FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

12563 & 12599 HWY 50 & 2 INDUSTRIAL RD

TOWN OF CALEDON
REGION OF PEEL

PREPARED FOR:

12599 HWY 50 LTD.

PREPARED BY:

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by 12599 Hwy 50 Ltd. (the Owner) to prepare a Functional Servicing and Stormwater Management Report in support of an Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) related to the mixed-use development for the subject lands located at 12563 & 12599 Highway 50 and 2 Industrial Road (the Site) in the Town of Caledon, Region of Peel.

This report outlines the proposed functional servicing and stormwater management plan for the Site, in accordance with the requirements of the Province of Ontario (Province), Region of Peel (Region), Town of Caledon (Town), and Toronto Region Conservation Authority (TRCA). The following reports, design criteria, and as-constructed drawings were referenced during the preparation of this report:

Provincial Guidelines:

- Stormwater Management Planning and Design Manual (Ministry of Environment, Conservation and Parks, March 2003)

Regional Guidelines:

- Water and Wastewater Master Plan for the Lake-based Systems (Region of Peel, June 2020)
- Public Works Design, Specifications, and Procedures Manual, Linear Infrastructure, Watermain Design Criteria (Region of Peel, revised June 2010)
- Public Works Design, Specifications, and Procedures Manual, Linear Infrastructure, Sanitary Sewer Design Criteria (Region of Peel, modified March 2017)

Municipal Guidelines:

- Development Standards Manual Version 5.0 (Town of Caledon, 2019)

Conservation Authority Guidelines:

- Stormwater Management Criteria (Toronto Region Conservation Authority, August 2012)

As-Constructed Drawings:

- Plan 03631-D, Highway 50, Proposed 250 Sanitary Sewer and 150 Forcemain, prepared by Region of Peel, dated May 1984.
- Plan 03632-D, Highway 50, Proposed 250 Sanitary Sewer and 150 Forcemain, prepared by Region of Peel, dated May 1984.
- Plan 03636-D, Industrial Road, 300 Watermain, prepared by Region of Peel, dated April 23, 1980.
- Plan 8187-D, Industrial Road, Sanitary Sewer, prepared by Beech Engineering Limited, dated September 1989.

- Drawing 03-110-01, Site Plan, Highway No. 50 Storm Sewer Connection, prepared by Calder Engineering Ltd., dated January 12, 2007.

- Drawing 63552-A-1, Site Plan, prepared by Aquafor Beech Limited, dated March 26, 2002.

Relevant as-constructed drawings are provided in Appendix A for reference.

2.0 Site Description

The Site covers an area of approximately 3.52 ha and currently consists of commercial and industrial land uses. The Site is located in the Bolton Highway 50 Commercial Area within the Bolton Urban Boundary and is bound by Highway 50 to the south-west, existing commercial developments to the south, Industrial Road to the south-east, and existing commercial developments to the north-west, north, and north-east. Zoning By-law 2006-50, Schedule A, Zone Map 1a (Town of Caledon, April 2018) states that the current land classification of the Site is "Bolton Highway Commercial" (CHB).

The proposed development for the Site, as per the Site Plan (SRN Architects, February 26, 2021) and Project Statistics (SRN Architects, January 5, 2022), provided in Appendix A, includes five (5) mixed-use, mid-rise and high-rise towers, detailed as follows:

- Building 1: 29-storey mixed-use commercial and condominium residential building.

- Building 2: 29-storey mixed-use commercial and condominium residential building.

- Building 3: 27-storey mixed-use commercial and condominium residential building.

- Building 4: 25-storey mixed-use, commercial and condominium residential building.

- Building 5: 23-storey mixed-use commercial and condominium residential building.

In addition to the towers, the development will include at-grade parking and three levels of underground parking, landscaped areas, and access to Highway 50 and Industrial Road.

3.0 Water Servicing

The Region of Peel is responsible for the operation and maintenance of the public water distribution and treatment system in the Town of Caledon, and any local system will have to connect to this public system. The existing and proposed water servicing is discussed in the following sections.

3.1 Existing Water Servicing

The Site is located in Pressure Zone 6, where existing water infrastructure generally provides adequate water supply and pressures up to a serviceable elevation of 259.1 meters above sea level (masl). Water is sourced from the Bolton Elevated Tank, which stores water from the Tullamore Reservoir Pumping Station. A review of as-constructed drawings from the Town and the Region shows the following watermains near the Site:

- Existing 300 mm diameter watermain on the north side of Industrial Road.

- Existing 300 mm diameter watermain on the west side of Highway 50.

Multiple hydrants are located near the Site for fire protection:

- Existing hydrant on the southwest corner of Highway 50 and Hopcroft Road near 12566 Highway 50 approximately 30 m from the Site.
- Existing hydrant on the northeast corner of Highway 50 and Industrial Road.
- Existing hydrant on the north side of Industrial Road approximately 130 m east of the intersection of Highway 50 and Industrial Road.

3.2 Design Water Demand

The Water and Wastewater Master Plan (Region of Peel, 2020) was used to determine the maximum domestic water demand generated by the Site, based on an equivalent population estimate for the Site. An equivalent population estimate was determined using the Project Statistics (SRN Architects, January 5, 2022), email correspondence with Alexander Sepe (December 1, 2020) confirming population density information, and the Linear Infrastructure Sanitary Sewer Design Criteria (Region of Peel, March 2017). Table 1 below provides a summary of the population estimate for the Site. Site statistics are provided in Appendix A, and supporting calculations are provided in Appendix B.

Table 1: Equivalent Population Estimate

Building Number	Townhouse	Apartment 1, 1+	Apartment 2, 2+	Apartment 3	Total Unit Population	Amenity Equivalent Population
Building 1	0	339	589	68	996	63
Building 2	18	358	462	57	894	
Building 3	28	289	533	84	934	
Building 4	49	486	810	27	1372	
Building 5	0	235	356	68	658	
Total	**95**	**1707**	**2751**	**302**	**4855**	**63**

Considering the unit breakdown for each building, the total population for the Site is 4,917 persons. This total population is derived from the sum of the total unit population and amenity equivalent population.

As per the Water and Wastewater Master Plan (Region of Peel, 2020), an average daily water demand of 270 L/cap/day, a maximum day factor of 1.8, and a peak hour factor of 3.0 were used to determine the maximum domestic water demand generated by the Site.

The Fire Underwriters Survey method was used to estimate the fire flow demand for the proposed development. This calculation is used to estimate the size of incoming fire lines and does not provide a recommendation for fire protection. The buildings are assumed to have fire-resistive construction and therefore, a construction coefficient of 0.6 was applied to the fire flow calculations (Water Supply for Public Fire Protection by Fire Underwriters Survey, 1999). The proposed residential buildings will be equipped with automatic sprinkler systems which reduces the initial fire flow demand of each building by up to 50%. Each automated sprinkler system is to be designed by the Mechanical Engineer; therefore, the detailed design of the system is not included in this report.

Table 2 below summarizes the estimated design water demand, the required fire flow demand and duration of flow required for each phase. Appendix B contains supporting water demand and fire flow calculations as well as the Region of Peel single use demand table.

Table 2: Estimated Design Water Demand and Fire Flow

Phase Number	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
Building 1	3.2	5.7	9.5	83
Building 2	2.8	5.1	8.5	83
Building 3	3.0	5.3	8.9	100
Building 4	4.3	7.8	13.0	100
Building 5	2.1	3.8	6.3	83
Total	**15.4**	**27.7**	**46.1**	**100**

For this application, the domestic water services for the Site will be designed to convey a water demand equivalent to the total peak hourly demand of 46.1 L/s, as shown in Table 2. The overall required fire suppression flow was estimated to be 100 L/s and will be delivered through a system of proposed on-site private hydrants and Siamese connections.

3.3 Proposed Water Servicing

The proposed residential towers (up to 29 storeys) are higher than 84 m and therefore require at least two sources of water from a public water system, per Ontario Building Code (OBC) 3.2.9.7.4.

Two (2) 300 mm diameter fire lines are proposed to service the Site from the existing 300 mm diameter watermain along Highway 50, complete with detector check valves in chambers. A 150 mm diameter domestic line is proposed to branch off of one (1) of the 300 mm diameter fire lines to service the Site. This split in the water service lines will be located 1.2 m from the property line. The Mechanical Engineer will design the internal private water system including the internal sprinkler system within the building and underground parking structure. Preliminary site servicing details can be found on Figure 1.

As per email correspondence from the Region of Peel dated August 6, 2021, it is understood that the existing 300 mm diameter watermain along Highway 50 has sufficient capacity to provide the required domestic and fire flow demand for the Site. Refer to email correspondence provided in Appendix B.

4.0 Sanitary Servicing

The Region of Peel is responsible for the operation and maintenance of the sanitary sewer network in the Town of Caledon. The overall area is serviced by the McVean Trunk System and the G.E. Booth Wastewater Treatment Facility according to the Water and Wastewater Master Plan (Region of Peel, 2020). The existing and proposed sanitary servicing is outlined in the following sections.

4.1 Existing Sanitary Servicing

A review of the Water and Wastewater Master Plan (Region of Peel, 2020) and as-constructed drawings indicate that the following infrastructure exists near the Site:

- Existing 250 mm diameter sanitary sewer on Highway 50 conveys flows south. This sanitary sewer is located on the east side of Highway 50 and crosses to the west side immediate south of the Industrial Road intersection.

- Existing 250 mm diameter sanitary sewer along the south side of Industrial Road conveys flows west. This sanitary sewer merges with the 250 mm diameter sanitary sewer along Highway 50 at an existing sanitary maintenance hole prior to crossing towards the west side of Highway 50.

- Existing 900 mm diameter Albion Vaughan Road sanitary trunk sewer approximately 480 m east of the Site. The 250 mm diameter sanitary sewers ultimately convey sewage south along Highway 50 into the Albion Vaughan trunk sewer, located 1.6 km farther south at its intersection at Mayfield Road.

4.2 Design Sanitary Flow

The sanitary design flow for the subject property was calculated using the Water and Wastewater Master Plan (Region of Peel, 2020) with reference to Public Works Design, Specifications & Procedures Manual – Linear Infrastructure Sanitary Sewer Manual (Region of Peel, March 2017) and the equivalent population estimate described in Section 3.2.

A unit sewage flow of 290 L/cap/d was used with an infiltration flow of 0.26 L/s/ha and a Harmon peaking factor applied to obtain the total estimated design sewage flow. This design sewage flow was estimated in a cumulative manner that mirrors the phasing of each building assuming that Building 1 will be constructed first, until full development with the construction of Building 5. A summary of the results is presented in Table 3 and supporting calculations are provided in Appendix C.

Table 3: Estimated Sanitary Design Flows

Phase	Cumulative Harmon Peaking Factor	Cumulative Average Daily Flow (L/s)	Cumulative Peak Flow (L/s)	Cumulative Infiltration (L/s)	Cumulative Total Design Flow (L/s)
Building 1	3.80	3.4	12.9	0.18	13.0
Buildings 1-2	3.60	6.4	23.1	0.37	23.5
Buildings 1-3	3.46	9.6	33.2	0.55	33.8
Buildings 1-4	3.31	14.3	47.2	0.73	47.9
Buildings 1-5	3.25	16.5	53.7	0.92	54.6
Total	**3.25**	**16.5**	**53.7**	**0.92**	**54.6**

The proposed sanitary services for the Site are designed to convey a total design sanitary demand of 54.6 L/s, as shown in Table 3 above.

4.3 Proposed Sanitary Servicing

Sanitary servicing will be provided to the Site through two (2) different 250 mm diameter sanitary laterals. The first sanitary lateral is proposed to be located at the southwest corner of Building 1. This lateral will connect to a sanitary maintenance hole at the property line, extending from the existing 250 mm diameter sanitary sewer on Highway 50.

As per email correspondence from the Region of Peel dated August 6, 2021, it is understood that the existing 250 mm diameter sanitary sewer on Highway 50 does not have sufficient capacity to service the complete Site.

It is also understood that there are no planned upgrades to this sanitary sewer. Moreover, the Region recommends that a new sanitary sewer be constructed to connect the proposed development to the existing Albion Vaughan trunk sewer, located within Albion Vaughan Road.

It is anticipated that the new sewer would follow the alignment of Industrial Road and the future George Bolton Parkway Extension. Details pertaining to the design and construction of the new sanitary sewer connection to the Albion Vaughan trunk sewer are being determined in coordination with the Region and Town.

Based on the foregoing, it is proposed to connect the first phase(s) to the existing 250 mm diameter sanitary sewer on Highway 50 until the residual capacity is utilized. During the timeline of this construction, it is anticipated that the new sanitary sewer will be constructed.

Once construction of the new sanitary sewer is complete, all future phases will connect into the new sanitary sewer. As such, a second lateral is proposed to be located along the east side of Building 3. This lateral will connect to a sanitary maintenance hole at the property line, extending from the new sanitary sewer within Industrial Road.

Details pertaining to the phasing and connection locations is subject to the ongoing coordination with the Region and Town.

The internal sanitary system of the buildings will be designed according to the Mechanical Engineer's details and specifications and sanitary servicing for each building will be conveyed through the underground mechanical system. Preliminary site servicing details are provided on Figure 1.

5.0 Drainage Conditions

As described in Section 2.0, the subject property currently consists of various paved and unpaved commercial lands. The following subsections detail the existing and proposed drainage conditions for the Site.

5.1 Existing Drainage Conditions

According to the topographic plan provided by ERTL Surveyors, the Site generally drains south in two (2) Catchments towards Industrial Road and Highway 50. Please refer to Figure 3 for the Pre-Development Drainage Plan.

Table 4 below summarizes the existing drainage from Catchment 101 (Highway 50) and Catchment 102 (Industrial Road).

Table 4: Pre-Development Land Areas and Runoff Coefficients

Catchment	Area (Ha)	Runoff Coefficient
Drainage to Highway 50		
101	1.28	0.50
Drainage to Industrial Road		
102	2.24	0.50
Total	**3.52**	**--**

Stormwater runoff from the southwest portion of the Site (Catchment 101) drains via overland flow towards an existing ditch along Highway 50. The stormwater runoff from the north and east portions of the Site (Catchment 102) drains via overland flow towards an existing ditch along Industrial Road, which subsequently connects into the existing ditch along Highway 50. Both areas of the Site are ultimately conveyed to the existing stormwater management pond located at the southeast corner of Highway 50 and George Bolton Parkway. A small external area (EX1 – 0.014 ha) drains south towards the Site, via overland toward, to an existing ditch located along the north property line. The existing ditch conveys collected runoff eastward, toward the Industrial Road ditch, where is combines with drainage form Catchment 101.

5.2 Proposed Drainage Conditions

The post-development drainage is divided into two (2) controlled drainage areas and four (4) uncontrolled drainage areas, based on proposed grading.

Drainage to Highway 50

- Catchment 201 (1.30 ha): This Catchment predominantly includes the surface areas and surrounding road, landscaped area, and parking spaces for Building 1 and Building 5, where major overland flow is directed south towards Highway 50.

- Catchment UC1 (0.015 ha) and Catchment UC2 (0.015 ha): These hardscaped and landscaped areas outside of Buildings 1 and 5 are proposed to drain uncontrolled to Highway 50 as clean and slow-flowing discharge.

Drainage to Industrial Road

- Catchment 202 (2.09 ha): This Catchment predominantly includes the surface areas and surrounding road, landscaped area, and parking spaces for Building 2, Building 3, and Building 4, where major overland flow is directed east towards Industrial Road.

- Catchment UC3 (0.043 ha) and Catchment UC4 (0.05 ha): These hardscaped and landscaped areas outside of Building 2 and Building 3 are proposed to drain uncontrolled toward Industrial Road.

- Catchment EX1 (0.014 ha): This Catchment consists of external drainage, as described in Section 5.1. Drainage will continue to be directed toward Industrial Road under post-development conditions.

Table 5 provides a breakdown of post-development site areas and associated runoff coefficients. Please refer to Figure 4 for the Post-Development Drainage Plan.

Table 5: Post-Development Land Areas and Runoff Coefficients

Catchment	Area (Ha)	Runoff Coefficient
Drainage to Highway 50		
201	1.30	0.90
UC1	0.02	0.88
UC2	0.02	0.87
Drainage to Industrial Road		
202	2.09	0.90
UC3	0.04	0.68
UC4	0.05	0.73
Total	**3.52**	**--**

Minor and Major System Drainage

Minor and Major system flows from Catchments 201 and 202 will be collected via area drains and rooftops. The collected drainage is proposed to be conveyed through internal underground storm sewer systems, designed in accordance with the Mechanical Engineer's design and specifications, to underground stormwater storage tanks located within the respective Catchment areas.

Additional details pertaining to the underground storage tanks and proposed stormwater management (SWM) plan for the Site are provided in Section 6.0 below

All proposed area drains will be designed to capture flow from the 100-year design storm event. At the detailed design phase, inlet capacity calculations for the proposed area drains will be provided. These calculations are to be completed assuming that the area drain grates are blocked by debris and are operating at 50% capacity.

Proposed site grading has been completed to ensure that emergency flows for Catchment 201 and Catchment 202 will be directed towards Highway 50 and Industrial Road, respectively. Preliminary site grading is provided on Figure 2.

6.0 Stormwater Management

The stormwater management criteria for the Site involves controlling the stormwater runoff from the development in accordance with standards set by the Region of Peel, Town of Caledon and Toronto and Region Conservation Authority, and are summarized as follows:

- Water Quantity Control: Control post-development peak flow to pre-development peak flow for all storm events up to the 100-year event, using a pre-development maximum runoff coefficient of 0.50.

- Water Quality Control: 80% Total Suspended Solids (TSS) removal on annual loading basis of the stormwater runoff leaving the development in accordance with Enhanced Water Quality Control Criteria (MECP, 2003).

- Water Balance: Retain runoff from a small design rainfall event (typically 5 mm) on-site through evaporation or rainwater reuse.

6.1 Stormwater Quantity Control

As outlined in Section 5.0, the existing site drainage is split between two outlets. The following sections outline the stormwater quantity control requirements for each outlet.

6.1.1 Highway 50 Outlet

As outlined in Section 6.0 the Site is required to control post-development peak flows to pre-development levels for all storm events up to the 100-year event. For drainage to Highway 50, pre-development flows are generated by Catchment 101.

Calculations were completed using Town of Caledon intensity-duration-frequency (IDF) data, and a runoff coefficient of 0.50, as mentioned in Section 5.1. The pre-development peak flows generated by Catchment 101 draining to Highway 50 are outlined in Table 6. Supporting calculations are provided in Appendix D.

Table 6: Summary of Pre-development Peak Flows – Highway 50

Catchment ID	Pre-development (L/s)					
	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
101	153.0	195.8	239.5	279.3	314.5	350.8

The peak flows presented in Table 6 have been taken as target rates for stormwater quantity control for drainage to Highway 50.

The Rational Method has also been used to determine the post-development peak flows generated by the catchments draining to Highway 50 in an uncontrolled condition. These catchments include Catchments 201, UC1 and UC2, as indicated in Section 5.2. Results are presented in Table 7 along with a comparison to the target flows, and supporting calculations are provided in Appendix D.

Table 7: Summary of Post-Development Peak Flows (Uncontrolled to Highway 50)

Return Period	Post-development				Difference Relative to Target Flows ((L/s)
	$Q_{post-201}$ (L/s)	$Q_{post-UC1}$ (L/s)	$Q_{post-UC2}$ (L/s)	Total Flow (L/s)	
2 yr	280.8	3.2	3.1	287.1	+134.1
5 yr	359.3	4.1	4.0	367.4	+171.6
10 yr	439.5	5.0	4.9	449.4	+209.9
25 yr	512.6	5.8	5.7	524.1	+244.8
50 yr	577.2	6.5	6.5	590.2	+275.7
100 yr	643.9	7.3	7.2	658.3	+307.5

Note: Difference Relative Target Flows = Total Flow – Target Flows

As presented in Table 7, the post-development peak flows generated by the proposed development draining to Highway 50 exceed the target flows. Therefore, stormwater quantity controls are required for this outlet.

The Modified Rational Method was used to determine the required stormwater quantity control for the post-development catchments draining to Highway 50. As outlined in Section 5.2, stormwater runoff from Catchment 201 will be captured and controlled within an underground storage tank located within the underground parking, prior to discharging to Highway 50.

Furthermore, stormwater runoff from Catchments UC1 and UC2 will drain uncontrolled. Therefore, stormwater quantity controls within Catchment 201 must be overcontrolled to account for the uncontrolled runoff. It has been assumed that the stormwater captured within the underground storage tank will require a pump to discharge the captured runoff to the receiving storm sewer. Details pertaining to the pump will be designed according to the Mechanical Engineer's details and specifications. For the purposes of this report a pump rate of 50.0 L/s has been assumed.

A summary of the controlled flows to Highway 50 is presented in Table 8 along with relative differences to the target flows. Supporting calculations are provided in Appendix D.

Table 8: Summary of Post-Development Peak Flows (Controlled to Highway 50)

Return Period	Post-development				Difference Relative to Target Flows (m^3/s)
	$Q_{post-201}$ (L/s)	$Q_{post-UC1}$ (L/s)	$Q_{post-UC2}$ (L/s)	Total Flow (m^3/s)	
2 yr	50.0	3.2	3.1	56.3	-96.7
5 yr	50.0	4.1	4.0	58.1	-137.7
10 yr	50.0	5.0	4.9	59.9	-179.6
25 yr	50.0	5.8	5.7	61.5	-217.8
50 yr	50.0	6.5	6.5	63.0	-251.5
100 yr	50.0	7.3	7.2	64.5	-286.3

Note: Difference Relative Target Flows = Total Flow - Target

As demonstrated by Table 8, the total post-development peak flows in a controlled condition are lower than the target flows, satisfying the water quantity control criteria. The required stormwater quantity control volumes are presented in Table 9.

