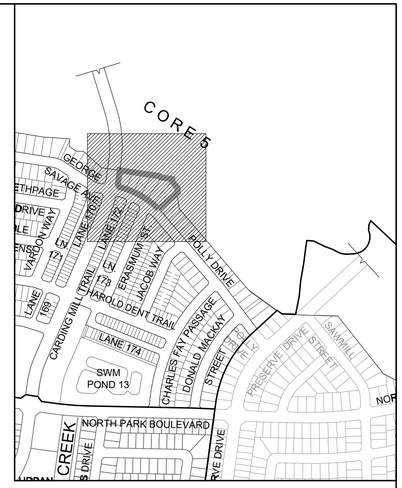
TITLE

© DSEL

GENERAL NOTES

MUNICIPAL FILE NO. 24T-XXXX	REGIONAL FILE NO. DO-XXXX
PROJECT NO. 21-1227	SHEET 1





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081981814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

SCALE HORIZ. 1:250 (0 2.5 5 7.5 10)

DATE JULY 2026

REFERENCES

FIELD NOTES

NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. WORKS WITHIN THE CH REGULATION LIMIT WILL REQUIRE A PERMIT FROM CONSERVATION HALTON UNDER ONTARIO REGULATION 162/06
7. ALL VALVES TO BE CAST IRON EPOXY COATED
8. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL
9. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- WATER CONNECTION
- HYDRANT
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE CATCHBASIN
- DOUBLE CATCHBASINS
- COMMUNITY MAILBOX AND PAD LOCATION (WITH SIDEWALK) E10X-ENG-08 (1) – ONE MODULE (2) – TWO MODULES (3) – THREE MODULES
- TEMP. M.B. TEMPORARY MAILBOX
- 1.2m HIGH DECORATIVE FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.2m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.8m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.8m HIGH WOOD PRIVACY FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- RETAINING WALL (SEE NOTES ON DWG 1 & STRUCTURAL DWG FOR DETAIL)
- PROPOSED OVERLAND FLOW DIRCTION
- EXTERNAL OVERLAND FLOW DIRECTION
- SLAB ON GRADE BLOCKS/UNITS DRIVEWAY WITH CONCRETE APRON (TOWN STD 10-3)
- PHASE LINE
- NOT PART OF APPLICATION
- TREES TO BE PRESERVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
- TREES TO BE REMOVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
- TREE PROTECTION FENCE
- TACTILE WALKING SURFACE INDICATOR WITH BLACK ASPHALT DIP FINISH (OPSD-310.033 & OPSD-310.039)

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP: LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton REGION — The Regional Municipality of Halton

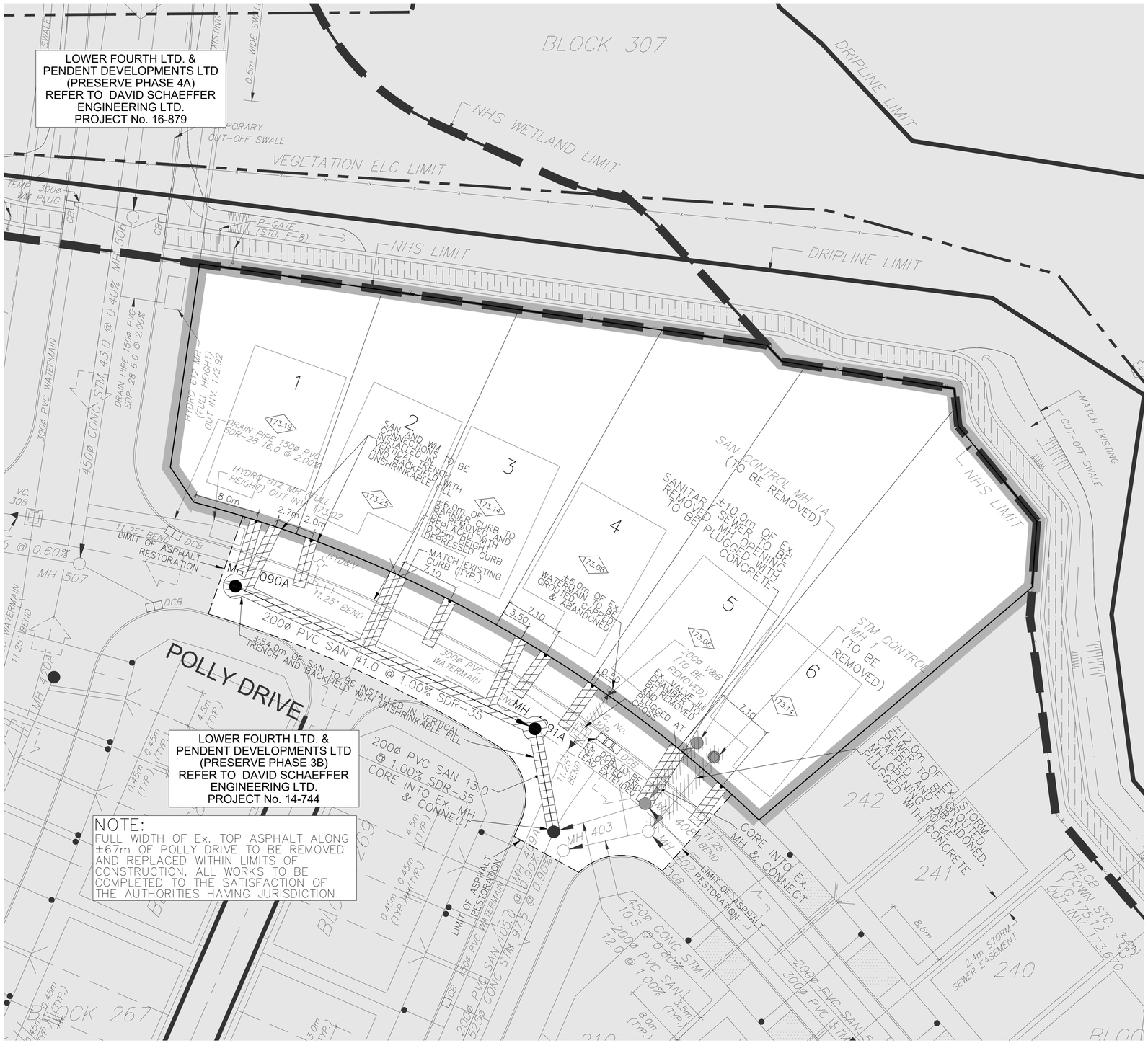
DEVELOPER: REMINGTON GROUP

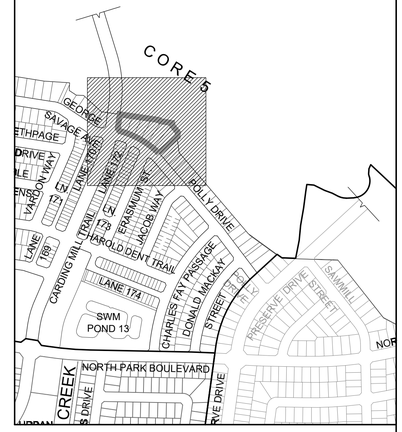
PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: ABOVEGROUND GENERAL PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 2





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081881814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. WORKS WITHIN THE CH REGULATION LIMIT WILL REQUIRE A PERMIT FROM CONSERVATION HALTON UNDER ONTARIO REGULATION 162/06
7. SERVICING AND GRADING DESIGN FOR FUTURE LOTS LANDS SHOWN ON THE DRAWINGS ARE CONCEPTUAL, WHICH ARE TO BE FURTHER REVIEWED / FINALIZED UPON FUTURE DEVELOPMENT
8. ALL VALVES TO BE CAST IRON EPOXY COATED
9. WATERMAIN CONSTRUCTION TO BE VERIFIED ONSITE BY GEOTECHNICAL CONSULTANT IN RELATION TO EXISTING FILL AND SOIL REMEDIATION PROGRAM. IF WATERMAIN IS TO BE INSTALLED IN AREAS OUTSIDE OF THE NATIVE ORIGINAL GROUND, MECHANICAL RESTRAINING JOINTS ARE REQUIRED, TO THE SATISFACTION OF REGION OF HALTON
10. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 2.5m AND THE COVER IS LESS THAN 1.7m. REFER TO DETAIL ON DWG. 8 UNLESS OTHERWISE SPECIFIED.
11. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL
12. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTERWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE STORM HOUSE CONNECTION
- WATER CONNECTION
- CURB STOP SERVICE
- HYDRANT
- TEE
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE
- DOUBLE CATCHBASIN
- SLAB ON GRADE BLOCKS/UNITS
- ANTI-SEEPAGE COLLAR (SEE DWG. 6.3 FOR DETAIL)
- PHASE LINE
- NOT PART OF APPLICATION

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	C.Y.	
SCALE HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL ☐ HYDRO ☐
GAS ☐ CABLE ☐
TRAFFIC ☐ WATER ☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-01-06 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

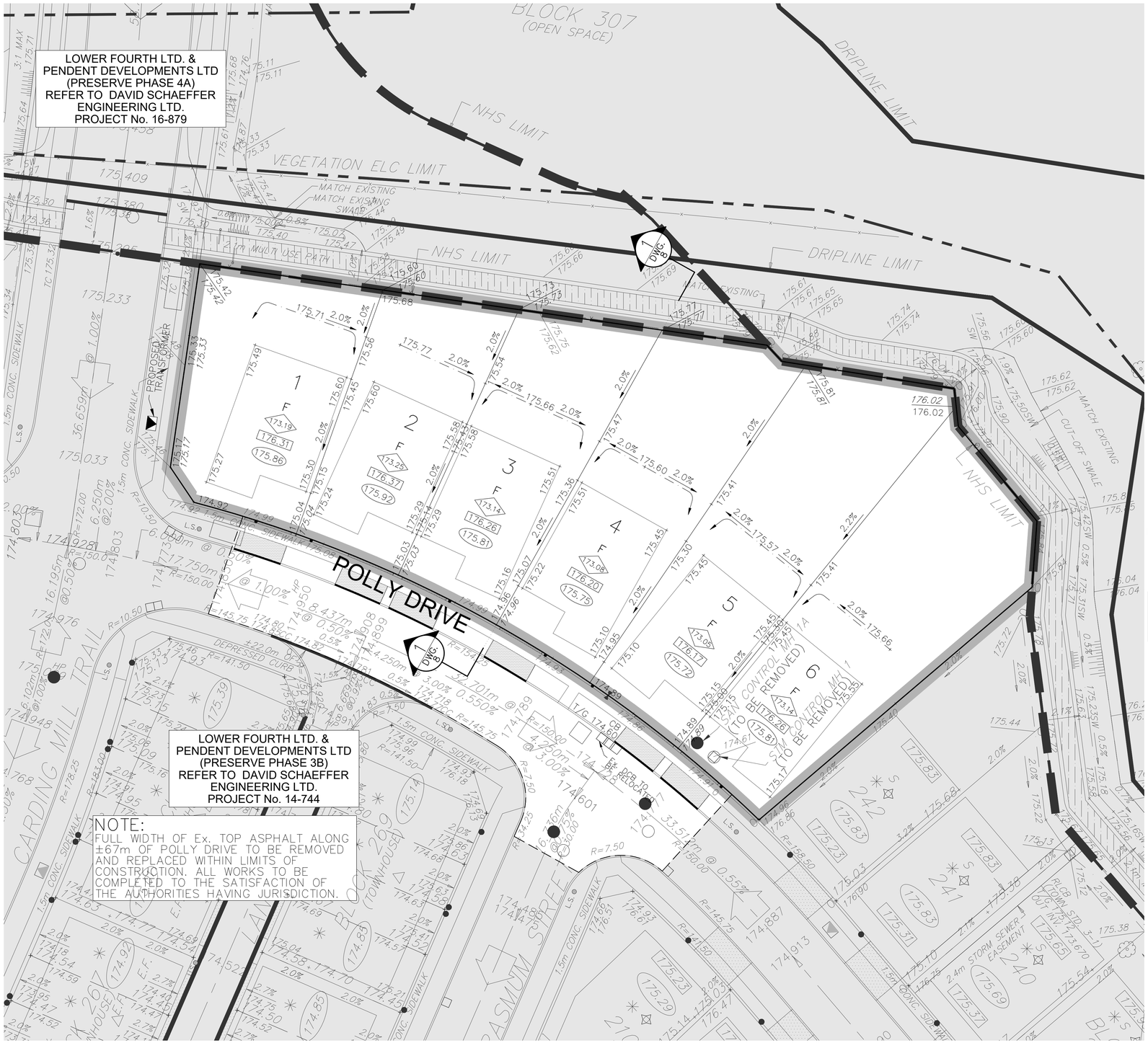
DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: UNDERGROUND GENERAL PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 3

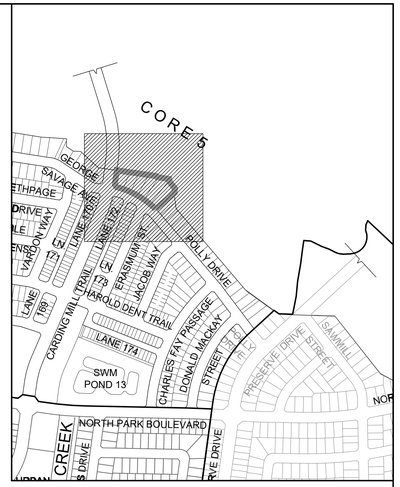


NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. TEMPORARY CUT-OFF SWALES TO BE PLACED WITH TOPSOIL AND SEEDED TO THE SATISFACTION OF AUTHORITIES HAVING JURISDICTION
7. FOR ENGINEERED FILL AND COMPACTION REQUIREMENTS, PLEASE SEE GEOTECHNICAL INVESTIGATION REPORT
8. ELEVATIONS SHOWN ON THE FUTURE STREETS, LOTS AND BLOCKS ARE FUTURE ELEVATIONS, UNLESS OTHERWISE NOTED
9. WORKS WITHIN THE CH REGULATION LIMIT WILL REQUIRE A PERMIT FROM CONSERVATION HALTON UNDER ONTARIO REGULATION 162/06
10. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG.8 FOR DETAIL
11. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTERWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.
12. MINIMUM 300mm OF TOPSOIL DEPTH REQUIRED ON STREET BOULEVARDS AND RESIDENTIAL FRONT & REAR YARDS.

