

MEMORANDUM

DATE: JANUARY 30, 2023
TO: MIRO SAVIC, P.ENG.
FROM: KALLIE AULD, P.ENG.
RE: AMAZON BOUNDARY ROAD PARKING LOT EXPANSION
PROJECT NO.: 117217
CC: LEE SHEETS, C.E.T.

INTRODUCTION

The purpose of this memo is to outline the impacts of increasing the size of the truck parking area on the south side of the building on the existing stormwater management infrastructure. This includes ditches, culverts, and the stormwater management facility. An update to the existing PCSWMM model of the site has been completed to determine the effects of the increased impervious area that will result due to the increase in parking area.

EXPANSION DETAILS

Approximately 50 new truck and trailer parking spaces are proposed along the east and west sides of the existing truck and trailer parking lot to the south of the building. The addition of these new spaces will result in approximately 0.84ha of impervious area tributary to the existing ditches, culverts, and stormwater management facility. Refer to the attached Post-Development Storm Drainage Area Plan, **Drawing 117217-POST**.

SWM MODELLING UPDATES

As mentioned above, the existing PCSWMM model for the site (as submitted and approved by the City of Ottawa) was updated with the new drainage areas as delineated on Drawing **117217-POST**. Model schematics for both the original and updated model have been attached for reference at the end of this memorandum. Changes to drainage area parameters are outlined in **Table 1**.

Table 1: Original and Updated PCSWMM Model Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (c)	Percent Impervious (%)	No Depression (%)	Equivalent Width (m)	Average Slope (%)
ORIGINAL MODEL						
B-05	1.17	0.56	51%	0%	50	1.00%
B-06	1.81	0.56	51%	0%	50	0.50%
B-07	3.84	0.35	21%	0%	120	1.00%
UPDATED MODEL						
B-05	0.52	0.66	66%	0%	50	1.00%
B-06	2.25	0.58	54%	0%	50	0.50%
B-07a	0.67	0.75	79%	0%	131	1.00%
B-07b	3.38	0.44	35%	0%	267	1.00%

RESULTS

To analyze the impact of the increased impervious area, four locations were chosen. The points are as follows, and have been noted on the attached model schematics for reference:

- Junction 'D-10', upstream end of the 3x750mm culverts crossing the access to the truck parking;
- Junction 'D-19', upstream end of the 2x 900mmx1800mm box culverts crossing under the main parking lot access road;
- Storage node 'POND-STOR', the stormwater management pond; and
- Junction 'J3', the outlet of the stormwater management pond.

Table 2 outlines the water levels and peak flows at each of the points listed above, for the 2, 5, and 100-year SCS 24hr storm events.

Table 2: Model Results

Storm Event	Node ID	Original Water Level (m)	New Water Level (m)	Original Flow Rate (L/s)	New Flow Rate (L/s)
2-year	D-10	75.54	75.55	121	140
	D-19	75.18	75.20	399	454
	POND-STOR	75.15	75.16	1,313	1,366
	J3	75.10	75.11	95	95
5-year	D-10	75.57	75.58	165	194
	D-19	75.24	75.26	550	619
	POND-STOR	75.24	75.25	1,765	1,832
	J3	75.12	75.12	97	98
100-year	D-10	75.67	75.69	310	367
	D-19	75.61	75.64	1,048	1,083
	POND-STOR	75.61	75.64	2,861	2,879
	J3	75.94	75.94	75	75

RECOMMENDATIONS/ CONCLUSIONS

As outlined in the above Table 2, the water levels and peak flows have increased slightly due to the increase in impervious area, as expected. Water levels will increase between 1-3cm for all storm events and are not expected to have a negative impact on the existing infrastructure.

