

Memo

To: Jason Stahl, Amec Foster Wheeler
From: Aaron Farrell /Ron Scheckenberger
Date: September 21, 2017
File: TPB166090
Re: **Class Environmental Assessment for Widening of McLaughlin Road and Construction of East-West Spine Road (Mayfield West Phase 2), Town of Caledon**

1. Introduction

The subject segment of McLaughlin Road and the future Spine Road lie within the Mayfield West Phase 2 Secondary Plan Area in the Town of Caledon. The study area constitutes the headwaters of the Fletcher's Creek Subwatershed and a portion of the Etobicoke Creek Watershed. The following has been prepared to summarize the stormwater management requirements for the future expansion of McLaughlin Road and the future Spine Road.

2. Background Information

The following background information has been provided for reference in developing the stormwater management plan for the road segments:

Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan Part A: Existing Conditions and Characterization (AMEC et. al., December 2014).

Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan Part B Report (AMEC et. al., December 2014).

Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan Part C: Detailed Analysis and Implementation (AMEC et. al., December 2014).

Mayfield West Phase 2 Functional Servicing Plan (Urbantech, August 2017).

Guidance for Development Activities in Redside Dace Protected Habitat (Ministry of Natural Resources and Forestry, March 2016).

Amec Foster Wheeler
September 21, 2017

3. Study Area Characterization

The study area encompasses portions of the Fletcher's Creek Subwatershed and the Etobicoke Creek Watershed within the Mayfield West Phase 2 Secondary Planning Area. The subject segment of McLaughlin Road lies within the Fletcher's Creek Subwatershed of the Credit River Watershed, and the segment of the Spine Road straddles the boundary of the Etobicoke Creek Watershed and the Fletcher's Creek Subwatershed of the Credit River Watershed.

Existing land use conditions within the study area are primarily agricultural, with some woodlots in the vicinity of the proposed alignment of the Spine Road. The surficial soils within the Study Area are primarily Chinguacousy clay loam, which is classified as SCS Soil Type 'C' (i.e. exhibits moderate to low infiltration rates), with small pockets of Jeddo Clay Loam which is classified as SCS Soil Type 'D' (i.e. exhibits low infiltration rates). Surficial slopes within the Fletcher's Creek Subwatershed have been characterized as typically low, with only the creek and valley features downstream of the study area having slopes that are steeper. The slopes within the Etobicoke Creek Watershed portion of the Study Area tend to be steeper, with the steepest slopes located along the watercourses through the area. The drainage along McLaughlin Road is currently provided by roadside ditches, which convey runoff from north to south; drainage within the limits of the future Spine Road is currently conveyed in the form of sheet flow with minor headwater drainage features in the vicinity of the terrestrial woodlots.

Under ultimate land use conditions, the lands surrounding the subject segments of McLaughlin Road and the Spine Road would be developed to primarily provide residential land use with some mixed uses and commercial lands based the Mayfield West Phase 2 Secondary Plan.

4. Stormwater Management Requirements

Stormwater management requirements for the future development within the Mayfield West Phase 2 Secondary Plan Area have been provided in the Comprehensive Environmental Impact Study and Management Plan Part C: Detailed Analysis and Implementation (AMEC et. al., December 2014). The stormwater management criteria correspond to various performance measures established as part of the Comprehensive Environmental Impact Study and Management Plan, which represent quantifiable metrics for establishing design criteria and monitoring performance post-development. The stormwater management requirements are as follows:

- ▶ Control post-development flows to pre-development levels (no increased risk from development)
- ▶ Maintaining and, where appropriate, enhancing and restoring quantity of surface water entering Wetland Core Areas, Core Fishery Resource Areas, and Valley and Stream Corridors
- ▶ Protect, maintain and, where appropriate, enhance and restore the quantity of groundwater recharge and discharge and the flow distribution of groundwater
- ▶ Provide stormwater quality control to an enhanced standard of treatment as per MOE 2003 design criteria
- ▶ Maintaining and, where appropriate, enhancing and restoring quality of surface water entering Wetland Core Areas, Core Fishery Resource Areas, and Valley and Stream Corridors
- ▶ No significant increase or decrease in duration of flows above erosion thresholds

In addition to the foregoing, developments proximate to the existing high constraint terrestrial features (i.e. woodlots) are required to address water budget requirements to maintain the hydroperiod supporting the terrestrial features. The locations of the woodlots and the limits of the areas required to manage water budget to the features is provided on Drawing 6 of the

Amec Foster Wheeler
September 21, 2017

Comprehensive Environmental Impact Study and Management Plan. A copy of this figure is attached for reference.

