

**SERVICING AND STORMWATER
MANAGEMENT REPORT**

8465 BOSTON CHURCH ROAD

**TOWN OF MITLON
HALTON REGION**

PREPARED FOR:

ALL ROUTES LOGISTICS

PREPARED BY:

**C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4**

SEPTEMBER 2025

CFCA FILE NO. 2878-7432

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Revision Number	Date	Comments
Rev.0	September 26, 2025	Issued for First ZBA Submission

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by All Routes Logistics to prepare a Servicing and Stormwater Management Report to support the Zoning By-Law Amendment for the proposed parking area located at 8465 Boston Church Road (the Site) in the Town of Milton (the Town), Halton Region (the Region).

This report will demonstrate that the Site can be serviced in accordance with the Town of Milton and Halton Region guidelines from a domestic water, wastewater, and stormwater management perspective.

The reports, drawings, and design standards referenced during the preparation of this report include the following:

- As-constructed drawing No. P-1 "Boston Church Road From Sta. 1+320.000 to Sta. 1+540.00" (Urban Ecosystems Limited, June 2003)
- As-constructed drawing No. P-2 "Boston Church Road From Sta. 1+540.00 to Sta. 1+780.00" (Urban Ecosystems Limited, June 2003)
- GIS Mapping "8465 Boston Church Rd" (Region of Halton, June 2025)
- Functional Stormwater and Environmental Management Strategy Report for the Highway 401 Industrial/Business Park Secondary Plan Area (Philips Engineering Ltd., July 2000)
- Site Plan (Robert Russel Planning Consultants, October 2025)
- Storm Drainage Area Plan (Regional File: DM-0154, Drawing No. G-11,) (Urban Ecosystems Limited, June 2003)
- Stormwater Management Report, ARG Milton Industrial Park Boston Church Road & 401 (Sernas Associates, February 2005)
- Topographic Survey (Van Harten, June 2025)
- Town of Milton Engineering and Parks Standards Manual (September 2024)

Relevant excerpts of the above listed items are provided in Appendix A.

2.0 Site Description

The Site, located in a mixed-use neighbourhood, covers an area of approximately 2.09 ha, inclusive of a proposed road widening along the western limit of the Site. The Site currently consists of landscaped areas, two 1-storey buildings, a garage, an asphalt parking area, a gravel parking area, a concrete pad, concrete walkways, and existing stormwater management infrastructure. The Site is bounded by industrial lots to the north, east, and south and Boston Church Road to the west.

Based on the Site Plan (Robert Russel Planning Consultants, October 2025) provided in Appendix A, the existing garage and concrete pad will be removed, and the existing gravel parking area and stormwater management infrastructure will be reconfigured to meet Town Standards.

3.0 Water Servicing

A review of the Topographic Survey (Van Harten, June 2025) provided in Appendix A indicates that the following services are present:

- Two (2) municipal hydrants located within the east boulevard of Boston Church Road.
- A 300 mm diameter municipal PVC watermain located within the east boulevard of Boston Church Road.

According to the as-constructed Drawing No. P-1 (Urban Ecosystems Limited, June 2003) provided in Appendix A, there is an existing water valve on the 300 mm municipal watermain adjacent to SAN MH 130A within the Boston Church Road boulevard. While a water service is not depicted in the as-constructed drawing, an existing water service in this approximate location is indicated on the Halton Region's GIS Mapping (June 2025), provided in Appendix A.

Although the garage will be removed, it is not water-serviced. Therefore, no changes are proposed to the existing water-serviced buildings, and the Site's water service will remain unchanged and continue to function as in existing conditions. Any changes to the internal water servicing system of the buildings, if required, will be designed by the Mechanical Engineer.

The existing municipal hydrant located north of the existing access to the Site is proposed to be relocated outside of the proposed driveway entrance as illustrated on the Site Servicing Plan (C102).

4.0 Sanitary Servicing

A review of the Topographic Survey (Van Harten, June 2025) provided in Appendix A indicates that the following services are present:

- A 375 mm diameter municipal PVC sanitary sewer located within Boston Church Road.
- An existing property line sanitary maintenance hole (SAN MH 130A) located along the west limits of the Site.

According to the as-constructed Drawing No. P-1 (Urban Ecosystems Limited, June 2003) provided in Appendix A, there is an existing 200 mm diameter sanitary service extending westward from SAN MH 130A that connects to the 375 mm diameter municipal sanitary sewer.

As no changes are proposed to the existing buildings, the existing sanitary service for the Site will remain and continue to function as in existing conditions. Any changes to the internal sanitary servicing system of the buildings, if required, will be designed by the Mechanical Engineer.

5.0 Drainage Conditions

The following sections outline the stormwater drainage conditions of the Site.

5.1 Previous Studies and Existing Infrastructure

According to the Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003) provided in Appendix A, the Site is located within the drainage area of the existing Milton St. Clair Lands (Bales) stormwater management pond located southwest of the Site. The stormwater management pond provides stormwater quantity, quality, and erosion control for approximately 138 ha of drainage area, as described in the Stormwater Management Report (Sernas Associates, February 2005) provided in Appendix A.

Under existing conditions, stormwater runoff generated within the Site is directed to municipal storm sewer infrastructure beneath Boston Church Road R.O.W. and is conveyed to the municipal stormwater pond. According to as-constructed drawings No. P-1 and No. P-2 (Urban Ecosystems Limited, June 2003) provided in Appendix A, the stormwater infrastructure beneath the Boston Church Road R.O.W. consists of an 1,800 mm diameter concrete storm sewer that drains into a 2,400 mm x 1,200 mm concrete box storm sewer.

Refer to the Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003) provided in Appendix A for the location of the existing storm infrastructure and stormwater management pond in relation to the Site.

5.2 Existing Drainage

Existing design conditions for the Site are defined by the Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003), which includes runoff coefficients and catchment boundaries for select contributing drainage areas, including the Site. These values were used in the design of the Milton St. Clair Lands (Bales) stormwater management pond and reflect the hydrologic response attributed to the Site within the existing design stormwater management strategy. Thus, referencing the Storm Drainage Area Plan's (Urban Ecosystems Limited, June 2003) established runoff coefficients and catchments ensures consistency with the capacity of the receiving system.

Likewise, a review of the Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003) and Topographic Survey (Van Harten, June 2025) provided in Appendix A, revealed that the Site is split into two (2) pre-development catchments at specified runoff coefficients and receives one (1) external catchment, as illustrated on the Pre-Development Storm Drainage Plan (Figure 1) and described below:

- Catchment 100 (1.07 ha, RC = 0.40): Includes runoff generated in the northern portion of the Site from landscaped area, buildings and associated concrete surfaces, gravel parking area, and a portion of the proposed road widening along the western limit of the Site. A portion of the runoff is collected by existing catch basins and conveyed west via CSP pipes to EX. DICB1, and the remainder of the runoff is conveyed overland to an existing catch basin on Boston Church Road. From EX. DICB1 and the existing catch basin on Boston Church Road, the stormwater is conveyed to the Milton St. Clair Lands (Bales) stormwater management pond through the municipal storm sewer system within Boston Church Road. There are no existing on-site water quality or quantity controls.
- Catchment EXT1 (0.05 ha, RC = 0.25): Includes runoff generated from pervious area within an external drainage catchment located along the northeast limits of the Site. Runoff from this external catchment is directed to Catchment 100.
- Catchment 101 (1.02 ha, RC = 0.50): Includes runoff generated in the southern portion of the Site from landscaped area, buildings and associated concrete surfaces, a garage, asphalt parking area, gravel parking area, and a portion of the proposed road widening along western limit of the Site. A portion of the runoff is collected by existing catch basins and conveyed west via CSP pipes to EX. DICB2. The remainder of the runoff is conveyed overland to an existing catch basin on Boston Church Road. From EX. DICB2 and an existing catch basin on Boston Church Road, the stormwater is conveyed to the Milton St. Clair Lands (Bales) stormwater management pond through the municipal storm sewer system within Boston Church Road. There are no existing on-site water quality or quantity controls.

5.3 Proposed Drainage

Based on the Site Plan (Robert Russel Planning Consultants, August 2025) provided in Appendix A, the existing gravel parking area and associated stormwater management infrastructure is proposed to be reconfigured to meet Town standards. In proposed conditions, the grading divides the Site into four (4) post-development drainage catchments and maintains the one (1) external catchment, as illustrated on the Post-Development Storm Drainage Plan (Figure 2):

- Catchment 200 (0.95 ha, RC = 0.90): Follows a similar drainage pattern as pre-development Catchment 101 and includes drainage from the northeastern portion of the reconfigured gravel parking area, surrounding landscaped area, portion of an existing building and associated existing concrete walkways. Major and minor drainage is captured by proposed catch basins and conveyed via storm sewers to a stormwater management tank located beneath the gravel parking area. The stormwater management tank outlets via an orifice tube to EX. DICB1 and subsequently flows to the municipal stormwater sewer system within Boston Church Road that directs the stormwater to the Milton St. Clair Lands (Bales) stormwater management pond.

During emergency rainfall events (ex. catch basin or storm sewer blockage, etc.), major overland flow is proposed to sheet flow towards EX. DICB1 and spill to the Boston Church Road R.O.W.

- Catchment EXT1 (0.05 ha, RC = 0.25): Includes runoff generated from pervious area within an external drainage catchment located along the northeast limits of the Site. Runoff from this external catchment will function as in existing conditions and will combine with Catchment 200.
- Catchment UC1 (0.15 ha, RC = 0.35): Includes drainage from a northwestern portion of the reconfigured gravel parking area, surrounding landscaped area, a portion of the existing building and associated concrete walkways, and a portion of the proposed road widening along the western limit of the Site. The runoff generated within the gravel parking area of this catchment flows overland to EX. DICB1 as in existing conditions via a proposed curb cut and associated rip rap spillway located in the northwest corner of the catchment.

The runoff generated within the landscaped area of this catchment flows overland to the existing municipal catch basins located along the Boston Church R.O.W. Stormwater from this catchment drains towards the Milton St. Clair Lands (Bales) stormwater management pond through the municipal storm sewer system.

- Catchment 201 (0.90 ha, RC = 0.90): Follows a similar drainage pattern as pre-development Catchment 101 and includes drainage from the southeastern portion of the reconfigured gravel parking area, surrounding landscaped area, a portion of the existing buildings and associated existing concrete walkways, and the existing asphalt parking area. Major and minor drainage is captured by proposed catch basins and conveyed via storm sewers to a stormwater management tank located beneath the existing asphalt parking area. The stormwater management tank outlets via an orifice tube to EX. DICB2 and subsequently flows to the municipal stormwater sewer system within Boston Church Road that directs the stormwater to the Milton St. Clair Lands (Bales) stormwater management pond.

During emergency events (ex. catch basin or storm sewer blockage, etc.), major overland flow is proposed to flow towards EX. DICB2 and the Boston Church Road R.O.W.

- Catchment UC2 (0.10 ha, RC = 0.56): Includes drainage from the southwestern portion of the existing asphalt parking area, a portion of the existing building and associated concrete walkways, and a portion of the proposed road widening along the western limit of the Site. As in existing conditions, the runoff generated within this catchment either flows overland to EX. DICB2 or the catchbasins within the Boston Church Road R.O.W. and is directed to the Milton St. Clair Lands (Bales) stormwater management pond throughout the municipal storm sewer system.

For additional details of the proposed drainage conditions on the Site, refer to Post-Development Storm Drainage Figure (Figure 2).

6.0 Stormwater Management

The stormwater management criteria for the Site were determined through review of the Functional Stormwater and Environmental Management Strategy Report for the Highway 401 Industrial/Business Park Secondary Plan Area (Philips Engineering Ltd., July 2000) and the Stormwater Management Report (Sernas Associates, February 2005), provided in Appendix A, and is as follows:

- Water Quantity Control: Post-development peak flows must be controlled to the pre-development peak flows for all storm events up to the 100-year storm event, based on the design runoff coefficients set within the Milton St. Clair Lands (Bales) stormwater management pond report's appended Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003), provided in Appendix A.

Water Quality Control: Runoff from the drainage area must achieve Level 1 Protection (Enhanced – 80% Average Annual Removal of Total Suspended Solids) for quality control.

- Erosion Control: The receiving Milton St. Clair Lands (Bales) stormwater management pond provides erosion control for the Site per the Stormwater Management Report (Sernas Associates, February 2005), provided in Appendix A. Therefore, no additional on-site erosion controls are required.
- Water Balance: Post-development water balance must maintain pre-development levels.

6.1 Stormwater Quantity Control

As outlined in Section 5.2, the proposed Site drainage is split into two (2) controlled post-development catchments, two (2) uncontrolled post-development catchments, and one (1) external catchment area.

On-site stormwater quantity controls are required for the Site because the reconfigured gravel parking area increases the Site's imperviousness when compared to pre-development conditions.

6.1.1 North Outlet (EX. DICB1)

For stormwater directed to the north outlet, a stormwater management tank is proposed to accept drainage from Catchment 200 and Catchment EXT1. Drainage from Catchment UC1 will flow to the municipal storm sewer system within Boston Church Road via EX. DICB1 and catch basins within the R.O.W., as in existing conditions.

The estimated peak flows directed to the north outlet in pre-development and post-development conditions are presented in Table 1.

Table 1: Summary of Peak Flows - North Outlet

Return Period	Pre-Development Peak Flow Target ($Q_{100} + Q_{EXT1}$) (L/s)	Post-Development Peak Flow			Required Storage (m ³)
		$Q_{200} + Q_{EXT1}$ (L/s) Controlled	Q_{UC1} (L/s) Uncontrolled	Total (L/s)	
2 yr	97	79	12	91	72.2
5 yr	127	94	16	110	104.0
10 yr	147	104	18	122	153.2
25 yr	173	115	21	136	125.0
50 yr	192	123	24	147	173.2
100 yr	211	130	26	156	195.4

To control the total post-development peak flows directed to the north outlet to pre-development levels, a total of 195 m³ of stormwater detention storage is required. The underground stormwater tank has been preliminarily sized to provide approximately 205 m³ of stormwater detention storage. Additional storage is also provided within the private storm sewer network; however, the storage within the storm sewer network has not been accounted for in the calculations to be conservative.

Detailed Modified Rational Method and storage calculations are provided in Appendix B. The detailed tank design and shop drawings will be provided following zoning approvals.

6.1.2 South Outlet

For stormwater directed to the south outlet, a stormwater management tank is proposed to accept drainage from Catchment 201. Drainage from Catchment UC2 will flow to the municipal storm sewer system beneath Boston Church Road through EX. DICB2 and catch basins within the R.O.W., as in existing conditions.

The estimated peak flows directed to the south outlet in pre-development and post-development conditions are presented in Table 2.

Table 2: Summary of Peak Flows - South Outlet

Return Period	Pre-Development Peak Flow Target (Q_{101}) (L/s)	Post-Development Peak Flow			Required Storage (m ³)
		Q_{201} (L/s) Controlled	Q_{UC2} (L/s) Uncontrolled	Total (L/s)	
2 yr	113	93	12	106	51.8

Return Period	Pre-Development Peak Flow Target (Q ₁₀₁) (L/s)	Post-Development Peak Flow			Required Storage (m ³)
		Q ₂₀₁ (L/s) Controlled	Q _{UC2} (L/s) Uncontrolled	Total (L/s)	
5 yr	149	118	16	134	71.1
10 yr	172	131	19	150	85.2
25 yr	202	147	22	169	104.1
50 yr	223	158	24	182	117.9
100 yr	246	170	26	196	132.4

To control the total post-development peak flows directed to the south outlet to pre-development levels, a total of 132 m³ of stormwater detention storage is required. The underground stormwater tank has been preliminarily sized to provide approximately 155 m³ of stormwater detention storage. Additional storage is also provided within the private storm sewer network; however, the storage within the storm sewer network has not been accounted for in the calculations to be conservative.

Detailed Modified Rational Method and storage calculations are provided in Appendix B. The detailed tank design and shop drawings will be provided following zoning approvals.

6.2 Stormwater Quality Control

Stormwater quality controls for the drainage area must meet Level 1 Protection (Enhanced – 80% Average Annual Removal of Total Suspended Solids) requirements.

The Milton St. Clair Lands (Bales) stormwater management pond was designed to provide Level 1 Protection for its contributing drainage areas, as outlined in the Stormwater Management Report (Sernas Associates, February 2005), provided in Appendix A. Any changes to the contributing drainage area that result in increased pollutant loading, relative to the pond's original design inputs, must be mitigated through appropriate pre-treatment measures to maintain compliance with water quality objectives. Accordingly, on-site controls are required for the Site due to the Site's increase in impervious land cover relative to the pond's design inputs. It is proposed to achieve the stormwater quality requirements through the use of a treatment train approach utilizing oil-grit separators and catch basin shields. Design details of the treatment train will be provided at the detailed design stage.

6.3 Water Balance

Post-development stormwater water balance for the Site must maintain pre-development levels. Water balance will be achieved through on-site infiltration and filtration methods via Low Impact Developments practices. Design details of the water balance design will be provided at the detailed design stage.

7.0 Erosion and Sediment Control During Construction

Erosion and sediment controls will be installed prior to the commencement of any construction activities and will be maintained until the Site is stabilized or as directed by the Site Engineer and/or Town. Controls will be inspected after each significant rainfall event and maintained in proper working condition.

The following sediment and erosion controls will be included during the construction on the Site:

Silt Fencing

Silt fencing will be installed around the perimeter of the Site to intercept sheet flow. Additional silt fencing may be added based on field decisions by the Site Engineer and Owner prior to, during, and following construction.

Mud Mat

A mud mat will be installed at the entrance to the construction zone to prevent mud tracking from the Site onto the surrounding lands and perimeter roadway network. All construction traffic will be restricted to this access only.

Silt Sacks in Catch Basins

A silt sack will be installed in the existing nearby storm sewer catch basins.

Refer to the Erosion and Sediment Control Plan (C101) for the proposed erosion and sediment control measures and Notes & Details (C104) for additional details.

8.0 Conclusions and Recommendations

The Site, located at 8465 Boston Church Road in the Town of Milton, proposes the reconfiguration of a gravel parking area. The proposed works can be completed in accordance with the Town of Milton and Halton Region guidelines from a domestic water, wastewater, and stormwater management perspective based on the information contained in this report and the following conclusions:

- The existing sanitary and water services will remain and continue to service the existing buildings as in existing conditions.
- The existing municipal hydrant located adjacent to the Site access is proposed to be relocated north, 1.5 m behind the proposed access driveway curb.
- The existing stormwater outlets for the Site, including EX. DICB1, EX. DICB2 and the Boston Church Road R.O.W., will remain where the runoff generated within the Site will continue to drain towards the Milton St. Clair (Bales) stormwater management pond.
- The internal stormwater network will be removed and replaced to suit the proposed grading where the stormwater quantity controls will be achieved through two (2) separate underground stormwater storage tanks located upstream of EX. DICB1 and EX. DICB2.
- As outlined in the Stormwater Management Report (Sernas Associates, February 2005) provided in Appendix A, erosion control for the Site is provided by the Milton St. Clair (Bales) stormwater management pond located southwest of the Site. Quality control will be provided to meet Level 1 Protection via treatment train approach with OGS and CB Shields.

Based on the above conclusions, we recommend approval for the Zoning By-law Amendment for the proposed development from a servicing and stormwater perspective.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Madeleine Hooper
Engineering Intern, Land Development

MPH:JKF:JB:MB/cj

C.F. CROZIER & ASSOCIATES INC.

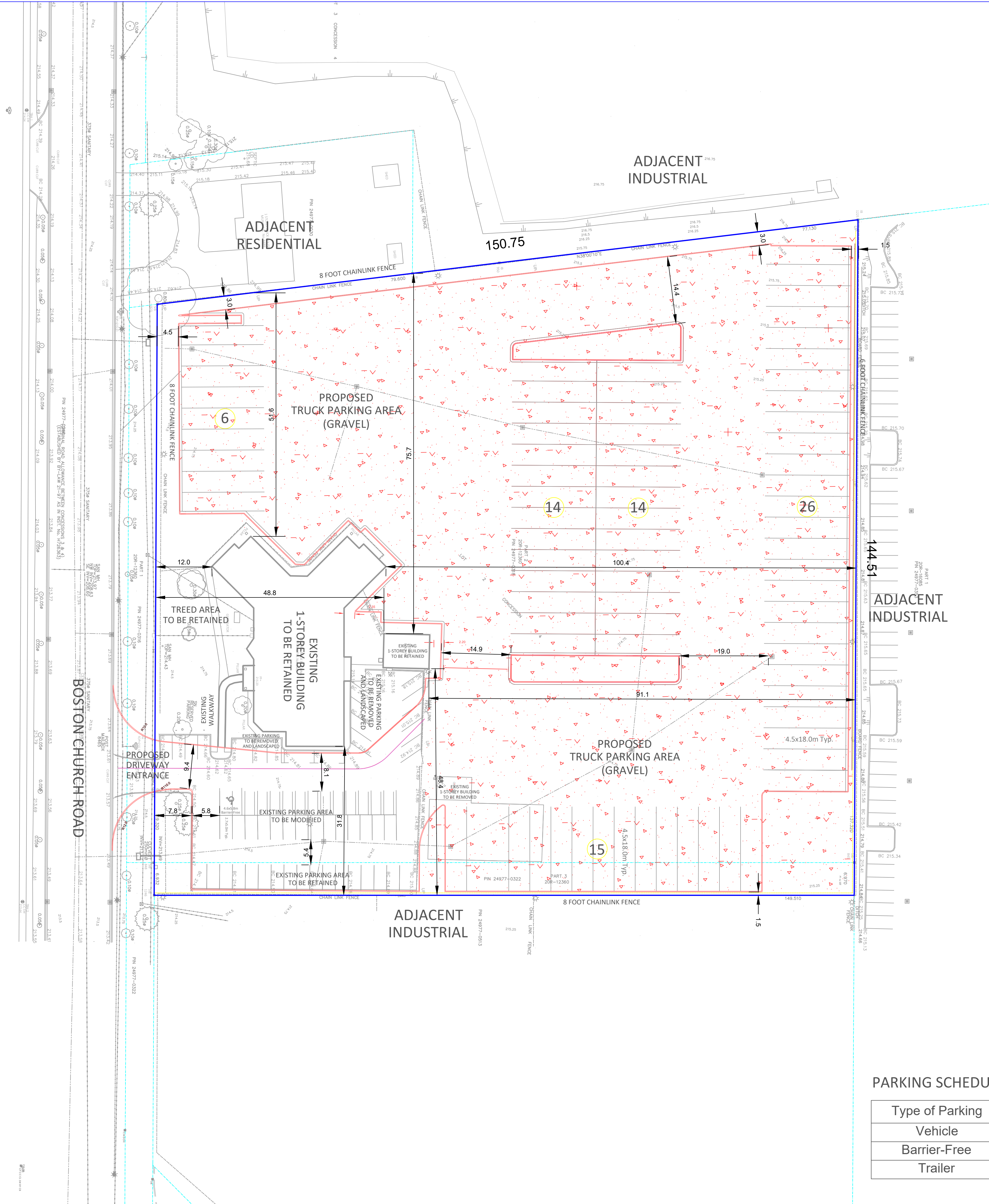


Jayesh Boily, P.Eng.
Project Engineer, Land Development

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APPENDIX A

Background Documentation



ZONING PARAMETERS

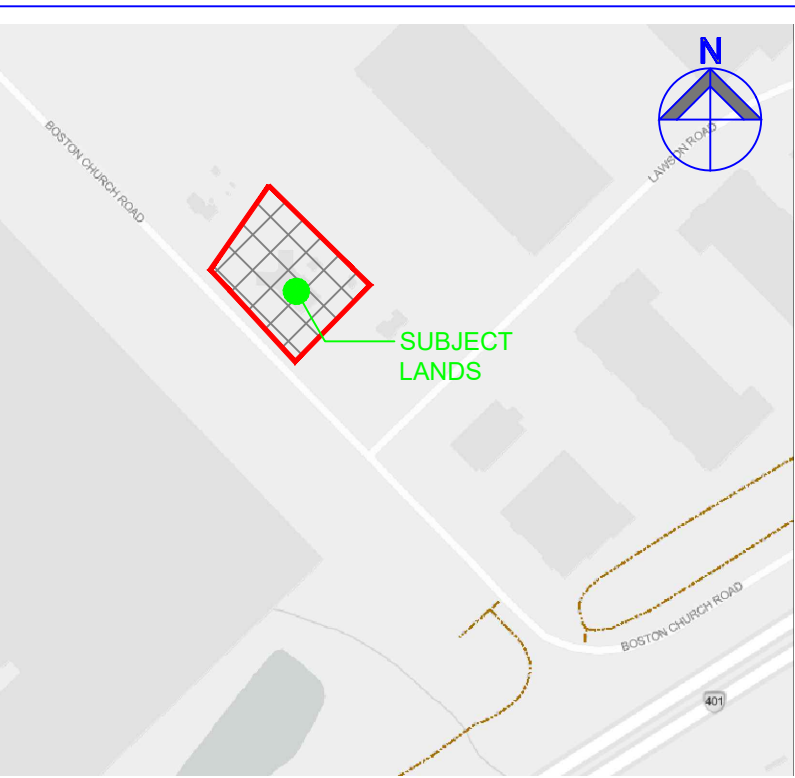
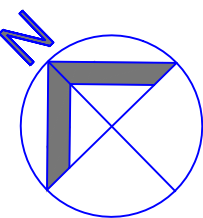
Accessory Building (1 Storey) - To Remain				
ZBL Section	Parameter	Required	Provided	Existing?
4.1.2.1(i)	Accessory Building/Structure Maximum Area	N/A in M2 Zone (4.1.2.1(1)(ii))	71.3 m ²	Yes
4.1.2.1(1)(a)	Accessory Building/Structure Maximum Height	5.5 m	Unknown	Yes
4.1.2.1(1)(b)	Minimum Setback from Interior Lot Line	3.0 m	75.7 m (North), 48.4 m (South)	Yes
4.1.2.1(1)(d)	Minimum Setback from Rear Lot Line	3.0 m	91.0 m	Yes
4.1.2.1(1)(e)	Minimum Setback from a Residential Zone	9.0 m (per Table 8B)	75.7 m	Yes

Accessory Building (Garage) - To Be Removed				
ZBL Section	Parameter	Required	Provided	Existing?
4.1.2.1(i)	Accessory Building/Structure Maximum Area	N/A in M2 Zone (4.1.2.1(1)(ii))	36.4 m ²	Yes
4.1.2.1(1)(a)	Accessory Building/Structure Maximum Height	5.5 m	Unknown	Yes
4.1.2.1(1)(b)	Minimum Setback from Interior Lot Line	3.0 m	107.2 m (North), 20.5 m (South)	Yes
4.1.2.1(1)(d)	Minimum Setback from Rear Lot Line	3.0 m	81.8 m	Yes
4.1.2.1(1)(e)	Minimum Setback from a Residential Zone	9.0 m (per Table 8B)	107.2 m	Yes

Principal Building/Use				
ZBL Section	Parameter	Required	Provided	Existing?
4.1.2.4(i)	Waste Storage Location	Principal Building	Principal Building	Unknown
4.1.2.5(i)	Ground Level HVAC Setback from Lot Line	3.0 m	35.6 m (south) Shortest Distance	Yes
4.5.1	Maximum Fence Height	3.0 m	2.5 m (8 feet)	No
Table 5A	Minimum Perpendicular Parking Space Length	5.8 m	5.0 m	Yes
Table 5A	Minimum Perpendicular Parking Space Width	2.75 m	2.77 m	Yes
5.0(ii)	Minimum Width of Parking Aisle	6.0 m	5.4 m	Yes
5.11(ii)	Oversize Vehicle Parking Setback to Street	(per Table 5C)	4.5 m	No
5.11(ii)	Oversize Vehicle Parking Setback to Side/Rear Lot Lines	1.5 m (per Table 5C)	1.5 m (3.0 m to residential zone)	No
Table 5E	Required Parking for Accessory Office	1 space per 30 m ² 30 spaces	1 space per 19.7 m ² 45 spaces	No
Table 5F	Minimum Accessible Parking (based on required parking of 30 spaces)	1	1	No
5.16.1(i)	Accessible Parking Space Length	5.8 m	5.8 m	No
5.16.2(i)	Accessible Parking Space Width	4.6 m	4.6 m	No
Table 5I	Loading Space Requirements	0	0	Yes
Table 8B	Lot Frontage	40.0 m	126.3 m	Yes
Table 8B	Lot Area	0.8 ha	2.0 ha	Yes
Table 8B	Lot Coverage Maximum	35.00%	4.70%	Yes
Table 8B	Front Yard Setback	9.0 m	12.0 m	Yes
Table 8B	Rear Yard Setback	12.0 m	100.4 m	Yes
Table 8B	Side Yard Setback – not abutting a Residential Zone	3.0 m	31.8 m	Yes
Table 8B	Side Yard Setback – Abutting a Residential Zone	9.0 m	51.6 m	Yes
Table 8B	Building Height – Office Uses	N/A	Unknown	Yes
Table 8B	Landscape Open Space	5.00%	15.46% (3,092 m ²)	No
Table 8B	Minimum Landscape Buffer – Abutting a Streetline	4.5 m	4.5 m	No
Table 8B	Minimum Landscape Buffer – Abutting a Residential Zone	3.0 m	3.0 m	No

PARKING SCHEDULE

Type of Parking	Typical Dimension	Existing	Proposed	Total
Vehicle	2.7m x 5.0m	64	-19	47
Barrier-Free	4.6m x 5.8m	1	-	1
Trailer	4.5m x 18.0m	0	+78	78



KEY PLAN N.T.S.

