Functional Servicing and Stormwater Management Report
55 Busato Drive (L&M Gardens – Block 140)
Town of Whitchurch-Stouffville

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Project: 07:146

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1.0 INTRODUCTION

The following stormwater management detailed design brief has been prepared in support of the proposed re-zoning of Block 140 in the existing L&M Gardens residential subdivision, located at 55 Busato Drive in the Town of Whitchurch-Stouffville. Block 140 is currently zoned as institutional. It is proposed to be re-zoned to residential, and the proposed development consists of 143 townhouse dwelling units, in the form of 20 street towns, 35 rear-lane towns and 88 back-to-back towns.

The proposed development is tributary to the existing SWMF A stormwater management facility and as discussed in Section 6.0, the existing facility has sufficient stormwater quality and quantity controls to support the proposed rezoning of Block 140 from institutional to residential.

Previous studies and reports used in the preparation of this report are as follows:

- Stormwater Management Detailed Design Brief L&M Gardens Phase 2 prepared by Sabourin Kimble & Associates Ltd. (May 2018)
- Supplemental Water Balance Assessment L&M Gardens – Phase 2 Draft prepared by EnVision Consultants Ltd. (September 2026)

2.0 STUDY AREA

The study area is located within the Sorbara/L&M G.P. Inc lands in the southeastern corner of the existing subdivision, bound by 10th Line to the east, Busato Drive to the north, Flower Garden Trail to the west and the Stouffville/Markham town limits to the south.

The total study area is comprised of approximately 2.45 hectares. The proposed development will consist of 143 townhouse dwelling units in the form of 20 street towns, 35 rear-lane towns and 88 back-to-back towns; private roads and parking areas; and an outdoor amenity area. The study area is part of the drainage tributary the existing SWMF A stormwater management facility, ultimately outletting to Stouffville Creek. See Figure 1 – Study Area for further details.

STUDY AREA
BLOCK 140

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
07:146	1

CAD FILE: P:\07\146\Drawing Files\Block 140\Figures\146 Block 140 Fig 1 - Study Area.dwg

3.0 SITE TOPOGRAPHY AND GRADING

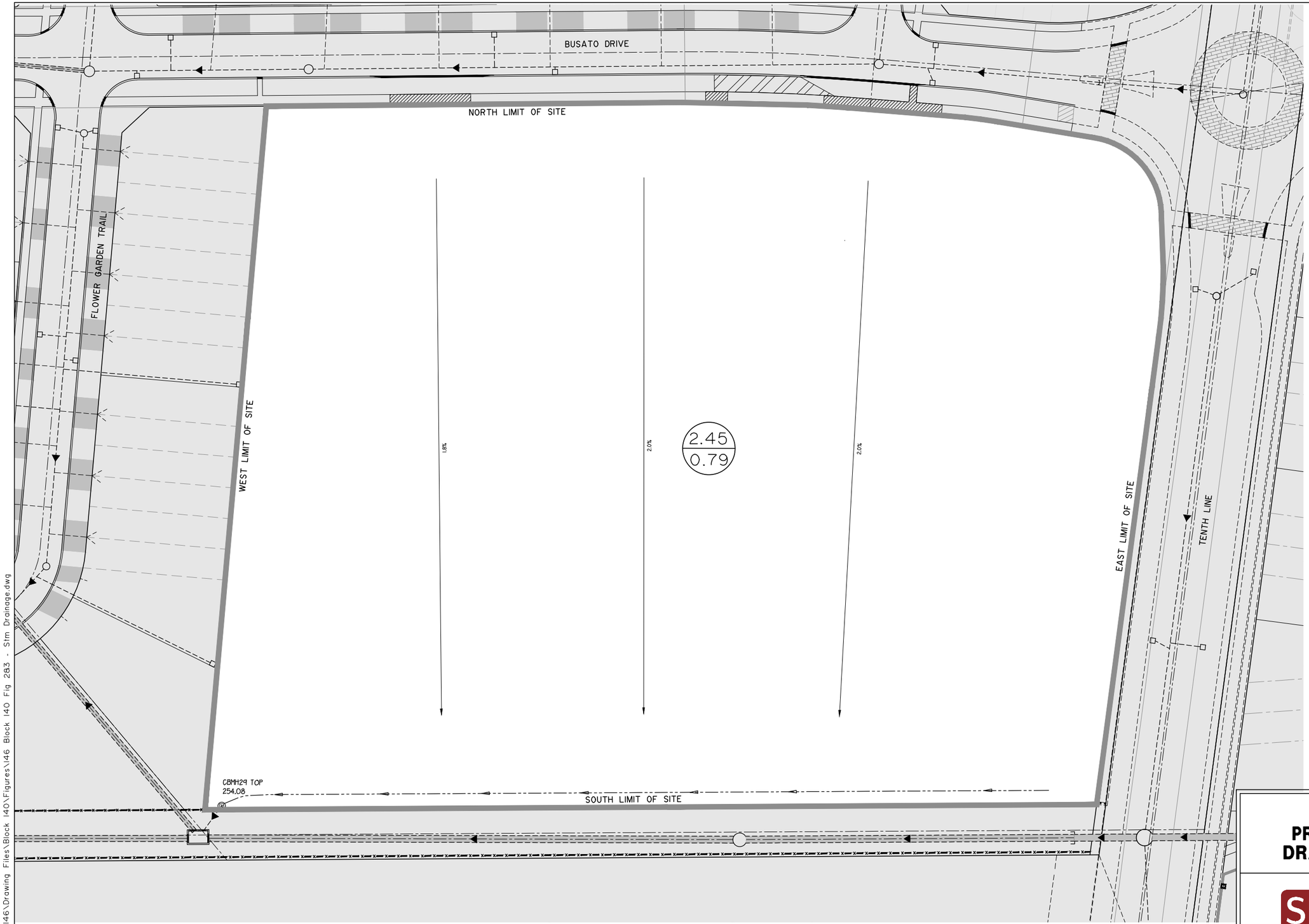
3.1 Existing Site Topography

Block 140 was pre-graded as part of the L&M Gardens Phase 2 subdivision earthworks program with the site graded from north to south with 2% grades. The drainage is captured by a swale along the south property line of the block and conveyed to existing CBMH29 at the southwest corner of the site, and ultimately to SWMF A. The topography can be found in Figure 2.

3.2 Proposed Grading

The proposed grading for Block 140 has been designed to meet the Town of Whitchurch-Stouffville Grading Criteria. All proposed grades will be within a minimum of 0.5% and a maximum of 5.0%. Drainage has been directed to two localized low points located at the southern limit of Block 140. The street towns fronting the west property line and the rear lane townhouses will be graded as walkout units to allow for desirable road grades throughout the site. The back-to-back townhouses will be graded as traditional split draining lots to ensure compatible finished floor elevations (FFEs) between units. 3:1 sloping has been utilized within Block 89 to match existing grades along the south property limit.

Proposed Grades are illustrated on the Site Grading Plan (Figure SG, back pocket).



SCALE 1:750

LEGEND

- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- DIRECTION OF EXISTING SEWER FLOW
- STORM MANHOLE
- CATCHBASIN/DOUBLE CATCHBASIN
- STORM DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- 0.15 / 0.90 — DRAINAGE AREA (ha) / PERCENT IMPERVIOUS
- EXISTING SWALE

PREVIOUSLY PROPOSED DRAINAGE CONDITIONS

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CONSULTING ENGINEERS

PROJECT NUMBER	FIGURE NO.
07:146	2

CAD FILE: P:\07\146\Drawing Files\Block 140\Figures\146 Block 140 Fig 2&3 - Stm Drainage.dwg

4.0 STORM DRAINAGE

4.1 Existing Storm Drainage

Block 140 was originally designed as part of the L&M Gardens Phase 2 subdivision to convey all drainage to the southwest corner of the site where the 100-year flows would be captured at CBMH 29 and conveyed via storm sewers to SWMF A. The storm sewers were originally designed for the 100-year flows utilizing a 0.75 run-off coefficient which is in keeping with Town of Whitchurch-Stouffville standards for institutional areas. The design flow for Block 140 was 1041.50 l/s as shown in the existing L&M Gardens Phase 2 storm design sheets located in Appendix A.

4.2 Proposed Storm Drainage

As shown in Figure 3, the proposed development will continue to utilize the existing outlet at CBMH 29 to convey flows to the existing downstream storm sewers, maintaining existing drainage patterns. Private storm sewers are proposed within the site laneways to provide gravity connections for each townhouse block. The private storm sewer will capture and convey the 5-year storm utilizing a run-off coefficient of 0.75 in accordance with Town of Whitchurch-Stouffville criteria. The 100-year overland flow will be conveyed to two localized low points at the south side of the block, where the 100-year flow will be captured within the storm sewers and conveyed to the existing outlet at CBMH 29. Catchbasin capture calculations have been provided in Appendix C for the two 100-year capture locations.

As shown in the proposed design sheets prepared for the Block 140 townhouse development, a total flow of 841.13 l/s is being conveyed to the existing downstream storm sewers. This is an approximately 19% reduction in flows from the original design, therefore confirming that the existing downstream storm sewers have sufficient capacity for the proposed development. The proposed storm design sheets can be found in Appendix A.

Proposed storm sewers are illustrated on the Site Servicing Plans (SS-1 & SS-2) and storm drainage boundaries on the Storm Drainage Plans (STM-1 & STM-2).

LEGEND

- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF EXISTING SEWER FLOW
- STORM MANHOLE
- CATCHBASIN/DOUBLE CATCHBASIN
- STORM DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- 0.15 / 0.90 — DRAINAGE AREA (ha) / PERCENT IMPERVIOUS

PROPOSED RELOTTING DRAINAGE CONDITIONS

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PROJECT NUMBER	FIGURE NO.
07:146	3

CAD FILE: P:\07\146\Drawing Files\Block 140\Figures\146 Block 140 Fig 2&3 - Stm Drainage.dwg

5.0 LOT COVERAGE CHANGES

Lot coverage changes are proposed for the previously proposed school block (Block 140), changing the land use designation from institutional to a residential lot comprised of townhouses. The proposed changes are as described in the following table.

Table 1 - Residential Units to be re-lotted to Block 140

Block Number	Residential Unit Type	Number of Units
1	Front-Loaded	6
2	Front-Loaded	8
3	Front-Loaded	6
4	Back-to-Back	12
5	Back-to-Back	16
6	Rear-Lane	6
7	Rear-Lane	5
8	Back-to-Back	14
9	Back-to-Back	18
10	Back-to-Back	14
11	Back-to-Back	14
12	Rear-Lane	6
13	Rear-Lane	6
14	Rear-Lane	6
15	Rear-Lane	6

Table 2 - Drainage area changes in Block 140

	Drainage Area (ha)	Runoff Coefficient	Imperviousness (%)
Previously Proposed School Block	**2.45**	**0.75**	**79%**
Proposed Western Residential Zone	1.39	0.75	79%
Proposed Eastern Residential Zone	1.06	0.75	79%
Total Area of Proposed Re-lotting	**2.45**	**0.75**	**79%**

As per the Stormwater Management Detailed Design Brief L&M Gardens Phase 2 prepared by Sabourin Kimble & Associates Ltd. (May 2018) and following the Town of Whitchurch-Stouffville Storm Drainage and Stormwater Management guidelines, the SWMF A design uses a runoff coefficient of 0.75 for institutional area types (ie. school block). The full conversion to a residential zone of townhouses also uses a runoff coefficient of 0.75, effectively matching the previously proposed conditions for Block 140. The storm sewer proposed to service the school block will now service the newly proposed townhouses. The new re-lotting will have no appreciable impacts on the approved subdivision and SWMF A design, hydraulic grade line and water balance.

6.0 STORMWATER MANAGEMENT

Design stormwater management criteria were established by guidelines from the TRCA and findings from the approved Town of Whitchurch-Stouffville's South East Quadrant Functional Servicing Study (FSS) prepared by URS Canada Inc. (June 2004). The design criteria and design can be found in the previous report Stormwater Management Detailed Design Brief L&M Gardens Phase 2 prepared by Sabourin Kimble & Associates Ltd. (May 2018).

The drainage area tributary to SWMF A encompasses the eastern half of the L&M Gardens subdivision, which includes Block 140. The proposed re-zoning of Block 140 will not have any effect on the tributary drainage area for SWMF A, as the drainage will be contained entirely on-site and conveyed to SWMF A by the minor system, in keeping with the original design for the school block. The water quality, water quantity, erosion control and outlet works will remain unchanged. The re-zoning also sees no change to both the total drainage areas and overall imperviousness, as the proposed lot coverages share the same characteristics as the existing school block.

6.1 Groundwater Recharge and Exfiltration Works

Best efforts were previously made to increase infiltration and evapotranspiration by the implementation of exfiltration galleries, re-directed roof runoff and the creation of a wetland in the central Open Space Block 139 to service the entire L&M Garden Phase 2 Development Area (which includes Block 140). With respect to Block 140, no LID measures were proposed in either the previously approved plans or in the newly proposed lotting plans. As such, the proposed re-lotting is expected to have no impact on the water balance calculations. The runoff coefficient for the block will remain unchanged.

7.0 SANITARY SEWERS

7.1 Existing Sanitary Servicing

As part of the L&M Gardens Phase 2 subdivision, there were local sanitary sewers installed on Busato Drive and a trunk sanitary sewer installed through Block 89 that conveys sanitary flows from the McKean property to the west of Tenth Line. A 200mm diameter sanitary sewer connection was provided from Busato Drive at the northwest corner of the site and was sized for 2.45 hectares of institutional flow, resulting in a design flow of 0.64 l/s.

Based on the alignment of the private laneways and the proposed grading, with the site falling from north to south with approximately 3m of fall, gravity connections could not be provided if the existing connection on Busato Drive was utilized. Therefore, the proposed development will be serviced from the trunk sanitary sewer that runs through Block 89 along the south limit of the site. The sanitary design flow of 7.04 l/s was calculated for the 143 townhouse dwellings as shown in the proposed sanitary design sheet in Appendix B. The existing downstream sanitary design sheet was updated with the flows from the proposed development, resulting in a capacity increase of approximately 4-7% within the downstream sewers. All existing downstream sewers are well below the 80% capacity with the additional flows from the proposed development, therefore confirming the existing sewers have sufficient capacity for the Block 140 sanitary flows.

