Caledon 410 Developments

Functional Servicing Report

VERSION 2 ▪ AUGUST 2019

REPORT PREPARED FOR

Caledon 410 Developments Ltd.
5400 YONGE STREET, 5TH FLOOR
TORONTO, ONTARIO
M2N 5R5

REPORT PREPARED BY

TMIG

THE MUNICIPAL INFRASTRUCTURE GROUP LTD.
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VAUGHAN, ON L4K 0C5
(905) 738-5700

TMIG PROJECT NUMBER 16109

this report has been formatted for double-sided printing

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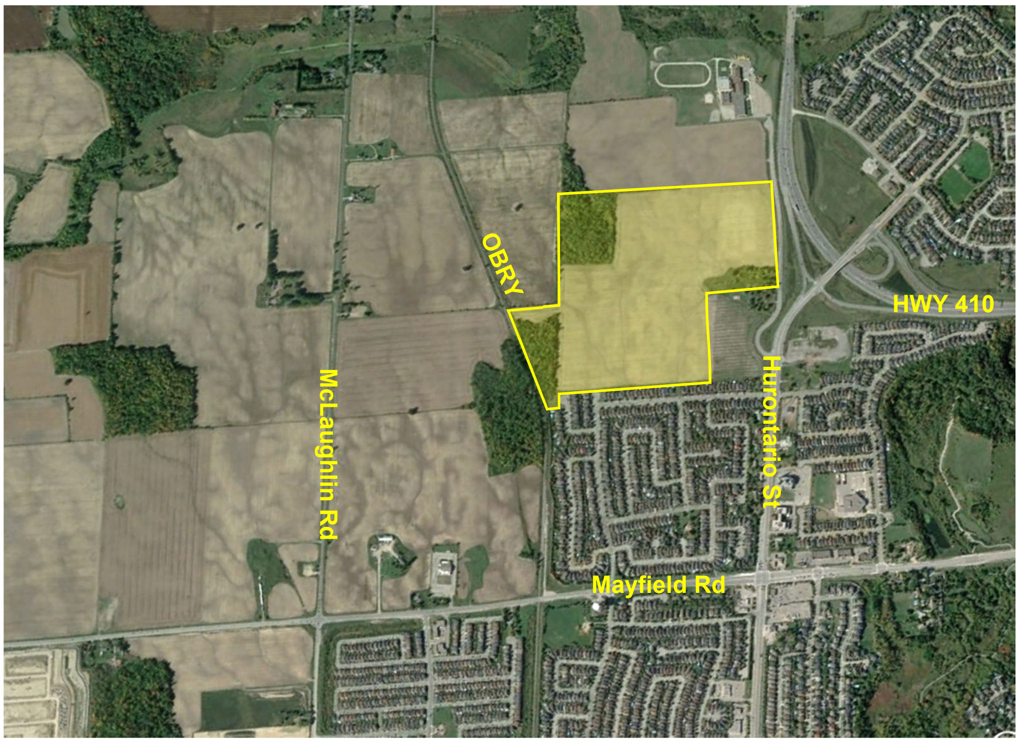
1 Introduction

The Municipal Infrastructure Group (TMIG) has been retained by Caledon 410 Developments Ltd. to prepare a Functional Servicing Report (FSR) in support of their Draft Plan of Subdivision application. The Caledon 410 site is a proposed 36.16ha residential and commercial development within the Mayfield West Phase 2 Secondary Plan Area, in the Town of Caledon. The proposed development is located west of Hurontario Street, east of the Orangeville-Brampton Railway (OBRY) and north of the existing subdivision as shown on **Figure 1-1**.

Figure 1-1: Location Plan



2 Background Information

2.1 Previous Reports

The information contained within this report is based on the Functional Servicing Report for Mayfield West Phase 2 Secondary Plan Area (MW2 FSR), dated December 2018 prepared by Urbantech.

The MW2 FSR outlined the stormwater, sanitary and water servicing, a grading strategy, environmental constraints and mitigation measures, hydrogeology and the geotechnical guidelines for future developments. This FSR Report is consistent with the strategies outlined in the MW2 FSR and the standards of the regulatory agencies (Town, TRCA and MOECC).

This report is to be read in conjunction with other related reports supporting the proposed draft plan including:

- MW2 Functional Servicing Report (FSR) prepared by Urbantech, dated December 2018
- Environmental Impact Statement (EIS) prepared by Hensel, dated March 2019
- Geotechnical Report prepared by Terraprobe, dated June 2017
- Feature Based Water Budget Assessment prepared by PECG, dated April 2018, and
- Caledon 410 Stormwater Management Report prepared by TMIG, dated July 2019

2.2 Site Constraints/Existing Conditions

Existing Topography and Natural Heritage System

The existing topography within the proposed development ranges in elevation from 239.00m to 231.00m. Existing topography falls generally from northwest to southeast from a ridge north of the subject site. The topography ranges in slope from 2% to 3%.

The existing land use is predominantly agricultural and rural in nature.

There are two natural heritage systems (NHS) located within the subject site. Two wetlands referred to as northeast wetland and southeast (TRCA wetland) in the Urbantech MW2 FSR are located along the western and southwestern boundary of the site i.e. Block 259 and Block 260 of the Draft Plan.

The draft plan of subdivision as shown on **Figure 3-1** illustrates the proposed development in the context of the site's NHS. For information on the detailed NHS and the width of the applied buffer, the corresponding Environmental Impact Statement (EIS) report should be reviewed.

3 Proposed Conditions/Proposed Development

3.1 Proposed Development

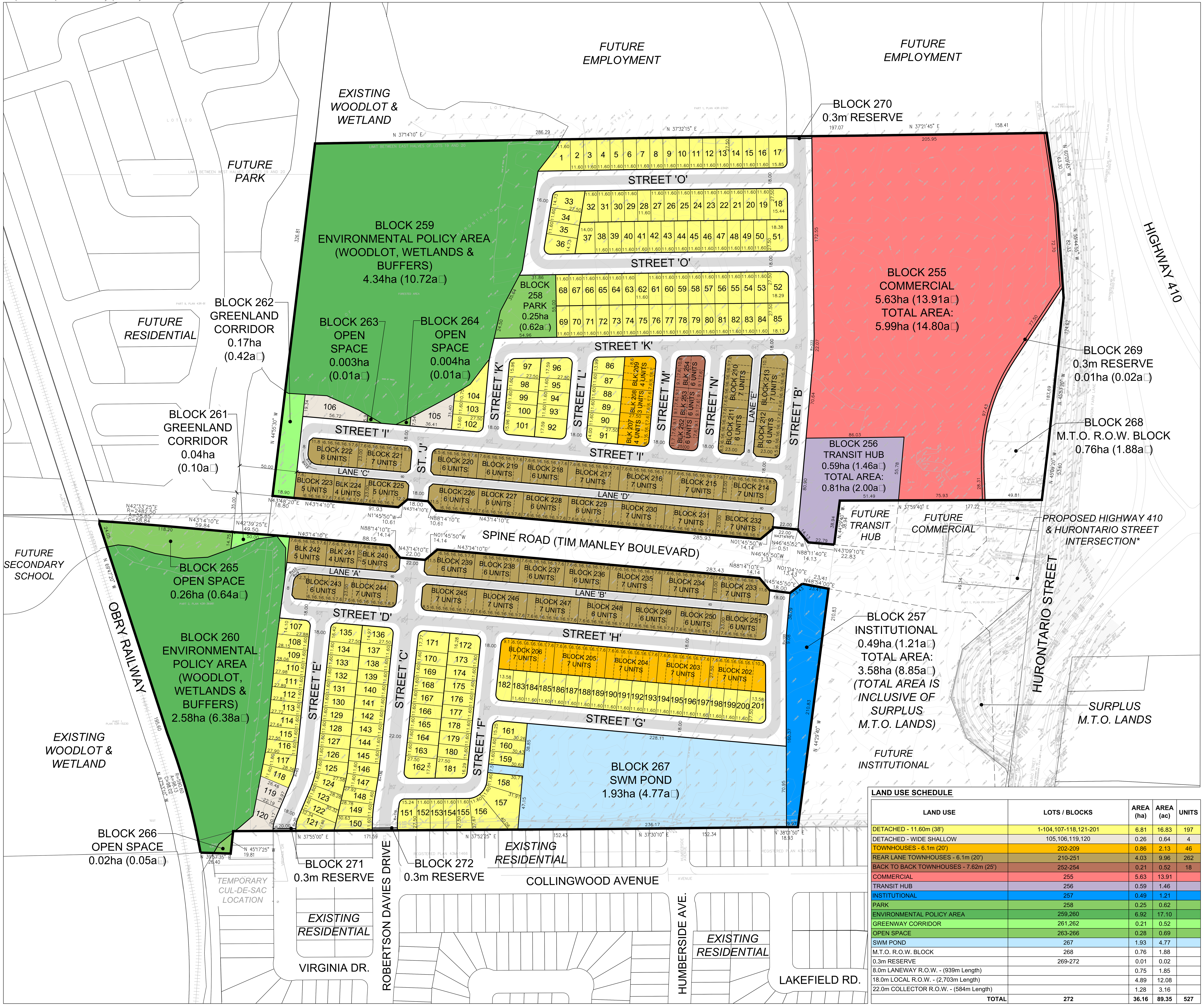
The proposed development land uses include low density residential, medium density residential, a transit hub block, roads, a stormwater management (SWM) facility, park, open space, Commercial lands and Natural Heritage System (NHS).

Table 3-1 summarize the proposed land uses and corresponding development areas. The proposed road network and lot layout is based on the Draft Plan of Subdivision prepared by Glen Schnarr & Associates Inc., dated July 3, 2019.

Table 3-1 Proposed Land Use Areas

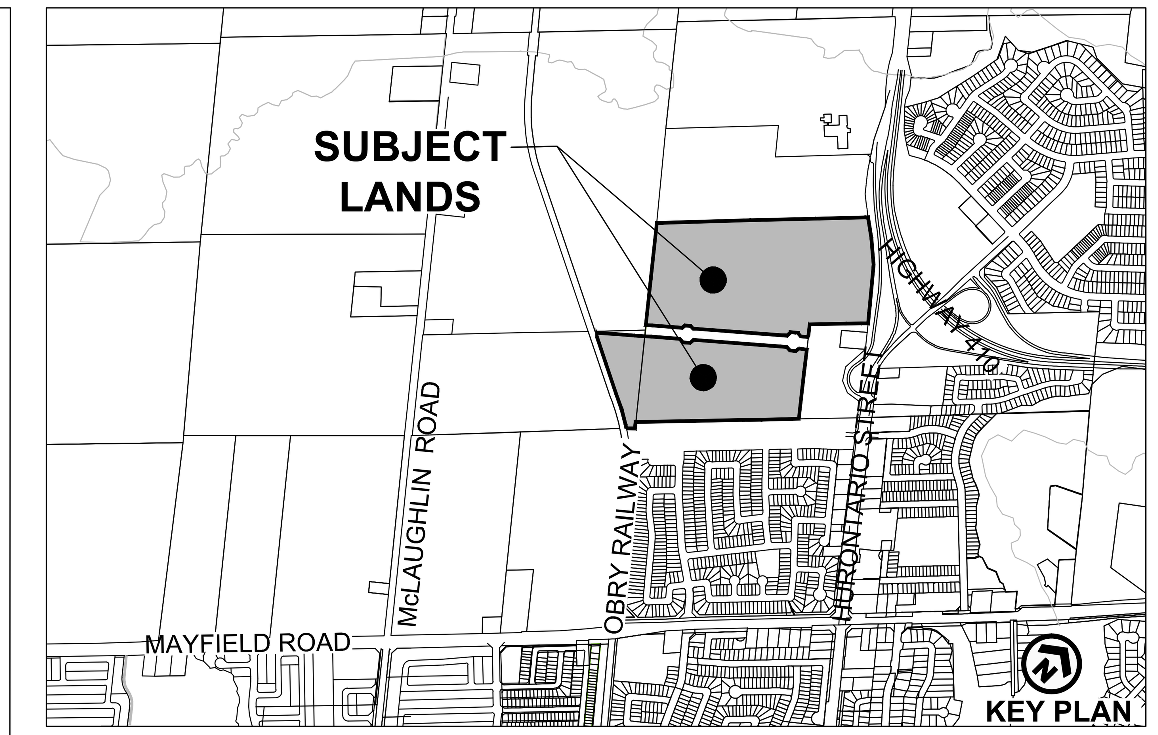
Land Use	Area (ha)
Low Density	7.07
Medium Density	5.10
Commercial	5.63
Transit	0.59
Institutional	0.49
Park	0.25
Environmental Policy Area	6.92
Greenway Corridor	0.21
Open Space	0.28
SWM Pond	1.93
Roads	6.92
MTO Reserve Block	0.76

Figure 3-1: Proposed Draft Plan



LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS
DETACHED - 11.60m (38')	1-104,107-118,121-201	6.81	16.83	197
DETACHED - WIDE SHALLOW	105,106,119,120	0.26	0.64	4
TOWNHOUSES - 6.1m (20')	202-209	0.86	2.13	46
REAR LANE TOWNHOUSES - 6.1m (20')	210-251	4.03	9.96	262
BACK TO BACK TOWNHOUSES - 7.62m (25')	252-254	0.21	0.52	18
COMMERCIAL	255	5.63	13.91	
TRANSIT HUB	256	0.59	1.46	
INSTITUTIONAL	257	0.49	1.21	
PARK	258	0.25	0.62	
ENVIRONMENTAL POLICY AREA	259,260	6.92	17.10	
GREENWAY CORRIDOR	261,262	0.21	0.52	
OPEN SPACE	263-266	0.28	0.69	
SWM POND	267	1.93	4.77	
M.T.O. R.O.W. BLOCK	268	0.76	1.88	
0.3m RESERVE	269-272	0.01	0.02	
8.0m LANEWAY R.O.W. - (939m Length)		0.75	1.85	
18.0m LOCAL R.O.W. - (2,703m Length)		4.89	12.08	
22.0m COLLECTOR R.O.W. - (584m Length)		1.28	3.16	
TOTAL	272	36.16	89.35	527



DRAFT PLAN OF SUBDIVISION
FILE # 21T-17007C & RZ 17-11
FIELDGATE DEVELOPMENTS
(CALEDON 410 DEVELOPMENTS LTD.)

PART OF LOT 19, CONCESSION 1,
WEST OF HURONTARIO STREET
(GEOGRAPHIC TOWNSHIP OF CHINGUACOUSY)
MAYFIELD WEST PHASE 2
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

OWNERS CERTIFICATE

I HEREBY AUTHORI□E GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF CALEDON FOR APPROVAL.

SIGNED ______________ DATE: Sept. 26, 2017

JACK EISENBERGER, ASO
CALEDON 410 DEVELOPMENTS LTD.