LEGEND

- 199.35 PROPOSED ELEVATION
- 198.50 EXISTING ELEVATION
- [199.35] FUTURE PROPOSED ELEVATION
- 198.00 EXISTING CONTOUR ELEVATION
- SWALE
- 92.00 UNDERSIDE OF FOOTING ELEVATION (USF)
- 212.13 FIRST FLOOR ELEVATION
- 212.16 SPECIFIED HOUSE GRADE
- L.O. LOOK OUT LOT
- W.O. WALK OUT LOT
- S SPLIT DRAINING LOT
- F BACK TO FRONT DRAINING LOT
- TR TRANSITION LOT
- PROPOSED OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- HYDRANT
- VALVE & CHAMBER
- VALVE & BOX
- 3:1 MAXIMUM SLOPE
- HYDRO TRANSFORMER
- LIGHT STANDARD
- SINGLE CATCHBASIN
- DOUBLE CATCHBASINS
- SLAB ON GRADE BLOCKS/UNITS
- STORM MANHOLE
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- 1.2m HIGH DECORATIVE FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.2m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.8m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.8m HIGH WOOD PRIVACY FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- RETAINING WALL (SEE NOTES ON DWG 1 & STRUCTURAL DWG FOR DETAIL)
- OP-08(3) COMMUNITY MAILBOX AND PAD LOCATION (WITH SIDEWALK) E10X-ENG-08
- OP-08(2) (1) – ONE MODULE (2) – TWO MODULES (3) – THREE MODULES
- TEMP. M.B. TEMPORARY MAILBOX
- DRIVEWAY WITH CONCRETE APRON (TOWN STD 10-3)
- SIDE YARD DETAIL (REFER TO DWG 8 FOR SHORT SIDES OF SIDE YARD DETAIL, UNLESS OTHERWISE NOTED)
- BARRIER CURB WITH DEPRESSED SECTION
- MOUNTABLE CURB (OPSD 600.060)
- PHASE LINE
- NOT PART OF APPLICATION
- TREES TO BE PRESERVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
- TREES TO BE REMOVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
- TREE PROTECTION FENCE
- TACTILE WALKING SURFACE INDICATOR WITH BLACK ASPHALT DIP FINISH (OPSD-310.033 & OPSD-310.039)



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081981814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD, BENCH MARK IS 56.7 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY: D.A. CHECKED BY: C.Y.
DRAWN BY: A.C. CHECKED BY: C.Y.
SCALE HORIZ. 1:250 0 2.5 5 7.5 10
DATE JULY 2026
REFERENCES
FIELD NOTES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

BELL ☐ HYDRO ☐
GAS ☐ CABLE ☐
TRAFFIC ☐ WATER ☐

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

STAMP
LICENSED PROFESSIONAL ENGINEER
Kaya Yuan
C. YUAN
100598347
2026-01-06
PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY
OAKVILLE
DEVELOPMENT SERVICES

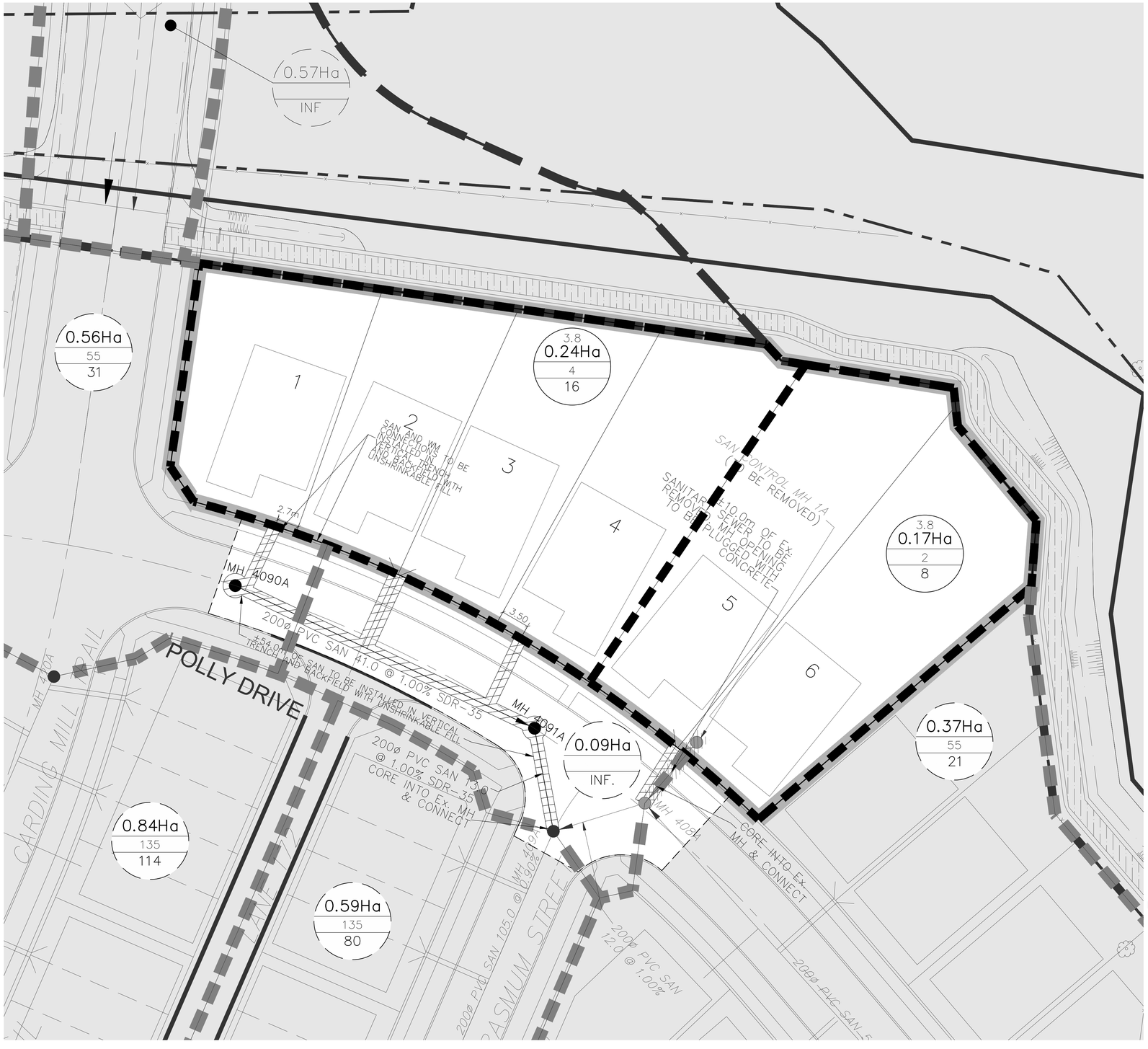
REGION
Halton REGION
The Regional Municipality of Halton

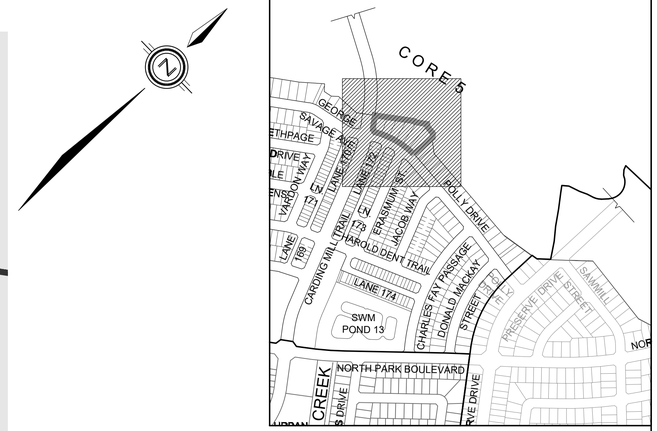
DEVELOPER
REMINGTON GROUP

PROJECT
PRESERVE BLOCK 301
(275 POLLY DRIVE)

TITLE
GRADING PLAN
© DSEL

MUNICIPAL FILE NO. 24T-XXXX
REGIONAL FILE NO. DO-XXXX
PROJECT NO. 21-1227
SHEET 4





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081881814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:		D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:		A.C.	CHECKED BY:	C.Y.	
SCALE	HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-07-06 — PROVINCE OF ONTARIO

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600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: SANITARY DRAINAGE PLAN

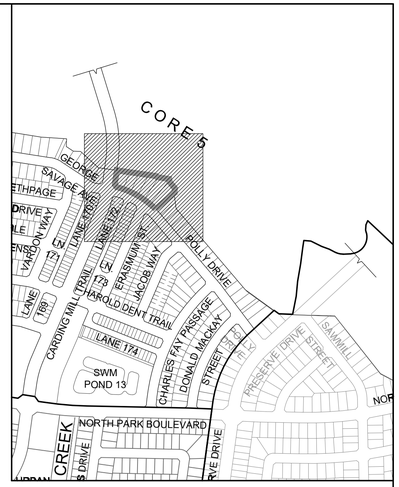
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MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 5

LEGEND

- ppU
- 3.8 / 0.17Ha / 2 / 8 — AREA IN HECTARES, NUMBER OF UNIT, POPULATION
- 0.17Ha / 55 / 10 — EXTERNAL AREA IN HECTARES, EXTERNAL PERSON PER HECTARE, EXTERNAL POPULATION
- SANITARY SINGLE HOUSE CONNECTION
- SANITARY SEWER TRIBUTARY BOUNDARY
- SANITARY SEWER EXTERNAL TRIBUTARY BOUNDARY
- PHASE LINE
- NOT PART OF APPLICATION





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081801814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD, BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.	DATE	JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	C.Y.		
SCALE HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES	

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-01-06 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: STORM DRAINAGE PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 6

LEGEND

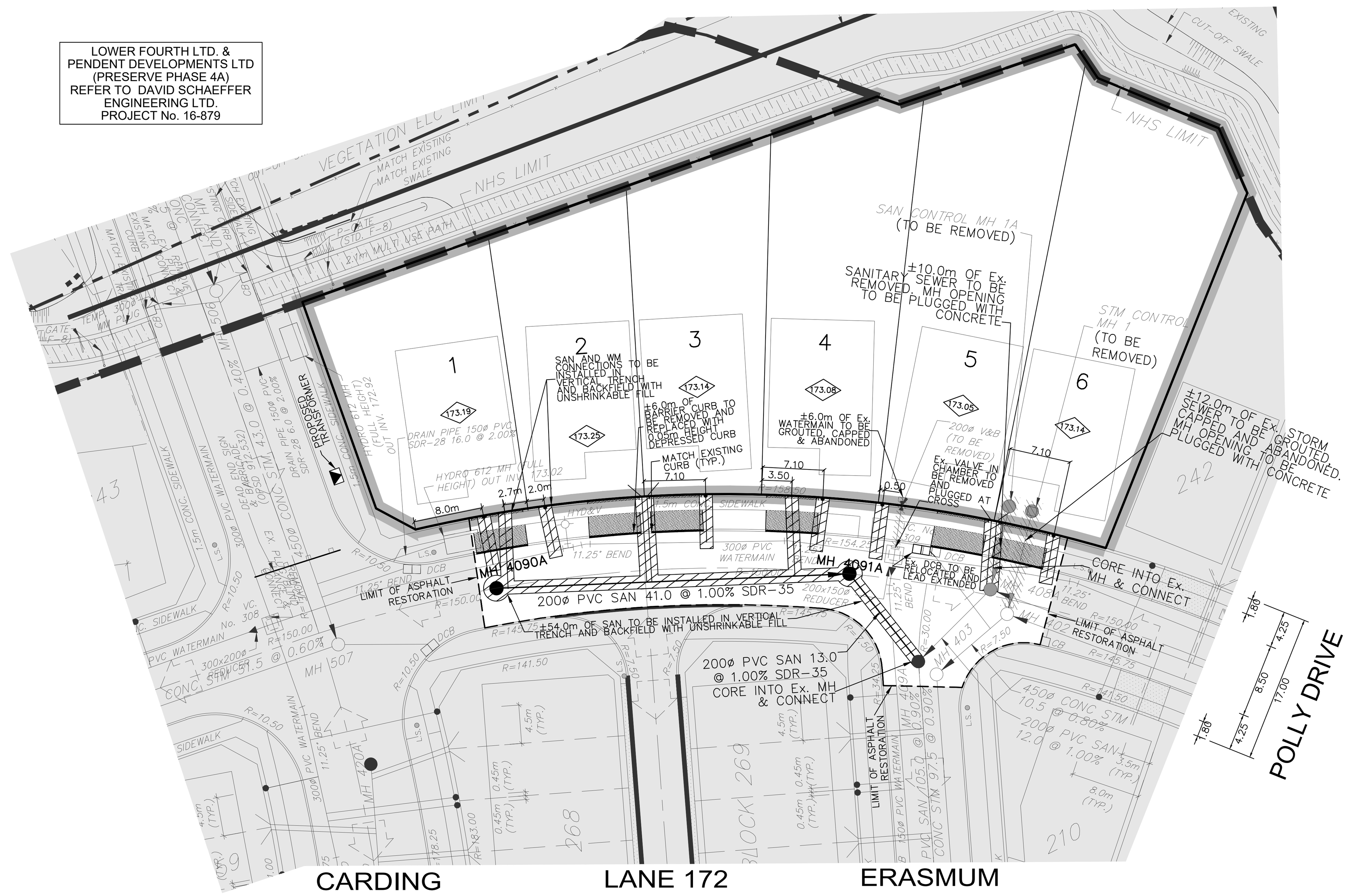
- 0.90Ha / 0.64 — DRAINAGE AREA IN HECTARES / RUN-OFF COEFFICIENT
- 1.20Ha / 0.90 — EXTERNAL DRAINAGE AREA IN HECTARES / RUN-OFF COEFFICIENT
- STORM SINGLE HOUSE CONNECTION
- OVERLAND FLOW DIRECTION
- OVERLAND FLOW DIRECTION
- SINGLE CATCHBASIN / DOUBLE CATCHBASINS / STORM SEWER TRIBUTARY BOUNDARY
- EXTERNAL STORM TRIBUTARY BOUNDARY
- PHASE LINE
- NOT PART OF THIS APPROVAL APPLICATION

PAVEMENT DESIGN
40mm HL-3 ASPHALT CONCRETE
50mm HL-8 ASPHALT CONCRETE
150mm GRANULAR "A" BASE
350mm GRANULAR "B" SUB-BASE

NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. SERVICING AND GRADING DESIGN FOR FUTURE LANDS SHOWN ON THE DRAWINGS ARE CONCEPTUAL, WHICH ARE TO BE FINALIZED UPON FUTURE DEVELOPMENT
7. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL.
8. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.
9. BEDDING MATERIAL FOR PVC PIPE, OPSD-802.010, TYPE 1 OR 2 SOILS, GRANULAR "A" OR EQUIVALENT; FOR CONCRETE PIPE, OPSD-802.030, CLASS "B", GRANULAR "A" OR EQUIVALENT, WITH GRANULAR "A" COVER. FOR BEDDING MATERIAL IN SHALE EXCAVATION, REFER TO GEOTECHNICAL REPORT FOR RECOMMENDATIONS.