7.2 Proposed Sanitary Servicing

The 143 townhouses within the development will be serviced by a private 200mm conventional gravity sanitary sewer located within the laneways. The sewer will provide gravity connections to each unit. The proposed sanitary sewer will utilize two (2) connections to the existing trunk sanitary sewer within Block 89. One connection will be made at the existing manhole 944B which will service the east side of the site while a new manhole is proposed downstream of Ex MH944B that will service the west side of the site.

The existing and proposed sanitary sewers within and adjacent to the site are illustrated on the Site Servicing Plans (SS-1 & SS-2, back pocket).

8.0 WATER SUPPLY

8.1 Existing Water Supply

There is an existing 300mm PVC watermain within the north boulevard of Busato Drive that runs along the north side of the site. A 200mm watermain connection was provided to the property line of the site approximately 40m west of the Lager Drive and Busato Drive intersection.

8.2 Proposed Water Supply

Based on the layout of the proposed townhouse development, the existing connection conflicts with Block 7. A 200mm watermain will be teed off of the existing connection within the south boulevard of Busato Drive and continue east to the east entrance of the proposed development. The existing connection south of the tee will be decommissioned in accordance with the details on the Site Servicing Plan.

A water meter chamber in accordance with WS-603 and backflow preventer per details on Drawing DET-2 are proposed in accordance with Town standards for private developments. A private 200mm watermain has been provided within the laneway to provide service connections to each townhouse units. Private hydrants have been provided throughout the site and are spaced in accordance with Town of Whitchurch-Stouffville standards.

The existing and proposed watermains are illustrated on the Site Servicing Plans (SS-1 & SS-2, back pocket).

9.0 EROSION AND SEDIMENT CONTROL

During construction of any portion of the site, adequate erosion and sedimentation controls (ESC) must be implemented. An ESC plan has been provided illustrating works such as sediment fences, mud mats, and catchbasin sediment traps to be implemented.

Sedimentation control practices will be implemented for all construction activities within the Study Area, including during tree removal, topsoil stripping, underground sewer construction, and building and road construction. Sedimentation control measures are to be installed and operational prior to any construction activity and are to remain in place until such time as the buildings are constructed and the fine grading is complete with established sod or other stabilization methods.

All ESC measures are illustrated on the Erosion and Sediment Control Plan (Drawing ESC, back pocket).

10.0 CONCLUSIONS

With respect to the proposed re-lotting of Block 140, the following conclusions are made:

- The proposed re-zoning of Block 140 will change the development of the block from institutional to residential.
- There is no change in area or runoff coefficient proposed compared to the original institutional design.
- The existing SWMF A will continue to provide all required quantity, quality and erosion control for Block 140
- As Block 140 was included in the overall site water balance calculations and there were no LIDs proposed within Block 140, there is no change to the on-site water balance or LIDs.
- Private storm sewers are proposed within the site laneways to provide gravity connections for each townhouse block. The private storm sewer will capture and convey the 5-year storm and the 100-year overland flow will be conveyed to and captured by two localized low points at the south side of the block.
- The proposed storm sewer system will utilize the existing outlet at CBMH 29 which conveys flows to SWMF A. The downstream storm sewer system has been sufficiently sized to convey the proposed flows.
- The 143 townhouses within the development will be serviced by a private 200mm conventional gravity sanitary sewer located within the laneways. The sewer will provide gravity connections to each unit.
- The proposed sanitary sewer will utilize two (2) connections to the existing trunk sanitary sewer within Block 89 which has sufficient capacity to accommodate the proposed development.
- A private 200mm watermain has been provided within the laneway to provide service connections to each townhouse units.
- A 200mm watermain connection was previously provided to the property from the existing 300mm PVC watermain within the north boulevard of Busato Drive that runs along the north side of the site.

SABOURIN KIMBLE & ASSOCIATES LTD.

Cody Baxter-Ojala, P. Eng.

APPENDIX A

EXISTING AND PROPOSED STORM DESIGN SHEET

PROJECT TITLE:	L&M Gardens Block 140
PROJECT No.:	07:146
CLIENT:	Sorbara/L&M G.P. Inc.
ISSUED FOR:	1st Submission

STORM SEWER DESIGN SHEET
5 - YEAR STORM
TOWN OF WHITCHURCH STOUFFVILLE - REGION OF YORK
DATE: SEPTEMBER 2026

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Captured Overland Flow = Q(100yr) - Q(5yr)
Inlet Time (mins): 10.00

Run-off Coefficients:	
Park/Open Space	0.20
Single Family Residential	0.45
Townhouses	0.75
Institutional	0.75
Commercial/Asphalt	0.90
Other (if applicable)	

IDF Parameters:

Storm:	A	B	C
5 - Year	1016	5	1
25 - Year	1547	6	1
100 - Year	2052	6	0.86

Formula:

$$I_{YR} = \frac{A}{(t + B)^C}$$

where; I= Intensity (mm/hr)
t= Time of Concentration (mins)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

PROPERTY	STREET	Upstream Manhole	Downstream Manhole	A Park/ Open Space (ha)	A Single Family Res. (ha)	A Townhouses (ha)	A Institutional (ha)	A Commercial / Asphalt (ha)	A Other - Specified Above (ha)	A x R This Section (ha)	Acc. AR (ha)	t (min)	I (5yr) (mm/hr)	Q (5yr) (l/s)	I (25yr) (mm/hr)	Q (25yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Captured Overland Flow (l/s)	Acc. Captured Overland Flow (l/s)	Q(design) (l/s)	Modeled Q(HGL) (l/s)	Type	Pipe (mm)	Grade (%)	Capacity (l/s)	Length (m)	Velocity (m/s)	Down-stream Velocity (m/s)	Change in Velocity (m/s)	Time (min)	Total Time (min)	Downstream Invert	Upstream Invert	Capacity (%)
Block 140	Laneway	4(w)	1			0.20				0.150	0.150	10.00	107.00	44.58	150.60	62.75	186.74	77.81		0.00	44.58		PVC	300	2.00	136.76	40.0	1.93	1.28	0.65	0.34	10.34	255.18	255.98	33%
		1	2			0.45				0.338	0.488	10.34	105.04	142.25	147.87	200.24	183.40	248.35		0.00	142.25		CONC	450	0.50	210.32	99.9	1.28	1.55	0.27	1.30	11.64	254.53	255.03	68%
		2	3			0.06				0.045	0.533	11.64	98.32	145.44	138.48	204.83	171.87	254.23	164.87	164.87	310.31		CONC	600	0.50	452.95	44.1	1.55	1.63	0.08	0.47	12.12	254.16	254.38	69%
		4	5			0.34				0.255	0.255	10.00	107.00	75.79	150.60	106.68	186.74	132.28		0.00	75.79		PVC	300	1.30	110.26	91.5	1.56	1.12	0.44	0.98	10.98	254.32	255.51	69%
		5	3			0.05				0.038	0.293	10.98	101.65	82.59	143.13	116.29	177.58	144.28		0.00	82.59		PVC	375	0.50	123.98	20.4	1.12	1.63	0.51	0.30	11.28	254.17	254.27	67%
		3	9							0.000	0.825	12.12	96.10	220.24	135.37	310.22	168.05	385.11		164.87	385.11		CONC	600	0.55	475.05	36.5	1.63	2.81	1.18	0.37	12.49	253.74	253.94	81%
		6	7			0.10				0.075	0.075	10.00	107.00	22.29	150.60	31.38	186.74	38.90		0.00	22.29		PVC	300	1.00	96.70	15.8	1.37	0.97	0.40	0.19	10.19	255.12	255.28	23%
		7	8			0.01				0.008	0.083	10.19	105.90	24.27	149.06	34.16	184.86	42.36		0.00	24.27		PVC	300	0.50	68.38	9.1	0.97	1.23	0.26	0.16	10.35	254.72	254.77	35%
		8	9			0.38				0.285	0.368	10.35	105.02	107.21	147.83	150.92	183.35	187.17		0.00	107.21		PVC	375	0.60	135.81	101.4	1.23	2.81	1.58	1.37	11.72	254.02	254.63	79%
		9	10			0.05				0.038	1.230	12.49	94.43	322.64	133.02	454.49	165.16	564.29	172.48	337.35	659.98		CONC	675	1.40	1037.60	39.0	2.81	3.75	0.94	0.23	12.72	253.11	253.66	64%
		7(w)	12			0.12				0.090	0.090	10.00	107.00	26.75	150.60	37.65	186.74	46.69		0.00	26.75		PVC	300	1.00	96.70	38.0	1.37	1.12	0.25	0.46	10.46	254.64	255.02	28%
		11	12			0.12				0.090	0.090	10.00	107.00	26.75	150.60	37.65	186.74	46.69	19.94	19.94	46.69		PVC	300	1.00	96.70	18.5	1.37	1.12	0.25	0.23	10.23	254.15	254.35	48%
		12	13			0.08				0.060	0.240	10.46	104.39	69.59	146.96	97.97	182.28	121.52		19.94	89.53		PVC	375	0.50	123.98	20.0	1.12	1.42	0.30	0.30	10.76	253.63	253.73	72%
		13	10			0.49				0.368	0.608	10.76	102.79	173.46	144.72	244.22	179.54	302.97		19.94	193.39		CONC	525	0.50	317.25	91.1	1.42	3.75	2.33	1.07	11.83	253.02	253.48	61%
		10	Ex(C394)							0.000	1.838	12.72	93.42	476.86	131.61	671.77	163.42	834.14		357.28	834.14		CONC	675	2.50	1386.56	28.2	3.75	3.60	0.15	0.13	12.85	252.16	252.87	60%
		Ex(C394)	*Ex(C350)*							*0.000*	*1.838*	*12.85*	*92.89*	*474.13*	*130.86*	*667.94*	*162.50*	*829.43*		*357.28*	*831.42*		*CONC*	*750*	*2.00*	*1642.49*	*6.2*	*3.60*	*N/A*		*0.03*	*12.88*	*250.25*	*250.37*	*51%*

PROJECT TITLE:	L&M Gardens Phase 2 Subdivision
PROJECT No.:	07:146
CLIENT:	Sorbara / L&M G.P. Inc.
ISSUED FOR:	4th Submission (July 2019)

STORM SEWER DESIGN SHEET - POND 29A
5 - YEAR STORM
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Captured Overland Flow = Q(100yr) - Q(5yr)
Inlet Time (mins): 10.00

Run-off Coefficients:	
Park/Open Space	0.25
Single Family	0.67
Townhouses	0.70
Institutional	0.75
Medium Density/Asphalt	0.90
Tenth Line	0.69
Other	0.76

IDF Parameters:

Storm:	A	B	C
5 - Year	30.40	0	0.744
25 - Year	42.30	0	0.757
100 - Year	52.00	0	0.763

Formula: $I_{YR} = \frac{A}{(t + B)^C}$

where; I= Intensity (mm/hr)
t= Time of Concentration (hours)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

