



URBANTECH®

Memorandum

To: Irina Marouchko, City of Pickering **Date:** April 02, 2026

Cc: Max Gargaro, Mattamy Homes

From: Andrew Fata
Destiny Li **Project #:** 24-790

Re: **Phase 2 (South of Highway 407) Preliminary Stormwater Management Memo
In Support of the OPA Application for Residential Conversion
Seaton (TFPM) Inc.
City of Pickering
Region of Durham**

This memo outlines the proposed updates to the stormwater management (SWM) strategy to support the Official Plan Amendment (OPA) application for the residential conversion of the Seaton (TFPM) Inc. Phase 2 lands south of Highway 407, located in the City of Pickering (the City), Region of Durham (the Region), and within the Duffins Creek Hydrology Update (DCHU) Catchments 38, 39, and 44, under the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

BACKGROUND

The subject site for the Seaton (TFPM) Inc. Phase 1B (West) and Phase 2 lands is located on the northwest side of Brock Road and Alexander Knox Road, specifically the lands west of Elsa Storry Avenue (hereinafter referred to as the “South Servicing Area” or “subject site”). This memo supports the Draft Plan of Subdivision (SP-2015-03) and the proposed bridge designed by R.J. Burnside, located south of Highway 407, which connects the “island block” to the Seaton TFPM Phase 2 residential lots on Blocks 176 and 177 (previously proposed for employment use). These blocks are located immediately north of Phase 1B and south of Highway 407.

In support of the OPA application for the residential conversion of Blocks 108, 109 and 110, this memo outlines updates to the storm servicing strategy, including preliminary verification of the design of stormwater management Ponds 55 and 47, as well as a feature-based water balance assessment for Wetlands U11 and U14 within the Urfe Creek watershed. A complete Phase 2 FSR and Stormwater Management Report will be provided at a later date and will include detailed design information and calculations to support the preliminary findings presented herein.

EXISTING DRAINAGE

The subject lands generally drain south through a series of swales, tributaries, and roadside ditches toward the East Tributary of Urfe Creek. Historical drainage divides have been used to determine the existing drainage areas and flow paths (i.e., prior to the Brock Road realignment). Under existing conditions, Phase 2 of the development drains to three different DCHU catchments (38, 39, and 44) (refer to **Drawing 3.7** for detailed existing drainage conditions). Approximately 4.91 ha of the Phase 2 lands, adjacent to and west of Callwood Court, drain west and south toward the Upper East Branch (UB7) of Urfe Creek (DCHU Catchment 38). Approximately 5.75 ha drain west and south toward the Upper East Branch (U15) of Urfe Creek (DCHU Catchment 39). The remaining Phase 2 lands

(approximately 5.03 ha) drain east and north toward Reach B1 of Brougham Creek (DCHU Catchment 44).

Under pre-development conditions, a drainage area of 311.18 ha contributes to Wetland U14, and a drainage area of 327.43 ha contributes to Wetland U11. Refer to the appended Water Balance Memo (March 2026) for details.

PROPOSED STORM DRAINAGE

The 3.16 ha site plan area (Block 109) was initially intended to drain directly to DCHU Catchment 39 with on-site controls. The island block was initially designed to drain to SWM Pond 55 and ultimately discharge to DCHU Catchment 38.

As part of the redesign of the island block and Blocks 108 and 109 to accommodate future conversion to residential freehold lots, as shown on the appended **Storm Drainage Plan**, the following changes have been made:

- **Drainage Area Changes**

The Block 110, the west portion of Block 109, and the proposed bridge comprise a total drainage area of 6.94 ha, with a pond area of 1.65 ha diverted to SWM Pond 55 and ultimately discharging to DCHU Catchment 38.

The east portion of Block 109 and Block 108 drainage, totaling 6.31 ha, is diverted to the approved SWM Pond 47 in DCHU Catchment 37. The remaining Phase 1B development (12.12 ha), including OSCA-47-1 and SWM Pond 47 (2.00 ha), remains unchanged as per the approved Phase 1B SWM Report (November 2024).

Overcontrol via the SWM pond can be provided to mitigate any peak flow increases related to the conversion and diversion of the west portion of Blocks 109 and 108 and the proposed bridge drainage.

Rear yards backing onto the NHS areas will not be directed into the minor system and will drain directly into the NHS without control. The City has confirmed that this approach is acceptable for Seaton (TFPM) developments.

Minor System Storm Drainage

A conventional storm sewer system designed in accordance with the City of Pickering standards will service the subject lands. Storm sewers have been sized at 80% capacity, at a depth sufficient to provide gravity storm service connections to individual lots using the 5-year return period storm. The minor system will discharge to an end-of-pipe SWM facility (Pond 55 and the approved Pond 47) within the subject lands, where runoff will be treated to ensure adequate water quality, erosion, and quantity control. The proposed storm sewer layout will be finalized through FSSR/detailed design.

Major System Storm Drainage

Major system runoff (the greater of the 100-year or Regional storm) will be conveyed overland within road allowances and directed to the SWM facilities. The 100-year storm peak flows govern for small areas. Storm sewers have been sized for the appropriate minor system event only, with the exception of the 100-year capture areas.