No.	DATE:	REVISIONS:
1.	11/08/25	---
2.	15/08/25	Titleblock & engineering base layer revisions

CLIENT: AR LAND HOLDINGS
8465 BOSTON CHURCH ROAD, MILTON
TOWN OF MILTON
SITE ADDRESS: 8465 BOSTON CHURCH ROAD
PART OF LOT 2, CONCESSION 4
(ESQUESGIN), TOWN OF MILTON,
REGIONAL MUNICIPALITY OF HALTON

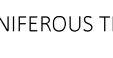


162 Guelph Street, Suite 209
Georgetown, ON L7G 5X7

TITLE: SITE PLAN

SCALE: 1:450
DATE: AUGUST 2025
DRAWN: M.M.
CHECKED: R.R.
PROJECT No: XXXX
DRAWING No:

TOPOGRAPHIC LEGEND

UNDERGROUND BELL	 URB	 URB
SANITARY SEWER	 SAN	 SAN
WATERMAIN	 W	 W
STORM SEWER	 ST	 ST
OVERHEAD HYDRO	 OH	 OH
FENCE LINE	 X	 X
DECK FENCE	 X	 X
CENTRELINE OF ROAD		
TOP OF BANK		
FINISHED FLOOR ELEVATION		
EXISTING ELEVATION		
TOP OF CURB		
BOTTOM OF CURB		
MEASURED INVERT		
BELL PENETRATOR	 BELL	 BELL
HYDRO POLE	 HY	 HY
GLT WIRE	 GLT	 GLT
LIGHT STANDOFF	 LS	 LS
HYDRO METER	 HM	 HM
CATCHBASIN	 CB	 CB
GA GAS VALVE	 GV	 GV
GA GAS METER	 GM	 GM
DECIDUOUS TREE	 DT	 DT
CONIFEROUS TREE	 CT	 CT
CONCRETE		
ASPHALT		





Van Harter

LAND SURVEYORS - ENGINEERS

Kitchener/Waterloo Ph: 519-742-8371	Guelph Ph: 519-821-2763	Orangeville Ph: 519-940-4111
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www.vanharter.com
info@vanharter.com

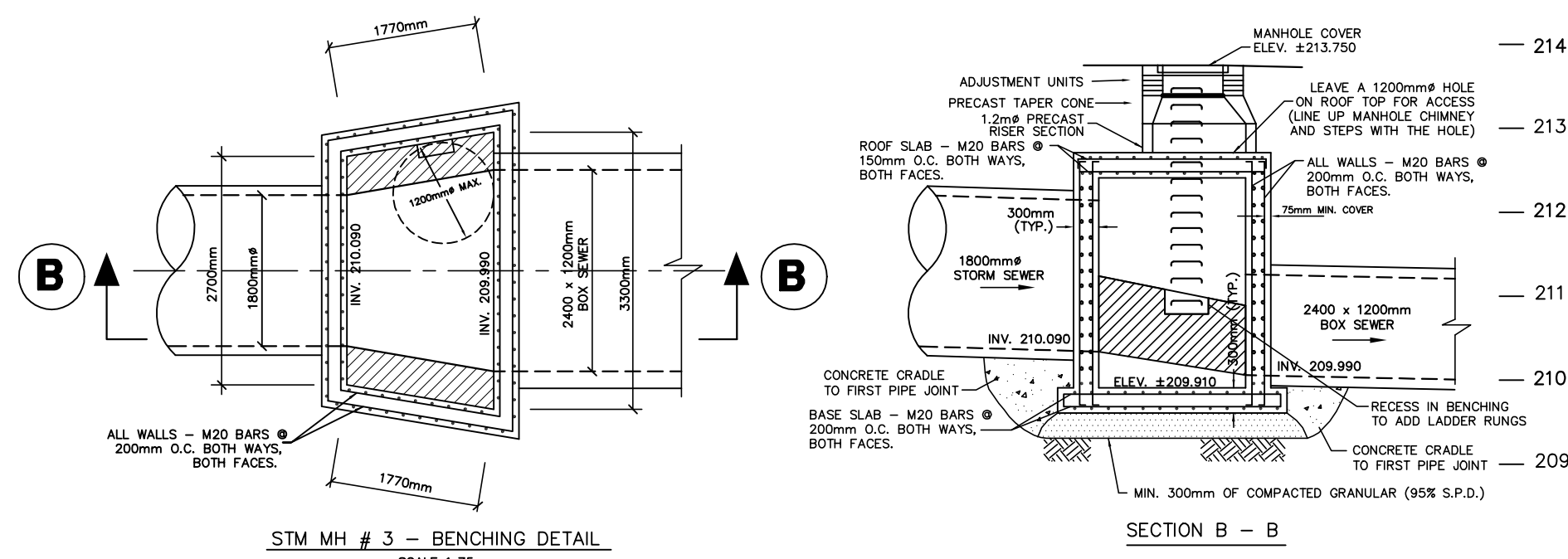
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CHECKED BY: JAL
PROJECT NO. 34192-25

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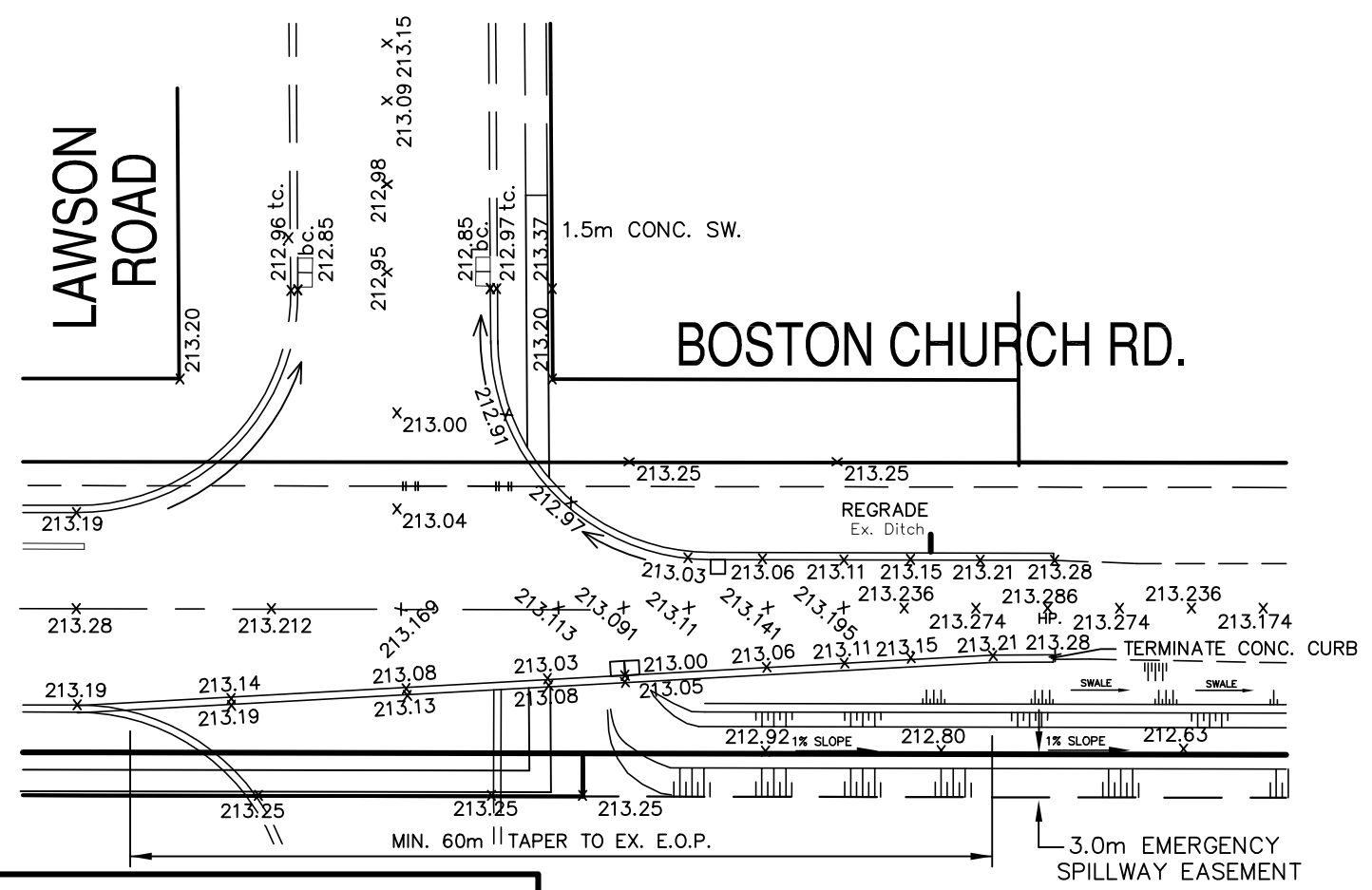
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ROAD DESIGN THICKNESS
40mm - HL-3 ASPHALT SURFACE COURSE
100mm - HL-8 ASPHALT BINDER COURSE
150mm - Granular "A" BASE
375mm - Granular "B", TYPE II SUB-BASE

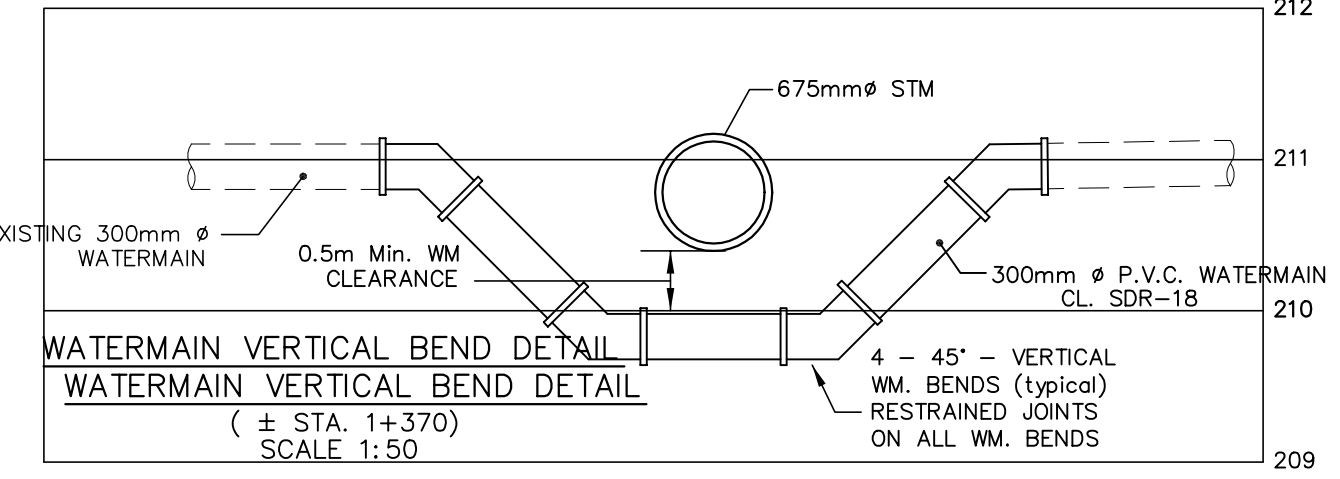
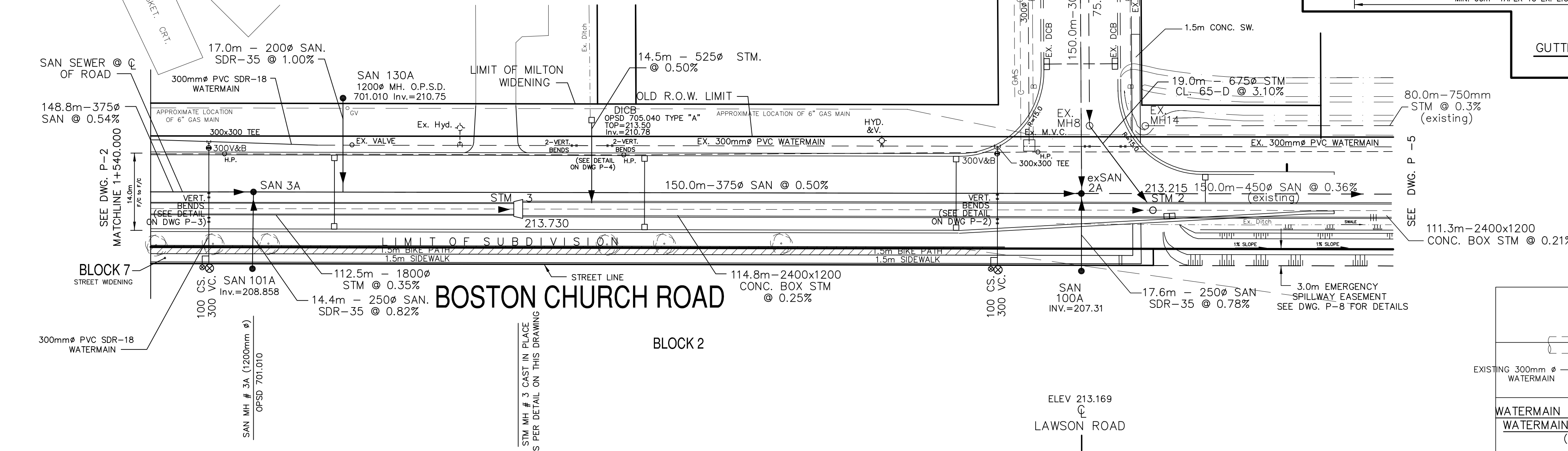
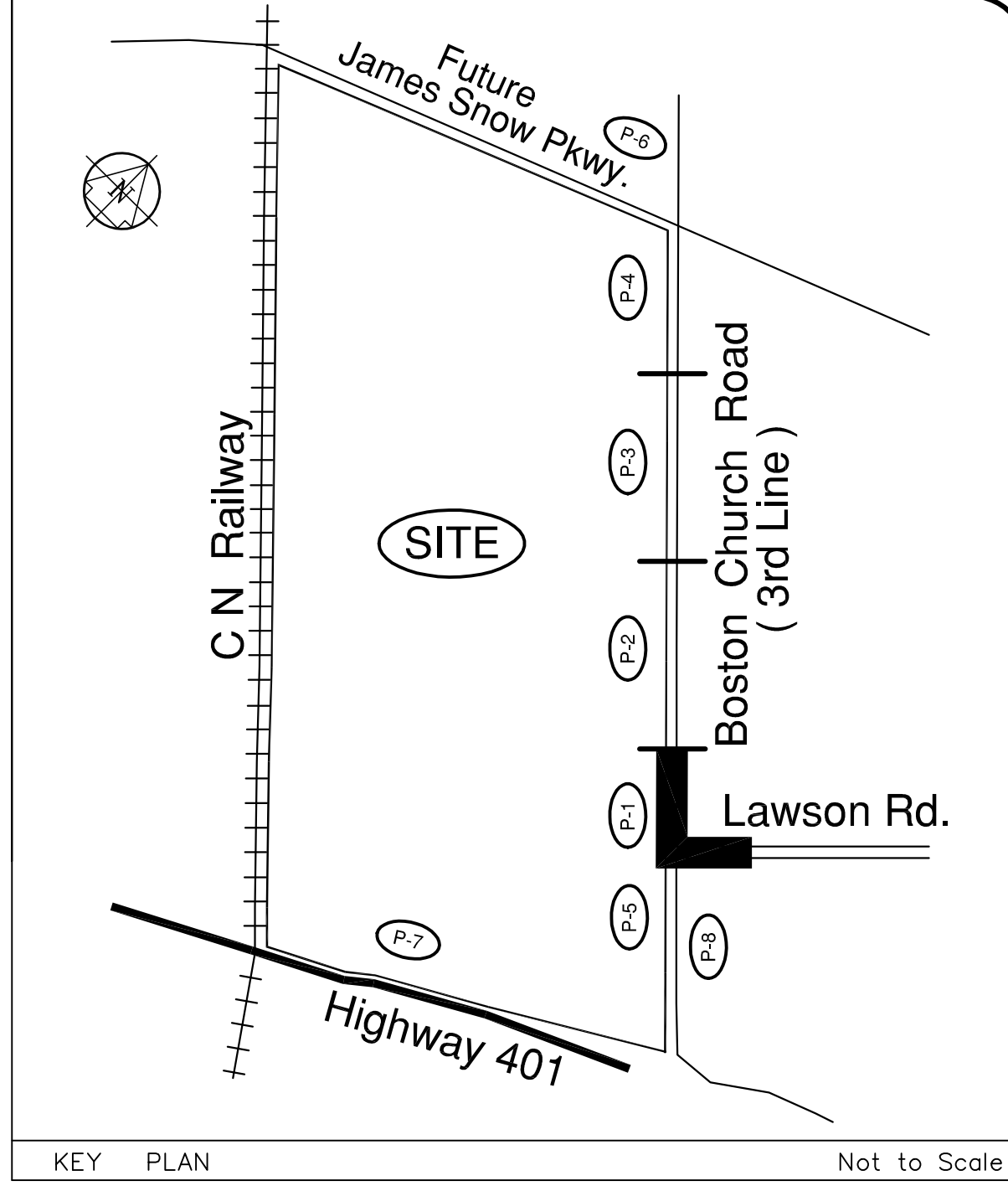


SEE MGM CONSULTING INC.
MILTON BUSINESS PARK
PROJECT No 97006
REGION FILE NUMBER DM-0084

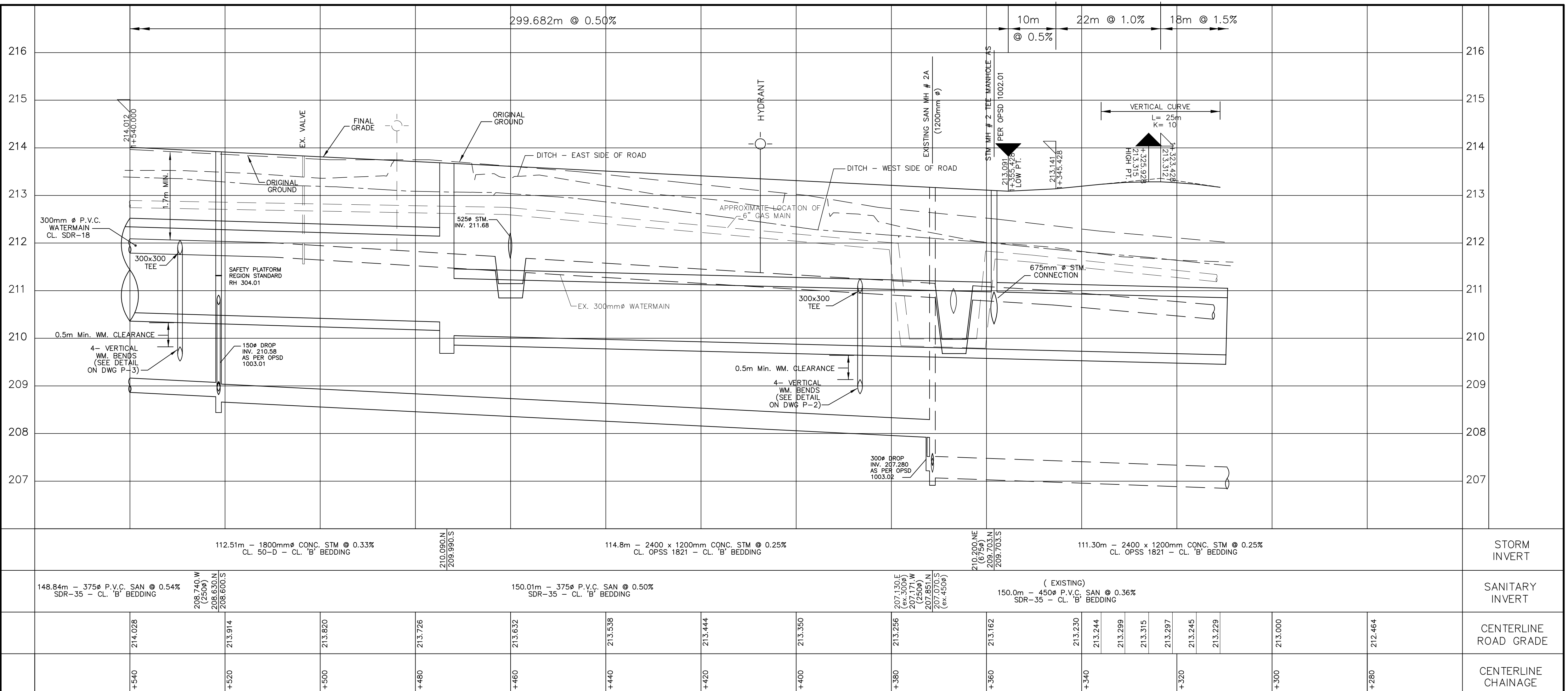
LAWSON RD.



GUTTER AND BOULEVARD GRADE DETAIL



- LEGEND
- SAN MH 2A - SANITARY MANHOLE
 - STM MH 2 - STORM MANHOLE
 - CATCHBASIN
 - DOUBLE CB
 - RYCB - REARYARD CB
 - DICB - DITCH INLET CB
 - CBMH - CATCHBASIN MANHOLE
 - HYD. & V. - HYDRANT & VALVE
 - 300x300 - VALVE & BOX
 - DEAD END BARRICADE
 - 1.2m CHAINLINK FENCE - XX
 - 1.83m CHAINLINK FENCE - XO



HORIZONTAL

VERTICAL

Metres

SURVEY BENCH MARK:

IS BASED ON THE MTO CONTROL POINT 880249

ELEV. 213.956m, BEING A BRASS CAP IN THE SIDEWALK AT THE SOUTHEAST CORNER OF THE JAMES SNOW PARKWAY BRIDGE OVER HIGHWAY 401.

No.	R.M.S. By	DATE	AS CONSTRUCTED	Revision	A.D.S. Checked
1.		JUNE 2007	AS CONSTRUCTED		

TOWN OF MILTON

PLANNING AND DEVELOPMENT

DIRECTOR OF ENGINEERING SERVICES

REGION OF HALTON

MUNICIPAL

DESIGN APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF MILTON STANDARDS AND SPECIFICATIONS.

ORIGINAL SIGNED

DEC. 12, 2005

DATE

REGIONAL

DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS OF SPECIFICATION AND LOCAL APPROVAL FROM THE AREA MUNICIPALITY.

ORIGINAL SIGNED

DEC. 13, 2005

DATE

PLANNING AND PUBLIC WORKS DEPARTMENT

URBAN ECOSYSTEMS LIMITED

7050 WESTON ROAD, SUITE 705

WOODBRIDGE, ONTARIO L4L 6Z7

TELEPHONE: (905) 866-0629

FAX: (905) 866-0698

BOSTON CHURCH ROAD

FROM STA. 1+320.000 TO STA. 1+540.000

REGIONAL FILE: DM-0154

REGION DRAWING No:

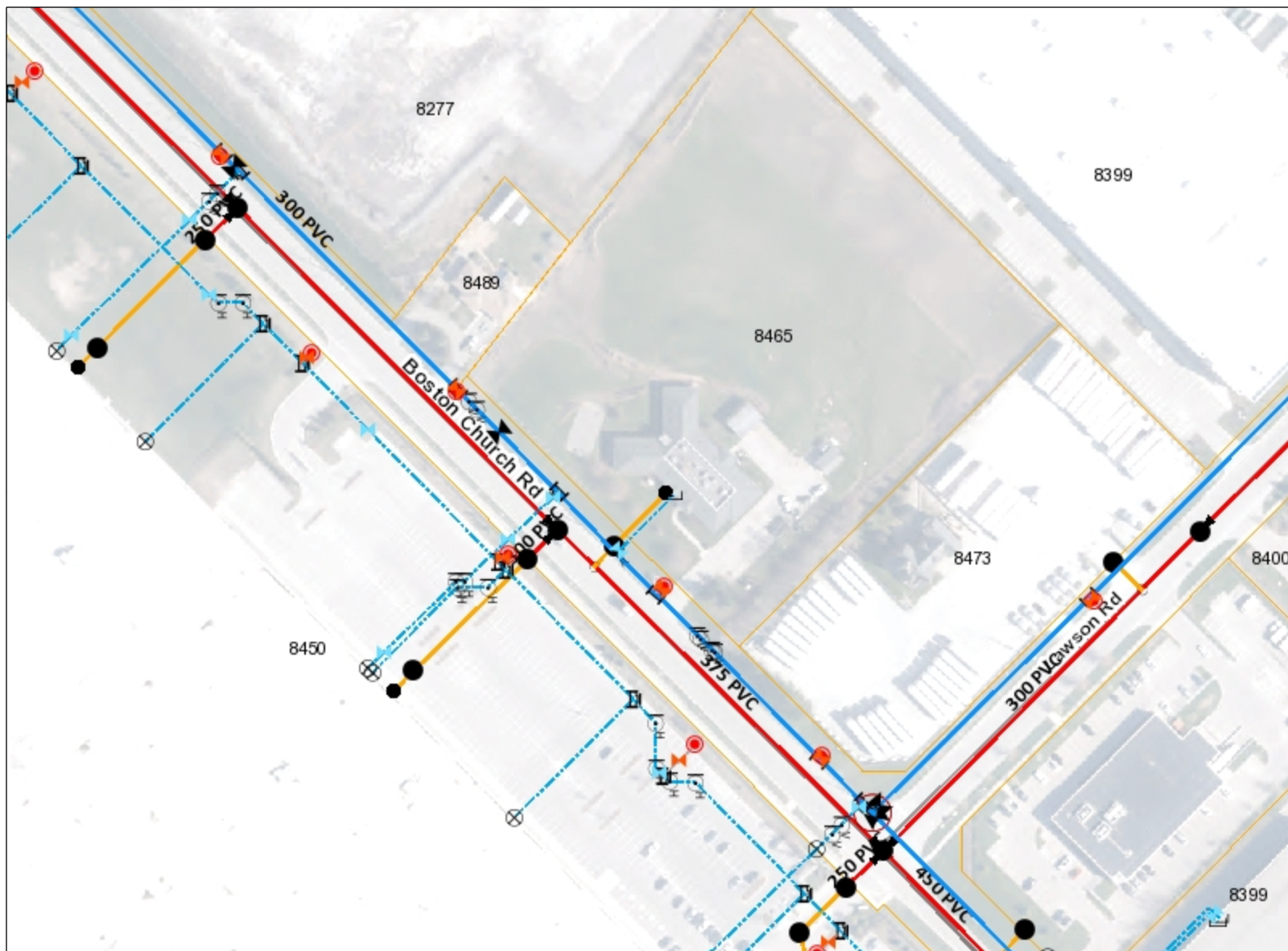
03005

Drawn By: D.J.S. Checked By: N.V. Contract No. 03005

Designed By: D.J.S. Checked By: N.V. Drawing No. P-1

Scale: v1:50, h1:500 Date: 2003-06

8465 Boston Church Rd



Legend

Water Control Valve

- System
- SystemDP
- Zone
- ZoneDP

Water Service Valve

- CurbStop
- PropertyLine
- Secondary
- TappingValve

Water Hydrant

Water Fitting

- Cap
- Cross
- HBend
- MainStop
- Reducer
- Sleeve
- TappingSleeve
- Tee
- VBend

Water Chamber

- Chamber

Notes:



THIS MAP IS NOT TO BE
USED FOR NAVIGATION

Information Valid as of:
6/3/2025

100.0 0 50.00 100.0 Metres

1: 2,000

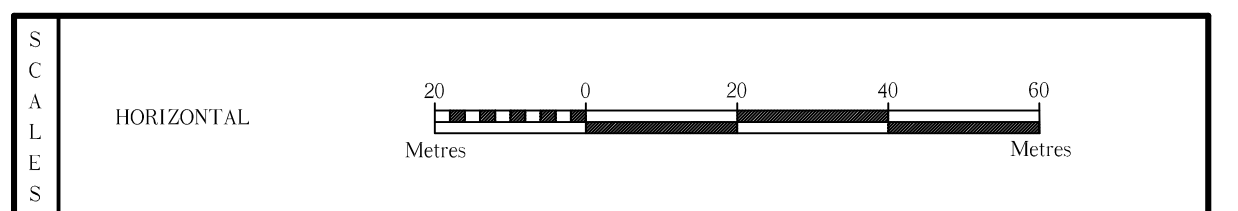
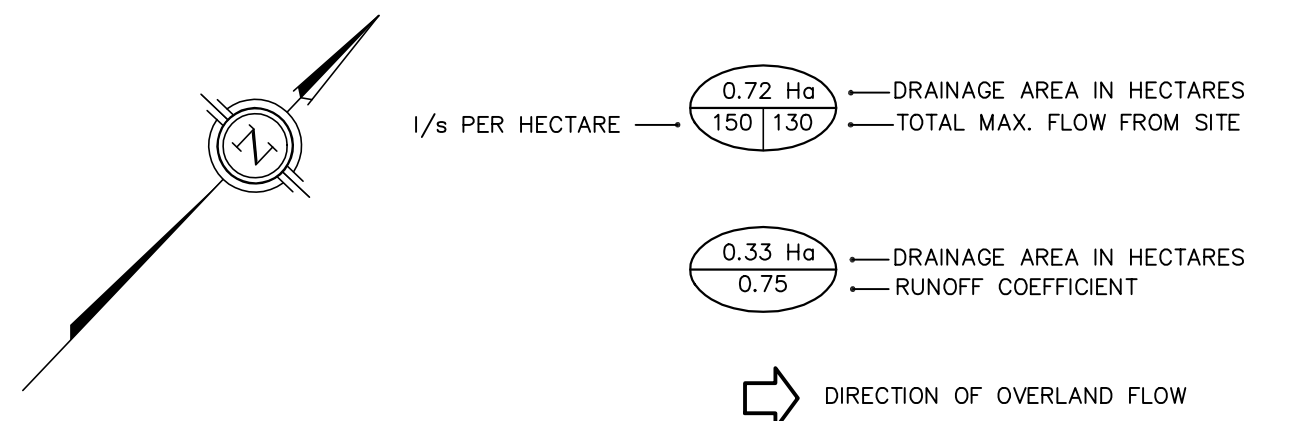
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1. FOR GENERAL NOTES REFER TO DWG. No. G-1

LEGEND



SURVEY BENCH MARK:
IS BASED ON THE MTO CONTROL POINT 880249
ELEV. 213.956m, BEING A BRASS CAP IN THE SIDEWALK AT
THE SOUTHEAST CORNER OF THE JAMES SNOW PARKWAY
BRIDGE OVER HIGHWAY 401.