Table 9: Storage Summary – Highway 50

Return Period	Required Active Storage
	201 (m^3)
2 yr	171.9
5 yr	275.4
10 yr	364.9
25 yr	482.0
50 yr	570.4
100 yr	667.1

As demonstrated in Table 9, a total of 667.1 m^3 of onsite storage is required to provide the requisite water quantity control for drainage to Highway 50. Supporting calculations are provided in Appendix D.

Details pertaining the underground stormwater storage tank and required pump will be determined at detailed design stage.

6.1.2 Industrial Road Outlet

As outlined in Section 6.0 the Site is required to control post-development peak flows to pre-development levels for all storm events up to the 100-year event. For drainage to Industrial Road, pre-development flows are generated by Catchment 102.

Calculations were completed using Town of Caledon IDF data, and a runoff coefficient of 0.50, as mentioned in Section 5.1. The pre-development peak flows generated by Catchment 102 draining to Industrial Road are outlined in Table 10. Supporting calculations are provided in Appendix D.

Table 10: Summary of Pre-development Peak Flows – Industrial Road

Catchment ID	Pre-development (L/s)					
	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
102	268.6	343.6	420.4	490.3	552.0	615.8

The peak flows presented in Table 10 have been taken as target rates for stormwater quantity control for drainage to Industrial Road

The Rational Method has also been used to determine the post-development peak flows generated by the catchments draining to Industrial Road in an uncontrolled condition. These catchments include Catchments 202, UC3 and UC24 as indicated in Section 5.2. Results are presented in Table 11 along with a comparison to the target flows, and supporting calculations are provided in Appendix D.

Table 11: Summary of Post-Development Peak Flows (Uncontrolled to Industrial Road)

Return Period	Post-development				Difference Relative to Target Flows ((L/s)
	$Q_{post-202}$ (L/s)	$Q_{post-UC3}$ (L/s)	$Q_{post-UC4}$ (L/s)	Total Flow (L/s)	
2 yr	451.5	7.0	8.8	467.2	+198.7
5 yr	577.6	9.0	11.2	597.8	+254.2
10 yr	706.6	11.0	13.7	731.3	+310.9
25 yr	824.1	12.8	16.0	852.9	+362.6
50 yr	928.0	14.4	18.0	960.4	+408.4
100 yr	1035.1	16.1	20.1	1071.3	+455.5

Note: Difference Relative Target Flows = Total Flow – Target Flows

As presented in Table 11, the post-development peak flows generated by the proposed development draining to Industrial Road exceed the target flows. Therefore, stormwater quantity controls are required for this outlet.

The Modified Rational Method was used to determine the required stormwater quantity control for the post-development catchments draining to Industrial Road. As outlined in Section 5.2, stormwater runoff from Catchment 202 will be captured and controlled within an underground storage tank located within the underground parking, prior to discharging to Industrial Road. Furthermore, stormwater runoff from Catchments UC3 and UC4 will drain uncontrolled. Therefore, stormwater quantity controls within Catchment 202 must be overcontrolled to account for the uncontrolled runoff. It has been assumed that the stormwater captured within the underground storage tank will require a pump to discharge the captured runoff to the receiving storm sewer. Details pertaining to the pump will be designed according to the Mechanical Engineer's details and specifications. For the purposes of this report a pump rate of 50.0 L/s has been assumed.

A summary of the controlled flows to Industrial Road is presented in Table 12 along with relative differences to the target flows. Supporting calculations are provided in Appendix D.

Table 12: Summary of Post-Development Peak Flows (Controlled to Industrial Road)

Return Period	Post-development				Difference Relative to Target Flows (m^3/s)
	$Q_{post-202}$ (L/s)	$Q_{post-UC3}$ (L/s)	$Q_{post-UC4}$ (L/s)	Total Flow (L/s)	
2 yr	50.0	7.0	8.8	65.8	-202.8
5 yr	50.0	9.0	11.2	70.2	-273.5
10 yr	50.0	11.0	13.7	74.7	-345.7
25 yr	50.0	12.8	16.0	78.8	-411.5
50 yr	50.0	14.4	18.0	82.4	-469.6
100 yr	50.0	16.1	20.1	86.2	-529.6

Note: Difference Relative Target Flows = Total Flow - Target

As demonstrated by Table 12, the total post-development peak flows in a controlled condition are lower than the target flows, satisfying the water quantity control criteria. The required stormwater quantity control volumes are presented in Table 13.

Table 13: Storage Summary – Industrial Road

Return Period	Required Active Storage
	202 (m^3)
2 yr	171.9
5 yr	532.8
10 yr	686.8
25 yr	897.6
50 yr	1049.7
100 yr	1215.5

As demonstrated in Table 13, a total of 1215.5 m^3 of onsite storage is required to provide the requisite water quantity control for drainage to Industrial Road. Supporting calculations are provided in Appendix D.

Details pertaining the underground stormwater storage tank and required pump will be determined at detailed design stage.

6.2 Stormwater Quality Control

As outlined in Section 6.0, stormwater quality controls for the proposed development must incorporate measures to provide an Enhanced Level of Protection (Level 1). In accordance with the MOECC (March 2003) guidelines, enhanced water quality protection involves the removal of at least 80% of the total suspended solids (TSS) from 90% of the annual runoff volume.

For Catchments 201 and 202, the treatment train approach is proposed to achieve the requisite quality control. The treatment train includes catchbasin shields and oil-grit-separators (OGS). Catchbasin shields are proposed within the catchbasins located in the asphalt parking lot, upstream of the proposed underground storage tanks.

OGS units are proposed downstream of both underground storage tanks. OGS sizing will be provided at the detailed design stage.

Catchments UC1 – UC4 consists of impervious walkways draining overland to pervious grassed areas. Runoff form these catchments is considered to be clean, however should there be any TSS loading from the impervious areas, the pervious grassed areas would provide the requisite water quality control.

6.3 Water Balance

As outlined in Section 6.0, runoff from the 5 mm storm event must be retained on site. The requisite water balance retention volume was calculated considering initial abstraction of runoff based on impervious areas of the proposed development.

The Site has a total of 3.15ha of impervious area. As such, a volume of 126 m^3 is required to be retained onsite in order to achieve the water balance criteria. Supporting calculations are provided in Appendix D

The storage will be provided via dead storage in the proposed underground storage tanks, which will be reused throughout the proposed development as grey water, or for irrigation purposes. The requisite water balance volume has been split between the two underground stormwater tanks based on the post-development drainage areas to Highway 50 and Industrial Road.

As such, 48.0 m^3 of dead storage is proposed within the underground storage tank located within Catchment 201, and 77.9 m^3 is proposed within the underground storage tank located within Catchment 202.

Once the final plan area of the underground stormwater tanks has been established during detailed design, the dead storage details will be determined.

Runoff from Catchments flowing uncontrolled in the post-development condition (UC1, UC2, UC3, and UC4) will not be captured, and therefore cannot be retained on-site. However, the storage volume provided within the underground stormwater tanks will compensate for the uncontrolled catchments.

7.0 Conclusions and Recommendations

The proposed developments can be serviced for water, sanitary, and stormwater in accordance with the Town of Caledon and Region of Peel requirements and standards. Our conclusions and recommendations include:

1. The equivalent population of the proposed development of five (5) multi-storey residential buildings was estimated to be approximately 4,917 persons.

2. Water servicing will be provided through redundant 300 mm diameter fire services and a 150 mm diameter domestic water service. The water servicing will extend from the existing 300 mm diameter watermain on Highway 50 to the limit of the underground parking garage. The internal water system, designed in accordance with Mechanical details and specifications, will provide water servicing for each building.

3. Sanitary servicing will be provided through two (2) 250 mm diameter sanitary laterals, one (1) extending from the existing 250 mm diameter sanitary sewer on Highway 50, and one (1) extending from a future sanitary sewer within Industrial Road, connecting to the Albion Vaughan trunk sewer. The design of the new Industrial Road sewer is currently on-going. The phasing of the sanitary connections for the Site will be determined as the design of the new Industrial Road sewer progresses. The internal sanitary sewer network, designed in accordance with Mechanical details and specifications, will provide sanitary servicing for each building.

4. Stormwater quantity control will be provided via underground stormwater storage tanks and peak flow control.

5. Stormwater quality control will be provided via catchbasin shields and oil/grit separators (OGS) sized to provide an enhanced level of protection (80% TSS removal).

6. Water balance will be provided as dead storage within the proposed underground stormwater storage tanks, which will be re-used throughout the proposed development as grey water, or for irrigation purposes.

We trust that this review satisfies any concerns associated with the proposed development. Please feel free to contact the undersigned for any further information required.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Autumn Rafeiro, E.I.T.
Engineering Intern

C.F. CROZIER & ASSOCIATES INC.

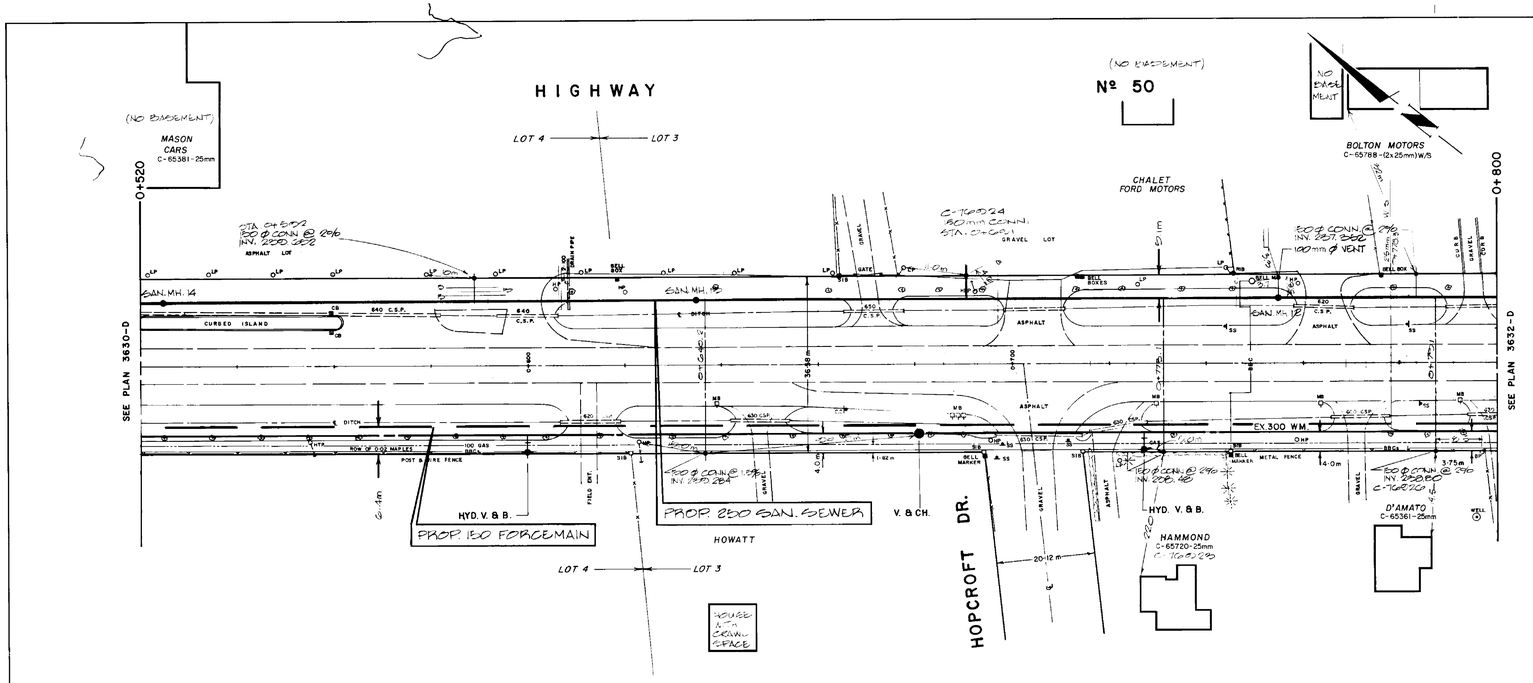
Matt Britton, P.Eng.
Project Manager

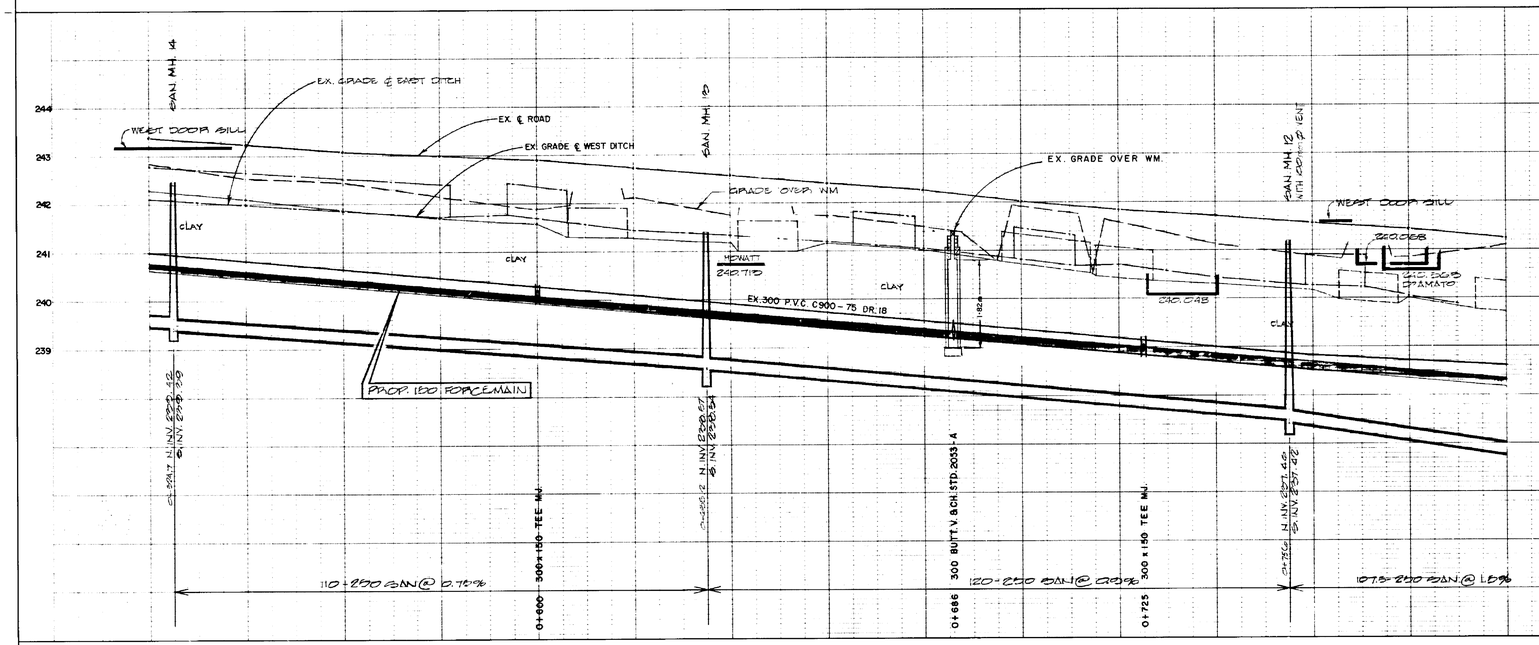
AR/cj

I:\1900\1986 - 12599 Hwy 50 Inc\5779 - 12563 & 12599 Hwy 50 & 2 Industrial Rd\Reports\2022.01.26_(1986-5779)_FSRSWM_.docx

APPENDIX A

Background Information





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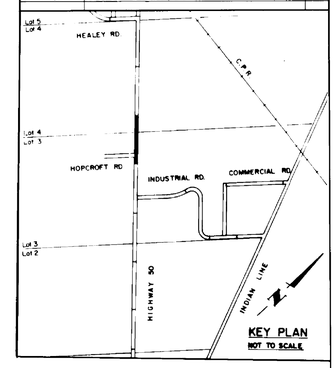
	240.70	240.50	240.35	240.15	239.95	239.80	239.60	239.40	239.25	239.05	238.85	238.70	238.50	238.40	238.30 EL. BOTTOM WM.
+	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800 RD. CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS	25th May 79	M/C
STORM SEWERS			BELL U/G CABLE	81.12.11	E.F.
WATERMAINS			HYDRO U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
5th NOV 79	GRADE OF WM. REVISED & GRADE OVER WM. ADDED	D.K.
23 APR. 80	AS CONSTRUCTED	D.K.
MAR. '82	PROP. SANITARY SEWER & FORCEMAIN.	E.F.
MAY '84	AS CONSTRUCTED	E.F.



PROJ. No 81-2134

S.H. LAM — PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

Designed by CMcA

Approved by

General Notes

- All Driveways Gravel Unless Otherwise Noted.
- All Service Locations Are Approximate And Must Be Located Accurately In Field.
- ● Denotes Building - Not Located
- ▭ Denotes Building Located
- Type 'B' Bedding unless Otherwise Noted (SAN.)

B.M. Nº Elev.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

PROJ. No. 78-1101

Designed by CMcA

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
MINISTRY OF ENVIRONMENT
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
HYDRO ELECTRIC COMM. PORT CREDIT
HYDRO ELECTRIC COMM. STREETSVILLE
CABLE TELEVISION

Region of Peel

Department of Public Works

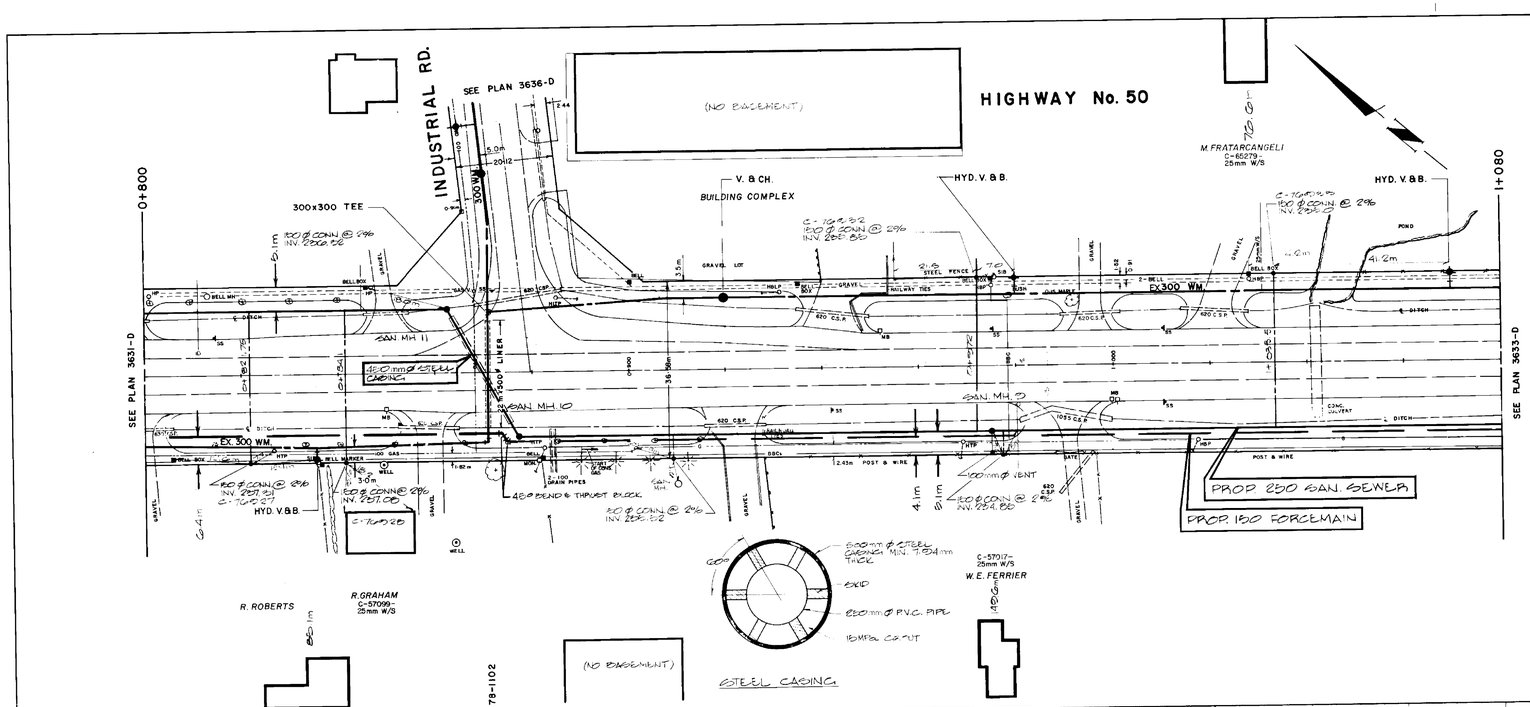
HIGHWAY 50

PROPOSED 250 SANITARY SEWER & 150 FORCEMAIN

Sta. 0+520 **To Sta.** 0+800

Lots 1-5	Area C-2		Project No. 81-2134
Scale Hor. 1:500 Ver. 1:50	Drawn by E.W.K.		Checked by
Date MAY 79	Sheet 3 of 7		Plan No. 3631-D

3631-D



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS	28th May 79	KVK
STORM SEWERS			BELL U/G CABLE	12th JULY 79	KVK
WATERMAINS			HYDRO U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
8th NOV 79	GRADE OF WM. REVISED & GRADE OVER WM. ADDED.	D.R.
23 APR. 80	AS CONSTRUCTED	KVK
MAR. 82	PROP. SANITARY SEWER & FORCEMAIN	E.F.
MAY 84	AS CONSTRUCTED	E.F.