The Guidance for Development Activities in Redside Dace Protected Habitat (Ministry of Natural Resources and Forestry, March 2016) specifies the following stormwater management requirements for development in Redside Dace habitat:

- ▶ Discharge temperatures for stormwater management facilities connected to Redside Dace streams should be below 24°C and have dissolved oxygen concentrations of at least seven milligrams per litre.
- ▶ Post development water balance (i.e., the hydrological cycle of the water including the flow and levels of surface and ground water) should match predevelopment water balance in order to protect the natural hydrological functions of Redside Dace streams. Therefore, there should be no storm run-off from rainfall events in the range of 5 – 15 mm.

5. Stormwater Management Plan

The stormwater management plan for the Mayfield West Phase 2 Area, including the subject segments of McLaughlin Road and the future Spine Road is provided in the Mayfield West Phase 2 Functional Servicing Plan (Urbantech, August 2017). Relevant excerpts from the report are attached for reference. The information provided in the August 2017 FSR indicates that all runoff from the expanded McLaughlin Road and the future Spine Road is proposed to be captured in the drainage system of the adjacent development, and conveyed toward the future end-of-pipe facilities within the Fletcher's Creek Subwatershed. As such, all stormwater management requirements for the future expansion of McLaughlin Road and the future Spine Road are to be provided within the future stormwater management facilities within the adjacent development.

Segments of the Spine Road lie within the existing contributing drainage areas to the terrestrial features. The August 2017 FSR notes that the water budget to the terrestrial features is to be managed through the provision of clean runoff (i.e. rooftop runoff) to the features from the adjacent development, and/or the collection of foundation drainage. No runoff from McLaughlin Road and the future Spine Road is required to be directed toward the terrestrial features to manage the water budget to the subject features.

In addition to the provision of stormwater management within the end-of-pipe facilities, Low Impact Development Best Management Practices (LID BMP's) are recommended to be provided within the road rights-of-way to provide further stormwater management and to promote groundwater recharge, and to further reduce thermal enrichment of storm runoff from road surfaces. The specific type of LID BMP is to be determined at the detailed design stage, however the following list of alternatives has been advanced for further consideration:

- ▶ Bumpouts (infiltration zones)
- ▶ Perforated pipes
- ▶ Permeable pavements
- ▶ Bio-swales
- ▶ Grassed swales
- ▶ Infiltration trenches

The stormwater management system is to include pre-treatment of storm runoff prior to entering those LID BMP's which promote infiltration. Pre-treatment may be provided in the form of grassed swales, oil/grit separators, and/or goss traps to capture pollutants prior to infiltration.

Amec Foster Wheeler
September 21, 2017

The proposed roadworks are anticipated to coincide with the urbanization of the adjacent developments. As such, no interim works are anticipated to be required.