				Area x Run-Off Coefficients									Design Flows										HGL Flows				Pipe Design												
PROPERTY	**STREET**	**Upstream Manhole**	**Downstream Manhole**	**A Park/ Open Space (ha)**	**A Single Family Res. (ha)**	**A Townhouses (ha)**	**A Institutional (ha)**	**A Medium Density / Asphalt (ha)**	**A Tenth Line (ha)**	**A Others (ha)**	**A x R This Section (ha)**	**Acc. AR (ha)**	**t (min)**	**I (5yr) (mm/hr)**	**Q (5yr) (l/s)**	**I (25yr) (mm/hr)**	**Q (25yr) (l/s)**	**I (100yr) (mm/hr)**	**Q (100yr) (l/s)**	**Additional Flow (l/s)**	**Acc. Additional Flow (l/s)**	**Q(design) (l/s)**	**Q OTTSWMM (l/s)**	**Additional HGL Flow (l/s)**	**Acc. Additional HGL Flow (l/s)**	**QHGL (l/s)**	**Type**	**Pipe (mm)**	**Grade (%)**	**Capacity (l/s)**	**Length (m)**	**Velocity (m/s)**	**Down-stream Velocity (m/s)**	**Change in Velocity (m/s)**	**Time (min)**	**Total Time (min)**	**Downstream Invert**	**Upstream Invert**	**Capacity (%)**
McKean & Tenth Line External		EXT	10th Plug									9.675																								13.22			
Note: Q_{design} for sewers for 10th Plug to MHC350 and MHC394 to MHC350 are equal to Q_{100}																																							
L&M Gardens - Phase 2	Tenth Line	10th Plug	C349								0.000	9.675	13.22	93.67	2517.53	132.93	3572.57	164.90	4431.85		0.00	4431.85	3189.00		0.00	3189.00	CONC	1350	1.40	6588.37	66.3	4.46	4.46	0.00	0.25	13.47	252.44	253.37	67%
L&M Gardens - Phase 2	Block 228	C349	C350								0.000	9.675	13.47	92.39	2482.98	131.08	3522.69	162.58	4369.49		0.00	4369.49	3189.00		0.00	3189.00	CONC	1350	1.40	6588.37	106.0	4.46	4.54	0.08	0.40	13.86	250.06	251.54	66%
L&M Gardens - Phase 2	School Block	C394	C350				2.45				1.838	1.838	10.00	115.30	588.50	164.21	838.16	204.05	1041.50		0.00	1041.50	792.80		0.00	792.80	CONC	750	1.40	1374.20	9.0	3.01	4.54	1.53	0.05	10.05	250.24	250.37	76%
Note: Q_{design} for sewers between MHC350 and HW1 is Q_5 + peak flow from 25mm storm upstream (1,123.40L/s)																																							
L&M Gardens - Phase 2	Easement	C350NW	C351								0.000	0.000	13.86	90.42	0.00	128.23	0.00	159.03	0.00	1123.40	1123.40	1123.40	0.00	2354.00	2354.00	2354.00	CONC	975	0.40	1478.65	60.4	1.92	2.20	0.28	0.52	14.39	249.77	250.01	76%
L&M Gardens - Phase 2	Flower Garden Trail	C376	C374			0.58					0.406	0.406	10.00	115.30	130.03	164.21	185.19	204.05	230.12		0.00	130.03	174.50		0.00	174.50	CONC	450	1.00	297.43	86.0	1.81	1.28	0.53	0.79	10.79	250.40	251.26	44%
L&M Gardens - Phase 2	Flower Garden Trail	C374	C351			0.12					0.084	0.490	10.79	108.95	148.29	155.01	210.99	192.53	262.06		0.00	148.29	193.50		0.00	193.50	CONC	450	0.50	210.32	11.5	1.28	2.20	0.92	0.15	10.94	250.29	250.35	71%
L&M Gardens - Phase 2	Flower Garden Trail	C351	C352		0.21						0.141	0.631	14.39	87.95	154.09	124.67	218.42	154.58	270.82		1123.40	1277.49	230.60		2354.00	2584.60	CONC	1200	0.40	2572.39	57.4	2.20	2.20	0.00	0.43	14.82	249.31	249.54	50%
L&M Gardens - Phase 2	Flower Garden Trail	C352	C353		0.07						0.047	0.678	14.82	86.03	161.93	121.90	229.45	151.12	284.44		1123.40	1285.33	229.90		2354.00	2583.90	CONC	1200	0.40	2572.39	14.0	2.20	2.20	0.00	0.11	14.93	249.20	249.26	50%
L&M Gardens - Phase 2	Flower Garden Trail	C353	C354		0.49	0.05					0.363	1.041	14.93	85.57	247.43	121.25	350.57	150.30	434.57		1123.40	1370.83	458.20		2354.00	2812.20	CONC	1200	0.40	2572.39	94.0	2.20	2.20	0.00	0.71	15.64	248.77	249.15	53%
L&M Gardens - Phase 2	Flower Garden Trail	C354	C371								0.000	1.041	15.64	82.66	239.01	117.05	338.44	145.06	419.42		1123.40	1362.41	453.00		2354.00	2807.00	CONC	1200	0.40	2572.39	11.5	2.20	2.91	0.71	0.09	15.73	248.67	248.72	53%
Note: For Block 221, please refer to drawings from SPA18.005 for details.																																							
Block 221	Laneway	3	2					0.37			0.333	0.333	10.00	115.30	106.65	164.21	151.90	204.05	188.75		0.00	106.65	31.70		0.00	31.70	PVC	375	1.20	192.06	88.2	1.74	1.42	0.32	0.85	10.85	257.45	258.51	56%
Block 221	Laneway	2	1					0.32			0.288	0.621	10.85	108.54	187.24	154.43	266.39	191.80	330.85		0.00	187.24	111.40		0.00	111.40	CONC	525	0.50	317.25	93.0	1.42	1.42	0.00	1.09	11.94	256.83	257.30	59%
Block 221	Laneway	1	18					0.09			0.081	0.702	11.94	101.07	197.08	143.61	280.04	178.26	347.61		0.00	197.08	178.60		0.00	178.60	CONC	525	0.50	317.25	25.5	1.42	1.55	0.13	0.30	12.24	256.62	256.75	62%
L&M Gardens - Phase 2	Block 221	18	C367								0.000	0.702	12.24	99.22	193.48	140.94	274.84	174.93	341.11		0.00	193.48	177.20		0.00	177.20	CONC	600	0.50	452.95	8.2	1.55	2.19	0.64	0.09	12.32	256.50	256.54	43%
L&M Gardens - Phase 2	Lageer Drive	C356	C365			0.17					0.119	0.119	10.00	115.30	38.11	164.21	54.28	204.05	67.45		0.00	38.11	47.60		0.00	47.60	PVC	300	1.00	96.70	22.0	1.37	1.66	0.30	0.27	10.27	258.03	258.25	39%
L&M Gardens - Phase 2	Lageer Drive	C365	C367			0.33					0.231	0.350	10.27	113.05	109.91	160.96	156.49	199.97	194.42		0.00	109.91	47.50		0.00	47.50	PVC	375	1.10	183.89	110.0	1.66	2.19	0.53	1.10	11.37	256.79	258.00	60%
L&M Gardens - Phase 2	Lageer Drive	C367	C368		0.10						0.067	1.119	12.32	98.69	306.77	140.18	435.73	173.97	540.76		0.00	306.77	359.00		0.00	359.00	CONC	600	1.00	640.56	40.5	2.19	3.67	1.48	0.31	12.63	256.01	256.42	48%
L&M Gardens - Phase 2	Tenth Line	Busato Plug	C368							1.39	1.056	1.056	11.66	102.85	301.80	146.19	428.98	181.49	532.56		0.00	301.80	157.90		0.00	157.90	CONC	450	2.85	502.13	43.8	3.06	3.67	0.61	0.24	11.90	256.16	257.41	60%
L&M Gardens - Phase 2	Busato Drive	C368	C369		0.39						0.261	2.437	12.63	96.90	655.88	137.59	931.30	170.73	1155.61		0.00	655.88	552.60		0.00	552.60	CONC	600	2.80	1071.86	112.9	3.67	3.01	0.67	0.51	13.14	252.77	255.93	61%
L&M Gardens - Phase 2	Busato Drive	C369	C370		0.11						0.074	2.510	13.14	94.08	656.02	133.51	931.02	165.63	1154.99		0.00	656.02	604.60		0.00	604.60	CONC	675	1.60	1110.63	43.4	3.01	4.70	1.69	0.24	13.39	251.92	252.62	59%
L&M Gardens - Phase 2	Lageer Drive	C355	C357			0.15					0.105	0.105	10.00	115.30	33.63	164.21	47.90	204.05	59.51		0.00	33.63	33.30		0.00	33.30	PVC	300	2.00	136.76	39.0	1.93	1.42	0.51	0.34	10.34	257.52	258.30	25%
L&M Gardens - Phase 2	Lageer Drive	C396	C357		0.08						0.054	0.054	10.00	115.30	17.17	164.21	24.45	204.05	30.38		0.00	17.17	27.20		0.00	27.20	PVC	300	1.00	96.70	15.5	1.37	1.42	0.05	0.19	10.19	257.13	257.29	18%
Block 221	Laneway	DCBMH2	8					0.15			0.135	0.135	10.00	115.30	43.24	164.21	61.58	204.05	76.52		0.00	43.24	51.30		0.00	51.30	PVC	300	2.00	136.76	7.8	1.93	1.93	0.00	0.07	10.07	259.00	259.16	32%
Block 221	Busato Drive	8	C357								0.000	0.135	10.07	114.72	43.02	163.38	61.27	203.01	76.13		0.00	43.02	51.30		0.00	51.30	PVC	300	2.00	136.76	7.5	1.93	1.42	0.51	0.06	10.13	257.52	257.67	31%
L&M Gardens - Phase 2	Busato Drive	C357	C358		0.04						0.027	0.320	10.34	112.50	100.12	160.15	142.54	198.97	177.08		0.00	100.12	97.20		0.00	97.20	PVC	375	0.80	156.82	21.5	1.42	2.51	1.09	0.25	10.59	256.88	257.05	64%
L&M Gardens - Phase 2	Busato Drive	C358	C360		0.30						0.201	0.521	10.59	110.50	160.04	157.26	227.76	195.34	282.92		0.00	160.04	178.70		0.00	178.70	PVC	375	2.50	277.22	54.3	2.51	1.55	0.96	0.36	10.95	255.44	256.80	58%
L&M Gardens - Phase 2	Busato Drive	C359	C360		0.55						0.369	0.369	10.00	115.30	118.02	164.21	168.09	204.05	208.87		0.00	118.02	164.10		0.00	164.10	PVC	375	0.75	151.44	70.5	1.37	1.55	0.18	0.86	10.86	255.44	255.97	78%
L&M Gardens - Phase 2	Seedling Crescent	C360	C361		0.13	0.34					0.325	1.215	10.95	107.78	363.75	153.32	517.46	190.41	642.64		0.00	363.75	439.00		0.00	439.00	CONC	600	0.50	452.95	72.9	1.55	2.19	0.64	0.78	11.73	254.86	255.22	80%
L&M Gardens - Phase 2	Seedling Crescent	C361	C362		0.09	0.47					0.389	1.604	11.73	102.38	456.24	145.51	648.45	180.64	805.00		0.00	456.24	551.70		0.00	551.70	CONC	600	1.00	640.56	55.2	2.19	3.10	0.91	0.42	12.15	254.23	254.78	71%
L&M Gardens - Phase 2	Seedling Crescent	C362	C363		0.23	0.33					0.385	1.989	12.15	99.74	551.18	141.69	783.02	175.86	971.85		0.00	551.18	755.90		0.00	755.90	CONC	600	2.00	905.89	68.7	3.10	2.40	0.70	0.37	12.52	252.78	254.15	61%
L&M Gardens - Phase 2	Seedling Crescent	C363	C364			0.04					0.028	2.017	12.52	97.54	546.63	138.52	776.27	171.90	963.29		0.00	546.63	753.30		0.00	753.30	CONC	600	1.20	701.70	18.6	2.40	1.99	0.42	0.13	12.65	252.47	252.69	78%
L&M Gardens - Phase 2	Seedling Crescent	C364	C370		0.22	0.08					0.203	2.221	12.65	96.80	597.18	137.45	847.93	170.56	1052.15		0.00	597.18	875.10		0.00	875.10	CONC	675	0.70	733.70	67.1	1.99	4.70	2.71	0.56	13.21	251.92	252.39	81%
L&M Gardens - Phase 2	Busato Drive	C370	C371		0.25						0.168	4.899	13.39	92.81	1262.98	131.69	1791.98	163.35	2222.82		0.00	1262.98	1468.90		0.00	1468.90	CONC	750	3.40	2142.49	80.7	4.70	2.91	1.78	0.29	13.67	249.09	251.84	59%
L&M Gardens - Phase 2	Busato Drive	C371	C372		0.00						0.000	5.940	15.73	82.32	1358.24	116.56	1923.10	144.44	2383.17		1123.40	2481.64	1804.80		2354.00	4158.80	CONC	1200	0.70	3402.96	24.9	2.91	2.91	0.00	0.14	15.87	248.45	248.62	73%
L&M Gardens - Phase 2	Busato Drive	C372	C373		0.00						0.000	5.940	15.87	81.77	1349.16	115.77	1910.03	143.45	2366.84		1123.40	2472.56	1802.70		2354.00	4156.70	CONC	1200	0.70	3402.96	19.0	2.91	2.91	0.00	0.11	15.98	248.27	248.40	73%
L&M Gardens - Phase 2	Busato Drive	C397	C373		0.20						0.134	0.134	10.00	115.30	42.92	164.21	61.12	204.05	75.95		0.00	42.92	252.40		0.00	252.40	PVC	300	2.00	136.76	10.4	1.93	2.91	0.98	0.09	10.09	249.54	249.75	31%
L&M Gardens - Phase 2	Busato Drive	C373	HW 1		0.00						0.000	6.074	15.98	81.36	1372.61	115.17	1943.06	142.71	2407.67		1123.40	2496.01	1993.60		2354.00	4347.60	CONC	1200	0.70	3402.96	32.0	2.91	N/A		0.18	16.16	248.00	248.22	73%
Note: Q_{design} for sewers between MH2 and HW3 are Q_{100} - peak flow from 25mm storm upstream (1,123.40L/s)																																							
L&M Gardens - Phase 2	Easement	C350	C366								0.000	11.513	13.86	90.42	2891.50	128.23	4100.73	159.03	5085.60	-1123.40	-1123.40	3962.20		1486.00	1486.00	1486.00	CONC	1200	1.70	5303.13	146.5	4.54	4.15	0.39	0.54	14.40	248.49	250.99	75%
L&M Gardens - Phase 2	Easement	C366	HW 3		0.47						0.315	11.827	14.40	87.89	2887.70	124.59	4093.32	154.48	5075.24		-1123.40	3951.84			1486.00	1486.00	CONC	1200	1.42	4846.76	30.2	4.15	N/A		0.12	14.52	248.00	248.43	82%

PROJECT TITLE:	L&M Gardens Phase 2 Subdivision
PROJECT No.:	07:146
CLIENT:	Sorbara / L&M G.P. Inc.
ISSUED FOR:	4th Submission (July 2019)

HGL DESIGN SHEET - POND 29A
100 - YEAR STORM
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Manhole Loss = $\frac{K \times V_{out}^2 - V_{in}^2}{2 \times G}$

K = 0.1 For velocity increase

K = 0.2 For velocity decrease

Maximum Depth of Footing below road = 2.45 m *based on split draining lot with high-point 6m from streetline and USF 2.52m below TFW

Minimum separation between USF and 100-year HGL = 0.30 m

2.75 m *minimum HGL depth below centreline at which a specified minimum USF is not requried