PROJ. No. 81-2134

Designed by — Chkd. —

Approved by

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B.M. No. Elev.

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PROJ. No. 78-1101

Designed by — Chkd. —

Approved by

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HYDRO ELECTRIC COMM. PORT CREDIT
HYDRO ELECTRIC COMM. STREETSVILLE
CABLE TELEVISION

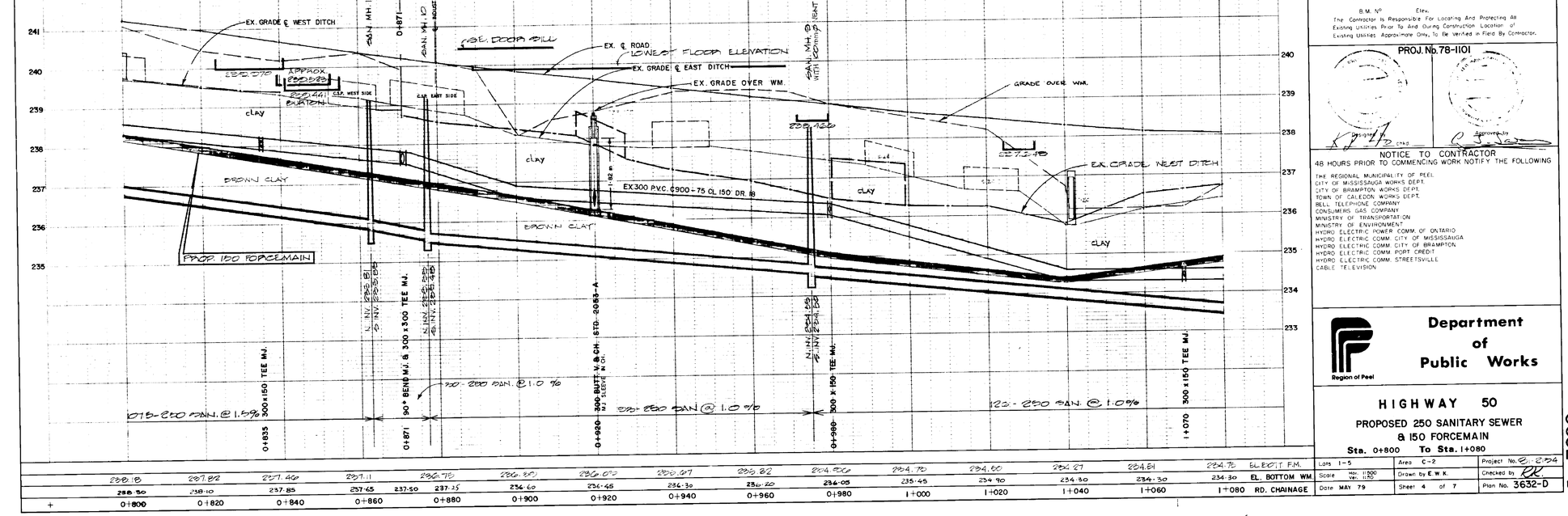
Region of Peel

Department of Public Works

HIGHWAY 50

PROPOSED 250 SANITARY SEWER & 150 FORCEMAIN

Sta. 0+800 To Sta. 1+080



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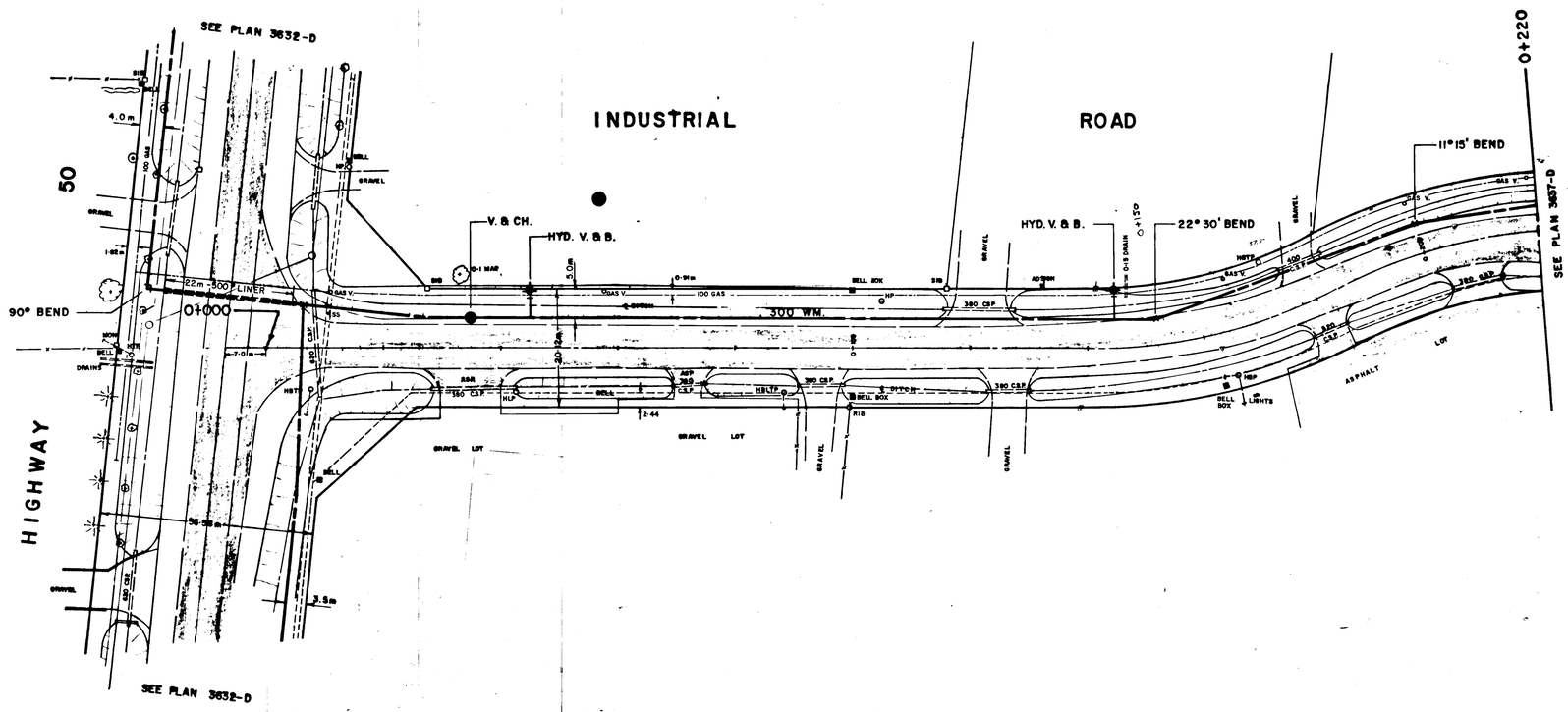
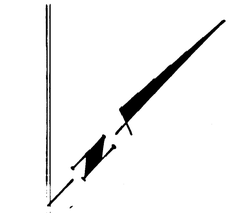
288.50	238.10	237.85	237.65	237.50	237.35	236.60	236.45	236.30	236.20	236.05	235.45	234.90	234.30	234.30
+ 0+800	0+820	0+840	0+860		0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060

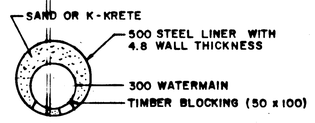
1+080 EL. BOTTOM WM. ELEC.T. P.M. RD. CHAINAGE

Lots 1-5		Area C-2	Project No. 81-2134
Scale	Hor. 1:500 Ver. 1:50	Drawn by E.W.K.	Checked by RE
Date MAY 79		Sheet 4 of 7	Plan No. 3632-D

3632-D







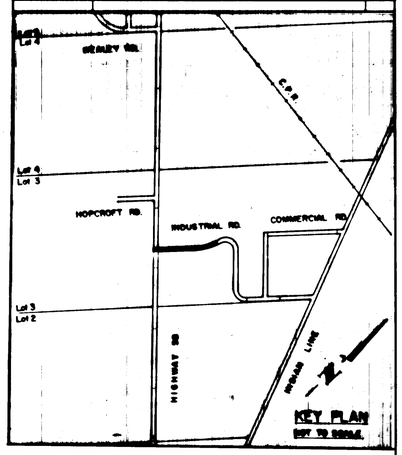
DETAIL 'C'
N.T.S.

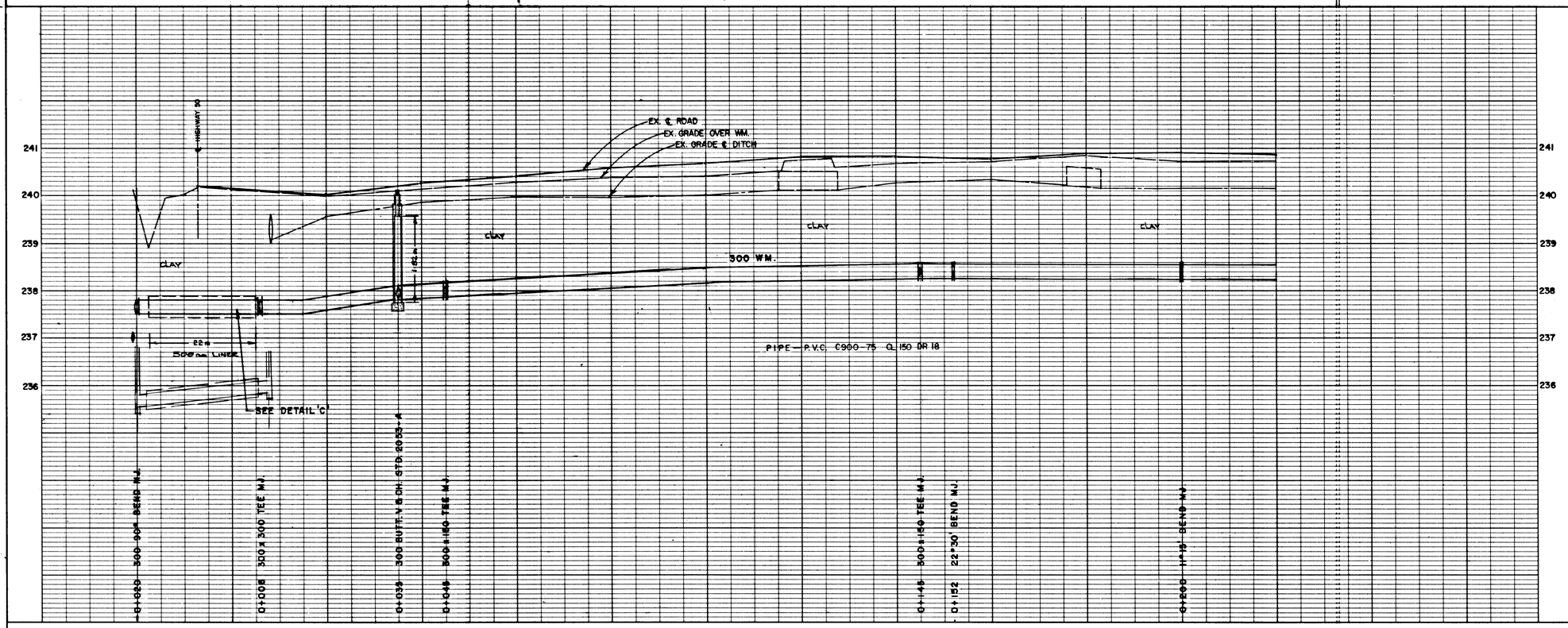
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS	26th May 79	[illegible]
STORM SEWERS			BELL U/G CABLE	12th July 79	[illegible]
WATERMAINS			HYDRO U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
5th Nov 79	GRADE OF W/M REVISED	[illegible]
23 APR. 80	AS CONSTRUCTED	[illegible]





General Notes

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- ▭ Denotes Building Located
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B.M. N° Elev.

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REGISTERED PROFESSIONAL ENGINEER K. P. HO PROVINCE OF ONTARIO

Designed by [illegible] chkd.

REGISTERED PROFESSIONAL ENGINEER G. J. SAVAGE PROVINCE OF ONTARIO

Approved [illegible]

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
MINISTRY OF ENVIRONMENT
HYDRO ELECTRIC POWER COMM. OF ONTARIO
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HYDRO ELECTRIC COMM. CITY OF BRAMPTON
HYDRO ELECTRIC COMM. PORT CREDIT
HYDRO ELECTRIC COMM. STREETSVILLE
CABLE TELEVISION

Region of Peel

Department of Public Works

INDUSTRIAL ROAD

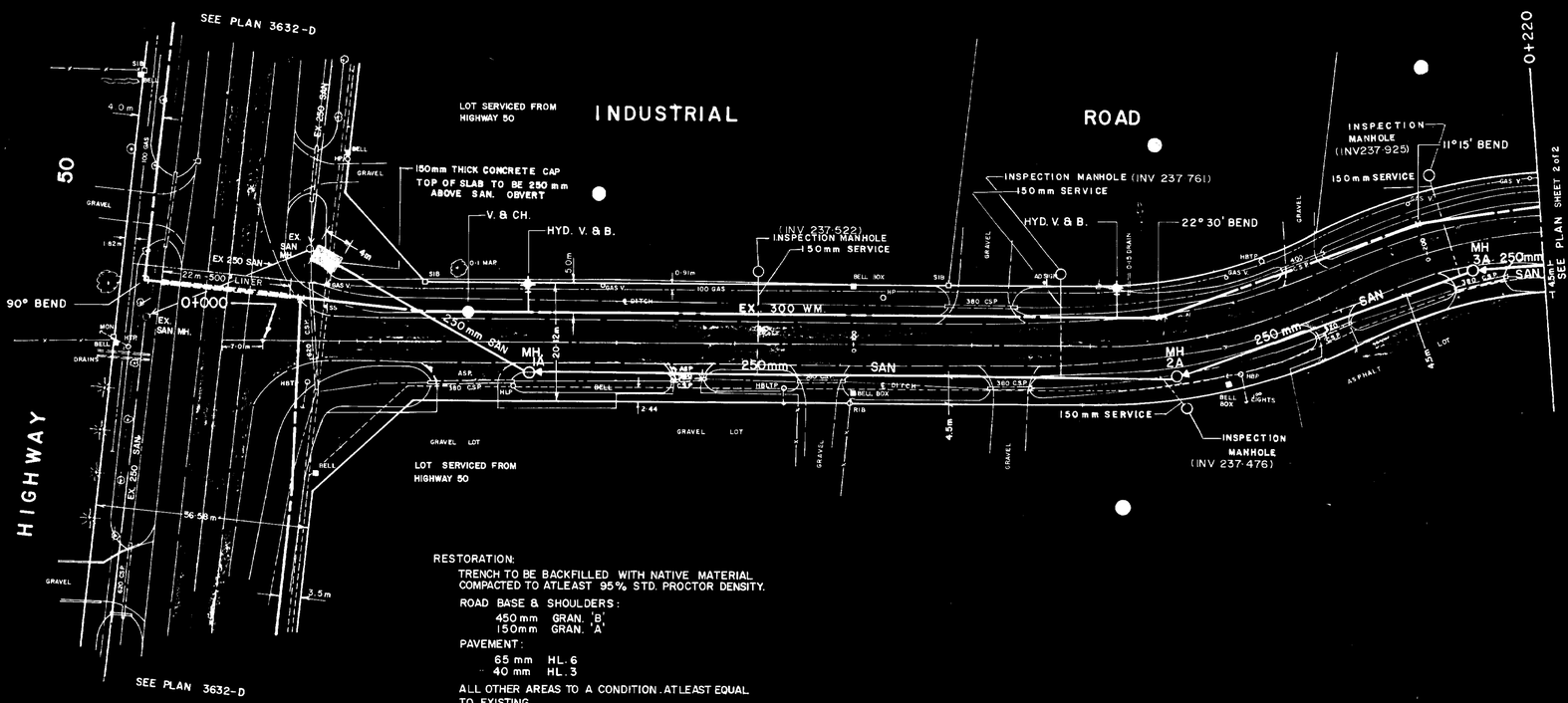
300 WATERMAIN

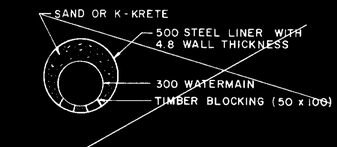
Sta. 0+020 **To Sta.** 0+220

	237.50	237.90	237.60	237.80	237.95	238.05	238.15	238.20	238.25	238.25	238.25	238.25	238.25	EL. BOTTOM WM.
+	+	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	+ RD. CHAINAGE

Lots 3		Area C-1	Project No. 78-1102
Scale	Hor. 1:500 Ver. 1:50	Drawn by E.W.K.	Checked by [illegible]
Date MAY 79		Sheet 1 of 2	Plan No. 3636-D

3636-D





DETAIL 'C'
NTS

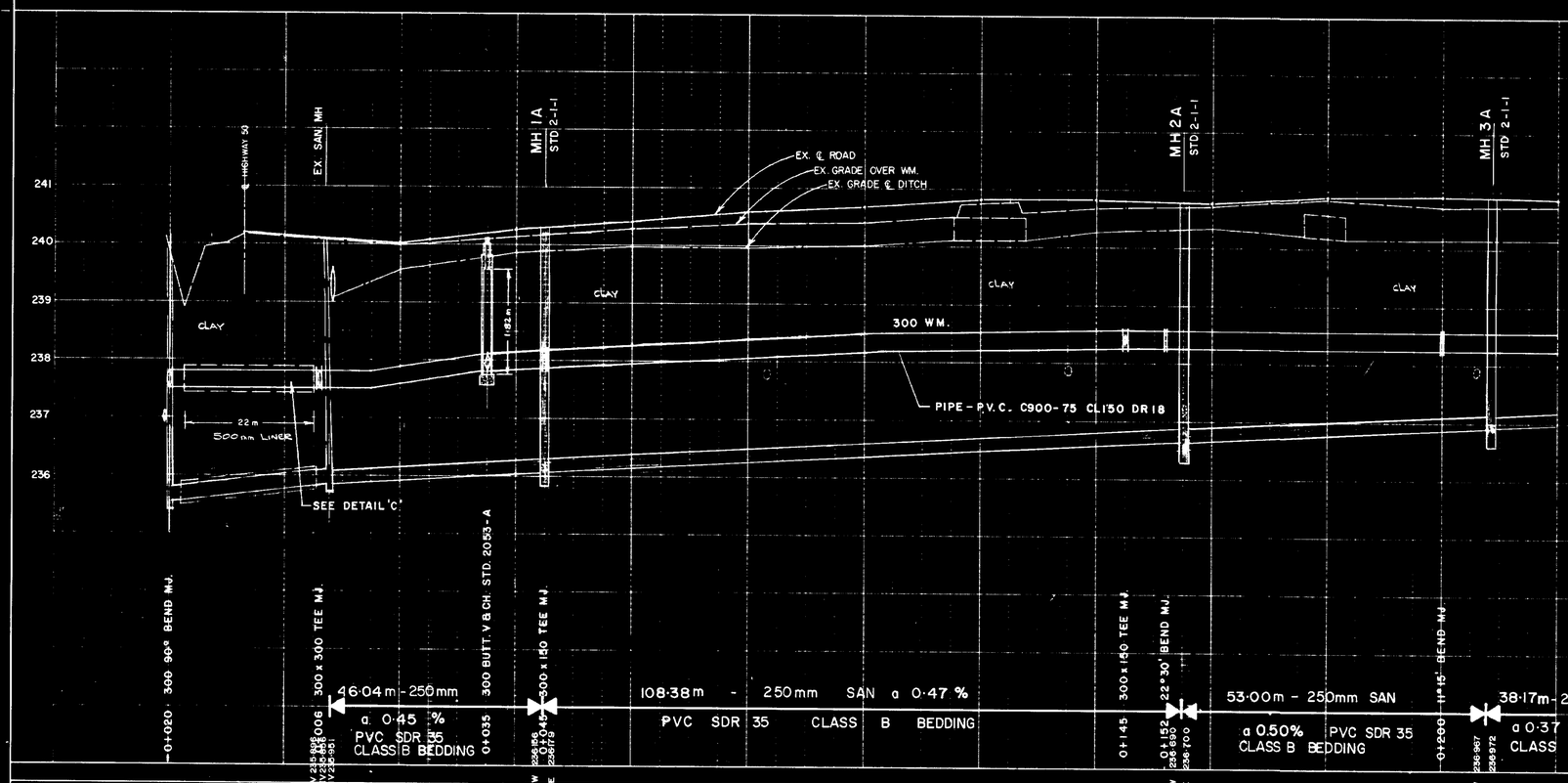
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS	28th MAY 79	BL
STORM SEWERS			BELL U/G CABLE	12th JULY 79	BL
WATERMAINS			HYDRO U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
5th NOV 79	GRADE OF WM REVISED	BAK
23 APR. 80	AS CONSTRUCTED	BAK
JUNE 1987	PROP. SANITARY SEWER	BEL
MAR 4, 1988	ADDED SAN. SERVICE, INSP M.H. & CONC. SLAB	ML
SEPT 1989	AS CONSTRUCTED	RA

BOLTON BUILDER'S SUPPLY
BOLTON
TOWN OF CALEDON



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- Denotes Building Located
- Type B Bedding Unless Otherwise Noted (SAN)

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BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
MINISTRY OF ENVIRONMENT
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
HYDRO ELECTRIC COMM. PORT CREDIT
HYDRO ELECTRIC COMM. STREETSVILLE
CABLE TELEVISION

Beech Engineering Limited
33 KING STREET WEST BOLTON ONTARIO L0P 1A0
857-5541

JUNE 1987

Department of Public Works
Region of Peel

INDUSTRIAL ROAD SANITARY SEWER

Sta. 0+020 **To Sta.** 0+220

Lots	Area C-1	Project No.
Scale Hor. 1:500 Ver. 1:50	Drawn by E.W.K.	Checked by
Date MAY 79	Sheet 1 of 2	Plan No. 8187-D

8187-D

87-0480

GENERAL NOTES

MEASUREMENTS

ALL DIMENSIONS ARE IN METERS, EXCEPT PIPE DIAMETERS WHICH ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED.