SURVEYORS CERTIFICATE

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

SIGNED ______________ DATE: Ju□ 10, 2019

THOMAS SALB, OLS
J. D. BARNES LIMITED
401 WHEELABRATOR WAY, SUITE A
MILTON, ON, L9T 3C1
PHONE: 905-875-9955
EMAIL: t□a□□ d□arne□.□om

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION RE□UIRED BY CLAUSES A,B,C,D,E,F,G, & J ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

NOTES

- LANEWAY TO LOCAL □COLLECTORE TRIANGLE - 3.0m □3.0m
- LOCAL TO LOCAL RADII - 5.0m
- LOCAL TO SPINE ROAD TRIANGLE - 7.5m □7.5m
- COLLECTOR TO SPINE ROAD TRIANGLE - 10m □10m
- PAVEMENT ILLUSTRATION IS DIAGRAMATTIC

□PROPOSED HIGHWAY 410 & HURONTARIO STREET INTERSECTION INFO. OBTAINED FROM WOOD DATED DECEMBER, 2018

SCALE 1:1500
(24 x 36)
JULY 3, 2019

GSAI

4 Grading Plan

4.1 Grading Design

This section summarizes the grading constraints identified for the Caledon 410 lands and the grading methodology considered in the development of the grading plan (**GR01** in **Appendix C**):

- Proposed grades will match existing elevations along the property limits and will not encroach into adjacent properties. This also the:
    - Existing residential subdivision to the south of the site,
    - Peel Regional Police lands southeast of the site, and
    - Future employment lands to the north of the site
- Proposed road centerline elevations will match the Spine road design being prepared by Urbantech, while accounting for the design of the Hurontario 410 intersection design by M.T.O.
- General grading constraints include conforming to the Town's road grading and lot grading criteria. The Town's standard minimum road grade is 0.75% for all ROW types, however, it is understood that the Town is willing to accept 0.5% minimum road grades for the Caledon 410 lands as stated in the Functional Servicing Report for Mayfield West Phase 2 Secondary Plan Area (MW2 FSR), dated December 2019 prepared by Urbantech.
- The roads have been graded to ensure positive drainage of major system flows towards the SWM pond. In general, the major system drainage can be directed overland to the SWM pond; however, in south end of the site at Street 'C' and 'E' as shown on **STM01** in **Appendix B3**, major system capture into the minor system is proposed to prevent overland drainage south into City of Brampton.
- The setbacks and existing ground elevations along the existing woodlots and wetlands were maintained to ensure adequate protection of features and to maintain drainage patterns in / out of the natural areas. Some grading is required within the buffer Block 259 as shown on the grading plans to transition to the proposed development grades and to accommodate trails and LID measures. The grading within the buffers conforms to the FSR prepared by Urbantech.

5 Municipal Servicing

5.1 Water Services

This section summarizes the existing and planned water infrastructure servicing the subject lands, as well as the proposed services internal to the Caledon 410 lands required to support the development. The Caledon 410 lands are located within Pressure Zone 7, which is part of the Region of Peel's Lake Based water distribution network. **Appendix B1** which conforms with the MW2 FSR, dated December 2018 prepared by Urbantech, illustrates the existing and planned water distribution infrastructure:

- Existing watermain connections at the following locations:
  - 300mm and 150mm watermains within the residential area to the south in City of Brampton lands.
  - 300mm watermain along Hurontario Street
- Future 400mm and 200mm watermain along the Caledon 410 Spine Road from McLaughlin Road to Hurontario Street (Region DC project #17-1186 as per the MW2 FSR prepared by Urbantech) constructed as a part of the Spine servicing works.
- Future 400mm watermain along the Hurontario Street from the Caledon 410 Spine Road to south of Old School Road
- Preliminary internal 300mm trunk watermains within the Caledon 410 development.
- Future 600mm watermain from Spine Road from Mayfield.

The internal infrastructure will be evaluated during detailed design using the Region's water distribution model and the MOE and Region water demand / fire flow criteria. It has been previously confirmed by the Region that the existing watermain infrastructure can support construction in the Caledon 410 Lands, which conforms with the MW2 FSR prepared by Urbantech.

Watermains greater than or equal to 400mm will be considered as Development Charge infrastructure as identified in Urbantech FSR. For the Caledon 410 Development, the proposed 400mm watermain running along Spine Road 'A' is DC eligible. The preliminary layout of the proposed watermain, DC Credit eligible pipes, future and existing infrastructure can be found in **WM01** in **Appendix B1**.

5.2 Sanitary Services

The proposed Caledon 410 lands development is tributary to the South Peel Wastewater System. The proposed conveyance system for the sanitary flow from the Caledon 410 lands are the Etobicoke Creek Trunk Sewer. Sanitary flow discharged to the Etobicoke Creek Trunk Sewer ultimately discharges to the Lakeview WPCP.

5.2.1 Existing Sanitary Infrastructure

As presented in Urbantech's Functional Servicing Report (December 2018), there are two existing sanitary outfalls available to service Caledon 410, which are shown on figure **SAN01** in **Appendix B2** and summarized in Table 5-1.

Table 5-1 Existing Sewer Outlets servicing Caledon 410

Outlet	Location	Description	Invert (m)	Available Capacity (L/s)	Receiving System
3	Northern limit of Robertson Davies Drive	Existing 250mm diameter sanitary sewer	254.70	16.1 L/s (based on Region of Peel monitoring)	Etobicoke Creek Trunk Sewer
4	Highwood Road east of Hurontario Street	Existing 300mm diameter sanitary sewer	252.75	68.8 L/s (approved design capacity)	Etobicoke Creek Trunk Sewer

5.2.2 Sanitary Sewer Design Criteria

The proposed sanitary sewer infrastructure within Caledon 410 was designed according to the Region of Peel's Sanitary Sewer Design Criteria (March 2017). The Region's criteria for population density for various land uses are summarized in **Table 5-2**.

Based on the calculated populations contributing to each sewer, the peak sanitary flows and pipe sizes in the design sheets provided in **Appendix B2** were determined using the Region's design standards for flow generation rates (302.8 L/c/d), sanitary flow peaking factors (based on Harmon Formula) and infiltration/inflow rate (0.2 L/s/ha) as per the Region's Standard Drawing 2-9-2.

The Region's sanitary sewer design criteria specifies a minimum grade of 0.40% for pipes 250mm in diameter, and 0.35% for pipes 300mm in diameter. The starting legs for local sanitary sewers have been designed at a minimum grade of 1.00%. The minimum velocity recommended by the Region is 0.75m/s. The Regions standard of minimum cover requirement of 2.5m on the sanitary sewers has been met for all sanitary sewers.

Table 5-2 Population density for various land uses

Density	Persons/Hectare
Single family (greater than 10m frontage)	50
Single family (less than 10m frontage)	70
Semi detached	70
Row dwellings	175
Apartments	475
Light industrial	70
Commercial	50
Schools	600 (Junior Public School) 900 (Senior Public School) 1,500 (Secondary School)

Drops across manholes have been used to determine the pipe inverts. The following drops were applied:

- 0° - 0.03m
- 45° - 0.06m
- 90° - 0.09m

5.2.3 Proposed Sanitary Sewer Design

The existing sanitary Outlets 3 and 4 as described in Table 5-1 have sufficient capacity.

SAN01 in **Appendix B2** illustrates the local and trunk sanitary within the Caledon 410 lands including the contributing areas, populations, pipe obverts and ground elevations to demonstrate that sufficient cover has been provided. As well, the sanitary sewers pass through a 8.0m wide easement within Block 267 and Block 257 to connect to existing 300mm diameter sewer on Highwood road. The pipe slopes used conforms with the MW2 FSR, dated December 2018 prepared by Urbantech.

The design sheets in **Appendix B2** demonstrate that the peak sanitary flows generated in the Caledon 410 Lands can be accommodated in the existing / future external infrastructure. The proposed sanitary flows at each outlet is presented in **Table 5-3**.

The flows that will be generated from the Future Employments to the north of the Caledon 410 Developments have also been considered in the design. The area and population for the future development were taken from the Urbantech MW2 FSR and Stub 1-3A has been provided to allow the development to connect to the Caledon 410 sanitary system.

The trunk sewers greater than or equal to 375mm will be considered as Development Charge infrastructure. The DC sewers have been agreed upon by the Region as per the Urbantech MW2 FSR.

Table 5-3 Existing Sewer Outlets servicing Caledon 410

Outlet	Location	Description	Available Capacity (L/s)	Proposed Flow (L/s)
3	Northern limit of Robertson Davies Drive	A relatively small area in Stage 1 east of the OBRY south of the Spine Road will drain to Outlet 3.	16.1 L/s (based on Region of Peel monitoring)	14.1 L/s
4	Highwood Road east of Hurontario Street	The remaining Stage 1 and Stage 2 lands between the OBRY and Hurontario Street will drain to Outlet 4.	68.8 L/s (approved design capacity)	57.5 L/s See Note 1

Note 1: Servicing and grading constraints related to the Caledon 410 Developments Limited lands prevent the extension of the existing sanitary outlet pipe size (300mm) and slope (0.50%) from Outlet 4 into the subject lands. The sewer slopes upstream of Outlet 4 are restricted to 0.30% and therefore a larger diameter (375mm) is required to convey the estimated MW2 flows to the existing 300mm sanitary connection. Permission from the Region of Peel will be required to implement this servicing solution (i.e., to connect a 375mm sewer to the existing 300mm sewer, which is not standard practice). This conforms with **Drawing 802** in **Appendix A** from the MW2 FSR prepared by Urbantech.

5.3 Stormwater Treatment and Drainage

This section describes the proposed storm drainage and related infrastructure within the Caledon 410 lands. **Drawing 501A** and **Drawing 501B** in **Appendix A** from the MW2 FSR prepared by Urbantech, dated December 2018, illustrate the interim and ultimate overall drainage areas (respectively). These drawings also show the storm trunk sewer alignments and major system flow path. The minor headwater reaches along the Etobicoke Creek valley will be utilized for the Etobicoke Creek SWM facility outfalls and others will be maintained to continue to provide surface conveyance; although with reduced contributing drainage areas. The major and minor drainage systems for the subject lands have been designed to convey storm runoff to the proposed SWM facilities prior to discharge to the Etobicoke Creek outlets.

Pond 9 – Under interim conditions, a large undeveloped external area drains to this facility. Since the total interim drainage area is larger than the ultimate drainage area, the interim conditions were assessed to ensure that Pond 9 will be adequately sized for both interim and ultimate conditions.

The storm trunk (minor) system is designed to accommodate flow from the 1:10 year storm without surcharging in accordance with the Town's standards and IDF parameters. For the south west end of the site, 1:100-year storm runoff will be captured as illustrated on drawing **STM01** in **Appendix B3.**

The overland flow blocks accommodate the storm sewers directed into the SWM facilities. In addition to the major system conveyance capacity requirements, the blocks were sized according to the Town's recommended widths based on pipe size and depth where applicable.

The storm sewer system inverts were established based on the permanent pool elevation of the end-of-pipe SWM facilities. The storm sewer design drawing and design sheet are included in **Appendix B3**.

Minor System

Internally within the development, drainage will be collected within a dual major/minor drainage network. The storm sewers within the proposed development will be designed to convey the runoff from a 10-year storm event and are designed as per the Town Standards.

Runoff within the Caledon 410 Lands will be conveyed to the Pond 9 within the proposed development area. The breakdown of drainage areas from these lands for to the pond is as noted in **Table 5-4** and **Table 5-5**. The proposed storm sewer layout drawing **STM01** and the storm design sheets can be found in **Appendix B3**. Sump pumps will be required within the subdivision and will be equipped with backflow prevention devices to protect against hydraulic grade line impacts.

LID measures will be implemented on the subject site per recommendations of Environmental Impact Statement (EIS) prepared by Hensel and the Feature Based Water Budget Assessment prepared by PECG, dated April 2018. See **Appendix A** for the drawings showing LID locations.

LID measures include:

- Infiltration galleries in rear lots as per Urbantech figure 507 in **Appendix A**,
- Infiltration galleries/swales along the wetland as per Urbantech figure 507 in **Appendix A**,
- Directing drainage from park Block 258 to Wetland Block 259 to maintain water balance, and,
- Directing rooftop clean water to wetland in Blocks 258 and 260 to maintain water balance.

Table 5-4 SWM Pond Tributary Areas - Ultimate Condition

Tributary Area (ha)	Comment
39.34	From this draft plan
6.96	External Area

Table 5-5 SWM Pond Tributary Areas- Interim Condition

Tributary Area (ha)	Comment
36.05	From this draft plan
16.15	External Area

Drops across manholes have been used to determine the pipe inverts. The following drops were applied, as per Town of Caledon standards:

- 0° - 0.03m
- 45° - 0.05m
- 90° - 0.08m

Major System

Runoff from events greater than the 10-year event will be directed overland along the internal road network to the established low points adjacent to the proposed stormwater management pond. Overland flows will be directed via appropriately sized inlet conveyances into the pond.

The major system overland flow routes shall be designed to safely convey the 100-year peak overland flow into the facility and will be designed as per the Town Standards. The site has been graded to ensure positive drainage to the intended major system outlet such that the depth of ponding under 100-year event does not exceed 0.3m. For the south-west end of the site, 1:100-year storm runoff will be captured in the minor system to prevent overland drainage south into City of Brampton as illustrated on drawing **STM01** in **Appendix B3**.

6 Conclusions

Based on our review and analysis, we conclude that the proposed development can be serviced by existing and proposed infrastructure based on the Town of Caledon and Region of Peel Criteria, MW2 Functional Servicing Report (FSR) prepared by Urbantech, dated August 2017

A summary of our findings are as follows;

- Proposed site grading conforms to the Town's road grading and lot grading criteria. It is understood that the Town is willing to accept 0.5% minimum road grades.
- The internal watermain network will be connected to proposed watermain connections at a 300mm watermain along Hurontario Street, proposed 400mm and 200mm watermains along the Spine, and a future 300mm watermain to the north of the site. There will also be two (2) existing watermain connections a 300mm and 150 mm watermains at the existing residential subdivision to the south. It has been previously confirmed by the Region that the existing watermain infrastructure can support development of in the Caledon 410 Lands. The internal infrastructure will be evaluated during detailed design using the Region's water distribution model and the MOE and Region water demand / fire flow criteria.
- Sanitary servicing of the site will be achieved with a conventional pipe network. The proposed sanitary system will outfall to two (2) separate outlets as described in **Table 5-1** where capacity is available for the proposed development. The sewer slopes upstream of Outlet 4 are restricted to 0.30% and therefore a larger diameter (375mm) is required to convey the estimated MW2 flows to the existing 300mm sanitary connection. Permission from the Region of Peel will be required to implement this servicing solution (i.e., to connect a 375mm sewer to the existing 300mm sewer, which is not standard practice).
- Storm sewer servicing can be achieved with a conventional 10-year minor pipe network and (+10) year major system overland flow conveyance to SWM pond 9. However, in the south west corner of the site, major system capture into the minor system is required. Sump pumps will be required and will be equipped with backflow prevention devices to protect against hydraulic grade line impacts.
- This report is to be read in conjunction with other related reports supporting the proposed draft plan including
    - MW2 Functional Servicing Report (FSR)
    - Environmental Impact Statement (EIS) prepared by Hensel
    - Geotechnical Report prepared by Terraprobe
    - Feature Based Water Budget Assessment prepared by PECG
    - Caledon 410 Stormwater Management Report prepared by TMIG

We trust you will find the contents of this report satisfactory. Should you have any questions or comments please do not hesitate to contact the undersigned.

Sincerely,

THE MUNICIPAL INFRASTRUCTURE GROUP LTD.