PIPE DATA									FRICTION LOSSES				MANHOLE LOSSES					HYDRAULIC GRADE LINE				HGL vs. PROFILE AND PROPOSED FOOTINGS						
PROPERTY	STREET	Downstream Manhole	Upstream Manhole	Pipe Size (m)	Grade (%)	Q(CAP) (l/s)	Q(100yr) (l/s)	Q(Design) (l/s)	QHGL (l/s)	Pipe Length (m)	Friction Slope (%)	Friction Loss (m)	Downstream Manhole	Vel(out) (m/s)	Vel(in) (m/s)	K	MH Loss (m)	Pipe Obv. Downstream	Pipe Obv. Upstream	HGL Elev. Downstream	HGL Elev. Upstream	HGL above obvert downstream	HGL above obvert upstream	Downstream centreline of road elev.	Upstream centreline of road elev.	HGL below road downstream	HGL below road upstream	Footing Check
L&M Gardens - Phase 2	Busato Drive	HW 1	C373	1200	0.70	3402.96	2407.67	2496.01	4347.60	32.0	1.14	0.37	HW 1	2.91	1.93	0.10	0.02	249.22	249.44	**250.80**	251.19	1.58	1.75	250.00	254.00	-0.80	2.81	No Connections
L&M Gardens - Phase 2	Busato Drive	C373	C397	300	2.00	136.76	75.95	42.92	252.40	10.4	6.81	0.71	373	1.93	N/A	0.10	0.00	249.84	250.05	251.19	251.90	1.35	1.85	254.00	254.42	2.81	2.52	No Connections
L&M Gardens - Phase 2	Busato Drive	C373	C372	1200	0.70	3402.96	2366.84	2472.56	4156.70	19.0	1.04	0.20	373	2.91	2.91	0.20	0.00	249.49	249.62	251.19	251.39	1.70	1.77	254.75	254.65	3.56	3.26	OK
L&M Gardens - Phase 2	Busato Drive	C372	C371	1200	0.70	3402.96	2383.17	2481.64	4158.80	24.9	1.05	0.26	372	2.91	4.70	0.20	0.14	249.67	249.84	251.39	251.79	1.72	1.94	254.65	254.70	3.26	2.91	OK
L&M Gardens - Phase 2	Busato Drive	C371	C370	750	3.40	2142.49	2222.82	1262.98	1468.90	80.7	1.60	1.29	371	4.70	1.99	0.10	0.09	249.85	252.60	251.79	253.17	1.94	0.57	254.70	255.28	2.91	2.11	Spec. USF
L&M Gardens - Phase 2	Seedling Crescent	C370	C364	675	0.70	733.70	1052.15	597.18	875.10	67.1	1.00	0.67	370	1.99	2.40	0.20	0.02	252.61	253.08	253.17	253.86	0.56	0.78	255.28	256.00	2.11	2.14	Spec. USF
L&M Gardens - Phase 2	Seedling Crescent	C364	C363	600	1.20	701.70	963.29	546.63	753.30	18.6	1.38	0.26	364	2.40	3.10	0.20	0.04	253.08	253.30	253.86	254.15	0.78	0.85	256.00	256.85	2.14	2.70	Spec. USF
L&M Gardens - Phase 2	Seedling Crescent	C363	C362	600	2.00	905.89	971.85	551.18	755.90	68.7	1.39	0.96	363	3.10	2.19	0.10	0.02	253.39	254.76	254.15	255.13	0.76	0.37	256.85	257.70	2.70	2.57	Spec. USF
L&M Gardens - Phase 2	Seedling Crescent	C362	C361	600	1.00	640.56	805.00	456.24	551.70	55.2	0.74	0.41	362	2.19	1.55	0.10	0.01	254.84	255.39	255.13	255.56	0.30	0.17	257.70	258.80	2.57	3.24	Spec. USF
L&M Gardens - Phase 2	Seedling Crescent	C361	C360	600	0.50	452.95	642.64	363.75	439.00	72.9	0.47	0.34	361	1.55	1.37	0.10	0.00	255.47	255.83	255.56	255.90	0.09	0.07	258.80	259.20	3.24	3.30	OK
L&M Gardens - Phase 2	Busato Drive	C360	C359	375	0.75	151.44	208.87	118.02	164.10	70.5	0.88	0.62	360	1.37	N/A	0.10	0.00	255.82	256.34	255.90	256.52	0.09	0.18	259.20	259.27	3.30	2.75	OK
L&M Gardens - Phase 2	Busato Drive	C360	C358	375	2.50	277.22	282.92	160.04	178.70	54.3	1.04	0.56	360	2.51	1.42	0.10	0.02	255.82	257.17	255.90	257.17	0.09	0.00	259.20	260.40	3.30	3.23	OK
L&M Gardens - Phase 2	Busato Drive	C358	C357	375	0.80	156.82	177.08	100.12	97.20	21.5	0.31	0.07	358	1.42	1.93	0.20	0.02	257.26	257.43	257.26	257.43	0.00	0.00	260.40	260.80	3.14	3.37	OK
Block 221	Busato Drive	C357	8	300	2.00	136.76	76.13	43.02	51.30	7.5	0.28	0.02	357	1.93	1.93	0.20	0.00	257.82	257.97	257.82	257.97	0.00	0.00	260.80	260.95	2.98	2.98	OK
Block 221	Laneway	8	DCBMH2	300	2.00	136.76	76.52	43.24	51.30	7.8	0.28	0.02	8	1.93	N/A	0.10	0.00	259.30	259.46	259.30	259.46	0.00	0.00	260.95	260.89	1.65	1.43	No Connections
L&M Gardens - Phase 2	Lageer Drive	C357	C396	300	1.00	96.70	30.38	17.17	27.20	15.5	0.08	0.01	357	1.37	N/A	0.10	0.00	257.43	257.59	257.43	257.59	0.00	0.00	260.79	260.68	3.36	3.10	OK
L&M Gardens - Phase 2	Lageer Drive	C357	C355	300	2.00	136.76	59.51	33.63	33.30	39.0	0.12	0.05	357	1.93	N/A	0.10	0.00	257.82	258.60	257.82	258.60	0.00	0.00	260.80	261.50	2.98	2.90	OK
L&M Gardens - Phase 2	Busato Drive	C370	C369	675	1.60	1110.63	1154.99	656.02	604.60	43.4	0.48	0.21	370	3.01	3.67	0.20	0.05	252.61	253.30	253.17	253.42	0.56	0.12	255.28	256.40	2.11	2.98	Spec. USF
L&M Gardens - Phase 2	Busato Drive	C369	C368	600	2.80	1071.86	1155.61	655.88	552.60	112.9	0.74	0.84	369	3.67	3.06	0.10	0.02	253.38	256.54	253.42	256.54	0.04	0.00	256.40	260.45	2.98	3.91	OK
L&M Gardens - Phase 2	Tenth Line	C368	Busato Plug	450	2.85	502.13	532.56	301.80	157.90	43.8	0.28	0.12	368	3.06	N/A	0.10	0.00	256.62	257.87	256.62	257.87	0.00	0.00	260.45	262.36	3.83	4.49	OK
L&M Gardens - Phase 2	Lageer Drive	C368	C367	600	1.00	640.56	540.76	306.77	359.00	40.5	0.31	0.13	368	2.19	1.66	0.10	0.01	256.62	257.02	256.62	257.02	0.00	0.00	260.45	260.43	3.83	3.41	OK
L&M Gardens - Phase 2	Lageer Drive	C367	C365	375	1.10	183.89	194.42	109.91	47.50	110.0	0.07	0.08	367	1.66	1.37	0.10	0.00	257.17	258.38	257.17	258.38	0.00	0.00	260.43	261.40	3.26	3.02	OK
L&M Gardens - Phase 2	Lageer Drive	C365	C356	300	1.00	96.70	67.45	38.11	47.60	22.0	0.24	0.05	365	1.37	N/A	0.10	0.00	258.33	258.55	258.38	258.55	0.05	0.00	261.40	261.50	3.02	2.95	OK
L&M Gardens - Phase 2	Block 221	C367	18	600	0.50	452.95	341.11	193.48	177.20	8.2	0.08	0.01	367	1.55	1.42	0.10	0.00	257.11	257.15	257.11	257.15	0.00	0.00	260.43	260.57	3.32	3.42	OK
Block 221	Laneway	18	1	525	0.50	317.25	347.61	197.08	178.60	25.5	0.16	0.04	18	1.42	1.42	0.20	0.00	257.15	257.28	257.15	257.28	0.00	0.00	260.57	260.70	3.42	3.42	OK
Block 221	Laneway	1	2	525	0.50	317.25	330.85	187.24	111.40	93.0	0.06	0.06	1	1.42	1.74	0.20	0.01	257.36	257.83	257.36	257.83	0.00	0.00	260.70	261.41	3.34	3.58	OK
Block 221	Laneway	2	3	375	1.20	192.06	188.75	106.65	31.70	88.2	0.03	0.03	2	1.74	N/A	0.10	0.00	257.83	258.88	257.83	258.88	0.00	0.00	261.41	261.90	3.58	3.02	OK
L&M Gardens - Phase 2	Flower Garden Trail	C371	C354	1200	0.40	2572.39	419.42	1362.41	2807.00	11.5	0.48	0.05	371	2.20	2.20	0.20	0.00	249.89	249.94	251.79	251.84	1.90	1.91	254.70	254.75	2.91	2.91	OK
L&M Gardens - Phase 2	Flower Garden Trail	C354	C353	1200	0.40	2572.39	434.57	1370.83	2812.20	94.0	0.48	0.45	354	2.20	2.20	0.20	0.00	249.99	250.37	251.84	252.29	1.85	1.93	254.75	255.12	2.91	2.83	OK
L&M Gardens - Phase 2	Flower Garden Trail	C353	C352	1200	0.40	2572.39	284.44	1285.33	2583.90	14.0	0.40	0.06	353	2.20	2.20	0.20	0.00	250.42	250.48	252.29	252.35	1.87	1.87	255.12	255.27	2.83	2.92	OK
L&M Gardens - Phase 2	Flower Garden Trail	C352	C351	1200	0.40	2572.39	270.82	1277.49	2584.60	57.4	0.40	0.23	352	2.20	1.28	0.10	0.02	250.53	250.76	252.35	252.60	1.82	1.84	255.27	255.60	2.92	3.00	OK
L&M Gardens - Phase 2	Flower Garden Trail	C351	C374	450	0.50	210.32	262.06	148.29	193.50	11.5	0.42	0.05	351	1.28	1.81	0.20	0.02	250.75	250.80	252.60	252.66	1.85	1.86	255.60	255.70	3.00	3.04	OK
L&M Gardens - Phase 2	Flower Garden Trail	C374	C376	450	1.00	297.43	230.12	130.03	174.50	86.0	0.34	0.30	374	1.81	N/A	0.10	0.00	250.86	251.72	252.66	252.96	1.80	1.24	255.70	255.20	3.04	2.24	Spec. USF
L&M Gardens - Phase 2	Easement	C351	C350NW	975	0.40	1478.65	0.00	1123.40	2354.00	60.4	1.01	0.61	351	1.92	N/A	0.10	0.00	250.76	251.00	252.60	253.21	1.84	2.21	255.27	253.94	2.67	0.73	No Connections
L&M Gardens - Phase 2	Easement	HW 3	C366	1200	1.42	4846.76	5075.24	3951.84	1486.00	30.2	0.13	0.04	HW 3	4.15	4.54	0.20	0.03	249.22	249.65	**250.80**	250.87	1.58	1.23	249.75	251.00	-1.05	0.13	No Connections
L&M Gardens - Phase 2	Easement	C366	C350	1200	1.70	5303.13	5085.60	3962.20	1486.00	146.5	0.13	0.20	366	4.54	3.01	0.10	0.06	249.71	252.20	250.87	252.20	1.16	0.00	251.00	253.94	0.13	1.74	No Connections
L&M Gardens - Phase 2	School Block	C350	C394	750	1.40	1374.20	1041.50	1041.50	792.80	9.0	0.47	0.04	350	3.01	N/A	0.10	0.00	251.00	251.13	253.21	253.25	2.21	2.12	253.94	254.08	0.73	0.83	No Connections
L&M Gardens - Phase 2	Block 228	C350	C349	1350	1.40	6588.37	4369.49	4369.49	3189.00	106.0	0.33	0.35	350	4.46	4.46	0.20	0.00	251.43	252.92	253.21	253.56	1.78	0.64	253.94	256.71	0.73	3.15	No Connections
L&M Gardens - Phase 2	Tenth Line	C349	10th Plug	1350	1.40	6588.37	4431.85	4431.85	3189.00	66.3	0.33	0.22	349	4.46	N/A	0.10	0.00	253.81	254.74	253.81	254.74	0.00	0.00	256.71	257.71	2.90	2.97	No Connections

APPENDIX B

EXISITING AND PROPOSED SANITARY DESIGN SHEET

PROJECT TITLE:	L&M Gardens Block 140
PROJECT No.:	07:146
CLIENT:	Sorbara/L&M G.P. Inc.
ISSUED FOR:	1st Submission

SANITARY SEWER DESIGN SHEET
TOWN OF WHITCHURCH-STOUFFVILLE
REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Densities (persons/unit):

Single Family, Semi-Detached Residential	3.2
Townhouse, Multi-Family Residential	2.9
High Density Residential	2.2
Other	3.0
Unplanned Developable Land (persons/hectare)	125

Harmon Peaking Factor:

Maximum: 3.8
Minimum: 1.5
Formula: $K_H = 1 + \frac{14}{(4 + P)^{1/2}}$
where; K_H = Harmon Peaking Factor
P = Population in Thousands

Design Flows:

Residential Flow	350	L/person/day
Infiltration Flow	19.9	m^3/ha/day
Commercial Flow	28	m^3/ha/day
Floor Space Index	0.5	of gross lot area
Institutional Flow	28	m^3/ha/day
Industrial Flow	28	m^3/ha/day