GENERAL

1. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF CALEDON DEVELOPMENT STANDARDS.
2. ALL UNDERGROUND SERVICE MATERIALS AND INSTALLATIONS TO BE IN ACCORDANCE WITH THE LATEST STANDARDS AND CODES.
3. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY TOWN OF CALEDON DEVELOPMENT STANDARDS, SECONDLY REGION OF PEEL STANDARD DRAWINGS, AND THIRDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).
4. LOCATION OF EXISTING SERVICES AND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING EXISTING UTILITIES. ANY CHANGES SHALL BE REPAIRED AT THE CONTRACTORS COST TO THE SATISFACTION OF THE APPROPRIATE UTILITY.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING WITH OWNER AND OR ARCHITECT THE LOCATION OF WATER AND SANITARY SERVICE CONNECTIONS.
6. THE BUILDING SITED ON THIS PLAN HAS BEEN DESIGNED UTILIZING CONTROLLED FLOW ROOF DRAINS IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.
7. NATIVE AND GRANULAR MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO A MIN. 95% SPDD EXCEPT TOP 0.3m WHICH MUST BE COMPACTED TO 98% SPDD, OR AS RECOMMENDED BY A QUALIFIED SOILS CONSULTANT.
8. MATCH EX. GRADES AT PROPERTY LINES.
9. ROAD OCCUPANCY PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.

SANITARY AND STORM SEWERS

1. ALL CONCRETE AND PLASTIC PIPE SHALL HAVE RUBBER GASKET JOINTS.
2. ALL SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH OPSD 802.03 CLASS "B" UNLESS OTHERWISE NOTED.
3. PLASTIC STORM SEWER PIPE SHALL BE CONSTRUCTED WITH ULTRA RIB OR APPROVED EQUAL UP TO THE MAXIMUM DIAMETER OF 600mm.
4. ALL CATCH BASIN MANHOLES TO HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.
5. SAN. SEWER PIPE TO BE PVC SDR 35 AND SHALL CONFORM TO C.S.A.–B–182.2,3,4.
6. SAN. MANHOLES SHALL BE INSTALLED IN ACCORDANCE WITH REGION OF PEEL STANDARD DRAWINGS 2–1–1 TO 2–1–6 AND 2–2–1 TO 2–2–4. MANHOLE COVERS TO HAVE THE WORD "SANITARY" CAST INTO THE COVER WITH 50mm LETTERS. STANDARD HEAVY DUTY FRAME AND COVER TO BE INSTALLED UNLESS OTHERWISE SPECIFIED.

WATERMAINS

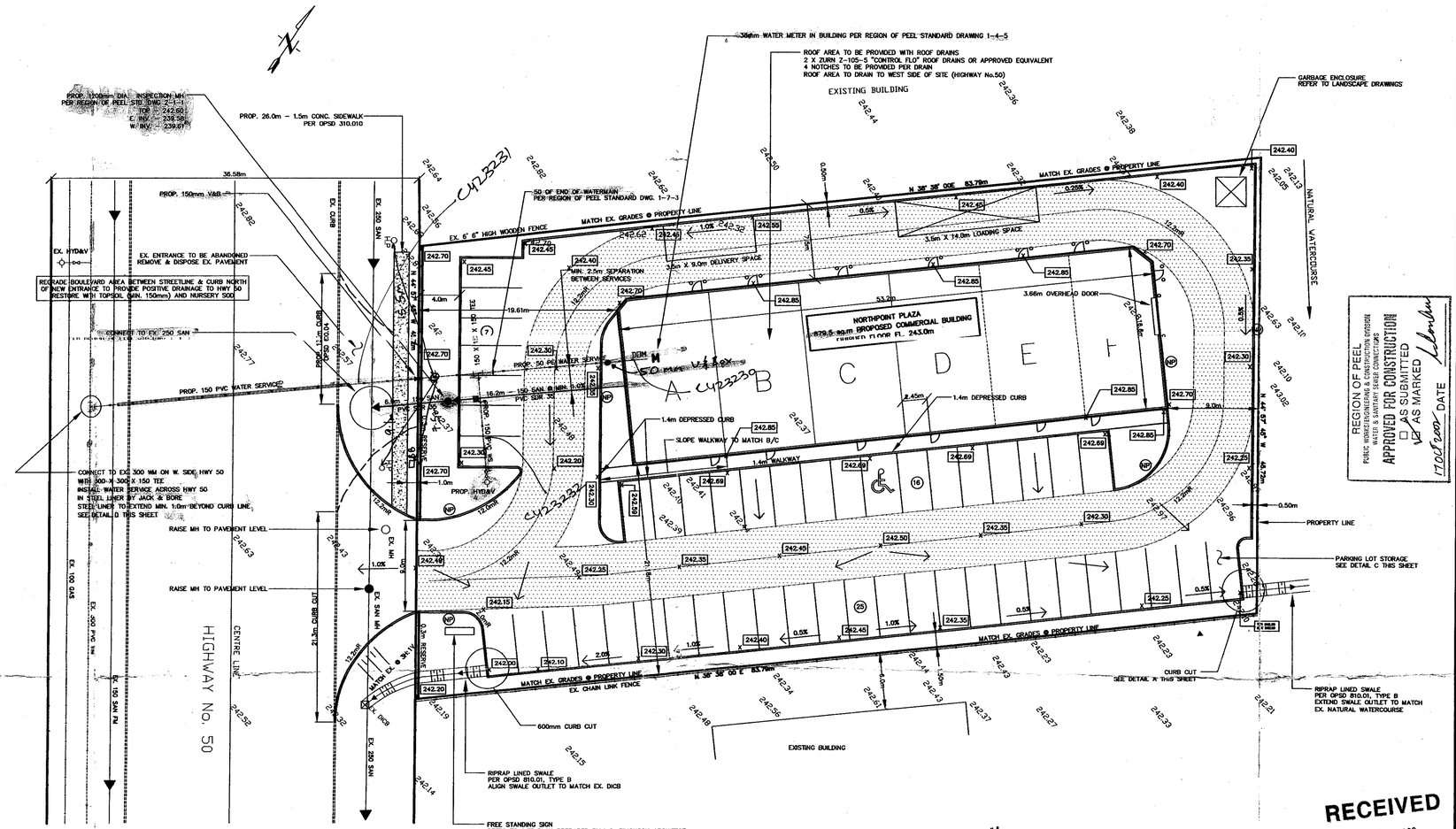
1. ALL WATERMAINS AND WATER SERVICE MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT REGION OF PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAINS AND/OR WATER SERVICE MATERIALS 100mm (4") AND LARGER MUST BE P.V.C. CLASS 150, MFG. TO A.W.W.A. SPEC. C900–75. SIZES 50mm (2") AND SMALLER, TO BE POLYETHYLENE PIPE 2306 TUBE SERIES 160 IN ACCORDANCE WITH C.S.A. B.137.1 –1970, A.W.W.A. SPEC. C901–78 IN SIZES 20 TO 50mm (1" TO 2").
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'–6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4'–0") FROM THEMSELVES AND ALL OTHER UTILITIES.
4. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS NOTED OTHERWISE.
5. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED COPY OF GRADE SHEET WHICH MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK. WHERE REQUESTED BY THE INSPECTOR, GRADE SHEET TO SPECIFY GRADE OF WATERMAIN, THE FINISHED GRADE OVER THE WATERMAIN AT INTERVALS OF AT LEAST 15 metres AND THE ELEVATIONS AT POINTS OF CROSSING OF THE WATERMAIN AND AND WATER SERVICES WITH OTHER UTILITIES AND DITCHES
6. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF .15m (6") OVER AND .3m (12") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
7. PROVISIONS FOR FLUSHING WATER LINES PRIOR TO TESTING MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES.
8. ALL PROPOSED WATERMAIN PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING EXISTING SYSTEM.

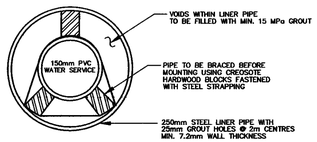
ROAD WORKS

1. DRIVEWAY GRANULAR BASE AND SUB–BASE TO BE CONSTRUCTED OF THE FOLLOWING:
   – 150mm GRANULAR 'A'
   – 300mm GRANULAR 'B'
   THE GRANULAR BASE AND SUB–BASE MATERIALS SHOULD CONFORM TO OPSS GRADATION SPECIFICATIONS AND SHOULD BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
2. UPON COMPLETION OF THE INSTALLATION OF GRANULAR MATERIALS, ELEVATIONS SHOULD BE CHECKED TO ENSURE WORKS CORRESPOND TO THE APPROVED GRADING DESIGN.
3. SUB–GRADE TO BE PROOF ROLLED PRIOR TO INSTALLATION OF GRANULAR SUB–BASE MATERIALS. SOFT SPOTS TO BE REMOVED AND FILLED WITH GRANULAR 'B' AND COMPACTED TO 95% SPMDD.
4. DRIVEWAY ENTRANCE TO BE PAVED FROM EDGE OF EX. PAVEMENT TO STREET LINE WITH 40mm HL3 AND 110mm HLB. SITE DRIVEWAYS AND PARKING AREAS TO BE PAVED WITH 40mm HL3 AND 65mm HLB.
5. CONCRETE CURB SHALL BE IN ACCORDANCE WITH OPSD 600.11.

LEGEND

- 242.15 — EXISTING GRADE (1992 SURVEY)
- 241.96 — PROPOSED GRADE
- 1.0% → — FLOW DIRECTION & GRADE (TYP)
- LOADING SPACE (3.5m X 14.0m)
- CONC. CURB – PER OPSD 600.11
- (14) — NUMBER OF PARKING SPACES
- 6.0m FIRE ROUTE
- MP — "NO PARKING FIRE ROUTE" SIGN – 6 REQUIRED FOR SITE – SEE DETAIL B THIS SHEET
- BOLLARDS





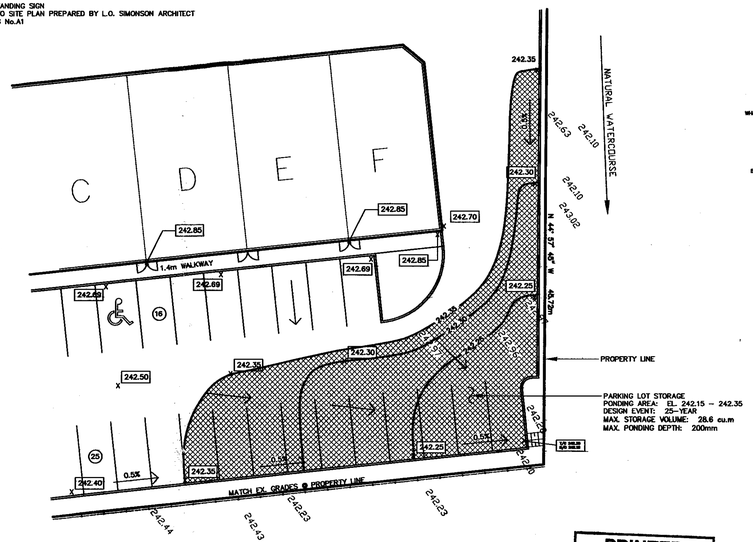
NOTES

1. INSTALLATION IS TO CONFORM WITH OPSS 416.
2. FLAX SOAP OR DRILLING MUD MAY BE USED AS A LUBRICANT BETWEEN SKIDS & CASING TO EASE INSTALLATION.
   CAUTION: DO NOT USE PETROLEUM PRODUCTS
3. WOODEN SKIDS MUST BE TREATED WITH WOOD PRESERVATIVE PRIOR TO INSTALLATION.
4. REFER TO GENERAL NOTES REGARDING "WATERMAINS" THIS SHEET.
5. LOCATION OF EXISTING SERVICES AND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING EXISTING UTILITIES. ANY CHANGES SHALL BE REPAIRED AT THE CONTRACTORS COST TO THE SATISFACTION OF THE APPROPRIATE UTILITY.

DETAIL D

JACK & BORE SECTION FOR WATERMAIN

SCALE: N.T.S.



DETAIL C

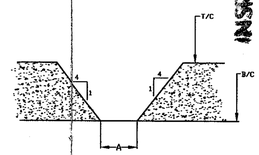
PARKING LOT STORAGE @ REAR OF PROPERTY FOR STORMWATER MANAGEMENT

SCALE: 1:250

DETAIL B

"NO PARKING FIRE ROUTE" SIGN

SCALE: N.T.S.



SOUTH CORNER – REAR PROPERTY LINE
T/C = 242.36
B/C = 242.15
A = 200mm

DETAIL A

CURB CUT @ REAR PROPERTY LINE

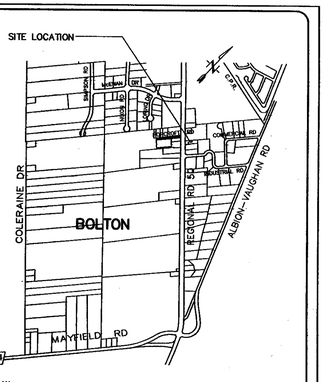
SCALE: N.T.S.

RECEIVED
SEP 30 2002
PUBLIC WORKS
REGION OF PEEL

PRINTED
JUL 10 2002
AQUAFOR BEECH LIMITED

REGION OF PEEL
PUBLIC WORKS, PLANNING & PROPERTY DIVISION
WATER & SANITARY SEWER CONNECTIONS
APPROVED FOR CONSTRUCTION
AS SUBMITTED
AS MARKED
DATE 17/OCT/2002

INSPECTORS COPY



SITE STATISTICS

SITE ZONE:	BOLTON HIGHWAY COMMERCIAL (HC-5)		
SITE AREA:	3,807.0	sq.m	
LANDSCAPED AREA:	455.4	sq.m	12.0% COVERAGE
BUILDING AREA:	889.7	sq.m	23.4% COVERAGE
NUMBER OF UNITS:	6		
–UNIT A	154.7	sq.m	23.4% COVERAGE
–UNIT B, C, D, E	600.0	sq.m	
–UNIT F	135.0	sq.m	

REQUIRED PARKING SPACES:

UNIT A (154.7/15)	11	spaces
UNIT B–E (4 X 150.0/20)	30	spaces
UNIT F (135.0/5)	27	spaces
TOTAL PARKING SPACES REQUIRED:	68	spaces
MINUS 20 SPACES PER MINOR VARIANCE:	–20	spaces
REVISED TOTAL PARKING SPACES REQUIRED:	48	spaces
TOTAL PARKING SPACES PROVIDED:	48	spaces
HANDICAPPED PARKING SPACES REQUIRED:	1	spoce
HANDICAPPED PARKING SPACES PROVIDED:	1	space
LOADING SPACES REQUIRED: (1 spoce/2,800 sq.m)	1	space
LOADING SPACES PROVIDED:	1	space
DELIVERY SPACES REQUIRED: (1 space per lot)	1	space
DELIVERY SPACES PROVIDED:	1	space

No.	By	Date	Revision	Chk'd
3	RJW	26 MAR. 02	GENERAL DRAWING UPDATE	RJW
2	RJW	12 FEB. 01	TOWN RED LINE COMMENTS	RJW
1	RJW	02 OCT. 00	ISSUED FOR APPROVALS	RJW
0	ARS	21 JUN. 00	ISSUED FOR CLIENT REVIEW	RJW

Aquafor Beech Limited
14 ABACUS ROAD
BRAMPTON, ONTARIO L6T 5S7
905–794–2287

PART OF LOTS 3 & 4
CONCESSION 7
TOWN OF CALEDON
REGION OF PEEL

SPA 00–03

LICENSED PROFESSIONAL ENGINEER
R.J. WHYTE
16 JULY 02
PROVINCE OF ONTARIO

DESIGNED BY

APPROVED BY

C–423230
12599 Highway 50, C

PROJECT:
NORTHPOINT PLAZA
12599 HIGHWAY 50

MUNICIPALITY:
TOWN OF CALEDON

TITLE:
SITE PLAN

Surveyed by: N/A		File:	63552–af–r3.dwg
Drawn by: ARS	Chk'd by: RJW	Drawing No.	Sheet No.
Designed by: RJW	Chk'd by: RJW	63552–A–1	1/1
Scale: 1:250	Date: JUNE 2000		

Archived Box C2

GENERAL NOTES

MEASUREMENTS

ALL DIMENSIONS ARE IN METERS, EXCEPT PIPE DIAMETERS WHICH ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED.

GENERAL

1. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF CALEDON DEVELOPMENT STANDARDS.
2. ALL UNDERGROUND SERVICE MATERIALS AND INSTALLATIONS TO BE IN ACCORDANCE WITH THE LATEST STANDARDS AND CODES.
3. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY TOWN OF CALEDON DEVELOPMENT STANDARDS, SECONDLY REGION OF PEEL STANDARD DRAWINGS, AND THIRDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).
4. LOCATION OF EXISTING SERVICES AND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING EXISTING UTILITIES. ANY CHANGES SHALL BE REPAIRED AT THE CONTRACTORS COST TO THE SATISFACTION OF THE APPROPRIATE UTILITY.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING WITH OWNER AND OR ARCHITECT THE LOCATION OF WATER AND SANITARY SERVICE CONNECTIONS.
6. THE BUILDING SITED ON THIS PLAN HAS BEEN DESIGNED UTILIZING CONTROLLED FLOW ROOF DRAINS IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.
7. NATIVE AND GRANULAR MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO A MIN. 95% SPDD EXCEPT TOP 0.3m WHICH MUST BE COMPACTED TO 98% SPDD, OR AS RECOMMENDED BY A QUALIFIED SOILS CONSULTANT.
8. MATCH EX. GRADES AT PROPERTY LINES.
9. ROAD OCCUPANCY PERMIT MUST BE OBTAINED 48 HOURS PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
10. ORIGINAL SITE PLAN (REVISIONS 1 TO 4B) PREPARED BY AQUAFOR BEECH LIMITED.

SANITARY AND STORM SEWERS

1. ALL CONCRETE AND PLASTIC PIPE SHALL HAVE RUBBER GASKET JOINTS.
2. ALL SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH OPSD 802.03 CLASS "B" UNLESS OTHERWISE NOTED.
3. PLASTIC STORM SEWER PIPE SHALL BE CONSTRUCTED WITH ULTRA RIB (CSA B182.4) OR APPROVED EQUAL UP TO THE MAXIMUM DIAMETER OF 600mm.
4. ALL CATCH BASIN MANHOLES TO HAVE A MINIMUM 0.3 METRE SUMP AND TOP AS PER MUNICIPAL STANDARDS.
5. SAN. SEWER PIPE TO BE PVC SDR 35 AND SHALL CONFORM TO C.S.A.–B–182.2,3,4.
6. SAN. MANHOLES SHALL BE INSTALLED IN ACCORDANCE WITH REGION OF PEEL STANDARD DRAWINGS 2–1–1 TO 2–1–6 AND 2–2–1 TO 2–2–4. MANHOLE COVERS TO HAVE THE WORD "SANITARY" CAST INTO THE COVER WITH 50mm LETTERS. STANDARD HEAVY DUTY FRAME AND COVER TO BE INSTALLED UNLESS OTHERWISE SPECIFIED.