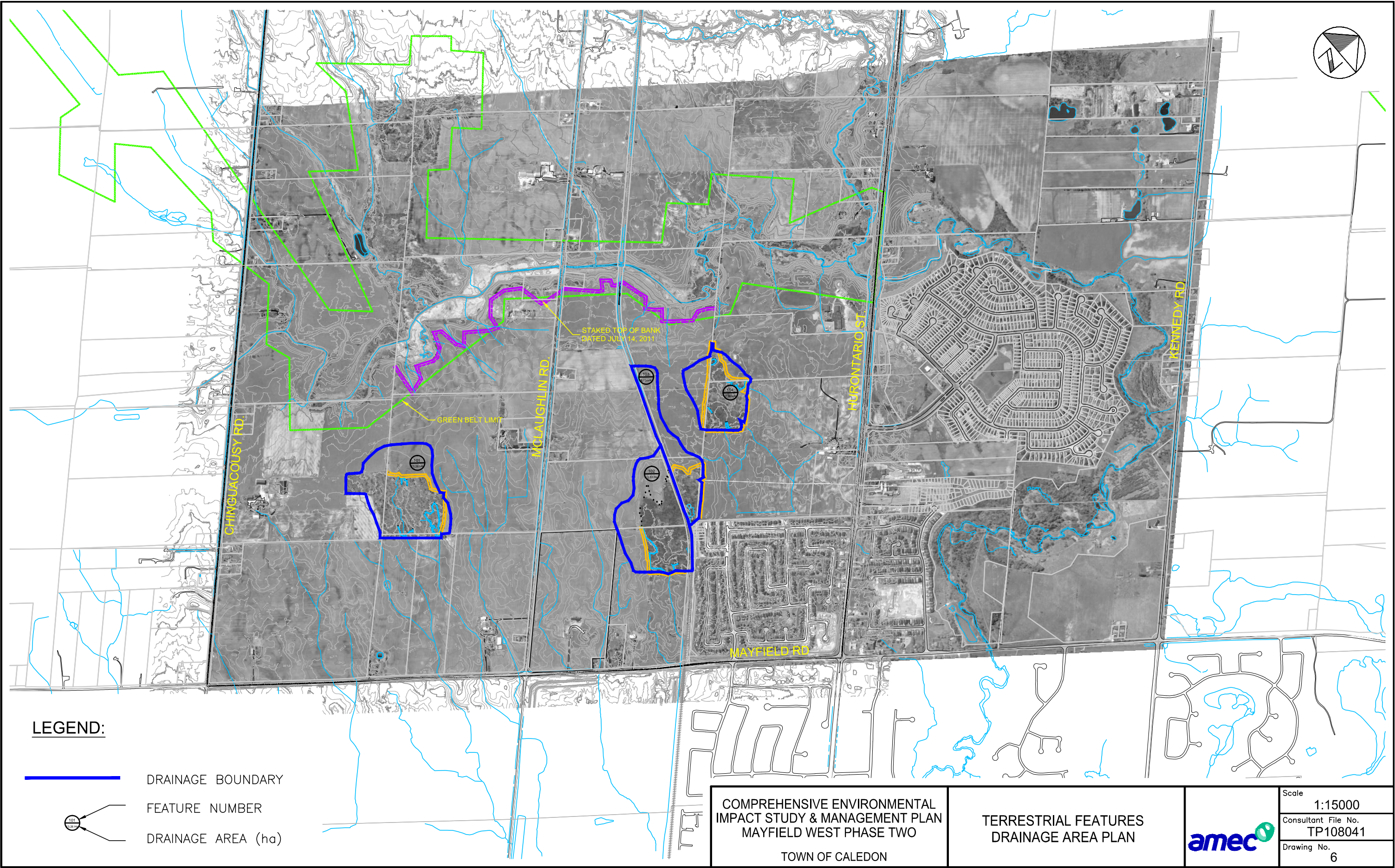
6. Conclusions

Based upon the foregoing, it is concluded that:



- i. Stormwater management for the future expansion of McLaughlin Road and the Spine Road is required to mitigate impacts to stormwater quality, erosion, water balance, and flood potential.
- ii. Segments of the Spine Road lie within the existing contributing drainage areas to terrestrial features requiring features-based water balance be provided.
- iii. Neither the subject segment of McLaughlin Road nor the Spine Road traverse regulated watercourses, hence no permanent hydraulic structures (i.e. bridges or open footing culverts) are required.
- iv. It is recommended that the stormwater management plan for the future expansion of McLaughlin Road and the Spine Road be incorporated into the drainage and stormwater management plan for the adjacent development areas, in accordance with the recommendations of the Mayfield West Phase 2 Area Comprehensive Environmental Impact Study and Management Plan (Amec et. al., December 2014) and the Mayfield West Phase 2 Functional Servicing Plan (Urbantech, August 2017).
- v. Low Impact Development Best Management Practices (LID BMP's) are recommended to mitigate thermal enrichment of storm runoff, as well as to manage water budget in accordance with the requirements provided in the The Guidance for Development Activities in Redside Dace Protected Habitat (Ministry of Natural Resources and Forestry, March 2016).
- vi. The proposed works are anticipated to coincide with the urbanization within the adjacent developments, hence no interim works are anticipated to be required.