1.	R.M.S.	JUNE 2007	AS CONSTRUCTED		A.D.S.
No.	By	Date	Revision		Checked



TOWN OF MILTON
PLANNING AND DEVELOPMENT
DIRECTOR OF ENGINEERING SERVICES
REGION OF HALTON

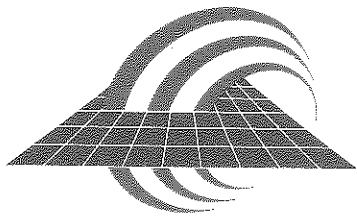
APPROVALS	MUNICIPAL	DESIGN APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF MILTON STANDARDS AND SPECIFICATIONS.	
	ORIGINAL SIGNED _____ DIRECTOR OF ENGINEERING SERVICES	DEC. 12, 2005	
REGIONAL	DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS OF SPECIFICATION AND LOCALATIONAL PRACTICE FROM THE AREA MUNICIPALITY.		
	ORIGINAL SIGNED _____ PLANNING AND PUBLIC WORKS DEPARTMENT	DEC. 13, 2005	



URBAN ECOSYSTEMS
L I M I T E D
7050 WESTON ROAD, SUITE 705
WOODBIDGE, ONTARIO L4L 8G7
TELEPHONE: (905)856-0629
FAX: (905)856-0698

STORM DRAINAGE AREA PLAN

REGIONAL FILE: DM-0154		REGION DRAWING No:	
Surveyed By	Date	Contract No.	03005
Drawn By D.J.S.	Checked By N.V.	Drawing No.	Sheet No.
Designed By D.J.S.	Checked By N.V.	G-11	
Scale: 1 : 1000	Date 2003-06		



SERNAS ASSOCIATES

A Member of The Sernas Group Inc.

STORMWATER MANAGEMENT REPORT

Land Development Engineering
Land Development Planning
Municipal Engineering Services
Transportation & Transit Planning
Utility Infrastructure Design
Water Resources Engineering

**ARG MILTON INDUSTRIAL PARK
BOSTON CHURCH ROAD & 401
TOWN OF MILTON**

PREPARED FOR:

ARG GROUP INC.

October, 2003
Revised: February, 2005
03211

1.0 INTRODUCTION

1.1 PURPOSE AND LOCATION

Sernas Associates has been retained by ARG Group Inc. to prepare the Stormwater Management Report for the proposed industrial development ARG Milton Industrial. This is a 54 hectare parcel of land owned by ARG Group Inc. located on the west side of Boston Church Road, bound by: the Canadian National Railway right-of-way on the west, Highway 401 on the south, and a utilities corridor, including the future James Snow Parkway right-of-way to the north, in the Town of Milton, Regional Municipality of Halton.

The purpose of this report is to address the stormwater management issues with regards to water quality and water quantity in accordance with the requirements of the Town of Milton, Conservation Halton (CH), and the requirements set out by the Functional Stormwater and Environmental Management Strategy (FSEMS) prepared by Phillips Engineering Ltd. (Phillips) revised July 2000 and the March 2003 Stormwater Management Planning and Design Manual (SWMP). This report will also be submitted to the Ministry of Transportation Ontario for their review.

This report documents the design of the stormwater management facility, located at the southeast corner of the site, required to provide quality, erosion and quantity control and deals with the required volumes and depths for the forebay and permanent pool for storm ranging from the 1:2-year storm event through to the 1:100-year storm event and the 25mm quality event. This report also reflects comments received from HRCA, MTO and the Town of Milton.

1.2 PREVIOUS REPORTS

1.2.1 FUNCTIONAL STORMWATER AND ENVIRONMENTAL STRATEGY - HIGHWAY 401 INDUSTRIAL/BUSINESS PARK – SECONDARY PLAN AREA – TOWN OF MILTON

This report was prepared for Town of Milton in March 2000 and revised July 2000 by Phillips Engineering Ltd. The report provides technical support to the Secondary Land Use planning process for Milton's 401 Industrial/Business Park. The report specifically identifies aquatic and terrestrial resources, including surface water and groundwater, and outlines where these prove to be a constraint to certain types of land use. The report also outlines the recommended stormwater and environmental management strategy for the 401 Industrial/Business Park Secondary Plan. The evaluation has focused on:

- Development of management strategies for the proposed development area in accordance with the Sixteen Mile Creek Watershed Plan 1996 and the Sixteen Mile Creek Subwatershed Planning Study - Areas 2 and 7, January, 2000.
- Integration of Subwatershed Plan environmental goals and objectives into the proposed land use plan.

401 Industrial/Business Park Objectives

Based on the foregoing, as well as subwatershed characterization work conducted in 1998/99 as part of the Subwatershed Planning Study, the following objectives have been identified specifically for the 401 Industrial/Business Park area:

- Maintain/enhance baseflow to the Sixteen Mile Creek - Main Branch.
- Based on existing flood damage potential downstream of this area, unit rate flow control would be required to achieve flood control objectives.
- Control (storage) of stormwater runoff to maintain existing flow-duration exceedance characteristics in the Main and East branches of the Sixteen Mile Creek would be required based on the presence of localized channel erosion.
- Stormwater Quality treatment of runoff from developing areas is required to mitigate surface water quality impacts in accordance with Ministry of Environment guidelines, to a Level I standard.

Stormwater Management Facility Criteria

The S37 facility which is the stormwater management facility for the subject lands, shall be designed with:

- Preferably a wetland pond, or alternatively a wetpond
- Level 1 protection for water quality storage
- Design flow conditions have been developed using a continuous simulation technique and frequency analysis, summarized below

	Storage m ³ /imp. ha	Release Rate m ³ /s/development ha
Erosion Control	229	0.0012
25 Year	277	0.0124
100 Year	366	0.0177

NOTE: The above was taken directly, or summarized from the FSEMS Report.

1.2.2 SUBWATERSHED IMPACT STUDY

This report was prepared for the subject lands by Cosburn Patterson Mather Limited (CPM) in April 2001. The purpose of this report was to provide functional servicing design information in support of the Draft Plan of Subdivision for the subject lands.

Stormwater Management Design

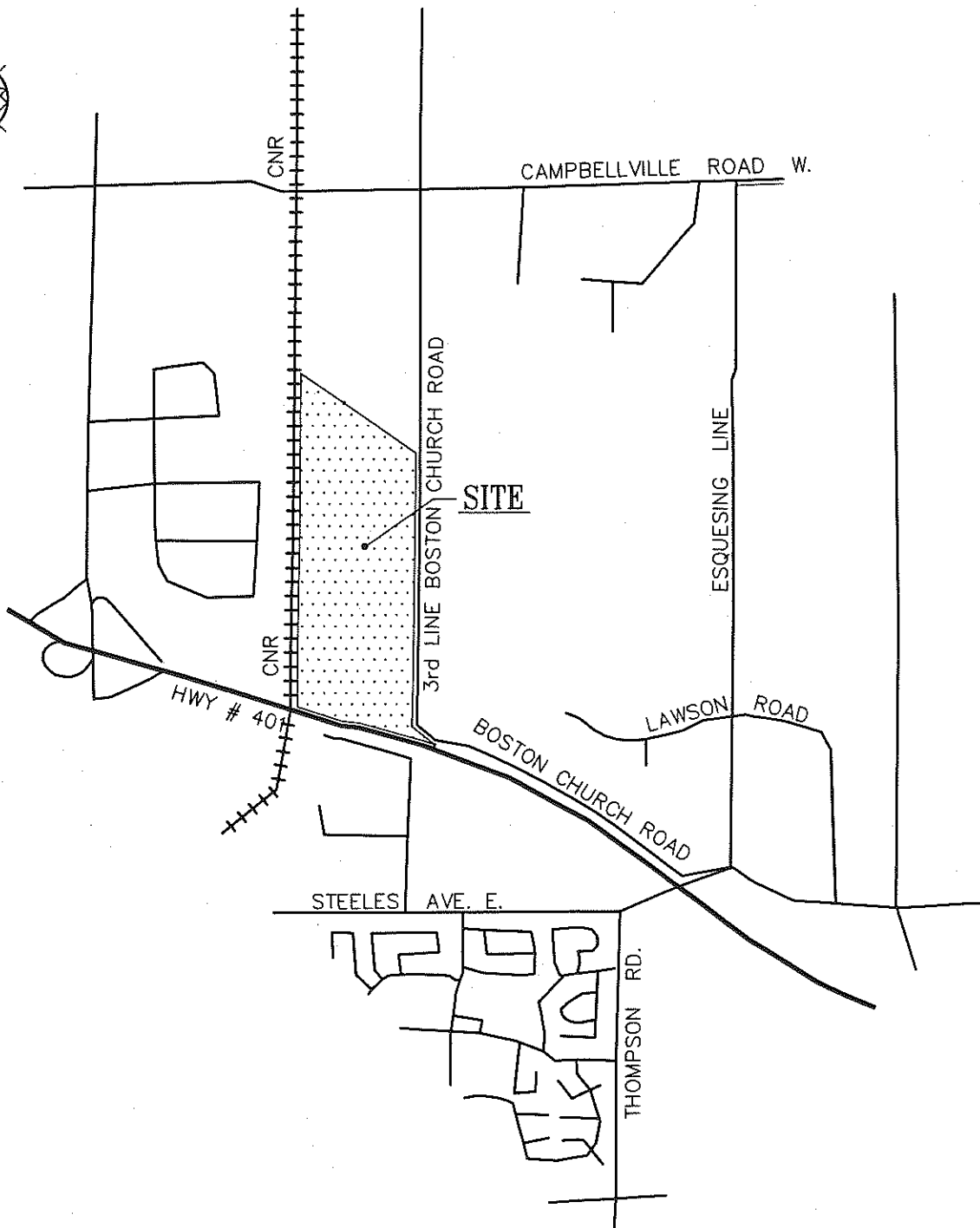
- The SWM facility shall be designed as a wetpond with Level 1 protection for water quality storage
- The intermittent drainage ditch will be replaced with a storm sewer pipe directed into the SWM facility. At existing condition runoff values for the lands to the north.

1.2.3 REVISED STORMWATER MANAGEMENT FACILITY REPORT

This report was prepared for the subject lands by Pitura Husson Limited in January 2002. The purpose of this report was to provide an update to the Subwatershed Impact Study prepared by CPM, with respect to the pond design.

Stormwater Management Design

- The SWM facility shall be located at the southeast limit of the site



KEY PLAN

N.T.S.

COMMENTS :

SERNAS ASSOCIATES



141 Brunel Road
Mississauga, ON
L4Z 1X3

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ARG MILTON INDUSTRIAL
LOCATION PLAN

PROJECT No.
03211

DRAWING No.
FIG-1.1

2.0 HYDROLOGY & SITE CONDITIONS

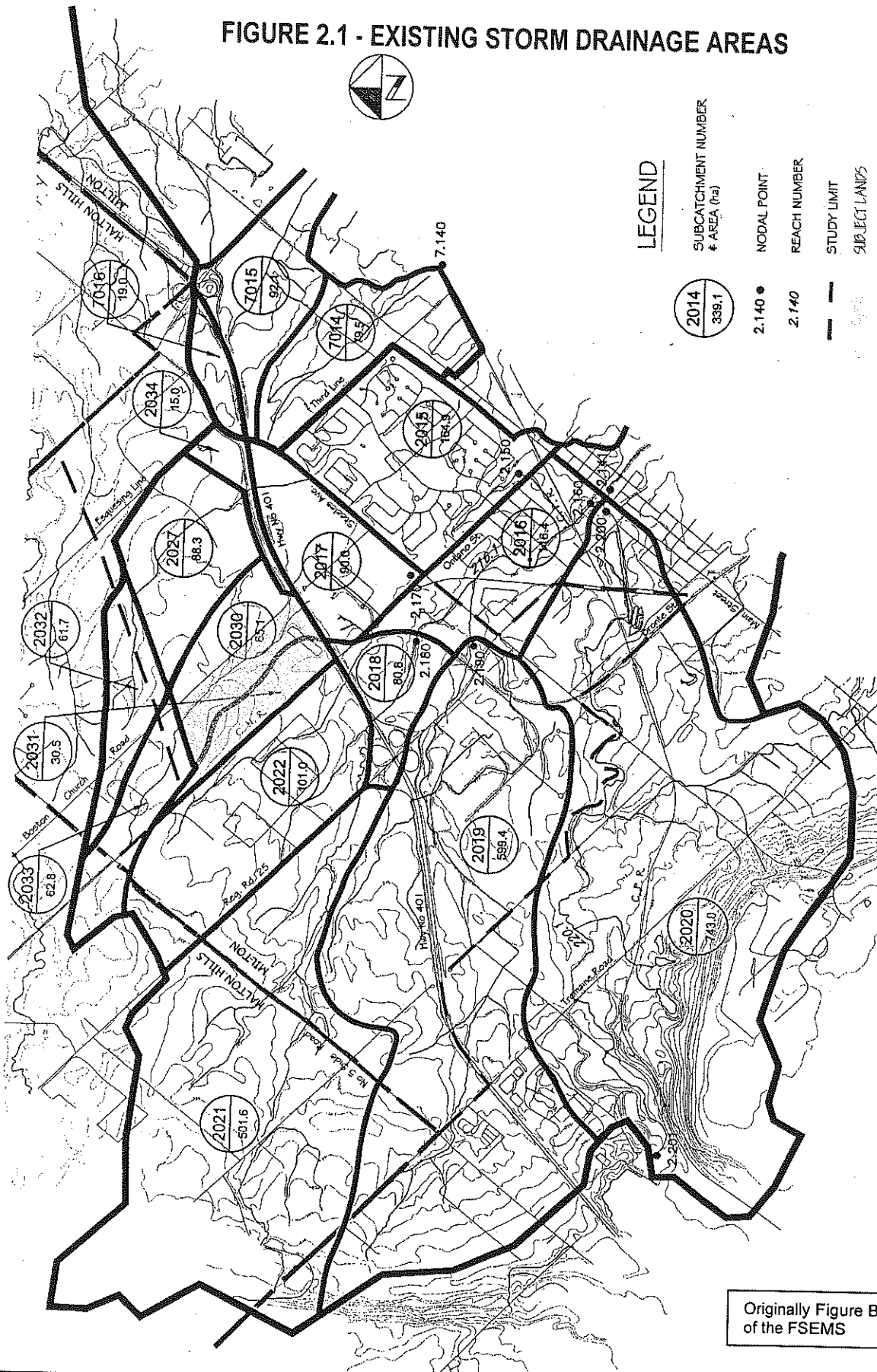
2.1 PRE-DEVELOPMENT CONDITIONS

The subject lands, approximately 54ha, currently drain under Highway 401 through culverts, identified as number 6 and 7 in the FSEMS. These flows ultimately drain to the Sixteen Mile Creek.

Figure 2 shows the existing drainage areas. Culvert number 6 has a drainage area of 127.9 hectares. This drainage area is comprised of subcatchment 2033 with a drainage area of 62.8 hectares which drains into subcatchment 2030 with a drainage area of 65.1 hectares for a total of 127.9 hectares. Subcatchment 2031 with a drainage area of 30.5ha drains towards culvert number 7. The allowable release rates for each culvert are shown in Table 2.1

The subject lands are contained within Subcatchments 2030 and 2031.

FIGURE 2.1 - EXISTING STORM DRAINAGE AREAS



Originally Figure B-1
of the FSEMS

2.2 POST-DEVELOPMENT CONDITIONS

2.2.1 PROPOSED STORM DRAINAGE

As shown of Drawing SWM-7 the developed condition tributary areas to culvert 6 and 7 is 138.2 hectares. Based on the criteria set forth is the FSEMS for quantity control, all post-development flows must be controlled to the target flows presented in Table 4.5 of the FSEMS as prepared by Philips Engineering Ltd. in July 2000 (page 38) as outlined in Table 2.1. All flows will be directed into the proposed SWM facility and the discharges from the SWM facility split as per the targets outlined in Table 2.1.

TABLE 2.1: POST DEVELOPMENT TARGET FLOWS (m³/s)

RETURN PERIOD	TARGET RELEASE RATES (m ³ /s)		
	CULVERT 6	CULVERT 7	TOTAL
1:2-year	0.51	0.16	0.67
1:5-year	0.89	0.27	1.16
1:10-year	1.15	0.35	1.50
1:25-year*	1.34	0.38	1.82
1:50-year	1.73	0.52	2.25
1:100-year	1.97	0.60	2.57
Regional	10.73	3.69	14.42

* As Table 4.5 of FSEMS does not provide a target release rate for the 1:25-year storm, the 1:25-year release rate for culvert 6 and 7 were calculated based on the 25-year controlled flow rate of 0.0124 m³/s/development ha, set forth in Table 4.4 of the FSEMS.

The post development drainage area is comprised of the following:

- 74 hectares of external lands north of the site. Of this area 71.8 hectares is existing agricultural lands. These land have been modeled in its existing condition since they area not presently in the urban boundary of the Town of Milton. Future development of the 71.8 hectares will require their own Stormwater Management Facility. The remaining 2.2 hectares is the future James Snow Parkway (based on 40m right of way for a 550m length). The 2.2 hectares of James Snow Parkway has been modeled based on 75% imperviousness with no on site controls.
- 53.7 hectares are the subject lands. These lands are modeled based on 50% roof and 40% paved and 10% landscaped. Site releases will be controlled to 150 l/s/ha.
- 2.9 hectares are Snoek lands. These lands located on the east side of Boston Church Road have been modeled based on 80% imperviousness with no site controls.
- 4.7 hectares of institutional land east of Boston Church Road. These lands have been modeled based on 75% imperviousness with no site controls.
- 3.0 hectares of Boston Church Road. These lands have been modeled based on 75% imperviousness with no site controls.

The possibility of bypassing external flows (from the 71.8 hectare area) around the SWM facility was considered. Since controlled flows from the SWM facility will be controlled to release rates outlined in the FSEMS report, the uncontrolled peak flow rates from the external area would be greater than the allowable release rates. For example, the 10 year existing condition flow rate from the 71.8 hectare external area is 1.84 cms and the allowable 10 year release to culvert 6 is based on the FSEMS report is 1.15 cms. For this reason, the external area will be taken into the SWM facility.

A stormwater management (SWM) facility will be required to provide both stormwater quantity and quality control for the proposed development. The proposed location for the stormwater management facility is in the southeast corner of the subject lands as shown on Drawing SWM-1, included with this report.

The subject lands has been divided into four distinct drainage areas (namely 100, 600, 700 and 800), as shown on Drawing SWM-7. Both drainage areas 100 and 600, 24.23ha 13.44ha respectively, will be routed through separate controlled service pipes limiting the flow to a maximum of 150l/s/ha before being directed to the sewer on Boston Church Road. The abovementioned areas will be routed to the SWM facility via the east forebay.

Since the main outlet from the pond cannot provide gravity flow to culvert 7 during the frequent low flow events, a portion of the 'clean' roof run-off from Area 700 will be routed through a flow-splitting manhole to culvert 7. A flow of 0.08m³/s, approximately 60% of the 2 year target of 0.14m³/s, will be directed to culvert 7. The balance of the runoff from Area 700 will be routed through a controlled service pipe limiting the flow to a maximum of 150l/s/ha before being routed into the pond at the west forebay. Area 800 represents the Stormwater Management Facility.

The SWMHYMO computer model was utilized to generate the post-development flows and volumes for the 1:2-year through 1:100-year return period storms. The post development flows from the site are broken into 5 sub-catchments as shown on the Drawing SWM-7. The subject lands and the Snoek lands were modeled with the proposed development having a coverage of 50% roof, 40% paved and a 10% landscaped. Controls limiting the flow to a maximum of 42l/s/ha for roof controls and 150l/s/ha for site controls were implemented. The large undeveloped external area was modeled as rural agricultural having a CN of 76, while the developed external institutional area and the Boston Church Road right-of-way were modeled having an imperviousness of 75% with no site controls. The Snoek lands was modeled having an imperviousness of 80% with no site controls. These values were considered reasonable given the current land uses. A schematic of the SYMHYMO model and a hard copy of the 100 year input and output file has been included in Appendix 'B'.

Since outflow from the SWM facility will outlet to two culverts (numbers 6 and 7) two outlet controls will be required. The outlet control to culvert 6 will provide extended detention control up to the 100 year storm. The outlet control to culvert 7 will be activated above the 2 year storm and will provide controls up to the 100 year storm.

3.0 STORMWATER MANAGEMENT FACILITY

3.1 WATER QUALITY CONTROL

3.1.1 QUALITY CONTROL POND SIZING

Upon completion of construction within the development, the potential for large-scale sediment transfer will be reduced. However, the possibility of low level, long-term sedimentation as well as increased pollution levels resulting from the activities within the development remains. The construction of the stormwater management facility at the southeast corner of the site will be designed to remove some sediments and pollutants from the stormwater.

A wet pond is proposed to achieve the water quality objectives for the subject lands. Three methods were used to determine the required quality pond volume. The first is a short duration 25mm rainfall event distributed over the entire site. The resulting runoff volume for this storm is 115m³ per hectare of contributing area, that is 16,000m³ based on a drainage area of 138.2 ha. The second method uses the MOEE guidelines for stormwater management ponds as specified in the Stormwater Management Planning and Design Manual (2003). For the use of this manual only developed area is considered. Based on the MOEE manual and using a Level 1 protection with an impervious rate of 85%, a constructed wet pond would require 250m³ per contributing hectare. For a developed contributing area of 72ha, 18,000m³ of storage is required, being comprised of 15,150m³ permanent pool storage and 2,850m³ of extended detention storage. The FSEMS specified that for the area north of Highway 401 a storage volume of 229m³/impervious hectare is required for extended detention. Based on an impervious area of 61ha, a volume of 14,000m³ is required. As the storage required to handle the 25mm rainfall event is larger than the volume calculated using the guidelines set forth by the MOEE and the FSEMS, the facility will be sized for 16,000m³ of extended detention storage.

The storage volume for extended detention of 17,500m³ has been provided between elevations 209.5m and 210.6m thus satisfying the extended detention requirements. Additionally, a permanent pool volume of 16,300m³ is provided between elevations 207.5 and 209.5m. A 290mm diameter orifice is proposed to provide over 47 hours of extended detention drawdown time with a maximum release rate of 0.17cms. Calculations can be found in Appendix 'C'.

3.1.2 EAST SEDIMENT FOREBAY

The purpose of the sediment forebay is to trap larger particles near the inlet of the pond. The forebay should be one of the deepest areas of the pond. The length of the forebay is calculated based on determining the distance required to settle out a certain particle size. The March 2003 SWMP manual recommends settling out particles greater than 0.15 mm. Equation 4.5 of the manual reproduced below can be used to determine the required forebay length.

$$\text{Dist} = \sqrt{\frac{r Q_p}{V_s}}$$

Where

Dist	=	forebay length
r	=	length to width ratio of forebay
V_s	=	settling velocity (m/s)
Q_p	=	peak discharge from the pond during the design quality storm (cms)

Based on a peak discharge rate from the facility of 0.17cms, a settling velocity of 0.0003m/s for particles greater than 0.15mm, and a length to width ratio of 3:1, the required forebay settling length will be 42m.

A check of the dispersion length, equation 4.6, should also be made to ensure that it is not greater than the forebay length as calculated by the settling equation. The dispersion length is given by the equation below:

$$\begin{aligned} \text{Dist} &= \frac{8Q}{dV_f} \\ \text{Where } Q &= \text{inlet flow rate (cms) 10 year storm} \\ &= 9.2 \\ d &= \text{depth of permanent pool in forebay (m)} \\ &= 2.5 \\ V_f &= \text{desired velocity in forebay} \\ &= 0.5\text{m/s (from MOEE manual)} \\ \text{Dist} &= \frac{8 \times 9.2}{2.5 \times 0.5} \\ \text{Dist} &= 59\text{m} \end{aligned}$$

Since the dispersion length is longer than the settling length, it is the more conservative length and is used for the length of the forebay.

The bottom width is determined by:

$$\begin{aligned} \text{Width} &= \frac{\text{Dist}}{8} \\ &= 7.0\text{m} \end{aligned}$$

At the downstream end of the forebay, there will be a submerged earthen berm with a 24m wide weir set 0.20m below the permanent pool elevation of the quality pond. The submerged portion of the forebay will be constructed at a 5:1 slope. It is anticipated that the majority of the sediment will accumulate in the forebay and the forebay will have to be periodically cleaned to ensure proper operation.

3.1.3 WEST SEDIMENT FOREBAY

Using equation 4.5 and recognizing that the peak discharge rate from the water quality portion of the SWM facility is 0.17cms and using a length to width ratio of 3:1, the required settling length of the pond will be 42m.

Equation 4.6 and recognizing that the 10 year inflow rate is 2.0m³/s and the depth of permanent pool is 1.5m, the required dispersion length is 24m. Since the settling length is greater than the dispersion length, the sediment forebay will be designed to satisfy the settling length of 42m.

At the downstream end of the forebay, there will be a 10m wide weir set 0.20m below the permanent water level of the quality pond. The submerged portion of the forebay will be constructed at a 5:1 slope.

3.1.4 SHORT CIRCUITING

The configuration of the SWM facility is such that the outlets for culvert 6 and 7 are near the outlet pipes into the SWM facility. The MOE Guidelines for Stormwater Management ponds are specified in the Stormwater Management Planning and Development Manual (2003). The manual states that a pond should have a length to width ratio greater than or equal to 3:1 for extended detention storage. The western outlet (outlet to culvert 7) is only utilized when flows exceed the 2 year storm. As such, short-circuiting is not a concern.

For the eastern outlet, the SWM facility has been designed with a berm at elevation 210.6m which is the limit of the extended detention storage. This berm redirects flows thereby lengthening the effective flow path. At the permanent pool elevation of 207.5m the pond width is 38m wide. At the extended detention elevation of 210.6m, the pond is 50m wide. The length of the flow path is 160m long measured along its centre. Thus, in both scenarios, the length to width ratio is greater than 3:1.

3.1.5 THERMAL IMPACTS

Runoff from asphalt surfaces resulting from development has a higher temperature than natural settings. In addition, the SWM facility has many environmental benefits but does result in the thermal heating of the residual waters. Several measures inherent in development will assist in reducing thermal impacts before the runoff reaches the SWM facility and several additional measures will also be implemented to help reduce thermal impacts before outletting to culvert numbers 6 and 7.