WATERMAINS

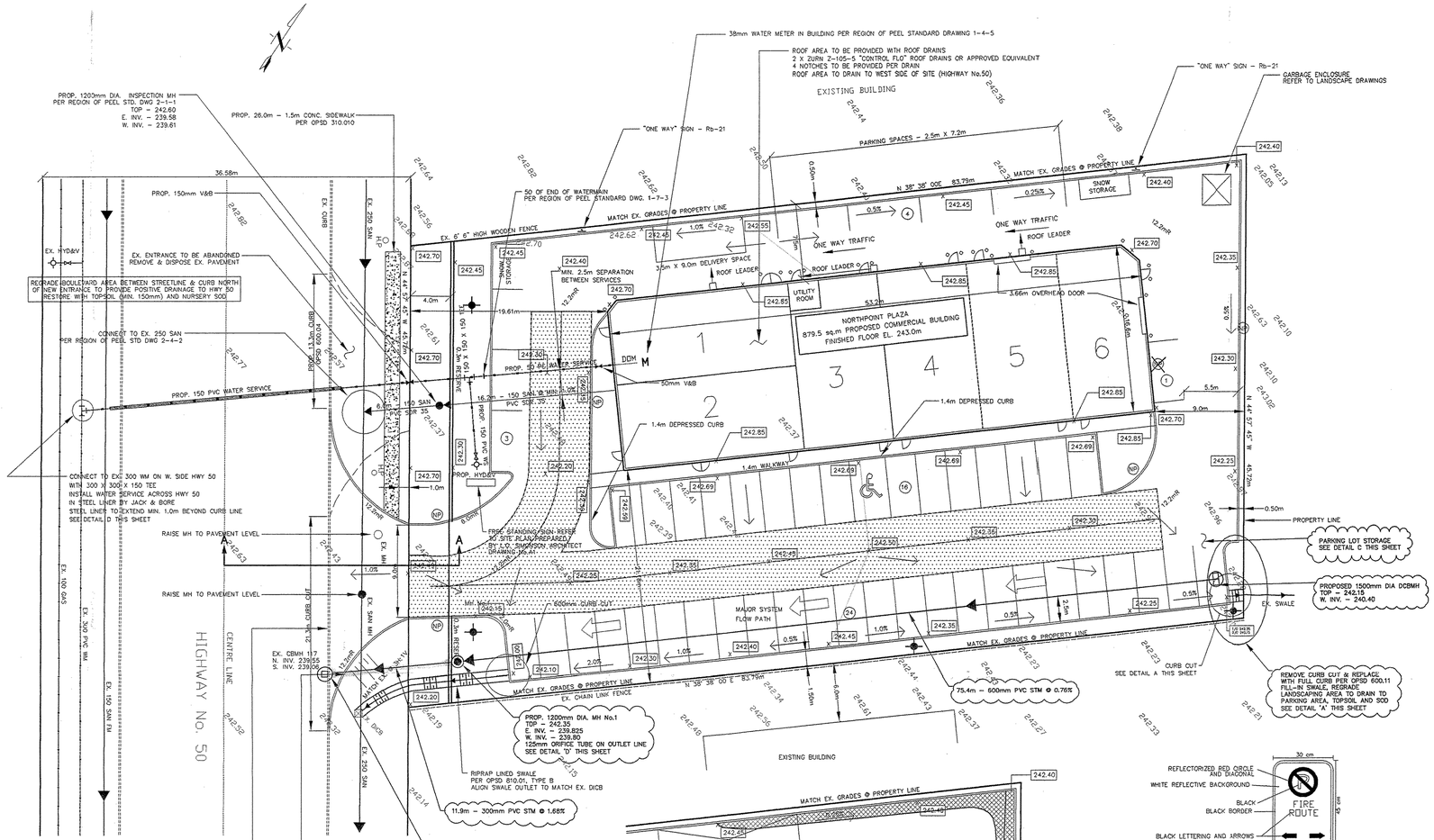
1. ALL WATERMAINS AND WATER SERVICE MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT REGION OF PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAINS AND/OR WATER SERVICE MATERIALS 100mm (4") AND LARGER MUST BE P.V.C. CLASS 150, MFG. TO A.W.W.A. SPEC. C900–75. SIZES 50mm (2") AND SMALLER, TO BE POLYETHYLENE PIPE 2306 TUBE SERIES 160 IN ACCORDANCE WITH C.S.A. B.137.1 –1970, A.W.W.A. SPEC. C901–78 IN SIZES 20 TO 50mm (1" TO 2").
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'–6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4'–0") FROM THEMSELVES AND ALL OTHER UTILITIES.
4. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS NOTED OTHERWISE.
   OVER THE WATERMAIN AT INTERVALS OF AT LEAST 15 metres AND THE ELEVATIONS AT POINTS OF CROSSING OF THE WATERMAIN AND AND WATER SERVICES WITH OTHER UTILITIES AND DITCHES
5. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED COPY OF GRADE SHEET WHICH MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK WHERE REQUESTED BY THE INSPECTOR. GRADE SHEET TO SPECIFY GRADE OF WATERMAIN, THE FINISHED GRADE
6. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF .15m (6") OVER AND .3m (12") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
7. PROVISIONS FOR FLUSHING WATER LINES PRIOR TO TESTING MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES.
8. ALL PROPOSED WATERMAIN PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING EXISTING SYSTEM.

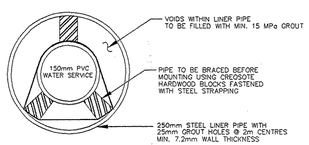
ROAD WORKS

1. DRIVEWAY GRANULAR BASE AND SUB–BASE TO BE CONSTRUCTED OF THE FOLLOWING:
   – 150mm GRANULAR 'A'
   – 300mm GRANULAR 'B'
   THE GRANULAR BASE AND SUB–BASE MATERIALS SHOULD CONFORM TO OPSS GRADATION SPECIFICATIONS AND SHOULD BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
2. UPON COMPLETION OF THE INSTALLATION OF GRANULAR MATERIALS, ELEVATIONS SHOULD BE CHECKED TO ENSURE WORKS CORRESPOND TO THE APPROVED GRADING DESIGN.
3. SUB–GRADE TO BE PROOF ROLLED PRIOR TO INSTALLATION OF GRANULAR SUB–BASE MATERIALS. SOFT SPOTS TO BE REMOVED AND FILLED WITH GRANULAR 'B' AND COMPACTED TO 95% SPMDD.
4. DRIVEWAY ENTRANCE TO BE PAVED FROM EDGE OF EX. PAVEMENT TO STREET LINE WITH 50mm HL3 AND 100mm HL8. SITE DRIVEWAYS AND PARKING AREAS TO BE PAVED WITH 40mm HL3 AND 65mm HL8.
5. CONCRETE CURB SHALL BE IN ACCORDANCE WITH OPSD 600.11.

LEGEND

- 242.15 — EXISTING GRADE (1992 SURVEY)
- 241.96 — PROPOSED GRADE
- 1.0% → — FLOW DIRECTION & GRADE (TYP)
- LOADING SPACE (3.5m X 14.0m)
- CONC. CURB – PER OPSD 600.11
- (14) — NUMBER OF PARKING SPACES
- 6.0m FIRE ROUTE
- (NP) — "NO PARKING FIRE ROUTE" SIGN – 6 REQUIRED FOR SITE – SEE DETAIL B THIS SHEET
- BOLLARDS
- LIGHT STANDARD
- ROOF DOWNSPOUT
- PROPOSED SITE PLAN REVISION

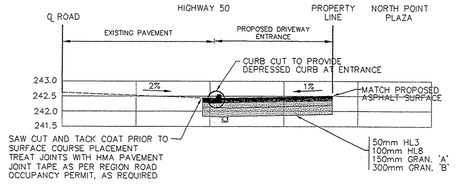




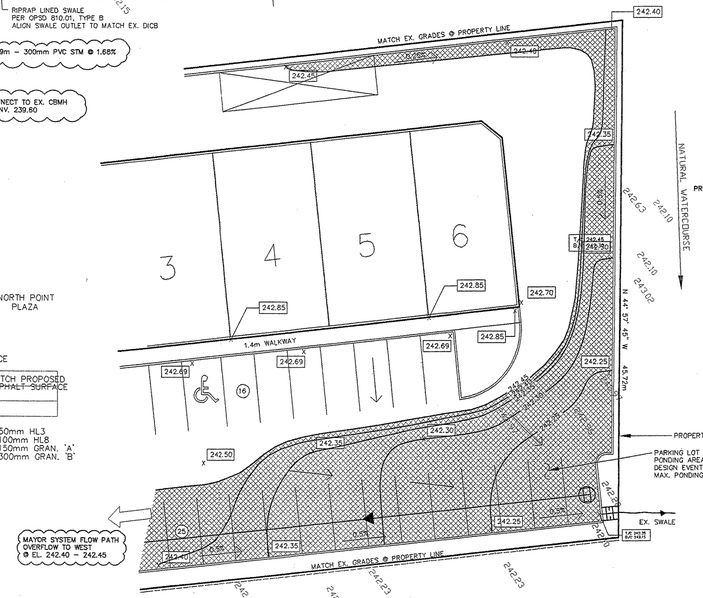
NOTES

1. INSTALLATION IS TO CONFORM WITH OPSS 416.
2. FLAX SOAP OR DRILLING MUD MAY BE USED AS A LUBRICANT BETWEEN SKIDS & CASING TO EASE INSTALLATION.
   CAUTION: DO NOT USE PETROLEUM PRODUCTS
3. WOODEN SKIDS MUST BE TREATED WITH WOOD PRESERVATIVE PRIOR TO INSTALLATION.
4. REFER TO GENERAL NOTES REGARDING "WATERMAINS" THIS SHEET.
5. LOCATION OF EXISTING SERVICES AND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING EXISTING UTILITIES. ANY CHANGES SHALL BE REPAIRED AT THE CONTRACTORS COST TO THE SATISFACTION OF THE APPROPRIATE UTILITY.

DETAIL D
JACK & BORE SECTION FOR WATERMAIN

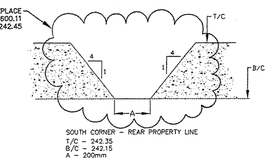


SECTION A–A
SCALE: N.T.S.

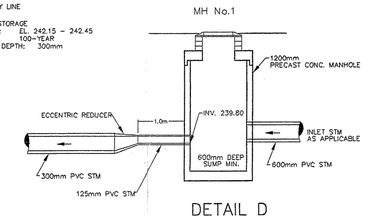


DETAIL C
PARKING LOT STORAGE @ REAR OF PROPERTY FOR STORMWATER MANAGEMENT
SCALE: 1:250

DETAIL B
"NO PARKING FIRE ROUTE" SIGN
SCALE: N.T.S.

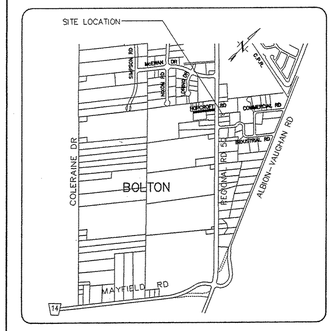


DETAIL A
CURB CUT @ REAR PROPERTY LINE
SCALE: N.T.S.



DETAIL D
ORIFICE TUBE ON OUTLET
SCALE: N.T.S.

KEY PLAN



SITE STATISTICS

SITE ZONE:	BOLTON HIGHWAY COMMERCIAL (CHB-5)		
SITE AREA:	3,807.0	sq.m	
LANDSCAPED AREA:	455.4	sq.m	12.0% COVERAGE
BUILDING AREA:	889.7	sq.m	23.4% COVERAGE
NUMBER OF UNITS:	6		
-UNIT 1 & 2	304.7	sq.m	23.4% COVERAGE
-UNIT 3, 4, 5	450.0	sq.m	
-UNIT 6	135.0	sq.m	

APPROVED FOR CONSTRUCTION

THIS APPROVED CONSTITUTES A GENERAL REVISION AND DOES NOT CERTIFY DIMENSION ACCURACY

THIS APPROVAL IS SUBJECTED TO THE FURTHER CERTIFICATION OF THE "AS CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO

DATE: _____ APPROVED BY: _____

Reference Drawings

N°	Date	Revisions	Dwn.	Dsg'd	Chk'd
1	12 JAN 07	ISSUED FOR APPROVAL	AAF	RJW	RJW

Bench Mark:
-

LICENCED PROFESSIONAL ENGINEER R. J. WHYTE Jan. 12, 2007 PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

REGION OF PEEL
PUBLIC WORKS/ENGINEERING & CONSTRUCTION DIVISION
APPROVED FOR WATER, SANITARY AND/OR STORM SEWERS IN ACCORDANCE WITH LATEST REGION OF PEEL STANDARDS AND SPECIFICATIONS
DATE: Feb 19/2007
FOR GENERAL EASEMENTS ONLY

Calder Engineering Ltd.
13226 Coleraine Drive, Caledon, ON L7E 2B2
T 905-857-7600 F 905-857-5900 www.calderenq.com

REGION OF PEEL RECEIVED
MAR 19 2007
PUBLIC WORKS REGION OF PEEL

TOWN OF CALEDON

Project Name:
NORTHPOINT PLAZA
12599 HIGHWAY 50

Title Name:
SITE PLAN
HIGHWAY No. 50 STORM SEWER CONNECTION

Drawing N°:	Sheet N°:	Rev. N°
03-110-01	1 OF 1	1
	Scale: 1:250	

Sub #2 C-444460

OVERALL_SITE PLAN

Scale: 1 : 500

1 A110

PARKING TAG LEGEND:

PHASE NUMBER — LEVEL NUMBER

PH1-L1 / 100 / R

PARKING NUMBER

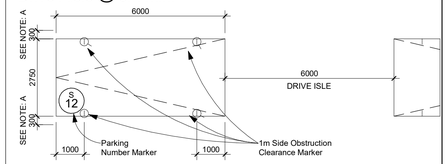
PARKING TYPE

RESIDENT PARKING SPACE (R)

VISITOR/COMMERCIAL PARKING SPACE (V)

TYPICAL PARKING SPACE:

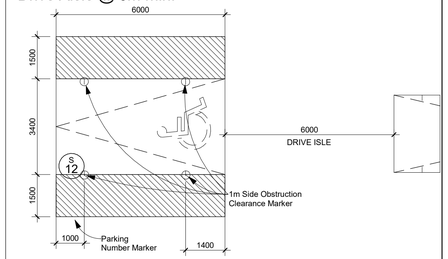
Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

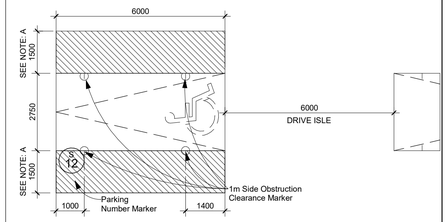
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



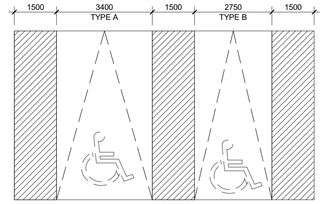
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:

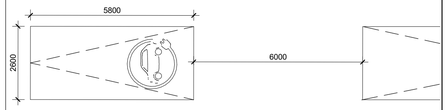


NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE A & B:

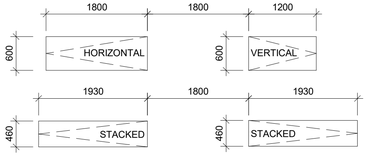


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



THESE DRAWINGS ARE NOT TO BE SCALED:

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

ADDITIONAL NOTES:

THE DRAWING, AS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF SRN ARCHITECTS INC. THE CONTRACTOR MUST VERIFY AND ACCEPT RESPONSIBILITY FOR ALL DIMENSIONS AND CONDITIONS ON SITE AND MUST NOTIFY SRN ARCHITECTS INC. OF ANY VARIATIONS FROM THE SUPPLIED INFORMATION. SRN ARCHITECTS INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC. ENGINEERING INFORMATION SHOWN ON THIS DRAWING REFER TO APPROPRIATE ENGINEERS DRAWINGS BEFORE PROCEEDING WITH ANY WORK. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (UNDERTAKEN OTHERWISE NOTED). NO INVESTIGATION HAS BEEN OR REPORTED ON BY THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITION OF THIS SITE.

CONDITIONS FOR ELECTRONIC INFORMATION TRANSFER:

ELECTRONIC INFORMATION IS SUPPLIED TO THE OTHER ASSOCIATED FIRMS TO ASSIST THEM IN THE ERECTION OF THEIR WORK/REVIEW. THE RECIPIENT FIRMS MUST DETERMINE THE COMPLETENESS/APPROPRIATENESS/ RELEVANCE OF THE INFORMATION IN RESPECT TO THEIR PARTICULAR RESPONSIBILITY.

NO:	DATE:	REVISION COMMENT:

SRN ARCHITECTS INC SHALL NOT BE RESPONSIBLE FOR:

1. ERRORS, OMISSIONS, INCOMPLETENESS DUE TO LOSS OF INFORMATION IN WHOLE OR PART WHEN INFORMATION IS TRANSFERRED.

2. TRANSMISSIONS OF ANY VIRUS OR DAMAGE TO RECEIVING ELECTRONIC SYSTEM WHEN INFORMATION IS TRANSFERRED

SRN ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

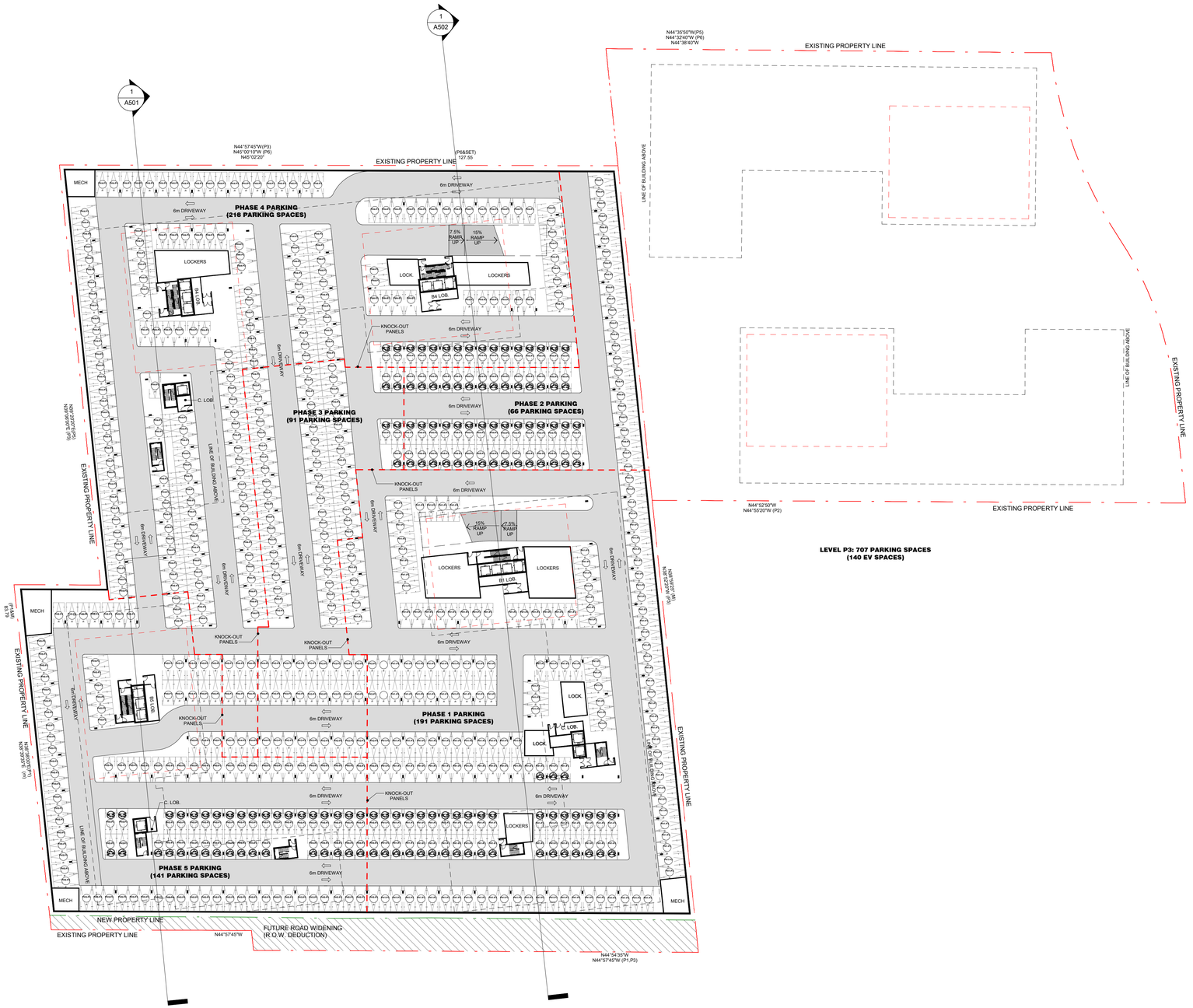
12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

SITE PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A110

C:\Users\allisonc\Documents\S20023_12563&12599 HWY 50_CONCEPT_RVT2020_AllisonCWPEY8.rvt

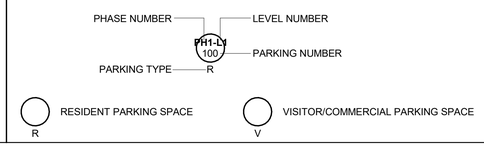


OVERALL- LEVEL P3 FLOOR PLAN

Scale: 1 : 500

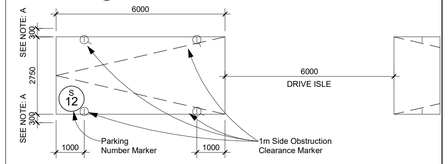
1 / A201

PARKING TAG LEGEND:



TYPICAL PARKING SPACE:

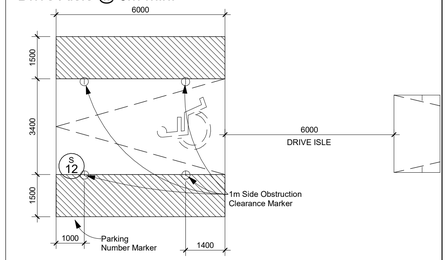
Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

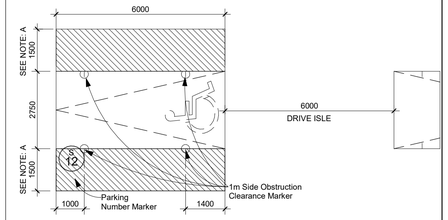
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



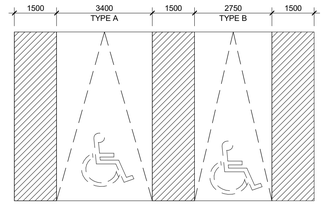
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:

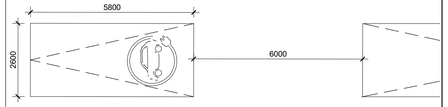


NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE A & B:

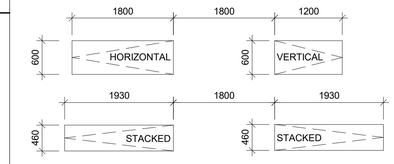


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



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8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P3 FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A201

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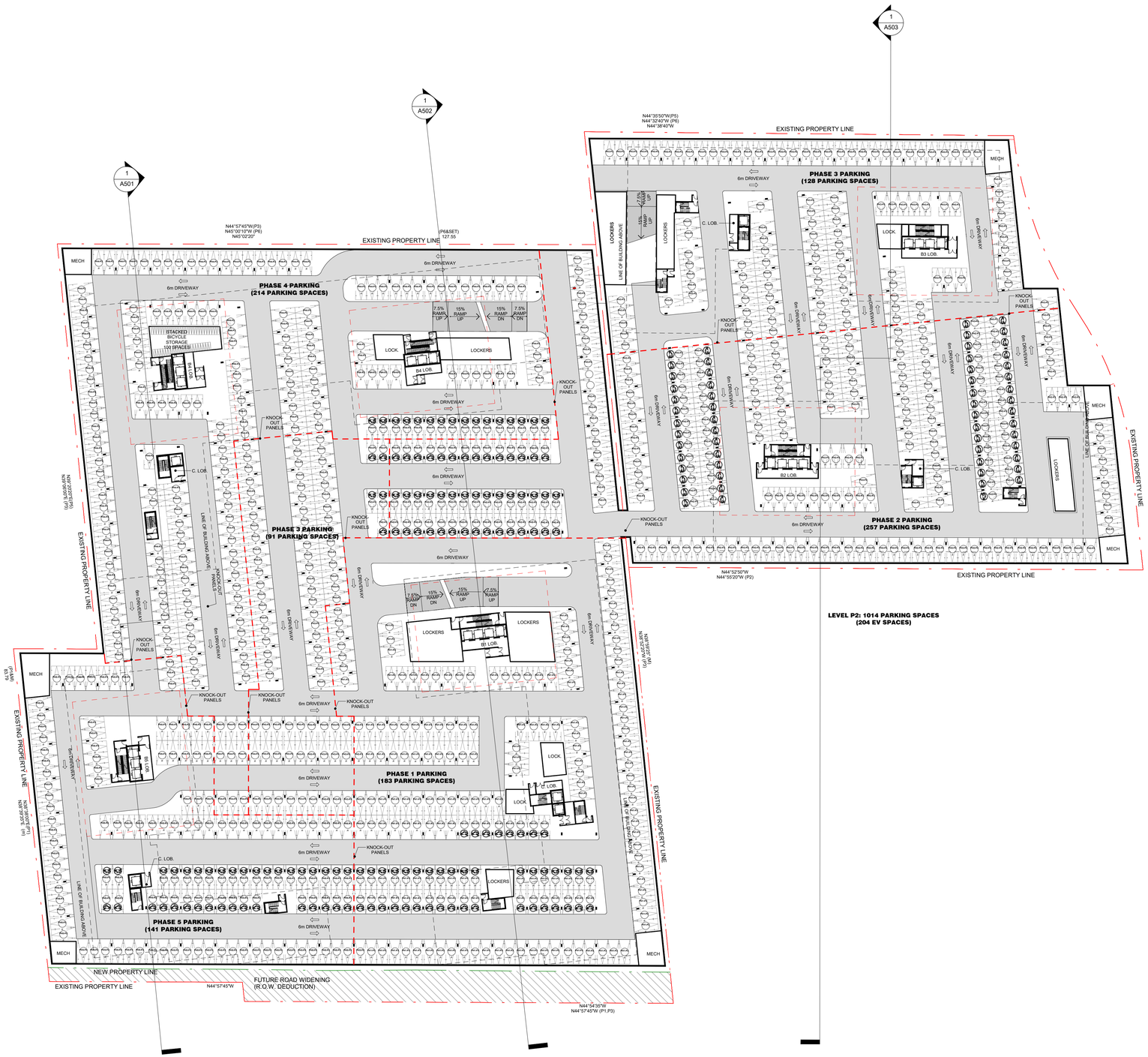
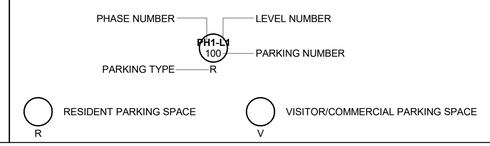


OVERALL- LEVEL P2 FLOOR PLAN

Scale: 1 : 500

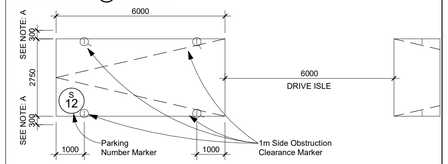
1 / A202

PARKING TAG LEGEND:



TYPICAL PARKING SPACE:

Drive Aisle @ 6m min.



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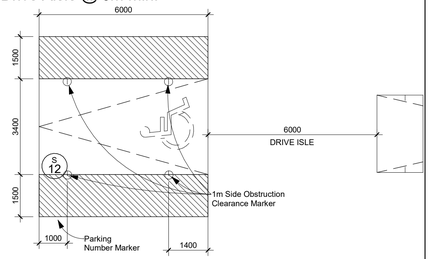
Drive Aisle @ 6m min.



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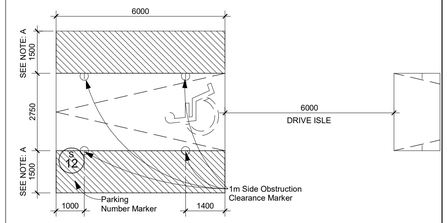
BARRIER-FREE PARKING SPACE TYPE B:



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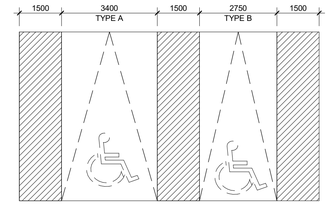
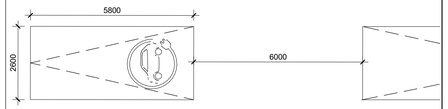


EV PARKING SPACE



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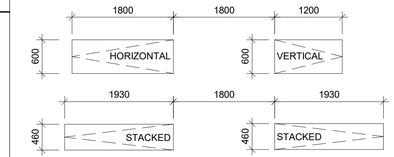

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STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P2 FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A202

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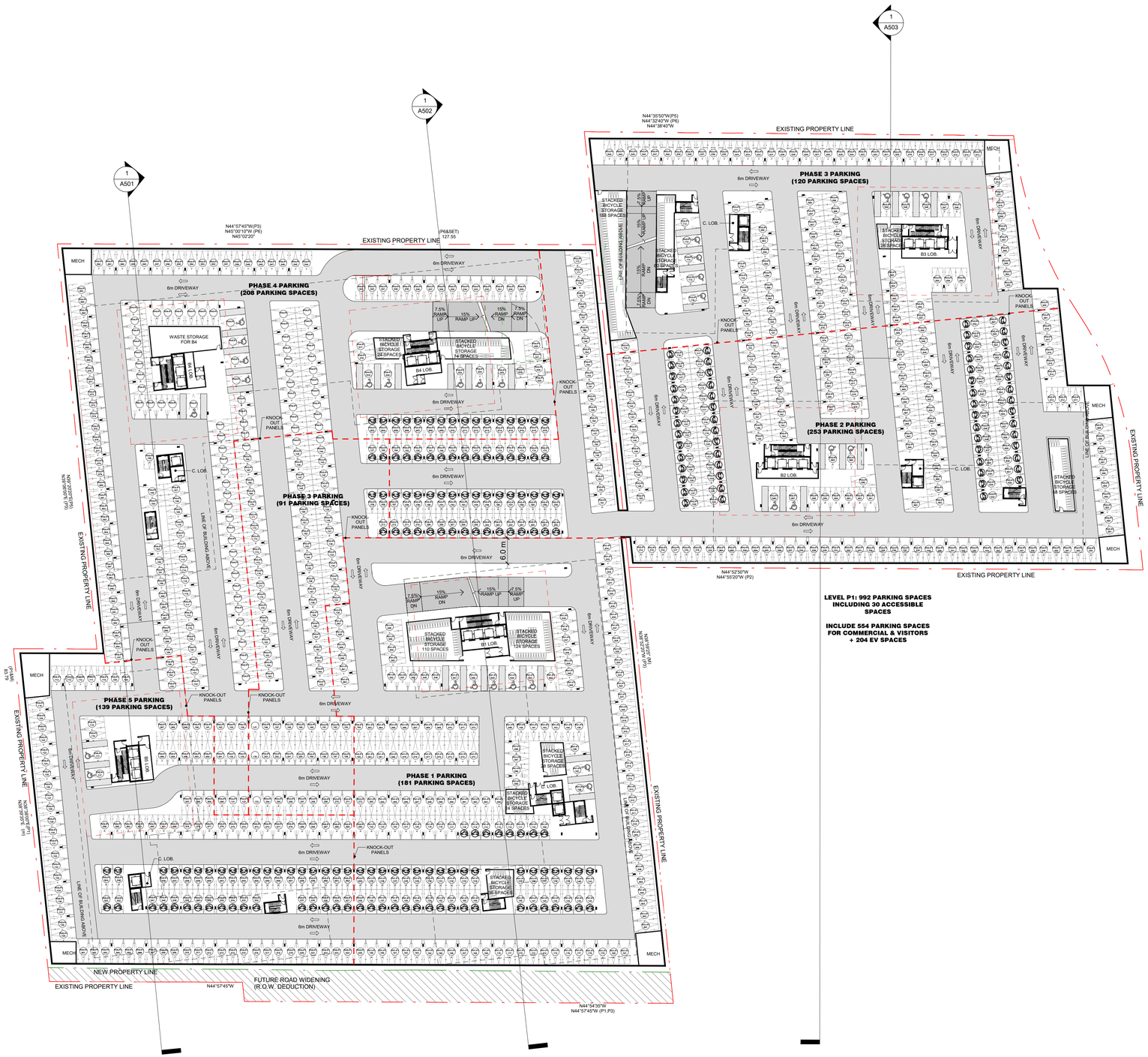


LEVEL P1: 992 PARKING SPACES INCLUDING 30 ACCESSIBLE SPACES

INCLUDE 554 PARKING SPACES FOR COMMERCIAL & VISITORS + 204 EV SPACES

OVERALL_LEVEL P1 FLOOR PLAN

Scale: 1 : 500

1 / A203

PARKING TAG LEGEND:

PHASE NUMBER — LEVEL NUMBER

PH1-L1 / 100 — PARKING NUMBER

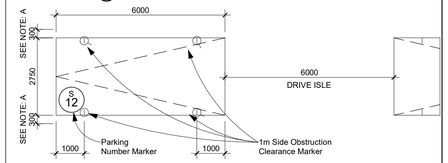
PARKING TYPE — R

R — RESIDENT PARKING SPACE

V — VISITOR/COMMERCIAL PARKING SPACE

TYPICAL PARKING SPACE:

Drive Aisle @ 6m min.



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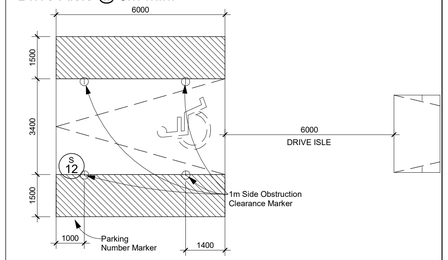
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



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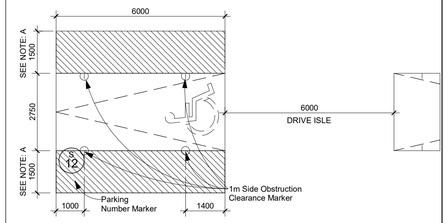
BARRIER-FREE PARKING SPACE TYPE B:



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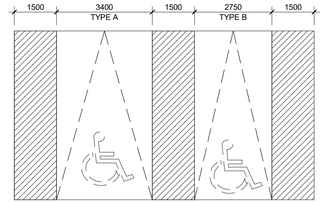

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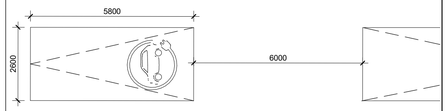

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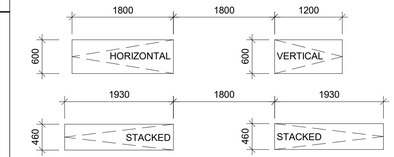

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STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P1 FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A203

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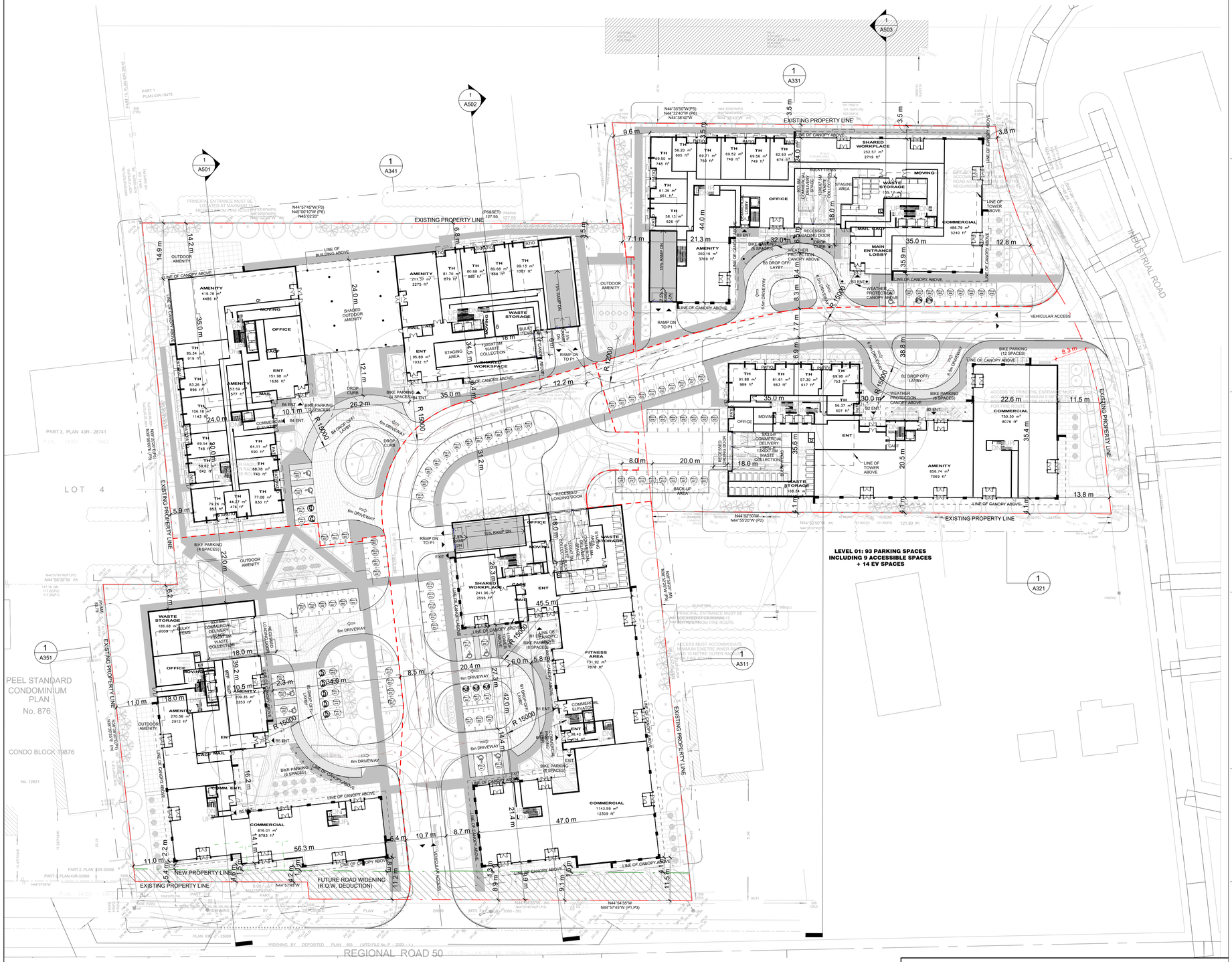

PARKING TAG LEGEND:

PHASE NUMBER — LEVEL NUMBER

PARKING TYPE — R — PH1-L1 100 — PARKING NUMBER

R — RESIDENT PARKING SPACE

V — VISITOR/COMMERCIAL PARKING SPACE

TYPICAL PARKING SPACE:

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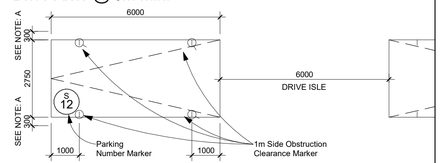

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WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

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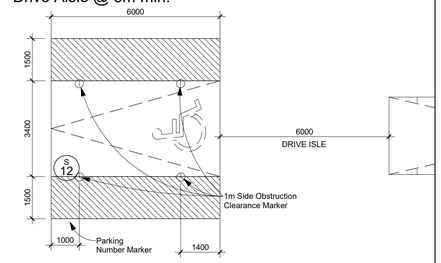

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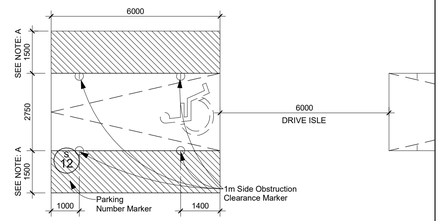
BARRIER-FREE PARKING SPACE TYPE B:



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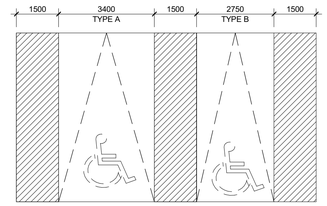

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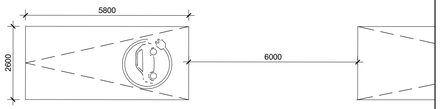

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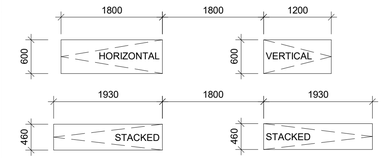

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CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL 1 - OVERALL FLOOR PLAN

DATE:	SCALE:
Feb. 26, 2021	As indicated
DRAWN BY: EM/EH	CHECKED BY: EM/GR
PROJECT NUMBER: S20023	DRAWING NUMBER: A301

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MIXED-USE DEVELOPMENT - 12563&12599 HWY 50

Bolton, Ontario

Project Statistics

January 5, 2022 Project No. S20023

1.0 Site Area

	Hectare	*acres*	*sq.m.*	*sq.ft.*
Survey Site Area	3.61	8.92	36,091.00	388,480
Potential HWY 50 Road Widening	0.09	0.22	904.00	9,731
Total Site Area	**3.52**	**8.69**	**35,187.00**	**378,750**

2.0 GFA

(excludes storage, parking, stairwell, elevator, trash chute, trash room, storage for mechanical & electrical equipments)

2.1 Commercial GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
B1 Level 1	1 x	*1,144.00*	1,144.00	12,314
B2 Level 1	1 x	*748.00*	748.00	8,051
B3 Level 1	1 x	*507.00*	507.00	5,457
B4 Level 1	1 x	*0.00*	0.00	0
B5 Level 1	1 x	780.00	780.00	8,396
Total GFA			**3,179.00**	**34,218**

2.2 Building 1 Residential GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
Level 1	1 x	1,206.00	1,206.00	12,981
Level 2	1 x	2,862.11	2,862.11	30,807
Levels 3 to 4	2 x	3,000.00	6,000.00	64,583
Levels 5 to 7	3 x	2,693.22	8,079.66	86,969
Levels 8 to 9	2 x	1,893.22	3,786.44	40,757
Levels 10 to 27	18 x	700.00	12,600.00	135,625
Levels 28 to 29	2 x	590.00	1,180.00	12,701
Total GFA			**35,714.21**	**384,423**

2.3 Building 2 Residential GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
Level 1	1 x	1,303.00	1,303.00	14,025
Level 2	1 x	2,309.57	2,309.57	24,860
Levels 3 to 4	2 x	2,450.57	4,901.14	52,755
Levels 5 to 9	5 x	1,981.36	9,906.80	106,636
Levels 10 to 27	18 x	700.00	12,600.00	135,625
Levels 28 to 29	2 x	590.00	1,180.00	12,701
Total GFA			**32,200.51**	**346,602**

2.4 Building 3 Residential GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
Level 1	1 x	1,643.70	1,643.70	17,693
Level 2	1 x	2,430.05	2,430.05	26,157
Levels 3 to 4	2 x	2,587.05	5,174.10	55,694
Levels 5 to 9	5 x	2,225.56	11,127.80	119,779
Levels 10 to 25	16 x	700.00	11,200.00	120,556
Levels 26 to 27	2 x	590.00	1,180.00	12,701
Total GFA			**32,755.65**	**352,580**