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

Infiltration Flow Applied to: Residential Area Only

PROPERTY	STREET	Upstream Manhole	Downstream Manhole	RESIDENTIAL: Section Area (ha)	Cummulative Area (ha)	Single Family, Semi-Detached Units	Townhouse Units	High Density Units	Other (specified above) Units	Unplanned Land (ha)	Section Population	Cummulative Population (thousands)	Harmon Peaking Factor	Residential Flow (L/s)	COMMERCIAL: Section Area (ha)	Gross Floor Area (ha)	Cummulative Gross Floor Area (ha)	Commercial Flow (L/s)	INSTITUTIONAL: Section Area (ha)	Cummulative Area (ha)	Institutional Flow (L/s)	INDUSTRIAL: Section Area (ha)	Cummulative Area (ha)	Industrial Flow (L/s)	EXTERNAL FLOWS: Total External Flow (L/s)	Cummulative External Flow (L/s)	TOTAL AREA: Total Section Area (ha)	Total Cummulative Area (ha)	INFILTRATION: Applicable Area (ha) (select above)	Infiltration Flow (L/s)	Total Design Flow (L/s)	PIPE DESIGN: Type	Pipe (mm)	Grade (%)	Capacity (l/s)	Length (m)	Velocity (m/s)	Down-stream Velocity (m/s)	Change in Velocity (m/s)	Capacity (%)
		1A	2A	0.14	0.14		6				18	0.018	3.80	**0.28**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.14	0.14	0.14	**0.03**	**0.31**	PVC	200	2.10	47.53	37.0	1.51	1.09	0.42	1%
		2A	3A	0.48	0.62		32				93	0.111	3.80	**1.71**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.48	0.62	0.62	**0.14**	**1.85**	PVC	200	1.10	34.40	97.3	1.09	0.74	0.36	5%
		3A	4A	0.05	0.67						0	0.111	3.80	**1.71**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.05	0.67	0.67	**0.15**	**1.86**	PVC	200	0.50	23.19	39.7	0.74	0.74	0.00	8%
		1A(s)	5A	0.40	0.40		28				82	0.082	3.80	**1.26**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.40	0.40	0.40	**0.09**	**1.35**	PVC	200	1.20	35.93	98.7	1.14	0.74	0.41	4%
		5A	4A	0.03	0.43		2				6	0.088	3.80	**1.35**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.03	0.43	0.43	**0.10**	**1.45**	PVC	200	0.50	23.19	9.3	0.74	0.74	0.00	6%
		4A	Ex 944B		1.10						0	0.199	3.80	**3.06**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.00	1.10	1.10	**0.25**	**3.32**	PVC	200	0.50	23.19	6.6	0.74	N/A		14%
		6A	7A	0.10	0.10		5				15	0.015	3.80	**0.23**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.10	0.10	0.10	**0.02**	**0.25**	PVC	200	2.80	54.88	27.0	1.75	0.74	1.01	0%
		7A	8A	0.02	0.12		1				3	0.018	3.80	**0.28**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.02	0.12	0.12	**0.03**	**0.30**	PVC	200	0.50	23.19	10.7	0.74	0.93	0.20	1%
		8A	9A	0.37	0.49		29				85	0.103	3.80	**1.59**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.37	0.49	0.49	**0.11**	**1.70**	PVC	200	0.80	29.34	100.4	0.93	0.74	0.20	6%
		11A	12A	0.12	0.12		3				9	0.009	3.80	**0.14**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.12	0.12	0.12	**0.03**	**0.17**	PVC	200	1.00	32.80	20.0	1.04	0.74	0.31	1%
		7A(w)	12A	0.12	0.12		6				18	0.018	3.80	**0.28**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.12	0.12	0.12	**0.03**	**0.30**	PVC	200	1.80	44.00	41.0	1.40	0.74	0.66	1%
		12A	13A	0.09	0.33		6				18	0.045	3.80	**0.69**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.09	0.33	0.33	**0.08**	**0.77**	PVC	200	0.50	23.19	21.6	0.74	0.74	0.00	3%
		13A	14A	0.42	0.75		23				67	0.112	3.80	**1.72**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.42	0.75	0.75	**0.17**	**1.90**	PVC	200	0.50	23.19	78.0	0.74	0.74	0.00	8%
		14A	15A	0.07	0.82		2				6	0.118	3.80	**1.82**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.07	0.82	0.82	**0.19**	**2.01**	PVC	200	0.50	23.19	10.9	0.74	0.74	0.00	9%
		15A	9A	0.05	0.87						0	0.118	3.80	**1.82**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.05	0.87	0.87	**0.20**	**2.02**	PVC	200	0.50	23.19	32.5	0.74	0.74	0.00	9%
		9A	10A		1.36						0	0.221	3.80	**3.40**		0.00	0.00	**0.00**		0.00	**0.00**		0.00	**0.00**		**0.00**	0.00	1.36	1.36	**0.31**	**3.72**	PVC	200	0.50	23.19	5.6	0.74	N/A		16%

PROJECT TITLE:	L&M Gardens Phase 2 Subdivision
PROJECT No.:	07:146
CLIENT:	Sorbara / L&M G.P. Inc.
ISSUED FOR:	4th Submission (July 16, 2019)

SANITARY SEWER DESIGN SHEET
TOWN OF WHITCHURCH-STOUFFVILLE - REGION OF YORK

ENGINEER'S SEAL

PREPARED BY:

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Densities (persons/unit):

Single Family, Semi-Detached Residential	3.7
Townhouse, Multi-Family Residential	3.4
High Density Residential	3.0
Other (Block 221 - Townhomes)	2.5
Unplanned Developable Land (persons/hectare)	125

Harmon Peaking Factor:
Maximum: 4
Minimum: 1.5
Formula: $K_H = 1 + \frac{14}{4 + P^{1/2}}$
where; K_H = Harmon Peaking Factor
P = Population in Thousands

Design Flows:

Residential Flow	450	L/person/day
Infiltration Flow	19.872	m^3/ha/day (0.23L/s/ha)
Commercial Flow	22.464	m^3/ha/day (0.26L/s/ha)
Floor Space Index	1	of gross lot area
Institutional Flow	22.464	m^3/ha/day (0.26L/s/ha)
Industrial Flow	22.464	m^3/ha/day (0.26L/s/ha)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

Infiltration Flow Applied to: Total Area

- Original School Block flows removed from north connection to site.
- Block 140 Townhouse flows added to these legs of existing sewer.

				RESIDENTIAL											COMMERCIAL				INSTITUTIONAL			INDUSTRIAL			EXTERNAL FLOWS	TOTAL AREA		INFILTRATION			PIPE DESIGN								
PROPERTY	**STREET**	**Upstream Manhole**	**Downstream Manhole**	**Section Area (ha)**	**Cummulative Area (ha)**	**Single Family, Semi-Detached Units**	**Townhouse Units**	**High Density Units**	**Block 221 (Townhomes)**	**Unplanned Land (ha)**	**Section Population**	**Cummulative Population (thousands)**	**Harmon Peaking Factor**	**Residential Flow (L/s)**	**Section Area (ha)**	**Gross Floor Area (ha)**	**Cummulative Gross Floor Area (ha)**	**Commercial Flow (L/s)**	**Section Area (ha)**	**Cummulative Area (ha)**	**Institutional Flow (L/s)**	**Section Area (ha)**	**Cummulative Area (ha)**	**Industrial Flow (L/s)**	**Total External Flow (L/s)**	**Cummulative External Flow (L/s)**	**Total Section Area (ha)**	**Total Cummulative Area (ha)**	**Applicable Area (ha) (see above)**	**Infiltration Flow (L/s)**	**Total Design Flow (L/s)**	**Type**	**Pipe (mm)**	**Grade (%)**	**Capacity (l/s)**	**Length (m)**	**Velocity (m/s)**	**Down-stream Velocity (m/s)**	**Change in Velocity (m/s)**	**Capacity (%)**
McKean External		*Ext.*	10th Plug	32.84	32.84						2192	2.192	3.55	40.58		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	32.84	32.84	32.84	7.55	48.13									
L&M Gardens Phase 2	Easement	10th Plug	944B	0.18	33.02	0					0	2.192	3.55	40.58		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.18	33.02	33.02	7.59	48.18	PVC	300	1.40	114.42	63.2	1.62	1.59	0.03	42%
L&M Gardens Phase 2	Easement	944B	945B	2.45	35.47	0	143				487	2.679	3.48	48.61		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	2.45	35.47	35.47	8.16	56.77	PVC	300	1.35	112.36	110.2	1.59	1.12	0.47	51%
L&M Gardens Phase 2	Easement	945B	946B	0.00	35.47	0					0	2.679	3.48	48.61		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	35.47	35.47	8.16	56.77	PVC	375	0.50	123.98	54.2	1.12	1.12	0.00	46%
L&M Gardens Phase 2	Flower Garden Trail	946B	961B	0.83	36.30	1	28				99	2.778	3.47	50.21		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.83	36.30	36.30	8.35	58.56	PVC	375	0.50	123.98	114.2	1.12	0.91	0.22	47%
L&M Gardens Phase 2	Lageer Drive	954B-South	955B	0.28	0.28	0	8				28	0.028	4.00	0.58		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.28	0.28	0.28	0.06	0.65	PVC	200	1.20	35.93	28.5	1.14	0.81	0.33	2%
L&M Gardens Phase 2	Lageer Drive	955B	957B	0.51	0.79	0	16				55	0.083	4.00	1.73		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.51	0.79	0.79	0.18	1.91	PVC	200	0.60	25.41	110.0	0.81	0.74	0.07	8%
Block 221	Laneway	3AS	2A	0.50	0.50				29		73	0.073	4.00	1.52		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.50	0.50	0.50	0.12	1.64	PVC	200	1.00	32.80	91.2	1.04	0.74	0.31	5%
Block 221	Laneway	2A	1A	0.51	1.01				31		78	0.151	4.00	3.15		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.51	1.01	1.01	0.23	3.38	PVC	200	0.50	23.19	93.0	0.74	0.74	0.00	15%
Block 221	Laneway	1A	14A	0.09	1.10				5		13	0.164	4.00	3.42		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.09	1.10	1.10	0.25	3.67	PVC	200	0.50	23.19	24.0	0.74	1.04	0.31	16%
L&M Gardens Phase 2	Fut. Block 221	14A	957B	0.00	1.10						0	0.164	4.00	3.42		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	1.10	1.10	0.25	3.67	PVC	200	1.00	32.80	11.2	1.04	0.74	0.31	11%
L&M Gardens Phase 2	Lageer Drive	957B	958B	0.05	1.94	0					0	0.247	4.00	5.15		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.05	1.94	1.94	0.45	5.59	PVC	200	0.50	23.19	36.4	0.74	1.93	1.19	24%
L&M Gardens Phase 2	Busato Drive	958B	960B	0.57	2.51	10					37	0.284	4.00	5.92		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.57	2.51	2.51	0.58	6.49	PVC	200	3.40	60.48	113.3	1.93	1.81	0.12	11%
L&M Gardens Phase 2	School Block	17A	960B		0.00						0	0.000	4.00	0.00		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	PVC	200	1.00	32.80	11.8	1.04	1.81	0.76	0%
L&M Gardens Phase 2	Busato Drive	960B	961B	0.14	2.65	3					12	0.296	4.00	6.17		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.14	2.65	2.65	0.61	6.78	PVC	200	3.00	56.81	42.9	1.81	0.91	0.90	12%
L&M Gardens Phase 2	Flower Gardens Trail	947B	948B	0.35	0.35	6					23	0.023	4.00	0.48		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.35	0.35	0.35	0.08	0.56	PVC	200	1.00	32.80	56.1	1.04	0.74	0.31	2%
L&M Gardens Phase 2	Flower Gardens Trail	948B	949B	0.23	0.58	3					12	0.035	4.00	0.73		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.23	0.58	0.58	0.13	0.86	PVC	200	0.50	23.19	16.6	0.74	0.74	0.00	4%
L&M Gardens Phase 2	Flower Gardens Trail	949B	950B	0.74	1.32	16					60	0.095	4.00	1.98		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.74	1.32	1.32	0.30	2.28	PVC	200	0.50	23.19	107.5	0.74	0.66	0.08	10%
L&M Gardens Phase 2	Busato Drive	951B	950B	0.20	0.20	2					8	0.008	4.00	0.17		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.20	0.20	0.20	0.05	0.21	PVC	200	1.00	32.80	25.5	1.04	0.66	0.38	1%
L&M Gardens Phase 2	Busato Drive	950B	952B	0.26	1.78	3					12	0.115	4.00	2.40		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.26	1.78	1.78	0.41	2.81	PVC	200	0.40	20.74	60.2	0.66	0.74	0.08	14%
L&M Gardens Phase 2	Busato Drive	952B	961B	0.01	1.79	0					0	0.115	4.00	2.40		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.01	1.79	1.79	0.41	2.81	PVC	200	0.50	23.19	14.3	0.74	0.91	0.17	12%
L&M Gardens Phase 2	Seedling Crescent	961B	962B	0.24	40.98	4					15	3.204	3.42	57.04		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.24	40.98	40.98	9.43	66.46	CONC	450	0.25	148.72	58.9	0.91	0.99	0.09	45%
L&M Gardens Phase 2	Seedling Crescent	962B	970B	0.05	41.03	1					4	3.208	3.42	57.10		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.05	41.03	41.03	9.44	66.54	CONC	450	0.30	162.91	10.0	0.99	0.91	0.09	41%
L&M Gardens Phase 2	Seedling Crescent	966B-South	967B	0.55	0.55	6	10				57	0.057	4.00	1.19		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.55	0.55	0.55	0.13	1.31	PVC	200	1.40	38.81	76.1	1.24	1.48	0.24	3%
L&M Gardens Phase 2	Seedling Crescent	967B	968B	0.34	0.89	4	7				39	0.096	4.00	2.00		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.34	0.89	0.89	0.20	2.20	PVC	200	2.00	46.38	43.9	1.48	1.48	0.00	5%
L&M Gardens Phase 2	Seedling Crescent	968B	969B	0.16	1.05		4				14	0.110	4.00	2.29		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.16	1.05	1.05	0.24	2.53	PVC	200	2.00	46.38	19.5	1.48	1.19	0.29	5%
L&M Gardens Phase 2	Seedling Crescent	969B	970B	0.47	1.52	3	10				46	0.156	4.00	3.25		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.47	1.52	1.52	0.35	3.60	PVC	200	1.30	37.40	72.6	1.19	0.91	0.28	10%
L&M Gardens Phase 2	Stream Crossing	970B	971B	0.00	42.55	0					0	3.364	3.40	59.57		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	42.55	42.55	9.79	69.35	CONC	450	0.25	148.72	96.2	0.91	0.91	0.00	47%
L&M Gardens Phase 2	Red Blossom Court	971B	972B	0.45	43.00	6					23	3.387	3.40	59.93		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.45	43.00	43.00	9.89	69.82	CONC	450	0.25	148.72	29.3	0.91	0.91	0.00	47%
L&M Gardens Phase 2	Red Blossom Court	972B	973B	0.45	43.45	9					34	3.421	3.39	60.46		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.45	43.45	43.45	9.99	70.45	CONC	450	0.25	148.72	66.9	0.91	0.91	0.00	47%
L&M Gardens Phase 2	Lageer Drive	954B-North	953B	0.17	0.17	0	4				14	0.014	4.00	0.29		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.17	0.17	0.17	0.04	0.33	PVC	200	2.00	46.38	41.1	1.48	1.19	0.29	1%
Block 221	Laneway	4A	3A	0.12	0.12				6		15	0.015	4.00	0.31		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.12	0.12	0.12	0.03	0.34	PVC	200	1.00	32.80	28.0	1.04	0.74	0.31	1%
Block 221	Laneway	3A	5A	0.08	0.20				3		8	0.023	4.00	0.48		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.08	0.20	0.20	0.05	0.53	PVC	200	0.50	23.19	23.5	0.74	0.74	0.00	2%
Block 221	Laneway	5A	21A	0.08	0.28				3		8	0.031	4.00	0.65		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.08	0.28	0.28	0.06	0.71	PVC	200	0.50	23.19	17.4	0.74	1.48	0.74	3%
L&M Gardens Phase 2	Fut. Block 221	21A	953B		0.28						0	0.031	4.00	0.65		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.28	0.28	0.06	0.71	PVC	200	2.00	46.38	10.3	1.48	1.19	0.29	2%
L&M Gardens Phase 2	Busato Drive	953B	964B	0.08	0.53	0					0	0.045	4.00	0.94		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.08	0.53	0.53	0.12	1.06	PVC	200	1.30	37.40	19.0	1.19	1.55	0.36	3%
L&M Gardens Phase 2	Busato Drive	964B	966B	0.26	0.79	5					19	0.064	4.00	1.33		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.26	0.79	0.79	0.18	1.52	PVC	200	2.20	48.65	49.9	1.55	0.74	0.81	3%
L&M Gardens Phase 2	Busato Drive	966B	965B	0.41	1.20	8					30	0.094	4.00	1.96		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.41	1.20	1.20	0.28	2.23	PVC	200	0.50	23.19	81.5	0.74	0.74	0.00	10%
L&M Gardens Phase 2	Busato Drive	965B	973B	0.53	1.73	11					41	0.135	4.00	2.81		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.53	1.73	1.73	0.40	3.21	PVC	200	0.50	23.19	104.1	0.74	0.91	0.17	14%
L&M Gardens Phase 2	Busato Drive	973B	974B	0.43	45.61	7					26	3.582	3.38	62.98		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.43	45.61	45.61	10.49	73.47	CONC	450	0.25	148.72	101.0	0.91	0.91	0.00	49%
L&M Gardens Phase 2	Busato Drive	974B	986B	0.84	46.45	19					71	3.653	3.37	64.09		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.84	46.45	46.45	10.68	74.77	CONC	450	0.25	148.72	110.0	0.91	0.81	0.10	50%
																				0.00	0.00		0.00	0.00		0.00													
L&M Gardens Phase 2	Byers Pond Way	975B	976B	0.50	0.50	8					30	0.030	4.00	0.63		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.50	0.50	0.50	0.12	0.74	PVC	200	2.80	54.88	84.0	1.75	0.74	1.01	1%
L&M Gardens Phase 2	Byers Pond Way	976B	977B	0.33	0.83	5					19	0.049	4.00	1.02		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.33	0.83	0.83	0.19	1.21	PVC	200	0.50	23.19	55.7	0.74	0.74	0.00	5%
L&M Gardens Phase 2	Busato Drive	977B	978B	0.21	1.04	3					12	0.061	4.00	1.27		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.21	1.04	1.04	0.24	1.51	PVC	200	0.50	23.19	43.2	0.74	0.66	0.08	7%
L&M Gardens Phase 2	Busato Drive	978B	979B	0.62	1.66	13					49	0.110	4.00	2.29		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.62	1.66	1.66	0.38	2.67	PVC	200	0.40	20.74	110.0	0.66	0.66	0.00	13%
L&M Gardens Phase 2	Busato Drive	979B	980B	0.14	1.80	1					4	0.114	4.00	2.38		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.14	1.80	1.80	0.41	2.79	PVC	200	0.40	20.74	14.9	0.66	0.66	0.00	13%
L&M Gardens Phase 2	Busato Drive	980B	983B	0.32	2.12	6					23	0.137	4.00	2.85		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.32	2.12	2.12	0.49	3.34	PVC	200	0.40	20.74	63.4	0.66	0.66	0.00	16%
L&M Gardens Phase 2	Sprucedale Way	981B	982B	0.67	0.67	14					52	0.052	4.00	1.08		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.67	0.67	0.67	0.15	1.24	PVC	200	1.00	32.80	75.0	1.04	1.14	0.10	4%
L&M Gardens Phase 2	Sprucedale Way	982B	983B	0.53	1.20	14					52	0.104	4.00	2.17		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.53	1.20	1.20	0.28	2.44	PVC	200	1.20	35.93	84.5	1.14	0.66	0.48	7%
																				0.00	0.00		0.00	0.00		0.00													
L&M Gardens Phase 2	Busato Drive	983B	984B	0.30	3.62	5					19	0.260	4.00	5.42		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.30	3.62	3.62	0.83	6.25	PVC	200	0.40	20.74	60.3	0.66	0.66	0.00	30%
L&M Gardens Phase 2	Busato Drive	984B	985B	0.14	3.76	2					8	0.268	4.00	5.58		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.14	3.76	3.76	0.86	6.45	PVC	200	0.40	20.74	16.6	0.66	0.66	0.00	31%
L&M Gardens Phase 2	Busato Drive	985B	986B	0.30	4.06	8					30	0.298	4.00	6.21		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.30	4.06	4.06	0.93	7.14	PVC	200	0.40	20.74	44.6	0.66	0.81	0.15	34%
L&M Gardens Phase 2	Easement	986B	*Ex 962A*	0.00	50.51	0					0	3.951	3.34	68.69		0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	50.51	50.51	11.62	80.31	CONC	450	0.20	133.02	47.8	0.81	N/A		60%