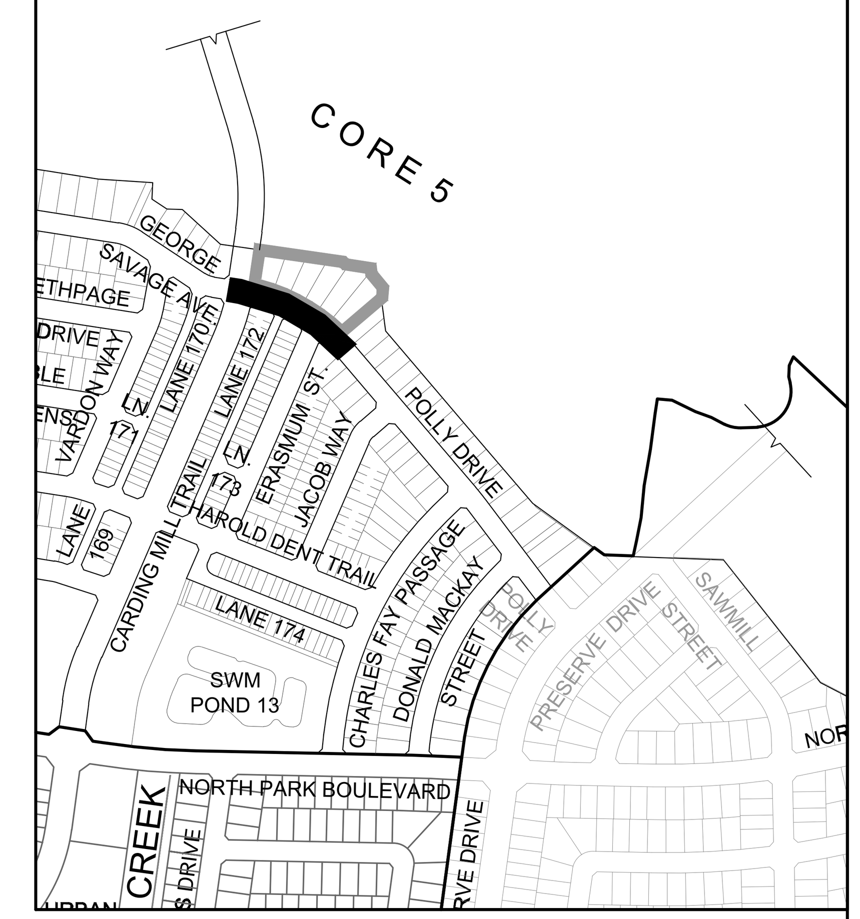
LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD (PRESERVE PHASE 4A) REFER TO DAVID SCHAEFFER ENGINEERING LTD. PROJECT No. 16-879



LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD (PRESERVE PHASE 3B) REFER TO DAVID SCHAEFFER ENGINEERING LTD. PROJECT No. 14-744

NOTE:
FULL WIDTH OF Ex. TOP ASPHALT ALONG ±67m OF POLLY DRIVE TO BE REMOVED AND REPLACED WITHIN LIMITS OF CONSTRUCTION. ALL WORKS TO BE COMPLETED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

STORM MANHOLE
SANITARY MANHOLE
SANITARY MANHOLE BY OTHERS
STORM MANHOLE BY OTHERS
SINGLE SANITARY HOUSE CONNECTION
DOUBLE STORM HOUSE CONNECTION
SINGLE STORM HOUSE CONNECTION
WATER CONNECTION
HYDRANT
TEE
VALVE & BOX
VALVE & CHAMBER
SINGLE CATCHBASIN
DOUBLE CATCHBASINS
HYDRO TRANSFORMER
COMMUNITY MAILBOX AND PAD LOCATION (WITH SIDEWALK) E10X-ENG-08
(1) - ONE MODULE
(2) - TWO MODULES
(3) - THREE MODULES
LIGHT STANDARD
1.2m HIGH DECORATIVE FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.2m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.8m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.8m HIGH WOOD PRIVACY FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
PROPOSED OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
UNDERSIDE OF FOOTING ELEVATION (USF)
SLAB ON GRADE BLOCKS/UNITS
DRIVEWAY WITH CONCRETE APRON (TOWN STD. 10-3)
TREES TO BE PRESERVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
TREES TO BE REMOVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
TREE PROTECTION FENCE
TACTILE WALKING SURFACE INDICATOR WITH BLACK ASPHALT DIP FINISH (OPSD-310.033 & OPSD-310.039)
ANTI-SEEPAGE COLLAR (OPSD-802.095)
PHASE LINE
NOT PART OF APPLICATION



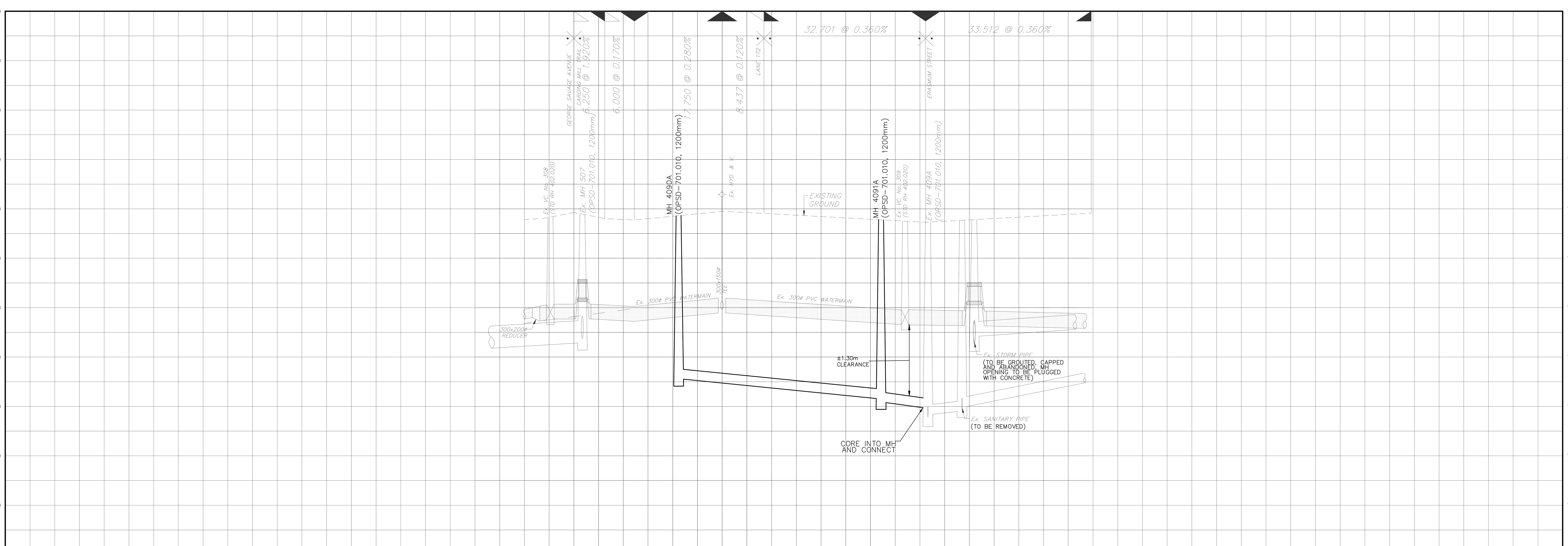
TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION
CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 00819818114 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 1.1 M SOUTH OF NORTH RIGHT-OF -WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION



STORM INVERT	Ex. 450Ø CONC STM 32.6 @ 0.65% 65-D	SW 172.270 NW 172.360				Ex. 200Ø PVC SAN 11.5 @ 0.70% SDR-35		SW 172.260 N 172.320 E 172.420	Ex. 300Ø PVC STM 69.1 @ 0.98% SDR-35	
SANITARY INVERT			W 171.561	200Ø PVC SAN 41.0 @ 1.00% SDR-35	E 171.151 SE 171.091	200Ø PVC SAN 13.0 @ 1.00% SDR-35	NW 170.961 S 170.790 NE 170.830	SW 170.910 N 170.970 E 170.940	Ex. 200Ø PVC SAN 56.0 @ 2.13% SDR-35	
PROPOSED GRADES	175.070	174.950 174.960	174.940 174.862	175.010 175.020 175.010	174.880 174.778		174.810 174.731	174.800		174.910
CENTERLINE CHAINAGE		0+006.250 0+012.250	0+021.189	0+030.000	0+062.134		0+071.617			

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

DATE: JULY 2026

SCALE: HORIZ. 1:250 (0 2.5 5 7.5 10); VERT. 1:50 (0 0.5 1 1.5 2.0)

REFERENCES

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

STAMP: LICENSED PROFESSIONAL ENGINEER — C. YUAN 100598347 — 2026-07-06 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton REGION — The Regional Municipality of Halton

DEVELOPER: REMINGTON GROUP

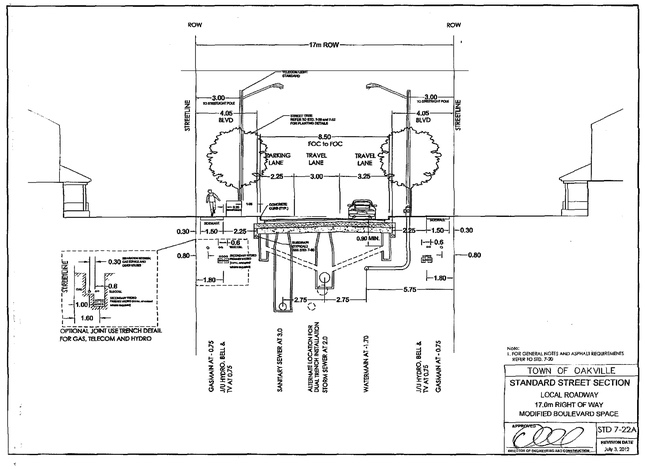
PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: PLAN AND PROFILE OF POLLY DRIVE STA. 0+000.000 TO STA. 0+105.000

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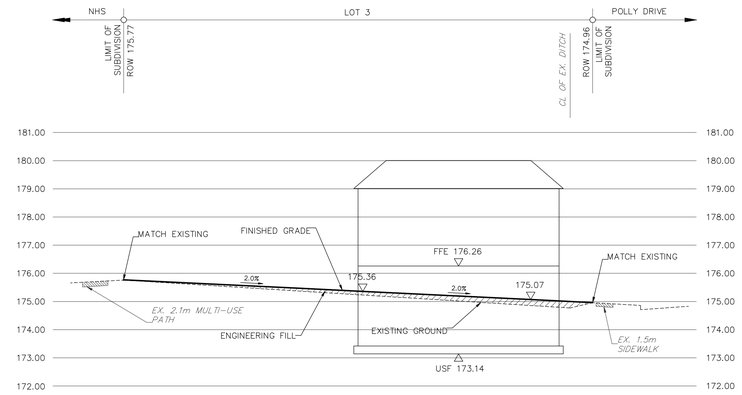
MUNICIPAL FILE NO. 24T-XXXX
REGIONAL FILE NO. DO-XXXX
PROJECT NO. 21-1227
SHEET 7

STANDARD ROADWAY SECTIONS



POLLY DRIVE

CROSS SECTION

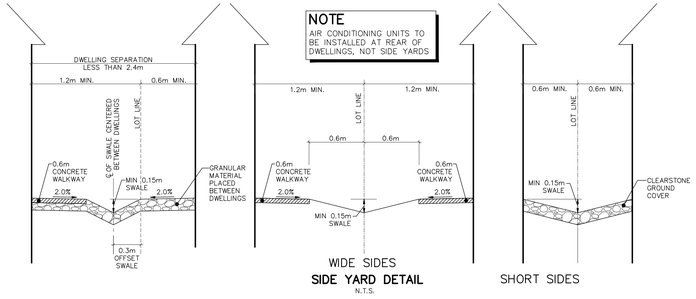


SECTION 1–1

SCALE HOR. 1:250

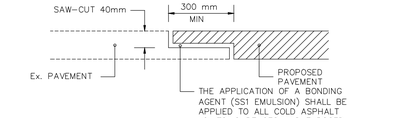
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CONSTRUCTION DETAILS



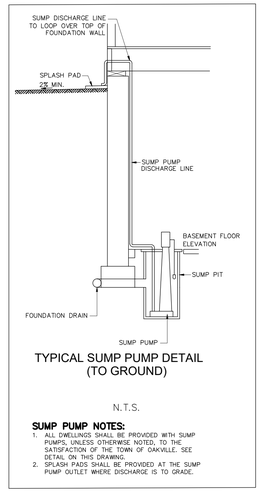
WIDE SIDES
SIDE YARD DETAIL
N.T.S.

SHORT SIDES



THE PAVEMENT SHALL BE SAW-CUT LEAVING A STEP JOINT 300mm WIDE BY 40mm DEEP, WHERE APPLICABLE. THE TOP LIFT OF ASPHALT SHALL OVERLAP BASE LIFT BY MINIMUM OF 0.5M ON EACH SIDE OF TRENCHES. ASPHALT RESTORATION WILL BE IN ACCORDANCE WITH OPSS 310. THE APPLICATION OF A BONDING AGENT (SS1 EMULSION) SHALL BE APPLIED TO ALL COLD ASPHALT JOINTS, SURFACES AND EXPOSED CONCRETE FACES AS PER OPSS 1103, TO THE SATISFACTION OF REGION OF HALTON.

STEP JOINT DETAIL



TYPICAL SUMP PUMP DETAIL (TO GROUND)

N.T.S.

SUMP PUMP NOTES:
1. ALL DWELLINGS SHALL BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED, TO THE SATISFACTION OF THE TOWN OF OAKVILLE. SEE DETAIL ON THIS DRAWING.
2. SPLASH PADS SHALL BE PROVIDED AT THE SUMP PUMP OUTLET WHERE DISCHARGE IS TO GRADE.

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

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STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	C.Y.	
SCALE				REFERENCES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER
Kaiyu Yuan
C. YUAN
100598347
2026-07-06
PROVINCE OF ONTARIO

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Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY

OAKVILLE
DEVELOPMENT SERVICES

REGION

Halton REGION
The Regional Municipality of Halton

DEVELOPER

REMINGTON GROUP

PROJECT

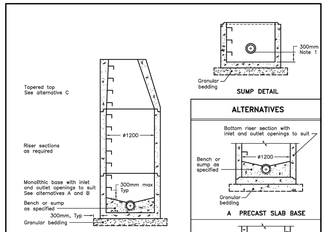
PRESERVE BLOCK 301
(275 POLLY DRIVE)

TITLE

DETAIL SHEET

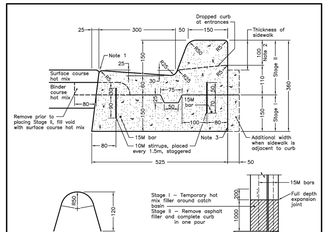
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MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 8



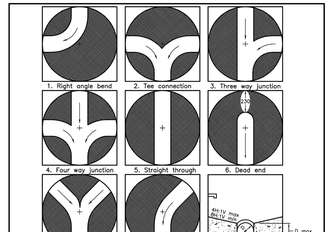
NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



NOTES:
1 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
2 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
3 For slipforming procedure a 5% batter is acceptable.
A Stage I surface shall be cleaned of foreign material prior to placement of Stage II material.
B Treatment at entrances shall be according to OPSD 351.010.
C Outlet treatment shall be according to the OPSD 610 Series.
D The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail, when it shall be according to the OPSD 900 Series.
E All dimensions are in millimetres unless otherwise shown.

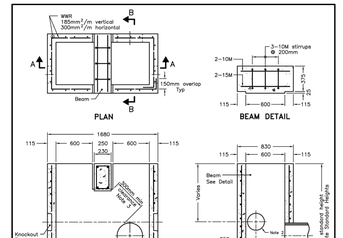
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB WITH STANDARD GUTTER TWO STAGE CONSTRUCTION		OPSD – 600.070



MAXIMUM SIZE HOLE IN THE WALL IN PRECAST RISER SECTIONS					
Maintenance Hole Diameter	No. 1–4	No. 5 and 6	No. 8	No.7	
				Inlet Hole	Outlet Hole
1200	700	860	780	700	860
1500	860	1220	960	860	1170
1800	1220	1485	1220	1220	1485
2400	1485	2020	1750	1485	2020
3000	1930	2450	2350	1930	2450
3600	2470	3085	2730	2470	3085

NOTES:
1 Slopes shall be maintained from the outlet hole opening for top of benching.
A Concrete for benching shall be 30MPa.
B When benching is hand-finished, it shall be given wood float finish, channel shall be given steel trowel finish.
C Benching slope and height shall be as specified.
D When specified, maintenance holes that are 1200mm in diameter with a uniform channel for 200 or 250mm pipe may be prebenched at the manufacturer with standardized benching slope and channel orientation.
E All dimensions are in millimetres.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 4
MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES		OPSD 701.021



NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
3 Minimum clearance between beam recess and hole for pipe shall be 300mm or minimum clearance can be 150mm with addition of two 15M size rebar on 45 degree diagonal.
A Centre reinforcing in base slab and walls @200mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ALTERNATE STANDARD HEIGHTS	
ALTERNATIVE	DIMENSION
A	1980
B	1830
C	1680

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE TWIN INLET CATCH BASIN 600 x 1450mm		OPSD 705.020

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES		OPSD 401.010

NOTES:
A Locking bolt shall be securely tightened.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON CIRCULAR LOCKING COVER FOR MAINTENANCE HOLES		OPSD 401.060

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010

NOTE:
1 The company undertaking welded fabrication shall be certified according to CSA W47.1. All welding shall be according to CSA W59.
A All aluminum components shall be 6000 series structural aluminum.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
MAINTENANCE HOLE STEPS HOLLOW		OPSD 405.010

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16–146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20–05052–00–000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST–ORDER VERTICAL BENCH MARK NUMBER 0081981814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).
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NOT FOR CONSTRUCTION

No.	DATE	BY
1.	26–07–06	C.Y.