Reviewed By:

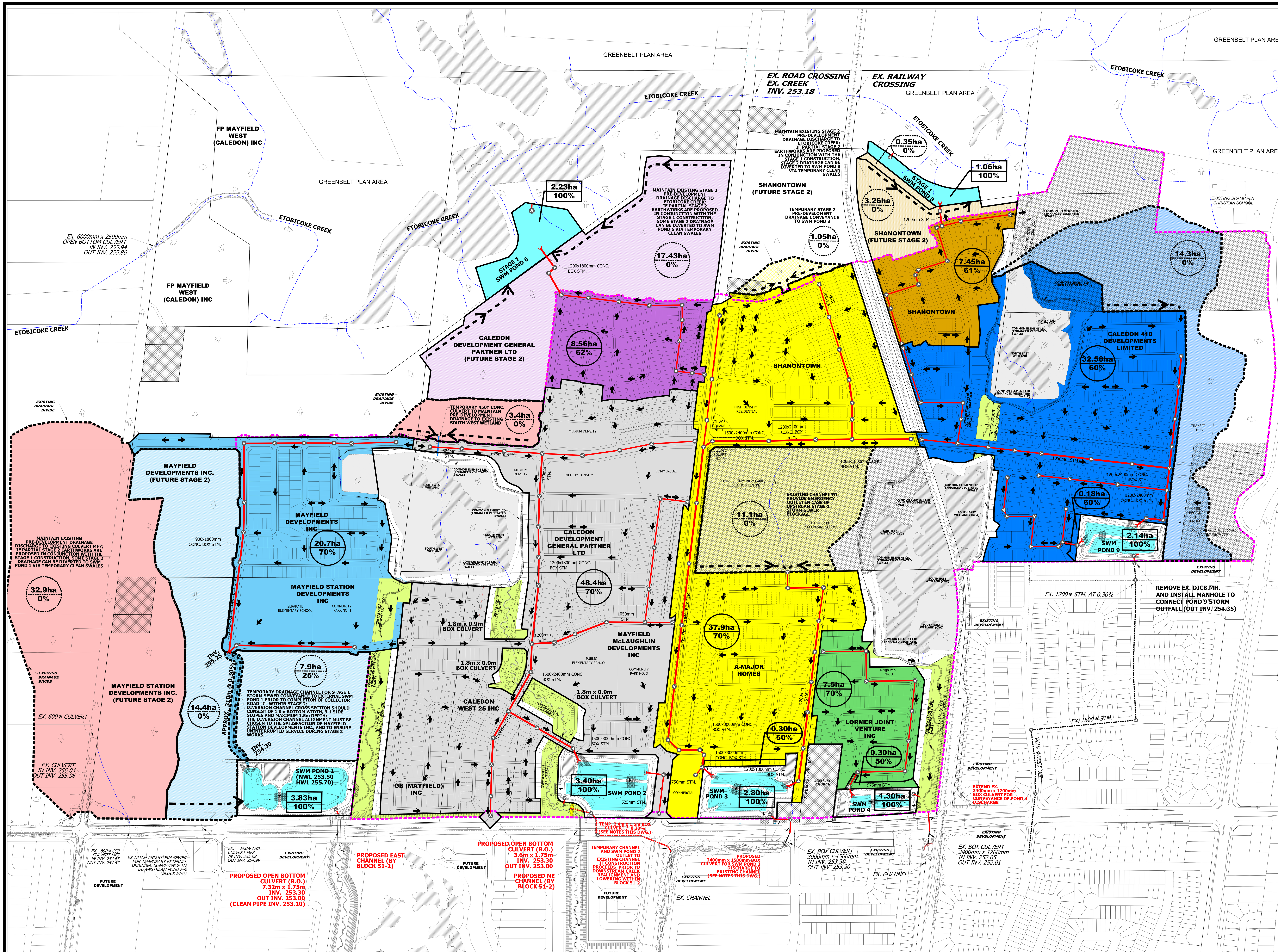
LICENSED PROFESSIONAL ENGINEER
A. A. AHMADZAI
100161453
2019/08/01
PROVINCE OF ONTARIO

Abdul Ahmadzai, P.Eng

Project Manager

APPENDIX A

Background Information



NOTES:

* PARTIAL STAGE 2 EARTHWORKS MAY OCCUR IN CONJUNCTION WITH THE STAGE 1 DEVELOPMENT. DEVELOPER TO ENSURE CLEAN SURFACE WATER DISCHARGE FROM THE DISTURBED STAGE 2 LANDS TO THE STAGE 1 PONDS OR TO THE EXISTING STAGE 2 OUTLETS (CULVERTS OR CHANNELS). CLEAN WATER SWALES TO BE IMPLEMENTED FOR THE PRE-DEVELOPMENT SURFACE DRAINAGE CONVEYANCE.

* PROPOSED MAYFIELD CROSSINGS MUST BE IN PLACE FOR SERVICING OF THE STAGE 1 PONDS (1 TO 4). EXISTING MAYFIELD CULVERTS CANNOT BE UTILIZED FOR STAGE 1 POND DISCHARGE DUE TO INADEQUATE SIZE AND HIGH INVERT.

* IF REQUIRED, DUE TO THE TIMING OF THE DOWNSTREAM CHANNEL IMPROVEMENTS, A TEMPORARY STORM OUTFALL TO BE CONSTRUCTED FOR SWM POND 2 DISCHARGE TO EXISTING McLAUGHLIN CHANNEL. TEMPORARY OUTFALL ALIGNMENT TO BE LOCATED WITHIN EXISTING MAYFILED ROW, AND TO BE PLACED AT LOCATION APPROVED BY REGION OF PEEL. TEMPORARY OUTFALL INSTALLATION, MAINTENANCE AND DECOMMISSIONING WILL BE SOLE RESPONSIBILITY OF MW2 LANDOWNER'S GROUP.

* IF REQUIRED, DUE TO THE TIMING OF THE HOLDOUT PROPERTY DEVELOPMENT, A TEMPORARY STORM OUTFALL TO BE CONSTRUCTED BY MW2 FOR SWM POND 3 DISCHARGE TO EXISTING McLAUGHLIN CHANNEL. TEMPORARY OUTFALL ALIGNMENT TO BE LOCATED WITHIN FUTURE MAYFIELD ROAD WIDENING, AND TO BE PLACED AT LOCATION APPROVED BY REGION OF PEEL. TEMPORARY OUTFALL INSTALLATION, MAINTENANCE AND DECOMMISSIONING WILL BE SOLE RESPONSIBILITY OF MW2 LANDOWNER'S GROUP.

* EXISTING DITCH WITHIN THE HOLDOUT PROPERTY TO SERVE AS A TEMPORARY EMERGENCY OUTLET IN CASE OF A SPILL AT THE PROPOSED SPINE ROAD LOW POINT/ 100 YEAR FLOW CAPTURE (SHANONTOWN DEVELOPMENT).

* PRE-DEVELOPMENT DRAINAGE DISCHARGE TO BE MAINTAINED TO ALL EXISTING FEATURES DURING ANY PROPOSED WORKS WITHIN BOTH STAGES 1 AND 2.

* REFER TO DRAWINGS 502-504 FOR MINOR AND MAJOR SYSTEM DRAINAGE AREAS AND FLOW CAPTURE.

* REFER TO DRAWINGS 301-312 FOR PROPOSED GRADING DETAILS.

* REFER TO DRAWINGS THE 600 SERIES DRAWINGS FOR STAGE 1 SWM POND DETAILS. SWM PONDS 1, 6 AND 8, WHICH ARE REQUIRED FOR STAGE 1 SERVICING, ARE LOCATED OUTSIDE OF THE STAGE 1 LIMITS AND WITHIN FUTURE STAGE 2.

* REFER TO DRAWING 507 FOR STAGE 1 LID MAP AND PROPOSED LID MEASURE DETAILS.

LEGEND:

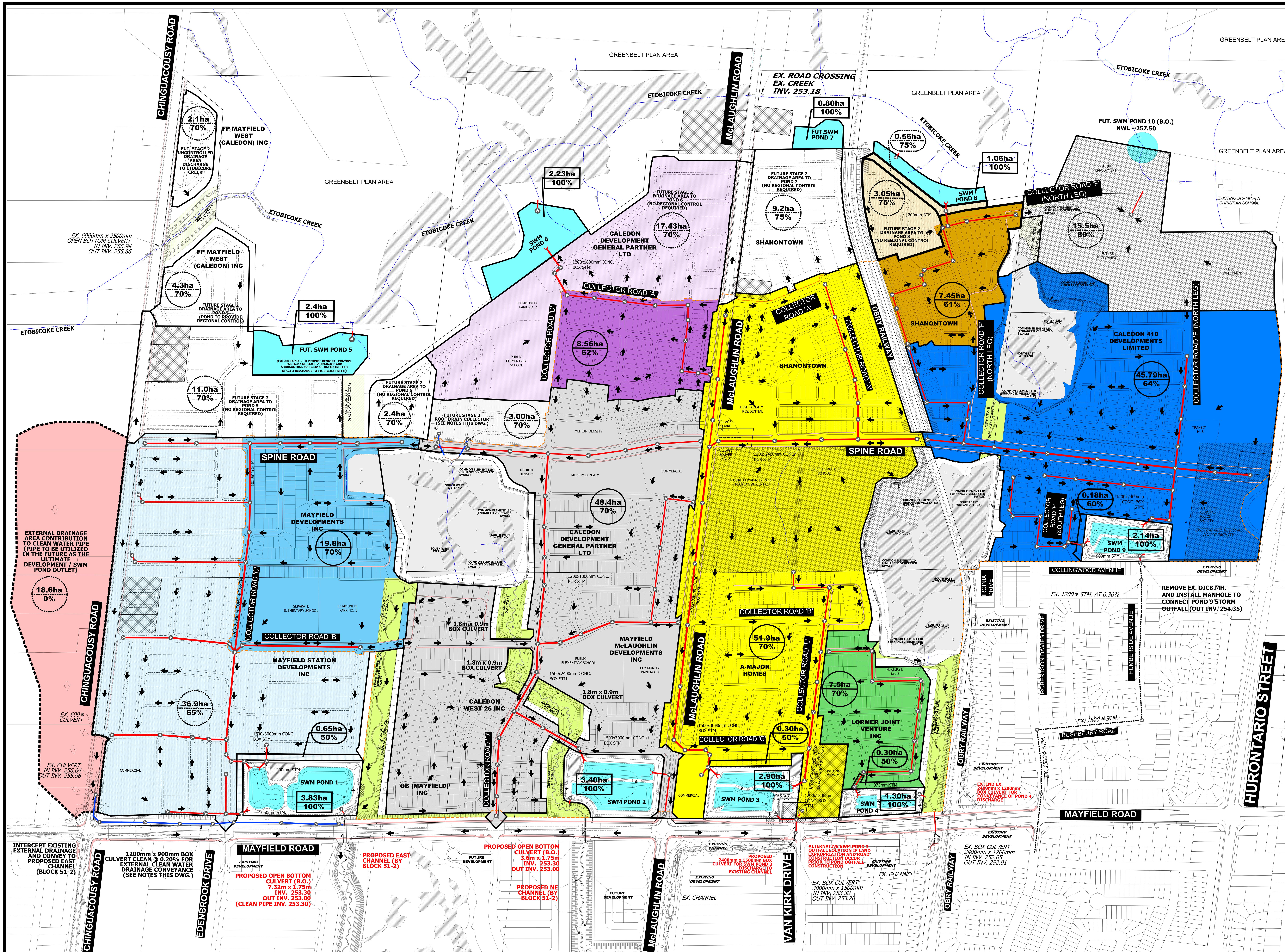
- MW2 STAGE 1 LIMIT
- EXISTING OVERLAND FLOW DIRECTION
- EXISTING STORM SEWER ALIGNMENT
- PROPOSED MAJOR SYSTEM FLOW DIRECTION
- PROPOSED STORM SEWER ALIGNMENT
- TEMPORARY STORM SEWER ALIGNMENT
- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 1
- STAGE 2 PRE-DEVELOPMENT CONTRIBUTING DRAINAGE AREA TO POND 1
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 2
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 3
- STAGE 2 PRE-DEVELOPMENT CONTRIBUTING DRAINAGE AREA TO POND 3
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 4
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 6
- STAGE 2 PRE-DEVELOPMENT CONTRIBUTING DRAINAGE AREA TO POND 6
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 8
- STAGE 2 PRE-DEVELOPMNET CONTRIBUTING DRAINAGE AREA TO POND 8
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 9
- STAGE 2 PRE-DEVELOPMNET CONTRIBUTING DRAINAGE AREA TO POND 9
- TEMPORARY CUT-OFF SWALE FOR RE-DIRECTION OF PRE-DEVELOPMENT STAGE 2 SURFACE DRAINAGE TO STAGE 1 SWM PONDS
- 30.6ha / 70%: STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND / STAGE 1 IMPERVIOUSNESS
- 0.65ha / 60%: REAR YARD AREA DISCHARGE TO POND / IMPERVIOUSNESS
- 3.83ha / 100%: POND BLOCK AREA / POND IMPERVIOUSNESS
- 11.0ha / 75%: STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND / STAGE 2 IMPERVIOUSNESS

urbantech

TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2

INTERIM DRAINAGE TO STAGE 1 STORMWATER MANAGEMENT PONDS

SURVEYED BY:	R.P.E.	DATE:	2015	JOB NO.:	15-483
DRAWN BY:	V.P.	CHECKED BY:	D.Z.	DRAWING NO.:	SHEET NO.
DESIGNED BY:	D.Z.	CHECKED BY:	D.Z.	501A	
SCALE:	1:3000	DATE:	DECEMBER 2018		



LEGEND:

- MW2 STAGE 1 LIMIT
- PROPOSED STORM SEWER ALIGNMENT
- PROPOSED CLEAN WATER PIPE ALIGNMENT ALONG MAYFIELD ROAD
- EXISTING STORM SEWER ALIGNMENT
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED MAJOR SYSTEM FLOW DIRECTION
- 30.6ha / 70% — STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND; STAGE 1 IMPERVIOUSNESS
- 0.65ha / 60% — REAR YARD AREA DISCHARGE TO POND; IMPERVIOUSNESS
- 3.83ha / 100% — POND BLOCK AREA; POND IMPERVIOUSNESS
- 11.0ha / 75% — STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND; STAGE 2 IMPERVIOUSNESS
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 1
- FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 1
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 2
- FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 2
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 3
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 4
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 6
- FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 6
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 8
- FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 8
- STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 9
- STAGE 2 CONTRIBUTING DRAINAGE AREA TO FUTURE STAGE 2 PONDS
- CONTRIBUTING DRAINAGE AREA TO MAYFIELD ROAD CLEAN WATER PIPE

NOTES:

* ULTIMATE MAYFIELD ROAD DRAINAGE TO BE SELF CONTAINED AND SHALL NOT RELY ON DISCHARGE TO MW2 SWM PONDS. OIL GRIT SEPARATORS AND LID INFILTRATION GALERIES WILL BE IMPLEMENTED WITHIN THE MAYFIELD ROAD ROW FOR QUALITY CONTROL PRIOR TO DISCHARGE TO DOWNSTREAM CHANNELS. REFER TO REGION DRAWINGS BY IBI GROUP FOR DETAIL ROAD DRAINAGE DESIGN.