2.5 Building 4 Residential GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
Level 1	1 x	2,623.15	2,623.15	28,235
Level 2	1 x	2,809.00	2,809.00	30,236
Levels 3 to 4	2 x	3,066.00	6,132.00	66,004
Levels 5 to 9	5 x	2,984.09	14,920.45	160,602
Levels 10 to 23	14 x	1,400.00	19,600.00	210,973
Levels 24 to 25	2 x	1,290.00	2,580.00	27,771
Total GFA			**48,664.60**	**523,821**

2.6 Building 5 Residential GFA

	floors	*sq.m.*	*sq.m.*	*sq.ft.*
Level 1	1 x	776.26	776.26	8,356
Level 2	1 x	1,713.97	1,713.97	18,449
Levels 3 to 5	3 x	1,831.76	5,495.28	59,151
Levels 6 to 7	2 x	1,648.76	3,297.52	35,494
Levels 8 to 9	2 x	1,183.76	2,367.52	25,484
Levels 10 to 21	12 x	700.00	8,400.00	90,417
Levels 22 to 23	2 x	590.00	1,180.00	12,701
Total GFA			**23,230.55**	**250,052**

Total GFA	÷	*Site Area*	*FSI*
175,744.52 sq.m.		36,091.00 sq.m.	**4.87**

4.0 Units Count

Proposed Units

*(*15% of suites to be fully accessible)*

4.1

Building 1 units	*floors*	**1BR**	**1BR+D**	**2BR**	**2BR+D**	**3BR**	**TH**	*Units*
Level 2	1 x	1	10	14	7	4	0	36
Levels 3 to 4	2 x	1	12	16	4	5	0	76
Levels 5 to 7	3 x	6	14	3	9	3	0	105
Levels 8 to 9	2 x	5	10	7	2	1	0	50
Level 10	1 x	1	2	3	0	0	0	6
Levels 11 to 27	17 x	1	3	3	3	0	0	170
Levels 28 to 29	2 x	2	0	5	1	0	0	16
Total Units		53	149	133	99	25	0	**459**

4.2

Building 2 units	*floors*	**1BR**	**1BR+D**	**2BR**	**2BR+D**	**3BR**	**TH**	*Units*
Level 2	1 x	0	3	11	7	1	5	27
Levels 3 to 4	2 x	0	3	11	10	5	0	58
Levels 5 to 9	5 x	3	16	8	0	2	0	145
Level 10	1 x	0	3	2	0	0	0	5
Levels 11 to 27	17 x	2	4	4	0	0	0	170
Levels 28 to 29	2 x	0	2	6	0	0	0	16
Total Units		49	164	155	27	21	5	**421**

4.3

Building 3 units			*floors*	1BR	1BR+D	2BR	2BR+D	3BR	TH	*Units*
Level	2		1 x	3	4	7	3	6	8	31
Levels	3	to 4	2 x	3	7	15	4	5	0	68
Levels	5	to 9	5 x	4	12	9	2	3	0	150
Level	10		1 x	1	0	4	1	0	0	6
Levels	11	to 25	15 x	1	3	6	0	0	0	150
Levels	26	to 27	2 x	2	0	6	0	0	0	16
Total Units				49	123	188	22	31	8	**421**

4.4

Building 4 units			*floors*	1BR	1BR+D	2BR	2BR+D	3BR	TH	*Units*
Level	2		1 x	3	9	5	2	5	14	38
Levels	3	to 4	2 x	7	11	14	9	0	0	82
Levels	5	to 9	5 x	8	17	13	3	1	0	210
Level	10		1 x	3	1	6	0	0	0	10
Levels	11	to 23	13 x	4	4	12	0	0	0	260
Levels	24	to 25	2 x	0	4	12	0	0	0	32
Total Units				112	177	284	35	10	14	**632**

4.5

Building 5 units			*floors*	1BR	1BR+D	2BR	2BR+D	3BR	TH	*Units*
Level	2		1 x	8	2	6	0	3	0	19
Levels	3	to 5	3 x	8	4	8	0	4	0	72
Levels	6	to 7	2 x	1	10	8	0	4	0	46
Levels	8	to 9	2 x	5	5	4	1	1	0	32
Levels	10	to 21	12 x	2	2	6	0	0	0	120
Levels	22	to 23	2 x	0	2	6	0	0	0	16
Total Units				68	72	138	2	25	0	**305**

Total Units Provided for B1,B2,B3,B4 & B5	331	685	898	185	112	27	**2,238**
	15%	*31%*	*40%*	*8%*	*5%*	*1%*	*100%*

5.0 Amenity Area

5.1

Proposed Indoor Amenity	sq.m.	Total Units	sq.m.	sq.f.
	2	2,238	4,476	48,179

5.2

Proposed Outdoor Amenity	sq.m.	Total Units		sq.m.	sq.f.
	4	2,238	Outdoor Amenity @ level 1	611	6,577
			Rooftop Amenity @ level 10 & 8	7,464	80,336

5.3

Total Proposed Amenity	**12,551**	**135,092**

6.0 Vehicular Parking

B1 Proposed Parking Demand

6.1A

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 459	459
Proposed Visitor/Commercials	0.25	x 459	115
Commercial	shared parking with visitors		0
Total Proposed Demand for B1			**574**

B1 Proposed Parking Supply

6.1B

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	15	2	2	15
Level P1	85	100	3	4	185
Level P2	183	0	0	0	183
Level P3	191	0	0	0	191
Total Proposed Supply for B1	459	115	5	6	**574**

B2 Proposed Parking Demand

6.2A

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 421	421
Proposed Visitor/Commercials	0.25	x 421	106
Commercial	shared parking with visitors		0
Total Proposed Demand for B2			**527**

B2 Proposed Parking Supply

6.2B

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	39	0	0	39
Level P1	183	66	2	2	249
Level P2	257	0	0	0	257
Level P3	66	0	0	0	66
Total Proposed Supply for B2	506	105	2	2	**611**

B3 Proposed Parking Demand

6.3A

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 421	421
Proposed Visitor/Commercials	0.25	x 421	106
Commercial	shared parking with visitors		0
Total Proposed Demand for B3			**527**

B3 Proposed Parking Supply

6.3B

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	10	1	0	10
Level P1	114	95	2	5	209
Level P2	219	0	0	0	219
Level P3	91	0	0	0	91
Total Proposed Supply for B3	424	105	3	5	**529**

B4 Proposed Parking Demand

6.4A

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 632	632
Proposed Visitor/Commercials	0.25	x 632	158
Commercial	shared parking with visitors		0
Total Proposed Demand for B4			**790**

B4 Proposed Parking Supply

6.4B

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	7	1	1	7
Level P1	54	153	6	4	207
Level P2	214	0	0	0	214
Level P3	218	0	0	0	218
Total Proposed Supply for B4	486	160	7	5	**646**

B5 Proposed Parking Demand

6.5A

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 305	305
Proposed Visitor/Commercials	0.25	x 305	77
Commercial	shared parking with visitors		0
Total Proposed Demand for B5			**382**

B5 Proposed Parking Supply

6.5B

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	22	1	1	22
Level P1	63	76	1	1	139
Level P2	141	0	0	0	141
Level P3	141	0	0	0	141
Total Proposed Supply for B5	345	98	2	2	**443**

Total Proposed Parking Demand for the Development

6.6

	ratio	*units*	*Parking Spaces*
Required Residential	1.00	x 2,238	2,238
Proposed Visitor/Commercials	0.25	x 2,238	560
Commercial	shared parking with visitors		0
Total Development Required Supply			**2,798**

Net Parking Spaces Provided

6.7

	Residential	*Visitor*	*A-Access*	*B-Access*	*Parking Spaces*
Level 1 (Commercial & Visitors Parking)	0	93	5	4	93
Level P1	438	554	14	16	992
Level P2	1,014	0	0	0	1,014
Level P3	707	0	0	0	707
Total Net Parking Spaces	**2,159**	**647**	**19**	**20**	**2,806**

Parking Supply - Proposed Demand

6.8

8

Proposed EV Parking

6.6

	ratio	Parking Spaces	*Parking Spaces*
Required Residential	0.20	x 2,806	561
Total Proposed EV spaces			**561**

7.0 Bicycle Parking

	Residential	*Visitor*	*Parking Spaces*
Level 1 (short term bicycle parking)	0	52	52
Level P1 (long term stacked bicycle parking)	764	0	764
Total Proposed Bicycle Parking			**816**

7.0 Lot Coverage

	sq.m.	*sq.ft.*	*%*
Proposed Building Coverage	15,080.00	162,320	42%
Proposed Inner Roads	7,480.00	80,514	21%
Landscape Coverage	13,531.00	145,646	37%
Site Area	**36,091.00**	**388,480**	**100%**

APPENDIX B

Equivalent Population & Water Demand Calculations

Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Prepared By: AR
Checked By: MB
Date: 11/13/2020
Revised : 1/14/2022

Site Statistics
12563 & 12599 Hwy 50 & 2 Industrial Road

SUMMARY OF UNIT BREAKDOWN

Site	Townhouse	Apartment 1, 1+	Apartment 2, 2+	Apartment 3	Total Units	Amenity Area (ha)
Building 1	0	202	232	25	459	
Building 2	5	213	182	21	421	
Building 3	8	172	210	31	421	1.26
Building 4	14	289	319	10	632	
Building 5	0	140	140	25	305	
Total	**27**	**1016**	**1083**	**112**	**2238**	**1.26**

SUMMARY OF POPULATION DENSITY BASED ON UNIT TYPE

Unit Type	Population Density	Unit
Row (Townhouse)	3.5	pop/unit
Apartment 1, 1+	1.68	pop/unit
Apartment 2, 2+	2.54	pop/unit
Apartment 3	2.70	pop/unit
Amenity	50	persons/ha

Note: Apartment 3 and Amenity area population based on Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Sanitary Sewer Design Criteria (March, 2017) Section 2.1. All other populations based on email correspondence with Alexander Sepe @ Region of Peel, dated December 1, 2020.

SUMMARY OF POPULATION

Site	Townhouse	Apartment 1, 1+	Apartment 2, 2+	Apartment 3	Total Unit Population	Amenity Area (ha)	Total
Building 1	0	339	589	68	996		
Building 2	18	358	462	57	894		
Building 3	28	289	533	84	934	63	
Building 4	49	486	810	27	1372		
Building 5	0	235	356	68	658		
Total	**95**	**1707**	**2751**	**302**	**4855**	**63**	**4917**

Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Prepared By: AR
Checked By: MB
Date: 2020-11-13
Revised: 2022-01-14

WATER DEMAND CALCULATIONS - PROPOSED CONDITIONS
12563 & 12599 Hwy 50 & 2 Industrial Road

Total Site	**Units**	**Building 1**	**Building 2**	**Building 3**	**Building 4**	**Building 5**	**Total**
Average Consumption	L/cap/day	270	270	270	270	270	270
Equivalent Population*	persons	1009	907	947	1384	671	4917
Average Daily Demand	L/day	272,347	244,855	255,585	373,769	181,130	1,327,686
	L/s	**3.2**	**2.8**	**3.0**	**4.3**	**2.1**	**15.4**
Maximum Day Factor	-	1.8	1.8	1.8	1.8	1.8	1.8
Peak Hour Factor	-	3.0	3.0	3.0	3.0	3.0	3.0
Maximum Daily Flow	L/day	490,224	440,739	460,053	672,785	326,034	2,389,835
	L/s	**5.7**	**5.1**	**5.3**	**7.8**	**3.8**	**27.7**
Peak Hour Flow	L/day	817,040	734,566	766,755	1,121,308	543,389	3,983,058
	L/s	**9.5**	**8.5**	**8.9**	**13.0**	**6.3**	**46.1**

*Each building includes an equal portion of the total amenity equivalent population.

References

2020 Region of Peel Water and Wastewater Master Plan Volume 3, Section 2.2, Table 1.

CROZIER CONSULTING ENGINEERS

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation
Building 1

Designed By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/14/2022

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

750	sq.m	25% of each of the immediately adjoining floor above
3000	sq.m	area of largest floor
716	sq.m	25% of each of the immediately adjoining floor below

A =	4,466	sq.m.	
C =	0.6		Fire-resistive construction

Therefore F = 8,821 L/min

Fire flow determined above shall not exceed:

30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	-25%

-2,205 L/min reduction
6,616 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Complete automatic sprinklers	-50%

-3,308 L/min reduction

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%	> 45 m	0%

Exposed buildings

Direction	Name	Distance	Charge	Surcharge (L/min)
Construction N	Building 4	30.1 to 45 m	5%	331
Construction S	n/a	> 45 m	0%	0
Construction E	Building 2	20.1 to 30 m	10%	662
Construction W	Building 5	20.1 to 30 m	10%	662
				1,654 L/min Surcharge

Determine Required Fire Flow

No.1	8,821		
No. 2	-2,205	reduction	
No. 3	-3,308	reduction	
No. 4	1,654	surcharge	
Required Flow:	**4,962**	**L/min**	
Rounded to nearest 1000 L/min:	**5,000**	**L/min** or	83.3 L/s
			1,321 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation
Building 2

Designed By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/14/2022

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

613	sq.m	25% of each of the immediately adjoining floor above
2451	sq.m	area of largest floor
577	sq.m	25% of each of the immediately adjoining floor below

A = 3,641 sq.m.
C = 0.6 Fire-resistive construction

Therefore F = 7,965 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	-25%

-1,991 L/min reduction
5,973 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Complete automatic sprinklers	-50%

-2,987 L/min reduction

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%	> 45 m	0%

Exposed buildings

Direction	**Name**	**Distance**	**Charge**	**Surcharge (L/min)**
Construction N	Building 3	10.1 to 20 m	15%	896
Construction S	Existing	20.1 to 30 m	10%	597
Construction E	n/a	> 45 m	0%	0
Construction W	Building 1	20.1 to 30 m	10%	597
				2,091 L/min Surcharge

Determine Required Fire Flow

No.1	7,965		
No. 2	-1,991	reduction	
No. 3	-2,987	reduction	
No. 4	2,091	surcharge	
Required Flow:	**5,077**	**L/min**	
Rounded to nearest 1000 L/min:	**5,000**	**L/min** or	83.3 L/s
			1,321 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation
Building 3

Designed By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/14/2022

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

647	sq.m	25% of each of the immediately adjoining floor above
2587	sq.m	area of largest floor
608	sq.m	25% of each of the immediately adjoining floor below

A = 3,841 sq.m.
C = 0.6 Fire-resistive construction

Therefore F = 8,181 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	-25%

-2,045 L/min reduction
6,136 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Complete automatic sprinklers	-50%

-3,068 L/min reduction

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%	> 45 m	0%

Exposed buildings

Direction	Name	Distance	Charge	Surcharge (L/min)
Construction N	Existing	10.1 to 20 m	15%	920
Construction S	Building 2	10.1 to 20 m	15%	920
Construction E	Existing	30.1 to 45 m	5%	307
Construction W	Building 4	10.1 to 20 m	15%	920
				3,068 L/min Surcharge

Determine Required Fire Flow

No.1	8,181	
No. 2	-2,045	reduction
No. 3	-3,068	reduction
No. 4	3,068	surcharge
Required Flow:	**6,136 L/min**	
Rounded to nearest 1000 L/min:	**6,000 L/min**	or 100.0 L/s 1,585 USGPM

Required Duration of Fire Flow

Flow Required L/min		Duration (hours)
2,000 or less		1.0
	3,000	1.25
	4,000	1.5
	5,000	1.75
	6,000	2.0
	8,000	2.0
	10,000	2.0
	12,000	2.5
	14,000	3.0
	16,000	3.5
	18,000	4.0
	20,000	4.5
	22,000	5.0
	24,000	5.5
	26,000	6.0
	28,000	6.5
	30,000	7.0
	32,000	7.5
	34,000	8.0
	36,000	8.5
	38,000	9.0
40,000 and over		9.5

CROZIER CONSULTING ENGINEERS

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation
Building 4

Designed By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/14/2022

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

746	sq.m	25% of each of the immediately adjoining floor above
3066	sq.m	area of largest floor
767	sq.m	25% of each of the immediately adjoining floor below

A = 4,579 sq.m.
C = 0.6 Fire-resistive construction

Therefore F = 8,932 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	-25%

-2,233 L/min reduction
6,699 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Complete automatic sprinklers	-50%

-3,349 L/min reduction

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%	> 45 m	0%

Exposed buildings

Direction	**Name**	**Distance**	**Charge**	**Surcharge (L/min)**
Construction N	n/a	> 45 m	0%	0
Construction S	Building 5	10.1 to 20 m	15%	1005
Construction E	Building 3	10.1 to 20 m	15%	1005
Construction W	Existing	10.1 to 20 m	15%	1005
				3,014 L/min Surcharge

Determine Required Fire Flow

No.1	8,932	
No. 2	-2,233	reduction
No. 3	-3,349	reduction
No. 4	3,014	surcharge
Required Flow:	**6,364**	**L/min**
Rounded to nearest 1000 L/min:	**6,000**	**L/min** or 100.0 L/s 1,585 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation
Building 5

Designed By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/14/2022

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Buildings

458	sq.m	25% of each of the immediately adjoining floor above
1832	sq.m	area of largest floor
458	sq.m	25% of each of the immediately adjoining floor below

A = 2,748 sq.m.
C = 0.6 Fire-resistive construction

Therefore F = 6,919 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	-25%

-1,730 L/min reduction
5,189 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Complete automatic sprinklers	-50%

-2,595 L/min reduction

12563 & 12599 Hwy 50 & 2 Industrial Road
Fire Protection Volume Calculation

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%	> 45 m	0%

Exposed buildings

Direction	Name	Distance	Charge	Surcharge (L/min)
Construction N	Building 4	10.1 to 20 m	15%	778
Construction S	n/a	> 45 m	0%	0
Construction E	Building 1	20.1 to 30 m	10%	519
Construction W	Existing	10.1 to 20 m	15%	778
				2,076 L/min Surcharge

Determine Required Fire Flow

No.1	6,919		
No. 2	-1,730	reduction	
No. 3	-2,595	reduction	
No. 4	2,076	surcharge	
Required Flow:	**4,670 L/min**		
Rounded to nearest 1000 L/min:	**5,000 L/min**	or	83.3 L/s 1,321 USGPM

Required Duration of Fire Flow

Flow Required L/min		Duration (hours)
2,000 or less		1.0
	3,000	1.25
	4,000	1.5
	5,000	1.75
	6,000	2.0
	8,000	2.0
	10,000	2.0
	12,000	2.5
	14,000	3.0
	16,000	3.5
	18,000	4.0
	20,000	4.5
	22,000	5.0
	24,000	5.5
	26,000	6.0
	28,000	6.5
	30,000	7.0
	32,000	7.5
	34,000	8.0
	36,000	8.5
	38,000	9.0
40,000 and over		9.5

Connection Demand Table

12563 & 12599 Highway 50 & 2 Industrial Road, Town of Caledon

WATER CONNECTION

Connection point [3] Existing 300 mm diameter watermain on Highway 50			
Pressure zone of connection point		Zone 6	
Total equivalent population to be serviced [1]		4917 persons	
Total lands to be serviced		3.52 ha	
Hydrant flow test			
Hydrant flow test location			
Test #1 – 12566 Highway 50, Caledon			
	Pressure (kPa)	Flow (in l/s)	Time
Minimum water pressure	68.95	461.06	
Maximum water pressure	137.90	506.17	
Hydrant flow test location			
Test #2 – 2 Industrial Drive, Caledon			
Minimum water pressure	68.95	454.18	
Maximum water pressure	137.90	497.78	

No.	Proposed Water Demands		
	Demand type	**Demand**	**Units**
1	Average day flow	15.4	l/s
2	Maximum day flow	27.7	l/s
3	Peak hour flow	46.1	l/s
4	Fire flow [2]	100	l/s
Analysis			
5	Maximum day plus fire flow	127.7	l/s

WASTEWATER CONNECTION

Connection point [4]		Existing 250 mm diameter sanitary sewer on Highway 50
Total equivalent population to be serviced		4917
Total lands to be serviced		3.52 ha
6	Wastewater sewer effluent (in l/s)	54.6

[1] Please refer to design criteria for population equivalencies
[2] Please reference the Fire Underwriters Survey Document
[3] Please specify the connection point ID
[4] Please specify the connection point (wastewater line or manhole ID)
Also, the “total equivalent population to be serviced” and the “total lands to be serviced” should reference the connection point. (the FSR should contain one copy of Site Servicing Plan)

Please include the graphs associated with the hydrant flow test information table
Please provide Professional Engineer's signature and stamp on the demand table
All required calculations must be submitted with the demand table submission.

Mark DiConstanzo
12599 Hwy 50 Ltd.
91 Parr Boulevard
Bolton, Ontario
L7E 4E3

November 9th, 2020

RE: Fire Flow Testing Hwy 50 and Industrial Road, Bolton, ON

Watermark has conducted two fire flow tests near the intersection of Highway 50 and Industrial Road, Town of Bolton, Caledon. The testing was completing in accordance with NFPA 291. Region of Peelwater operations staff were on hand to assist.

Test #1 - 12566 Highway 50

Static pressure prior to the test was observed to be 73 PSI. Using 2 x 2.5" ports on one flow hydrant, and 1 x 4" port on a second flow hydrant, a maximum flow rate of 3050 USGPM was achieved. This provided an 14% pressure drop, to 62.5 PSI.

Test #2 - 2 Industral Road

Static pressure prior to the test was observed to be 74 PSI. Using 2 x 2.5" ports on one flow hydrant, and 1 x 4" port on a second flow hydrant, a maximum flow rate of 3050 USGPM was achieved. This provided an 15% pressure drop, to 63 PSI.