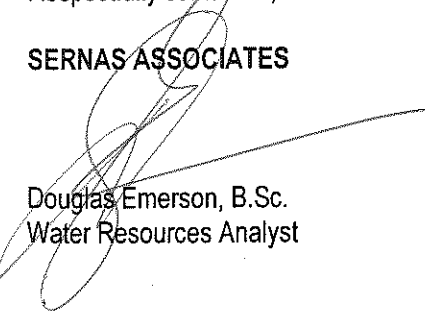
The collection of runoff in piped systems buried underground will naturally drop the water temperature as the water is carried along to the SWM facility. In addition, by collecting the external lands in a piped system to the SWM facility, this will also act as a means of supplying cool water to the SWM facility. A reverse slope pipe will be used to discharge water from the SWM facility. This pipe will pick up the cooler water near the bottom of the SWM facility. In addition, a cooling trench has been added to the "clean" water discharge to culvert number 7. A portion of the "clean" roof runoff from Area 700 will be routed through a flow splitting manhole and directed to culvert 7 thereby passing the SWM facility. This runoff will travel through a 69m long cooling trench comprised of rip rap stone wrapped within a 1m x 1m trench. A 300mm diameter perforated pipe will route the flow through the 1m x 1m stone filled trench. As water flows through the trench, heat will be transferred to the stone and the resultant discharge will be at a lower temperature.

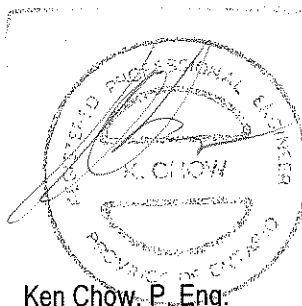
5.0 CONCLUSIONS AND RECOMMENDATIONS

- The stormwater quality control criteria from the Ministry of Transportation, Halton Conservation and the Town of Milton can be achieved for the proposed Development Lands.
- The stormwater quantity control criteria outlined by the Functional Stormwater and Environmental Strategy Report and Conservation Authority can be achieved for the proposed Development Lands.
- An end-of-pipe wet pond type stormwater management facility will be constructed. The proposed stormwater management facility will:
 - Provide sufficient permanent pool volume for Level 1 quality control
 - Provide adequate extended detention time for the 25mm storm event and unit rates set out in the FSEMS
 - Provide flow control to meet the attenuated flow targets
- Controlled roof releases will be ensured with the use of reduced ground pipes sized to accommodate a roof release of 42 l/s/ha.
- Controlled site releases will be ensured with the use of site connections sized to accommodate a site release of 150 l/s/ha.
- Overflow from the development area will be directed to both culverts 6 and 7 under Highway 401.
- To ensure flow to Culvert 7 during frequent storm events, a release rate of 80 l/s will be directed to Culvert 7 up to the 2 year storm.
- As required by the Ministry of Transportation, a 14m buffer has been created between the stormwater management facility and the highway right-of-way and this buffer will be left in its present state.
- All flows north of the site will be piped to the stormwater management facility.

Respectfully submitted,

SERNAS ASSOCIATES


Douglas Emerson, B.Sc.
Water Resources Analyst



Ken Chow, P. Eng.
Principal, Manager, Water Resources

3.2 QUANTITY CONTROL

3.2.1 QUANTITY POND CALCULATIONS

The proposed stormwater management facility will also provide storage for detention of the lower frequency quantity events. The SWMHYMO hydrologic model was used to calculate the runoff hydrographs that will contribute to the facility. Table 3.2 shows the release rates and storage volumes for the 1:2-year to 1:100-year storms. Outlet control is achieved through the use of two control structures. Both the structures are outlet control manholes with water being supplied by reverse slope pipes. The first structure is located at the southwest end of the facility and controls flows to culvert 7, through a 450mm diameter orifice at an elevation of 210.6m. The second structure is located at the southeast end of the facility and controls flows to culvert 6, through a 290mm diameter orifice at an elevation of 209.5m and a 850mm wide by 600mm high rectangular orifice at an elevation of 210.6m. For schematics of the outlet structures see details on the Outlet Details drawings SWM-2, SWM-3 and SWM-4. The 750mm diameter outlet pipe from the west structure will outlet to culvert 7. Similarly the 1200mm diameter outlet pipe from the east structure will outlet to culvert 6 from UEL drawings.

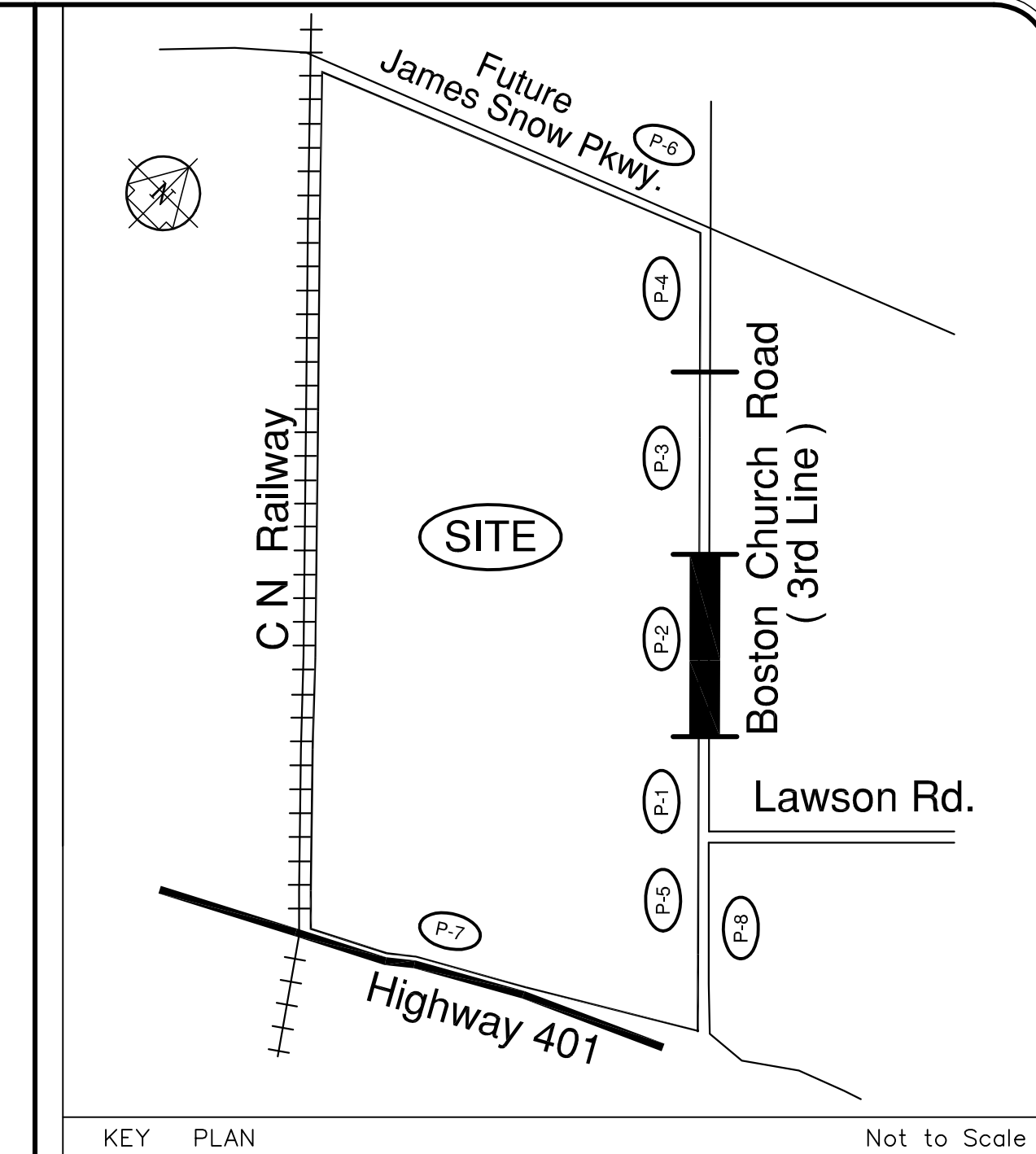
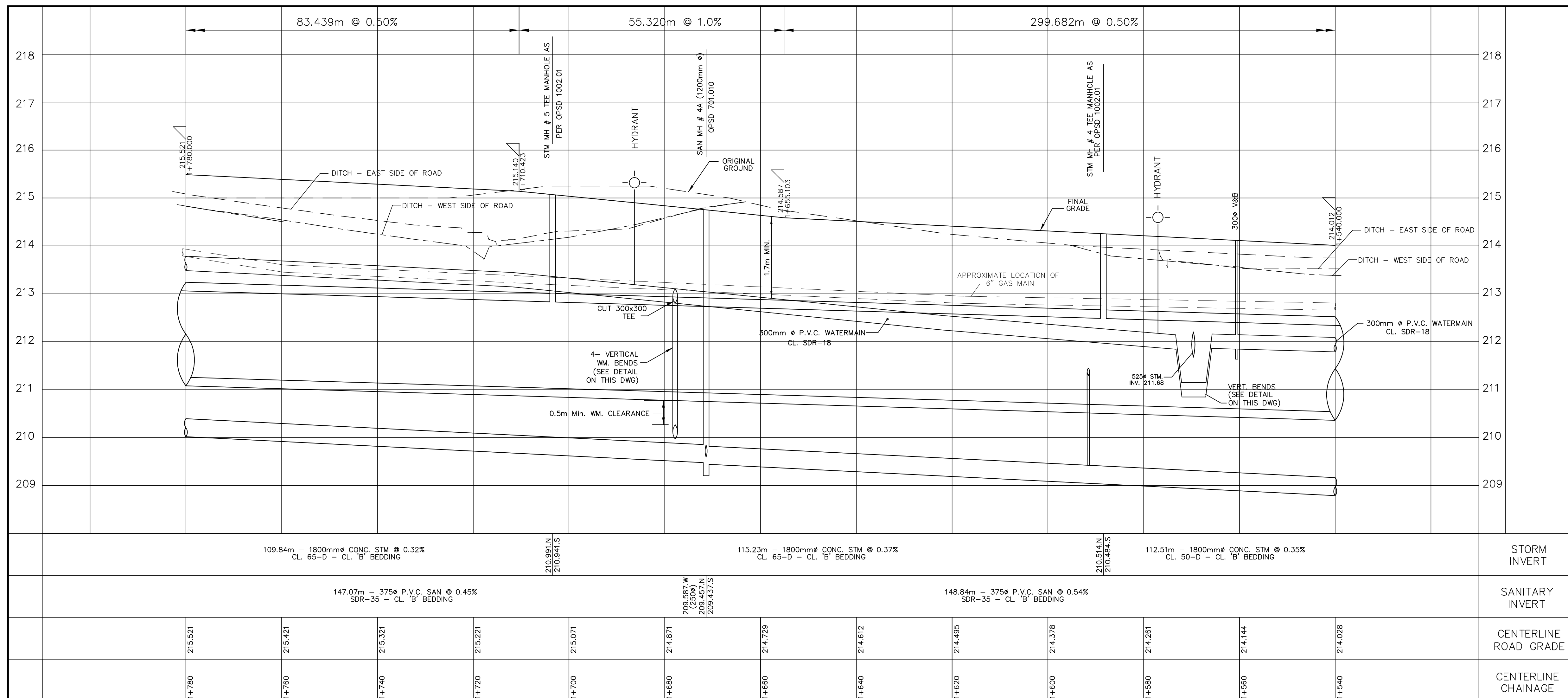
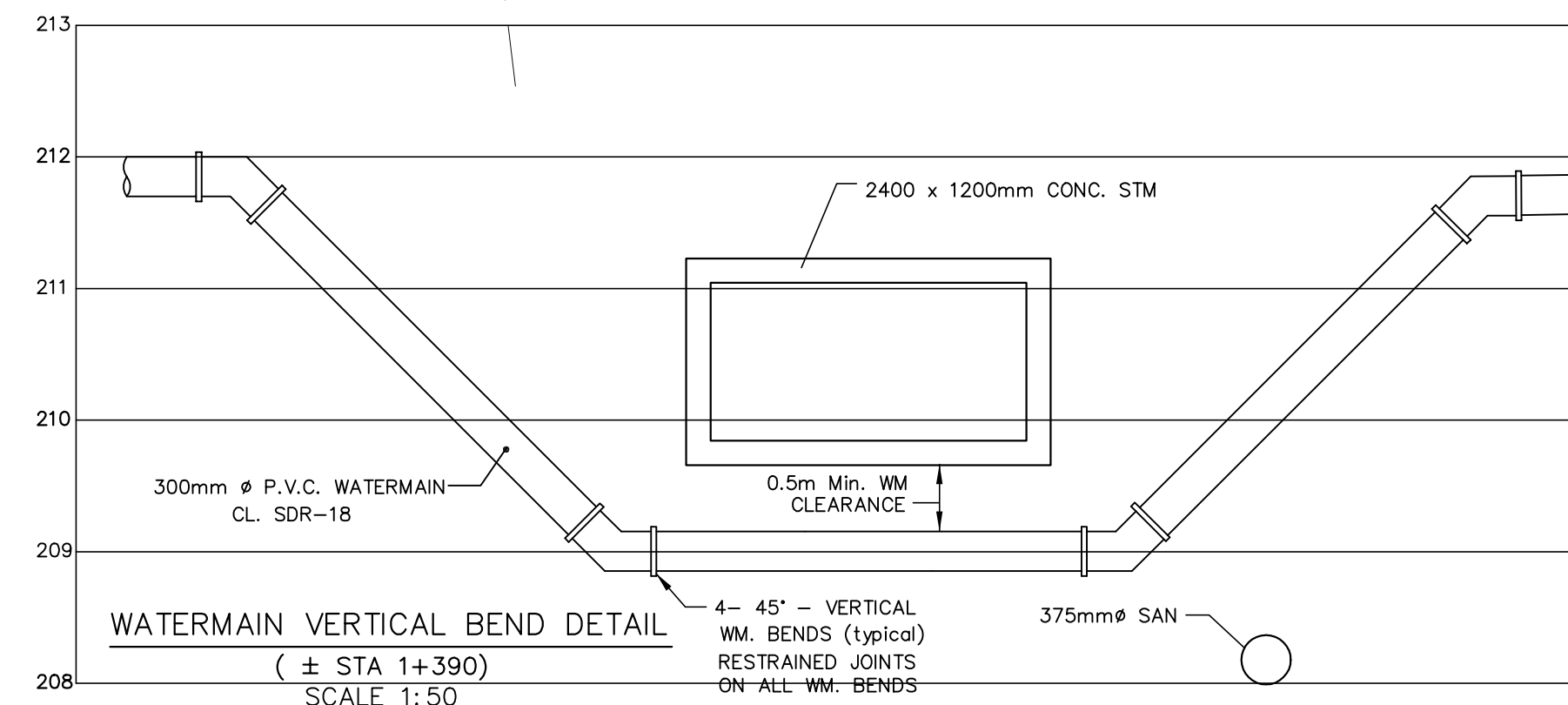
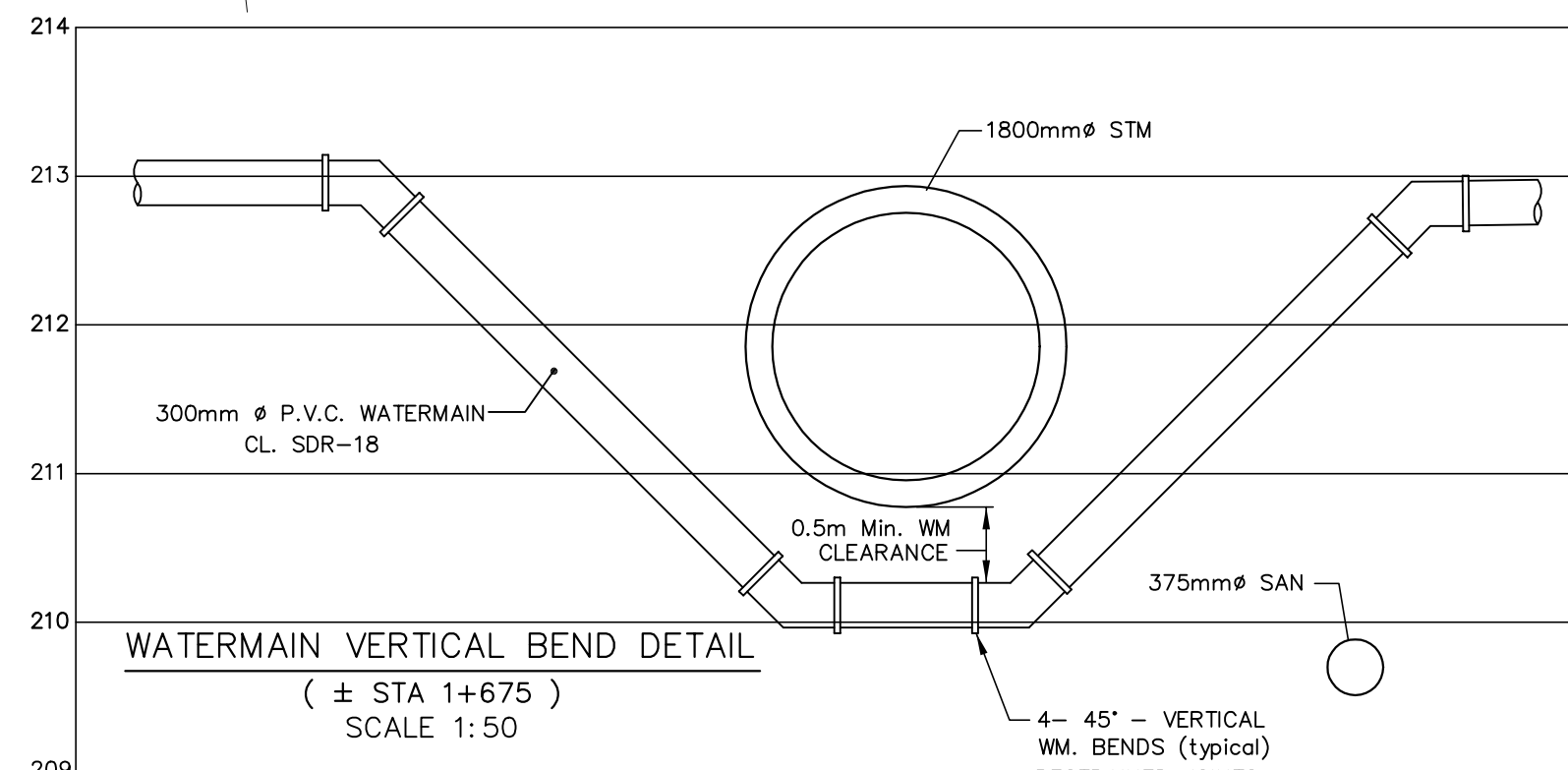
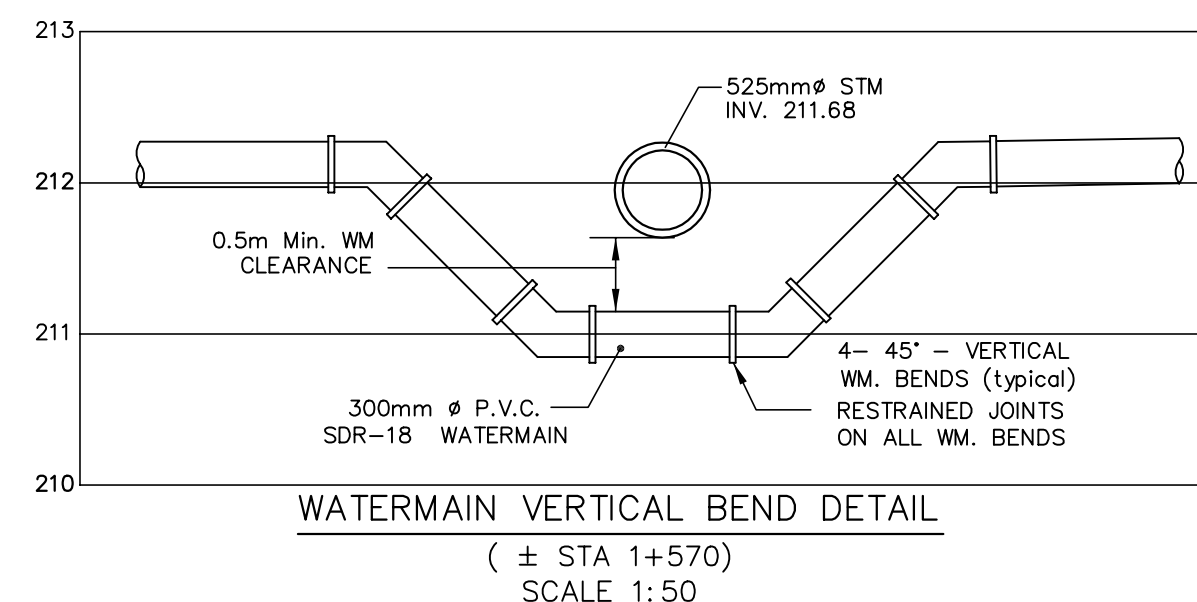
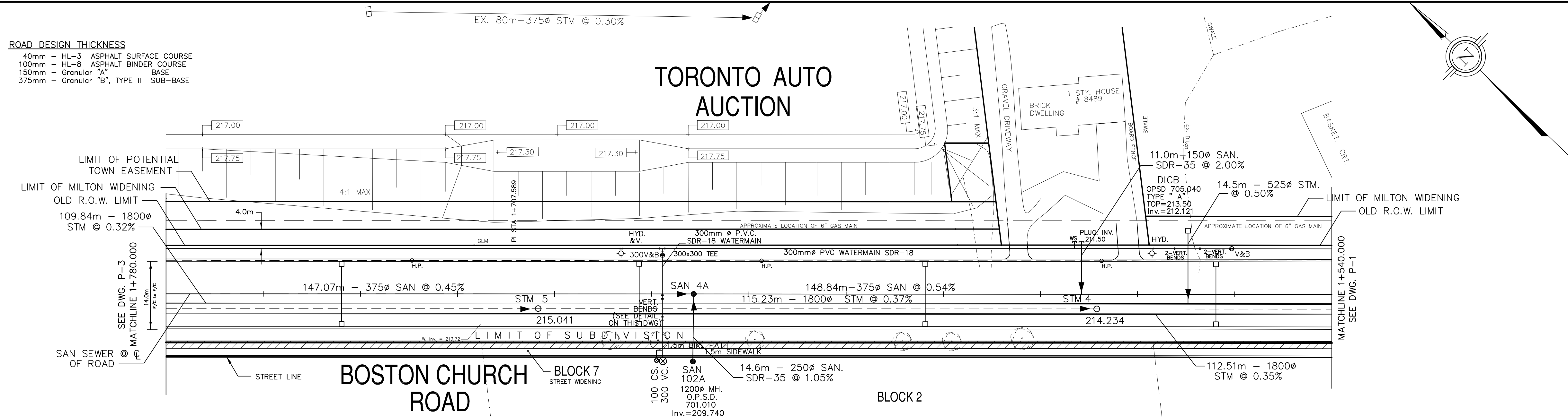
TABLE 3.2: POST-DEVELOPMENT RELEASE RATES AND STORAGE VOLUMES

EVENT STORM	INFLOW (m ³ /s)	FSEMS TARGET FLOWS FOR CULVERT 6 (cms)	DISCHARGE TO CULVERT 6 (cms)	FSEMS TARGET FLOWS FOR CULVERT 7 (cms)	DISCHARGE TO CULVERT 7 (cms)	TOTAL DISCHARGE (m ³ /s)	STORAGE (m ³)	ELEVATION (m)
2 year	4.05	0.51	0.17	0.16	0.08	0.25	16,690	210.60
5 year	6.62	0.89	0.55	0.27	0.20	0.75	23,950	211.00
10 year	8.33	1.15	0.94	0.35	0.29	1.23	28,410	211.20
25 year	10.23	1.34	1.33	0.38	0.36	1.69	34,330	211.50
50 year	11.75	1.73	1.52	0.52	0.40	1.92	39,630	211.70
100 year	13.28	1.97	1.71	0.60	0.45	2.16	44,880	212.00
Regional Storm	13.86	10.73	10.5	3.69	3.40	13.9	52,220	212.30

The MTO has a 14m setback requirement from the present Highway 401 property limit. Our original report and SWM facility design contemplated grading within this 14m setback. At the request of the MTO, we now start our grading at the limit of the 14m setback.

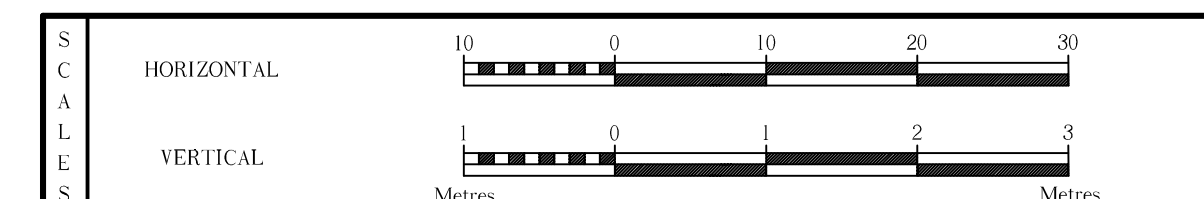
ROAD DESIGN THICKNESS

40mm - HL-3 ASPHALT SURFACE COURSE
 100mm - HL-8 ASPHALT BINDER COURSE
 150mm - Granular "A" BASE
 375mm - Granular "B", TYPE II SUB-BASE



LEGEND

- SAN MH SANITARY MANHOLE
- STM MH STORM MANHOLE
- CATCHBASIN
- DOUBLE CB
- RYCB REARYARD CB
- DICB DITCH INLET CB
- CBMH CATCHBASIN MANHOLE
- HYD. VALVE & VALVE
- 300x300 VALVE & BOX
- DEAD END BARRICADE
- 1.2m CHAINLINK FENCE - XX
- 1.83m CHAINLINK FENCE - XO



SURVEY BENCH MARK:

IS BASED ON THE MTO CONTROL POINT 880249
 ELEV. 213.956m, BEING A BRASS CAP IN THE SIDEWALK AT
 THE SOUTHEAST CORNER OF THE JAMES SNOW PARKWAY
 BRIDGE OVER HIGHWAY 401.

1.	R.M.S.	JUNE 2007	AS CONSTRUCTED	Revision	A.D.S.
No.	By	Date			Checked



APPROVALS	MUNICIPAL	DESIGN APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN OF MILTON STANDARDS AND SPECIFICATIONS.	
	ORIGINAL SIGNED	DEC. 12, 2005	
	DIRECTOR OF ENGINEERING SERVICES	DATE	
	REGIONAL	DESIGN OF SANITARY AND WATER SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS OF SPECIFICATION AND LOCAL APPROVAL FROM THE AREA MUNICIPALITY.	
	ORIGINAL SIGNED	DEC. 13, 2005	
	PLANNING AND PUBLIC WORKS DEPARTMENT	DATE	

URBAN ECOSYSTEMS LIMITED
 7050 WESTON ROAD, SUITE 705
 WOODBRIDGE, ONTARIO L4L 6Z7
 TELEPHONE: (905) 856-0629
 FAX: (905) 856-0698

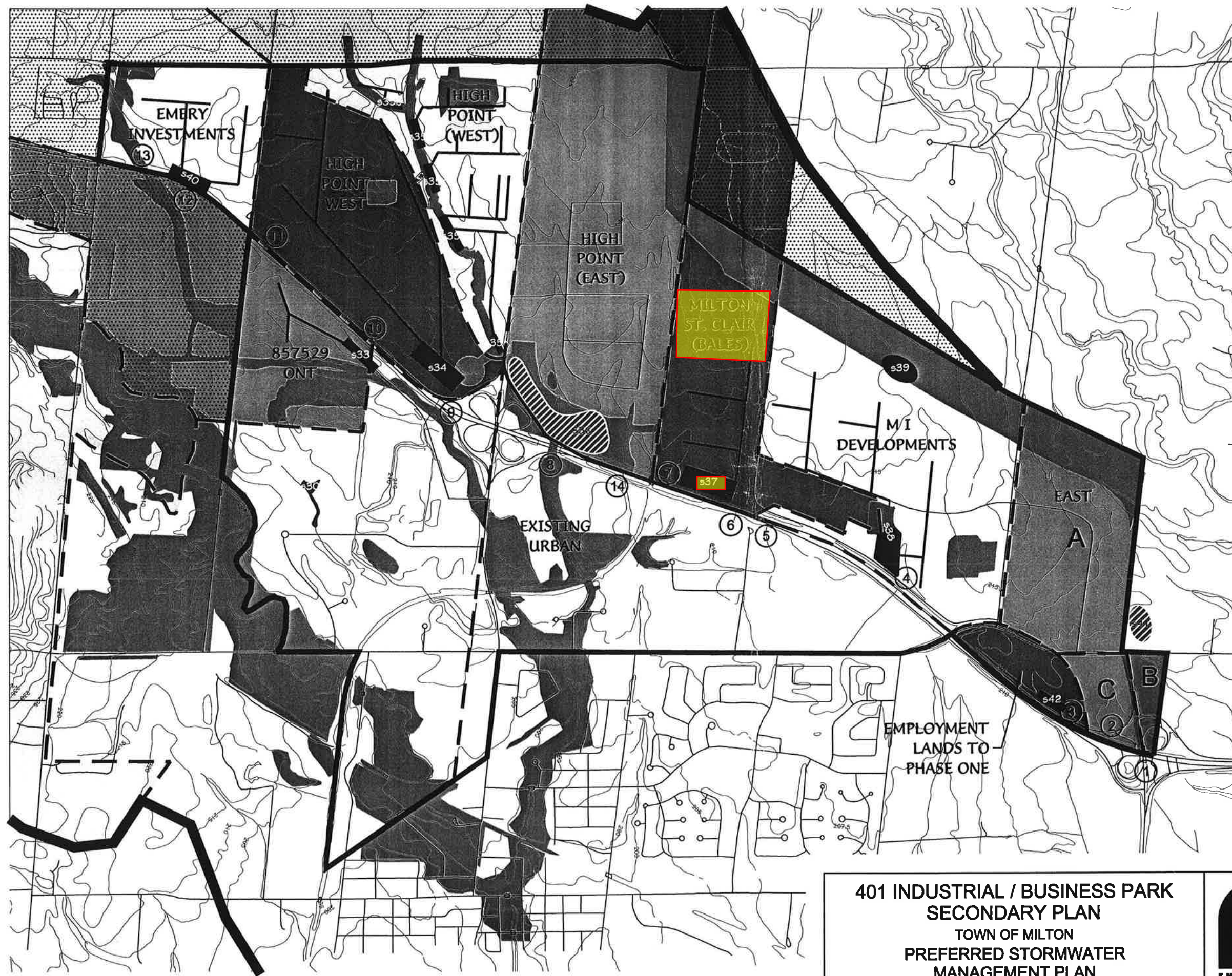
BOSTON CHURCH ROAD
 FROM STA. 1+540.000 TO STA. 1+780.000

REGIONAL FILE: DM-0154 REGION DRAWING No: **03005**

Surveyed By	Date	Contract No.	03005
Drawn By D.J.S.	Checked By N.V.	Drawing No.	
Designed By D.J.S.	Checked By N.V.	Scale: v1:50, h1:500	Sheet No.
Date	2003-06		

P-2

g:\work\99067a\water\dwg\functionalswm\fig-9.dwg



LEGEND

- HIGHWAY 401
- MAJOR ROADS
- PROPOSED ROADS AND IMPROVEMENTS
- MINOR ROADS
- REMOVE ROAD
- HYDRO CORRIDOR
- RAIL LINES
- STUDY AREA
- LINKED GREENLANDS SYSTEM
- WATERWAY
- EXISTING STORMWATER MANAGEMENT FACILITY LOCATION AND NUMBER
- PROPOSED STORMWATER MANAGEMENT FACILITY LOCATION AND NUMBER
- POTENTIAL RETROFIT OPPORTUNITY
- CONCEPTUAL STORM SEWER LAYOUT
- EXISTING CULVERT LOCATION

NOTE:

LAND USE, ENVIRONMENTAL FEATURES AND TOPOGRAPHIC OVERLAYS ARE REFERENCED TO BASE MAPPING WHICH HAVE SEPARATE DATUMS. HENCE MINOR ANOMALIES IN MAPPING REPRESENTATION MAY BE PRESENT. DETAILED SITE SPECIFIC MAPPING OF FEATURES SHOULD BE VERIFIED TO SOURCE INFORMATION AVAILABLE FROM THE TOWN OF MILTON, CONSERVATION HALTON AND REGION OF HALTON.