AF/ls

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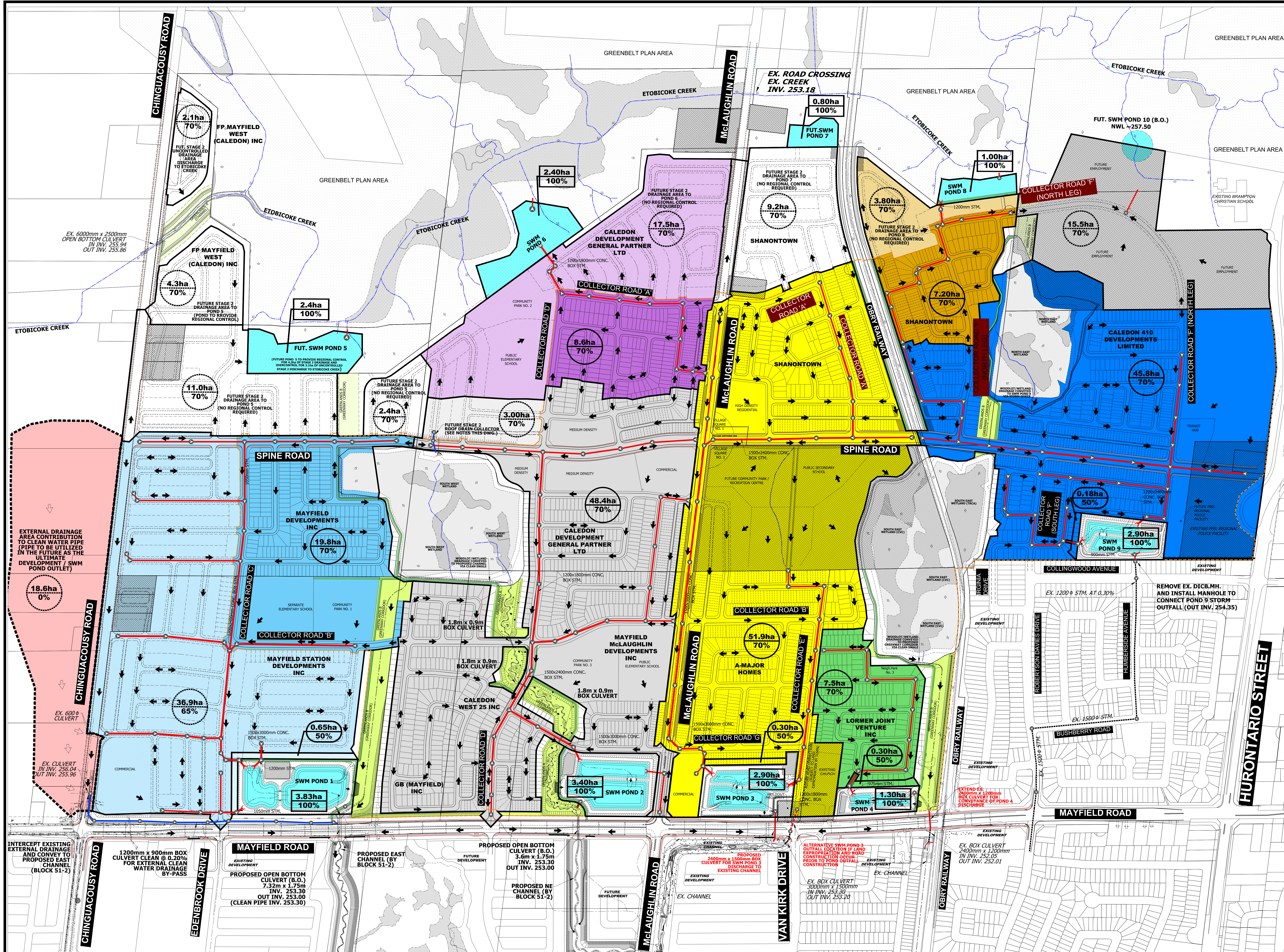
LEGEND:

- DRAINAGE BOUNDARY
-  FEATURE NUMBER
-  DRAINAGE AREA (ha)

COMPREHENSIVE ENVIRONMENTAL
IMPACT STUDY & MANAGEMENT PLAN
MAYFIELD WEST PHASE TWO
TOWN OF CALEDON

TERRESTRIAL FEATURES
DRAINAGE AREA PLAN

	Scale 1:15000
	Consultant File No. TP108041
	Drawing No. 6



- NOTES:**
- * ULTIMATE MAYFIELD ROAD DRAINAGE TO BE SELF CONTAINED AND SHALL NOT RELAY 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 PRELIMINARY 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. 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 DRAINAGE AREAS AND FLOW CAPTURE.
 - * REFER TO DRAWINGS 301-312 FOR PROPOSED GRADING DETAILS.
 - * REFER TO DRAWINGS 601-609 FOR SWM POND DETAILS. DETAILS FOR SWM PONDS 6 AND 8 WHICH ARE REQUIRED FOR STAGE 1 SERVICING, BUT LOCATED OUTSIDE OF THE STAGE 1 LIMITS, WILL BE PROVIDED IN THE FSR ADDENDUM FOLLOWING TRCA ACCEPTANCE OF POND ENCROACHMENT LIMITS WITHIN THE GREENBELT.

LEGEND:

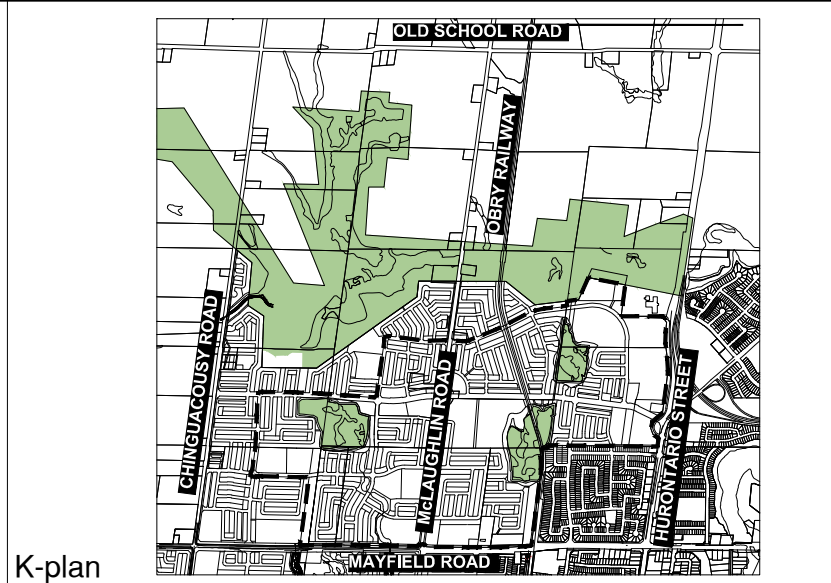
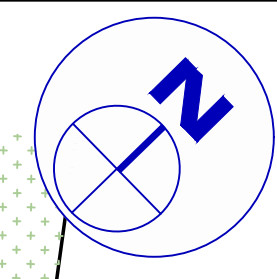
- MW2 STAGE 1 LIMIT
- PROPOSED STORM SEWER ALIGNMENT
- PROPOSED CLEAN WATER PIPE ALIGNMENT ALONG MAYFIELD ROAD
- EXISTING STORM SEWER ALIGNMENT
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED MAJOR SYSTEM FLOW DIRECTION

30.6ha 70%	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 1	STAGE 1 IMPERVIOUSNESS
0.65ha 50%	FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 1	REAR YARD AREA DISCHARGE TO POND IMPERVIOUSNESS
3.83ha 100%	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 2	POND BLOCK AREA
11.0ha 70%	FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 2	POND IMPERVIOUSNESS
	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 3	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 4
	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 6	STAGE 1 CONTRIBUTING DRAINAGE AREA TO POND 9
	FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 6	FUT. STAGE 2 CONTRIBUTING DRAINAGE AREA TO POND 8
		CONTRIBUTING DRAINAGE AREA TO MAYFIELD ROAD CLEAN WATER PIPE