1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

DATE JULY 2026

SCALE

REFERENCES

FIELD NOTES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

BELL ☐	HYDRO ☐
GAS ☐	CABLE ☐
TRAFFIC ☐	WATER ☐

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

STAMP

LICENSED PROFESSIONAL ENGINEER
Kaya Yuan
C. YUAN
100598347
2026-07-07
PROVINCE OF ONTARIO

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600 Alden Road, Suite 606
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Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY
OAKVILLE DEVELOPMENT SERVICES

REGION
Halton REGION
The Regional Municipality of Halton

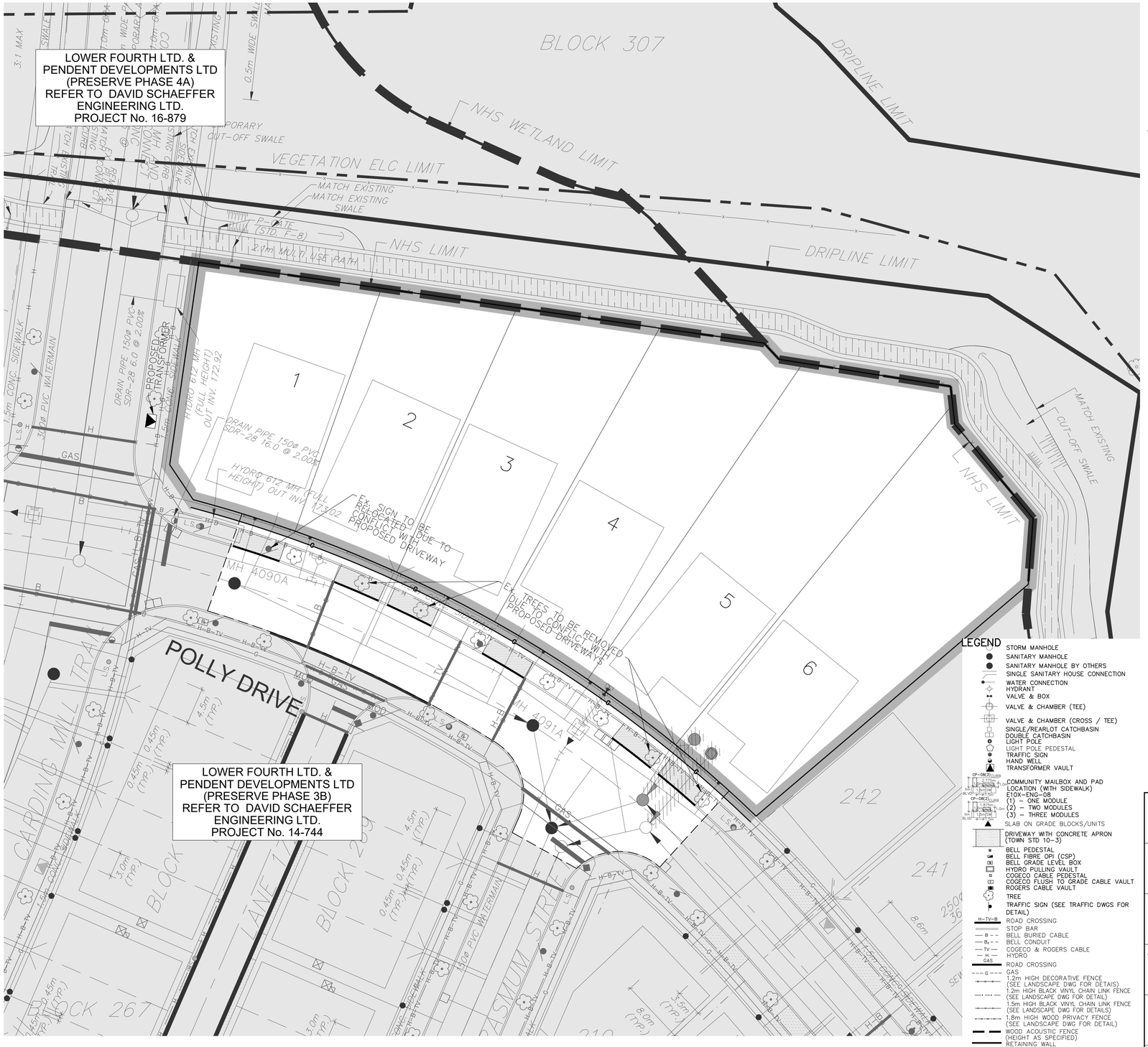
DEVELOPER
REMINGTON GROUP

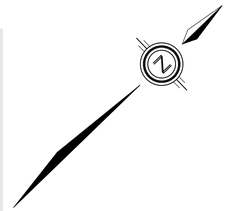
PROJECT
PRESERVE BLOCK 301
(275 POLLY DRIVE)

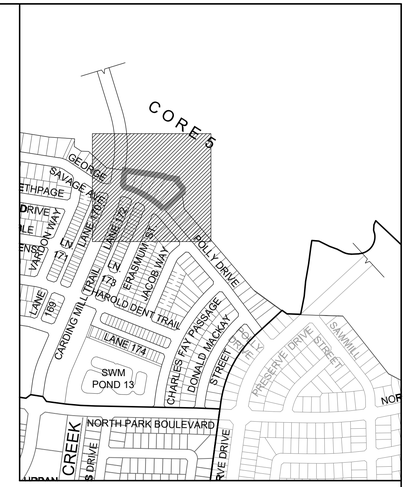
TITLE
DETAIL SHEET

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T–XXXX	DO–XXXX
PROJECT NO.	SHEET
21–1227	9







TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST-ORDER VERTICAL BENCH MARK NUMBER 0081981814 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY
1.	26-07-06	C.Y. 1st SUBMISSION

NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. DESIGN COORDINATION OF UTILITIES IS ONGOING. UPON UTILITY DESIGN BEING FINALIZED, ALL UTILITIES ARE REQUIRED TO SIGN OFF OF RESPECTIVE DESIGN ON THE COMPOSITE UTILITY PLAN
7. 1. UTILITY ASSET LOCATIONS SHOWN ON THIS DRAWING ARE BASED ON DESIGN DRAWINGS AND ARE SUBJECT TO CHANGE DURING CONSTRUCTION; 2. OAKVILLE HYDRO RESERVES THE RIGHT TO APPROVE OR DENY TREES IN THE VICINITY OF TRANSFORMERS OR ANY OTHER ASSETS; 3. NO UTILITY PEDESTAL, MAILBOX, TREE AND/OR OTHER ASSETS ALLOWED TO BE INSTALLED ON TOP OF JOINT USE UTILITY TRENCH (HYDRO/GAS/BELL/COGECO)
8. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL
9. ALL UNITS TO BE PROVIDED WITH PRESSURE REDUCING VALVES, UNLESS OTHERWISE NOTED. SEE WATERMAIN MEMO FOR DETAIL.
10. STORM PIPES WILL BE SURCHARGED DURING, AND IN EXCESS OF 5YR STORM. OAKVILLE HYDRO ACKNOWLEDGES AND ACCEPTS THE POTENTIAL FOR SURCHARGING INTO THE TRANSFORMER VAULTS

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- SINGLE SANITARY HOUSE CONNECTION
- WATER CONNECTION
- HYDRANT
- VALVE & BOX
- VALVE & CHAMBER (TEE)
- VALVE & CHAMBER (CROSS / TEE)
- SINGLE/REARLOT CATCHBASIN
- DOUBLE CATCHBASIN
- LIGHT POLE
- LIGHT POLE PEDESTAL
- TRAFFIC SIGN
- HAND WELL
- TRANSFORMER VAULT
- COMMUNITY MAILBOX AND PAD LOCATION (WITH SIDEWALK) E10K-ENG-08 (1) – ONE MODULE (2) – TWO MODULES (3) – THREE MODULES
- SLAB ON GRADE BLOCKS/UNITS
- DRIVEWAY WITH CONCRETE APRON (TOWN STD 10-3)
- BELL PEDESTAL
- BELL FIBRE OPI (CSP)
- BELL GRADE LEVEL BOX
- HYDRO PULLING VAULT
- COGECO CABLE PEDESTAL
- COGECO FLUSH TO GRADE CABLE VAULT
- ROGERS CABLE VAULT
- TREE
- TRAFFIC SIGN (SEE TRAFFIC DWGS FOR DETAIL)
- H-TV-B ROAD CROSSING
- STOP BAR
- B BELL BURIED CABLE
- B_x BELL CONDUIT
- TV COGECO & ROGERS CABLE
- H HYDRO
- GAS ROAD CROSSING
- G GAS
- 1.2m HIGH DECORATIVE FENCE (SEE LANDSCAPE DWG FOR DETAIS)
- 1.2m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG FOR DETAILS)
- 1.8m HIGH WOOD PRIVACY FENCE (SEE LANDSCAPE DWG FOR DETAIL)
- WOOD ACOUSTIC FENCE (HEIGHT AS SPECIFIED)
- RETAINING WALL (SEE NOTES ON DWG 1 AND STRUCTURAL DWG FOR DETAIL)
- PHASE LINE
- NOT PART OF SITE PLAN
- GUY WIRE
- TACTILE WALKING SURFACE INDICATOR (OPSD-310.033 & OPSD-310.039)

CANADA POST CORPORATION	SIGN	
	DATE	
OAKVILLE HYDRO	SIGN	
	DATE	
BELL CANADA	SIGN	
	DATE	
ENBRIDGE	SIGN	
	DATE	
COGECO CABLE	SIGN	
	DATE	
ROGERS CABLE	SIGN	
	DATE	

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

SCALE HORIZ. 1:250 (0, 2.5, 5, 7.5, 10)

DATE JULY 2026

REFERENCES

FIELD NOTES

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-07-06 — PROVINCE OF ONTARIO

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www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: The Regional Municipality of Halton

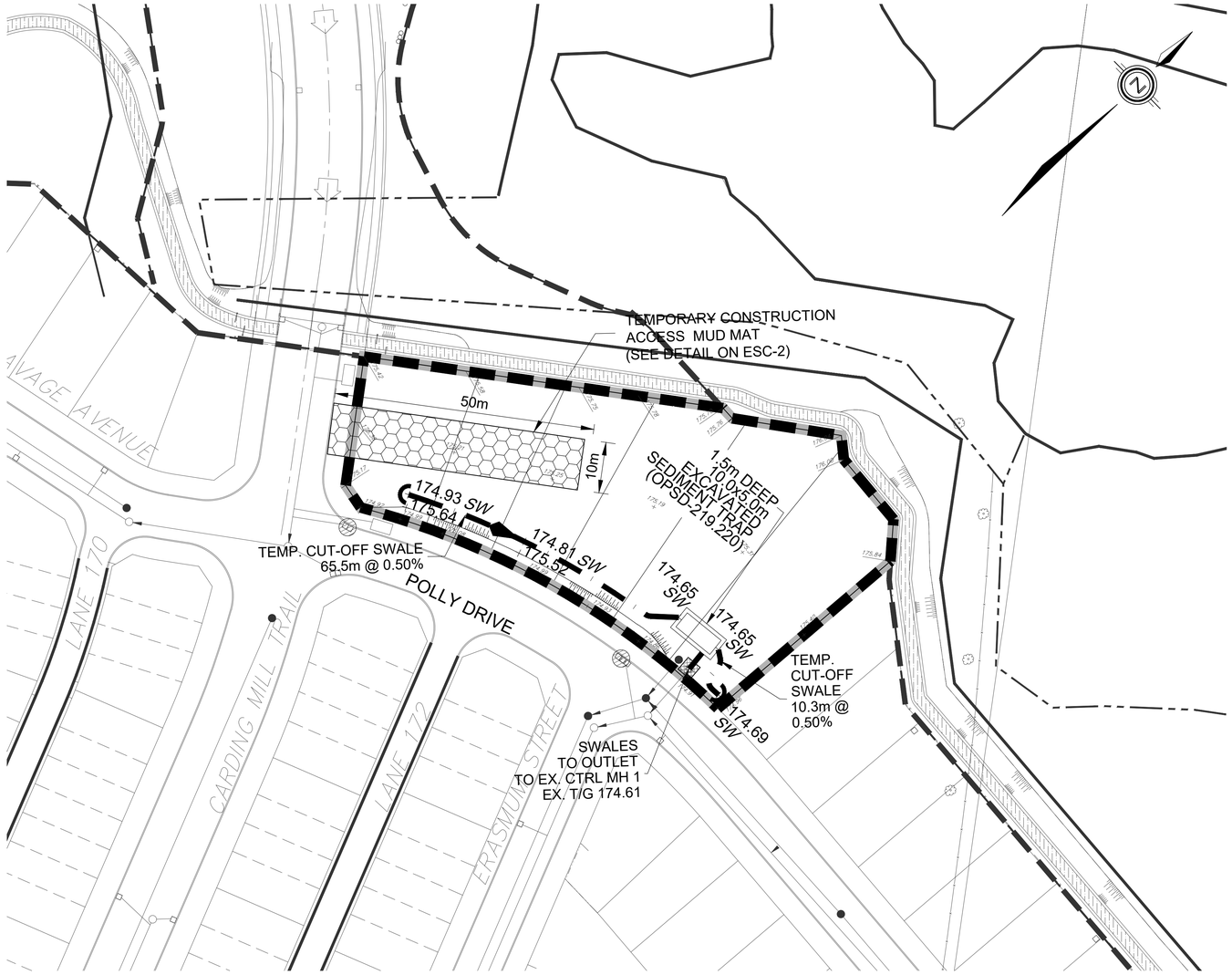
DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: COMPOSITE UTILITY PLAN

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MUNICIPAL FILE NO. 24T-XXXX	REGIONAL FILE NO. DO-XXXX
PROJECT NO. 21-1227	SHEET CUP-1



GENERAL MONITORING & MAINTENANCE OF EROSION & SEDIMENT CONTROLS

1. THE EROSION AND SEDIMENT CONTROL PLAN IS A DYNAMIC DOCUMENT WHICH MAY BE SUBJECT TO CHANGE OR MODIFICATIONS AS SITE CONDITIONS CHANGE TO PREVENT SEDIMENT RELEASE TO THE NATURAL ENVIRONMENT.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER AND CLEANED PERIODICALLY AS REQUIRED BY THE CONTRACTOR.
3. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS' NOTICE.
4. ADDITIONAL ESC MATERIALS (I.E. SILT FENCE, FILTER SOCKS, STRAW BALES, CLEAR STONE ETC.) ARE TO BE KEPT ON-SITE FOR EMERGENCIES AND REPAIRS.
5. SEDIMENT SHOULD BE REMOVED FROM THE SEDIMENT CONTROL FENCING ONCE SEDIMENT HAS ACCUMULATED TO A LEVEL OF 1/3 THE HEIGHT OF THE FENCING OR TO A MAXIMUM HEIGHT OF 0.3M. ALL ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO THE REMOVAL OF THE ESC MEASURES.
6. SEDIMENT ACCUMULATION IN THE TEMPORARY SEDIMENT BASIN MUST BE MEASURED A MINIMUM OF ONCE EVERY 6 MONTHS. THE BASIN WILL REQUIRE CLEANING WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE FOREBAY DESIGN CAPACITY.
7. THE CONTRACTOR SHALL MONITOR WEATHER FORECAST TO ENSURE THAT THE WORKS WILL BE CONDUCTED IN FAVOURABLE WEATHER. CONSTRUCTION SHOULD BE AVOIDED DURING UNUSUALLY WET, RAINY OR WINTER THAW CONDITIONS.
8. SEDIMENT CONTROL FENCING TO REMAIN IN PLACE UNTIL THE WORK AREA HAS BEEN STABILIZED AND REVEGETATED, AND WRITTEN DIRECTION IS RECEIVED FROM THE PROJECT ENVIRONMENTAL CONSULTANT.
9. DURING CONSTRUCTION THE FREQUENCY FOR EROSION AND SEDIMENT CONTROL INSPECTIONS BY THE PROJECT ENVIRONMENTAL CONSULTANT SHOULD BE COMPLETED AS FOLLOWS:
   a. ON A WEEKLY BASIS
   b. PRIOR TO PREDICTED SIGNIFICANT RAINFALL OR SNOWMELT EVENTS
   c. SUBSEQUENT TO SIGNIFICANT RAIN EVENTS OR SNOWMELTS
   d. DAILY DURING EXTENDED RAIN OR SNOWMELT PERIODS
   e. DURING INACTIVE CONSTRUCTION PERIODS, WHERE THE SITE IS LEFT ALONE FOR 30 DAYS OR LONGER, A MONTHLY INSPECTION CAN BE CONDUCTED.