* CLEAN WATER PIPE ALONG MAYFIELD ROAD WILL BE REQUIRED FOR CONVEYANCE OF THE EXTERNAL FLOWS WEST OF CHINGUACOUSY ROAD TO THE EXISTING EAST CHANNEL IN BLOCK 51-2 (CITY OF BRAMPTON). CLEAN WATER PIPE TO BE INSTALLED AS PART OF THE MAYFIELD ROAD WIDENING BY REGION, OR EARLIER IF THE MW2 STAGE 2 LANDS PROCEED WITH DEVELOPMENT PRIOR TO COMPLETION OF THE ROAD WIDENING. AS PER PREVIOUS AGREEMENT WITH THE REGION, THE BLOCK 51-2 LANDOWNER'S GROUP (SOUTH OF MAYFILED ROAD) WILL BE FULLY RESPONSIBLE FOR THE CLEAN WATER PIPE INSTALLATION. REFER TO DRAWING 325 FOR PRELIMINARY CLEAN WATER PIPE PROFILE.

* A ROOF DRAIN COLLECTION SYSTEM TO BE INSTALLED WITH FUTURE STAGE 2 TO MAINTAIN CLEAN SURFACE WATER DISCHARGE TO EXISTING SOUTH-WEST WETLAND UNDER POST-DEVELOPMENT CONDITION. REFER TO DRAWING 501A AND GRADING PLAN 305 FOR INTERIM DRAINAGE SOLUTION PRIOR TO STAGE 2 DEVELOPMENT.

* REFER TO DRAWINGS 502-504 FOR MINOR AND MAJOR SYSTEM DRAIANAGE AREAS AND FLOW CAPTURE.

* REFER TO DRAWINGS 301-312 FOR PROPOSED GRADING DETAILS.

* REFER TO THE 600 SERIES DRAWINGS FOR MW2 STAGE 1 SWM POND DETAILS. PONDS 1, 6 AND 8, WHICH ARE REQUIRED FOR STAGE 1 SERVICING, ARE LOCATED OUTSIDE OF THE STAGE 1 LIMITS AND WITHIN STAGE 2.

* THE PROPOSED POND 6 AND 8 FOOTPRINTS WILL RESPECT THE GREENBELT DEVELOPMENT LIMIT ENCROACHMENTS AS APPROVED BY TRCA. MORE DETAIL CONTRIBUTING DRAINAGE AREA BREAKDOWN AND GREENBELT POND 6 AND 8 LAYOUTS ARE SHOWN ON DRAWING 502A.

* REFER TO LID MAP AND PROPOSED LID MEASURE DETAILS ON DRAWING 507.

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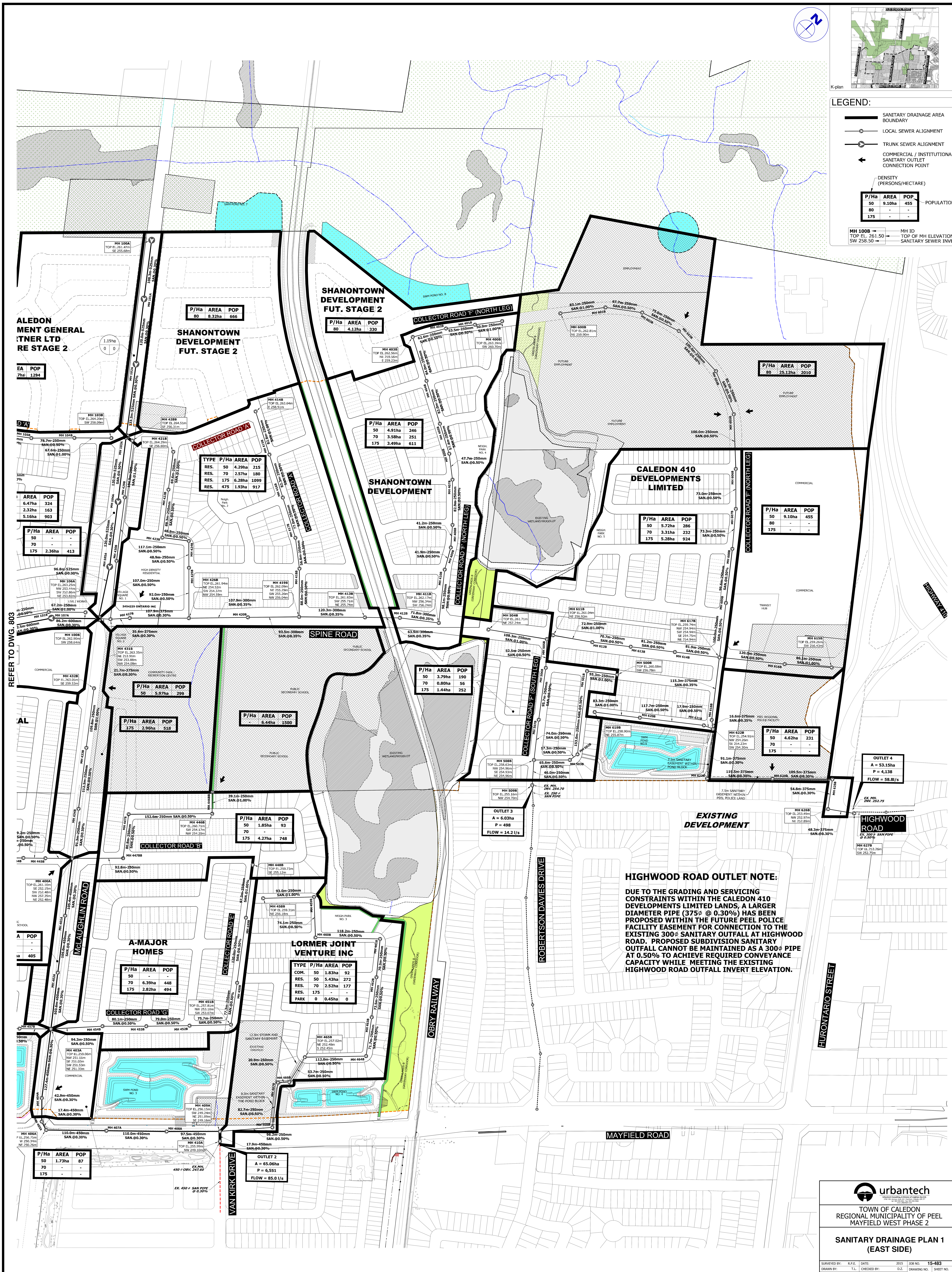
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2

ULTIMATE CONTRIBUTING DRAINAGE AREAS TO SWM PONDS

SURVEYED BY:	R.P.E.	DATE:	2016	JOB NO.	15-483
DRAWN BY:	V.P.	CHECKED BY:	D.Z.	DRAWING NO.	SHEET NO.
DESIGNED BY:	D.Z.	CHECKED BY:	D.Z.	501B	
SCALE:	1:3000	DATE:	DECEMBER 2018		

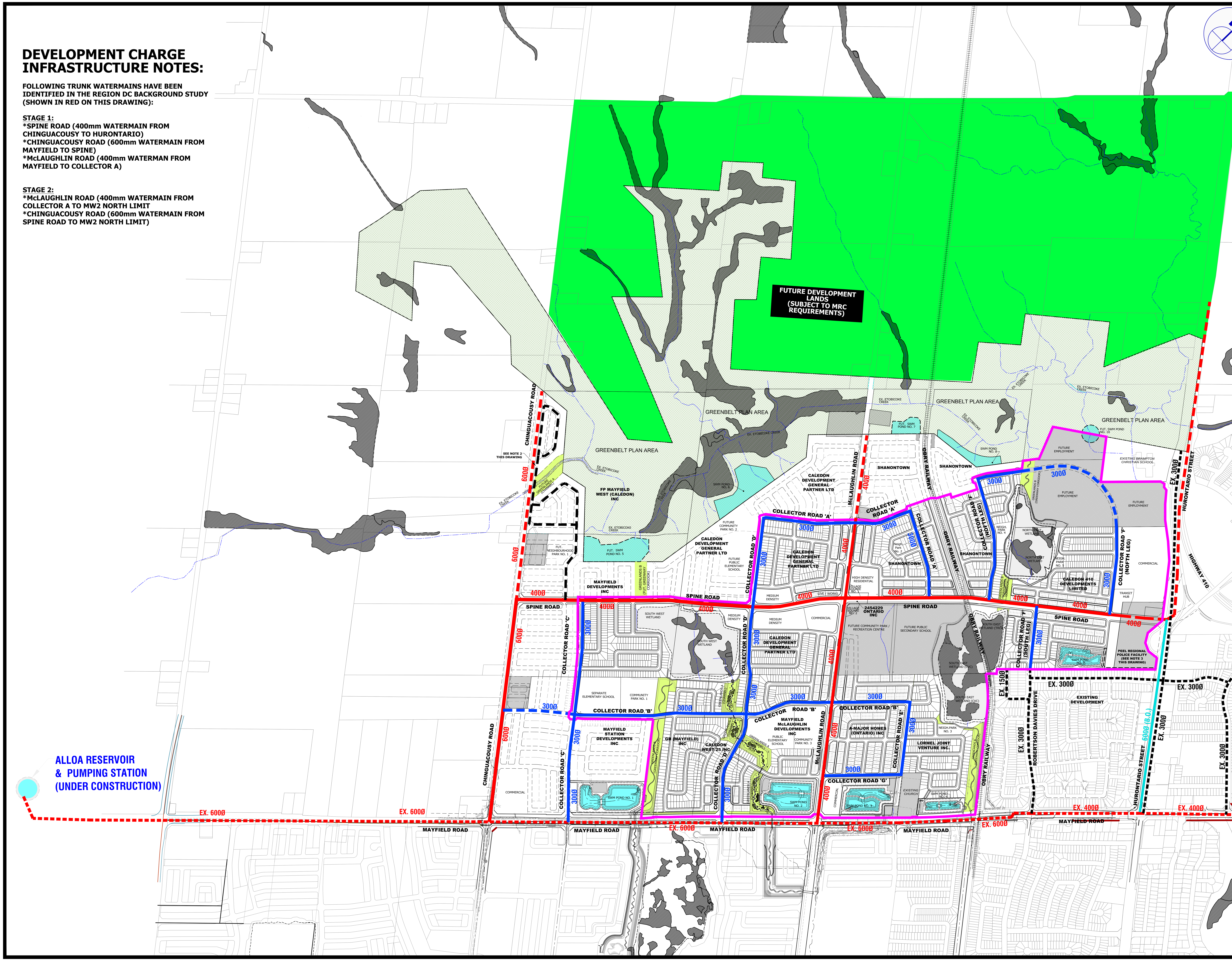

LEGEND:
SANITARY DRAINAGE AREA BOUNDARY
LOCAL SEWER ALIGNMENT
TRUNK SEWER ALIGNMENT
COMMERCIAL / INSTITUTIONAL SANITARY OUTLET CONNECTION POINT
DENSITY (PERSONS/HECTARE)
POPULATION
MH ID
TOP OF MH ELEVATION
SANITARY SEWER INVERT
K-plan
SHANONTOWN DEVELOPMENT FUT. STAGE 2
SHANONTOWN DEVELOPMENT
CALEDON 410 DEVELOPMENTS LIMITED
A-MAJOR HOMES
LORMER JOINT VENTURE INC
EXISTING DEVELOPMENT
COLLECTOR ROAD 'F' (NORTH LEG)
COLLECTOR ROAD 'F' (SOUTH LEG)
COLLECTOR ROAD 'A'
COLLECTOR ROAD 'B'
COLLECTOR ROAD 'E'
COLLECTOR ROAD 'G'
SPINE ROAD
MCLAUGHLIN ROAD
VAN KIRK DRIVE
OBRY RAILWAY
ROBERTSON DAVIES DRIVE
HURONTARIO STREET
HIGHWAY 410
HIGHWOOD ROAD
MAYFIELD ROAD
REFER TO DWG. 803
OUTLET 2
A = 65.06ha
P = 6,551
FLOW = 85.0 l/s
OUTLET 3
A = 6.03ha
P = 498
FLOW = 14.2 l/s
OUTLET 4
A = 53.15ha
P = 4,138
FLOW = 58.8l/s
HIGHWOOD ROAD OUTLET NOTE:
DUE TO THE GRADING AND SERVICING CONSTRAINTS WITHIN THE CALEDON 410 DEVELOPMENTS LIMITED LANDS, A LARGER DIAMETER PIPE (375ϕ @ 0.30%) HAS BEEN PROPOSED WITHIN THE FUTURE PEEL POLICE FACILITY EASEMENT FOR CONNECTION TO THE EXISTING 300ϕ SANITARY OUTFALL AT HIGHWOOD ROAD. PROPOSED SUBDIVISION SANITARY OUTFALL CANNOT BE MAINTAINED AS A 300ϕ PIPE AT 0.50% TO ACHIEVE REQUIRED CONVEYANCE CAPACITY WHILE MEETING THE EXISTING HIGHWOOD ROAD OUTFALL INVERT ELEVATION.
urbantech
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2
SANITARY DRAINAGE PLAN 1 (EAST SIDE)
JOB NO. 15-483
DATE: DECEMBER 2018
DRAWING NO. 802

DEVELOPMENT CHARGE INFRASTRUCTURE NOTES:

FOLLOWING TRUNK WATERMAINS HAVE BEEN IDENTIFIED IN THE REGION DC BACKGROUND STUDY (SHOWN IN RED ON THIS DRAWING):

STAGE 1:
*SPINE ROAD (400mm WATERMAIN FROM CHINGUACOUSY TO HURONTARIO)
*CHINGUACOUSY ROAD (600mm WATERMAIN FROM MAYFIELD TO SPINE)
*McLAUGHLIN ROAD (400mm WATERMAN FROM MAYFIELD TO COLLECTOR A)

STAGE 2:
*McLAUGHLIN ROAD (400mm WATERMAIN FROM COLLECTOR A TO MW2 NORTH LIMIT
*CHINGUACOUSY ROAD (600mm WATERMAIN FROM SPINE ROAD TO MW2 NORTH LIMIT)



LEGEND

- MW2 STAGE 1 LIMIT
- EXISTING PRESSURE ZONE 7 TRUNK WATERMAIN
- PROPOSED STAGE 1 PRESSURE ZONE 7 TRUNK WATERMAIN
- FUTURE STAGE 2 PRESSURE ZONE 7 TRUNK WATERMAIN
- EXISTING PRESSURE ZONE 7 300mm DIA WATERMAIN
- PROPOSED STAGE 1 PRESSURE ZONE 7 300mm DIA WATERMAIN
- FUTURE STAGE 2 PRESSURE ZONE 7 300mm DIA WATERMAIN
- FUTURE STAGE 2 PRESSURE ZONE 7 LOCAL WATERMAIN
- EXISTING GREENBELT
- NON PARTICIPATING LANDOWNERS
- EXISTING WOODLOT/WETLAND
- PROPOSED OPEN SPACE
- PROPOSED SWM POND
- FUTURE DEVELOPMENT LANDS NORTH OF MW2 AND ETOBICOKE CREEK (SUBJECT TO MRC REQUIREMENTS)

NOTES:

1. HYDRAULIC ANALYSIS FOR LOCAL WATERMAIN NETWORK SIZING TO BE COMPLETED BY INDIVIDUAL LANDOWNERS AS PART OF THEIR DEVELOPMENT APPLICATIONS.
2. EXTENSION OF TRUNK 600Ø WATERMAIN ALONG CHINGUACOUSY ROAD AND NORTH OF SPINE ROAD WILL BE REQUIRED FOR FUTURE DEVELOPMENTS OUTSIDE OF THE MW2 FRAMEWORK PLAN; THEREFORE, A LOCAL WATERMAIN NETWORK CREEK CROSSING WILL BE NEEDED TO SERVICE FUTURE STAGE 2 MW2 LANDS NORTH OF THE ETOBICOKE CREEK.
3. A STUB CONNECTION FROM THE 400mm TRUNK WATERMAIN PROPOSED ALONG SPINE ROAD SHOULD BE PROVIDED FOR FUTURE PEEL REGIONAL POLICE LAND SERVICING.