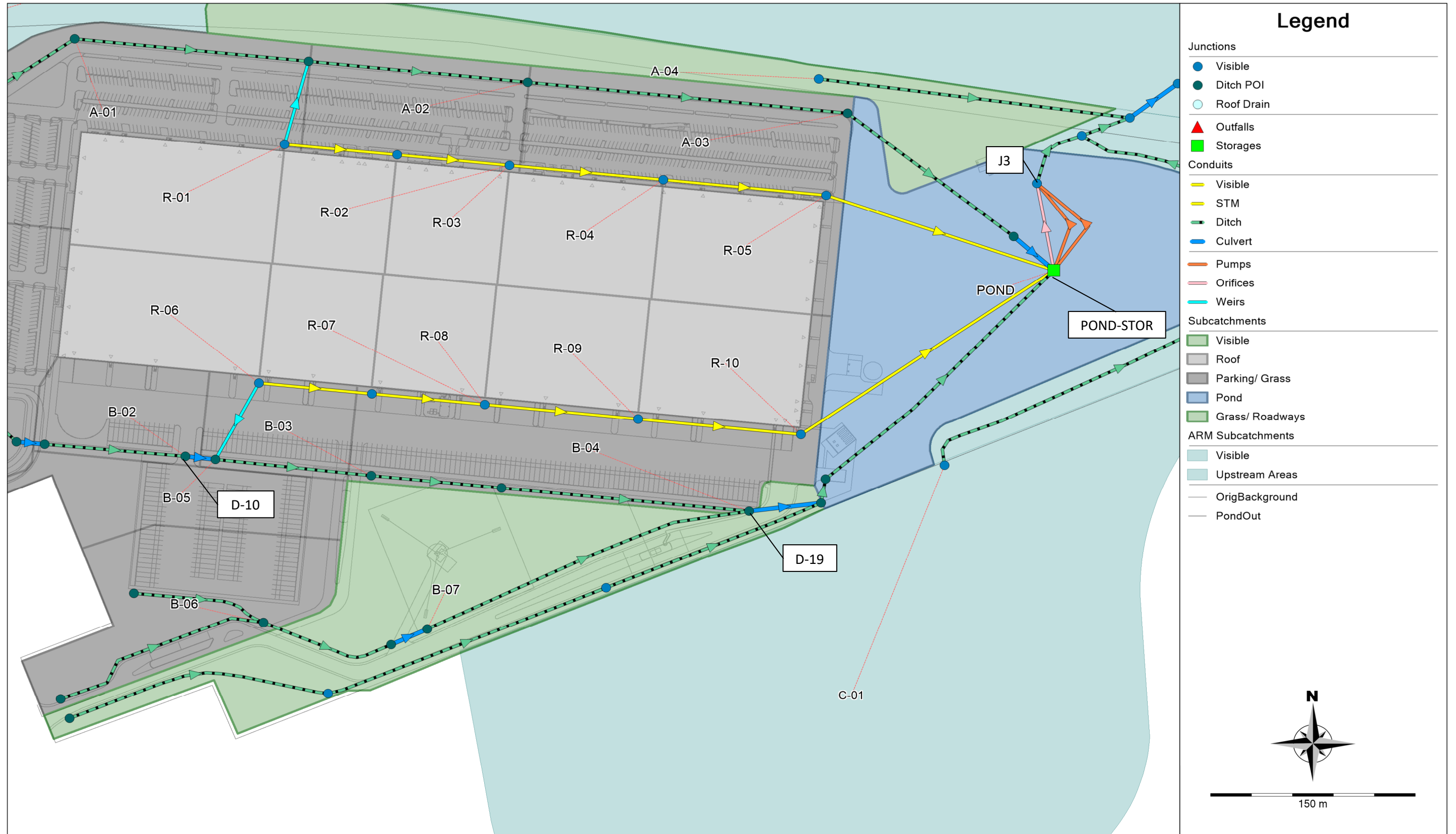
Culverts

Water levels and flows for each of the culverts are still within the capacity of the culverts and there will be no overtopping.