PUMPING AND UNWATERING

1. ALL PUMPING DISCHARGE SHOULD BE, AT A MINIMUM, TO A FILTER BAG OR APPROVED EQUIVALENT, TO A LOCATION APPROVED BY THE PROJECT ENVIRONMENTAL CONSULTANT, AND AS PER THE REQUIREMENTS OF THE PERMIT TO TAKE WATER (IF APPLICABLE).

GENERAL NOTES

1. THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND/OR REPAIR OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR THE CONSTRUCTION PROJECTS". THE GENERAL CONTRACTOR SHALL BE DESIGNATED AS THE CONSTRUCTOR AS DEFINED IN THE ACT.
3. THE FUTURE ROAD LAYOUT SHOWN ON THIS PLAN IS PRELIMINARY AND IS BEING PROVIDED FOR REFERENCE ONLY.
4. THE SILTATION CONTROL PLAN IS INTENDED TO ASSIST THE CONTRACTOR IN THE LAYOUT AND CONSTRUCTION OF THE SILTATION CONTROL FEATURES ONLY. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION OF SITE SERVICES OR ANY OTHER CONSTRUCTION ACTIVITIES.
5. ENGINEERED FILL TO BE FREE OF ORGANIC & DELETERIOUS MATERIAL.
6. ALL FILL MATERIAL TO BE APPROVED BY THE PROJECT GEOTECHNICAL CONSULTANT PRIOR TO PLACING.
7. ALL COMPACTION TO BE COMPLETED AS DIRECTED BY THE PROJECT GEOTECHNICAL CONSULTANT.
8. TEMPORARY SEDIMENT BASIN TO BE CONSTRUCTED UNDER THE SUPERVISION OF THE PROJECT GEOTECHNICAL CONSULTANT.
9. APPROXIMATE REGULATION AREA TO BE CONFIRMED PRIOR TO COMMENCEMENT OF WORK.
10. WORKS WITHIN 10M FROM THE LIMIT OF AN ENVIRONMENTALLY SIGNIFICANT FEATURE TO BE COMPLETED USING SMALL EQUIPMENT TO THE EXTENT POSSIBLE UNDER THE SUPERVISION OF THE PROJECT ENVIRONMENTAL CONSULTANT.
11. WASH-DOWN AREA TO BE PROVIDED DURING CONSTRUCTION AS REQUIRED.
12. EQUIPMENT AND MACHINERY SHALL NOT ENTER OR CROSS ANY WATERCOURSES FOR ANY REASON AND CONCRETE WASH WATER STATIONS SHALL BE LOCATED AT LEAST 50 METERS AWAY FROM ALL WATER COURSES.
13. ALL DITCHES ON MUNICIPAL ROADWAYS ARE TO HAVE SILT CONTROL MEASURES PROVED AND MAINTAINED AS DIRECTED BY THE AUTHORITY HAVING JURISDICTION.
14. ALL WORKS TO BE IN ACCORDANCE WITH THE TOWN OF OAKVILLE SITE ALTERATION BY-LAW NO. 2003-021.
15. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE EROSION AND SEDIMENT CONTROLS ARE MAINTAINED AND OPERATING AS INTENDED, INCLUDING MAKING FIELD ADJUSTMENTS AS NECESSARY, TO THE SATISFACTION OF THE TOWN OF OAKVILLE AND CONSERVATION HALTON.
16. THE CONTRACTOR MUST HAVE SEVERAL SPILL KITS ON-SITE AT ALL TIMES.
17. PERMISSION FROM ADJACENT LANDOWNER IS REQUIRED PRIOR TO COMPLETION OF ANY WORKS ON ADJACENT PROPERTY.
18. INSPECTORS USED ON THE PROJECT ARE TO BE QUALIFIED PROFESSIONALS TRAINED IN SEDIMENT AND EROSION CONTROLS (CERTIFIED INSPECTOR OF SEDIMENT AND EROSION CONTROL (CISEC), CERTIFIED PROFESSIONAL ENGINEER IN EROSION AND SEDIMENT CONTROL (CPESC) OR APPROVED EQUIVALENT).

GENERAL SPILL CONTROL NOTES

1. ALL CONSTRUCTION ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF DEBRIS, SEDIMENTS, OR OTHER DELETERIOUS PRODUCTS TO ANY ENVIRONMENTALLY SENSITIVE AREAS.
2. ALL CONSTRUCTION EQUIPMENT SHALL BE REFUELED, MAINTAINED AND STORED NO LESS THAN 30 METERS FROM WATERCOURSES, STREAM, CREEKS, WOODLOTS, WETLANDS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
3. ALL CONTRACTORS MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS, MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
4. IN THE EVENT OF A LEAK, DISCHARGE, OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL, OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
   a. IMMEDIATELY NOTIFY THE MINISTRY OF ENVIRONMENT (SPILL ACTION CENTER) AT 1-800-268-6060.
   b. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   c. RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
   d. ADDITIONALLY, IMMEDIATELY NOTIFY THE TOWN OF THE INCIDENT.

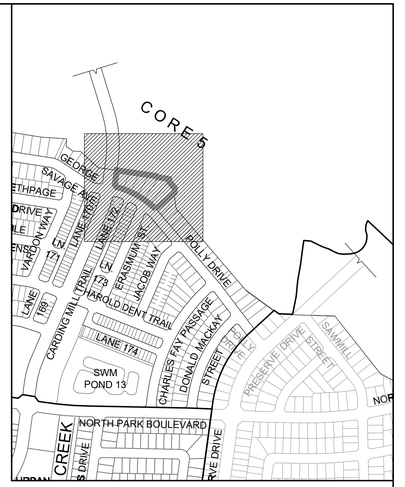
IN-WATER WORKS

1. WORKS SHALL BE COMPLETED DURING THE DESIGNATED IN-WATER WORKS WINDOW SET OUT BY MNR/DFO IF APPLICABLE.

REDSIDE DACE PROTECTION NOTES

THE ADJACENT WATERCOURSE HAS BEEN DESIGNATED BY THE MNRF AS REDSIDE DACE HABITAT. THIS SPECIES IS LISTED UNDER THE ENDANGERED SPECIES ACT (ESA, 2007), AND AS SUCH THE HABITAT IS PROTECTED UNDER THE ACT. REDSIDE DACE ARE KNOWN TO BE SENSITIVE TO SEDIMENT INPUT AND TURBIDITY. THEREFORE, INSTALLATION, MAINTENANCE, AND MONITORING OF ALL EROSION AND SEDIMENT CONTROL MEASURES ARE IMPORTANT FOR THE PROTECTION OF THE SPECIES. THE FOLLOWING MUST BE ADHERED TO DURING THE ENTIRETY OF THE WORKS:

1. WORKS ARE LIMITED TO THE AREAS SHOWN.
2. IT IS RECOMMENDED THAT AN ENVIRONMENTAL INSPECTOR BE PRESENT DURING CONSTRUCTION TO ENSURE THAT WORKS ARE COMPLETED AND FUNCTIONING AS INTENDED.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED BEFORE COMMENCEMENT OF WORK.
4. NO WORKS ARE TO PROCEED UNTIL THE EROSION AND SEDIMENT CONTROLS HAVE BEEN REVIEWED AND APPROVED BY THE ENVIRONMENTAL INSPECTOR.
5. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSPECTED DAILY DURING PERIODS OF NEAR-CHANNEL WORKS.
6. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE CONTINUALLY MAINTAINED.
7. DISTURBANCE TO NATURAL VEGETATION IS TO BE MINIMIZED WHERE POSSIBLE.
8. VEHICLES AND ALL ASSOCIATED CONSTRUCTION MATERIALS ARE TO REMAIN AWAY FROM THE WATERCOURSE AND STORED IN OUTLINED STAGING AREAS. THESE STAGING AREAS SHALL BE SITUATED OUTSIDE OF THE REGULATED HABITAT LIMITS (I.E., MEANDER BELT PLUS 30 METERS).
9. ONCE CONSTRUCTION IS COMPLETE, ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 15 DAYS OF THE COMPLETION OF THE WORK, TO MINIMIZE EROSION AND PREVENT RELEASE OF SEDIMENT INTO THE WATERCOURSE



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

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BENCHMARK NOTE

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STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD., 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD, BENCH MARK IS SET 11 M SOUTH OF NORTH RIGHT-OF-WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	D.P.	1st SUBMISSION

DESIGNED BY:	K.Y.	CHECKED BY:	D.P.	DATE	JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	D.P.		
SCALE HORIZ. 1:500	0 5 10 15 20			REFERENCES	

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

LEGISLATIVE AND PLANNING SERVICES — DATE

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER — D.M.PRIDDLE — 100216848 — 26-01-06 — PROVINCE OF ONTARIO

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600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
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www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: EROSION & SEDIMENT CONTROL PLAN

© DSEL

MUNICIPAL FILE NO. 24T-23002/1331	REGIONAL FILE NO. DO-XXXX
PROJECT NO. 20-1218	SHEET NO. ESC-1

STAGE 1 – CONSTRUCTION SEQUENCING

1. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED WITHIN GRADING LIMITS OF WETLAND RECONSTRUCTION AREA ONLY
2. SITE WORKS TO PROGRESS AS SPECIFIED IN THE 'GENERAL SEQUENCE OF ACTIVITIES' NOTES
3. NO WORKS TO OCCUR WITHIN ANY CONSERVATION HALTON REGULATED LANDS, UNLESS PERMISSION HAS BEEN GRANTED BY CONSERVATION HALTON

PRIOR TO SITE GRADING

1. PRIOR TO THE COMMENCEMENT OF SITE GRADING WORKS, ALL SILTATION CONTROL MEASURES SHALL BE INSTALLED AND OPERATIONAL. THE EXACT LOCATION TO BE DETERMINED IN THE FIELD AND APPROVED BY THE PROJECT ENVIRONMENTAL CONSULTANT AND AUTHORITY HAVING JURISDICTION.
2. ANY TREES SELECTED BY THE PROJECT ARBORIST FOR PRESERVATION ARE TO BE PROTECTED BY TREE PROTECTION FENCE. THE PROJECT ARBORIST TO INDICATE ANY TREES THAT ARE TO BE TRANSPLANTED.
3. REMOVAL OF THE SITE VEGETATION IN ACCORDANCE WITH ALL APPLICABLE BY-LAWS.
4. NO WORK IS PERMITTED WITHIN THE CONSERVATION HALTON REGULATION LIMITS WITHOUT A PERMIT FROM THE CONSERVATION HALTON BEING POSTED ON-SITE.

GENERAL SEQUENCE OF ACTIVITIES

1. INSTALLATION OF ALL TREE PROTECTION FENCING WHERE INDICATED. CONFIRMATION OF LOCATIONS TO BE PROVIDED BY THE PROJECT ARBORIST.
2. INSTALLATION OF THE PERIMETER SEDIMENT CONTROL FENCING WHERE INDICATED.
3. CONSTRUCTION OF THE MUD MATS.
4. STRIP TOPSOIL, EXCAVATE THE TEMPORARY SEDIMENT BASIN, INSTALL TEMPORARY OUTFALL AND STABILIZE THE BASIN.
5. INSTALLATION OF THE SEDIMENT CONTROL FENCING AROUND TEMPORARY STOCKPILE LOCATIONS.
6. REMOVAL OF INDICATED SITE VEGETATION IN ACCORDANCE WITH ALL APPLICABLE BY-LAWS AND START TOPSOIL STRIPPING AT THE STOCKPILE LOCATIONS ONLY.
7. ALL PROPOSED CUT-OFF SWALES AND SEDIMENT TRAPS (WHERE APPLICABLE) TO BE CONSTRUCTED AT A PRIORITY IN ORDER TO DIVERT THE OVERLAND FLOW INTO THE APPROVED OUTLET LOCATION AS PER DESIGN.
8. COMPLETE SITE GRADING, WHILE MAINTAINING CUT-OFF SWALES IN ORDER TO DIRECT SITE DRAINAGE TO THE TEMPORARY SEDIMENT BASIN.
9. ANY IN-WATER AND NEAR-WATER WORKS WILL BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS IN PLACE.

SITE ENTRANCE / MUD & DUST CONTROL

1. CONTRACTOR TO INSTALL AND MAINTAIN MUD MATS AT CONSTRUCTION ACCESSES IN ORDER TO REDUCE MUD TRACKING ONTO ADJACENT ROADS.
2. ALL EXISTING CATCHBASINS ADJACENT TO THE SITE, OR WITH IN 100M OF THE SITE ENTRANCE ALONG THE HAUL ROUTE, TO BE DOUBLE WRAPPED WITH FILTER FABRIC (TERRAFIX 270R OR APPROVED EQUIVALENT) UNDER THE GRATE. FILTER FABRIC TO BE MAINTAINED AND REPLACED AS REQUIRED UNTIL THE SITE IS STABILIZED.
3. MACHINERY IS TO ARRIVE ON SITE IN A CLEAN CONDITION (INCLUDING FREE OF MUD / SOIL / DIRT FROM OTHER LOCATIONS; INCLUDING CLEAN WHEELS / TIRES / TRACKS) AND FREE OF FLUID LEAKS.
4. NO CONSTRUCTION ACTIVITY OR MACHINERY SHALL INTRUDE BEYOND THE SILT FENCE. ALL CONSTRUCTION VEHICLES SHALL EXIT THE SITE VIA THE TEMPORARY CONSTRUCTION ACCESSES SHOWN ON THE DRAWING ONLY.
5. CONTRACTOR TO CLEAN THE ADJACENT ROADS ON A REGULAR BASIS TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
6. ALL CONSTRUCTION ENTRANCE SIGNAGE MUST BE INSTALLED AS PER BOOK 7 – TEMPORARY CONDITIONS OF THE ONTARIO TRAFFIC MANUAL (OTM).