**401 INDUSTRIAL / BUSINESS PARK
SECONDARY PLAN**
TOWN OF MILTON
**PREFERRED STORMWATER
MANAGEMENT PLAN**



Project No.	99067A
Date	MARCH 2000
Scale	1:20,000
Figure No.	9

TABLE 6.3
DEVELOPMENT AREA STORMWATER MANAGEMENT ASSESSMENT SUMMARY
MILTON ST. CLAIR LANDS (BALES)

Total Drainage Area (ha)		External Area (ha)		Development Area (ha)	
144.73		71.57		73.16	
Future Conditions					
Primary Proposed Land Uses (ha)					
Institutional	Industrial	Employment	Business Park	Roads	
0	36.5	0	28.7	2.5	
Comment:					
Aquatic Habitat and Stream Management					
On-site Watercourses to remain	Habitat Ranking	Beltwidth (m)	Description of Enhancement Objectives		
N/A	N/A	N/A	No watercourses within this area have been recommended to remain as open systems however the function of the existing watercourses would need to be replicated through the design of site drainage systems		
Stormwater Management					
Watercourse Specific Issues/ Objectives	Option Description		Assessment		
SWM Facility Location	Facility location options are limited by the presence of the CNR railway and Boston Church Rd. Hence the proposed facility would be in the general location of the existing farm pond		The recommended facility location is in general accordance with the location recommended in previous studies (ref. Milton Industrial Area – Implementation Policy, R.V. Anderson, 1981). It is also recommended that an alignment following the 401 alignment would maximize the function of the facility as linkage along the Proposed Landscape Corridor		
SWM Facility Sizing			Facility sizing to follow requirements: Water Quality - Level 1 habitat Erosion – Apply Requirements (from Subwatershed Plan) Flood Control – Apply Requirements (from Subwatershed Plan)		
External Drainage	1. Combine with on-site drainage 2. Separate conveyance to the system outlet		Facility sizing should incorporate external drainage if it is to be captured within the proposed SWM facility. Alternatively, external flow may be conveyed around the facility. Based on the size of the external drainage area, and benefit to water quality treatment effectiveness through avoiding dilution of urban discharge, separate conveyance of stormwater from external lands would be recommended Note: Approximately 15.9 ha of external drainage from lands east of Boston Church Road is proposed to discharge to the proposed stormwater management facility.		
SWM Facility Type	1. Wetland 2. Wet pond		Based on the proximity of the facility to the 401 landscape corridor a wetland system would be preferred , however a wet pond would also be acceptable		
Storm servicing	Deep Sewer System vs. Shallow		Based on the OBM 1:10 000 scale mapping, it would appear that there would be would be areas within this development which would require fill material in order allow a deep sewer system (fill requirements ranging from (3.3- 4.3m). The north sector of the site may be serviced with gravity foundation. Hence a hybrid shallow/deep storm sewer should be considered.		

TABLE 6.3
DEVELOPMENT AREA STORMWATER MANAGEMENT ASSESSMENT SUMMARY
MILTON ST. CLAIR LANDS (BALES)

Watercourse Specific Issues/ Objectives	Option Description	Assessment
Outlet Culvert Capacity	Highway 401	Assessment of limiting culvert capacity as follows: $Q(\text{culvert capacity}) = 7.3 + 5.8 \text{ m}^3/\text{s}$ (culvert 6 & 7) $Q(100 \text{ predevelopment target}) = 0.6 \text{ (Node E)} + 1.97 \text{ (Node D)}$ Based on the foregoing the culvert available capacity would not pose an additional constraint on required SWM flow rate control. Consideration should be given to splitting both low flow and storm flow between the two culvert outlets from the site (Culverts 6 and 7 – Figure 5).

APPENDIX B

Stormwater Management Supporting Calculations & Documentation

Modified Rational Method - Input Data

Storm Data: Town of Milton

Time of Concentration: 10 min = 0.17 hours
= 600 sec

Return Period	A	B	C	i mm/hr
2 yr	779	6.0	0.8206	80.1
5 yr	959	5.7	0.8024	105.3
10 yr	1089	5.7	0.7955	121.8
25 yr	1234	5.5	0.7863	143.0
50 yr	1323	5.3	0.7786	158.2
100 yr	1435	5.2	0.7751	174.1

Pre-Development Conditions

Catchment ID	Area (Ha)	Area (m2)	Weighted Average C
100	1.07	10686	0.40
101	1.02	10248	0.50
EXT1	0.05	472	0.25
Total Site	2.14	21406	0.44

Pre-development runoff coefficients for Catchment 100 and 101 are based on the Milton St. Clair Lands (Bales) stormwater management pond report's appended Storm Drainage Area Plan (Urban Ecosystems Limited, June 2003)

Post-Development Conditions

Catchment ID	Area (Ha)	Area (m2)	Weighted Average C
200	0.95	9460	0.90
201	0.90	8966	0.90
EXT1	0.05	472	0.25
UC1	0.15	1531	0.35
UC2	0.10	977	0.56
Total Site	2.14	21406	0.83

North Outlet

Return Period	i	Target Flow Rate $Q_{100}+Q_{EXT1}$	Uncontrolled Post-Development Peak Flow		% Increase to Target Rate
			$Q_{200}+Q_{EXT1}$		
			Q_{UC1}		
	mm/hr	Q (L/s)	Q (L/s)	Q (L/s)	
2 yr	80.1	97	192	12	110%
5 yr	105.3	127	253	16	110%
10 yr	121.8	147	292	18	110%
25 yr	143.0	173	343	21	110%
50 yr	158.2	192	380	24	110%
100 yr	174.1	211	418	26	110%

Average Rainfall Intensity for Set Duration Formula:

$$i = \frac{A}{(t_d + b)^2} \quad \text{where: } A, b, \text{ and } c \text{ are constants}$$

t_d = Duration

Rational Method Formula:

$$Q = 2.78 \text{ CiA} \quad \text{where: } C = \text{Runoff Coefficient}$$

i = Rainfall Intensity (mm/hr)
 A = Drainage Area (ha)

South Outlet

Return Period	i	Target Flow Rate Q ₁₀₁	Uncontrolled Post-Development Peak Flow		% Increase to Target Rate
			Q ₂₀₁	Q _{UC2}	
			mm/hr	Q (L/s)	
2 yr	80.1	113	180	12	70%
5 yr	105.3	149	236	16	70%
10 yr	121.8	172	273	19	70%
25 yr	143.0	202	321	22	70%
50 yr	158.2	223	355	24	70%
100 yr	174.1	246	391	26	70%



Project: 8465 Boston Church Road
Project No.: 2878-7432
Date: 2025-09-19
Designed by: MPH
Checked by: JB/JKF

Peak Flow Summary (North Outlet)

Return Period	Pre-Development Peak Flow Target (Q ₁₀₀ +Q _{EXT1}) (L/s)	Post-Development Peak Flow (L/s)				Required Storage (m ³)	Provided Storage (m ³)
		Q ₂₀₀ + Q _{EXT1}		Q _{UC1}	Total Peak Flow (Q ₂₀₀ +Q _{EXT1} +Q _{UC1})		
		Uncontrolled	Controlled	Uncontrolled			
2-yr	97	192	79	12	91	72.2	205.0
5-yr	127	253	94	16	110	104.0	
10-yr	147	292	104	18	122	153.2	
25-yr	173	343	115	21	136	125.0	
50-yr	192	380	123	24	147	173.2	
100-yr	211	418	130	26	156	195.4	



Project: Boston Church
Project No.: 2878-7432
Date: 2025-09-19
Designed By: MPH
Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 100 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a / (T + c)^b$$

Town of Milton IDF
(100-Year)

a=	1435
b=	5.2
c=	0.775

		CONTROLLED AREA			UNCONTROLLED AREA	
		Drainage Area ID = 200+EXT1 Drainage Area = 0.99 ha Runoff Coefficient = 0.90 Controlled Release= 130 L/s			Drainage Area ID = UC1 Drainage Area = 0.15 ha Runoff Coefficient = 0.35 Target Site Release Rate = 211 L/s	
		Max. Storage Volume Required = 195.4 m3 Storage Volume Provided = 340.0 m3			Controlled Release= 130 L/s Uncontrolled Release Rate = 26 L/s Total Site Release Rate = 156 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	174.1	432.65	130.00	181.6	25.94	
15	139.7	347.06	130.00	195.4	20.80	
20	117.7	292.39	130.00	194.9	17.53	
25	102.3	254.11	130.00	186.2	15.23	
30	90.8	225.66	130.00	172.2	13.53	
35	81.9	203.59	130.00	154.5	12.20	
40	74.8	185.90	130.00	134.2	11.14	
45	69.0	171.38	130.00	111.7	10.27	
50	64.1	159.22	130.00	87.7	9.54	
55	59.9	148.87	130.00	62.3	8.92	
60	56.3	139.95	130.00	35.8	8.39	
65	53.2	132.16	130.00	8.4	7.92	
70	50.4	125.29	125.29	0.0	7.51	
75	48.0	119.19	119.19	0.0	7.15	
80	45.8	113.74	113.74	0.0	6.82	
85	43.8	108.82	108.82	0.0	6.52	
90	42.0	104.36	104.36	0.0	6.26	
95	40.4	100.30	100.30	0.0	6.01	
100	38.9	96.59	96.59	0.0	5.79	
105	37.5	93.17	93.17	0.0	5.59	
110	36.2	90.02	90.02	0.0	5.40	
115	35.1	87.11	87.11	0.0	5.22	
120	34.0	84.40	84.40	0.0	5.06	
125	32.9	81.87	81.87	0.0	4.91	
130	32.0	79.52	79.52	0.0	4.77	
135	31.1	77.31	77.31	0.0	4.63	
140	30.3	75.24	75.24	0.0	4.51	
145	29.5	73.29	73.29	0.0	4.39	
150	28.8	71.45	71.45	0.0	4.28	
155	28.1	69.72	69.72	0.0	4.18	
160	27.4	68.08	68.08	0.0	4.08	
165	26.8	66.52	66.52	0.0	3.99	
170	26.2	65.05	65.05	0.0	3.90	



Project: Boston Church

Project No.: 2878-7432

Date: 2025-09-19

Designed By: MPH

Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 50 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF
(50-Year)

a= 1323

b= 5.3

c= 0.779

CONTROLLED AREA

Drainage Area ID = 200+EXT1

Drainage Area = 0.99 ha

Runoff Coefficient = 0.90

Controlled Release= 123.0 L/s

Max. Storage Volume Required = 173.2 m3

Storage Volume Provided = 340.0 m3

UNCONTROLLED AREA

Drainage Area ID = UC1

Drainage Area = 0.15 ha

Runoff Coefficient = 0.35

Target Site Release Rate = 192 L/s

Controlled Release= 123 L/s

Uncontrolled Release Rate = 24 L/s

Total Site Release Rate = 147 L/s

Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)
10	158.2	393.09	123.00	162.1	23.56
15	126.9	315.41	123.00	173.2	18.91
20	106.9	265.72	123.00	171.3	15.93
25	92.9	230.91	123.00	161.9	13.84
30	82.5	205.02	123.00	147.6	12.29
35	74.4	184.93	123.00	130.0	11.09
40	67.9	168.83	123.00	110.0	10.12
45	62.6	155.61	123.00	88.1	9.33
50	58.2	144.55	123.00	64.6	8.66
55	54.4	135.13	123.00	40.0	8.10
60	51.1	127.00	123.00	14.4	7.61
65	48.3	119.91	119.91	0.0	7.19
70	45.7	113.66	113.66	0.0	6.81
75	43.5	108.11	108.11	0.0	6.48
80	41.5	103.15	103.15	0.0	6.18
85	39.7	98.67	98.67	0.0	5.91
90	38.1	94.62	94.62	0.0	5.67
95	36.6	90.92	90.92	0.0	5.45
100	35.2	87.54	87.54	0.0	5.25
105	34.0	84.44	84.44	0.0	5.06
110	32.8	81.57	81.57	0.0	4.89
115	31.8	78.92	78.92	0.0	4.73
120	30.8	76.46	76.46	0.0	4.58
125	29.8	74.16	74.16	0.0	4.45
130	29.0	72.02	72.02	0.0	4.32
135	28.2	70.02	70.02	0.0	4.20
140	27.4	68.13	68.13	0.0	4.08
145	26.7	66.36	66.36	0.0	3.98
150	26.0	64.69	64.69	0.0	3.88
155	25.4	63.11	63.11	0.0	3.78
160	24.8	61.62	61.62	0.0	3.69
165	24.2	60.21	60.21	0.0	3.61
170	23.7	58.87	58.87	0.0	3.53



Project: Boston Church
Project No.: 2878-7432
Date: 2025-09-19
Designed By: MPH
Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 25 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (25-Year)	
a=	1234
b=	5.5
c=	0.786

CONTROLLED AREA					UNCONTROLLED AREA	
Drainage Area ID = 200+EXT1					Drainage Area ID = UC1	
Drainage Area = 0.99 ha					Drainage Area = 0.15 ha	
Runoff Coefficient = 0.90					Runoff Coefficient = 0.35	
Controlled Release= 115.0 L/s					Target Site Release Rate = 173 L/s	
Max. Storage Volume Required = 153.2 m3					Controlled Release= 115 L/s	
Storage Volume Provided = 340.0 m3					Uncontrolled Release Rate = 21 L/s	
					Total Site Release Rate = 136 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	143.0	355.38	115.00	144.2	21.30	
15	114.8	285.24	115.00	153.2	17.10	
20	96.7	240.26	115.00	150.3	14.40	
25	84.0	208.71	115.00	140.6	12.51	
30	74.5	185.23	115.00	126.4	11.10	
35	67.2	167.00	115.00	109.2	10.01	
40	61.3	152.39	115.00	89.7	9.14	
45	56.5	140.39	115.00	68.6	8.42	
50	52.5	130.35	115.00	46.0	7.81	
55	49.0	121.80	115.00	22.4	7.30	
60	46.0	114.43	114.43	0.0	6.86	
65	43.5	108.00	108.00	0.0	6.47	
70	41.2	102.33	102.33	0.0	6.13	
75	39.2	97.30	97.30	0.0	5.83	
80	37.3	92.80	92.80	0.0	5.56	
85	35.7	88.74	88.74	0.0	5.32	
90	34.2	85.07	85.07	0.0	5.10	
95	32.9	81.72	81.72	0.0	4.90	
100	31.7	78.66	78.66	0.0	4.72	
105	30.5	75.85	75.85	0.0	4.55	
110	29.5	73.26	73.26	0.0	4.39	
115	28.5	70.85	70.85	0.0	4.25	
120	27.6	68.63	68.63	0.0	4.11	
125	26.8	66.55	66.55	0.0	3.99	
130	26.0	64.61	64.61	0.0	3.87	
135	25.3	62.80	62.80	0.0	3.76	
140	24.6	61.09	61.09	0.0	3.66	
145	23.9	59.49	59.49	0.0	3.57	
150	23.3	57.98	57.98	0.0	3.48	
155	22.8	56.56	56.56	0.0	3.39	
160	22.2	55.21	55.21	0.0	3.31	
165	21.7	53.93	53.93	0.0	3.23	
170	21.2	52.72	52.72	0.0	3.16	



Project: Boston Church
 Project No.: 2878-7432
 Date: 2025-09-19
 Designed By: MPH
 Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 10 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a / (T + c)^b$$

Town of Milton IDF (10-Year)	
a=	1089
b=	5.7
c=	0.796

CONTROLLED AREA					UNCONTROLLED AREA
Drainage Area ID = 200+EXT1					Drainage Area ID = UC1
Drainage Area = 0.99 ha					Drainage Area = 0.15 ha
Runoff Coefficient = 0.90					Runoff Coefficient = 0.35
Controlled Release= 104.0 L/s					Target Site Release Rate = 147 L/s
Max. Storage Volume Required = 125.0 m3					Controlled Release= 104 L/s
Storage Volume Provided = 340.0 m3					Uncontrolled Release Rate = 18 L/s
					Total Site Release Rate = 122 L/s
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)
10	121.8	302.71	104.00	119.2	18.15
15	97.8	242.94	104.00	125.0	14.56
20	82.3	204.53	104.00	120.6	12.26
25	71.5	177.56	104.00	110.3	10.64
30	63.4	157.47	104.00	96.3	9.44
35	57.1	141.88	104.00	79.6	8.51
40	52.1	129.39	104.00	60.9	7.76
45	47.9	119.13	104.00	40.9	7.14
50	44.5	110.54	104.00	19.6	6.63
55	41.5	103.24	103.24	0.0	6.19
60	39.0	96.94	96.94	0.0	5.81
65	36.8	91.44	91.44	0.0	5.48
70	34.9	86.60	86.60	0.0	5.19
75	33.1	82.31	82.31	0.0	4.93
80	31.6	78.46	78.46	0.0	4.70
85	30.2	75.00	75.00	0.0	4.50
90	28.9	71.87	71.87	0.0	4.31
95	27.8	69.02	69.02	0.0	4.14
100	26.7	66.41	66.41	0.0	3.98
105	25.8	64.01	64.01	0.0	3.84
110	24.9	61.80	61.80	0.0	3.70
115	24.0	59.75	59.75	0.0	3.58
120	23.3	57.85	57.85	0.0	3.47
125	22.6	56.09	56.09	0.0	3.36
130	21.9	54.44	54.44	0.0	3.26
135	21.3	52.89	52.89	0.0	3.17
140	20.7	51.44	51.44	0.0	3.08
145	20.2	50.08	50.08	0.0	3.00
150	19.6	48.80	48.80	0.0	2.93
155	19.1	47.59	47.59	0.0	2.85
160	18.7	46.44	46.44	0.0	2.78
165	18.3	45.35	45.35	0.0	2.72
170	17.8	44.32	44.32	0.0	2.66



Project: Boston Church
 Project No.: 2878-7432
 Date: 2025-09-19
 Designed By: MPH
 Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 5 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (5-Year)	
a=	959
b=	5.7
c=	0.802

CONTROLLED AREA					UNCONTROLLED AREA
Drainage Area ID = 200+EXT1					Drainage Area ID = UC1
Drainage Area = 0.99 ha					Drainage Area = 0.15 ha
Runoff Coefficient = 0.90					Runoff Coefficient = 0.35
Controlled Release= 94.0 L/s					Target Site Release Rate = 127 L/s
Max. Storage Volume Required = 104.0 m3					Controlled Release= 94 L/s
Storage Volume Provided = 340.0 m3					Uncontrolled Release Rate = 16 L/s
					Total Site Release Rate = 110 L/s
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)
10	105.3	261.55	94.00	100.5	15.68
15	84.3	209.51	94.00	104.0	12.56
20	70.9	176.12	94.00	98.5	10.56
25	61.5	152.71	94.00	88.1	9.15
30	54.4	135.30	94.00	74.3	8.11
35	49.0	121.79	94.00	58.4	7.30
40	44.7	110.98	94.00	40.7	6.65
45	41.1	102.11	94.00	21.9	6.12
50	38.1	94.68	94.00	2.1	5.68
55	35.6	88.37	88.37	0.0	5.30
60	33.4	82.93	82.93	0.0	4.97
65	31.5	78.19	78.19	0.0	4.69
70	29.8	74.02	74.02	0.0	4.44
75	28.3	70.32	70.32	0.0	4.22
80	27.0	67.01	67.01	0.0	4.02
85	25.8	64.03	64.03	0.0	3.84
90	24.7	61.33	61.33	0.0	3.68
95	23.7	58.87	58.87	0.0	3.53
100	22.8	56.63	56.63	0.0	3.39
105	22.0	54.57	54.57	0.0	3.27
110	21.2	52.67	52.67	0.0	3.16
115	20.5	50.91	50.91	0.0	3.05
120	19.8	49.28	49.28	0.0	2.95
125	19.2	47.76	47.76	0.0	2.86
130	18.6	46.34	46.34	0.0	2.78
135	18.1	45.02	45.02	0.0	2.70
140	17.6	43.77	43.77	0.0	2.62
145	17.1	42.60	42.60	0.0	2.55
150	16.7	41.50	41.50	0.0	2.49
155	16.3	40.46	40.46	0.0	2.43
160	15.9	39.48	39.48	0.0	2.37
165	15.5	38.55	38.55	0.0	2.31
170	15.2	37.67	37.67	0.0	2.26

MODIFIED RATIONAL METHOD CALCULATIONS - 2 YEAR STORM EVENT (NORTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

 Town of Milton IDF
 (2-Year)

a= 779

b= 6

c= 0.821

Rainfall Intensity Equation: I = a/(T+c) ^b		CONTROLLED AREA			UNCONTROLLED AREA	
		Drainage Area ID = 200+EXT1 Drainage Area = 0.99 ha Runoff Coefficient = 0.90			Drainage Area ID = UC1 Drainage Area = 0.15 ha Runoff Coefficient = 0.35	
		Controlled Release= 79.0 L/s			Target Site Release Rate = 97 L/s	
		Max. Storage Volume Required = 72.2 m3 Storage Volume Provided = 340.0 m3			Controlled Release= 79 L/s Uncontrolled Release Rate = 12 L/s Total Site Release Rate = 91 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m³)	Q _{Runoff} (L/s)	
10	80.1	198.96	79.00	72.0	11.93	
15	64.1	159.17	79.00	72.2	9.54	
20	53.8	133.58	79.00	65.5	8.01	
25	46.5	115.63	79.00	54.9	6.93	
30	41.2	102.27	79.00	41.9	6.13	
35	37.0	91.92	79.00	27.1	5.51	
40	33.7	83.64	79.00	11.1	5.01	
45	30.9	76.85	76.85	0.0	4.61	
50	28.6	71.17	71.17	0.0	4.27	
55	26.7	66.35	66.35	0.0	3.98	
60	25.0	62.19	62.19	0.0	3.73	
65	23.6	58.58	58.58	0.0	3.51	
70	22.3	55.40	55.40	0.0	3.32	
75	21.2	52.57	52.57	0.0	3.15	
80	20.1	50.05	50.05	0.0	3.00	
85	19.2	47.78	47.78	0.0	2.86	
90	18.4	45.73	45.73	0.0	2.74	
95	17.7	43.87	43.87	0.0	2.63	
100	17.0	42.16	42.16	0.0	2.53	
105	16.3	40.60	40.60	0.0	2.43	
110	15.8	39.15	39.15	0.0	2.35	
115	15.2	37.82	37.82	0.0	2.27	
120	14.7	36.59	36.59	0.0	2.19	
125	14.3	35.44	35.44	0.0	2.12	
130	13.8	34.36	34.36	0.0	2.06	
135	13.4	33.36	33.36	0.0	2.00	
140	13.0	32.42	32.42	0.0	1.94	
145	12.7	31.54	31.54	0.0	1.89	
150	12.4	30.70	30.70	0.0	1.84	
155	12.0	29.92	29.92	0.0	1.79	
160	11.7	29.18	29.18	0.0	1.75	
165	11.5	28.48	28.48	0.0	1.71	
170	11.2	27.81	27.81	0.0	1.67	



Project: 8465 Boston Church Road
Project No.: 2878-7432
Date: 2025-09-19
Designed by: MPH
Checked by: JB/JKF

Peak Flow Summary (South Outlet)

Return Period	Pre-Development Peak Flow Target (Q ₁₀₁) (L/s)	Post-Development Peak Flow (L/s)				Required Storage (m ³)	Provided Storage (m ³)
		Q ₂₀₁		Q _{UC2}	Total Peak Flow (Q ₂₀₁ +Q _{UC2})		
		Uncontrolled	Controlled	Uncontrolled			
2-yr	113	180	93	12	106	51.8	155.0
5-yr	149	236	118	16	134	71.1	
10-yr	172	273	131	19	150	85.2	
25-yr	202	321	147	22	169	104.1	
50-yr	223	355	158	24	182	117.9	
100-yr	246	391	170	26	196	132.4	



Project: Boston Church
Project No.: 2878-7432
Date: 1900-01-00
Designed By: MPH
Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 100 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a / (T + c)^b$$

Town of Milton IDF (100-Year)	
a=	1435
b=	5.2
c=	0.775

		CONTROLLED AREA			UNCONTROLLED AREA	
		Drainage Area ID = 201 Drainage Area = 0.90 ha Runoff Coefficient = 0.90 Controlled Release = 170 L/s			Drainage Area ID = UC2 Drainage Area = 0.10 ha Runoff Coefficient = 0.56 Target Site Release Rate = 246 L/s	
		Max. Storage Volume Required = 132.4 m ³ Storage Volume Provided = 155.0 m ³			Controlled Release = 170 L/s Uncontrolled Release Rate = 26 L/s Total Site Release Rate = 196 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	174.1	390.56	169.89	132.4	26.47	
15	139.7	313.30	169.89	129.1	21.24	
20	117.7	263.94	169.89	112.9	17.89	
25	102.3	229.40	169.89	89.3	15.55	
30	90.8	203.71	169.89	60.9	13.81	
35	81.9	183.78	169.89	29.2	12.46	
40	74.8	167.82	167.82	0.0	11.38	
45	69.0	154.71	154.71	0.0	10.49	
50	64.1	143.73	143.73	0.0	9.74	
55	59.9	134.39	134.39	0.0	9.11	
60	56.3	126.33	126.33	0.0	8.56	
65	53.2	119.30	119.30	0.0	8.09	
70	50.4	113.10	113.10	0.0	7.67	
75	48.0	107.60	107.60	0.0	7.29	
80	45.8	102.67	102.67	0.0	6.96	
85	43.8	98.23	98.23	0.0	6.66	
90	42.0	94.21	94.21	0.0	6.39	
95	40.4	90.55	90.55	0.0	6.14	
100	38.9	87.19	87.19	0.0	5.91	
105	37.5	84.11	84.11	0.0	5.70	
110	36.2	81.27	81.27	0.0	5.51	
115	35.1	78.63	78.63	0.0	5.33	
120	34.0	76.19	76.19	0.0	5.16	
125	32.9	73.91	73.91	0.0	5.01	
130	32.0	71.78	71.78	0.0	4.87	
135	31.1	69.79	69.79	0.0	4.73	
140	30.3	67.92	67.92	0.0	4.60	
145	29.5	66.16	66.16	0.0	4.48	
150	28.8	64.50	64.50	0.0	4.37	
155	28.1	62.94	62.94	0.0	4.27	
160	27.4	61.46	61.46	0.0	4.17	
165	26.8	60.05	60.05	0.0	4.07	
170	26.2	58.72	58.72	0.0	3.98	