STORMWATER MANAGEMENT

Consistent with the DCHU, MESPA, and FSSR, the stormwater management strategy for the Phase 2 subject lands includes end-of-pipe SWM ponds to provide quantity, quality, and erosion control.

The DCHU has established both the unitary flow release targets and the unitary storage requirements in accordance with MESPA criteria. The DCHU release targets - based on the limits of development within the pre-development drainage areas - are summarized in **Tables 1 and 2**. Required storage volumes were determined through hydrologic modeling using Visual OTTHYMO (VO6) for SWM Ponds 55 and 47, with outlet controls designed to meet the applicable DCHU unit rates.

Since the approval of the FSSR (March 2023), SWM Pond 55 has been expanded to accommodate an increased drainage area. **Table 1** and **Drawing 10.2A** present the pre-development release rates, calculated using DCHU Catchment 38 unit rates and a post-development area of 5.80 ha within the corresponding pre-development drainage area tributary to SWMF 55.

Table 1: Pre-Development Release Rates for Existing Drainage to SWMF 55 outfall location

Catchment 38	Extended Detention	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
DCHU Unit Rate (m³/s/ha)	0.0006	0.00236	0.00379	0.00480	0.00622	0.00733	0.00850
Calculated DCHU target based on 5.80 ha (m³/s)	0.003	0.014	0.022	0.028	0.036	0.043	0.049

SWM Pond 47 has been approved to service Phase 1B development; therefore, the approved SWM Pond 47 design remains unchanged to accommodate the proposed drainage. **Table 2** and **Drawing 10.2A** present the pre-development release rates calculated based on DCHU Catchment 37 unit rates and a 24.80 ha post-development area within the pre-development drainage area tributary to the approved SWMF 47.

Table 2: Pre-Development Release Rates for Existing Drainage to Approved SWMF 47 outfall location (Approved)

Catchment 37	Extended Detention	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
DCHU Unit Rate (m³/s/ha)	0.0006	0.00177	0.00287	0.00366	0.00477	0.00564	0.00656
Calculated DCHU target based on 24.80 ha (m³/s)	0.015	0.044	0.071	0.091	0.118	0.140	0.163

Unitary release rates for the subject lands for 2-year through 100-year storm events are prescribed by the DCHU. The study confirmed that quantity controls are not required for the Regional storm event.

Quality Control

SWM Pond 55 requires an Enhanced Level of water quality protection to achieve the removal of 80% of total suspended solids from the proposed development areas. Based on a proposed drainage area of 8.59 ha and an imperviousness of 90%, the facility requires a permanent pool volume of approximately 1,934 m³, while the provided permanent pool volume is approximately 7,481 m³.

SWM Pond 47 requires an Enhanced Level of water quality protection to achieve the removal of 80% of total suspended solids from the proposed development areas. Based on a proposed drainage area of 20.43 ha and an imperviousness of 83%, the facility requires a permanent pool volume of approximately 4,284 m³, while the provided permanent pool volume is approximately 9,208 m³.

Erosion Control

The erosion control criteria require providing 250 m³/ha of runoff storage for the site, with a target drawdown time of 120 hours. To achieve the required release rate based on the DCHU unit rate for extended detention, an orifice control is to be incorporated at the facility outlet. The extended detention volume within the SWM facility will discharge through a perforated, reverse-sloped pipe.

SWM Pond 55 has a drainage area of 8.59 ha (5.80 ha of which is within DCHU Catchment 37). The extended detention volume requirement, based on 250 m³/impervious ha applied to the proposed 8.59 ha area at 90% imperviousness, results in a required volume of 1,933 m³. The extended detention volume provided in the pond design is 2,267 m³, at a depth of 0.35 m above the permanent pool elevation. An orifice will be designed to maintain an erosion control release rate as close as possible to 0.003 m³/s. However, since the target release rate is very low, the minimum orifice plate diameter (65 mm) may be implemented and accepted by the City at the detailed design stage, with an associated release rate of 0.005 m³/s. The drawdown time for the extended detention volume is 211 hours (approximately 8.8 days), compared to the target 120 hours (5 days).

SWM Pond 47 has a drainage area of 20.43 ha (24.80 ha of which is within DCHU Catchment 37). The extended detention volume requirement, based on 250 m³/impervious ha applied to the proposed 20.43 ha area at 83% imperviousness, results in a required volume of 4,242 m³. The extended detention volume provided in the pond design is 4,557 m³, at a depth of 0.55 m above the permanent pool elevation. A 100 mm orifice at invert elevation 170.35 m is currently implemented in the outlet of this pond and will be maintained to meet an erosion control release rate of 0.015 m³/s. The drawdown time for the extended detention volume is 144 hours (6 days), compared to the target 120 hours (5 days).

Quantity Control

Note that the 2-year to 100-year storage volumes were determined assuming that the extended detention storage was completely occupied (i.e. “dead” / “stacked” storage scenarios). Detailed calculations and the VO6 modelling results and digital files are appended to the memo.

Table 3 below outlines the discharge and storage relationship for SWMF 55.

