

MEMO

TO: Rémi Godin, P.Eng
Senior Area Engineer
Eastern Canada Area
rgodin@wm.com

2301 Carp Road
Ottawa, ON, K0A 1L0

FROM: Kathryn Kerker, P.Eng
Eeshan Kumar, P.Eng., P.E., PMP

SUBJECT: West Carleton Environmental Centre – Stormwater Analysis for Proposed Maintenance Building

DATE: September 22, 2025

The Stormwater Design Brief prepared in August 2015 by WSP Canada Inc. provides an analysis of the proposed site conditions and design of the stormwater management ponds and infiltration basins on site. A new 12000 ft² maintenance building is proposed on land that was gravel-covered in the original design. The purpose of this memo is to verify that the existing stormwater infrastructure has the capacity to accept the additional flow from this new building. The original Stormwater Design Brief has been attached for reference.

DESIGN CRITERIA

The design criteria used in the original design of the stormwater management system are as follows:

- Internal ditches and stormwater structures: 1:25 year storm, with overland flow route to carry peak flow from 1:100 year storm
- Surface Water Quality Control: Stormwater ponds sized to store/treat runoff generated from a 4-hour, 25mm storm event.
- Surface Water Quantity Control: Control post-development peak flows to pre-development levels. However, as there is no off-site discharge from the central site area, this condition is automatically met.
- Infiltration Basins: At least 1m to bedrock and water table, and no more than 0.6m water storage depth.

STORMWATER MODELLING

Modelling was previously completed using Bentley PondPack. As we no longer have access to this software, modelling was replicated in PCSWMM to determine the impact of the added

impervious area on the overall stormwater management system. The PCSWMM model was calibrated to align with the PondPack results. PCSWMM model results are attached for reference.

The proposed maintenance building lies within catchment area A8, which was originally modelled with parameters as shown in Table 1. The new 12000 ft² (1115 m²) maintenance building will be placed on land that was previously gravel-covered, which leads to a slight increase in runoff coefficient and CN value. Drainage mosaics for pre-development and post-development conditions is included at the end of this memo within the Drawings section.

Table 1: Catchment A8 model parameters

	WITHOUT MAINTENANCE BUILDING	WITH MAINTENANCE BUILDING
C	0.561	0.57
CN	85.7	86.0

RESULTS

INFILTRATION BASIN

The PCSWMM model was run with the 100-year 24-hour SCS Type II storm. Under existing conditions, the infiltration basin reaches a maximum depth of 0.59m, which remains unchanged under proposed conditions. This meets the design requirement of ponding less than 0.60m in the infiltration basin. Modelling results are shown in Table 2.

Table 2: PCSWMM Modelling Results

	WITHOUT MAINTENANCE BUILDING	WITH MAINTENANCE BUILDING
Maximum water depth in Infiltration Basin #2	0.590 m	0.590 m
Total runoff volume entering Pond #2	28800 m ³	28827 m ³
Peak runoff Subcatchment A8	0.582 m ³ /s	0.587 m ³ /s

WATER QUALITY

The 25mm 4-hour Chicago storm event was run in the model under proposed conditions. The total volume reaching the pond during the water quality event is 266 m³. As the pond has a permanent pool volume of 4200 m³ and an extended detention volume of 19520 m³, there is sufficient volume to store and treat runoff generated from a 4-hour, 25mm storm event.

The quality criteria outlined in the MOE SWM Planning and Design Manual were also assessed. Based on Table 3.2 of the manual and extrapolating for a 4.5% impervious contributing area, the pond also meets an enhanced 80% TSS removal protection level as shown in Table 3.

Table 3: Pond Water Quality Parameters

PARAMETER	VALUE
Contributing Area Imperviousness	4.5%
Contributing Area	52 ha
Storage Volume for Imperviousness Level	75 m ³ /ha
Required Extended Detention Volume (40 m ³ /ha)	2080 m ³
Available Extended Detention Volume	19520 m ³
Required Permanent Pool Volume (35 m ³ /ha)	1820 m ³
Available Permanent Pool Volume	4200 m ³

CONVEYANCE

The existing ditches and stormwater infrastructure were verified to ensure that they still meet the design criteria with the additional flow from the new maintenance building. Figure 1 shows that the existing triangular ditch (1.1m deep, 3:1 side slopes) and 0.6 m culvert convey the 25-year storm without surcharging and convey the 100-year storm without overtopping.