APPENDIX C

CATCHBASIN CAPTURE ANALYSIS

LEGEND

- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF EXISTING SEWER FLOW
- STORM MANHOLE
- CATCHBASIN/DOUBLE CATCHBASIN
- STORM DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- 0.15 / 0.90 — DRAINAGE AREA (ha) / PERCENT IMPERVIOUS
- MAXIMUM PONDING EXTENT

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

CATCHBASIN PONDING DEPTH

FIGURE No.

C-1

Table D-3: Chicago Distribution Design Storm Parameters and Rainfall Amounts						
Return Period	2 Year	5 Year	10 Year	25 Year	50 Year	**100 Year**
A	696.679	1015.963	1279.71	1546.81	1802.6	**2051.71**
B	4.957	5.255	5.715	5.746	6.029	**6.23**
C	0.811	0.826	0.841	0.845	0.853	**0.86**
24 hour rainfall (mm)	45.9	59	67.6	78.5	86.7	**94.7**

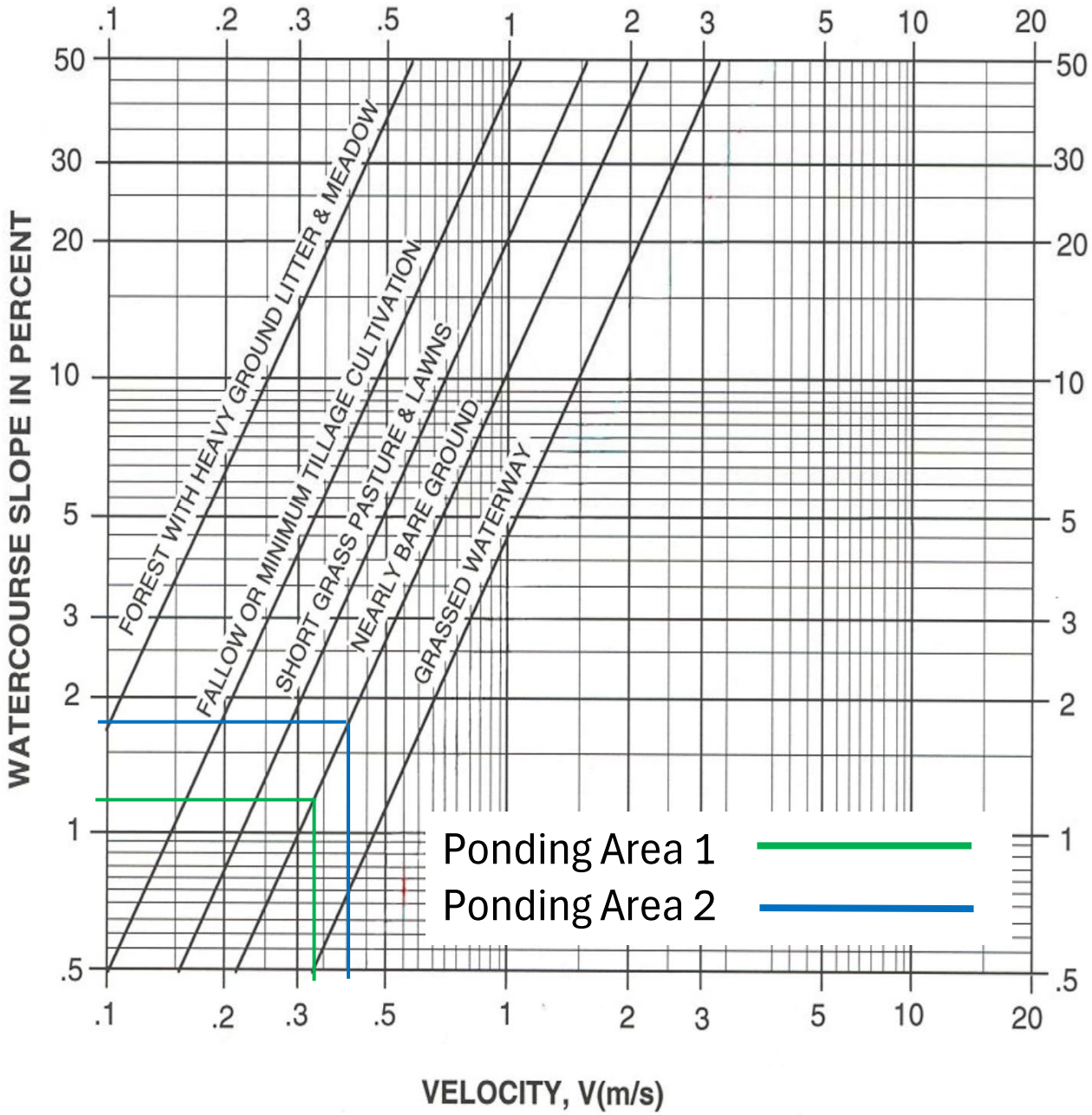
	Ponding Area 1	Ponding Area 2
Elev. Change (m)	2.43	2.95
Distance (m)	206.38	177.15
Slope (%)	1.18%	1.67%
Time (mins.)	10.423	10.000
Velocity (m/s, uplands)	0.33	0.4
Intensity (mm/hr) (IDF)	182.7	186.7
Drainage Area (ha)	1.35962	1.094
C (Runoff Coefficient)	0.75	0.75
Q_100 (m3/s)	**0.517**	**0.426**

Refer to Figure C-1 for ponding area illustration

	Ponding Area 1	Ponding Area 2
Area (ha)	0.1457	0.1457
C (Orifice Coefficient)	0.60	0.60
Q (m3/s)	0.5172	0.4255
Q check	0.000	0.000
Ponding Depth H (m)	**0.112**	**0.076**

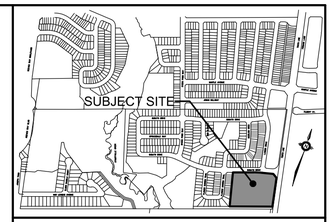
Iterate Q (orifice equation) by varying depth H to match the 100-year design flow

$$Orifice\ Equation$$
$$Q = CA \cdot \sqrt{2gH}$$


WATERCOURSE SLOPE IN PERCENT
VELOCITY, V(m/s)
FOREST WITH HEAVY GROUND LITTER & MEADOW
FALLOW OR MINIMUM TILLAGE CULTIVATION
SHORT GRASS PASTURE & LAWNS
NEARLY BARE GROUND
GRASSED WATERWAY
Ponding Area 1
Ponding Area 2

CIVIL DRAWING SET

REFER TO DRAWING No. SG-2



KEYMAP N.T.S.

LEGEND:

- SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED HYDRANT
- PROPOSED GRADE × 92.89
- EXISTING GRADE × 91.20
- DRAINAGE DIRECTION
- SLOPING
- MINIMUM UNDERSIDE OF FOOTING ELEVATION 136.86
- MAXIMUM SURFACE PONDING
- OVERLAND FLOW ARROW
- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- FRONT DOWNSPOUTS TO BE CONNECTED TO THE STORM SERVICE CONNECTION. REAR DOWNSPOUTS TO DISCHARGE TO SURFACE SPLASH PADS.
- ALL DOWNSPOUTS TO BE CONNECTED TO THE STORM SERVICE CONNECTION.
- ALL DOWNSPOUTS TO BE CONNECTED TO THE STORM SERVICE CONNECTION VIA DEDICATED PIPE AROUND THE TOWNHOUSE BLOCK.

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
SITE GRADING PLAN - NORTH

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

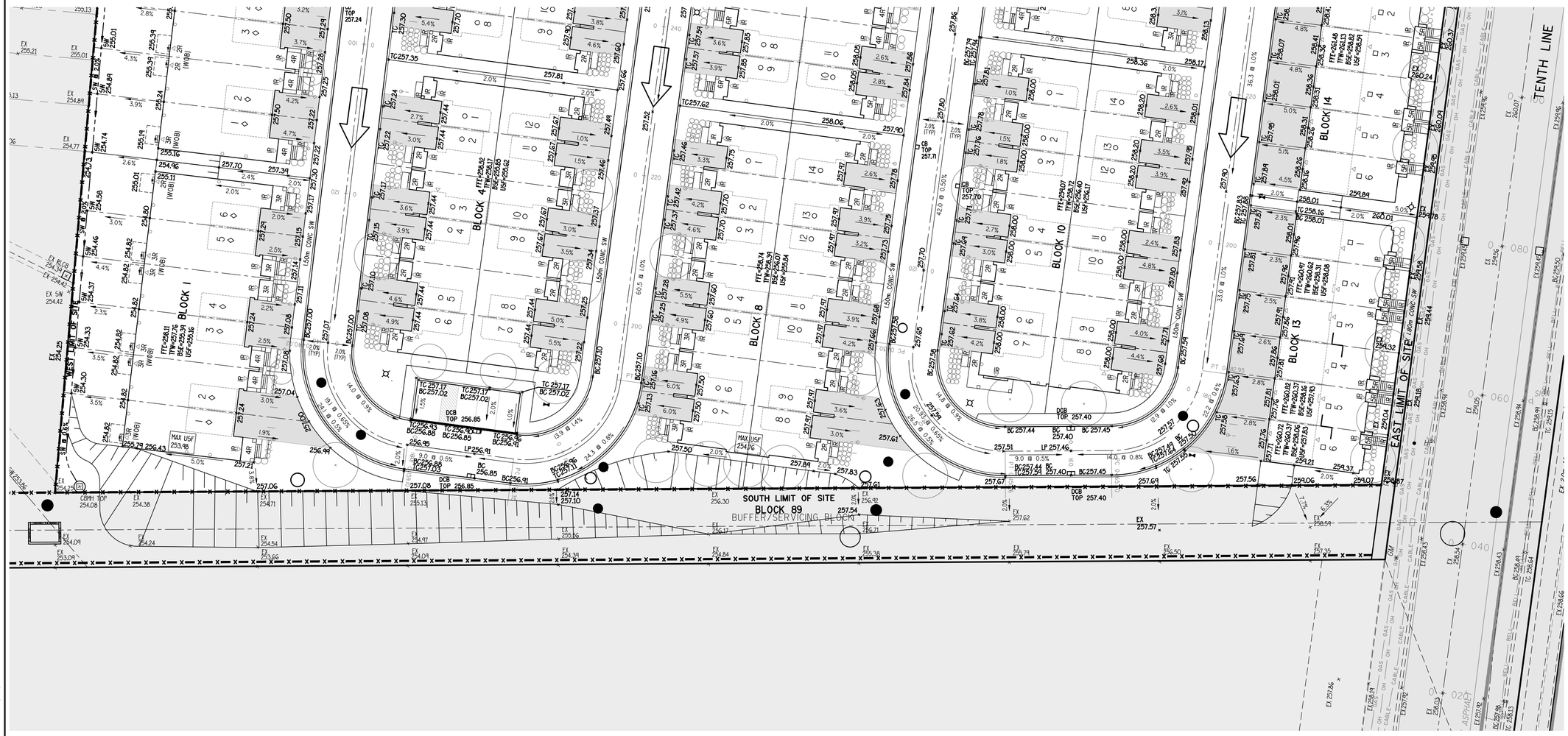
DESIGNED	DRAWN	CHECKED
CBO	JPR	RMS

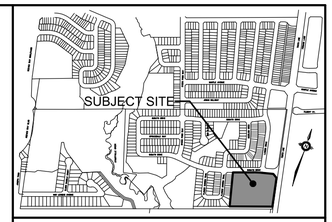
SCALE 1:300 DATE OCTOBER 2026

PROJECT NUMBER 07:146 DWG. NUMBER SG-1

PLOT DATE: October 7, 2026 10:11:41 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan - Grading.dwg