urbantech

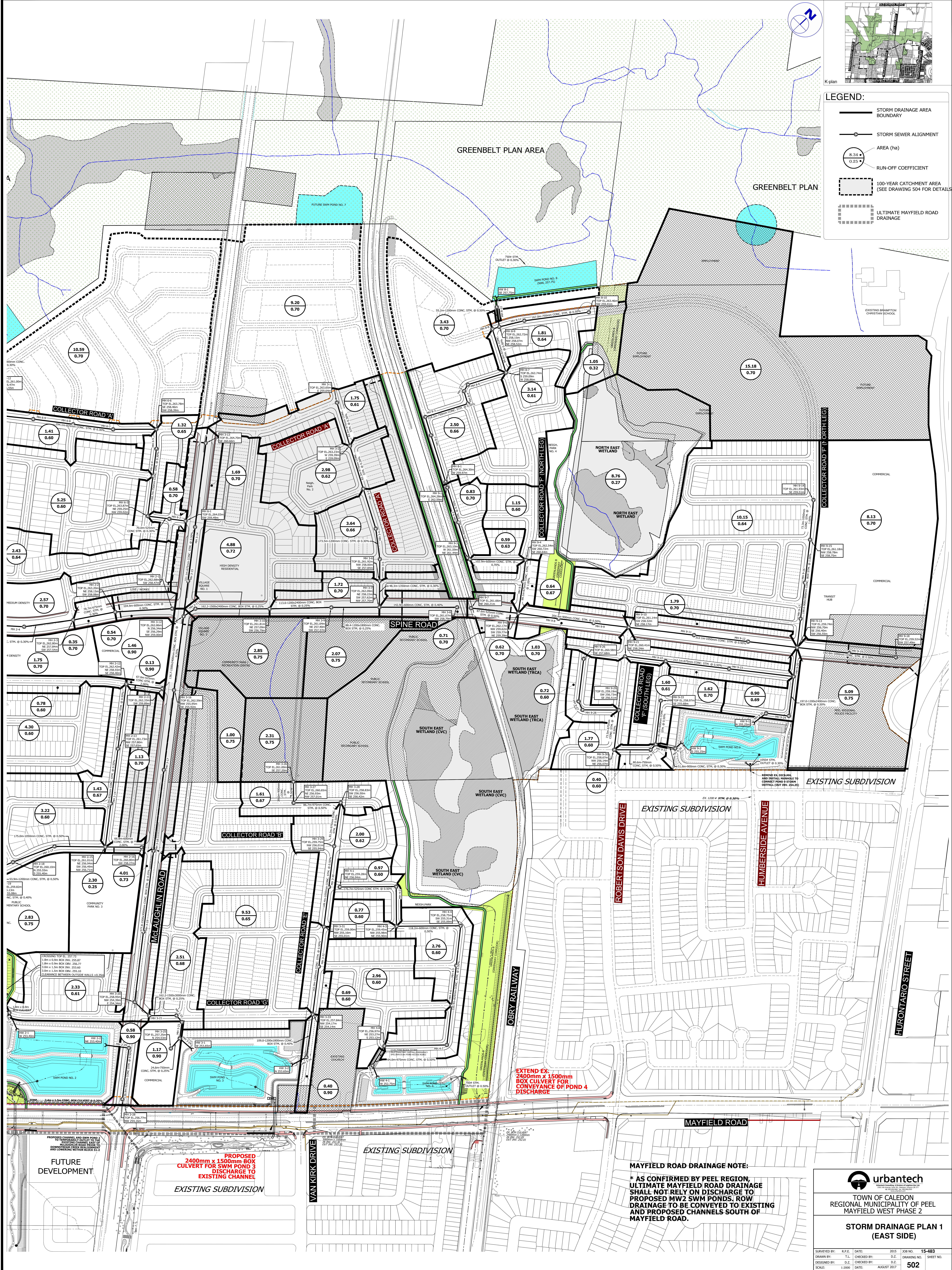
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2
ULTIMATE CONTRIBUTING DRAINAGE AREAS TO SWM PONDS