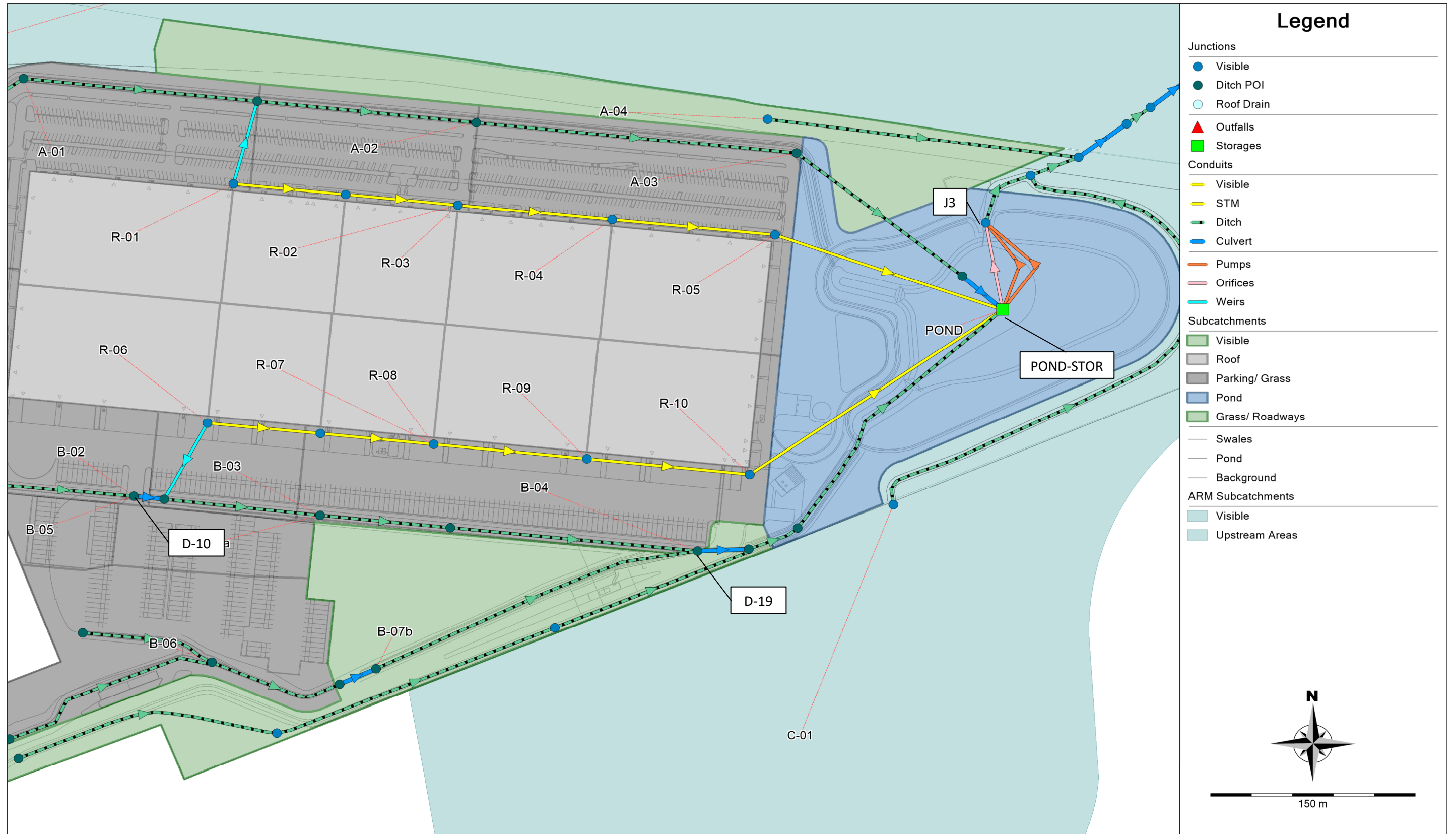
Pond & Outlet

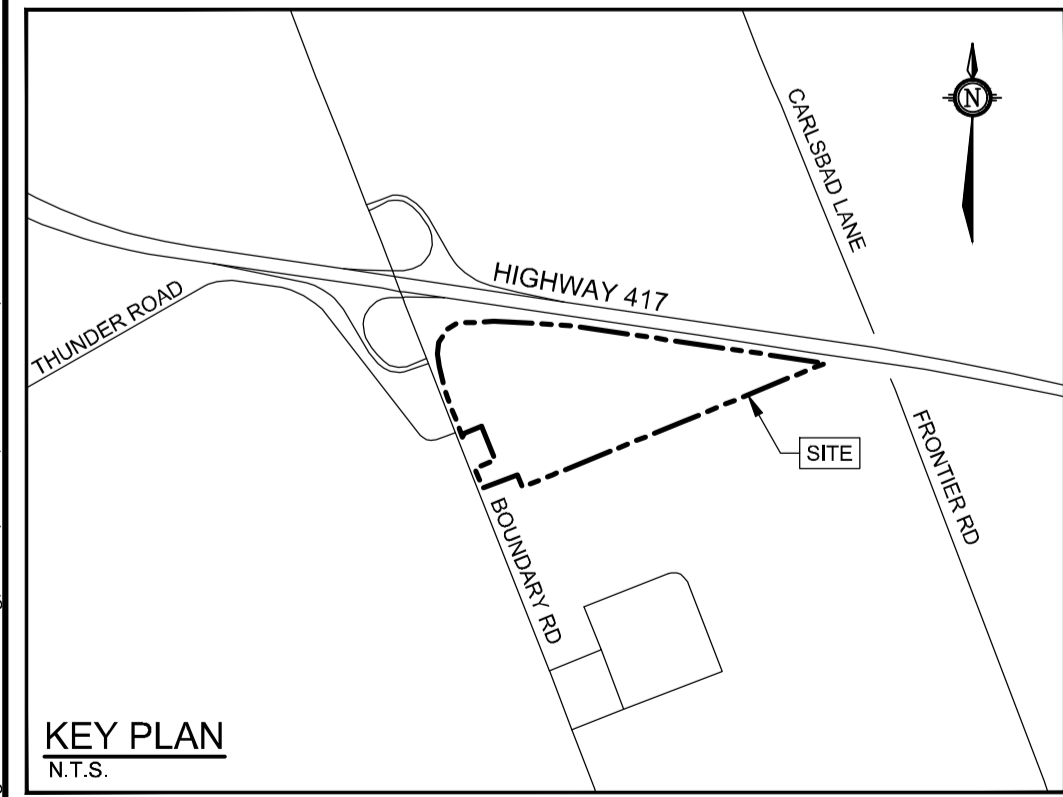
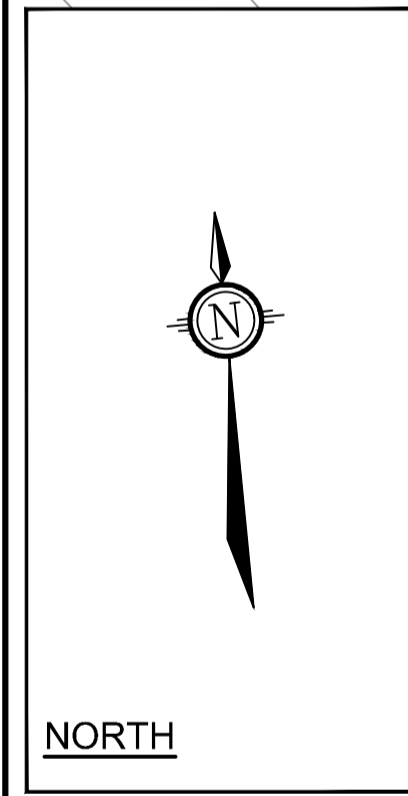
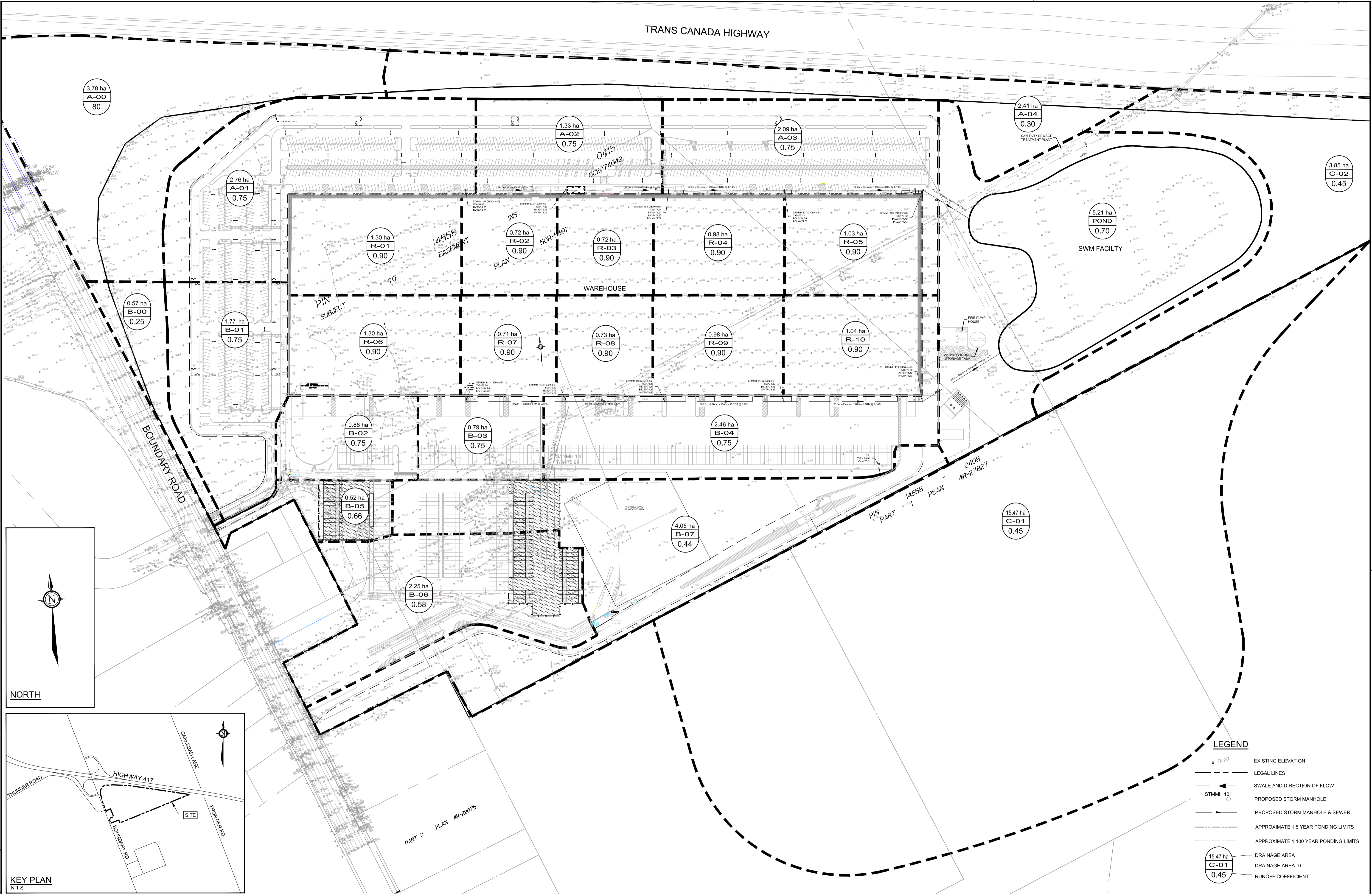
Water levels and flows into the pond and at the outlet structure are well within the capacity of the pond for the 2-year and 5-year event. During the 100-year storm event, water levels will increase by 3cm above the current 100-year pond water level (from 75.61m to 75.64m). While this will result in some encroachment onto the access pathway surrounding the pond, water will not overflow past the boundary of the access pathway or pose any risks to the surrounding building or other infrastructure. Pond outflows during the 100-year event will be unchanged.