Figure 1: Hydraulic Grade Line along ditch and culvert adjacent to new maintenance building

CONCLUSIONS

The peak depth in the infiltration basin, water quality treatment, and stormwater conveyance have all been confirmed to meet the design criteria. This memo has shown that the existing stormwater system is sufficient to support the proposed maintenance building.

We trust that the foregoing satisfies your current requirements. Should you have any questions regarding the above, please do not hesitate to contact our office.

Sincerely,

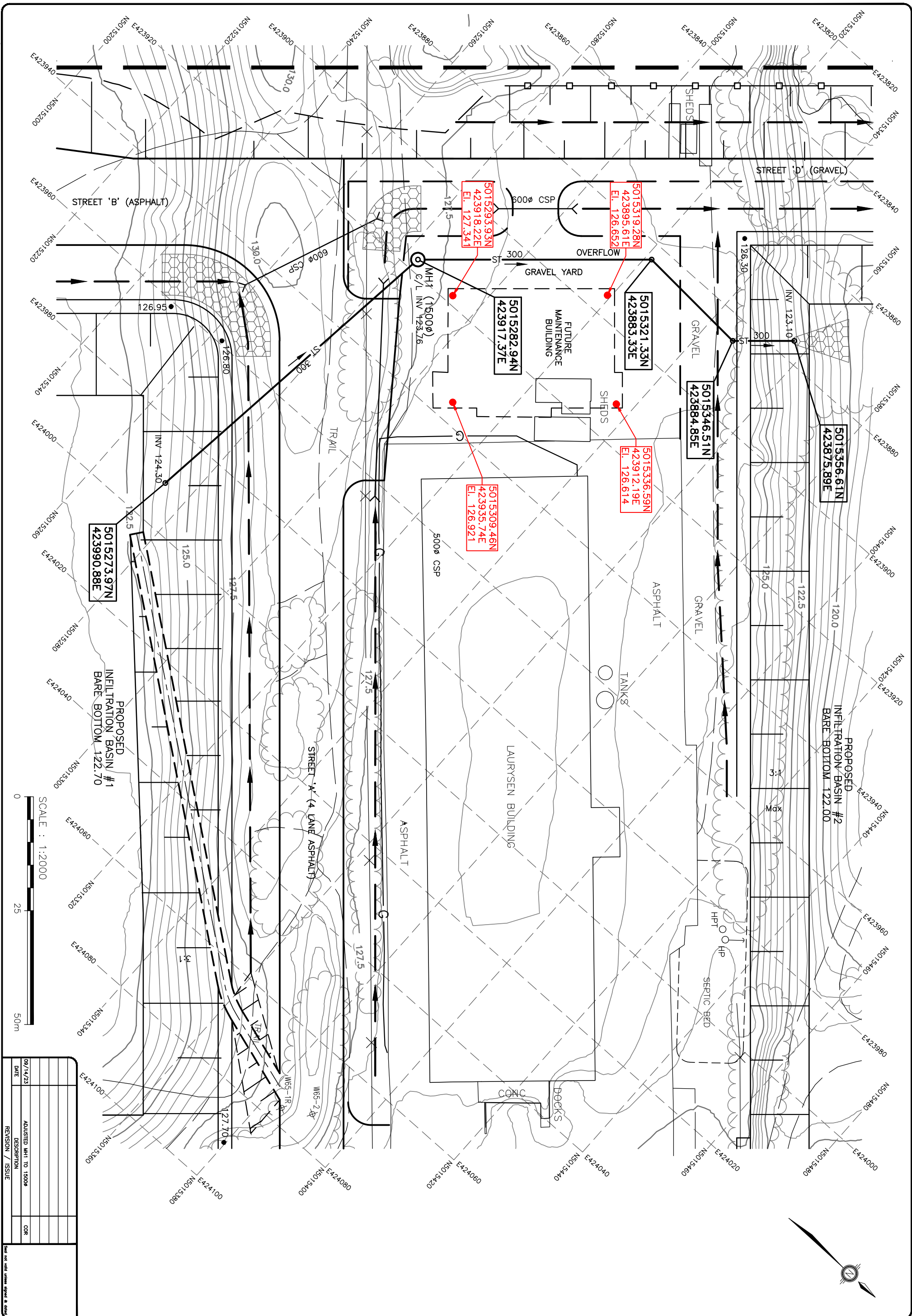


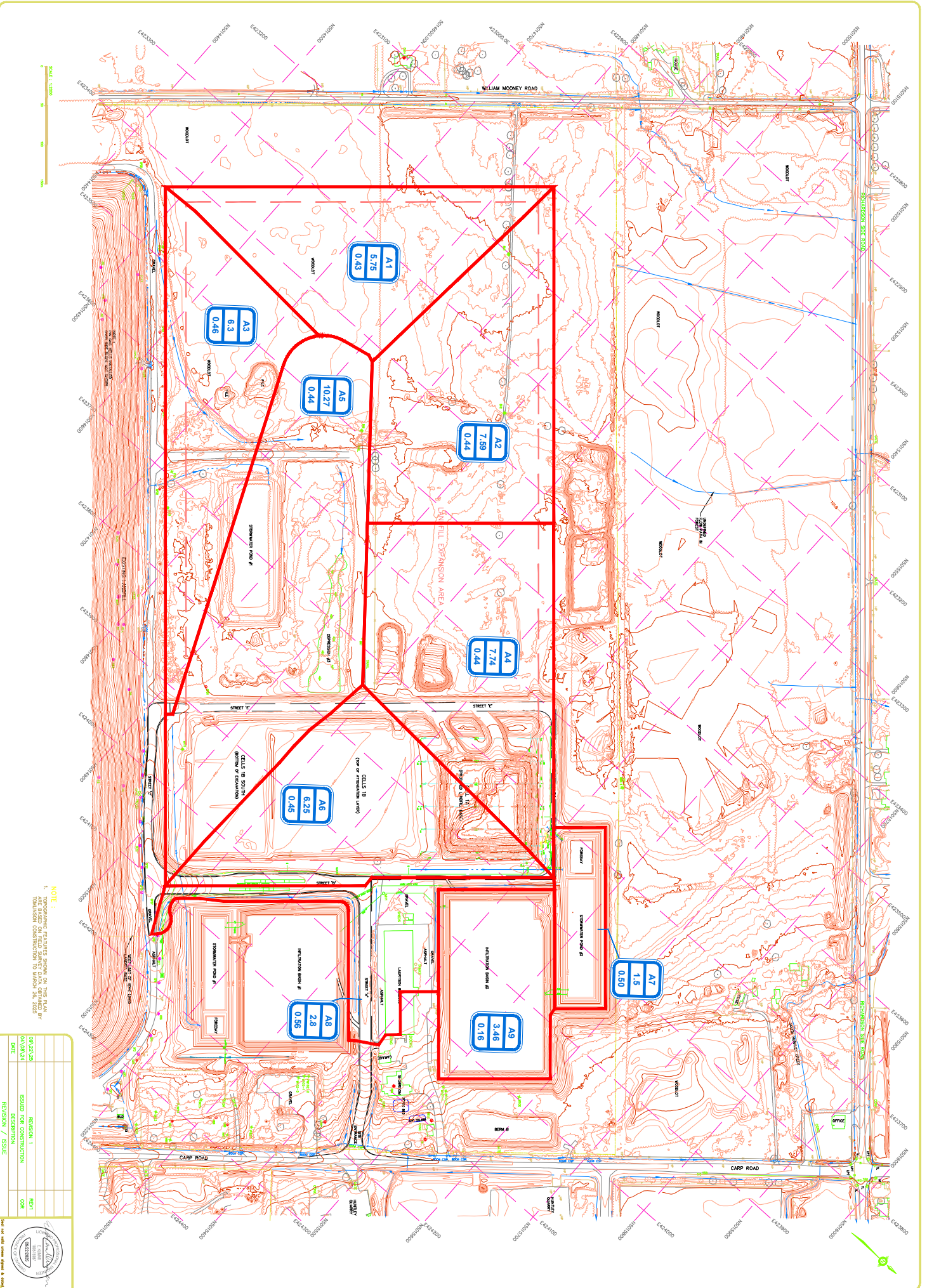
Eeshan Kumar, P.Eng., P.E., PMP
Senior Water Resources Engineer