Table 3: SWMF 55 Stage-Storage Characteristics

Return Period	Stage (m)	Target Discharge (DCHU rates) (m ³ /s)	Required Volume to control to DCHU Targets (m ³)	Provided Volume Stage-storage Table (m ³)
Permanent Pool	189.65	-	1934 (MOE Calculations)	7481
Extended Detention based on 250 m³/imp ha	190.00	0.003*	1933 (250m ³ /imp ha)	2267
2-Year	190.40	0.014	2923 (VO6)	3039
5-Year	190.50	0.022	3765 (VO6)	3854
10-Year	190.60	0.028	4285 (VO6)	4685
25-Year	190.65	0.036	4956 (VO6)	5108
50-Year	190.70	0.043	5449 (VO6)	5535
100-Year	190.75	0.049	5951 (VO6)	5966
Emergency	190.95	1.260**	-	7736

*Since the target release rate is very low, the minimum diameter of orifice plate (65mm) may be implemented and considered by the City at detailed design stage to achieve a release rate of 0.005 m³/s.

**Uncontrolled Regional flow of 1.260 m³/s is greater than uncontrolled 100-year flow of 0.907 m³/s from VO6. Hence, uncontrolled Regional flow governs for emergency spillway target flow.

The SWM pond 55 detailed pond design associated with the provided discharge rates from outlet structure design, the resulted VO flows/volume, forebay, spillways and pond drawings will be provided at detailed design.

Table 4 below outlines the discharge and storage relationship for SWMF 47. Since SWMF 47 has been approved to service Phase 1B lands, the stage, provided discharge rate and volume have been verified for all the storm events.

Table 4: SWMF 47 Stage-Storage Characteristics (Approved / Verified)

Return Period	Stage (m)	Target Discharge (DCHU rates) (m ³ /s)	Provided Volume Stage-storage Table (m ³)	Design Discharge Rate from Outlet Structure (m ³ /s)	Required Volume from VO6 (m ³)
Permanent Pool	170.35	-	9208	-	4284 (MOE Calculations)
Extended Detention based on 250 m³/imp ha	170.90	0.015	4557	0.015	4242 (250m ³ /imp ha)

2-Year	171.56	0.044	6729	0.044	6351 (VO6)
5-Year	171.71	0.071	8414	0.071	8173 (VO6)
10-Year	171.84	0.091	9871	0.090	9306 (VO6)
25-Year	171.96	0.118	11140	0.118	10766 (VO6)
50-Year	172.03	0.140	12011	0.140	11801 (VO6)
100-Year	172.10	0.163	12833	0.163	12820 (VO6)
Emergency	172.30	2.972*	15232	4.830**	-

*Uncontrolled Regional flow of 2.972 m³/s is greater than uncontrolled 100-year flow of 1.957 m³/s from VO6. Hence, uncontrolled Regional flow governs for emergency spillway target flow.

**Provided emergency spillway capacity

FEATURE-BASED WATER BALANCE

The proposed drainage area changes result in decreasing of the overall drainage area to wetland U14 and increasing the overall drainage area to wetland U11. A water balance memo with a continuous VO6 hydrologic model was prepared by Urbantech (February 2026) and reviewed by TRCA. The continuous model simulates the existing and post-development runoff volumes to Wetlands with monthly water balance since the FSR stage.

Table 5 below, illustrates the total pre-development and post-development areas to U14 and U11 wetland feature identified for analysis shown in **Drawing 10.9C-1**.

Table 5 Total Pre- and Post-Development Areas Draining to Wetland Features

ID	Pre-Development Area (ha)	Post-Development Area (ha)			% Change
		Developed Area (ha)	Remaining Undeveloped Area (ha)	Total Area (ha)	
U14	311.18	2.00	300.81	302.81	2.7% decrease in overall area
U11	327.43	24.03	311.45	335.48	2.5% increase in overall area

The updated continuous modelling and LID strategy demonstrate that post-development conditions generally maintain wetland and headwater feature hydrology within the range of natural variability while meeting the feature-based water balance objectives for the Seaton (TFPM) development especially for Wetland U14 and U11. The water balance memo confirms the conversion to residential lots and drainage diversion of the proposed SWM plan for the subject site has negligible impacts.

CONCLUSION

In support of the Official Plan Amendment application for the residential conversion of Blocks 108, 109 and 110, this memorandum has documented the proposed storm drainage modifications and presented a preliminary stormwater management strategy for the Phase 2 lands south of Highway 407. The preliminary verification of Stormwater Management Ponds 55 and 47 confirms that the proposed drainage diversions can be accommodated within the existing and proposed pond designs while satisfying applicable quantity, quality, and erosion control criteria. In addition, the feature-based water balance assessment prepared for Wetlands U11 and U14 demonstrates that the proposed changes result in negligible impacts and maintain wetland hydrology within the range of natural

variability. Overall, the proposed storm servicing and stormwater management framework is considered technically feasible and appropriate in support of the proposed residential conversion, subject to refinement and confirmation through the forthcoming Phase 2 Functional Servicing and Stormwater Management Report and detailed design work.