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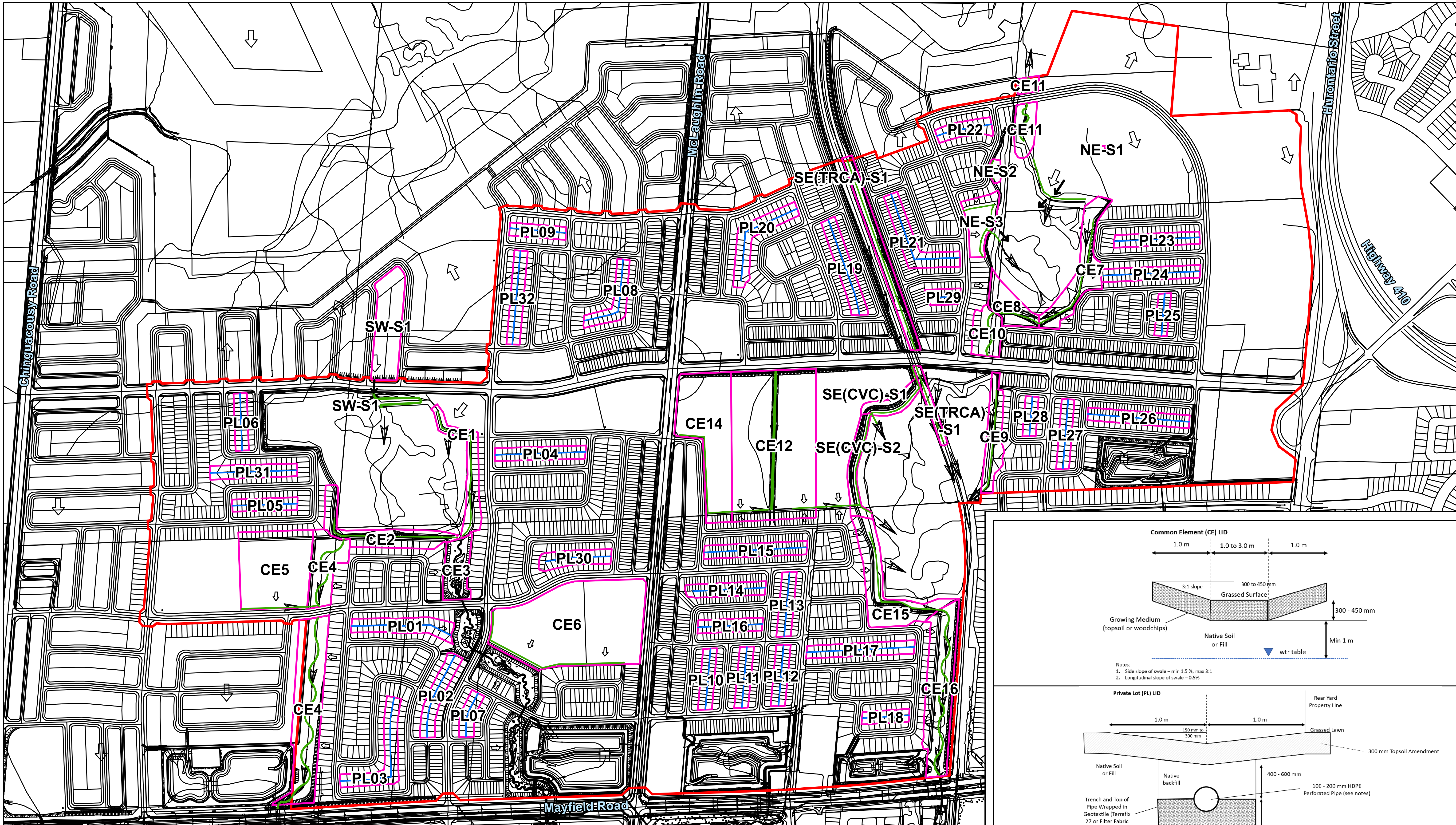
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2

TRUNK WATERMAINS

SURVEYED BY:	R.P.E.	DATE:	2015	JOB NO.	15-483
DRAWN BY:	D.L.	CHECKED BY:	D.Z.	DRAWING NO.	SHEET NO.
DESIGNED BY:	D.Z.	CHECKED BY:	D.Z.	901	
SCALE:	1:7000	DATE:	DECEMBER 2018		

File: P:\Projects\15-483\FSR-EIR\Drawings\09 - WATER SERVICING\901-Trunk Watermains.dwg - Revised by <JBLANUSA> : Wed, Nov 21 2018 - 3:35pm



PREPARED BY:

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project: Mayfield West FBWB
Client: GSAI
DRAWN: S.K.F.
CHECKED: J. Cole
PROJECT NO.: 160581
DATE: Apr 27, 2018

LEGEND

- Mayfield West Phase 2 Stage 1
- Development Plan
- Catchment Area
- Public LID
- Private LID

SCALE 1:8,000

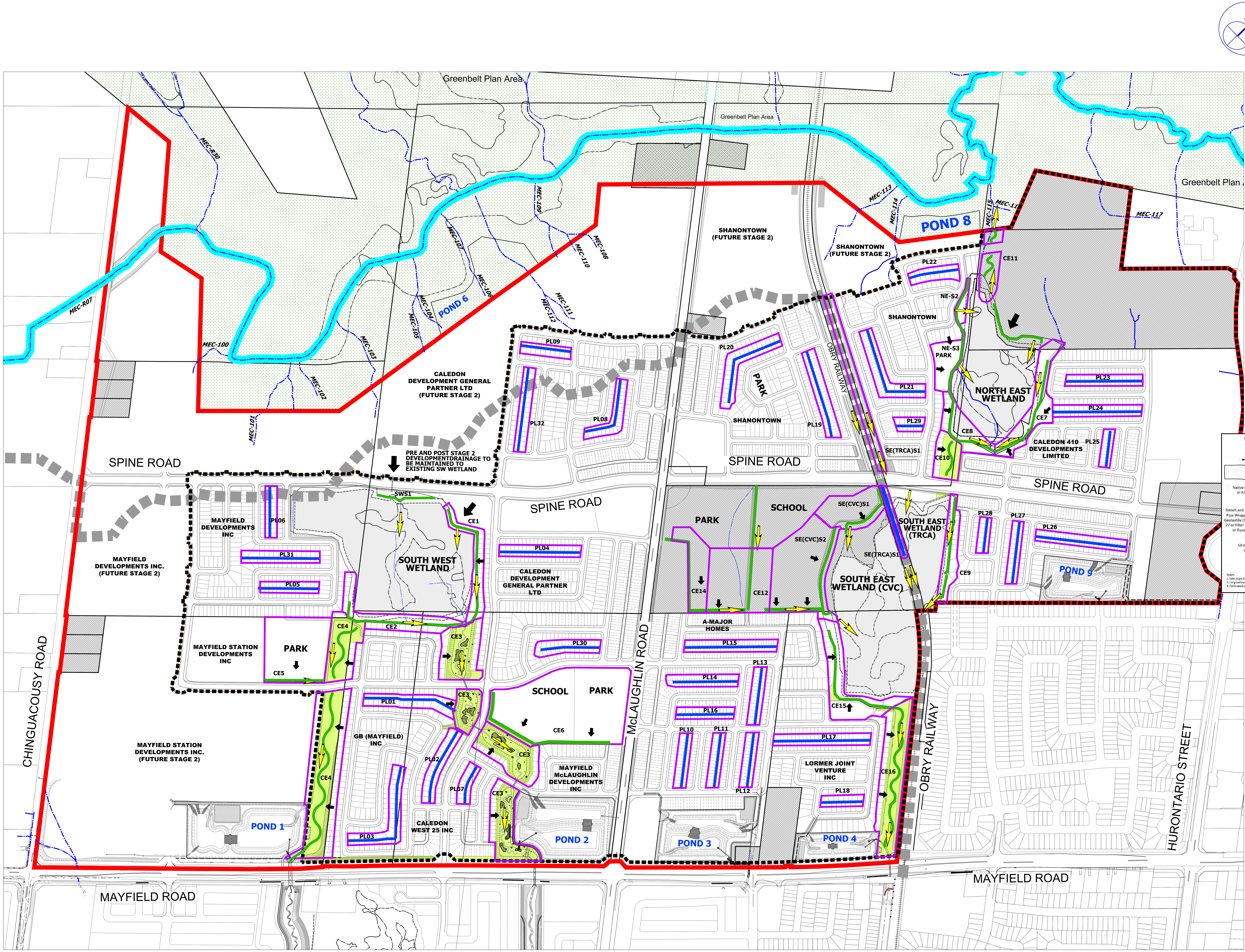
0 100 200 300 400 500
METRES

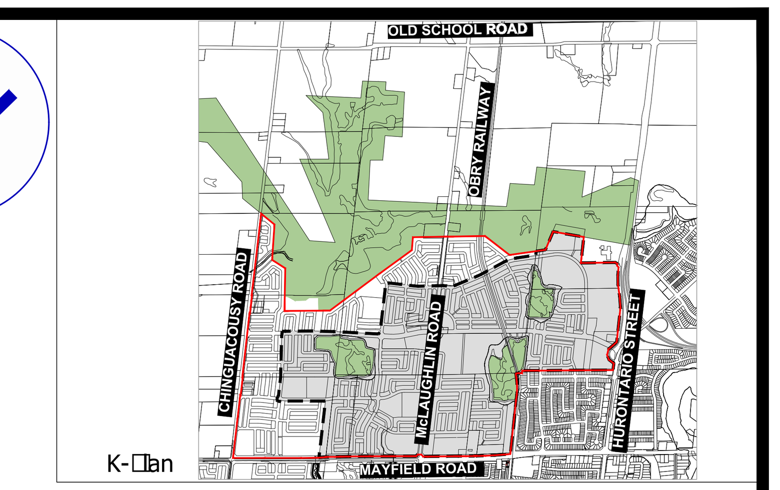
DATA SOURCES: Property boundaries provided by Urbantech Consulting.

Study Area Development Plan with LID Locations

FIGURE 32

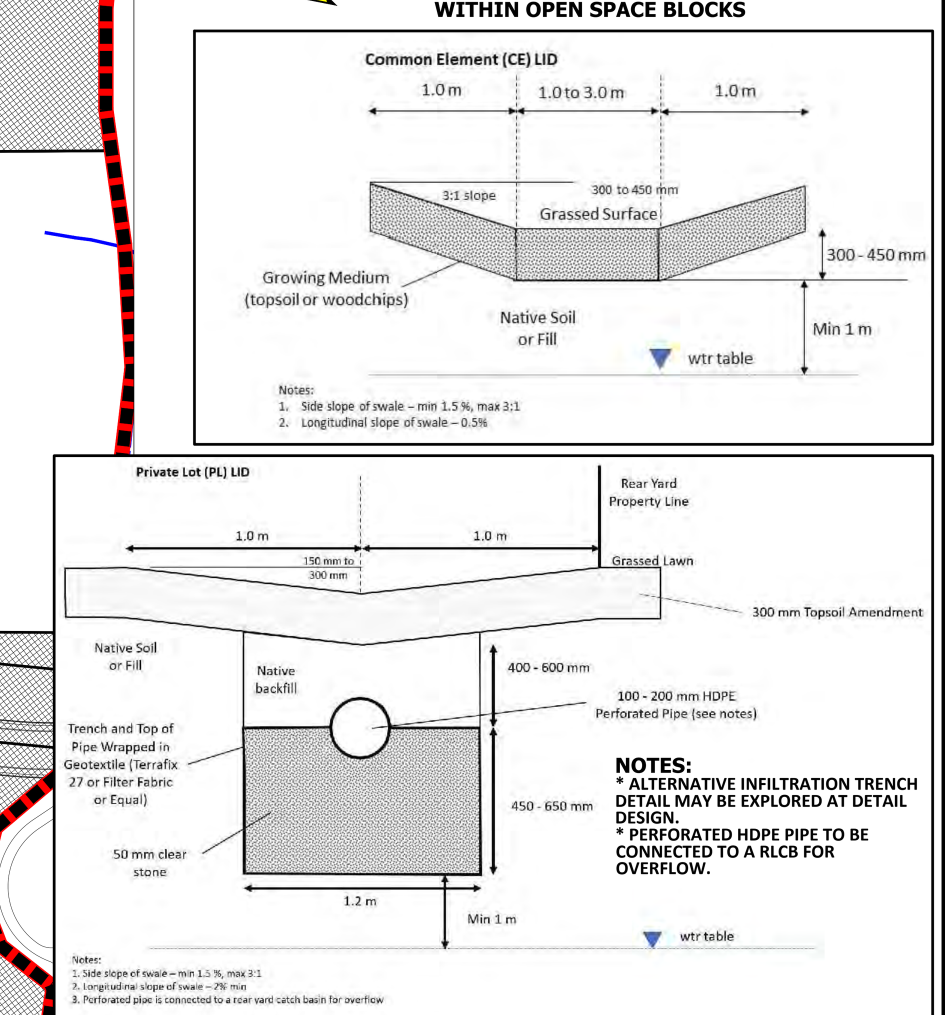
Document Path: C:\Users\Samantha Feist\Documents\GSAI Mayfield\LID-GradingBasedwgs.mxd





LEGEND:

- MAYFIELD WEST 2 FRAMEWORK PLAN LIMIT
- EXISTING ETOBICOKE CREEK
- EXISTING FLETCHERS/ETOBICOKE CREEK WATERSHED BOUNDARY
- MAYFIELD WEST 2 STAGE 1 LIMIT
- PROPOSED GREEN CORRIDOR
- PROPOSED DRAINAGE BOUNDARY TO LID FEATURE
- DIRECTION OF SURFACE FLOW CONTRIBUTING TO LID FEATURE
- PRIVATE LID FEATURE
- PUBLIC LID FEATURE
- DIRECTION OF SURFACE FLOW ENTERING AND WITHIN OPEN SPACE BLOCKS



NOTES:
* ALTERNATIVE INFILTRATION TRENCH DETAIL MAY BE EXPLORED AT DETAIL DESIGN.
* PERFORATED HDPE PIPE TO BE CONNECTED TO A RLCB FOR OVERFLOW.