SURVEYED BY: R.P.E. DATE: 2016 XIR NO. 15-483
DRAWN BY: V.P. CHECKED BY: D.Z. DRAWING NO. 501B
DESIGNED BY: D.Z. CHECKED BY: D.Z. D.Z.
SCALE: 1:5000 DATE: JULY 2017



LEGEND:

- STORM DRAINAGE AREA BOUNDARY
- STORM SEWER ALIGNMENT
- AREA (ha)
- 0.25 RUN-OFF COEFFICIENT
- 100-YEAR CATCHMENT AREA (SEE DRAWING 504 FOR DETAILS)
- ULTIMATE MAYFIELD ROAD DRAINAGE



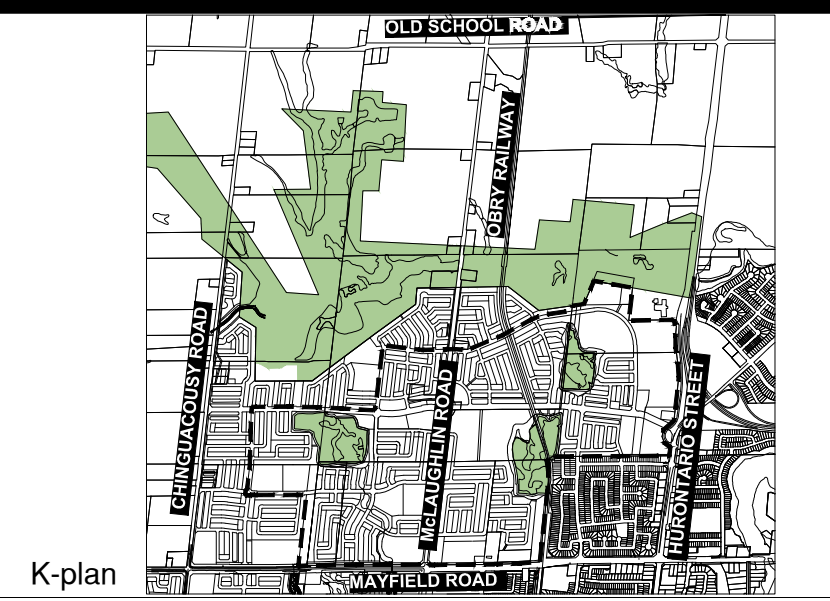
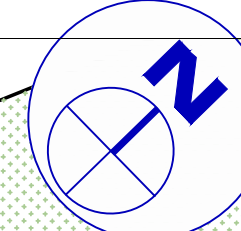
EXTEND EX. 2400mm x 1500mm BOX CULVERT FOR CONVEYANCE OF POND 4 DISCHARGE

PROPOSED 2400mm x 1500mm BOX CULVERT FOR SWM POND 3 DISCHARGE TO EXISTING CHANNEL

MAYFIELD ROAD DRAINAGE NOTE:
 * AS CONFIRMED BY PEEL REGION, ULTIMATE MAYFIELD ROAD DRAINAGE SHALL NOT RELY ON DISCHARGE TO PROPOSED MW2 SWM PONDS, ROW DRAINAGE TO BE CONVEYED TO EXISTING AND PROPOSED CHANNELS SOUTH OF MAYFIELD ROAD.