**Boundary Road Distribution Centre - Parking Expansion
Model Schematic - Existing Parking/ Original Design**



**Boundary Road Distribution Centre - Parking Expansion
Model Schematic - Expanded Parking**



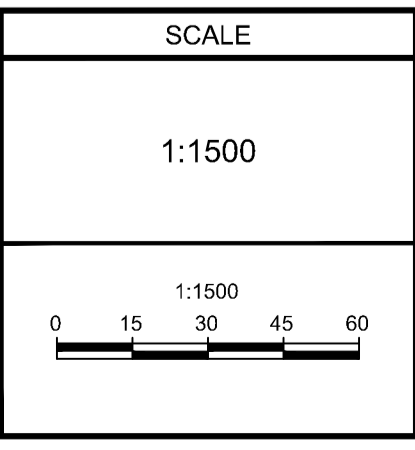


LEGEND

- x 76.20 EXISTING ELEVATION
- LEGAL LINES
- SWALE AND DIRECTION OF FLOW
- STMMH 101 PROPOSED STORM MANHOLE
- PROPOSED STORM MANHOLE & SEWER
- APPROXIMATE 1:5 YEAR PONDING LIMITS
- APPROXIMATE 1:100 YEAR PONDING LIMITS
- 15.47 ha C-01 0.45 DRAINAGE AREA
- DRAINAGE AREA ID
- RUNOFF COEFFICIENT

NOTE:
 THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.			MS



DESIGN	LKS/KA
CHECKED	MP
DRAWN	LKS
CHECKED	KA/MP
APPROVED	KA/MP

FOR REVIEW ONLY

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LOCATION CITY OF OTTAWA 5225 BOUNDARY ROAD - YOW1		PROJECT No. 117217
DRAWING NAME POST-DEVELOPMENT STORM DRAINAGE AREA PLAN		REV REV # 3
DRAWING No. 117217-POST		

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