Notes:
1. Side slope of swale – min 1.5 %, max 3:1
2. Longitudinal slope of swale – 2% min
3. Perforated pipe is connected to a rear yard catch basin for overflow

LID SUMMARY

LID NUMBER	LID VOLUME (M3)	STORAGE VOLUME (M3)
SW-S1	240	135
SE(TRCA)-S1	312	81.9
NE-S1	96	40.5
NE-S2	132	27.8
NE-S3	192	70.9
SE(CVC)-S1	68.5	64.5
SE(CVC)-S2	48.4	46.8
CE1	104	88.9
CE2	119	101.3
CE3	-	94.5
CE4	161.5	58.5
CE5	362.6	309.4
CE6/CE6A	30.2	13.5
CE7	145.6	115.7
CE8	74.7	57.7
CE9	53.1	51.8
CE10	34.3	28.1
CE11	42.3	28.1
CE12	238	196.9
CE14	139.8	112.5
CE15	33.9	28.1
CE16	48.8	33.8

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TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2

MW2 STAGE 1
LID MAP

SURVEYED BY: R.P.E.	DATE: 2015	JOB NO. 15-483	
DRAWN BY: D.L.	CHECKED BY: D.Z.	DRAWING NO. 507	SHEET NO.
DESIGNED BY: D.Z.	CHECKED BY: D.Z.		
SCALE: 1:4000	DATE: MAY 2018		

File: P:\Projects\15-483\FSR-EIR\Drawings\05 - STORM SERVICING\507_LID Map.dwg - Revised by <DZEC> : Sun, May 13 2018 - 9:37am

Figure 18

APPENDIX B

Municipal Servicing

APPENDIX B1

Watermain Servicing

TMIG
The Municipal Infrastructure Group Ltd

8800 Dufferin Street,
Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700
f: 905.738.0065

WATER SERVICING PLAN
FUNCTIONAL SERVICING REPORT
CALEDON 410 DEVELOPMENT - MAYFIELD WEST PHASE 2, TOWN OF CALEDON

SCALE: 1:1250		PROJECT No. 16109
DATE: AUGUST 2019		
DESIGNED BY: CT	DRAWN BY: CT	FIGURE No. WM01
CHECKED BY: AK	CHECKED BY: AK	

File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\Servicing\2019 07 10 - Pipes Figure.dwg, Layout : WM Date: Aug 01, 2019 - 3:44pm, Edit By : akhan

APPENDIX B2

Sanitary Servicing

TMIG
The Municipal Infrastructure Group Ltd
8800 Dufferin Street,
Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700
f: 905.738.0065

SANITARY DRAINAGE PLAN
FUNCTIONAL SERVICING REPORT
CALEDON 410 DEVELOPMENT - MAYFIELD WEST PHASE 2, TOWN OF CALEDON

SCALE: 1:1250		PROJECT No.	16109
DATE: AUGUST 2019			
DESIGNED BY: AK	DRAWN BY: AK	FIGURE No.	SAN01
CHECKED BY: AA	CHECKED BY: AA		

TOWN OF CALEDON

CONSULTING FIRM: TMIG Ltd

ADDRESS: 8800 Dufferin Street
Suite 200, Vaughan
L4K 0C5

PHONE: 905-738-5700

SANITARY SEWER DESIGN

CALEDON 410 - FIELDGATE
Sanitary Network 1

PREPARED BY: AK

CHECKED BY: AA

DATE: AUG 2019

FILE NO: 16109

Location					Residential				Commercial		Miscellaneous Area	Flow Data							Sewer Data						
Street	From		To		Single Family (greater than 10m frontage)		Row Dwellings		Commercial		Road / Park	Total Population	Peaking Factor	Residential Flow	Minimum Residential Flow	Total Area	Infiltration Flow	Total Design Flow (L/s)	Length	Pipe Diameter	Grade	Full Flow Capacity	Full Flow Velocity	Actual Velocity at Design Flow	Percent Full
	MH#	Inv	MH#	Inv	Section Area (ha)	Population	Section Area (ha)	Population	Area (ha)	Population	Area (ha)	P		(L/s)	(L/s)	(ha)	(L/s)	(L/s)	(m)	(mm)	(%)	(L/s)	(m/s)	(m/s)	%
Street O	MH1-1A		MH1-2A		0.650	33						33	4.0	0.5	13.0	0.65	0.1	13.1	82.6	250	1.00	59.5	1.2	1.0	22.1%
	MH1-2A		MH1-4A		0.810	41						74	4.0	1.0	13.0	1.46	0.3	13.3	120.0	250	0.50	42.0	0.9	0.8	31.6%
INFORMATION FROM URBANTECH FSR SAN DESIGN SHEET DEC 2018 EXTERNAL FLOWS NO. 1 URBANTECH MH605B TO STUB 80 POP / HA	MH605B		STUB 1-3A		25.120	2010						2010	3.6	25.2	25.1	25.12	5.0	30.2							
	STUB 1-3A		MH1-4A								0.07	2010	3.6	25.2	25.1	25.19	5.0	30.3	33.3	250	0.50	42.0	0.9	0.0	72.0%
STREET B	MH1-4A		MH1-9A								0.15	2084	3.6	26.1	25.1	26.80	5.4	31.4	73.0	250	0.40	37.6	0.8	0.9	83.6%
STREET O	MH1-5A		MH1-6A		0.260	13						13	4.0	0.2	13.0	0.26	0.1	13.1	49.2	250	1.00	59.5	1.2	1.0	21.9%
	MH1-6A		MH1-7A								0.04	13	4.0	0.2	13.0	0.30	0.1	13.1	11.3	250	0.50	42.0	0.9	0.8	31.1%
	MH1-7A		MH1-8A		0.650	33						46	4.0	0.6	13.0	0.95	0.2	13.2	108.1	250	0.50	42.0	0.9	0.8	31.4%
	MH1-8A		MH1-9A		0.820	41						87	4.0	1.2	13.0	1.77	0.4	13.4	120.0	250	0.50	42.0	0.9	0.8	31.8%
STREET B	MH1-9A		MH1-12A								0.15	2171	3.6	27.1	25.1	28.71	5.7	32.8	72.2	250	0.40	37.6	0.8	0.9	87.2%
STREET K	MH1-10A		MH1-11A		0.530	27					0.25	27	4.0	0.4	13.0	0.78	0.2	13.2	98.2	250	1.00	59.5	1.2	1.0	22.1%
	MH1-11A		MH1-12A		0.510	26						53	4.0	0.7	13.0	1.29	0.3	13.3	120.0	250	0.50	42.0	0.9	0.8	31.5%
STREET B	MH1-12A		MH1-23A				0.44	78	5.64	282		2584	3.5	31.7	29.6	36.09	7.2	38.9	111.2	300	0.50	68.4	1.0	1.0	56.9%
STREET I	MH1-13A		MH1-14A				0.32	56				56	4.0	0.8	13.0	0.32	0.1	13.1	33.2	250	1.00	59.5	1.2	1.0	22.0%
	MH1-14A		MH1-16A				0.68	119				175	4.0	2.5	13.0	1.00	0.2	13.2	120.0	250	0.50	42.0	0.9	0.8	31.4%
STREET K	MH1-15A		MH1-16A		0.430	22						22	4.0	0.3	13.0	0.43	0.1	13.1	68.8	250	1.00	59.5	1.2	1.0	22.0%
STREET I	MH1-16A		MH1-18A				0.32	56				253	4.0	3.5	13.0	1.75	0.4	13.4	72.9	250	0.50	42.0	0.9	0.8	31.7%
STREET L	MH1-17A		MH1-18A		0.540	27						27	4.0	0.4	13.0	0.54	0.1	13.1	78.5	250	1.00	59.5	1.2	1.0	22.0%
STREET I	MH1-18A		MH1-20A				0.35	61				341	4.0	4.8	13.0	2.64	0.5	13.5	73.1	250	0.50	42.0	0.9	0.8	32.2%
STREET M	MH1-19A		MH1-20A				0.47	82				82	4.0	1.1	13.0	0.47	0.1	13.1	83.8	250	1.00	59.5	1.2	1.0	22.0%
STREET I	MH1-20A		MH1-22A				0.21	37				460	4.0	6.4	13.0	3.32	0.7	13.7	42.9	250	0.50	42.0	0.9	0.8	32.5%
STREET N	MH1-21A		MH1-22A				0.46	81				81	4.0	1.1	13.0	0.46	0.1	13.1	86.2	250	1.00	59.5	1.2	1.0	22.0%
STREET I	MH1-22A		MH1-23A				0.38	67				608	3.9	8.4	13.0	4.16	0.8	13.8	74.0	250	1.00	59.5	1.2	1.0	23.3%
STREET B	MH1-23A		MH1-29A						0.81	41	0.14	3233	3.4	38.7	36.1	41.20	8.2	46.9	79.9	300	0.50	68.4	1.0	1.0	68.6%
SPINE ROAD (TIM MANLEY BLVD)	MH1-24A		MH1-25A						0.36	18	0.45	18	4.0	0.3	13.0	0.81	0.2	13.2	81.7	250	1.00	59.5	1.2	1.0	22.1%
	MH1-25A		MH1-29A								0.36	18	4.0	0.3	13.0	1.17	0.2	13.2	89.8	250	0.50	42.0	0.9	0.8	31.5%
SPINE ROAD (TIM MANLEY BLVD)	MH1-26A		MH1-27A				0.71	124				124	4.0	1.7	13.0	0.71	0.1	13.1	68.6	250	1.00	59.5	1.2	1.0	22.1%
	MH1-27A		MH1-28A				1.05	184				308	4.0	4.3	13.0	1.76	0.4	13.4	120.0	250	0.50	42.0	0.9	0.8	31.8%
	MH1-28A		MH1-29A				0.99	173				481	4.0	6.7	13.0	2.75	0.6	13.6	120.0	250	0.50	42.0	0.9	0.8	32.2%
STREET B	MH1-29A		MH1-33A								0.11	3732	3.4	43.9	41.5	45.23	9.0	53.0	80.1	375	0.35	103.7	0.9	0.9	51.1%
STREET H	MH1-30A		MH1-31A				0.33	58				58	4.0	0.8	13.0	0.33	0.1	13.1	74.8	250	1.00	59.5	1.2	1.0	22.0%
	MH1-31A		MH1-32A				0.85	149				207	4.0	2.9	13.0	1.18	0.2	13.2	120.0	250	0.50	42.0	0.9	0.8	31.5%
	MH1-32A		MH1-33A				0.75	131				338	4.0	4.7	13.0	1.93	0.4	13.4	120.0	250	0.50	42.0	0.9	0.8	31.8%

TOWN OF CALEDON

CONSULTING FIRM: TMIG Ltd

ADDRESS: 8800 Dufferin Street
Suite 200, Vaughan
L4K 0C5

PHONE: 905-738-5700

SANITARY SEWER DESIGN

CALEDON 410 - FIELDGATE
Sanitary Network 1

PREPARED BY: AK

CHECKED BY: AA

DATE: AUG 2019

FILE NO: 16109

Location					Residential				Commercial		Miscellaneous Area	Flow Data							Sewer Data						
Street	From		To		Single Family (greater than 10m frontage)		Row Dwellings		Commercial		Road / Park	Total Population	Peaking Factor	Residential Flow	Minimum Residential Flow	Total Area	Infiltration Flow	Total Design Flow (L/s)	Length	Pipe Diameter	Grade	Full Flow Capacity	Full Flow Velocity	Actual Velocity at Design Flow	Percent Full
	MH#	Inv	MH#	Inv	Section Area (ha)	Population	Section Area (ha)	Population	Area (ha)	Population	Area (ha)	P		(L/s)	(L/s)	(ha)	(L/s)	(L/s)	(m)	(mm)	(%)	(L/s)	(m/s)	(m/s)	%
STREET B	MH1-33A		MH1-37A								0.12	4070	3.3	47.4	46.7	47.28	9.5	56.9	68.0	375	0.35	103.7	0.9	1.0	54.9%
STREET G	MH1-34A		MH1-35A		0.11	6						6	4.0	0.1	13.0	0.11	0.0	13.0	20.0	250	1.00	59.5	1.2	1.0	21.9%
	MH1-35A		MH1-36A		0.47	24						30	4.0	0.4	13.0	0.58	0.1	13.1	100.0	250	0.50	42.0	0.9	0.8	31.2%
	MH1-36A		MH1-37A		0.51	26						56	4.0	0.8	13.0	1.09	0.2	13.2	120.0	250	0.50	42.0	0.9	0.8	31.4%
STREET B	MH1-37A		MH1-38A								0.00	4126	3.3	48.0	46.7	48.37	9.7	57.7	6.0	375	0.30	96.0	0.9	0.9	60.1%
PROPOSED 8M WIDE EASEMENT	MH1-38A		MH1-39A								0.05	4126	3.3	48.0	46.7	48.42	9.7	57.7	74.9	375	0.30	96.0	0.9	0.9	60.1%
	MH1-39A		MH1-40A								0.09	4126	3.3	48.0	46.7	48.51	9.7	57.7	100.3	375	0.30	96.0	0.9	0.9	60.1%
	MH1-40A		MH1-41A						3.43	172	0.08	4298	3.3	49.8	49.2	52.02	10.4	60.2	100.3	375	0.30	96.0	0.9	0.9	62.7%
HURONTARIO STREET	MH1-41A		MH1-42A								0.02	4298	3.3	49.8	49.2	52.04	10.4	60.2	48.5	375	0.30	96.0	0.9	0.9	62.7%
HIGHWOOD ROAD	MH1-42A		Outlet NO. 4								0.01	4298	3.3	49.8	49.2	52.05	10.4	60.2	44.2	375	0.30	96.0	0.9	0.9	62.7%

Region of Peel standards
Single Family (greater than 10m frontage) = 50 persons/ha
Single Family (less than 10m frontage) / Semi Detached = 70 persons/ha
Row Dwellings = 175 persons/ha
Apartments = 475 persons/ha
Residential Flows = 302.8 L/c/d
Commercial = 50 persons/ha
Light Industrial = 70 persons/ha
Institutional (Junior Public School) = 600 persons/ha
Institutional (Senior Public School) = 900 persons/ha
Institutional (Secondary School) = 1500 persons/ha

NOTES

$$P.F. = 1 + \frac{14}{4 + (pop)^{0.5}}$$

Residential Flows	302.8 L/c/d
Domestic Sewage Flows for <1000 ppl	0.013 m3/s
Extraneous Flows	0.2 L/ha/s