STOCKPILES AND STABILIZATION

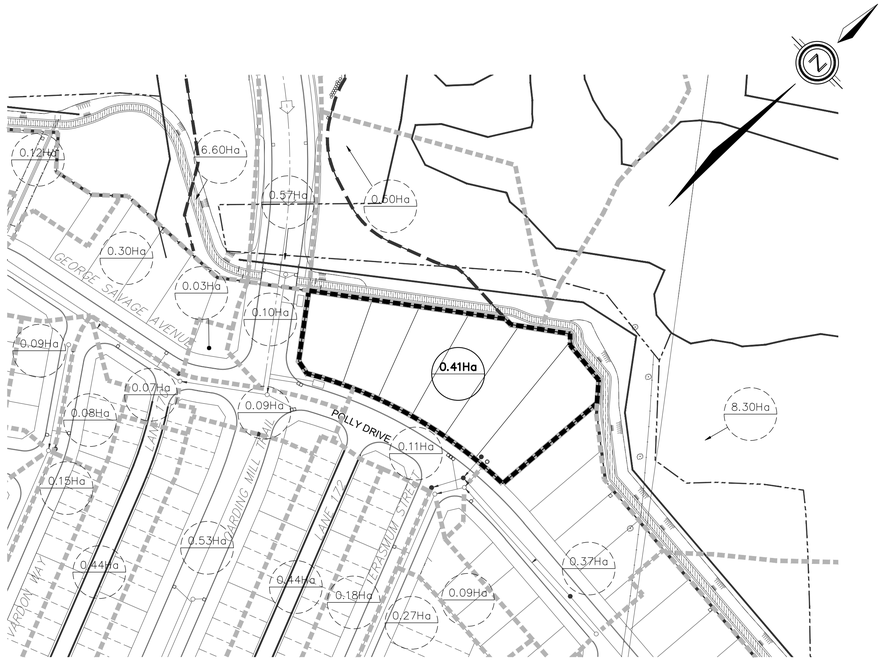
1. ALL TOPSOIL STOCKPILES SHALL BE SURROUNDED WITH SILT CONTROL FENCING.
2. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES. ALL DISTURBED GROUND (INCLUDING STOCKPILES) LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED USING APPROPRIATE EROSION CONTROL MEASURES AND AN APPROPRIATE NATIVE NON-INVASIVE SEED MIX OR WITH THE FINAL APPROVED RESTORATION PLAN.
3. TOPSOIL STOCKPILED FOR OVER SIX (6) MONTHS SHOULD BE AMENDED WITH COMPOST.
4. PLANT MATERIAL AND LEAF LITTER, WITH THE EXCEPTION OF INVASIVE SPECIES, WHICH ARE GENERATED BY CLEARING THE SITE, ARE TO BE STOCKPILED.
   a. LARGE WOODY MATERIAL TO BE SEPARATED AND SET ASIDE FOR USE IN NEARBY NATURAL HERITAGE RESTORATION AREAS, IF APPLICABLE.
5. STOCKPILED FILL CANNOT BE LOCATED WITHIN 15M OF A WATERCOURSE OR STORMWATER MANAGEMENT BLOCK.

SEDIMENT BASIN CONVERSION TO ULTIMATE SWM POND

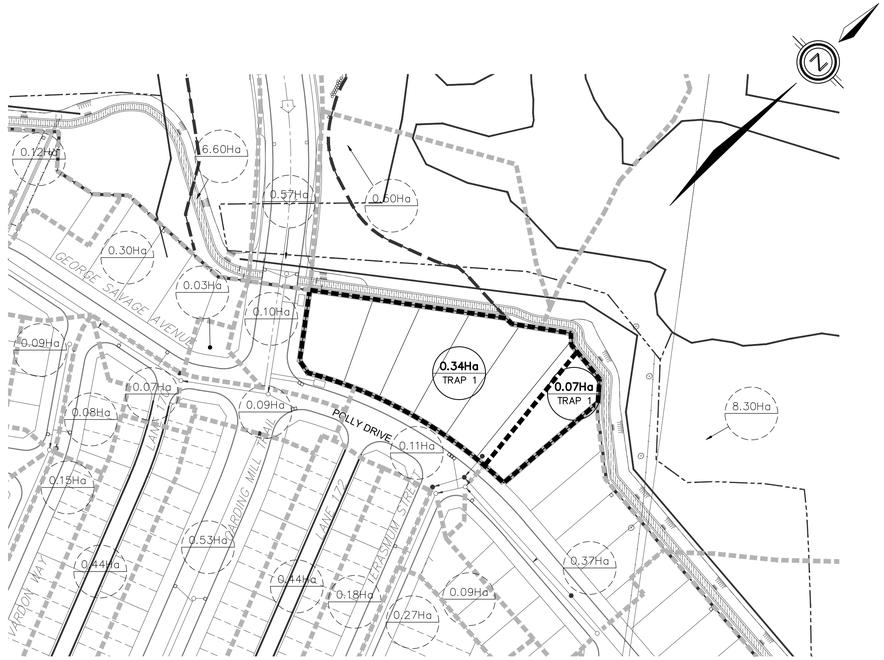
1. SETUP PUMP IN THE TEMPORARY SEDIMENT BASIN AND PUMP TO THE EXISTING TEMPORARY OUTFALL WITH A MINIMUM OF A FILTER BAG AT THE DISCHARGE LOCATION. PUMPING SETUP MUST BE REVIEWED BY THE PROJECT ENVIRONMENTAL CONSULTANT PRIOR TO COMMENCING.
2. DISCHARGE RATES TO BE RESTRICTED BY THE PERMIT TO TAKE WATER (WHERE APPLICABLE), EXISTING SEDIMENT BASIN EXTENDED DETENTION DISCHARGE RATE OR AS RECOMMENDED BY THE PROJECT ENVIRONMENTAL CONSULTANT. THE LOWEST FLOW RATE WILL GOVERN.
3. ONCE THE BASIN HAS BEEN DEWATERED, ANY REQUIRED GRADING WORKS WILL BE COMPLETED TO CONVERT THE TEMPORARY SEDIMENT BASIN TO THE ULTIMATE SWM POND GRADES, AND THE ULTIMATE SWM POND OUTFALL WILL BE INSTALLED CONCURRENTLY.

LEGEND

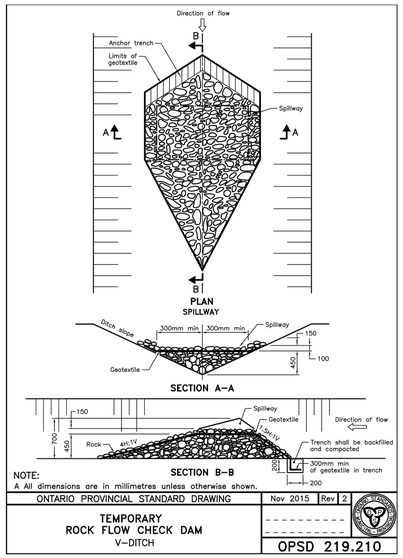
- BOUNDARY
- SILT FENCE
- DOUBLE SILT FENCE
- SWALE
- ROCK CHECK DAM
- FILTERSOCK
- 162.80 SW — PROPOSED SWALE CENTERLINE GRADE
- INTERIM FLOW DIRECTION
- STREET CB SILT PROTECTION (SEE DETAIL ON THIS DWG)
- STREET CB SILT PROTECTION (SEE DETAIL ON THIS DWG)
- TREE PROTECTION FENCE



SILT CONTROL TRIBUTARY AREA
PRE–DEVELOPMENT
SCALE: 1:1000

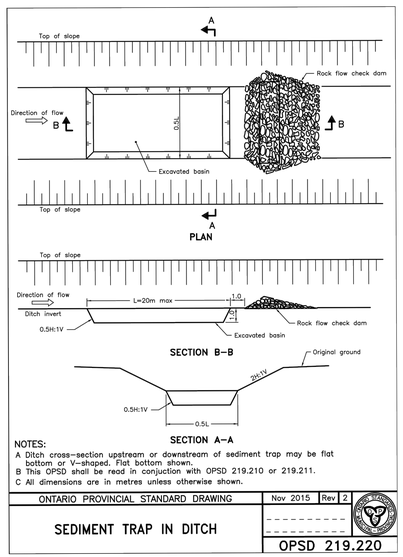


SILT CONTROL TRIBUTARY AREA
POST–DEVELOPMENT
SCALE: 1:1000



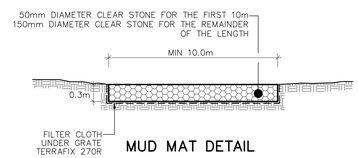
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
TEMPORARY ROCK FLOW CHECK DAM V–DITCH			
	OPSD 219.210		

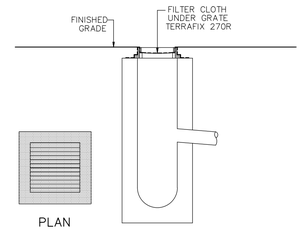


NOTES:
A Ditch cross–section upstream or downstream of sediment trap may be flat bottom or V–shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

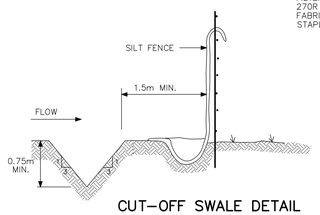
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
SEDIMENT TRAP IN DITCH			
	OPSD 219.220		



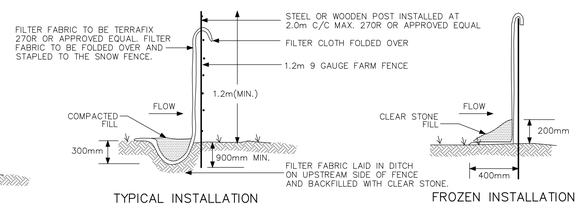
MUD MAT DETAIL
SCALE N.T.S.



DETAIL FOR STREET CB SILT PROTECTION
SCALE: NTS



CUT–OFF SWALE DETAIL
SCALE N.T.S.



SILT CONTROL FENCE
(MODIFIED OPSD 219.130)
SCALE: N.T.S

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY–PENTEK & EDWARD SURVEYING LTD.; JOB No. 16–146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20–05052–00–000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

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STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M. EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD, BENCH MARK IS 56.1 M SOUTH OF NORTH RIGHT–OF–WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26–07–06	D.P.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	C.Y.	
SCALE HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES

APPROVALS

FIELD NOTES

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES — DATE

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

STAMP

LICENCED PROFESSIONAL ENGINEER
D.M.PRIDDLE
100216848
26–07–06
PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475–3080
Fax. (905) 475–3081
www.DSEL.ca

MUNICIPALITY
OAKVILLE
DEVELOPMENT SERVICES

REGION
Halton REGION
The Regional Municipality of Halton

DEVELOPER
REMINGTON GROUP

PROJECT
PRESERVE BLOCK 301
(275 POLLY DRIVE)

TITLE
© DSEL
EROSION & SEDIMENT CONTROL DETAILS

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T–XXXX	DO–XXXX
PROJECT NO. 21–1227	SHEET ESC–2

Attachment 8 – SEDIMENT TRAP SIZING CALCUALTIONS (DSEL, 2026)

Project:	Preserve Block 301
DSEL File:	1227
Date:	Jul-26

Preserve Block 301
Excavated Sediment Trap
Sediment Trap 1 - Volume Calculations

Parameters

Length (L):	10	m
Width (W):	5	m
Depth (D):	1.5	m
Side Slope (S):	0.5	:1
Drainage Area (A):	0.41	Ha
Volume Requirement:	125	m^3/Ha

Volume Calculation (per OPSD-219.220)

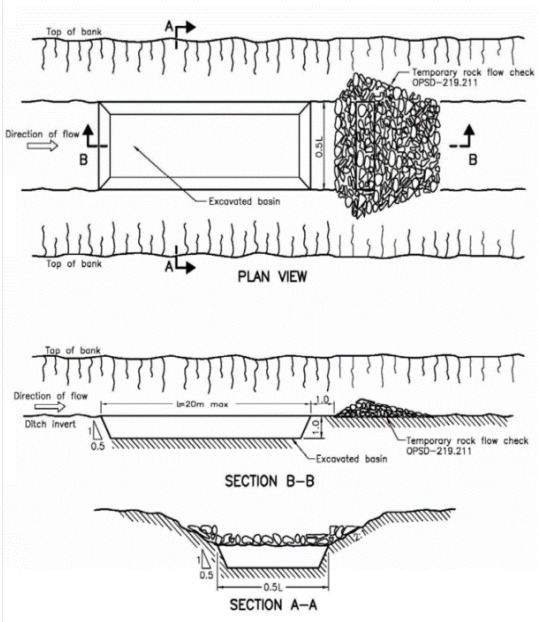
Provided Volume = (L - D x S) x (W - D x S) x D

= 58 m^3

Required Volume = A x 125m3/Ha

= 52 m^3

Provided Volume > Required



Attachment 9 – MECP Form SS1 (DSEL, 2026)

Ontario

Ministry of the Environment, Conservation and Parks

Form SS1 - Record of Future Alteration Authorized for Separate Sewers/ Nominally Separate Sewers/Forcemains

Retain Completed Form - Do Not Send to the Ministry

Part 1 - Environmental Compliance Approval Number

(Insert the Environmental Compliance Approval number authorizing the alteration of Separate Sewers/Nominally Separate Sewers/Forcemains)

Part 2 - Description of separate sewer/nominally separate sewer/forcemain alteration

(Use attachments if required)

The description shall include:

1) A brief description above of the undertaking (e.g. street name(s); subdivision name; project name); and

2) An attachment including a plan view drawing identifying at a minimum:

   a) location(s) of the undertaking (e.g. showing street names, easements, discharge points, slope (sewer only) etc.);

   b) nominal diameter of the sewers/forcemain(s), associated with the alteration.

Site Plan Project Name - 275 Polly Drive (Preserve Block 301)
Project Description - The construction of 54.0m of 200mm diameter PVC sanitary sewer located within the Polly Drive municipal right-of-way, located within the existing Preserve Phase 3 Subdivision.

Attached:
Underground General Servicing Drawing #3
Sanitary Drainage Plan Drawing #5
Polly Drive Plan and Profile Drawing #7

Part 3 - Verification by Licensed Engineering Practitioner

I hereby verify that I am a Licensed Engineering Practitioner who is licensed to practice in the Province of Ontario and the design of the separate sewer/nominally separate sewer/forcemain alteration:

1) Has been prepared by a Licensed Engineering Practitioner who is licensed to practice in the Province of Ontario;

2) Has been documented in a design report and any other applicable design forms;

3) Has been designed only to collect and transmit sewage and has not been designed to treat sewage;

4) Satisfies the design criteria set out in the Ministry of the Environment, Conservation and Parks publication “Design Criteria for Sanitary Sewers, Storm Sewers, and Forcemains for Alterations Authorized under Environmental Compliance Approval”, as amended, and have documented the reasons for this opinion; and

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5) Is consistent with, or otherwise addresses, the design objectives contained within the Ministry of the Environment, Conservation and Parks publication “Design Guidelines for Sewage Works”, as amended.

Name	PEO Licence Number
Kaya Yuan	100598347
Signature Kaya Yuan Digitally signed by Kaya Yuan	Date (yyyy/mm/dd) 2026/07/10

Part 4 - Verification by Owner

I hereby verify that:

1) The maximum wastewater discharge by users who will be serviced by the addition, modification, replacement or extension of the separate sewer/nominally separate sewer/forcemain will not result in:
   a) An excedance of the municipal sewage collection system hydraulic capacity, sewage treatment plant uncommitted reserve hydraulic capacity, or the downstream pumping station capacity;
   b) Adverse effects;
   c) Any increase in collection system overflows that is not offset by measures, and have documented any offset measures used; or,
   d) Any increase in the frequency and/or volume of Sewage Treatment Plan (STP) bypasses or STP overflows that is not offset by measures, and have documented any offset measures used. (Alternatively, if the wastewater flows to a STP not owned by the Owner, then the wastewater volume or flow rate is as agreed to with the Owner of the STP.)
2) The separate sewer, nominally separate sewer or forcemain alteration will:
   a) Not cause overflows or backups, nor increase surcharging at any maintenance holes or privately owned infrastructure (e.g. basements) within the municipal sewage collection system or any municipal sewage collection system connected to it; and
   b) Provide smooth flow transition to existing gravity sewers.
3) An assessment of the proposed works has been completed to determine if the works pose a significant drinking water threat. The proposed works do not pose any threats to sources of drinking water or design includes features that mitigate the threat to sources of drinking water, such as those included in: Ministry’s Standard Operating Policy for Sewage Works, as amended from time to time; and Source Protection Plan policies pertaining to the works;
4) The separate sewer/nominally separate sewer/forcemain alteration is wholly located within the municipal boundary over which the owner has jurisdiction except where there is an agreement existed between municipalities;
5) The owner consents to the separate sewer/nominally separate sewer/forcemain alteration; and
6) I am an authorized representative of the owner to complete this verification.