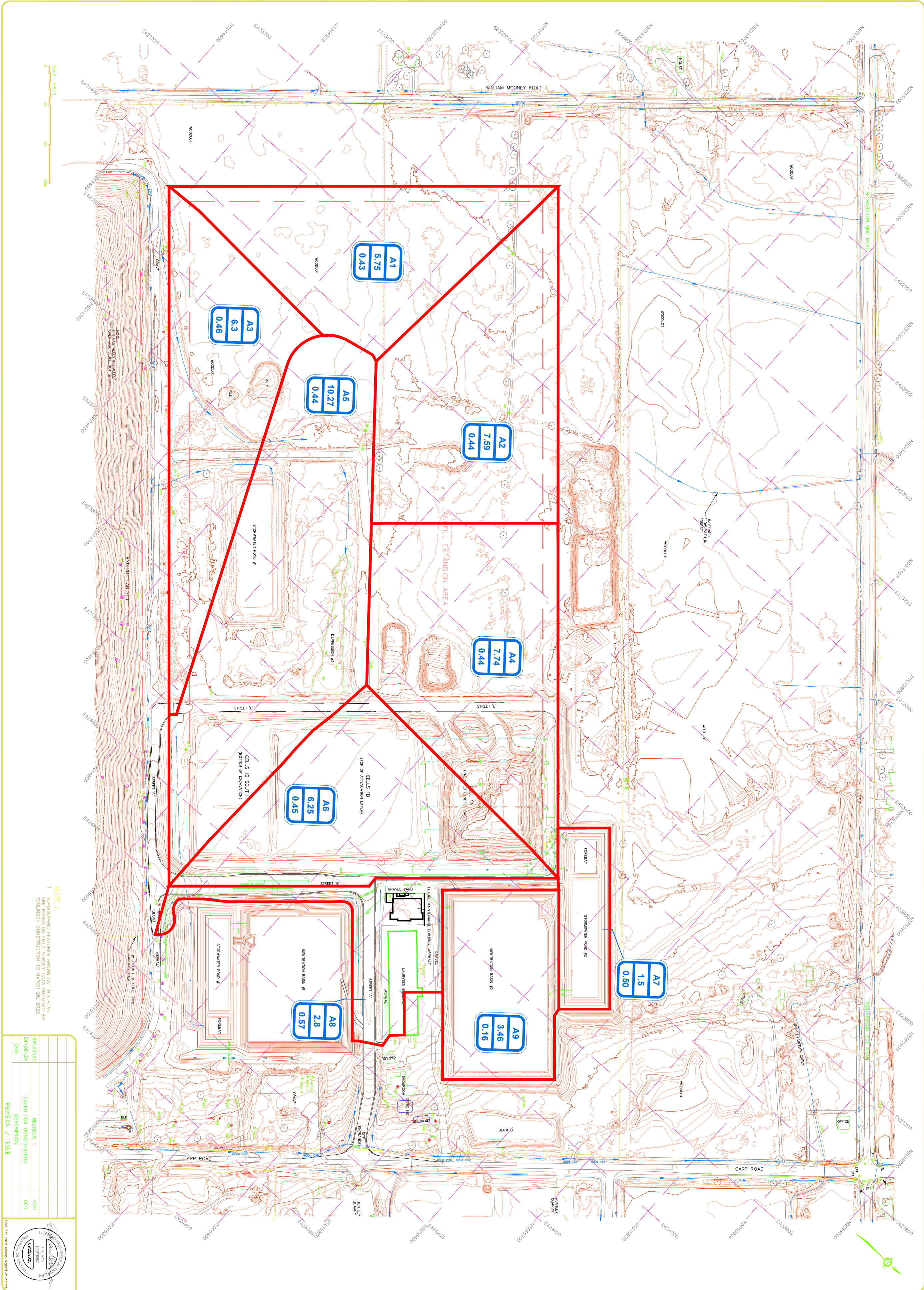


ATTACHMENTS

- Proposed Maintenance Building Location
- Stormwater Design Brief, August 2015
- PCSWMM Model Output







NOTE:
1. TOPOGRAPHIC FEATURES SHOWN ON THIS PLAN ARE BASED ON FIELD SURVEY DATA OBTAINED BY TOMLINSON CONSTRUCTION TO MARCH 26, 2025

DATE	09/23/25	REVISION 1	REV1
DATE	04/08/24	ISSUED FOR CONSTRUCTION	COR
DATE		REVISION / ISSUE	