Project: Boston Church
 Project No.: 2878-7432
 Date: 1900-01-00
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MODIFIED RATIONAL METHOD CALCULATIONS - 50 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (50-Year)	
a=	1323
b=	5.3
c=	0.779

CONTROLLED AREA					UNCONTROLLED AREA
Drainage Area ID = 201					Drainage Area ID = UC2
Drainage Area = 0.90 ha					Drainage Area = 0.10 ha
Runoff Coefficient = 0.90					Runoff Coefficient = 0.56
Controlled Release= 158.4 L/s					Target Site Release Rate = 223 L/s
Max. Storage Volume Required = 117.9 m3					Controlled Release= 158 L/s
Storage Volume Provided = 155.0 m3					Uncontrolled Release Rate = 24 L/s
					Total Site Release Rate = 182 L/s
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)
10	158.2	354.85	158.40	117.9	24.05
15	126.9	284.73	158.40	113.7	19.30
20	106.9	239.87	158.40	97.8	16.26
25	92.9	208.45	158.40	75.1	14.13
30	82.5	185.08	158.40	48.0	12.54
35	74.4	166.94	158.40	17.9	11.32
40	67.9	152.41	152.41	0.0	10.33
45	62.6	140.48	140.48	0.0	9.52
50	58.2	130.48	130.48	0.0	8.84
55	54.4	121.98	121.98	0.0	8.27
60	51.1	114.64	114.64	0.0	7.77
65	48.3	108.24	108.24	0.0	7.34
70	45.7	102.61	102.61	0.0	6.95
75	43.5	97.60	97.60	0.0	6.62
80	41.5	93.11	93.11	0.0	6.31
85	39.7	89.07	89.07	0.0	6.04
90	38.1	85.41	85.41	0.0	5.79
95	36.6	82.08	82.08	0.0	5.56
100	35.2	79.03	79.03	0.0	5.36
105	34.0	76.22	76.22	0.0	5.17
110	32.8	73.64	73.64	0.0	4.99
115	31.8	71.24	71.24	0.0	4.83
120	30.8	69.02	69.02	0.0	4.68
125	29.8	66.95	66.95	0.0	4.54
130	29.0	65.02	65.02	0.0	4.41
135	28.2	63.20	63.20	0.0	4.28
140	27.4	61.50	61.50	0.0	4.17
145	26.7	59.91	59.91	0.0	4.06
150	26.0	58.40	58.40	0.0	3.96
155	25.4	56.98	56.98	0.0	3.86
160	24.8	55.63	55.63	0.0	3.77
165	24.2	54.35	54.35	0.0	3.68
170	23.7	53.14	53.14	0.0	3.60



Project: Boston Church
 Project No.: 2878-7432
 Date: 1900-01-00
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MODIFIED RATIONAL METHOD CALCULATIONS - 25 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (25-Year)	
a=	1234
b=	5.5
c=	0.786

CONTROLLED AREA					UNCONTROLLED AREA	
Drainage Area ID = 201					Drainage Area ID = UC2	
Drainage Area = 0.90 ha					Drainage Area = 0.10 ha	
Runoff Coefficient = 0.90					Runoff Coefficient = 0.56	
Controlled Release= 147.3 L/s					Target Site Release Rate = 202 L/s	
Max. Storage Volume Required = 104.1 m3					Controlled Release= 147 L/s	
Storage Volume Provided = 155.0 m3					Uncontrolled Release Rate = 22 L/s	
					Total Site Release Rate = 169 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	143.0	320.81	147.30	104.1	21.75	
15	114.8	257.50	147.30	99.2	17.45	
20	96.7	216.89	147.30	83.5	14.70	
25	84.0	188.41	147.30	61.7	12.77	
30	74.5	167.21	147.30	35.8	11.33	
35	67.2	150.75	147.30	7.2	10.22	
40	61.3	137.56	137.56	0.0	9.32	
45	56.5	126.74	126.74	0.0	8.59	
50	52.5	117.67	117.67	0.0	7.98	
55	49.0	109.95	109.95	0.0	7.45	
60	46.0	103.30	103.30	0.0	7.00	
65	43.5	97.49	97.49	0.0	6.61	
70	41.2	92.38	92.38	0.0	6.26	
75	39.2	87.84	87.84	0.0	5.95	
80	37.3	83.77	83.77	0.0	5.68	
85	35.7	80.11	80.11	0.0	5.43	
90	34.2	76.79	76.79	0.0	5.21	
95	32.9	73.77	73.77	0.0	5.00	
100	31.7	71.01	71.01	0.0	4.81	
105	30.5	68.47	68.47	0.0	4.64	
110	29.5	66.13	66.13	0.0	4.48	
115	28.5	63.96	63.96	0.0	4.34	
120	27.6	61.95	61.95	0.0	4.20	
125	26.8	60.08	60.08	0.0	4.07	
130	26.0	58.33	58.33	0.0	3.95	
135	25.3	56.69	56.69	0.0	3.84	
140	24.6	55.15	55.15	0.0	3.74	
145	23.9	53.70	53.70	0.0	3.64	
150	23.3	52.34	52.34	0.0	3.55	
155	22.8	51.05	51.05	0.0	3.46	
160	22.2	49.84	49.84	0.0	3.38	
165	21.7	48.69	48.69	0.0	3.30	
170	21.2	47.59	47.59	0.0	3.23	



Project: Boston Church
 Project No.: 2878-7432
 Date: 1900-01-00
 Designed By: MPH
 Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 10 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (10-Year)	
a=	1089
b=	5.7
c=	0.796

CONTROLLED AREA					UNCONTROLLED AREA	
Drainage Area ID = 201					Drainage Area ID = UC2	
Drainage Area = 0.90 ha					Drainage Area = 0.10 ha	
Runoff Coefficient = 0.90					Runoff Coefficient = 0.56	
Controlled Release= 131.3 L/s					Target Site Release Rate = 172 L/s	
Max. Storage Volume Required = 85.2 m3					Controlled Release= 131 L/s	
Storage Volume Provided = 155.0 m3					Uncontrolled Release Rate = 19 L/s	
					Total Site Release Rate = 150 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	121.8	273.26	131.30	85.2	18.52	
15	97.8	219.31	131.30	79.2	14.87	
20	82.3	184.63	131.30	64.0	12.52	
25	71.5	160.29	131.30	43.5	10.86	
30	63.4	142.16	131.30	19.5	9.64	
35	57.1	128.08	128.08	0.0	8.68	
40	52.1	116.80	116.80	0.0	7.92	
45	47.9	107.54	107.54	0.0	7.29	
50	44.5	99.79	99.79	0.0	6.76	
55	41.5	93.19	93.19	0.0	6.32	
60	39.0	87.51	87.51	0.0	5.93	
65	36.8	82.55	82.55	0.0	5.60	
70	34.9	78.18	78.18	0.0	5.30	
75	33.1	74.30	74.30	0.0	5.04	
80	31.6	70.83	70.83	0.0	4.80	
85	30.2	67.71	67.71	0.0	4.59	
90	28.9	64.88	64.88	0.0	4.40	
95	27.8	62.30	62.30	0.0	4.22	
100	26.7	59.95	59.95	0.0	4.06	
105	25.8	57.78	57.78	0.0	3.92	
110	24.9	55.79	55.79	0.0	3.78	
115	24.0	53.94	53.94	0.0	3.66	
120	23.3	52.23	52.23	0.0	3.54	
125	22.6	50.63	50.63	0.0	3.43	
130	21.9	49.14	49.14	0.0	3.33	
135	21.3	47.75	47.75	0.0	3.24	
140	20.7	46.44	46.44	0.0	3.15	
145	20.2	45.21	45.21	0.0	3.06	
150	19.6	44.05	44.05	0.0	2.99	
155	19.1	42.96	42.96	0.0	2.91	
160	18.7	41.92	41.92	0.0	2.84	
165	18.3	40.94	40.94	0.0	2.78	
170	17.8	40.01	40.01	0.0	2.71	



Project: Boston Church
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 Designed By: MPH
 Checked By: JB/JKF

MODIFIED RATIONAL METHOD CALCULATIONS - 5 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

Town of Milton IDF (5-Year)	
a=	959
b=	5.7
c=	0.802

CONTROLLED AREA					UNCONTROLLED AREA	
Drainage Area ID = 201					Drainage Area ID = UC2	
Drainage Area = 0.90 ha					Drainage Area = 0.10 ha	
Runoff Coefficient = 0.90					Runoff Coefficient = 0.56	
Controlled Release= 117.6 L/s					Target Site Release Rate = 149 L/s	
Max. Storage Volume Required = 71.1 m3					Controlled Release= 118 L/s	
Storage Volume Provided = 155.0 m3					Uncontrolled Release Rate = 16 L/s	
					Total Site Release Rate = 134 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	105.3	236.11	117.60	71.1	16.00	
15	84.3	189.13	117.60	64.4	12.82	
20	70.9	158.99	117.60	49.7	10.78	
25	61.5	137.86	117.60	30.4	9.34	
30	54.4	122.14	117.60	8.2	8.28	
35	49.0	109.94	109.94	0.0	7.45	
40	44.7	100.18	100.18	0.0	6.79	
45	41.1	92.17	92.17	0.0	6.25	
50	38.1	85.47	85.47	0.0	5.79	
55	35.6	79.78	79.78	0.0	5.41	
60	33.4	74.87	74.87	0.0	5.07	
65	31.5	70.59	70.59	0.0	4.78	
70	29.8	66.82	66.82	0.0	4.53	
75	28.3	63.48	63.48	0.0	4.30	
80	27.0	60.49	60.49	0.0	4.10	
85	25.8	57.80	57.80	0.0	3.92	
90	24.7	55.36	55.36	0.0	3.75	
95	23.7	53.15	53.15	0.0	3.60	
100	22.8	51.12	51.12	0.0	3.47	
105	22.0	49.26	49.26	0.0	3.34	
110	21.2	47.54	47.54	0.0	3.22	
115	20.5	45.96	45.96	0.0	3.12	
120	19.8	44.48	44.48	0.0	3.02	
125	19.2	43.11	43.11	0.0	2.92	
130	18.6	41.83	41.83	0.0	2.84	
135	18.1	40.64	40.64	0.0	2.75	
140	17.6	39.51	39.51	0.0	2.68	
145	17.1	38.46	38.46	0.0	2.61	
150	16.7	37.46	37.46	0.0	2.54	
155	16.3	36.53	36.53	0.0	2.48	
160	15.9	35.64	35.64	0.0	2.42	
165	15.5	34.80	34.80	0.0	2.36	
170	15.2	34.00	34.00	0.0	2.30	

MODIFIED RATIONAL METHOD CALCULATIONS - 2 YEAR STORM EVENT (SOUTH OUTLET)

Rainfall Intensity Equation:

$$I = a/(T+c)^b$$

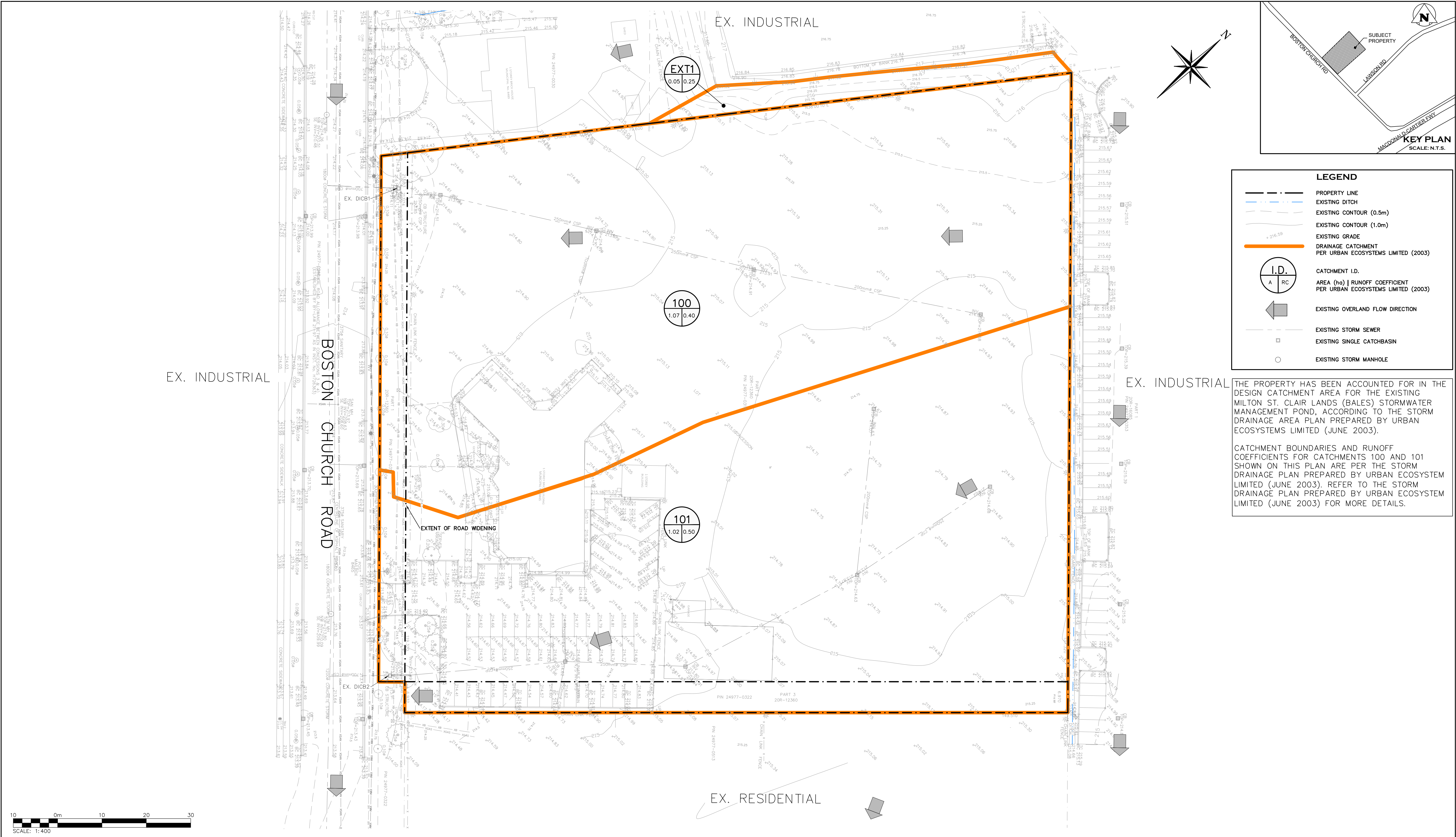
Town of Milton IDF
(2-Year)

a=	779
b=	6
c=	0.821

		CONTROLLED AREA			UNCONTROLLED AREA	
		Drainage Area ID = 201 Drainage Area = 0.90 ha Runoff Coefficient = 0.90 Controlled Release= 93.3 L/s			Drainage Area ID = UC2 Drainage Area = 0.10 ha Runoff Coefficient = 0.56 Target Site Release Rate = 113 L/s	
		Max. Storage Volume Required = 51.8 m3 Storage Volume Provided = 155.0 m3			Controlled Release= 93 L/s Uncontrolled Release Rate = 12 L/s Total Site Release Rate = 106 L/s	
Time (minutes)	Rainfall Intensity (mm/hr)	Q _{Runoff} (L/s)	Q _{Release} (L/s)	Storage Volume Required (m ³)	Q _{Runoff} (L/s)	
10	80.1	179.61	93.33	51.8	12.17	
15	64.1	143.68	93.33	45.3	9.74	
20	53.8	120.59	93.33	32.7	8.17	
25	46.5	104.38	93.33	16.6	7.08	
30	41.2	92.33	92.33	0.0	6.26	
35	37.0	82.98	82.98	0.0	5.62	
40	33.7	75.50	75.50	0.0	5.12	
45	30.9	69.37	69.37	0.0	4.70	
50	28.6	64.25	64.25	0.0	4.35	
55	26.7	59.89	59.89	0.0	4.06	
60	25.0	56.14	56.14	0.0	3.81	
65	23.6	52.88	52.88	0.0	3.58	
70	22.3	50.01	50.01	0.0	3.39	
75	21.2	47.46	47.46	0.0	3.22	
80	20.1	45.18	45.18	0.0	3.06	
85	19.2	43.14	43.14	0.0	2.92	
90	18.4	41.28	41.28	0.0	2.80	
95	17.7	39.60	39.60	0.0	2.68	
100	17.0	38.06	38.06	0.0	2.58	
105	16.3	36.65	36.65	0.0	2.48	
110	15.8	35.35	35.35	0.0	2.40	
115	15.2	34.14	34.14	0.0	2.31	
120	14.7	33.03	33.03	0.0	2.24	
125	14.3	31.99	31.99	0.0	2.17	
130	13.8	31.02	31.02	0.0	2.10	
135	13.4	30.11	30.11	0.0	2.04	
140	13.0	29.27	29.27	0.0	1.98	
145	12.7	28.47	28.47	0.0	1.93	
150	12.4	27.72	27.72	0.0	1.88	
155	12.0	27.01	27.01	0.0	1.83	
160	11.7	26.34	26.34	0.0	1.79	
165	11.5	25.71	25.71	0.0	1.74	
170	11.2	25.10	25.10	0.0	1.70	

FIGURES

- Figure 1:** Pre-Development Storm Drainage Plan
Figure 2: Post-Development Storm Drainage Plan



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6. DO NOT SCALE DRAWINGS.

ELEVATION NOTE:
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SITE BENCHMARKS:
SITE TEM 1: CUT CROSS ON CONCRETE SIDEWALK, 214.54M.
SITE TEM 2: CUT CROSS ON CONCRETE SIDEWALK, 213.64M.
SURVEY NOTES:
THE TOPOGRAPHIC SURVEY WAS COMPLETED BY VAN HARTEN LAND SURVEYORS AND PROFESSIONAL ENGINEERS ON JUNE 5, 2025. PROJECT NO. 34292-25

THE REGIONAL MUNICIPALITY OF HALTON

LEGISLATIVE AND PLANNING SERVICES DEPARTMENT

TOWN OF MILTON

ENGINEERING SERVICES DEPARTMENT

FILE NUMBER

DIRECTOR OF ENGINEERING SERVICES/
DIRECTOR OF COMMUNITY SERVICES

No.	ISSUE	DATE: YYYY/MM/DD	Engineer
0	ISSUED FOR 1ST SUBMISSION	2025/09/26	

FOR REVIEW

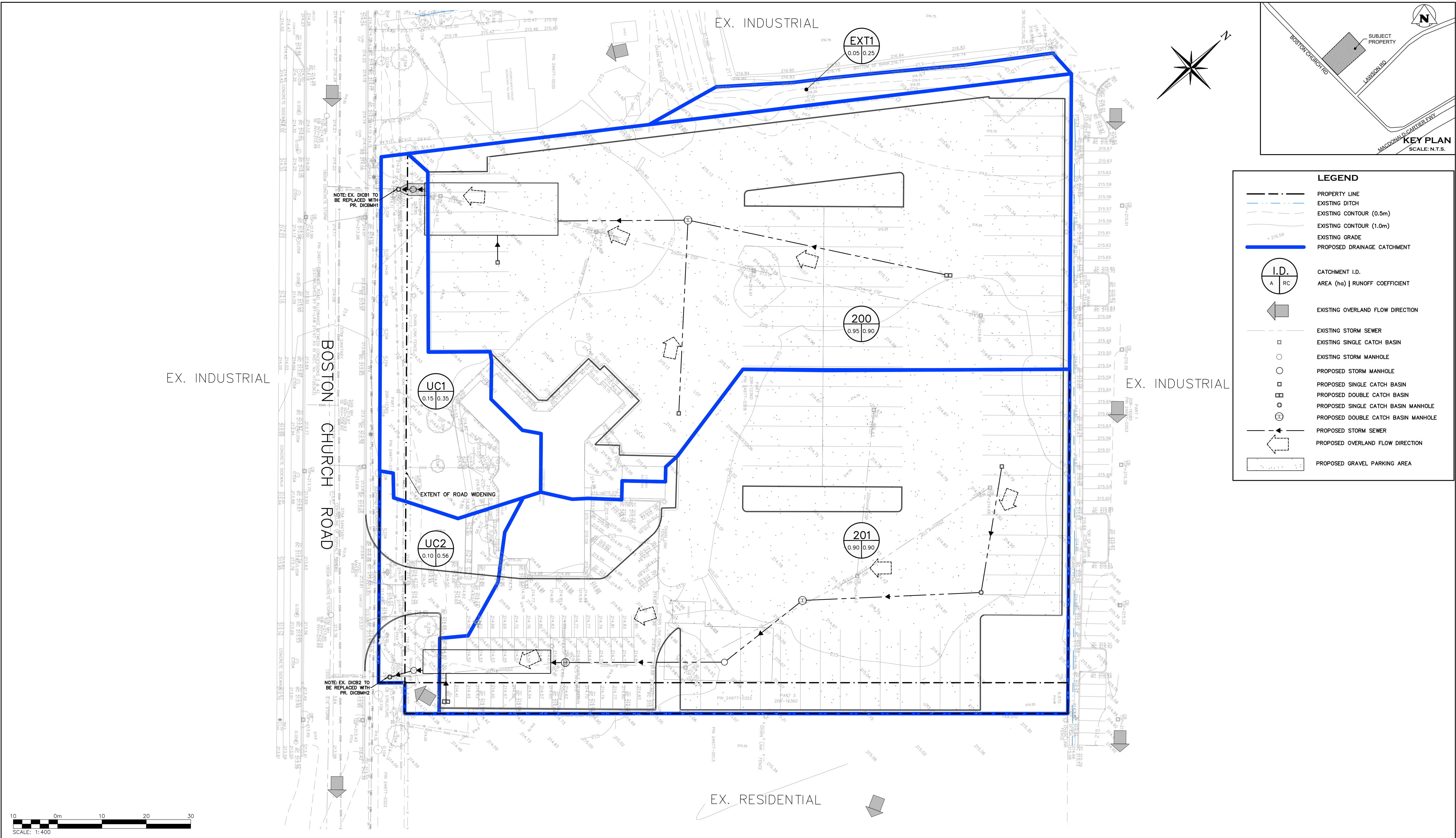
NOT TO BE USED FOR CONSTRUCTION

Project: 8465 BOSTON CHURCH ROAD
TOWN OF MILTON

Drawing: PRE-DEVELOPMENT STORM DRAINAGE PLAN

CROZIER
CONSULTING ENGINEERS

Drawn By	M.P.H.	Design By	M.P.H./J.K.F.	Project	2878-7432
Check By	J.B.	Check By	M.B.	Drawing	FIG.1



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Regional
Halton
THE REGIONAL MUNICIPALITY OF HALTON
FILE NUMBER
LEGISLATIVE AND PLANNING SERVICES DEPARTMENT
DATE

Town
TOWN OF MILTON
ENGINEERING SERVICES DEPARTMENT
FILE NUMBER
MILTON
DIRECTOR OF ENGINEERING SERVICES/
DIRECTOR OF COMMUNITY SERVICES
MANAGER OF DEVELOPMENT ENGINEERING/
MANAGER OF PARKS AND OPEN SPACE

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR 1ST SUBMISSION	2025/09/26

Engineer
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION
Engineer

Project
8465 BOSTON CHURCH ROAD
TOWN OF MILTON
Drawing
POST-DEVELOPMENT STORM DRAINAGE PLAN

CROZIER
CONSULTING ENGINEERS
Drawn By M.P.H. Design By M.P.H./J.K.F. Project 2878-7432
Check By J.B. Check By M.B. Drawing FIG.2

DRAWINGS

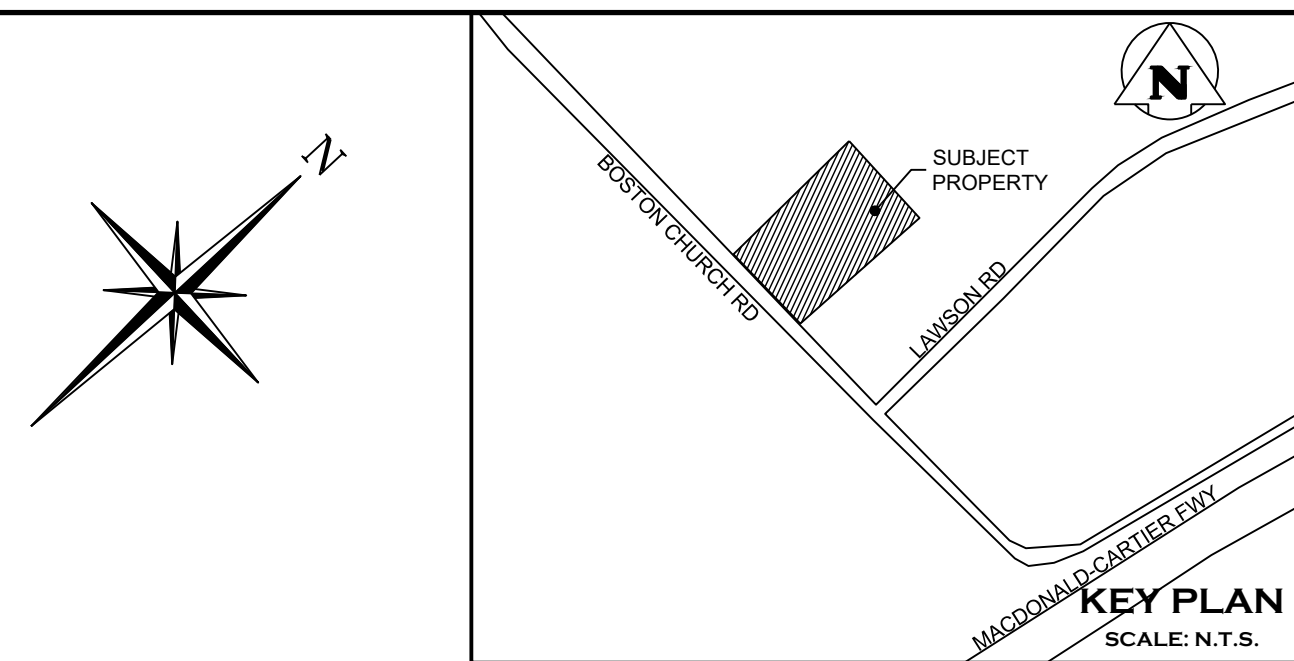
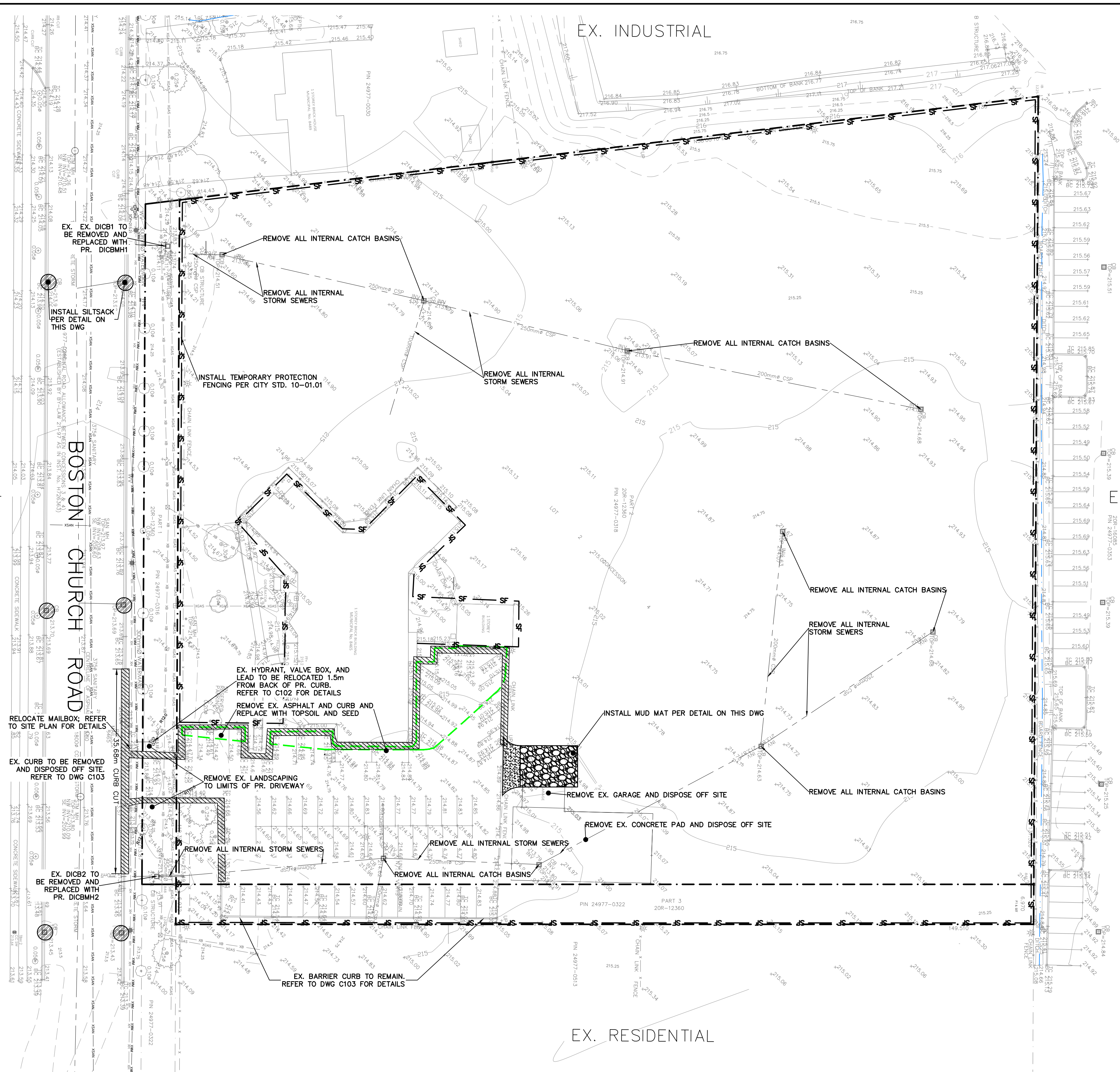
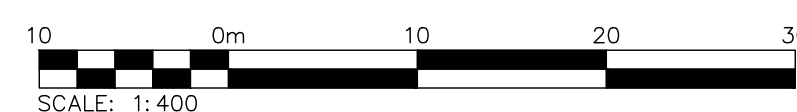
Drawing C101: Erosion and Sediment Control Plan

Drawing C102: Servicing Plan

Drawing C103: Grading Plan

Drawing C104: Notes and Details

Drawing C105: Notes and Details



LEGEND

	PROPERTY LINE
	EXISTING DITCH
	EXISTING CONTOUR (0.5m)
	EXISTING CONTOUR (1.0m)
	EXISTING GRADE
	EXISTING STORM MANHOLE
	EXISTING SINGLE CATCH BASIN
	MUD MAT SEE DETAIL ON THIS DRAWING
	TEMPORARY PROTECTION FENCING SEE DETAIL ON THIS DRAWING
	TEMPORARY CATCH BASIN SILTATION CONTROL DEVICE. (SILTSACK) SEE DETAIL ON THIS DRAWING
	EXISTING ASPHALT AND CURB TO BE REMOVED AND REPLACED WITH TOPSOIL AND SEED
	EX. CURB TO BE REMOVED

NOTES:

1. ALL STORM SEWER INFRASTRUCTURE TO BE DECOMMISSIONED AND DISPOSED OFF SITE.
2. ALL SEDIMENT FENCE TO BE INSTALLED ALONG CONSTRUCTION LIMIT. FENCE LOCATION SHOWN ON THIS DRAWINGS ARE OFFSET FOR ILLUSTRATION PURPOSES.