Name of Owner	Name of Owner Representative
Regional Municipality of Halton	Dave Kenth, Manager
Signature	Date (yyyy/mm/dd)

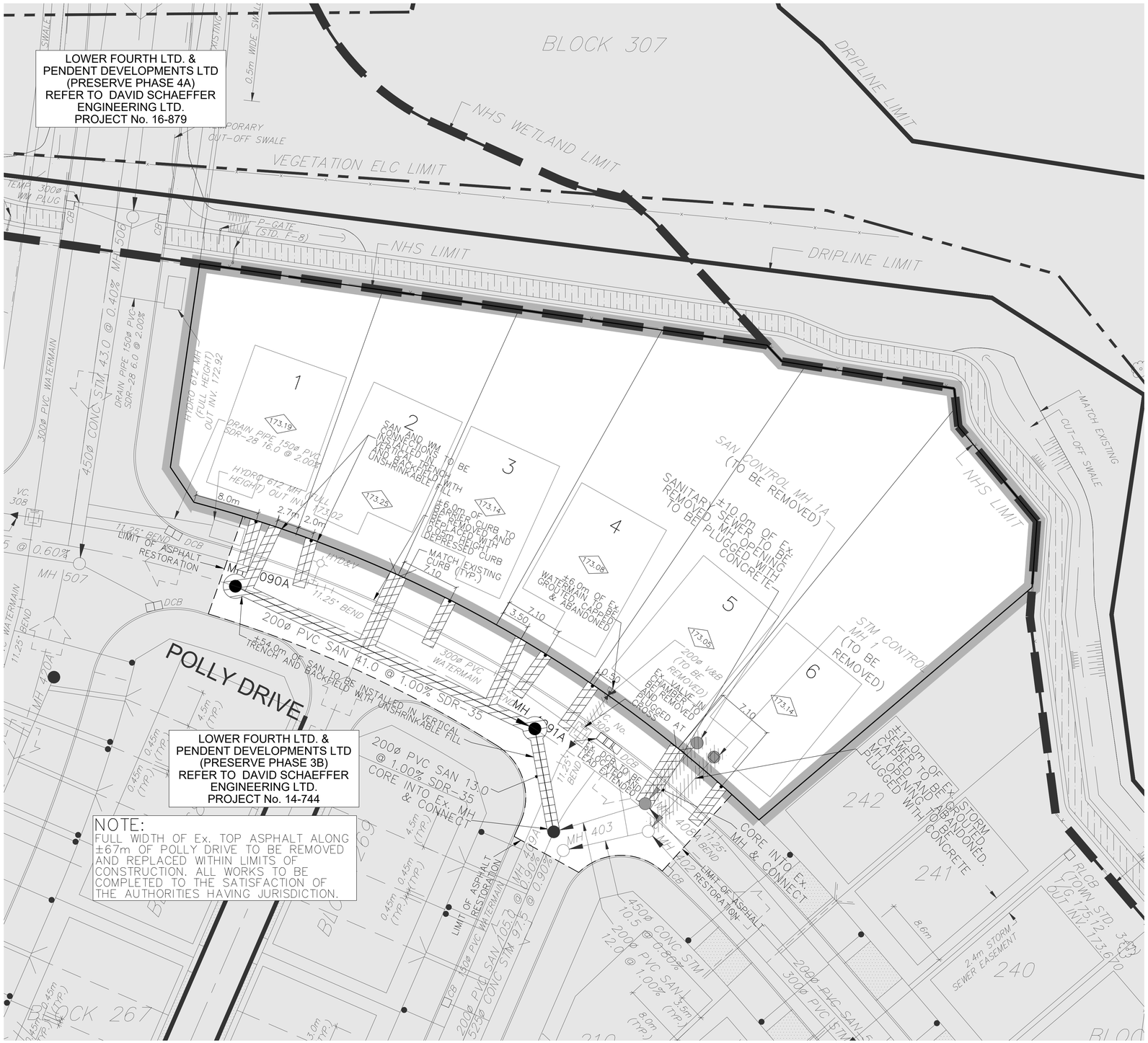
Part 5 - Post Construction Verification by Owner for Inspection and Testing

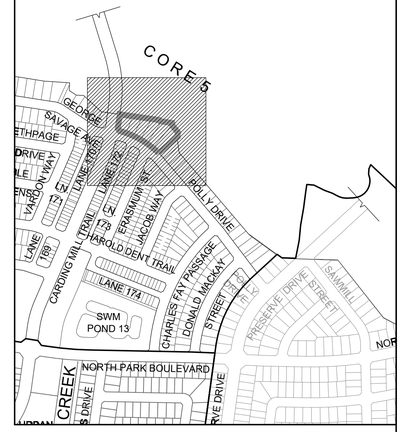
I hereby verify that:

1) The separate sewer, nominally separate sewer or forcemain alteration has complied with inspection and testing requirements set out in the Ministry of the Environment, Conservation and Parks publication “Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under Environmental Compliance Approval”, as amended, and have documented of the inspection and testing results.

Name of Owner	Name of Owner Representative
Signature	Date (yyyy/mm/dd)

Note: Parts 1 to 4 above shall be completed before construction.
Part 5 is to be completed after the inspection and testing have been undertaken.





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY-PENTEK & EDWARD SURVEYING LTD.: JOB No. 16-146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20-05052-00-000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

LEGAL INFORMATION

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NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. WORKS WITHIN THE CH REGULATION LIMIT WILL REQUIRE A PERMIT FROM CONSERVATION HALTON UNDER ONTARIO REGULATION 162/06
7. SERVICING AND GRADING DESIGN FOR FUTURE LOTS LANDS SHOWN ON THE DRAWINGS ARE CONCEPTUAL, WHICH ARE TO BE FURTHER REVIEWED / FINALIZED UPON FUTURE DEVELOPMENT
8. ALL VALVES TO BE CAST IRON EPOXY COATED
9. WATERMAIN CONSTRUCTION TO BE VERIFIED ONSITE BY GEOTECHNICAL CONSULTANT IN RELATION TO EXISTING FILL AND SOIL REMEDIATION PROGRAM. IF WATERMAIN IS TO BE INSTALLED IN AREAS OUTSIDE OF THE NATIVE ORIGINAL GROUND, MECHANICAL RESTRAINING JOINTS ARE REQUIRED, TO THE SATISFACTION OF REGION OF HALTON
10. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 2.5m AND THE COVER IS LESS THAN 1.7m. REFER TO DETAIL ON DWG. 8 UNLESS OTHERWISE SPECIFIED.
11. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL
12. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTERWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- SANITARY MANHOLE BY OTHERS
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE STORM HOUSE CONNECTION
- WATER CONNECTION
- CURB STOP SERVICE
- HYDRANT
- TEE
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE
- DOUBLE CATCHBASIN
- SLAB ON GRADE BLOCKS/UNITS
- ANTI-SEEPAGE COLLAR (SEE DWG. 6.3 FOR DETAIL)
- PHASE LINE
- NOT PART OF APPLICATION

NOT FOR CONSTRUCTION

No.	DATE	BY	
1.	26-07-06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:	A.C.	CHECKED BY:	C.Y.	
SCALE HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES

APPROVALS

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MANAGER OF DEVELOPMENT SERVICES — DATE

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DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL ☐ HYDRO ☐
GAS ☐ CABLE ☐
TRAFFIC ☐ WATER ☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-01-06 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

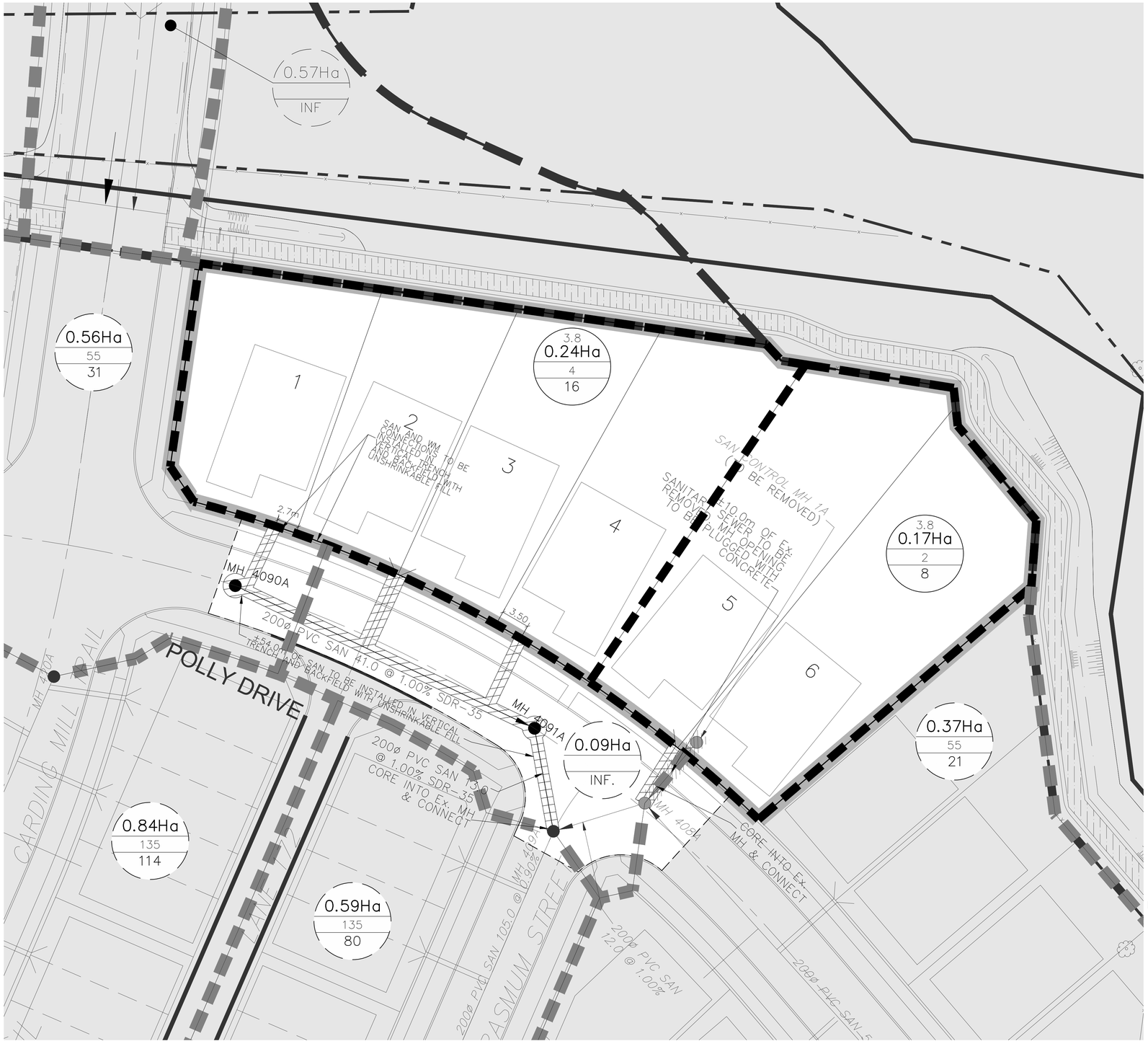
DEVELOPER: REMINGTON GROUP

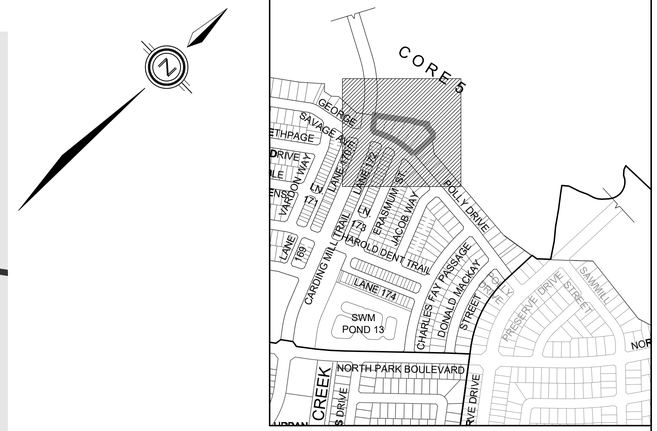
PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: UNDERGROUND GENERAL PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 3





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NOT FOR CONSTRUCTION

No.	DATE	BY	
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DESIGNED BY:		D.A.	CHECKED BY:	C.Y.	DATE JULY 2026
DRAWN BY:		A.C.	CHECKED BY:	C.Y.	
SCALE	HORIZ. 1:250	0 2.5 5 7.5 10			REFERENCES

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MANAGER OF DEVELOPMENT SERVICES — DATE

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DEVELOPMENT SERVICES, PUBLIC WORKS — DATE

FIELD NOTES

BELL	☐	HYDRO	☐
GAS	☐	CABLE	☐
TRAFFIC	☐	WATER	☐

STAMP

LICENSED PROFESSIONAL ENGINEER — Kaya Yuan — C. YUAN — 100598347 — 2026-07-06 — PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY: OAKVILLE DEVELOPMENT SERVICES

REGION: Halton Region — The Regional Municipality of Halton

DEVELOPER: REMINGTON GROUP

PROJECT: PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE: SANITARY DRAINAGE PLAN

© DSEL

MUNICIPAL FILE NO.	REGIONAL FILE NO.
24T-XXXX	DO-XXXX
PROJECT NO. 21-1227	SHEET 5

LEGEND

- ppU
- 3.8 / 0.17Ha / 2 / 8 — AREA IN HECTARES, NUMBER OF UNIT, POPULATION
- 0.17Ha / 55 / 10 — EXTERNAL AREA IN HECTARES, EXTERNAL PERSON PER HECTARE, EXTERNAL POPULATION
- SANITARY SINGLE HOUSE CONNECTION
- SANITARY SEWER TRIBUTARY BOUNDARY
- SANITARY SEWER EXTERNAL TRIBUTARY BOUNDARY
- PHASE LINE
- NOT PART OF APPLICATION