Regards,
Urbantech® Consulting



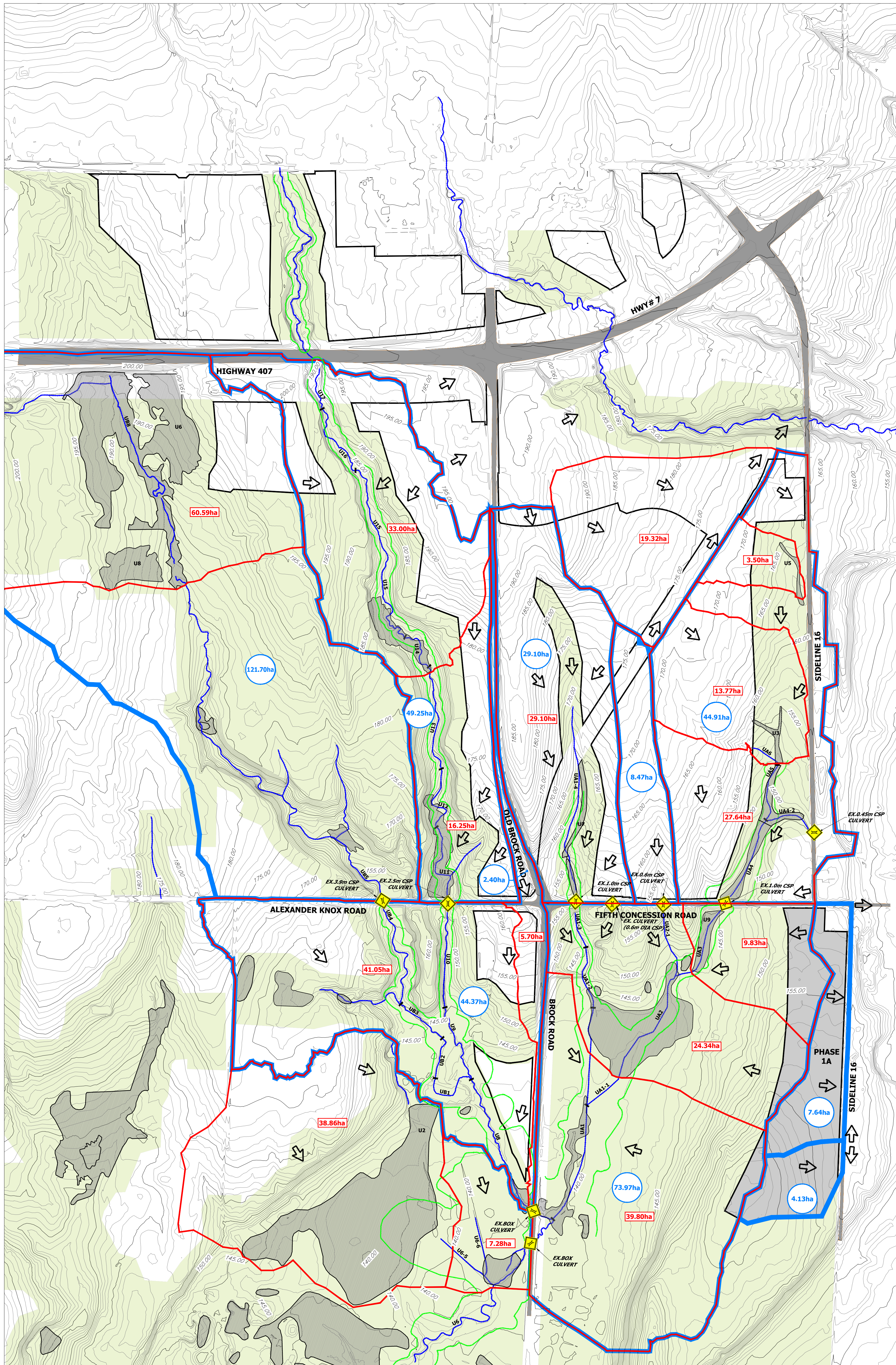
A handwritten signature in black ink that reads "yuanli".

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Senior Associate, Water Resources

Destiny (Yuan) Li, M. Eng., EIT.
Designer, Water Resources

Attachments

- DWG 3.7 Pre-development Drainage
- DWG 10.2A Pre-development Drainage
- SWM-1 - POND 47 & 55 DRAINAGE PLAN
- DWG 10.9C-1_WETLAND U11 & U14 PRE & POST DEV DRAINAGE PLAN (RES CONVERSION)