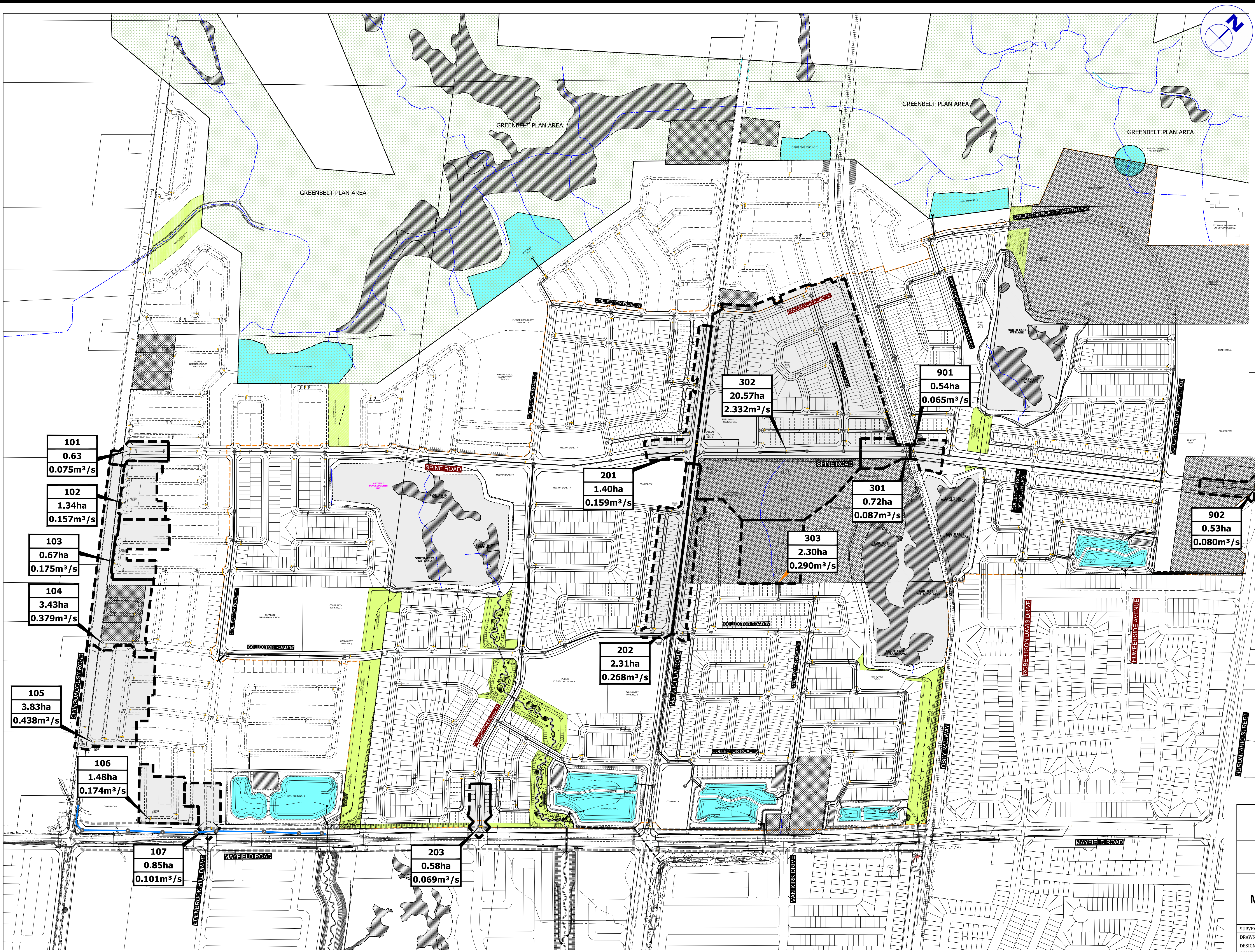
urbantech
 TOWN OF CALEDON
 REGIONAL MUNICIPALITY OF PEEL
 MAYFIELD WEST PHASE 2
**STORM DRAINAGE PLAN 1
 (EAST SIDE)**

SURVEYED BY:	R.P.E.	DATE:	2015	JOB NO.:	15-483
DRAWN BY:	T.L.	CHECKED BY:	D.Z.	DRAWING NO.:	SHEET NO.
DESIGNED BY:	D.Z.	CHECKED BY:	D.Z.	SCALE:	502
DATE:	AUGUST 2017				



LEGEND:

- 100-YEAR CATCHMENT AREA
- AREA ID
MAJOR SYSTEM CAPTURE AREA
CONSTANT FLOW CAPTURED IN PIPE AT LOW POINT
- STORM SEWER ALIGNMENT



TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
MAYFIELD WEST PHASE 2

MAJOR SYSTEM FLOW CAPTURE

SURVEYED BY:	R.P.E.	DATE:	2015	JOB NO.	15-483
DRAWN BY:	T.L.	CHECKED BY:	D.Z.	DRAWING NO.	SHEET NO.
DESIGNED BY:	D.Z.	CHECKED BY:	D.Z.		
SCALE:	1:2000	DATE:	AUGUST 2017		504