NO.	REVISION	DATE	AUTH
2	SECOND SUBMISSION	Aug-19	
1	FIRST SUBMISSION	Dec-17	

TOWN OF CALEDON

SANITARY SEWER DESIGN SHEET

SCALE: N.T.S.		Date:	8/1/2019
DRAWN BY: AK	FILE: 16109	DWG NO: SAN	

TOWN OF CALEDON

CONSULTING FIRM: TMIG Ltd

PREPARED BY: AK

ADDRESS: 8800 Dufferin Street
Suite 200, Vaughan
L4K 0C5

SANITARY SEWER DESIGN

CHECKED BY: AA

DATE: AUG 2019

CALEDON 410 - FIELDGATE
Sanitary Network 2

PHONE: 905-738-5700

FILE NO: 16109

Location					Residential				Commercial		Miscellaneous Area	Flow Data							Sewer Data						
Street	From		To		Single Family (greater than 10m frontage)		Row Dwellings		Commercial		Road	Total Population	Peaking Factor	Residential Flow	Minimum Residential Flow	Total Area	Infiltration Flow	Total Design Flow (L/s)	Length	Pipe Diameter	Grade	Full Flow Capacity	Full Flow Velocity	Actual Velocity at Design Flow	Percent Full
	MH#	Inv	MH#	Inv	Section Area (ha)	Population	Section Area (ha)	Population	Area (ha)	Population	Area (ha)	P		(L/s)	(L/s)	(ha)	(L/s)	(L/s)	(m)	(mm)	(%)	(L/s)	(m/s)	(m/s)	%
STREET E	MH2-1A		MH2-2A		0.08	4						4	4.0	0.1	13.0	0.08	0.0	13.0	8.5	250	1.0	59.5	1.2	1.0	21.9%
	MH2-2A		MH2-3A		0.28	14						18	4.0	0.3	13.0	0.36	0.1	13.1	43.5	250	0.4	37.6	0.8	0.7	34.8%
	MH2-3A		MH2-4A		0.14	7						25	4.0	0.4	13.0	0.50	0.1	13.1	23.2	250	0.4	37.6	0.8	0.7	34.8%
	MH2-4A		MH2-5A		0.89	45						70	4.0	1.0	13.0	1.39	0.3	13.3	109.5	250	0.4	37.6	0.8	0.7	35.3%
	MH2-5A		MH2-7A									70	4.0	1.0	13.0	1.39	0.3	13.3	17.5	250	0.4	37.6	0.8	0.7	35.3%
STREET D	MH2-6A		MH2-7A				0.14	25				25	4.0	0.4	13.0	0.14	0.0	13.0	39.4	250	1.0	59.5	1.2	1.0	21.9%
	MH2-7A		MH2-11A				0.20	35				130	4.0	1.8	13.0	1.74	0.3	13.3	60.3	250	0.5	42.0	0.9	0.8	31.7%
SPINE ROAD (TIM MANLEY BLVD)	MH2-8A		MH2-9A				0.28	49				49	4.0	0.7	13.0	0.28	0.1	13.1	35.6	250	1.0	59.5	1.2	1.0	22.0%
	MH2-9A		MH2-10A				0.74	130				179	4.0	2.5	13.0	1.02	0.2	13.2	87	250	0.5	42.0	0.9	0.8	31.4%
STREET C	MH2-10A		MH2-11A								0.14	179	4.0	2.5	13.0	1.16	0.2	13.2	80.1	250	0.5	42.0	0.9	0.8	31.5%
	MH2-11A		MH2-12A		0.50	25						334	4.0	4.7	13.0	3.40	0.7	13.7	74.9	250	0.5	42.0	0.9	0.8	32.5%
	MH2-12A		MH2-17A		0.56	28						362	4.0	5.1	13.0	3.96	0.8	13.8	74.9	250	0.5	42.0	0.9	0.8	32.8%
STREET F	MH2-13A		MH2-14A		0.12	6						6	4.0	0.1	13.0	0.12	0.0	13.0	20	250	1.0	59.5	1.2	1.0	21.9%
	MH2-14A		MH2-15A		0.64	32						38	4.0	0.5	13.0	0.76	0.2	13.2	94.8	250	0.5	42.0	0.9	0.8	31.3%
	MH2-15A		MH2-16A		0.17	9						47	4.0	0.7	13.0	0.93	0.2	13.2	13.7	250	0.5	42.0	0.9	0.8	31.4%
	MH2-16A		MH2-17A		0.29	14						61	4.0	0.9	13.0	1.22	0.2	13.2	65.5	250	0.5	42.0	0.9	0.8	31.5%
	MH2-17A		MH2-18A		0.13	7						430	4.0	6.0	13.0	5.30	1.1	14.1	30.4	250	0.5	42.0	0.9	0.8	33.4%
STREET C	MH2-18A		Outlet NO.3		0.09	5						435	4.0	6.1	13.0	5.39	1.1	14.1	20.2	250	0.5	42.0	0.9	0.8	33.5%

Region of Peel standards
Single Family (greater than 10m frontage) = 50 persons/ha
Single Family (less than 10m frontage) / Semi Detached = 70 persons/ha
Row Dwellings = 175 persons/ha
Apartments = 475 persons/ha
Residential Flows = 302.8 L/c/d
Commercial = 50 persons/ha
Light Industrial = 70 persons/ha
Institutional (Junior Public School) = 600 persons/ha
Institutional (Senior Public School) = 900 persons/ha
Institutional (Secondary School) = 1500 persons/ha

NO.	REVISION	DATE	AUTH
2	SECOND SUBMISSION	Aug-19	
1	FIRST SUBMISSION	Dec-17	

TOWN OF CALEDON

SANITARY SEWER DESIGN SHEET

SCALE: N.T.S.		Date:	8/1/2019
DRAWN BY: AK	FILE: 16109	DWG NO: SAN	

APPENDIX B3

Stormwater Management

File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\Servicing\2019 07 10 - Pipes Figure.dwg, Layout : STM Date: Aug 01, 2019 - 5:46pm, Edit By : akhan

TMIG
The Municipal Infrastructure Group Ltd
8800 Dufferin Street,
Suite 200
Vaughan, ON
L4K 0C5
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f: 905.738.0065

STORM DRAINAGE PLAN
FUNCTIONAL SERVICING REPORT
CALEDON 410 DEVELOPMENT - MAYFIELD WEST PHASE 2, TOWN OF CALEDON

SCALE: 1:1250		PROJECT No. 16109
DATE: AUGUST 2019		
DESIGNED BY: AK	DRAWN BY: AK	FIGURE No. STM01
CHECKED BY: AA	CHECKED BY: AA	

TOWN OF CALEDON

TOWN OF CALEDON

CONSULTING FIRM: TMIG LTD

PREPARED BY: AK

ADDRESS: 8800 Dufferin Street, Suite 200
Vaughan, ONT
L4K 0C5

STORM SEWER DESIGN (10 YEAR AND 100 YEAR STORM EVENT)

CHECKED BY: AA

CALEDON 410 FIELDGATE
Storm Sewer System 1

DATE: AUGUST 2019

PHONE: 905-738-5700

FILE NO: 16109

STREET	Upstream Manhole	Downstream Manhole	Area (A) of P/RY/C > 4 ha (ha) C=0.27	Area (A) of P/RY/C < 4 ha (ha) C=0.27	Area (A) of Single Fam. (ha) C=0.65	Area (A) of Semi Det. (ha) C=0.65	Area (A) of Row Dewl. (ha) C=0.75	Area (A) of Roads / Comm. (ha) C=0.9	Runoff Coefficient	A x R this section (ha)	Acc. AR (ha)	t (min)	I (10yr) (mm/hr)	Q (10yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Pipe	Pipe (mm)	Grade (%)	Capacity (l/s)	Velocity (m/s)	Length (m)	Time (min)	Total Time (min)	% Capacity (10 year)
STREET O	MH1-1	MH1-2			0.65				0.65	0.422	0.422	10.00	134.16	158.69	196.54	232.47	METRIC	450	0.40	180.32	1.13	92.3	1.36	11.36	88.0%
	MH1-2	MH1-3			0.79				0.65	0.514	0.936	11.36	127.07	332.99	187.48	491.31	METRIC	600	0.40	388.34	1.37	110.0	1.33	12.69	85.7%
	MH1-3	MH1-5								0.000	0.936	12.69	120.81	316.60	179.36	470.03	METRIC	600	0.40	388.34	1.37	12.4	0.15	12.84	81.5%
EXTERNAL INTERIM DESIGN FLOWS NO. 1 (STREET B)	EXT FLOWS NO. 1	MH1-4	9.19						0.27	2.481	2.481	19.00	98.26	682.70	149.01	1035.24	METRIC							19.00	
	MH1-4	MH1-5						0.10	0.90	0.090	2.571	19.00	98.26	707.46	149.01	1072.79	METRIC	600	2.50	970.84	3.43	44.5	0.22	19.22	72.9%
STREET B	MH1-5	MH1-11						0.15	0.90	0.132	3.640	19.22	97.65	995.11	148.15	1509.80	METRIC	900	0.40	1144.94	1.80	70.5	0.65	19.87	86.9%
STREET O	MH1-6	MH1-7			0.25				0.65	0.165	0.165	10.00	134.16	62.13	196.54	91.02	METRIC	375	0.40	110.89	1.00	50.8	0.84	10.84	56.0%
	MH1-7	MH1-8								0.000	0.165	10.84	129.66	60.05	190.80	88.36	METRIC	375	0.40	110.89	1.00	14.2	0.24	11.08	54.2%
	MH1-8	MH1-9			0.65				0.65	0.423	0.588	11.08	128.45	211.45	189.26	311.55	METRIC	525	0.40	272.00	1.26	109.8	1.46	12.54	77.7%
	MH1-9	MH1-10			0.82				0.65	0.536	1.124	12.54	121.51	382.33	180.27	567.21	METRIC	675	0.30	460.41	1.29	110.0	1.42	13.96	83.0%
	MH1-10	MH1-11								0.000	1.124	13.96	115.44	363.22	172.28	542.07	METRIC	675	0.30	460.41	1.29	9.0	0.12	14.08	78.9%
STREET B	MH1-11	MH1-15						0.15	0.90	0.132	4.896	19.87	95.83	1313.65	145.62	1996.28	METRIC	900	0.65	1459.52	2.29	72.1	0.52	20.39	90.0%
STREET K	MH1-12	MH1-13			0.51				0.65	0.329	0.329	10.00	134.16	123.55	196.54	180.99	METRIC	450	0.40	180.32	1.13	110.0	1.62	11.62	68.5%
	MH1-13	MH1-14			0.51				0.65	0.333	0.662	11.62	125.79	233.04	185.84	344.28	METRIC	600	0.30	336.31	1.19	114.6	1.61	13.22	69.3%
	MH1-14	MH1-15								0.000	0.662	13.22	118.50	219.53	176.32	326.66	METRIC	600	0.30	336.31	1.19	7.4	0.10	13.33	65.3%
BLOCK 255 - COMMERCIAL BLOCK FLOWS OUTFLOW RATE = 680 L/s	BLOCK 255	MH1-15						5.57						680.00											
STREET B	MH1-15	MH1-29					0.45		0.75	0.338	5.895	20.39	94.42	2238.49	143.66	2371.26	METRIC	1800X900	0.40	3246.08	2.11	113.5	0.90	21.29	69.0%
EXTERNAL NHS FLOWS	NHS	MH1-17	6.60						0.27	1.782	1.782	14.20	114.48	571.21	171.01	853.26	METRIC							14.20	
STREET I	MH1-16	MH1-17					0.26		0.75	0.195	0.195	10.00	134.16	73.25	196.54	107.31	METRIC	375	0.40	110.89	1.00	57.0	0.95	10.95	66.1%
	MH1-17	MH1-19					0.31		0.75	0.233	2.210	14.20	114.48	708.24	171.01	1057.95	METRIC	825	0.30	786.22	1.47	92.1	1.04	15.24	90.1%
STREET K	MH1-18	MH1-19			0.46				0.65	0.299	0.299	10.00	134.16	112.32	196.54	164.54	METRIC	450	0.40	180.32	1.13	72.2	1.06	11.06	62.3%
STREET I	MH1-19	MH1-21					0.24		0.75	0.180	2.689	15.24	110.49	831.76	165.68	1247.18	METRIC	900	0.30	991.55	1.56	73.0	0.78	16.02	83.9%
STREET L	MH1-20	MH1-21			0.55				0.65	0.358	0.358	10.00	134.16	134.30	196.54	196.73	METRIC	450	0.40	180.32	1.13	77.6	1.14	11.14	74.5%
STREET I	MH1-21	MH1-23					0.25		0.75	0.188	3.234	16.02	107.69	975.03	161.91	1465.86	METRIC	975	0.30	1227.48	1.64	73.0	0.74	16.76	79.4%
STREET M	MH1-22	MH1-23					0.47		0.75	0.353	0.353	10.00	134.16	132.42	196.54	193.98	METRIC	450	0.30	156.16	0.98	83.2	1.41	11.41	84.8%
STREET I	MH1-23	MH1-25					0.14		0.75	0.105	3.691	16.76	105.17	1086.95	158.49	1637.95	METRIC	1050	0.30	1495.68	1.73	43.0	0.41	17.18	72.7%
STREET N	MH1-24	MH1-25					0.47		0.75	0.353	0.353	10.00	134.16	132.42	196.54	193.98	METRIC	450	0.30	156.16	0.98	86.5	1.47	11.47	84.8%
STREET I	MH1-25	MH1-27					0.11		0.75	0.083	4.126	17.18	103.82	1199.36	156.64	1809.60	METRIC	1050	0.30	1495.68	1.73	37.0	0.36	17.54	80.2%
LANE E	MH1-26	MH1-27					0.18		0.75	0.135	0.135	10.00	134.16	50.71	196.54	74.29	METRIC	375	0.30	96.03	0.87	89.3	1.71	11.71	52.8%
STREET I	MH1-27	MH1-28					0.09		0.75	0.068	4.329	17.54	102.68	1244.40	155.08	1879.52	METRIC	1050	0.30	1495.68	1.73	28.2	0.27	17.81	83.2%
	MH1-28	MH1-29								0.000	4.329	17.81	101.82	1234.09	153.91	1865.38	METRIC	1050	0.30	1495.68	1.73	12.5	0.12	17.93	82.5%
STREET B	MH1-29	MH1-37						0.07	0.90	0.062	10.285	21.29	92.11	3332.52	140.42	4043.87	METRIC	2400x1200	0.40	7257.63	2.59	31.5	0.20	21.49	45.9%
LANE C	MH1-30	MH1-31						0.02	0.90	0.018	0.018	10.00	134.16	6.76	196.54	9.91	METRIC	300	0.40	61.16	0.87	15.2	0.29	10.29	11.1%
	MH1-31	MH1-32						0.02	0.90	0.015	0.033	10.29	132.56	12.19	194.51	17.89	METRIC	300	0.40	61.16	0.87	11.9	0.23	10.52	19.9%
	MH1-32	MH1-33					0.17		0.75	0.128	0.160	10.52	131.34	58.97	192.95	86.63	METRIC	375	0.40	110.89	1.00	80.5	1.34	11.86	53.2%
LANE D	MH1-33	MH1-34					0.21		0.75	0.158	0.318	11.86	124.64	110.93	184.34	164.06	METRIC	450	0.40	180.32	1.13	110.0	1.62	13.48	61.5%
	MH1-34	MH1-35					0.22		0.75	0.165	0.483	13.48	117.43	158.77	174.92	236.49	METRIC	450	0.40	180.32	1.13	110.0	1.62	15.09	88.0%
	MH1-35	MH1-36					0.22		0.75	0.165	0.648	15.09	111.05	201.44	166.43	301.90	METRIC	525	0.40	272.00	1.26	110.0	1.46	16.55	74.1%
	MH1-36	MH1-37								0.000	0.648	16.55	105.89	192.07	159.46	289.25	METRIC	525	0.40	272.00	1.26	9.7	0.13	16.68	70.6%
STEEET B	MH1-37	MH1-44						0.10	0.90	0.090	11.023	21.49	91.60	3507.19	139.71	4312.02	METRIC	2400x1200	0.40	7257.63	2.59	39.8	0.26	21.75	48.3%
STREET A (SPINE ROAD)	MH1-38	MH1-39						0.79	0.90	0.711	0.711	10.00	134.16	267.09	196.54	391.26	METRIC	600	0.30	336.31	1.19	57.3	0.80	10.80	79.4%
	MH1-39	MH1-44						1.14	0.90	1.026	1.737	10.80	129.87	631.61	191.07	929.29	METRIC	825	0.30	786.22	1.47	92.8	1.05	11.85	80.3%
*FROM URBANTECH FSR	EXT FLOWS NO. 2 MH9-08	MH1-40									3.230	13.18	118.68	1073.37	176.57	1596.86	METRIC	900	0.50	1280.09	2.01	75.3	0.62	13.80	83.9%
STREET A (SPINE ROAD)	MH1-40	MH1-41					0.66		0.75	0.495	3.725	13.80	116.08	1210.67	173.12	1805.68	METRIC	1050	0.40	1727.07	1.99	92.5	0.77	14.58	70.1%
	MH1-41	MH1-42					0.85		0.75	0.638	4.363	14.58	113.01	1380.37	169.04	2064.86	METRIC	1050	0.40	1727.07	1.99	120.0	1.00	15.58	79.9%
	MH1-42	MH1-43					0.79		0.75	0.593	4.955	15.58	109.27	1516.00	164.03	2275.79	METRIC	1200	0.40	2465.78	2.18	120.0	0.92	16.50	61.5%
	MH1-43	MH1-44					0.73		0.75	0.548	5.503	16.50	106.07	1634.23	159.71	2460.61	METRIC	1200	0.40	2465.78	2.18	116.3	0.89	17.39	66.3%
STREET B	MH1-44	MH1-48						0.10	0.90	0.090	18.353	21.75	90.97	5354.64	138.82	7133.55	METRIC	2400x1200	0.50	8114.28	2.90	47.5	0.27	22.02	66.0%
LANE B	MH1-45	MH1-46					0.22		0.75	0.165	0.165	10.00	134.16	61.98	196.54	90.80	METRIC	375	0.40	110.89	1.00	97.4	1.62	11.62	55.9%
	MH1-46	MH1-47					0.18		0.75	0.135	0.300	11.62	125.79	105.67	185.84	156.10	METRIC	450	0.40	180.32	1.13	89.7	1.32	12.94	58.6%
	MH1-47	MH1-48								0.000	0.300	12.94	119.74	100.58	177.95	149.48	METRIC	450	0.40	180.32	1.13	7.6	0.11	13.05	55.8%
STREET B	MH1-48	MH1-52						0.07	0.90	0.063	18.716	22.02	90.31	5412.33	137.88	7225.63	METRIC	2400x1200	0.50	8114.28	2.90	40.6	0.23	22.26	66.7%
STREET H	MH1-49	MH1-50					0.78		0.75	0.585	0.585	10.00	134.16	219.76	196.54	321.93	METRIC	600	0.30	336.31	1.19	110.0	1.54	11.54	65.3%
	MH1-50	MH1-51					0.67		0.75	0.503	1.088	11.54	126.16	384.16	186.31	567.32	METRIC	750	0.30	609.77	1.38	110.0	1.33	12.87	63.0%
	MH1-51	MH1-52								0.000	1.088	12.87	120.03	365.48	178.33	543.02	METRIC	750	0.30	609.77	1.38	11.7	0.14	13.01	59.9%