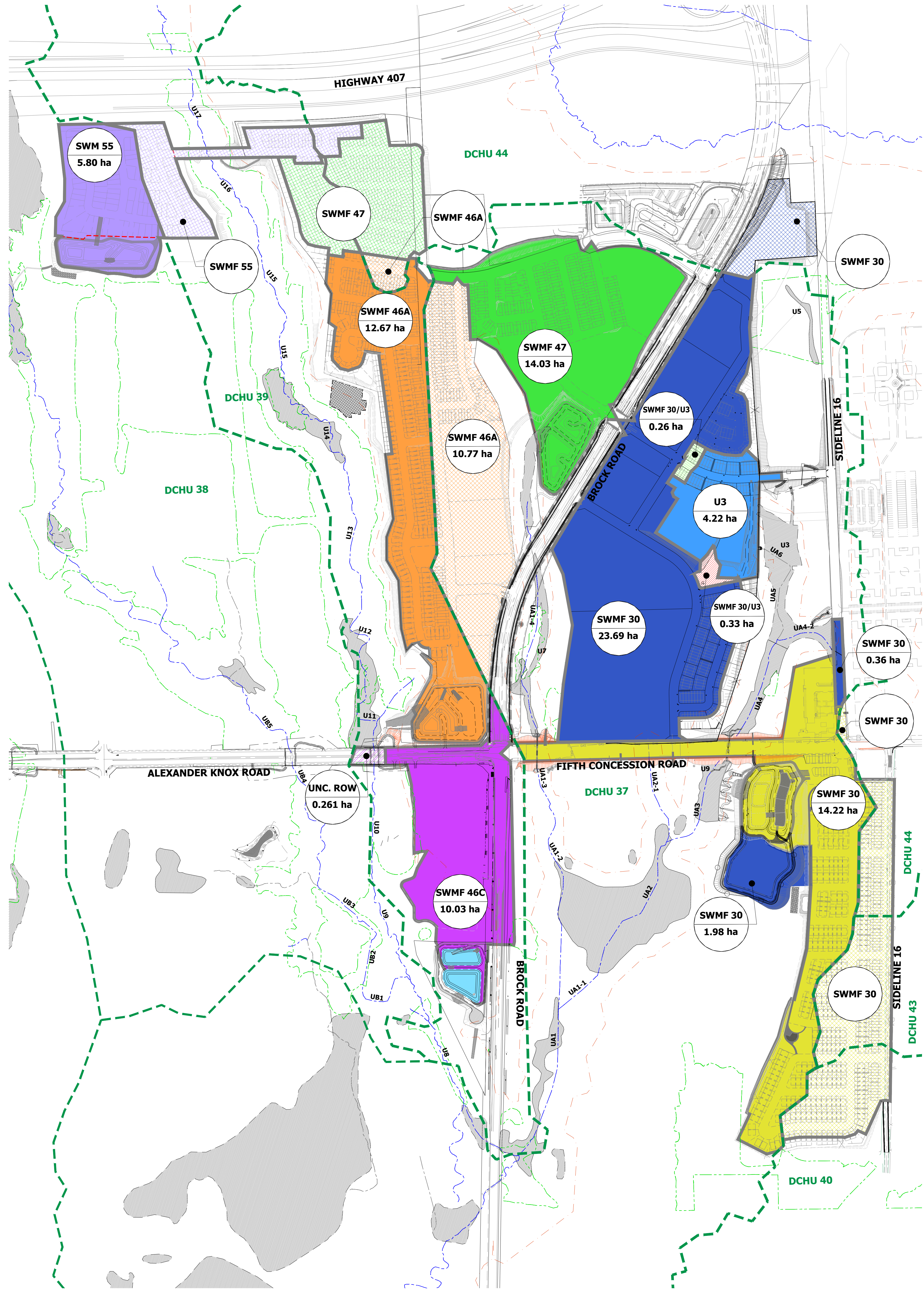
- LEGEND**
- FUTURE DEVELOPMENT BOUNDARY
 - PHASE 1A BOUNDARY
 - NATURAL HERITAGE SYSTEM
 - U12 EXISTING WATERCOURSE AND ID
 - EXISTING REGIONAL FLOODLINE
 - PRE-DEVELOPMENT DRAINAGE BOUNDARY
 - PRE-DEVELOPMENT DRAINAGE BOUNDARY TO WETLAND
 - SURFACE DRAINAGE PATH FLOW ARROW
 - EXISTING ROAD CROSSING
 - 29.15ha PRE-DEVELOPMENT DRAINAGE AREA TO EXISTING CULVERT
 - 9.83ha PRE-DEVELOPMENT DRAINAGE AREA TO WETLAND
 - 140.00 EXISTING CONTOUR AND ELEVATION
 - U9 EXISTING WETLAND & ID

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THOMPSON'S CORNERS
SEATON (TFPM) INC.
SEATON COMMUNITY
CITY OF PICKERING

PRE-DEVELOPMENT DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-765	NOV. 2025	1:5000	3.7