REFER TO DRAWING No. SG-I





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- MINIMUM UNDERSIDE OF FOOTING ELEVATION 136.86
- MAXIMUM SURFACE PONDING
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ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
SITE GRADING PLAN - SOUTH

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

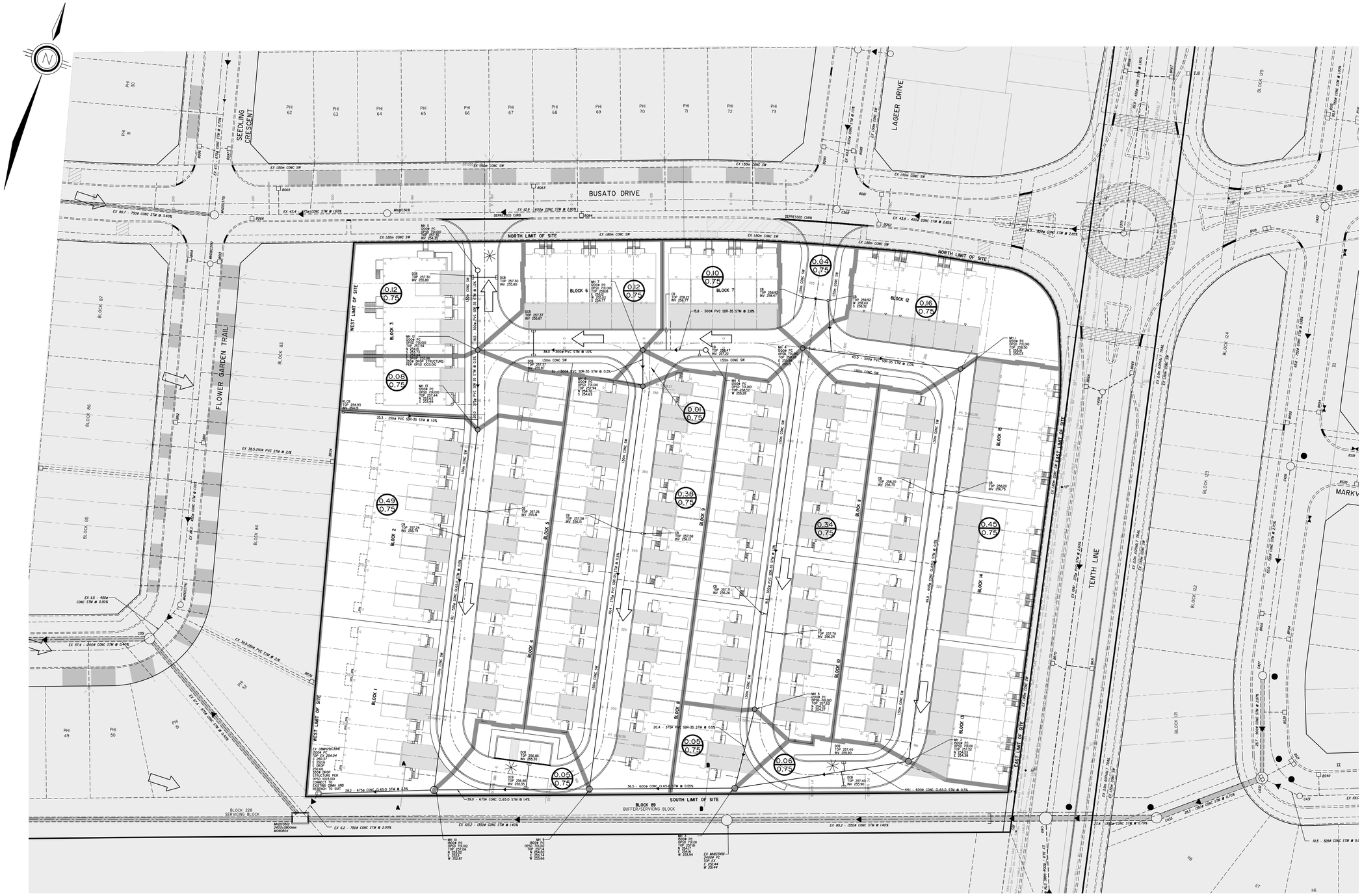
LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

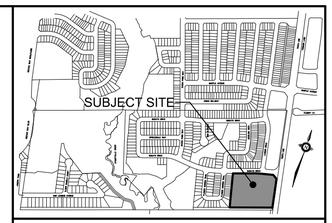
DESIGNED	DRAWN	CHECKED
CBO	JPR	RMS

SCALE	DATE
1:300	OCTOBER 2026

PROJECT NUMBER	DWG. NUMBER
07:146	SG-2

PLOT DATE: October 7, 2026 10:11:47 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan – Grading.dwg





KEYMAP N.T.S.

LEGEND

- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF EXISTING SEWER FLOW
- STORM MANHOLE
- CATCHBASIN/DOUBLE CATCHBASIN
- STORM DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- 0.15 / 0.90 — AREA IN HECTARES / RUNOFF COEFFICIENT
- 100 YR CAPTURE LOCATION

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
STORM DRAINAGE PLAN

SABOURIN KIMBLE & ASSOCIATES LTD.
CONSULTING ENGINEERS

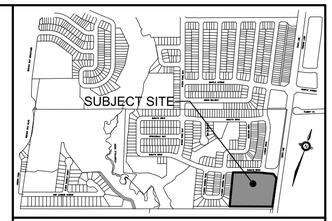
LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE	DATE
1:500	OCTOBER 2026

PROJECT NUMBER	DWG. NUMBER
07:146	STM

PLOT DATE: October 7, 2026 10:12:51 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan – Stm Drainage.dwg



KEYMAP N.T.S.

LEGEND

- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF EXISTING SEWER FLOW
- SANITARY MANHOLE
- SANITARY DRAINAGE BOUNDARY
- 0.99 / 45 — AREA IN HECTARES / POPULATION

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
SANITARY DRAINAGE PLAN

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

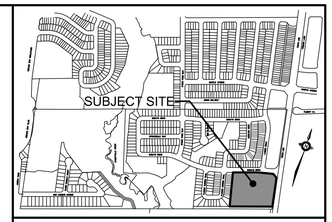
SCALE	DATE
1:500	OCTOBER 2026

PROJECT NUMBER	DWG. NUMBER
07:146	SAN

PLOT DATE: October 7, 2026, 10:12:17 AM
FILE LOCATION: P:\07\140\Drawing Files\Block 140\146 Blk 140 Site Plan – San Drainage.dwg

CROSSING DATA TABLE

CROSSING 1		**CROSSING 3**		**CROSSING 5**		**CROSSING 7**		**CROSSING 9**		**CROSSING 11**		**CROSSING 13**		**CROSSING 15**		**CROSSING 17**	
SAN TOP	254.43	200ø SAN TOP	254.11	200ø SAN TOP	254.84	300ø STM TOP	255.53	250ø CB LEAD BOT	257.30	200ø SAN TOP	255.89	250ø CB LEAD BOT	256.75	250ø CB LEAD BOT	256.13	250ø CB LEAD BOT	255.81
250ø CB LEAD BOT	255.80	200ø WM BOT	255.54	300ø STM BOT	255.14	200ø WM BOT	256.18	200ø WM TOP	256.80	200ø WM BOT	257.28	200ø WM TOP	256.25	200ø WM TOP	255.63	200ø WM TOP	255.31
CLEARANCE	1.37m	CLERANCE	1.43m	CLEARANCE	0.30m	CLEARANCE	0.65m	CLEARANCE	0.50m	CLERANCE	1.39m	CLEARANCE	0.50m	CLEARANCE	0.50m	CLERANCE	0.50m
CROSSING 2		**CROSSING 4**		**CROSSING 6**		**CROSSING 8**		**CROSSING 10**		**CROSSING 12**		**CROSSING 14**		**CROSSING 16**		**CROSSING 18**	
200ø SAN TOP	254.15	300ø STM BOT	254.68	200ø SAN TOP	255.00	200ø SAN TOP	255.04	300ø STM TOP	256.20	250ø CB LEAD BOT	257.82	200ø SAN TOP	254.67	250ø CB LEAD BOT	256.09	250ø CB LEAD BOT	255.77
300ø STM BOT	254.66	200ø WM BOT	255.54	200ø WM BOT	256.18	250ø CB LEAD BOT	256.73	200ø WM BOT	257.28	200ø WM BOT	257.32	250ø CB LEAD BOT	256.72	200ø SAN TOP	254.25	200ø SAN TOP	253.93
CLEARANCE	0.51m	CLEARANCE	0.86m	CLEARANCE	1.18m	CLEARANCE	1.69m	CLEARANCE	1.08m	CLEARANCE	0.50m	CLEARANCE	2.05m	CLEARANCE	1.84m	CLEARANCE	1.84m



KEYMAP N.T.S.

LEGEND:

- STORM MANHOLE
- SANITARY MANHOLE
- CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT AND VALVE
- VALVE AND CHAMBER
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF SEWER FLOW BY OTHERS
- STORM/SANITARY/WATER CONNECTIONS
- PROPOSED FENCING
- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- BOULEVARD RESTORATION
- SIDEWALK RESTORATION

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
SITE SERVICING PLAN - NORTH

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE	DATE
1:300	OCTOBER 2026

PROJECT NUMBER 07:146
DWG. NUMBER SS-1

PLOT DATE: October 7, 2026, 10:13:35 AM
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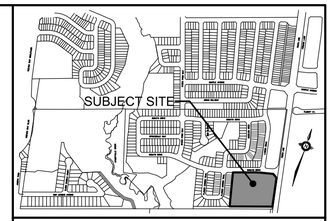
REFER TO DRAWING No. SS-1



KEYMAP N.T.S.

LEGEND:

- STORM MANHOLE
- SANITARY MANHOLE
- CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT AND VALVE
- VALVE AND CHAMBER
- DIRECTION OF SEWER FLOW PROPOSED
- DIRECTION OF SEWER FLOW BY OTHERS
- STORM/SANITARY/WATER CONNECTIONS
- PROPOSED FENCING
- REFER TO DRAWINGS BY OTHERS FOR DETAILS BEYOND BLOCK 140
- BOULEVARD RESTORATION
- SIDEWALK RESTORATION

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER DATE:
TOWN OF WHITCHURCH–STOUFFVILLE

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
SITE SERVICING PLAN - SOUTH

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE 1:300 DATE OCTOBER 2026

PROJECT NUMBER 07:146 DWG. NUMBER SS-2

Block 1 Section

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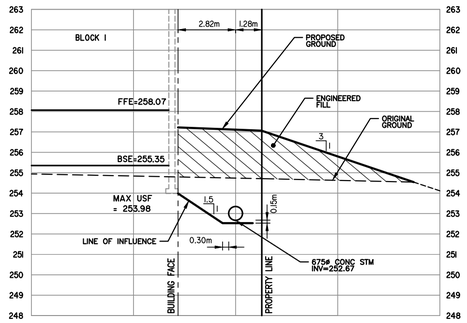
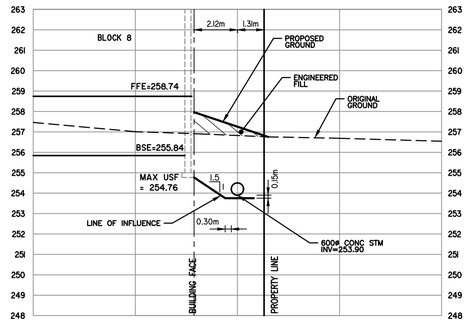
V 1:50



Block 8 Section

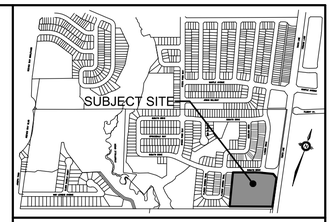
Scale H 1:300
V 1:50



CROSSING DATA TABLE

CROSSING 1		CROSSING 3		CROSSING 5		CROSSING 7		CROSSING 9	
600ø STM TOP	254.99	200ø SAN TOP	253.96	600ø STM BOT	253.74	200ø SAN TOP	253.41	250ø CB LEAD BOT	256.25
200ø WM BOT	255.50	200ø WM BOT	255.18	200ø SAN TOP	253.23	250ø CB LEAD BOT	255.31	200ø WM TOP	255.75
CLEARANCE	0.51m	CLERANCE	1.22m	CLEARANCE	0.51m	CLEARANCE	1.90m	CLEARANCE	0.50m
CROSSING 2		**CROSSING 4**		**CROSSING 6**		**CROSSING 8**			
250ø CB LEAD BOT	255.88	600ø STM BOT	259.18	375ø STM BOT	254.02	250ø CB LEAD BOT	256.21		
200ø WM TOP	255.38	200ø SAN TOP	253.77	200ø SAN TOP	253.32	200ø SAN TOP	254.52		
CLEARANCE	0.50m	CLEARANCE	0.37m	CLEARANCE	0.70m	CLEARANCE	1.69m		

PLOT DATE: October 7, 2026, 10:13:41 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan.dwg



KEYMAP N.T.S.