TOWN OF CALEDON

TOWN OF CALEDON

CONSULTING FIRM: **TMIG LTD**

ADDRESS: **8800 Dufferin Street, Suite 200**
Vaughan, ONT
L4K 0C5

PHONE: **905-738-5700**

STORM SEWER DESIGN (10 YEAR AND 100 YEAR STORM EVENT)

CALEDON 410 FIELDGATE
Storm Sewer System 1

PREPARED BY: AK
CHECKED BY: AA
DATE: AUGUST 2019
FILE NO: 16109

STREET	Upstream Manhole	Downstream Manhole	Area (A) of P/RY/C > 4 ha (ha) C=0.27	Area (A) of P/RY/C < 4 ha (ha) C=0.27	Area (A) of Single Fam. (ha) C=0.65	Area (A) of Semi Det. (ha) C=0.65	Area (A) of Row Dewl. (ha) C=0.75	Area (A) of Roads / Comm. (ha) C=0.9	Runoff Coefficient	A x R this section (ha)	Acc. AR (ha)	t (min)	I (10yr) (mm/hr)	Q (10yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Pipe	Pipe (mm)	Grade (%)	Capacity (l/s)	Velocity (m/s)	Length (m)	Time (min)	Total Time (min)	% Capacity (10 year)
STREET B	MH1-52	MH1-53						0.10	0.90	0.090	19.893	22.26	89.75	5678.92	137.09	7636.26	METRIC	2400x1200	0.50	8114.28	2.90	54.8	0.32	22.57	70.0%
	MH1-53	MH1-54						3.33		2.997	22.890	22.57	89.00	6384.41	136.04	8719.34	METRIC	2400x1200	0.50	8114.28	2.90	14.9	0.09	22.66	78.7%
	MH1-54	MH1-55			0.24				0.65	0.156	23.046	22.66	88.80	6410.39	135.76	8760.51	METRIC	2400X1200	0.50	8114.28	2.90	33.1	0.19	22.85	79.0%
	MH1-55	MH1-59								0.000	23.046	22.85	88.36	6381.95	135.14	8720.23	METRIC	2400x1200	0.50	8114.28	2.90	15.4	0.09	22.94	78.7%
STREET G	MH1-56	MH1-57			0.43				0.65	0.280	0.280	10.00	134.16	104.99	196.54	153.81	METRIC	450	0.30	156.16	0.98	76.6	1.30	11.30	67.2%
	MH1-57	MH1-58			0.42				0.65	0.273	0.553	11.30	127.35	197.00	187.84	290.59	METRIC	525	0.30	235.56	1.09	89.4	1.37	12.67	83.6%
	MH1-58	MH1-59								0.000	0.553	12.67	120.91	187.05	179.49	277.67	METRIC	525	0.30	235.56	1.09	15.4	0.24	12.91	79.4%
SWMPOND 9	MH1-59	MH1-60								0.000	23.599	22.94	88.16	6505.21	134.85	8910.22	METRIC	2400x1200	0.50	8114.28	2.90	9.9	0.06	22.99	80.2%
	MH1-60	Headwall 1								0.000	23.599	22.99	88.03	6496.60	134.66	8898.01	METRIC	2400x1200	0.50	8114.28	2.90	12.7	0.07	23.07	80.1%

RUNOFF COEFFICIENTS (R)

0.27: PARK - RAILYARDS - CEMETERIES (OVER 4 HA)
0.65: SINGLE FAMILY RESIDENTIAL (SUBURBAN)
0.65: SEMI DETACHED (SUBURBAN)
0.75: ROW DWELLINGS
0.76: SCHOOL
0.90: ROAD - COMMERCIAL

NO.	REVISION	DATE	AUTH
2	Second Submission	Aug-19	
1	First Submission	Dec-17	

TOWN OF CALEDON
DIVISION

STORM SEWER DESIGN SHEET

SCALE: N.T.S.		DATE: AUGUST 2019
DRAWN BY: AK	16109	DWG. NO.: STM

TOWN OF CALEDON

CONSULTING FIRM:	**TMIG LTD**		**PREPARED BY:** **AK**
ADDRESS:	**8800 Dufferin Street, Suite 200** **Vaughan, ONT** **L4K 0C5**	**STORM SEWER DESIGN (10 YEAR AND 100 YEAR STORM EVENT)** **CALEDON 410 FIELDGATE** **Storm Sewer System 2**	**CHECKED BY:** **AA** **DATE:** **AUGUST 2019**
PHONE:	**905-738-5700**		**FILE NO:** **16109**

STREET	Upstream Manhole	Downstream Manhole	Area (A) of P/RY/C (ha)	Area (A) of P/RY/C < 4 ha (ha)	Area (A) of Single Fam. (ha) C=0.65	Area (A) of Semi Det. (ha) C=0.65	Area (A) of Row Dewl. (ha) C=0.75	Area (A) of Road / Comm (ha) C=0.9	Runoff Coefficient	A x R this section (ha)	Acc. AR (ha)	t (min)	I (10yr) (mm/hr)	Q (10yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Pipe	Pipe (mm)	Grade (%)	Capacity (l/s)	Velocity (m/s)	Length (m)	Time (min)	Total Time (min)	% Capacity (10 year)
STREET E (100 year capture)	MH2-1	MH2-2			0.30				0.65	0.197	0.197	10.00	134.16	74.01	196.54	108.41	METRIC	375	0.50	123.98	1.12	27.2	0.40	10.40	59.7%
100 - 10 YEAR FLOW FROM MH2-1 TO MH2-2														34.41											
	MH2-2	MH2-3			0.18				0.65	0.118	0.315	10.40	131.96	150.67	193.75	170.69	METRIC	450	0.50	201.60	1.27	17.9	0.24	10.64	74.7%
	MH2-3	MH2-4			0.27				0.65	0.173	0.488	10.64	130.72	212.85	192.16	262.32	METRIC	525	0.50	304.10	1.40	47.1	0.56	11.20	70.0%
STREET E	MH2-4	MH2-5			0.63				0.65	0.409	0.897	11.20	127.86	355.50	188.50	473.38	METRIC	600	0.50	434.17	1.54	80.0	0.87	12.07	81.9%
	MH2-5	MH2-7								0.000	0.897	12.07	123.66	344.96	183.07	459.76	METRIC	600	0.50	434.17	1.54	11.1	0.12	12.19	79.5%
STREET D	MH2-6	MH2-7					0.13		0.75	0.098	0.098	10.00	134.16	36.63	196.54	53.65	METRIC	300	2.00	136.76	1.93	34.4	0.30	10.30	26.8%
	MH2-7	MH2-12					0.25		0.75	0.188	1.182	12.19	123.10	441.80	182.35	603.45	METRIC	675	0.50	594.39	1.66	79.4	0.80	12.98	74.3%
LANE A	MH2-8	MH2-10					0.19		0.75	0.143	0.143	10.00	134.16	53.53	196.54	78.42	METRIC	300	1.25	108.11	1.53	103.1	1.12	11.12	49.5%
LANE B	MH2-9	MH2-10					0.21		0.75	0.158	0.158	10.00	134.16	59.17	196.54	86.67	METRIC	300	0.50	68.38	0.97	100.6	1.73	11.73	86.5%
STREET C	MH2-10	MH2-11						0.13	0.90	0.117	0.417	11.73	125.23	146.29	185.11	216.23	METRIC	375	1.25	196.03	1.77	28.5	0.27	12.00	74.6%
	MH2-11	MH2-12								0.000	0.417	12.00	123.97	144.81	183.47	214.31	METRIC	375	1.25	196.03	1.77	13.3	0.12	12.13	73.9%
STREET D	MH2-12	MH2-13					0.27		0.75	0.203	1.802	12.98	119.53	637.38	177.68	896.31	METRIC	750	0.50	787.21	1.78	51.4	0.48	13.46	81.0%
	MH2-13	MH2-14								0.000	1.802	13.46	117.48	627.04	174.98	882.69	METRIC	750	0.50	787.21	1.78	13.0	0.12	13.59	79.7%
STREET F	MH2-14	MH2-15			0.60				0.65	0.390	2.192	13.59	116.97	752.22	174.31	1069.66	METRIC	825	0.50	1015.01	1.90	105.6	0.93	14.51	74.1%
	MH2-15	MH2-23								0.000	2.192	14.51	113.26	729.39	169.38	1039.36	METRIC	825	0.50	1015.01	1.90	12.4	0.11	14.62	71.9%
STREET C	MH2-16	MH2-17			0.58				0.65	0.375	0.375	10.00	134.16	140.79	196.54	206.25	METRIC	375	1.00	175.33	1.59	68.3	0.72	10.72	80.3%
	MH2-17	MH2-18			0.40				0.65	0.260	0.635	10.72	130.31	231.62	191.64	340.62	METRIC	450	1.00	285.11	1.79	64.5	0.60	11.32	81.2%
	MH2-18	MH2-21								0.000	0.635	11.32	127.26	226.20	187.73	333.68	METRIC	525	0.50	304.10	1.40	9.5	0.11	11.43	74.4%
STREET C (100 year capture)	MH2-19	MH2-20			0.24				0.65	0.156	0.156	10.00	134.16	58.60	196.54	85.85	METRIC	375	0.30	96.03	0.87	23.4	0.45	10.45	61.0%
100 - 10 YEAR FLOW FROM MH2-19 TO MH2-20														27.25											
	MH2-20	MH2-21								0.000	0.156	10.45	131.73	57.54	193.44	84.50	METRIC	375	0.30	96.03	0.87	9.3	0.18	10.63	59.9%
STREET F	MH2-21	MH2-22			0.44				0.65	0.286	1.077	11.43	126.71	409.27	187.02	563.86	METRIC	750	0.30	609.77	1.38	57.1	0.69	12.12	67.1%
	MH2-22	MH2-23			0.21				0.65	0.137	1.213	12.12	123.41	446.51	182.75	620.85	METRIC	750	0.30	609.77	1.38	29.1	0.35	12.47	73.2%
SWM POND 9	MH2-23	MH2-24								0.000	3.405	14.62	112.83	1137.38	168.81	1609.42	METRIC	975	0.40	1417.37	1.90	37.0	0.33	14.95	80.2%
	MH2-24	Headwall 2								0.000	3.405	14.95	111.60	1125.59	167.16	1593.66	METRIC	975	0.40	1417.37	1.90	13.6	0.12	15.07	79.4%

RUNOFF COEFFICIENTS (R)

0.27: PARK - RAILYARDS - CEMETERIES (OVER 4 HA)	0.75: ROW DWELLINGS
0.65: SINGLE FAMILY RESIDENTIAL (SUBURBAN)	0.76: SCHOOL
0.65: SEMI DETACHED (SUBURBAN)	0.90: ROAD - COMMERCIAL

NO.	REVISION	DATE	AUTH
2	Second Submission	Aug-19	
1	First Submission	Dec-17	

TOWN OF CALEDON

DIVISION

STORM SEWER DESIGN SHEET

SCALE: N.T.S.		DATE: AUGUST 2019
DRAWN BY: AK	16109	DWG. NO.: STM

APPENDIX C

Preliminary Grading Plan

TMIG The Municipal Infrastructure Group Ltd

8800 Dufferin Street, Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700
f: 905.738.0065

GRADING PLAN
FUNCTIONAL SERVICING REPORT
CALEDON 410 DEVELOPMENT - MAYFIELD WEST PHASE 2, TOWN OF CALEDON

SCALE: 1:1250		PROJECT No. 16109
DATE: AUGUST 2019		
DESIGNED BY: AK	DRAWN BY: AK	FIGURE No. GR01
CHECKED BY: AA	CHECKED BY: AA	

File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\Grading\2019-07-22 - Grading Figure.dwg Layout : GR01 Date: Aug 01, 2019 - 3:47pm, Edit By : akhan