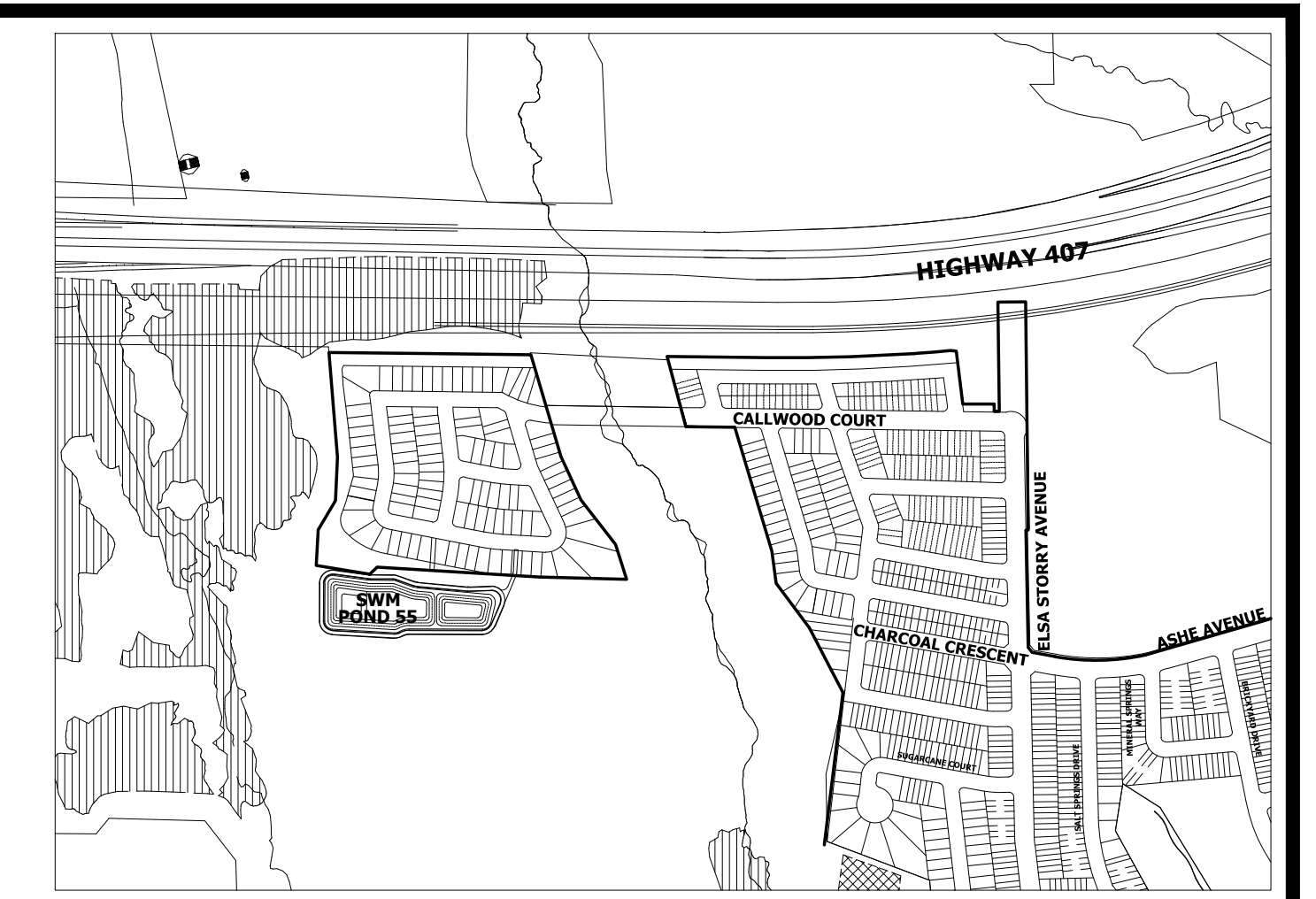
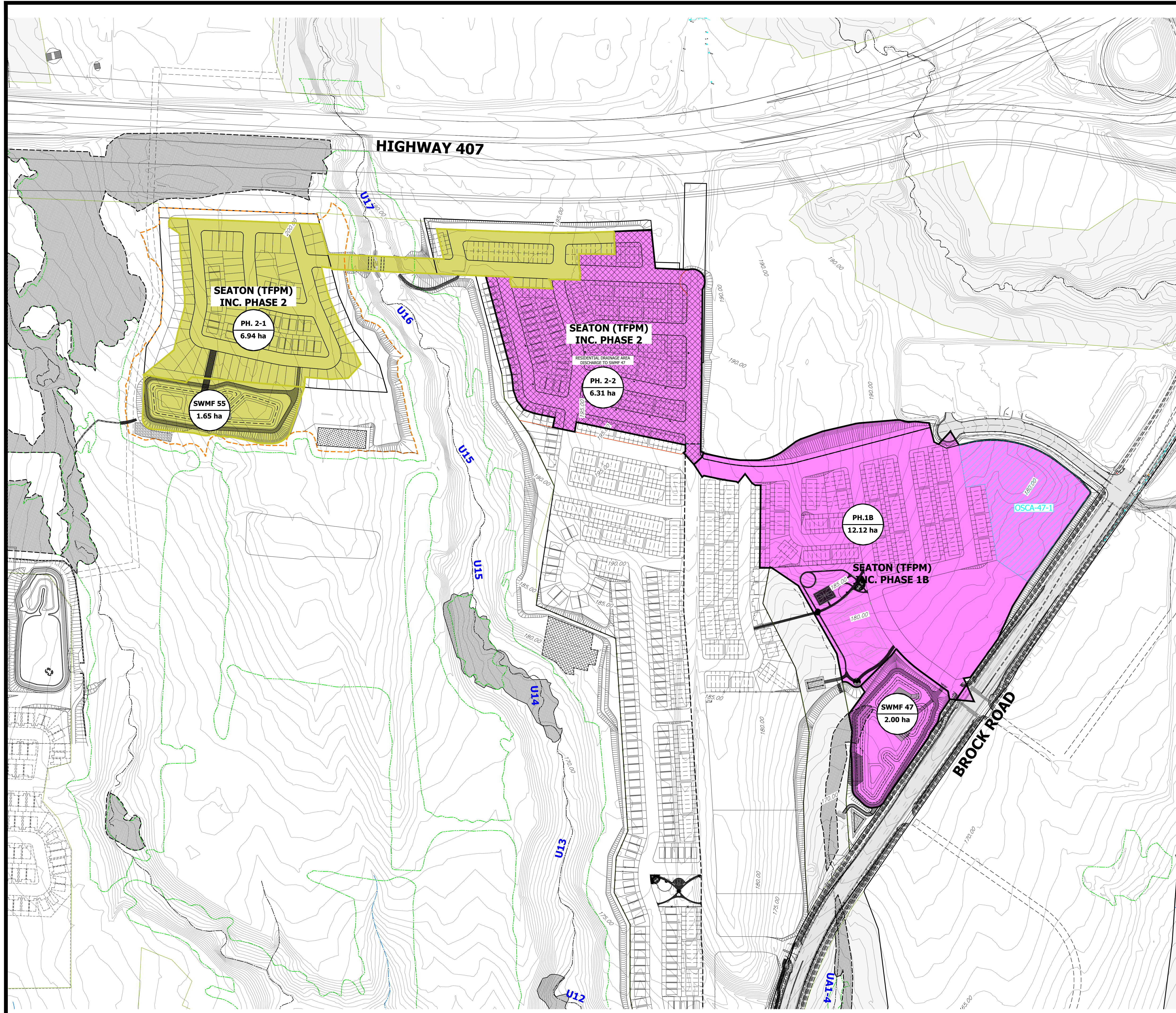
- LEGEND**
- EXISTING WATERCOURSE
 - DCHU CATCHMENT BOUNDARY
 - DCHU 30 CATCHMENT LABEL
 - NEIGHBOURHOOD 20 (N20) BOUNDARY
 - CITY OF PICKERING / TOWN OF AJAX BOUNDARY LIMIT
 - NHS
21.23 ha PRE-DEVELOPMENT DRAINAGE AREA
 - 140.00 EXISTING CONTOUR AND ELEVATION
 - US EXISTING WETLAND
 - SWMF 30 CATCHMENT (PH. 1A, FIFTH CONCESSION & EMS STATION)
 - SWMF 30 CATCHMENT (PH. 2A)
 - SWMF 30 CATCHMENT (PH. 2A) EXTERNAL TO DCHU CATCHMENT AREA
 - SWMF 30 CATCHMENT-MAJOR SYSTEM U3 CATCHMENT - MINOR SYSTEM (PH. 2A)
 - SWMF 30 CATCHMENT-MINOR SYSTEM U3 CATCHMENT - MAJOR SYSTEM (PH. 2A)
 - U3 CATCHMENT
 - SWMF 46A CATCHMENT
 - SWMF 46A CATCHMENT EXTERNAL TO DCHU CATCHMENT AREA
 - FUTURE SWMF 55 CATCHMENT
 - FUTURE SWMF 55 CATCHMENT EXTERNAL TO DCHU CATCHMENT AREA
 - SWMF 47 CATCHMENT
 - SWMF 47 CATCHMENT EXTERNAL TO DCHU CATCHMENT AREA
 - FUTURE SWMF 46C CATCHMENT
 - UNCONTROLLED ROW CATCHMENT
 - FUTURE U15 CATCHMENT
 - FUTURE U15 CATCHMENT EXTERNAL TO DCHU CATCHMENT AREA