LEGEND:

- PROPOSED 3:1 SLOPE
- SEDIMENT CONTROL FENCE
- TEMPORARY INTERCEPTOR SWALE
- *EX SW 2%@.42 EXISTING INTERCEPTOR SWALE GRADE
- TEMPORARY ROCK CHECK DAM
- OVERLAND FLOW ROUTE DIRECTION
- TEMPORARY CATCHBASIN SILT TRAP

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN - EARTHWORKS

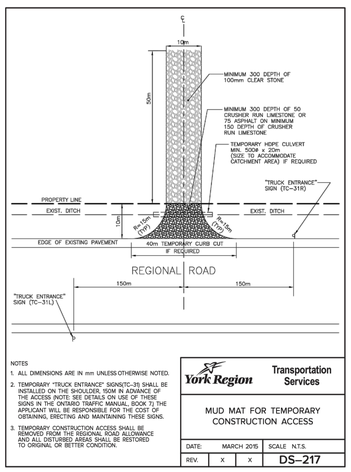
SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE	DATE
1:500	OCTOBER 2026

PROJECT NUMBER	DWG. NUMBER
07:146	ESC-1

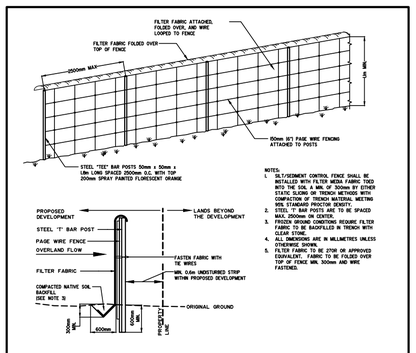


NOTES
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. TEMPORARY "TRUCK ENTRANCE" SIGNS(TC-3?) SHALL BE INSTALLED ON THE SHOULDER, 150M IN ADVANCE OF THE ACCESS (NOTE: SEE DETAILS ON USE OF THESE SIGNS IN THE ONTARIO TRAFFIC MANUAL, BOOK 7) THE APPLICANT WILL BE RESPONSIBLE FOR THE COST OF OBTAINING, ERECTING AND MAINTAINING THESE SIGNS.
3. TEMPORARY CONSTRUCTION ACCESS SHALL BE REMOVED FROM THE REGIONAL ROAD ALLOWANCE AND ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.

York Region Transportation Services

MUD MAT FOR TEMPORARY CONSTRUCTION ACCESS

DATE:	MARCH 2019	SCALE N.T.S.
REV.	X	X	DS–217



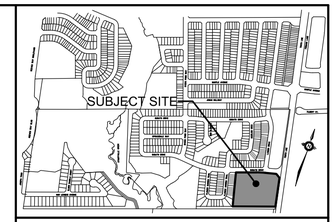
NOTES:
1. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TIED INTO THE SOIL A MIN. OF 300mm BY EITHER PLOWING OR TRENCHING AND THEN COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR DENSITY.
2. STEEL "T" BAR POSTS ARE TO BE SPACED MAX. 2500mm ON CENTER.
3. WHERE SILT/SEDIMENT CONTROL REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. FILTER FABRIC TO BE 270R OR APPROVED EQUIVALENT. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

POST AND WIRE SEDIMENT CONTROL FENCE
NTS

NOTES:

1. SEDIMENT FENCE TO BE INSTALLED PRIOR TO ALL OTHER CONSTRUCTION ACTIVITIES ON SITE.
2. ALL INTERCEPTOR SWALES TO BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF EARTHWORKS OPERATIONS.
3. ALL DISTURBED AREAS AND STOCKPILES TO BE SEEDED IMMEDIATELY FOLLOWING COMPLETION OF EARTH-MOVING ACTIVITIES.
4. CONTRACTOR TO MAINTAIN ALL SEDIMENT CONTROL DEVICES TO THE SATISFACTION OF THE TOWN OF WHITCHURCH-STOUFFVILLE AND THE TORONTO AND REGION CONSERVATION AUTHORITY.
5. SILT FENCING TO BE INSPECTED WEEKLY AND AFTER EVERY RAINFALL EVENT. STRUCTURAL FAILURES (RIPS, TEARS, ETC.) TO BE REPAIRED IMMEDIATELY. SEDIMENT TO BE REMOVED WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
6. IN THE EVENT OF ANY SEDIMENT CONTROL FAILURE, ANY SEDIMENT RUNOFF OFF THE SITE SHOULD BE CLEANED UP IMMEDIATELY.
7. THE EROSION AND SEDIMENT CONTROL (ESC) STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO PREVENT SEDIMENT RELEASES TO THE NATURAL ENVIRONMENT.
8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION & SEDIMENTATION CONTROL (ESC) MEASURES IN WORKING CONDITIONS AT ALL TIMES TO THE SATISFACTION OF THE TOWN AND TRCA. THE CONTRACTOR SHALL ROUTINELY INSPECT ALL EROSION AND SEDIMENT CONTROL DEVICES A MINIMUM OF ONCE A WEEK AND AFTER EACH RAINFALL EVENT GREATER THAN 10mm TO ENSURE THAT ESC MEASURES ARE IN PROPER WORKING CONDITIONS. ANY DAMAGES MUST BE REPAIRED WITHIN 24 HOURS.

PLOT DATE: October 7, 2026 10:11:09 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan – Erosion And Sediment Control.dwg



KEYMAP N.T.S.

LEGEND:

- PROPOSED 3:1 SLOPE
- SEDIMENT CONTROL FENCE
- TEMPORARY INTERCEPTOR SWALE
- *EX SW 2%0.42 — EXISTING INTERCEPTOR SWALE GRADE
- TEMPORARY ROCK CHECK DAM
- OVERLAND FLOW ROUTE DIRECTION
- TEMPORARY LOT DRAIN
- TEMPORARY CATCHBASIN SILT TRAP

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER
TOWN OF WHITCHURCH–STOUFFVILLE
DATE:

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN - ROAD CONSTRUCTION

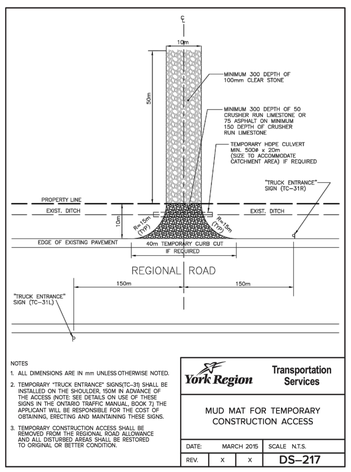
SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE	DATE
1:500	OCTOBER 2026

PROJECT NUMBER	DWG. NUMBER
07:146	ESC-2

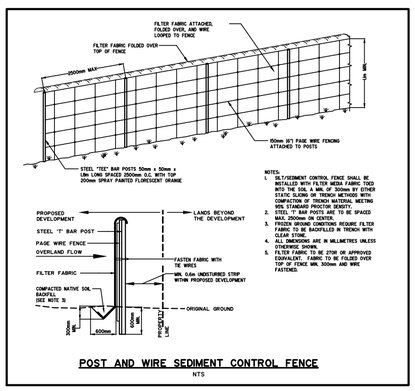


NOTES
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. TEMPORARY "TRUCK ENTRANCE" SIGNS(TC-3) SHALL BE INSTALLED ON THE SHOULDER, 150M IN ADVANCE OF THE ACCESS (NOTE: SEE DETAILS ON USE OF THESE SIGNS IN THE ONTARIO TRAFFIC MANUAL, BOOK 7) THE APPLICANT WILL BE RESPONSIBLE FOR THE COST OF OBTAINING, ERECTING AND MAINTAINING THESE SIGNS.
3. TEMPORARY CONSTRUCTION ACCESS SHALL BE REMOVED FROM THE REGIONAL ROAD ALLOWANCE AND ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.

York Region — Transportation Services

MUD MAT FOR TEMPORARY CONSTRUCTION ACCESS

DATE:	MARCH 2019	SCALE N.T.S.	
REV.	X	X	DS–217



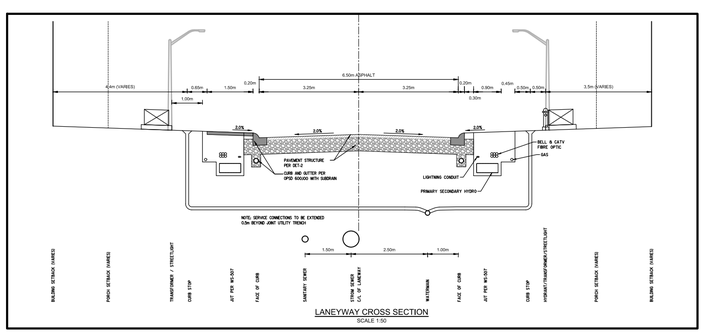
NOTES:
1. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TIED INTO THE SOIL A MIN. OF 300mm BY EITHER PLOWING OR TRENCHING AND THEN COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR DENSITY.
2. STEEL "T" BAR POSTS ARE TO BE SPACED MAX. 2500mm ON CENTER.
3. WHERE SILT/SEDIMENT CONTROL REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. FILTER FABRIC TO BE 270R OR APPROVED EQUIVALENT. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

POST AND WIRE SEDIMENT CONTROL FENCE
NTS

NOTES:

1. SEDIMENT FENCE TO BE INSTALLED PRIOR TO ALL OTHER CONSTRUCTION ACTIVITIES ON SITE.
2. ALL INTERCEPTOR SWALES TO BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF EARTHWORKS OPERATIONS.
3. ALL DISTURBED AREAS AND STOCKPILES TO BE SEEDED IMMEDIATELY FOLLOWING COMPLETION OF EARTH-MOVING ACTIVITIES.
4. CONTRACTOR TO MAINTAIN ALL SEDIMENT CONTROL DEVICES TO THE SATISFACTION OF THE TOWN OF WHITCHURCH-STOUFFVILLE AND THE TORONTO AND REGION CONSERVATION AUTHORITY.
5. SILT FENCING TO BE INSPECTED WEEKLY AND AFTER EVERY RAINFALL EVENT. STRUCTURAL FAILURES (RIPS, TEARS, ETC.) TO BE REPAIRED IMMEDIATELY. SEDIMENT TO BE REMOVED WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
6. IN THE EVENT OF ANY SEDIMENT CONTROL FAILURE, ANY SEDIMENT RUNOFF OFF THE SITE SHOULD BE CLEANED UP IMMEDIATELY.
7. THE EROSION AND SEDIMENT CONTROL (ESC) STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO PREVENT SEDIMENT RELEASES TO THE NATURAL ENVIRONMENT.
8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION & SEDIMENTATION CONTROL (ESC) MEASURES IN WORKING CONDITIONS AT ALL TIMES TO THE SATISFACTION OF THE TOWN AND TRCA. THE CONTRACTOR SHALL ROUTINELY INSPECT ALL EROSION AND SEDIMENT CONTROL DEVICES A MINIMUM OF ONCE A WEEK AND AFTER EACH RAINFALL EVENT GREATER THAN 10mm TO ENSURE THAT ESC MEASURES ARE IN PROPER WORKING CONDITIONS. ANY DAMAGES MUST BE REPAIRED WITHIN 24 HOURS.

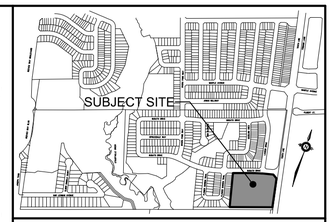
PLOT DATE: October 7, 2026 10:11:03 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan – Erosion And Sediment Control.dwg



LANEYWAY CROSS SECTION
SCALE 1:50

NOTE: BLOCKS 6, 7 & 12 TO BE SERVICED FROM THE EXISTING JOINT UTILITY TRENCH ON BUSATO DRIVE.

NOTE: BLOCKS 13, 14 & 15 TO BE SERVICED FROM THE EXISTING UTILITIES ON TENTH LINE.



KEYMAP N.T.S.

LEGEND:

- STORM MANHOLE
- SANITARY MANHOLE
- CATCHBASIN
- DOUBLE CATCHBASIN
- HYDRANT
- VALVE AND BOX
- PROPOSED GAS MAIN CROSSING
- HYDRO TRANSFORMER
- HYDRO SERVICE CONNECTION
- PROPOSED STREET LIGHT
- PROPOSED BELL END WALL PEDESTAL
- BELL GRADE LEVEL BOX
- ROGERS PEDESTAL
- JOINT UTILITY TRENCH PER TOWN STD WS-507
- ROAD CROSSING LOCATION
- CANADA POST MAILBOX
- PROPOSED TREE
- PROPOSED CHAIN LINK FENCE
- PROPOSED PRIVACY FENCE
- PROPOSED DECORATIVE FENCE
- SWITCH GEAR

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM MTO BENCH MARK No 00819768488 HAVING A PUBLISHED ELEVATION OF 255.290 METRES.

TOWN REVIEWED

TOWN ENGINEER DATE:
TOWN OF WHITCHURCH–STOUFFVILLE

NOTE:
ALL DIMENSIONS AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE. ALL PIPE SIZES IN MILLIMETRES.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1.	1ST SPA SUBMISSION	CBO	2026/10/02	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
SORBARA/L&M G.P. INC.

MUNICIPALITY
TOWN OF WHITCHURCH-STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

PROJECT TITLE
L&M GARDENS - BLOCK 140 SITE PLAN

SHEET TITLE
COMPOSITE UTILITY PLAN

SABOURIN KIMBLE & ASSOCIATES LTD. CONSULTING ENGINEERS

LICENSED PROFESSIONAL ENGINEER
C. T. BAXTER-OJALA
100548191
2026/10/02
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
CBO	SWS	RMS

SCALE 1:500 DATE OCTOBER 2026

PROJECT NUMBER 07:146 DWG. NUMBER CUP

PLOT DATE: October 7, 2026 10:13:27 AM
FILE LOCATION: P:\07\146\Drawing Files\Block 140\146 Blk 140 Site Plan – Utility Coordination Plan.dwg