SEE ESC NOTES ON DWG C104

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--	---

THE REGIONAL MUNICIPALITY OF HALTON

FILE NUMBER _____

DESIGN OF SANITARY, WATER SERVICES & REGIONAL
APPROVED SUBJECT TO DETAIL CONSTRUCTION CODE
HALTON REGION STANDARDS & SPECIFICATIONS & USE
APPROVAL FROM AREA MUNICIPALITY

LEGISLATIVE AND PLANNING SERVICES DEPARTMENT

DATE _____

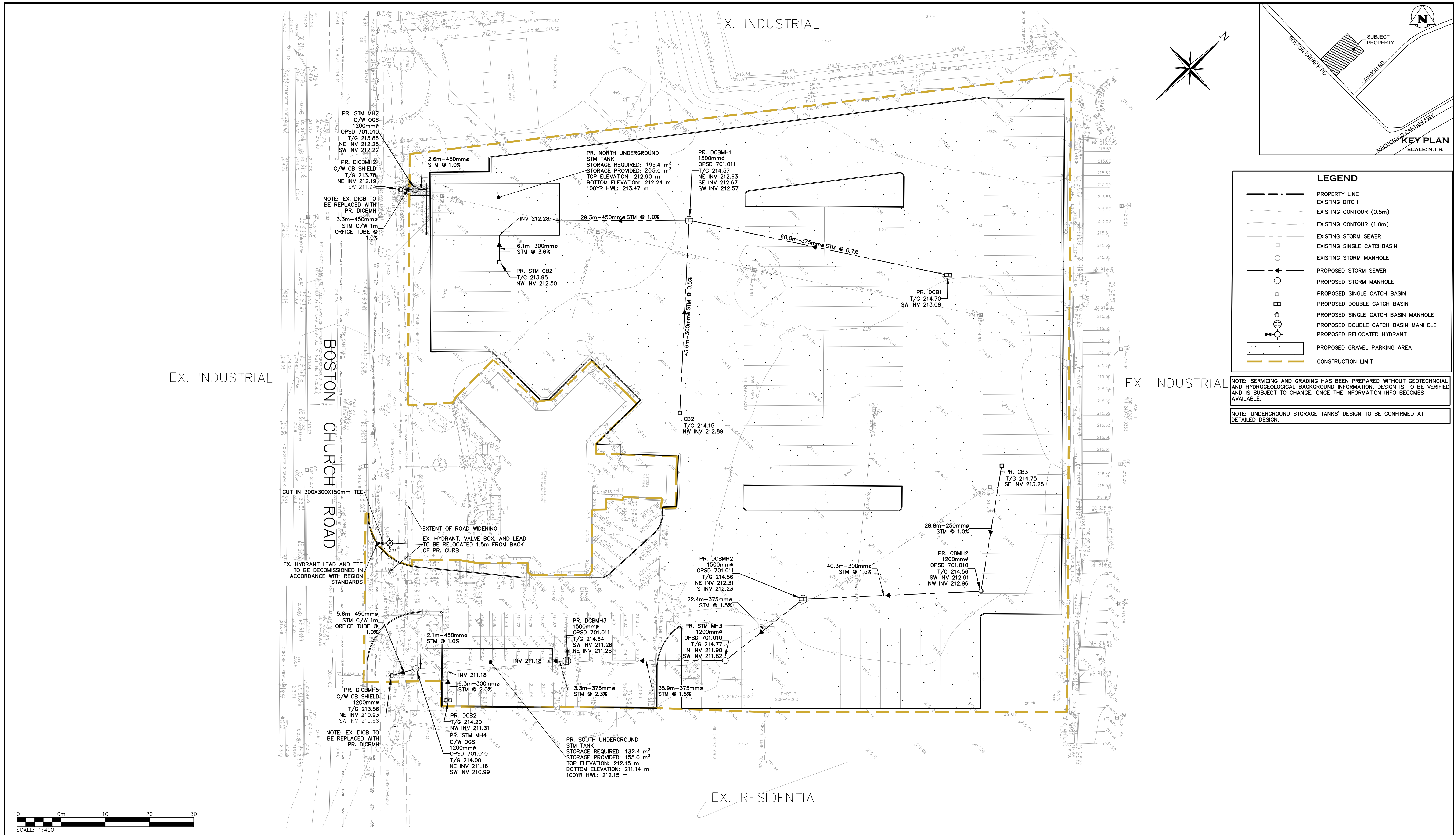
Regional	To
TOWN OF MILTON ENGINEERING SERVICES DEPARTMENT	
TOWN	FILE NUMBER
ROAD WORKS FORMING TO LOCATION	 _____ DIRECTOR OF ENGINEERING SERVICES/ DIRECTOR OF COMMUNITY SERVICES _____ MANAGER OF DEVELOPMENT ENGINEERING/ MANAGER OF PARKS AND OPEN SPACE
T	

[illegible]

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

Project	8465 BOSTON CHURCH ROAD TOWN OF MILTON
Drawing	REMOVALS AND EROSION & SEDIMENT CONTROL PLAN

Drawn By	M.P.H.	Design By	M.P.H./J.K.F.	Project	2878-7432
Check By	J.B.	Check By	M.B.	Drawing	C101



100

0m

10

20

30

SCALE: 1:400

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SURVEY NOTES:
THE TOPOGRAPHIC SURVEY WAS COMPLETED BY VAN HARTEN LAND SURVEYORS AND PROFESSIONAL ENGINEERS ON JUNE 5, 2025. PROJECT NO. 34292-25



THE REGIONAL MUNICIPALITY OF HALTON



MANAGER OF DEVELOPMENT ENGINEERING/
MANAGER OF PARKS AND OPEN SPACE

TOWN OF MILTON

ENGINEERING SERVICES DEPARTMENT

FILE NUMBER

DESIGN OF SANITARY, WATER SERVICES & REGIONAL ROAD WORKS

APPROVED SUBJECT TO LOCAL CONSTRUCTION STANDARDS & LOCATION APPROVAL FROM AREA MUNICIPALITY

DIRECTOR OF ENGINEERING SERVICES/
DIRECTOR OF COMMUNITY SERVICES

No.	ISSUE	DATE: YYYY/MM/DD	Engineer	Engineer
0	ISSUED FOR 1ST SUBMISSION	2025/09/26		

FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

Project

8465 BOSTON CHURCH ROAD
TOWN OF MILTON

Drawing

SERVICING PLAN



CROZIER
CONSULTING ENGINEERS

Drawn By

M.P.H.

Design By

M.P.H./J.K.F.

Project

2878-7432

Check By

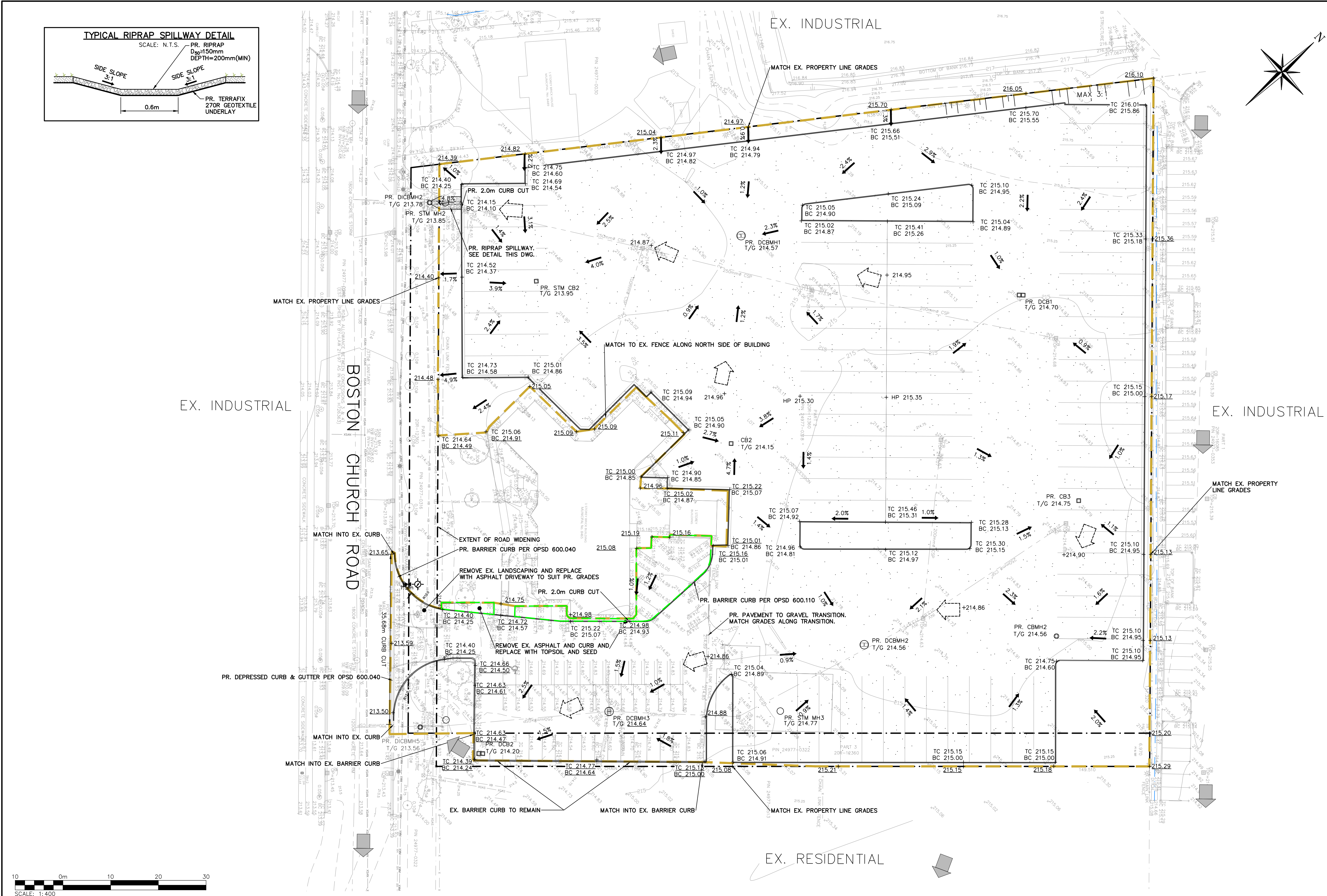
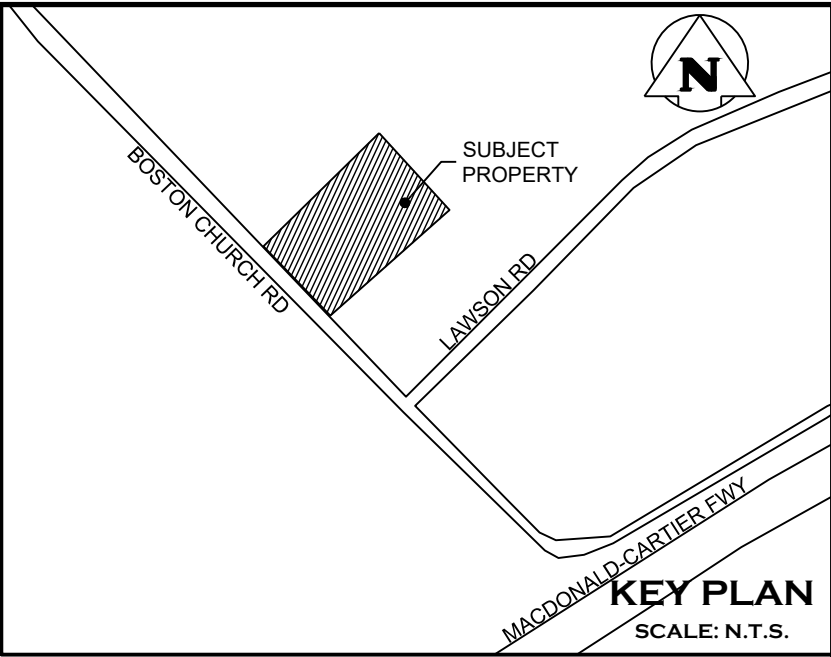
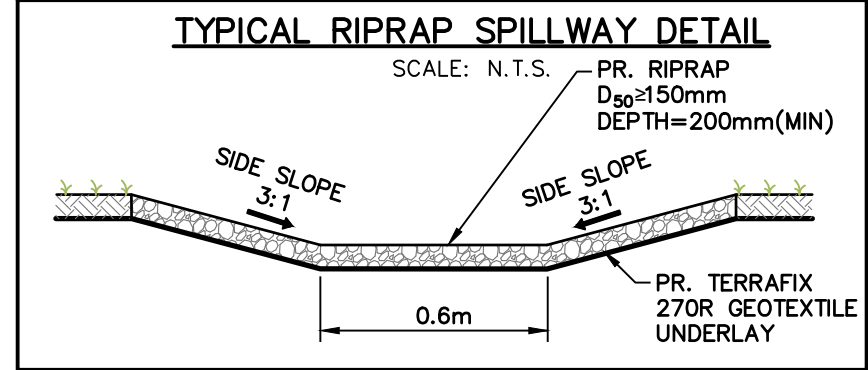
J.B.

Check By

M.B.

Drawing

C102



- LEGEND**
- PROPERTY LINE
 - EXISTING DITCH
 - EXISTING CONTOUR (0.5m)
 - EXISTING CONTOUR (1.0m)
 - EXISTING GRADE
 - EXISTING OVERLAND FLOW DIRECTION
 - EXISTING STORM SEWER
 - EXISTING SINGLE CATCH BASIN
 - EXISTING STORM MANHOLE
 - PROPOSED GRADE
 - PROPOSED GRADE (TO MATCH EXISTING)
 - PROPOSED MINOR FLOW DIRECTION
 - PROPOSED STORM MANHOLE
 - PROPOSED SINGLE CATCH BASIN
 - PROPOSED DOUBLE CATCH BASIN
 - PROPOSED SINGLE CATCH BASIN MANHOLE
 - PROPOSED DOUBLE CATCH BASIN MANHOLE
 - PROPOSED RELOCATED HYDRANT
 - PROPOSED OVERLAND FLOW DIRECTION
 - 3:1 MAX SLOPE
 - EXISTING ASPHALT AND CURB TO BE REMOVED AND REPLACED WITH TOPSOIL AND SEED
 - PROPOSED GRAVEL PARKING AREA
 - PROPOSED BARRIER CURB PER OPSD 600.110
 - CONSTRUCTION LIMIT

NOTE: SERVING AND GRADING HAS BEEN PREPARED WITHOUT GEOTECHNICAL AND HYDROGEOLOGICAL BACKGROUND INFORMATION. DESIGN IS TO BE VERIFIED AND IS SUBJECT TO CHANGE, ONCE THE INFORMATION INFO BECOMES AVAILABLE.

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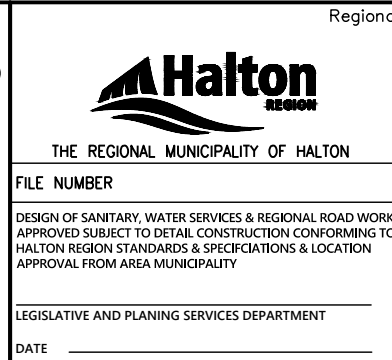
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THE TOPOGRAPHIC SURVEY WAS COMPLETED BY VAN HARTEN LAND SURVEYORS AND PROFESSIONAL ENGINEERS ON JUNE 5, 2025. PROJECT NO. 34292-25



No.	ISSUE	DATE: YYYY/MM/DD	Engineer
0	ISSUED FOR 1ST SUBMISSION	2025/09/26	

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

Project: 8465 BOSTON CHURCH ROAD
TOWN OF MILTON

Drawing: GRADING PLAN

CROZIER CONSULTING ENGINEERS

Drawn By: M.P.H. Design By: M.P.H./J.K.F. Project: 2878-7432

Check By: J.B. Check By: M.B. Drawing: C103

CONSTRUCTION NOTES:

1.0 GENERAL

- 1.1 THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THESE DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE LOCATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED BEFORE STARTING WORK. THE CONTRACTOR SHALL DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS WITH THE EXISTING UTILITIES.
- 1.2 ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS SHOWN HEREIN SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING 100mm OF TOPSOIL AND NO. 1 NURSERY SOD TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE TOWN UNLESS NOTED OTHERWISE.
- 1.3 TOWN OF MILTON AND REGION OF HALTON STANDARD DRAWINGS AND OPSD WITH REGIONAL AMENDMENTS FOR SANITARY SEWERS AND WATERMAINS SHALL CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT. CONTRACTOR TO MAINTAIN CURRENT COPY OF TOWN, REGION AND ONTARIO STANDARDS ON SITE AT ALL TIMES.
- 1.4 ALTERNATIVE MATERIALS MAY BE ACCEPTABLE, PROVIDED APPROVAL HAS FIRST BEEN OBTAINED FROM THE TOWN AND/OR THE REGIONAL COMMISSIONER OF PUBLIC WORKS.
- 1.5 NO BLASTING IS PERMITTED.
- 1.6 MANHOLE AND VALVE CHAMBER COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT.
- 1.7 ALL TRENCHES WITHIN EXISTING R.O.W. ARE TO BE BACKFILLED IN ACCORDANCE WITH TOWN OF MILTON REQUIREMENTS.
- 1.8 ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON THE SITE PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER BEFORE PROCEEDING.
- 1.9 CONTRACTOR TO PROVIDE SHOP DRAWINGS OF ALL MATERIALS AND PRODUCTS FOR REVIEW BY THE ENGINEER PRIOR TO INSTALLATION.
- 1.10 REFER TO TOWN AND REGION STANDARDS AND SPECIFICATIONS FOR LIST OF APPROVED MANUFACTURERS AND MATERIALS.
- 1.11 ENCROACHMENT ONTO ADJACENT PROPERTIES IS NOT PERMITTED UNLESS OTHERWISE NOTED AND INSTRUCTED BY THE ENGINEER.
- 1.12 THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM OBTAINING AND PAYING FOR PERMITS.
- 1.13 THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE SITE PLAN AND ANY OTHER PLANS OR DRAWINGS THAT DEPICT WORKS THAT ARE PROPOSED FOR THIS SITE.
- 1.14 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS FOR THE TOWN AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR ONTARIO.
- 1.15 THE CONTRACTOR SHALL ENDEAVOR TO PREVENT MUD TRACKING ONTO ADJACENT LANDS AND EXISTING ROADS AND SHALL PROVIDE CLEANSEAS AS DIRECTED BY THE TOWN AND ENGINEER. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO CONTROL DUST ON THE PROJECT AND HE SHALL PROVIDE AT OWN EXPENSE DUST CONTROLLING MEASURES AS DIRECTED.
- 1.16 THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING ABOVE AND BELOW GROUND UTILITIES PRIOR TO AND DURING CONSTRUCTION.
- 1.17 ANY UTILITY RELOCATIONS DUE TO THIS DEVELOPMENT TO BE UNDERTAKEN AT THE EXPENSE OF THE OWNER.
- 1.18 ALL CONSTRUCTION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTIONS PROJECTS.
- 1.19 CONSTRUCTION ACCESS SHALL BE CONSTRUCTED PER DETAIL ON THIS PLAN, AND PER TOWN ENTRANCE AND ROAD OCCUPANCY PERMITS, AS REQUIRED.
- 1.20 ALL EXISTING SEWERS ARE TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION INCLUDING SEWER INVERTS, MATERIAL TYPE, AND SIZE. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
- 1.21 PRECONSTRUCTION FLUSH AND VIDEO OF EXISTING PRIVATE OR MUNICIPAL SEWERS TO CONFIRM CONDITIONS OF ANY SEWER TIE-INS, TO THE SATISFACTION OF THE ENGINEER/MUNICIPALITY AS APPLICABLE.
- 1.22 FLUSH AND VIDEO ALL STORM SEWERS UPON INSTALLATION AND PROVIDE THREE (3) PHYSICAL COPIES OF REPORTS AND VIDEOS. THIS INCLUDES MAINLINE SEWERS, LATERALS, LEADS AND SERVICES UP TO THE STUB. THE CCTV INSPECTION TO BE CARRIED OUT AS DETAILED IN OPSS 409. ONE FLUSH AND CCTV VIDEO ROUND IS TO BE COMPLETED PRIOR THE PLACEMENT OF BASE ASPHALT. SECOND ROUND OF FLUSH AND CCTV TO BE COMPLETED AFTER THE PLACEMENT OF TOP ASPHALT AND COMPLETION OF ALL LANDSCAPING. THIS ITEM TO ALSO INCLUDE CLEANING OF ALL STRUCTURES.
- 1.23 CONTRACTOR SHALL PROVIDE A DIGITAL AS-BUILT SURVEY OF ALL UNDERGROUND AND ABOVEGROUND WORKS TO THE SATISFACTION OF THE ENGINEER. AS-BUILT INFORMATION TO INCLUDE A FULL TOPOGRAPHIC SURVEY OF THE SITE, THE AS-BUILT SHOULD INCLUDE BUT IS NOT LIMITED TO: LAYOUT OF ALL SEWERS AND WATERMAINS, INVERTS AND TOP OF COVER/GRATES IN STRUCTURES, STORMWATER MANAGEMENT FEATURES, CURBS, LONGITUDINAL AND CROSSFALL SLOPES OF SIDEWALKS, CENTRE LINE OF ROADS AND EDGE OF PAVEMENT TO CHECK CROSSFALLS AND ROAD/PARKING LOT GRADES, HANDICAP RAMPS, ETC. ANY DEVIATIONS FROM THE ORIGINAL DESIGN ARE TO BE INCLUDED IN THE AS-BUILT DRAWINGS. AS-BUILT INFORMATION TO BE SUPPLIED TO CONTRACT ADMINISTRATOR IN BOTH CAD & PDF FORMATS. THE AS-BUILT INFORMATION WILL BE REQUIRED ONCE AT BASE ASPHALT PLACEMENT COMPLETION AND AGAIN AFTER COMPLETION OF TOP ASPHALT AND LANDSCAPING.
- 1.24 THE CONTRACTOR IS TO INCLUDE IN THEIR SCOPE TO CONFIRM CONDITIONS OF ANY WATERMAIN ELEMENTS (HYDRANTS, VALVE BOXES, WATER CHAMBERS, ETC.) A MINIMUM THREE TIE-INS TO EXISTING ABOVE-GROUND VISIBLE PERMANENT ELEMENTS (I.E. EXISTING POLES, CATCHBASINS, ETC.)
- 1.25 CONTRACTOR TO INSTALL A SEDIMENT FENCE ON THE PERIMETER OF THE PROPERTY AND AT LOCATIONS DETERMINED BY THE MANAGER, DEVELOPMENT ENGINEERING, TOWN OF MILTON, PRIOR TO COMMENCEMENT OF ANY WORKS ON THE SITE. SEDIMENT FENCE TO REMAIN IN PLACE FOR THE DURATION OF THE CONTRACT OR AS DIRECTED BY THE MANAGER, DEVELOPMENT ENGINEERING, TOWN OF MILTON.
- 1.26 SILT CONTROLS ARE TO BE IN PLACE PRIOR TO THE START OF SITE WORKS AND ARE TO BE MAINTAINED FOR THE DURATION OF THE CONSTRUCTION.
- 1.27 PRIOR TO COMMENCEMENT OF ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE, THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS FROM THE TOWN OF MILTON, FOR THE PURPOSES OF VEHICULAR ACCESS TO THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING EXCAVATIONS, (ROAD OCCUPANCY PERMIT), WITHIN THE MUNICIPAL RIGHT OF ALLOWANCE. THE CONTRACTOR SHALL ALSO COMPLY WITH ALL CONDITIONS DICTATED BY SUCH PERMITS AT NO EXTRA COST TO THE OWNER. ALL PERMITS AND ASSOCIATED DRAWINGS AND CONDITIONS MUST BE ON-SITE AND AVAILABLE UPON REQUEST.

2.0 STORM SEWERS

- 2.1 ALL STORM SEWERS 450mm AND SMALLER TO BE PVC SDR-35, ASTM F794, ASTM D1784 OR LATEST REVISIONS.
- 2.2 ALL STORM SEWERS 525mm AND LARGER TO BE CONCRETE PER OPSS 1820 AND OPSS 1821.
- 2.3 BEDDING AND COVER FOR PVC SEWERS (FLEXIBLE PIPE) AS PER OPSD 802.010.
- 2.4 BEDDING AND COVER FOR CONCRETE SEWERS (RIGID PIPE) AS PER OPSD 802.030.
- 2.5 STORM MANHOLES SHALL BE AS PER OPSD AS SPECIFIED. BENCHING TO SPRINGLINE OF PIPE AS PER OPSD 701.021. FRAME & COVER AS PER OPSD 401.010 TYPE "A". COVERS TO BE EMBOSSED WITH THE WORD "STORM".
- 2.6 ALL CATCH BASIN MANHOLES AS PER OPSD AS SPECIFIED. FRAMES AND GRATES AS PER OPSD 400.010 WHEN ADJACENT TO CURB & 400.020 IN ALL OTHER CASES.
- 2.7 ALL MANHOLE AND CATCH BASIN ADJUSTMENTS SHALL BE AS PER OPSD 704.010. MAXIMUM OF THREE (3) UNITS AND 300mm HIGH, WHERE EXCEEDED CAST-IN-PLACE OR PRE-CAST RISER SECTIONS SHALL BE PROVIDED.
- 2.8 ALL CATCH BASINS SHALL BE AS PER OPSD AS SPECIFIED. FRAMES AND GRATES AS PER OPSD 400.010 WHEN ADJACENT TO CURB & 400.020 IN ALL OTHER CASES.
- 2.9 ALL CATCH BASIN CONNECTIONS SHALL BE AS PER OPSD 708.010 (RIGID PIPE) AND OPSD 708.030 (FLEXIBLE PIPE).
- 2.10 ALL SEWER SERVICE CONNECTIONS FOR FLEXIBLE PIPE SHALL BE AS PER OPSD 1006.020.
- 2.11 ALL TESTING OF STORM SERVICES TO BE IN ACCORDANCE WITH ONTARIO PROVINCIAL STANDARD SPECIFICATIONS.
- 2.12 ALL SINGLE CATCH BASIN LEADS TO BE 250mm AND DOUBLE CATCH BASIN LEADS TO BE 300mm, UNLESS NOTED OTHERWISE.