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CITY OF PICKERING

**SWMF RELEASE RATE PLAN
(BASED ON DCHU CATCHMENTS)**

PROJECT No.	DATE	SCALE	DWG No.
23-765	NOV. 2025	1:4000	10.2A



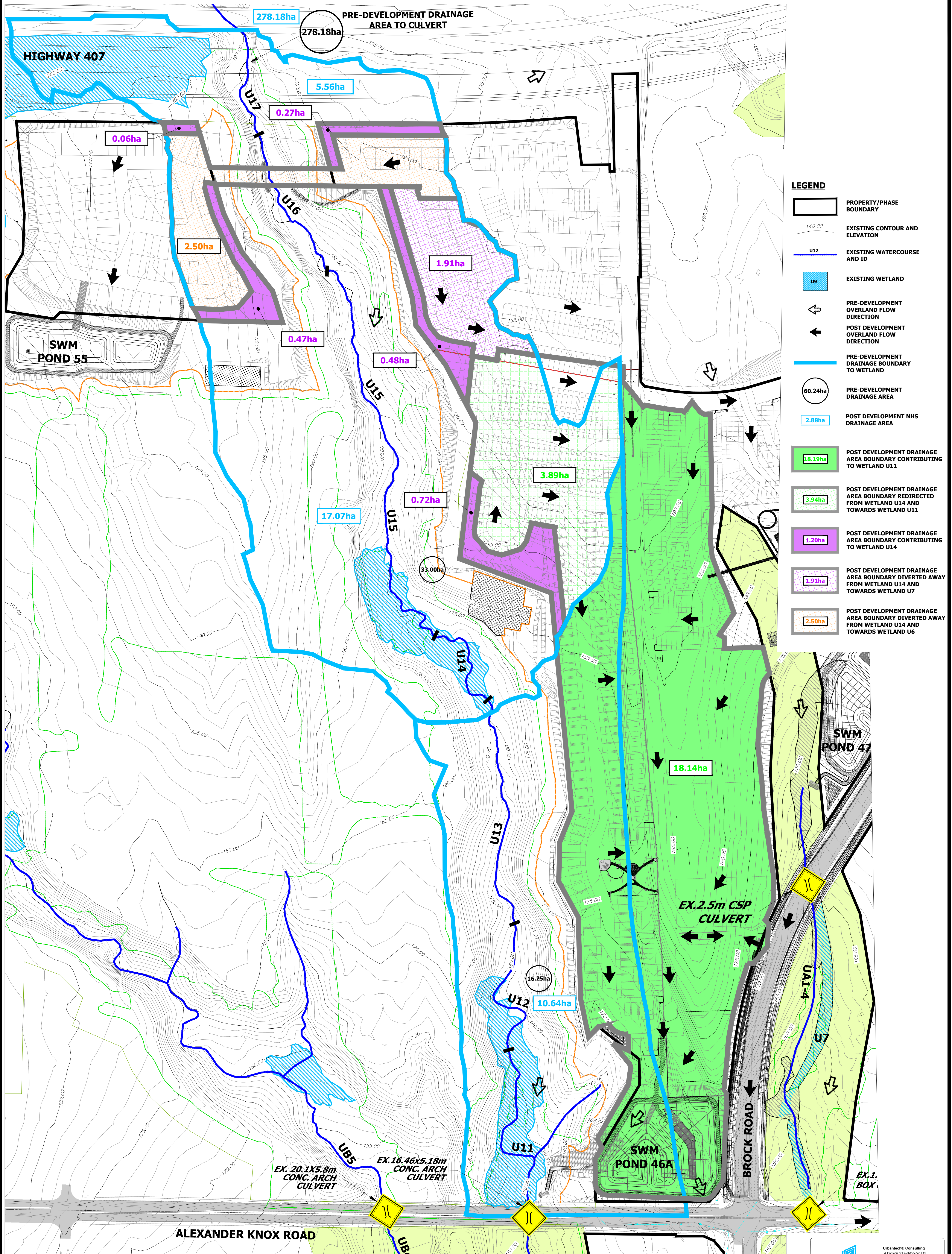
- LEGEND**
- EXISTING WATERCOURSE
 - POST-DEVELOPMENT DRAINAGE AREA
 - EXISTING CONTOUR AND ELEVATION
 - EXISTING WETLAND & ID
 - SWMF 55 CATCHMENT
 - SWMF 47 CATCHMENT
 - SWMF 47 CATCHMENT (PHASE 2 LANDS)
 - ON-SITE CONTROL AREA (OSCA)



THOMPSON'S CORNERS
SEATON (TFPM) INC.
SEATON COMMUNITY
CITY OF PICKERING

STORMWATER MANAGEMENT
POND 47 & 55 DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
24-790	MAR. 2026	1:2500	SWM-1



- LEGEND**
- PROPERTY/PHASE BOUNDARY
 - 140.00 EXISTING CONTOUR AND ELEVATION
 - U12 EXISTING WATERCOURSE AND ID
 - EXISTING WETLAND
 - ↗ PRE-DEVELOPMENT OVERLAND FLOW DIRECTION
 - ↘ POST DEVELOPMENT OVERLAND FLOW DIRECTION
 - PRE-DEVELOPMENT DRAINAGE BOUNDARY TO WETLAND
 - 60.24ha PRE-DEVELOPMENT DRAINAGE AREA
 - 2.88ha POST DEVELOPMENT NHS DRAINAGE AREA
 - 18.19ha POST DEVELOPMENT DRAINAGE AREA BOUNDARY CONTRIBUTING TO WETLAND U11
 - 3.94ha POST DEVELOPMENT DRAINAGE AREA BOUNDARY REDIRECTED FROM WETLAND U14 AND TOWARDS WETLAND U11
 - 1.20ha POST DEVELOPMENT DRAINAGE AREA BOUNDARY CONTRIBUTING TO WETLAND U14
 - 1.91ha POST DEVELOPMENT DRAINAGE AREA BOUNDARY DIVERTED AWAY FROM WETLAND U14 AND TOWARDS WETLAND U7
 - 2.50ha POST DEVELOPMENT DRAINAGE AREA BOUNDARY DIVERTED AWAY FROM WETLAND U14 AND TOWARDS WETLAND U6

POST DEVELOPMENT DRAINAGE AREA SUMMARY TABLE

WETLAND ID	PRE-DEVELOPMENT DRAINAGE AREA (Ha)	POST DEVELOPMENT DRAINAGE AREA (Ha)	
		NHS	DEVELOPED LANDS
U14	311.18	300.81	2.00
U11	327.43	311.45	24.03

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THOMPSON'S CORNERS
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CITY OF PICKERING

WETLAND U11 & U14
PRE & POST DEVELOPMENT
DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-765	NOV. 2025	1:2000	10.9C-1