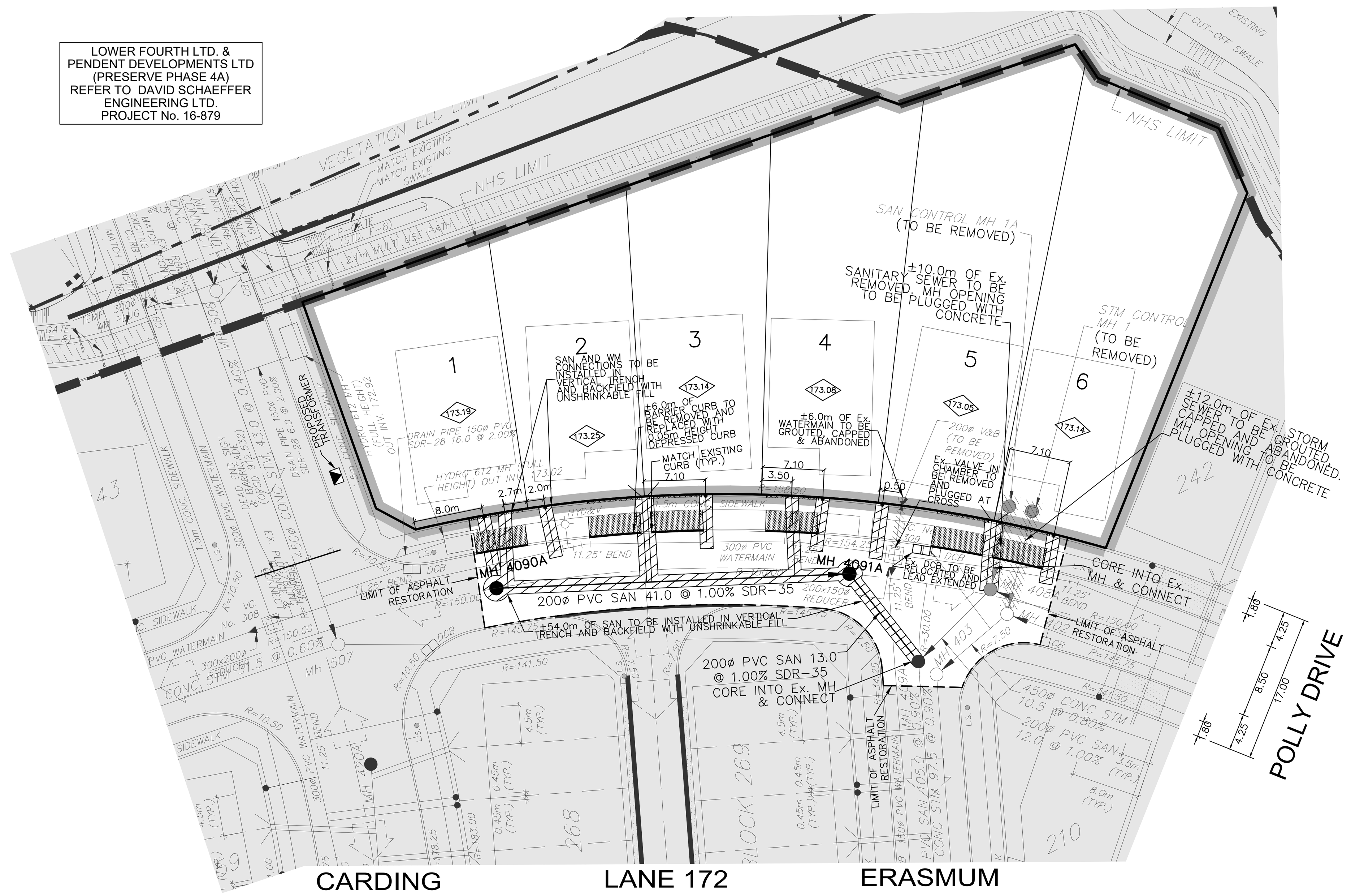
PAVEMENT DESIGN

40mm HL-3 ASPHALT CONCRETE
50mm HL-8 ASPHALT CONCRETE
150mm GRANULAR "A" BASE
350mm GRANULAR "B" SUB-BASE

NOTES:

1. ALL EXISTING BUILDINGS, POST & WIRE FENCE, TREES, UTILITY POLES, CULVERTS AND RETAINING WALLS, ETC. WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
2. EXISTING MH AND CB COVERS, WATER V&Bs, WATER V&Cs AND UTILITY PEDESTALS ETC. TO BE ADJUSTED WITHIN NEW ROADWAYS AND BOULEVARDS, WHERE APPLICABLE
3. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
4. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
5. WRITTEN PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
6. SERVICING AND GRADING DESIGN FOR FUTURE LANDS SHOWN ON THE DRAWINGS ARE CONCEPTUAL, WHICH ARE TO BE FINALIZED UPON FUTURE DEVELOPMENT
7. ALL UNITS TO BE PROVIDED WITH SUMP PUMPS, UNLESS OTHERWISE NOTED. SEE DWG. 8 FOR DETAIL.
8. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE TOWN OF OAKVILLE, THE REGION OF HALTON AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), SPECIFICATIONS (OPSS), AND HALTON REGION'S WATER AND WASTEWATER LINEAR DESIGN MANUAL, AS AMENDED BY THE TOWN OF OAKVILLE AND THE REGION OF HALTON.
9. BEDDING MATERIAL FOR PVC PIPE, OPSD–802.010, TYPE 1 OR 2 SOILS, GRANULAR "A" OR EQUIVALENT; FOR CONCRETE PIPE, OPSD–802.030, CLASS "B", GRANULAR "A" OR EQUIVALENT, WITH GRANULAR "A" COVER. FOR BEDDING MATERIAL IN SHALE EXCAVATION, REFER TO GEOTECHNICAL REPORT FOR RECOMMENDATIONS.

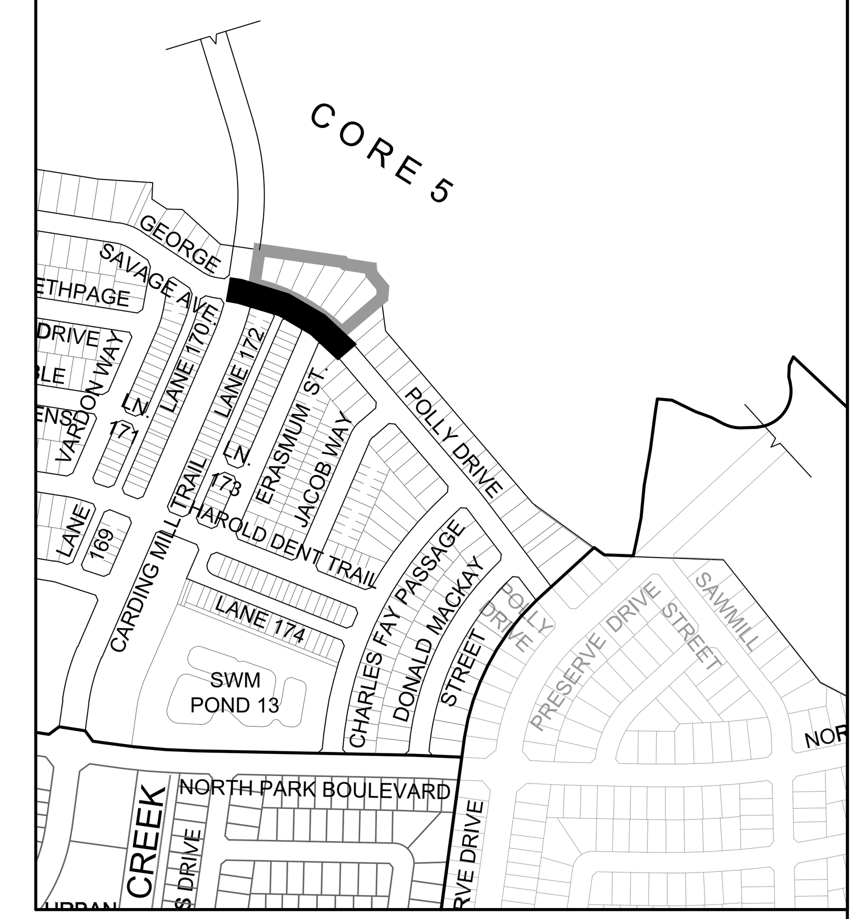
LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD (PRESERVE PHASE 4A) REFER TO DAVID SCHAEFFER ENGINEERING LTD. PROJECT No. 16-879



LOWER FOURTH LTD. & PENDENT DEVELOPMENTS LTD (PRESERVE PHASE 3B) REFER TO DAVID SCHAEFFER ENGINEERING LTD. PROJECT No. 14-744

NOTE:
FULL WIDTH OF Ex. TOP ASPHALT ALONG ±67m OF POLLY DRIVE TO BE REMOVED AND REPLACED WITHIN LIMITS OF CONSTRUCTION. ALL WORKS TO BE COMPLETED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

STORM MANHOLE
SANITARY MANHOLE
SANITARY MANHOLE BY OTHERS
STORM MANHOLE BY OTHERS
SINGLE SANITARY HOUSE CONNECTION
DOUBLE STORM HOUSE CONNECTION
SINGLE STORM HOUSE CONNECTION
WATER CONNECTION
HYDRANT
TEE
VALVE & BOX
VALVE & CHAMBER
SINGLE CATCHBASIN
DOUBLE CATCHBASINS
HYDRO TRANSFORMER
COMMUNITY MAILBOX AND PAD LOCATION (WITH SIDEWALK) E10X–ENG–08
(1) – ONE MODULE
(2) – TWO MODULES
(3) – THREE MODULES
LIGHT STANDARD
1.2m HIGH DECORATIVE FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.2m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.8m HIGH BLACK VINYL CHAIN LINK FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
1.8m HIGH WOOD PRIVACY FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
PROPOSED OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
UNDERSIDE OF FOOTING ELEVATION (USF)
SLAB ON GRADE BLOCKS/UNITS
DRIVEWAY WITH CONCRETE APRON (TOWN STD. 10–3)
TREES TO BE PRESERVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
TREES TO BE REMOVED (WITHIN OR ADJACENT TO LIMIT OF SUBDIVISION)
TREE PROTECTION FENCE
TACTILE WALKING SURFACE INDICATOR WITH BLACK ASPHALT DIP FINISH (OPSD–310.033 & OPSD–310.039)
ANTI–SEEPAGE COLLAR (OPSD–802.095)
PHASE LINE
NOT PART OF APPLICATION



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY RADY–PENTEK & EDWARD SURVEYING LTD.: JOB No. 16–146, TOPOGRAPHIC SURVEY DATED ON JULY 5, 2016 AND DATED JULY 20, 2016.
MARSHALL MACKLIN MONAGHAN ONTARIO LTD., JOB NO 20–05052–00–000, TOPOGRAPHIC SURVEY DATED JUNE 11, 2005 TO JULY 21, 2005.

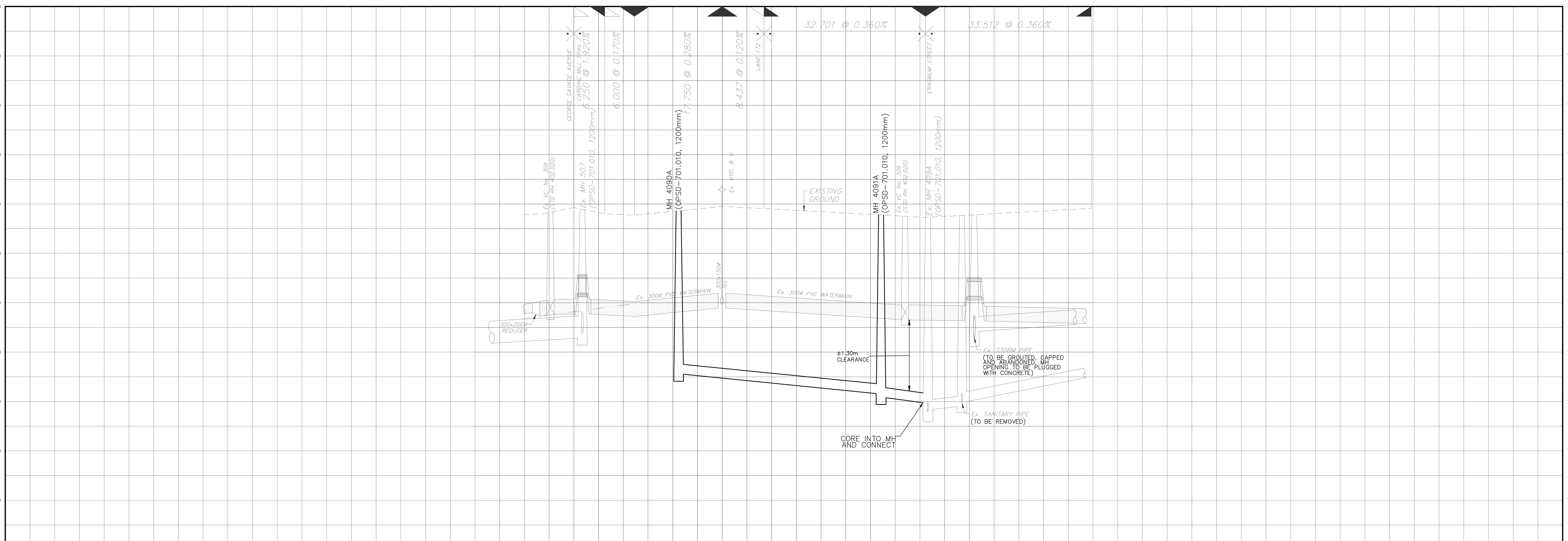
LEGAL INFORMATION

CONCEPT PLAN PROVIDED BY KORSIAK URBAN PLANNING LTD., DATED DECEMBER 13, 2024.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION ONTARIO FIRST–ORDER VERTICAL BENCH MARK NUMBER 00819818114 HAVING AN ORTHOMETRIC ELEVATION OF 188.594 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).
STEEL ROD WITH BRASS CAP BENCH MARK ON NORTH SIDE OF BURNHAMTHORPE RD, 138.7 M EAST OF THE JCT OF BURNHAMTHORPE RD AND SIXTH LINE RD IN OAKVILLE, AND 9.2 M NORTH OF CENTRELINE OF BURNHAMTHORPE RD. BENCH MARK IS SET 1.1 M SOUTH OF NORTH RIGHT–OF –WAY FENCE OF BURNHAMTHORPE RD AND IS MARKED BY A STEEL MARKER 46 CM EAST OF BENCH MARK.

NOT FOR CONSTRUCTION



STORM INVERT	Ex. 450ø CONC STM 32.6 @ 0.65% 65–D	SW 172.270 NW 172.360				Ex. 200Ø PVC SAN 11.5 @ 0.70% SDR–35			SW 172.260 N 172.320 E 172.420	Ex. 300ø PVC STM 69.1 @ 0.98% SDR–35		STORM INVERT
SANITARY INVERT			W 171.561	200Ø PVC SAN 41.0 @ 1.00% SDR–35	E 171.151 SE 171.091	200Ø PVC SAN 13.0 @ 1.00% SDR–35	NW 170.961	S 170.790 NE 170.830	SW 170.910 N 170.970 E 170.940	Ex. 200ø PVC SAN 56.0 @ 2.13% SDR–35		SANITARY INVERT
PROPOSED GRADES	175.070	174.950 174.960	174.940 174.862	175.010 175.020 175.010	174.880 174.778		174.810 174.731		174.800		174.910	PROPOSED GRADES
CENTERLINE CHAINAGE		0+006.250 0+012.250	0+021.189	0+030.000	0+062.134		0+071.617					CENTERLINE CHAINAGE

No.	DATE	BY	
1.	26–07–06	C.Y.	1st SUBMISSION

DESIGNED BY:	D.A.	CHECKED BY:	C.Y.
DRAWN BY:	A.C.	CHECKED BY:	C.Y.

DATE JULY 2026

SCALE HORIZ. 1:250 VERT. 1:50

REFERENCES

FIELD NOTES

BELL ☐ HYDRO ☐ GAS ☐ CABLE ☐ TRAFFIC ☐ WATER ☐

APPROVALS

MUNICIPAL APPROVAL

APPROVED IN PRINCIPLE SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF OAKVILLE STANDARDS AND SPECIFICATIONS

MANAGER OF DEVELOPMENT SERVICES DATE

REGIONAL APPROVAL

APPROVED DESIGN OF SANITARY, WATER SERVICES AND REGIONAL ROAD WORKS SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS & SPECIFICATIONS & LOCATIONAL APPROVAL FROM AREA MUNICIPALITY

DEVELOPMENT SERVICES, PUBLIC WORKS DATE

STAMP
LICENSED PROFESSIONAL ENGINEER
Kaya Yuan
C. YUAN
100598347
2026-07-06
PROVINCE OF ONTARIO

DSEL
600 Alden Road, Suite 606
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

MUNICIPALITY
OAKVILLE DEVELOPMENT SERVICES

REGION
Halton REGION
The Regional Municipality of Halton

DEVELOPER
REMINGTON GROUP

PROJECT
PRESERVE BLOCK 301 (275 POLLY DRIVE)

TITLE
PLAN AND PROFILE OF POLLY DRIVE
STA. 0+000.000 TO STA. 0+105.000

© DSEL

MUNICIPAL FILE NO. 24T–XXXX
REGIONAL FILE NO. DO–XXXX
PROJECT NO. 21–1227
SHEET 7