3.0 MAINTENANCE & OPERATION OF SEDIMENT CONTROLS

- 3.1 SEDIMENT FENCE TO BE INSTALLED BY THE CONTRACTOR IN LOCATIONS SHOWN ON PLAN AND AS DIRECTED BY SITE ENGINEER PRIOR TO CONSTRUCTION.
- 3.2 SEDIMENT FENCE MUST BE INSPECTED BY THE CONTRACTOR WEEKLY FOR RIPS OR TEARS, BROKEN STAKES, BLOW-OUTS AND ACCUMULATION OF SEDIMENT.
- 3.3 SEDIMENT FENCE MUST BE INSPECTED BY THE CONTRACTOR FOLLOWING ALL 10MM OR GREATER RAIN STORM EVENT OR AS DIRECTED BY ENGINEER.
- 3.4 SEDIMENT MUST BE REMOVED BY THE CONTRACTOR FROM SEDIMENT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF FENCE.
- 3.5 ALL SEDIMENT FENCES MUST BE REMOVED BY THE CONTRACTOR ONLY WHEN THE ENTIRE SITE IS STABILIZED AND AS DIRECTED BY THE SITE ENGINEER.
- 3.6 EXISTING STREET CATCHBASINS AT CONSTRUCTION ENTRANCES TO INCLUDE SILT SACKS, AND INSPECTED FOLLOWING ALL 10MM OR GREATER RAIN STORM EVENTS, OR AS DIRECTED BY ENGINEER.
- 3.7 UPON INSTALLATION OF ALL FUTURE CATCH BASINS AND CATCH BASIN MANHOLES TO INCLUDE SILT SACKS, AND INSPECTED BY THE CONTRACTOR FOLLOWING ALL 10MM OR GREATER RAIN STORM EVENTS, OR AS DIRECTED BY ENGINEER.

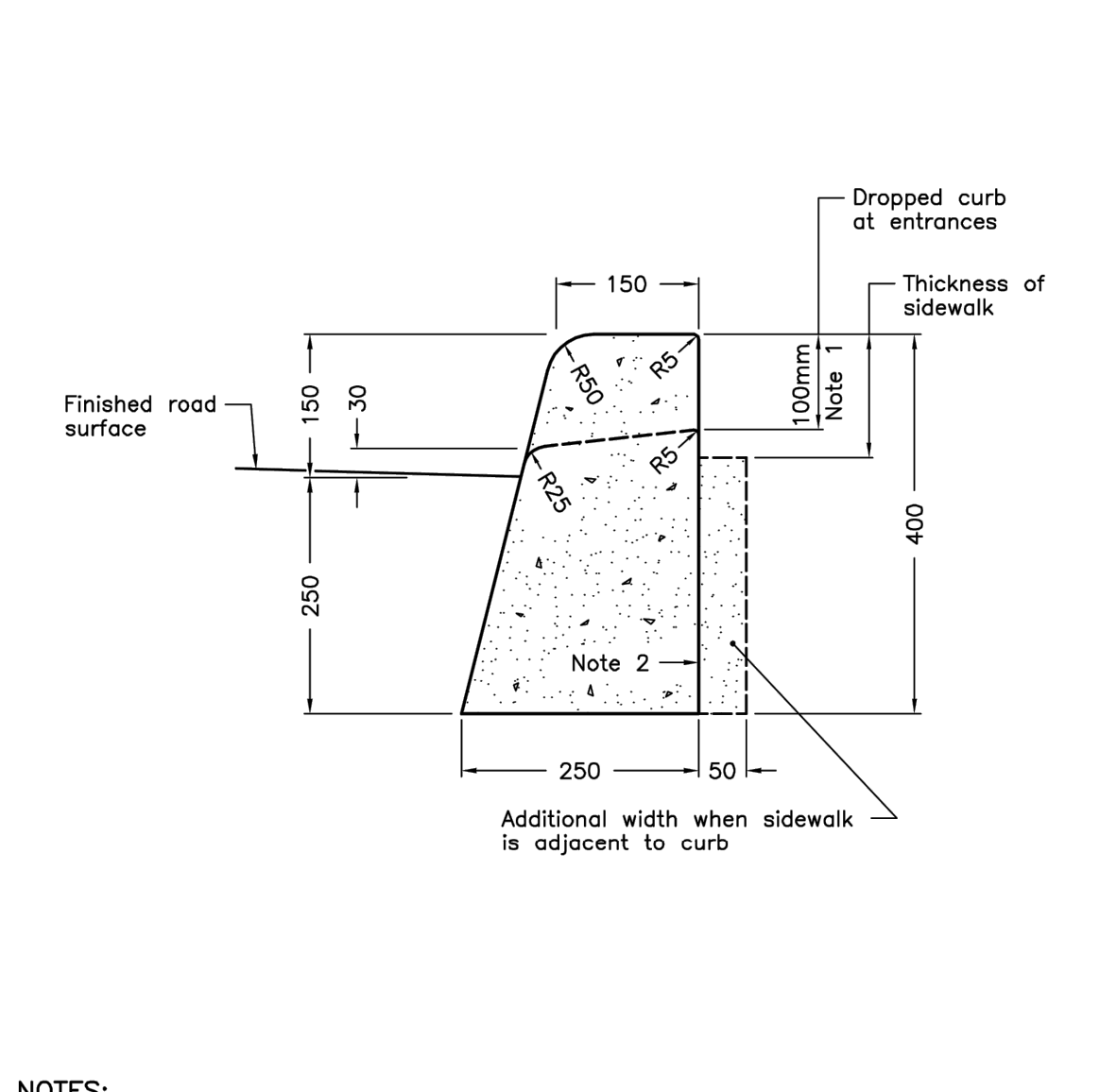
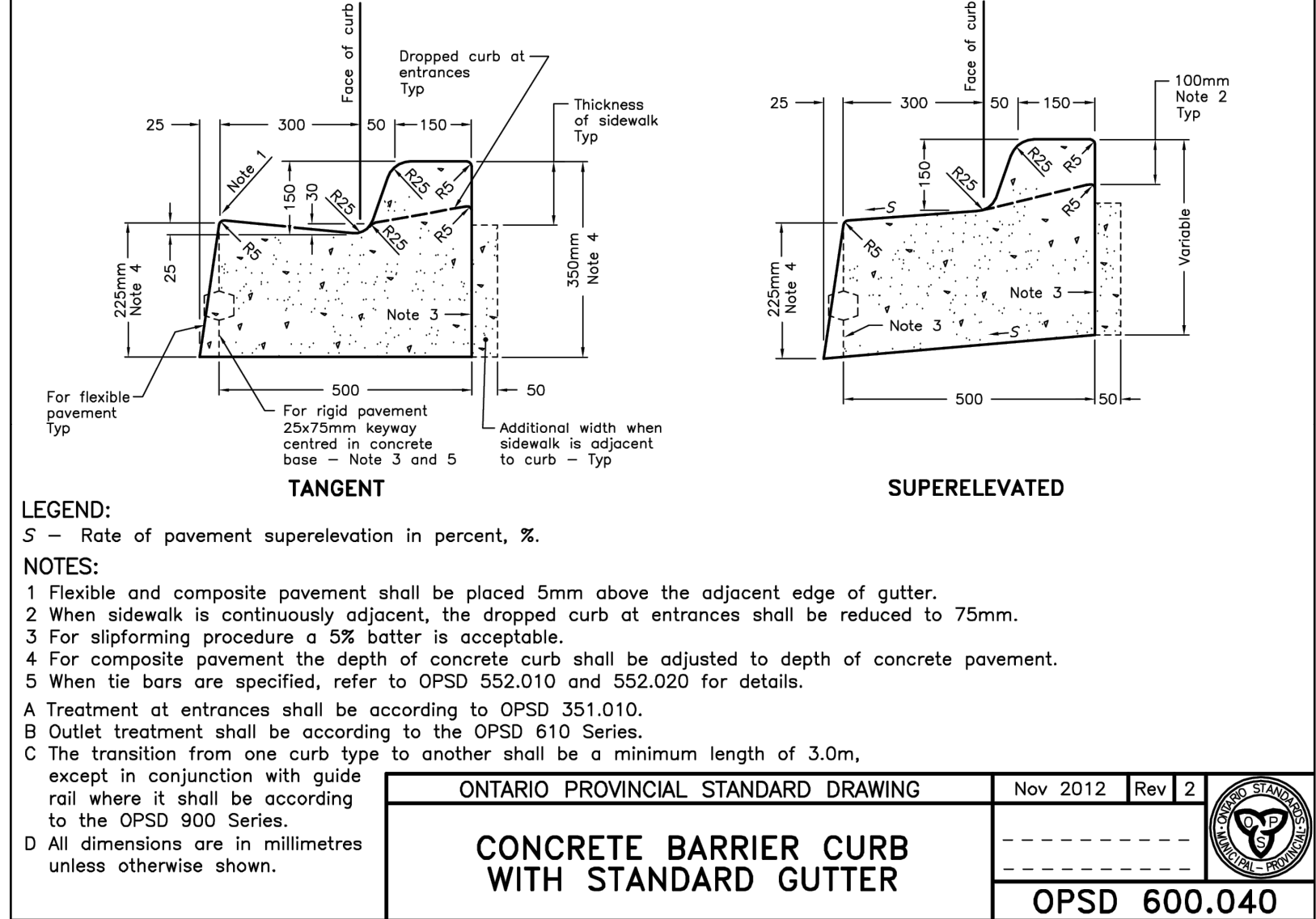
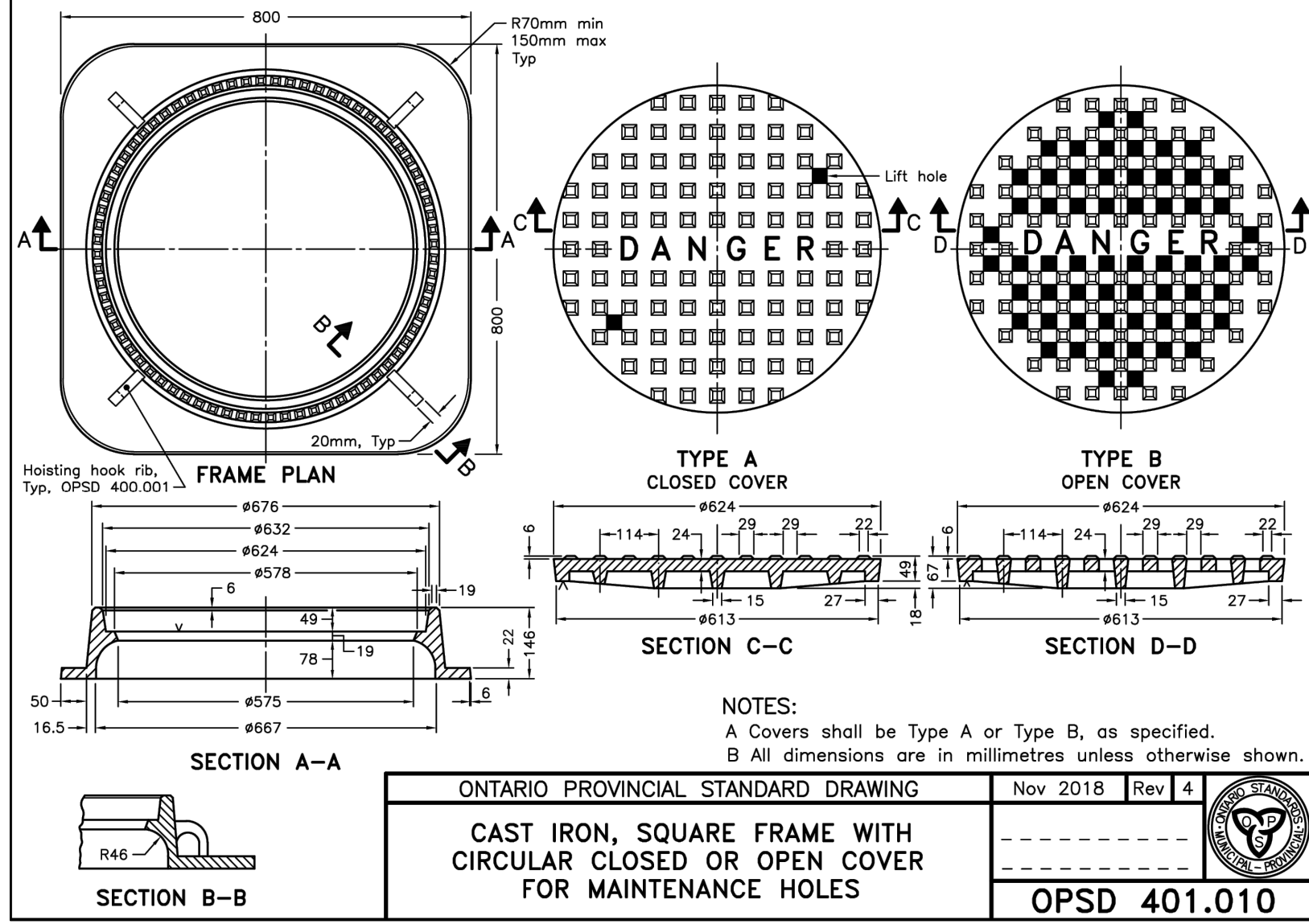
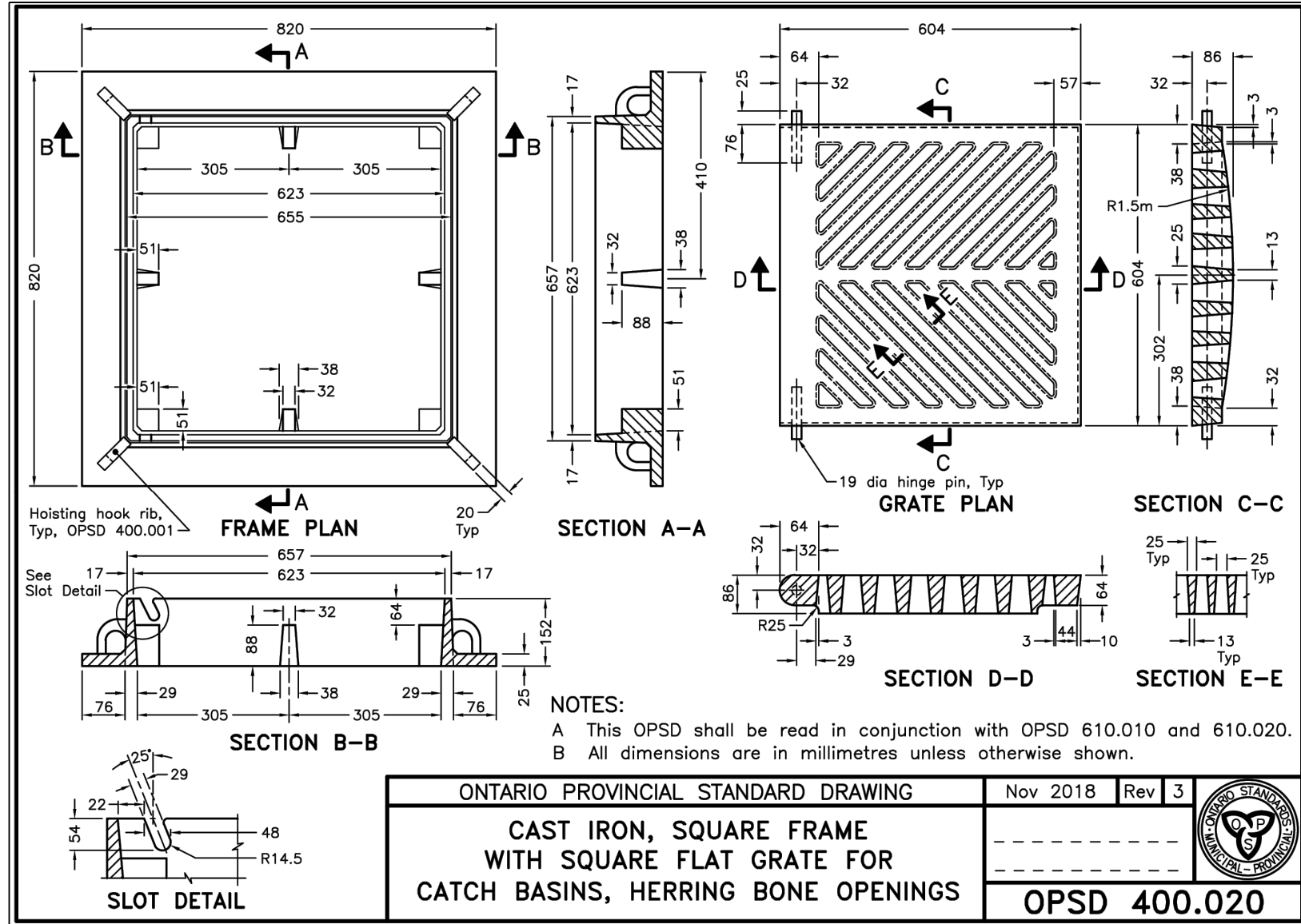
4.0 SITE GRADING

- 4.1 ALL GRADING MUST COMPLY WITH THE TOWN OF MILTON STANDARDS UNLESS OTHERWISE NOTED.
- 4.2 ENGINEERED FILL TO BE PLACED IN 300MM THICK LIFTS AND MECHANICALLY COMPACTED TO 100% SPMD AS RECOMMENDED OR AS APPROVED BY GEOTECHNICAL ENGINEER.
- 4.3 COMPACTION RESULTS AND CERTIFICATION FROM GEOTECHNICAL ENGINEER REQUIRED FOR ALL ENGINEERED FILL.
- 4.4 GEOTECHNICAL ENGINEER SHALL ASSESS AND CONFIRM SUITABILITY OF EXISTING INSITU SOILS TO ACCEPT ENGINEERED FILL AND MEET SPECIFICATIONS.
- 4.5 ALL FILLING OPERATIONS TO BE GRADED TO ENSURE SHEET FLOW DRAINAGE TO EXISTING OUTLET AS NOTED ON THE ESC PLAN. THE CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED TESTING BY THE MUNICIPALITY AND/OR ENGINEER AS APPLICABLE.
- 4.6 CONTRACTOR TO PROVIDE TOPOGRAPHIC SURVEY AT THE FOLLOWING STAGES FOR REVIEW BY THE ENGINEER: (I) PRE-CONSTRUCTION, (II) AFTER THE COMPLETION OF TOPSOIL STRIPPING, (III) AFTER THE COMPLETION OF EARTHWORKS.

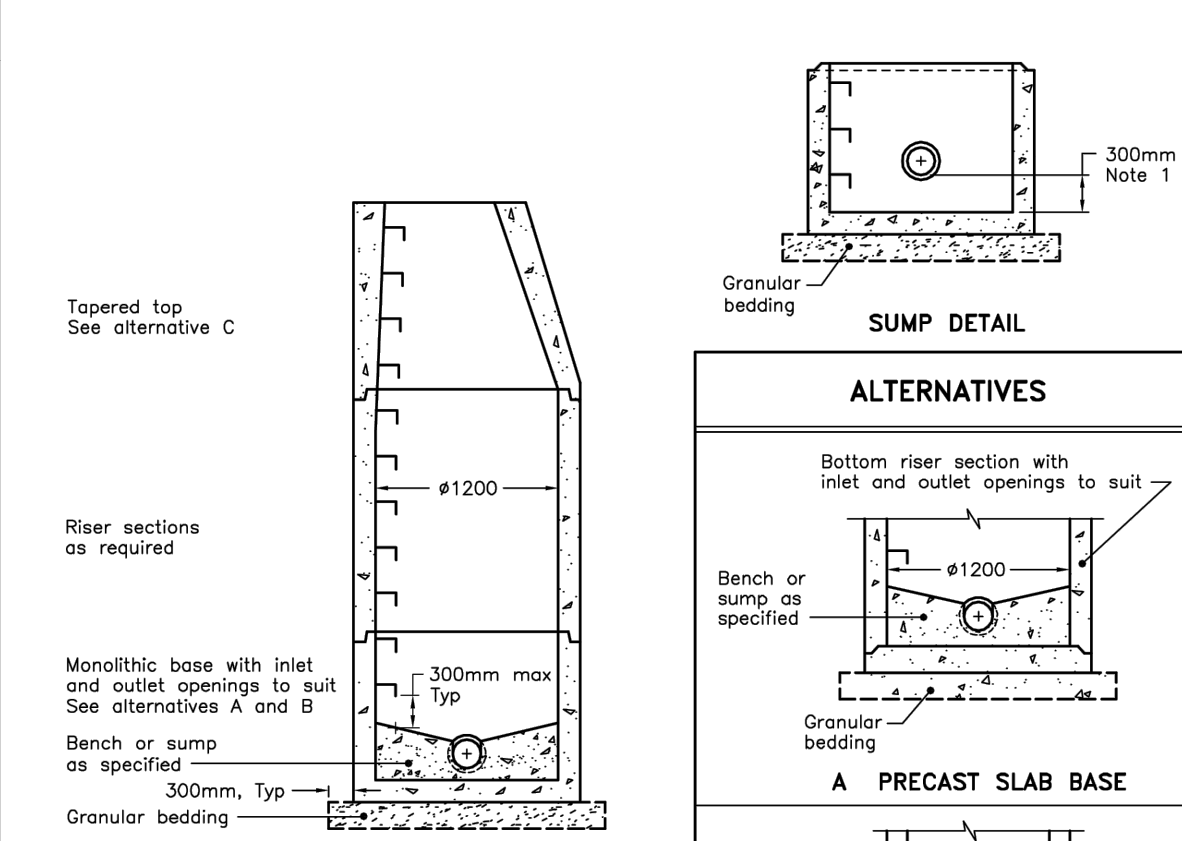
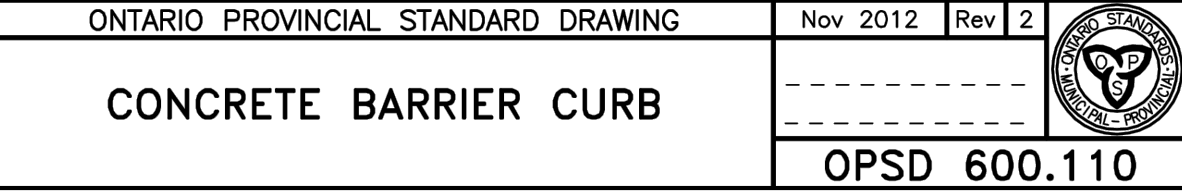
EROSION & SEDIMENT CONTROL NOTES:

1.0 GENERAL NOTES

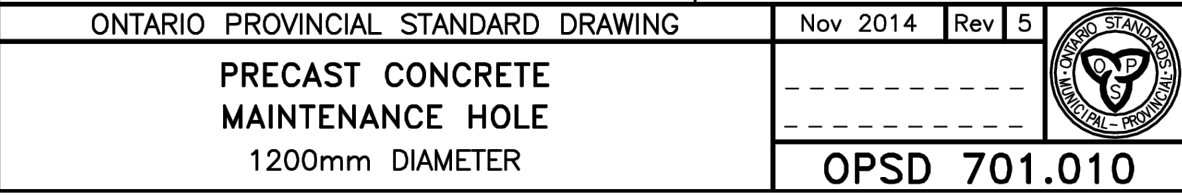
- 1.1 ALL CONSTRUCTION EQUIPMENT TO REMAIN ON-SITE FOR THE DURATION OF ALL CONSTRUCTION ACTIVITIES. NO EXTERNAL ACCESS IS REQUIRED.
- 1.2 CONTRACTOR SHALL NOTIFY THE TOWN AND ENGINEER IN WRITING WITHIN 48 HOURS OF COMMENCING ANY SITE WORKS.
- 1.3 CONTRACTOR SHALL NOTIFY TOWN AND ENGINEER IN WRITING OF THE COMPLETION OF ANY CONTROL MEASURES WITHIN 24 HOURS AFTER THEIR INSTALLATIONS.
- 1.4 CONTRACTOR SHALL OBTAIN PERMISSION FROM THE DIRECTOR (ENGINEERING, TOWN OF MILTON), PRIOR TO MODIFYING THE ESC PLAN C101.
- 1.5 CONTRACTOR SHALL MAINTAIN ALL ROAD DRAINAGE SYSTEMS, STORMWATER DRAINAGE SYSTEMS, AND CONTROL MEASURES IDENTIFIED IN THE ESC PLAN C101.
- 1.6 CONTRACTOR SHALL IMMEDIATELY REPAIR ANY SILTATION OR EROSION DAMAGE TO ADJOINING SURFACES AND DRAINAGE-WAYS RESULTING FROM LAND DEVELOPING OR DISTURBING ACTIVITIES.
- 1.7 CONTRACTOR SHALL INSPECT THE CONSTRUCTION CONTROL MEASURES AT LEAST ONCE PER WEEK AND AFTER EACH RAINFALL OF 10MM OR GREATER AND MAKE NEEDED REPAIRS.
- 1.8 CONTRACTOR MUST ALLOW EMPLOYEES OF THE TOWN TO ENTER THE SITE FOR THE PURPOSE OF INSPECTING FOR COMPLIANCE WITH THE CONTROL PLAN OR FOR PERFORMING ANY WORK NECESSARY TO BRING THE SITE INTO COMPLIANCE WITH THE CONTROL PLAN.
- 1.9 CONTRACTOR MUST MAINTAIN A PRINTED COPY OF THE ESC PLAN C101 ON THE SITE.
- 1.10 CONTRACTOR TO REVIEW CONDITIONS OF ALL APPROVALS PRIOR TO CONSTRUCTION.
- 1.11 ALL STOCKPILE SIDE SLOPES TO BE 4:1 MAX. ANY STOCKPILES LEFT UNDISTURBED FOR 30 DAYS ARE TO BE SEEDDED WITH NATIVE GRASS.
- 1.12 CONTRACTOR TO EROSION AND SEDIMENT CONTROLS AS PER DRAWINGS AND ELSEWHERE AS NOTED BY THE ENGINEER.



- NOTES:
- 1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
- 2 For slipforming procedure a 5% batter is acceptable.
- A Treatment at entrances shall be according to OPSD 351.010.
- B Outlet treatment shall be according to the OPSD 610 Series.
- C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
- D All dimensions are in millimetres unless otherwise shown.



- NOTES:
- 1 The sump is measured from the lowest invert.
- A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
- B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
- C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 704.020.
- D Pipe support according to OPSD 708.020.
- E For benching and pipe opening details, see OPSD 701.021.
- F For adjustment unit and frame installation, see OPSD 704.010.
- G All dimensions are nominal.
- H All dimensions are in millimetres unless otherwise shown.



1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OR REUSE OF ANY PART OF THIS DRAWING IS STRICTLY PROHIBITED WITHOUT WRITTEN AUTHORIZATION FROM THIS OFFICE.	ELEVATION NOTE: ELEVATIONS SHOWN HEREON ARE BASED ON GPS OBSERVATIONS TO PERMANENT REFERENCE STATION IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTV2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.
2. THE DIGITAL FILES CONTAINING INTELLECTUAL AND DIGITAL DATA PROPERTY THAT IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC.	
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO C.F. CROZIER & ASSOCIATES INC. PRIOR TO CONSTRUCTION.	SITE BENCHMARKS: SITE TBM 1: CUT CROSS ON CONCRETE SIDEWALK, 214.54M. TBM 2: CUT CROSS ON CONCRETE SIDEWALK, 213.64M.
4. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.	
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.	SURVEY NOTES: THE TOPOGRAPHIC SURVEY WAS COMPLETED BY VAN HARTEN LAND SURVEYORS AND PROFESSIONAL ENGINEERS ON JUNE 5, 2025. PROJECT NO. 34292-25
6. DO NOT SCALE DRAWINGS.	

Regional	Town
 THE REGIONAL MUNICIPALITY OF HALTON	 TOWN OF MILTON ENGINEERING SERVICES DEPARTMENT
FILE NUMBER	FILE NUMBER
LEGISLATIVE AND PLANNING SERVICES DEPARTMENT	DIRECTOR OF ENGINEERING SERVICES/ DIRECTOR OF COMMUNITY SERVICES
DATE	MANAGER OF DEVELOPMENT ENGINEERING/ MANAGER OF PARKS AND OPEN SPACE

No.	ISSUE	DATE: YYYY/MM/DD
0	ISSUED FOR 1ST SUBMISSION	2025/09/26

Engineer	Engineer

Project	Project

Drawing	Drawing

Drawn By	M.P.H.	Design By	M.P.H./J.K.F.	Project	2878-7432
Check By	J.B.	Check By	M.B.	Drawing	C104

8465 BOSTON CHURCH ROAD TOWN OF MILTON	 CROZIER CONSULTING ENGINEERS
NOTES & DETAILS	