Althought the minimum required pressure drop was not acheived (25% of static), the high flow rate acheived provides increased confidence in the projected flow rates and subsequent ratings.

Equipment:

Flow: 1 x 4" HoseMonster with integrated 4" Pitotless Nozzle
Flow: 2 x 2.5" HoseMonster with integrated 2" Pitotless Nozzle
Pressure: HYDREKA Octopus LX Data Logger w/ 20 bar integrated pressure sensor

We strongly feel that all attempts have been made to ensure that the required data as stipulated will be captured, stored and presented in an accurate, efficient and timely manner for the required period. We are pleased Watermark again as your data provider, and we look forward to working with you in the future.

Kind Regards,

Colin Powell

(519) 217-3439
colin.powell@watermark.ca

Watermark Solutions Limited
Unit 117
115 George Street
Oakville, Ontario
L6J 0A2
www.watermark.ca

Hydrant Flow Test Report

Date: 09-Nov-20 Time: 1:30 PM Operator: Colin Powell

Test Location: 12566 Highway 50 Project No.

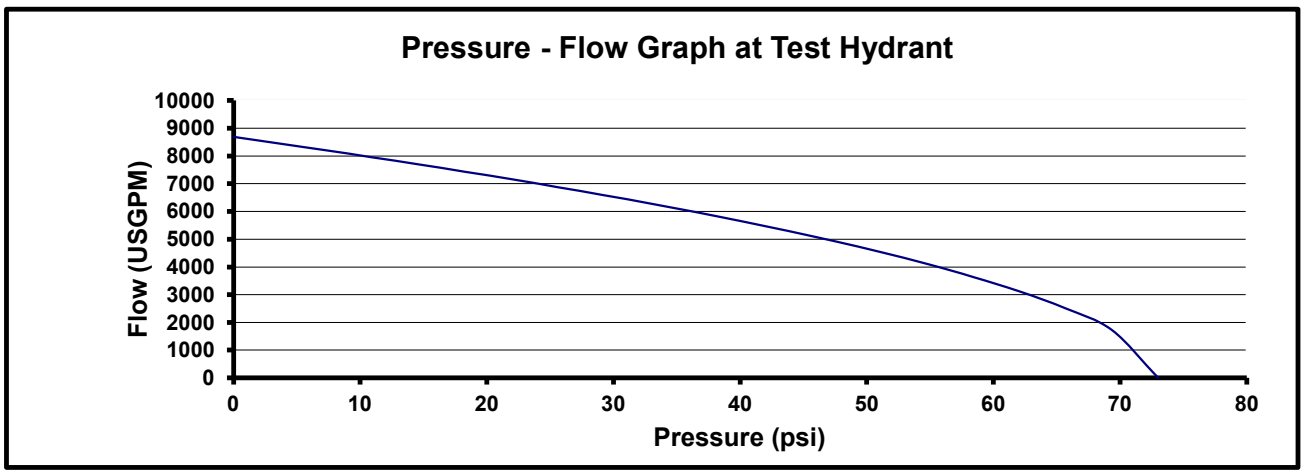
Test Number: 1
N.F.P.A. Colour Code: **BLUE**

STATIC PRESSURE: 73 psi Pressure Drop
RESIDUAL PRESSURE: 62.5 psi 14.4%

Flow Hydrants Location: A - 12544 Highway 50
B - 12525 Hwy 50 (on Industrial Road)

Hydrant No.	Flow Device	Outlet Dia. (in.)	Coefficient (~0.9)	Pitot Gauge Reading (psi)	Flow (USGPM)
A	Pitot	2.5	0.9	18	662
A	Pitot	2.5	0.9	18	662
B	HoseMonster	4"			1725
	TSI	2.5	0.9		
			Total Flow (USGPM)		3049

Available Flow At Test Hydrant at 20 psi 7308 USGPM 6039 IGPM
Available Flow At Test Hydrant at 10 psi 8023 USGPM 6630 IGPM



Comments/Discrepencies/Diagram:

Watermark Solutions Limited
(705) 250-0368 www.watermark.ca

Hydrant Flow Test Report

Date: 09-Nov-20 Time: 1:30 PM Operator: Colin Powell

Test Location: 2 Industrial Drive Project No.

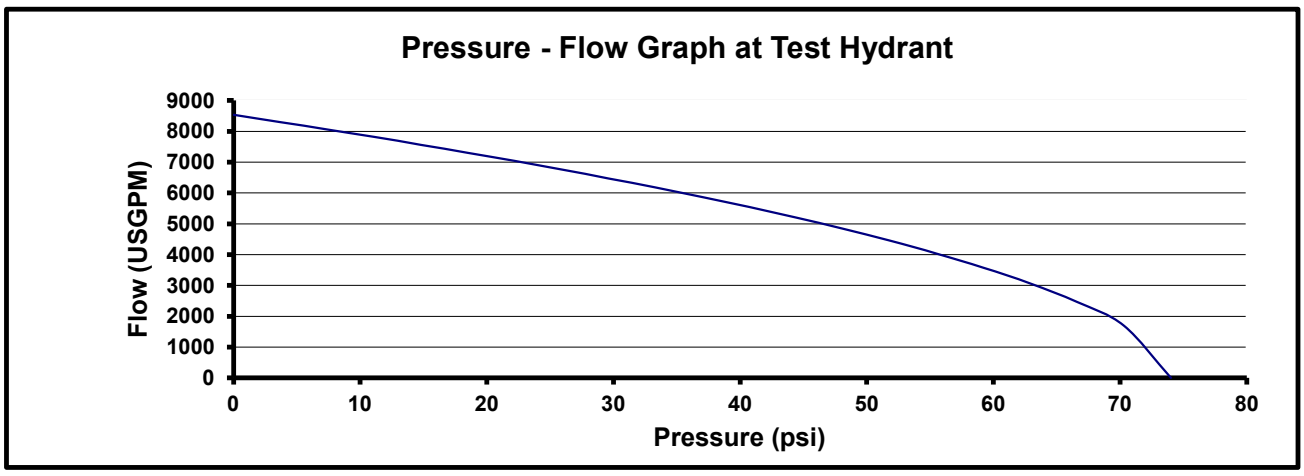
Test Number: 2
N.F.P.A. Colour Code: **BLUE**

STATIC PRESSURE: 74 psi Pressure Drop
RESIDUAL PRESSURE: 63 psi 14.9%

Flow Hydrants Location: A - 12544 Highway 50
B - 12525 Hwy 50 (on Industrial Road)

Hydrant No.	Flow Device	Outlet Dia. (in.)	Coefficient (~0.9)	Pitot Gauge Reading (psi)	Flow (USGPM)
A	Pitot	2.5	0.9	18	662
A	Pitot	2.5	0.9	18	662
B	HoseMonster	4"			1725
	TSI	2.5	0.9		
			Total Flow (USGPM)		3049

Available Flow At Test Hydrant at 20 psi 7199 USGPM 5949 IGPM
Available Flow At Test Hydrant at 10 psi 7890 USGPM 6521 IGPM



Comments/Discrepencies/Diagram:

Watermark Solutions Limited
(705) 250-0368 www.watermark.ca

From: Marczuk, Camila
To: Joanna Fast
Cc: MDiCostanzo@verdialliance.com
Subject: FW: OZ-21-003C - 12599 & 12563 Highway 50 - FSR Comments
Date: Friday, August 6, 2021 10:45:40 AM

Hello,

I do not have the contact information for the engineering consultants, please forward this email accordingly.

I have received and reviewed the FSR provided by Crozier & Associated Inc., dated February 2021. Based on the proposed development, the Region has capacity to service the proposed water demands.

However, the Region cannot service the proposed flows of 53.09 L/s from the proposed development into the 250mm sanitary sewer in Highway 50. The 900mm trunk sewer is able to service the proposed development via a new 250mm sewer along Industrial Road, which is to be constructed by the developer.

There are no new or future planned upgrades for the existing sanitary sewer within Highway 50 by the Region.

Please let me know if you would like to arrange a time to discuss this in further detail.

Regards,
Camila Marczuk

Technical Analyst, Servicing Connections
Development Services, Public Works, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, On L6T 4B9

camila.marczuk@peelregion.ca
905-791-7800, ext.8230

We have recently updated our website to better serve your needs. For information on Planning and Engineering matters of Regional interest, please visit this link : https://www.peelregion.ca/planning/about/devservices.htm . Let us know how we can serve you better

the email. Thank you.

APPENDIX C

Sanitary Sewage Design Flow Calculations

Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Prepared By: AR
Checked By: MB
Date: 2020-11-13
Revised: 2022-01-14

SANITARY CALCULATIONS - PROPOSED CONDITIONS
12563 & 12599 Hwy 50 & 2 Industrial Road

Total Site	**Units**	**Building 1**	**Building 2**	**Building 3**	**Building 4**	**Building 5**	**Total**
Average Daily Flow	L/cap/day	290	290	290	290	290	290
Equivalent Population	persons	1009	907	947	1384	671	4917
Average Daily Flow	L/day	292,520	262,993	274,517	401,456	194,547	1,426,033
	L/s	**3.4**	**3.0**	**3.2**	**4.6**	**2.3**	**16.5**
Harmon Peaking Factor (M) M = 1+(14/(4+p^0.5))	-	3.80	3.83	3.82	3.70	3.91	3.25
Peak Flow	L/day	1,110,868	1,006,465	1,047,348	1,487,190	759,731	4,637,038
	L/s	**12.9**	**11.6**	**12.1**	**17.2**	**8.8**	**53.7**
Infiltration	cms/ha	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
	ha	0.70	0.70	0.70	0.70	0.70	3.52
	L/s	**0.18**	**0.18**	**0.18**	**0.18**	**0.18**	**0.92**
Peak Hour Flow	**L/s**	**13.0**	**11.8**	**12.3**	**17.4**	**9.0**	**54.6**

References

2020 Region of Peel Water and Wastewater Master Plan Volume 3, Section 2.2, Table 1.

Total peak flow based on Harmon Peaking Factor using the total population.

Infiltration area assumed to be uniform across all buildings.

Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Prepared By: AR
Checked By: MB
Date: 2020-11-13
Revised: 2022-01-14

CUMULATIVE SANITARY CALCULATIONS - PROPOSED CONDITIONS
12563 & 12599 Hwy 50 & 2 Industrial Road

Total Site	**Units**	**Building 1**	**Buildings 1-2**	**Buildings 1-3**	**Buildings 1-4**	**Buildings 1-5**	**Total**
Average Daily Flow	L/cap/day	290	290	290	290	290	290
Cumulative Population	persons	1009	1916	2862	4247	4917	4917
Average Daily Flow	L/day	292,520	555,513	830,030	1,231,486	1,426,033	1,426,033
	L/s	**3.4**	**6.4**	**9.6**	**14.3**	**16.5**	**16.5**
Harmon Peaking Factor (M) M = 1+(14/(4+p^0.5))	-	3.80	3.60	3.46	3.31	3.25	3.25
Peak Flow	L/day	1,110,868	2,000,002	2,871,639	4,076,173	4,637,038	4,637,038
	L/s	**12.9**	**23.1**	**33.2**	**47.2**	**53.7**	**53.7**
Infiltration	cms/ha	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
	ha	0.70	1.41	2.11	2.82	3.52	3.52
	L/s	**0.18**	**0.37**	**0.55**	**0.73**	**0.92**	**0.92**
Peak Hour Flow	**L/s**	**13.0**	**23.5**	**33.8**	**47.9**	**54.6**	**54.6**

References

2020 Region of Peel Water and Wastewater Master Plan Volume 3, Section 2.2, Table 1.

Total peak flow based on Harmon Peaking Factor using the total population.

Infiltration area assumed to be uniform across all buildings.

APPENDIX D

Stormwater Management Calculations

Project: 12563 & 12599 Hwy 50
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/26/2022

Preliminary Modified Rational Calculations - Input Parameters

Storm Data: Caledon

Time of Concentration: T_c = **10** **min** (per city of Town of Caledon standards)

Return Period	A	B	C	I (mm/hr)
2 yr	1,070	7.85	0.8759	85.72
5 yr	1,593	11.00	0.8789	109.68
10 yr	2,221	12.00	0.9080	134.16
25 yr	3,158	15.00	0.9335	156.47
50 yr	3,886	16.00	0.9495	176.19
100 yr	4,688	17.00	0.9624	196.54

Pre-Development Conditions

Catchment 101: Highway 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**[1]	**Drainage Node**
Gravel	1.11	11,120	0.90	0.78	Highway 50
Impervious	0.16	1,630	0.90	0.12	
Sub total	**1.28**	**12,750**	**-**	**0.50**	
Catchment 102: Industrial Road					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**[1]	**Drainage Node**
Gravel	2.14	21,350	0.90	0.86	Industrial Road
Impervious	0.10	1,030	0.90	0.04	
Sub total	**2.24**	**22,380**	**-**	**0.50**	
Overall	**3.51**	**35,130**	**-**	**0.50**	-

[1] Conservatively limited to a runoff coefficient of 0.50

Project: 12563 & 12599 Hwy 50
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/26/2022

Preliminary Modified Rational Calculations - Input Parameters

Post-Development Conditions

Catchment 201: Highway 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**[1]	**Drainage Node**
Pervious	0.13	1,300	0.25	0.03	Highway 50
Impervious	1.17	11,700	0.90	0.81	
Subtotal	**1.30**	**13,000**	**-**	**0.90**	

1420
11580

Catchment 202: Industrial Road					
Land Use	**Area** (ha)	**Area** (m^2)	`	**Weighted Average C**[1]	**Drainage Node**
Pervious	0.21	2,090	0.25	0.03	Industrial Road
Impervious	1.88	18,810	0.90	0.81	
Sub total	**2.09**	**20,900**	**-**	**0.90**	

UC1: Uncontrolled Highway 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**	**Drainage Node**
Pervious	0.0005	5	0.25	0.01	Highway 50
Impervious	0.015	146	0.90	0.87	
Sub total	**0.015**	**150**	**-**	**0.88**	

UC2: Uncontrolled Highway 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**	**Drainage Node**
Pervious	0.0006	6	0.25	0.01	Highway 50
Impervious	0.014	144	0.90	0.86	
Sub total	**0.015**	**150**	**-**	**0.87**	

UC3: Uncontrolled Industrial 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**	**Drainage Node**
Pervious	0.0147	147	0.25	0.09	Industrial Road
Impervious	0.028	283	0.90	0.59	
Sub total	**0.043**	**430**	**-**	**0.68**	

UC4: Uncontrolled Industrial 50					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**	**Drainage Node**
Pervious	0.0130	130	0.25	0.06	Industrial Road
Impervious	0.037	370	0.90	0.67	
Sub total	**0.050**	**500**	**-**	**0.73**	
Overall	**3.51**	**35,130**	**-**	**0.89**	-

[1] Conservatively assigned to a runoff coefficient 0.90.

Equations:

Peak Flow
$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Intensity
$$i(T_d) = A / (T + B)^{\wedge}C$$

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Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 1/22/2021
Updated: 1/26/2022

Modified Rational Calculations - Peak Flow Summary

Peak Flows to Highway 50

Peak Flow
$Q_{post} = 0.0028 \cdot C_{post} \cdot i(T_d) \cdot A$

Pre-Development

Catchment 101

Storm Event	C	i (mm/hr)	A (ha)	Q (m^3/s)	Q (L/s)
2 yr	0.50	85.72	1.28	0.153	153.01
5 yr	0.50	109.68		0.196	195.77
10 yr	0.50	134.16		0.239	239.48
25 yr	0.50	156.47		0.279	279.30
50 yr	0.50	176.19		0.315	314.50
100 yr	0.50	196.54		0.351	350.82

Post-Development

Catchment 201

Storm Event	C	i (mm/hr)	A (ha)	Q (m^3/s)	Q (L/s)
2 yr	0.90	85.72	1.30	0.281	280.8
5 yr	0.90	109.68		0.359	359.3
10 yr	0.90	134.16		0.440	439.5
25 yr	0.90	156.47		0.513	512.6
50 yr	0.90	176.19		0.577	577.2
100 yr	0.90	196.54		0.644	643.9

UC1

Storm Event	C	i (mm/hr)	A (ha)	Q (m^3/s)	Q (L/s)
2 yr	0.88	85.72	0.015	0.003	3.2
5 yr	0.88	109.68		0.004	4.1
10 yr	0.88	134.16		0.005	5.0
25 yr	0.88	156.47		0.006	5.8
50 yr	0.88	176.19		0.007	6.5
100 yr	0.88	196.54		0.007	7.3

UC2

Storm Event	C	i (mm/hr)	A (ha)	Q (m^3/s)	Q (L/s)
2 yr	0.87	85.72	0.015	0.003	3.1
5 yr	0.87	109.68		0.004	4.0
10 yr	0.87	134.16		0.005	4.9
25 yr	0.87	156.47		0.006	5.7
50 yr	0.87	176.19		0.006	6.5
100 yr	0.87	196.54		0.007	7.2

Total to Highway 50

Storm Event	C	i (mm/hr)	A (ha)	Q (m^3/s)	Q (L/s)
2 yr	0.90	85.72	1.33	0.287	287.1
5 yr	0.90	109.68		0.367	367.4
10 yr	0.90	134.16		0.449	449.4
25 yr	0.90	156.47		0.524	524.1
50 yr	0.90	176.19		0.590	590.2
100 yr	0.90	196.54		0.658	658.3

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Modified Rational Calculations - Peak Flow Summary

Peak Flows to Industrial Road

Pre-Development

Catchment 102					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.50	85.72	2.24	0.269	268.57
5 yr	0.50	109.68		0.344	343.64
10 yr	0.50	134.16		0.420	420.36
25 yr	0.50	156.47		0.490	490.26
50 yr	0.50	176.19		0.552	552.04
100 yr	0.50	196.54		0.616	615.79

Post-Development

Catchment 202					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.90	85.72	2.09	0.451	451.5
5 yr	0.90	109.68		0.578	577.6
10 yr	0.90	134.16		0.707	706.6
25 yr	0.90	156.47		0.824	824.1
50 yr	0.90	176.19		0.928	928.0
100 yr	0.90	196.54		1.035	1035.1

UC3					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.68	85.72	0.043	0.007	7.0
5 yr	0.68	109.68		0.009	9.0
10 yr	0.68	134.16		0.011	11.0
25 yr	0.68	156.47		0.013	12.8
50 yr	0.68	176.19		0.014	14.4
100 yr	0.68	196.54		0.016	16.1

UC4					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.73	85.72	0.050	0.009	8.8
5 yr	0.73	109.68		0.011	11.2
10 yr	0.73	134.16		0.014	13.7
25 yr	0.73	156.47		0.016	16.0
50 yr	0.73	176.19		0.018	18.0
100 yr	0.73	196.54		0.020	20.1

Total to Industrial Road					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.89	85.72	2.18	0.467	467.2
5 yr	0.89	109.68		0.598	597.8
10 yr	0.89	134.16		0.731	731.3
25 yr	0.89	156.47		0.853	852.9
50 yr	0.89	176.19		0.960	960.4
100 yr	0.89	196.54		1.071	1071.3

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Checked By: MB
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Modified Rational Calculations - Summary

Catchments

Type	Area (ha)	Weighted Average C	Flows to Node
Pre-Development			
Catchment 101	1.28	0.50	Highway 50
Catchment 102	2.24	0.50	Industrial Road
Total	3.51	0.50	-
Post-Development			
Catchment 201	1.30	0.90	Highway 50
Catchment 202	2.09	0.90	Industrial Road
UC1	0.015	0.88	Highway 50
UC2	0.015	0.87	Highway 50
UC3	0.043	0.68	Industrial Road
UC4	0.050	0.73	Industrial Road
Total	3.51	0.89	-

Pre- and Post-Development Peak Flows to Highway 50 (L/s)

Storm Event	Pre-Development	Post-Development			
	Catchment 101	*Catchment 201 Pumping Discharge*	*UC1*	UC2	**Total Release Rate**
2 yr	153.0	50.0	3.2	3.1	56.3
5 yr	195.8	50.0	4.1	4.0	58.1
10 yr	239.5	50.0	5.0	4.9	59.9
25 yr	279.3	50.0	5.8	5.7	61.5
50 yr	314.5	50.0	6.5	6.5	63.0
100 yr	350.8	50.0	7.3	7.2	64.5

Pre- and Post-Development Peak Flows to Industrial Road (L/s)

Storm Event	Pre-Development	Post-Development			
	Catchment 101	*Catchment 202 Pumping Discharge*	*UC3*	UC4	**Total Release Rate**
2 yr	268.6	50.0	7.0	8.8	65.8
5 yr	343.6	50.0	9.0	11.2	70.2
10 yr	420.4	50.0	11.0	13.7	74.7
25 yr	490.3	50.0	12.8	16.0	78.8
50 yr	552.0	50.0	14.4	18.0	82.4
100 yr	615.8	50.0	16.1	20.1	86.2

Storage for Drainage to Highway 50 (Catchment 201)

Storm Event	Storage Required (m^3)	Maximum Storage Required (m^3)	Water Balance Retention Required (m^3)	Total Storage Required (m^3)	Total Storage Provided (m^3)
2 yr	171.9	667.1	48.0	715.0	715
5 yr	275.4				
10 yr	364.9				
25 yr	482.0				
50 yr	570.4				
100 yr	667.1				

Storage for Drainage to Industrial Road (Catchment 202)

Storm Event	Storage Required (m^3)	Maximum Storage Required (m^3)	Water Balance Retention Required (m^3)	Total Storage Required (m^3)	Total Storage Provided (m^3)
2 yr	171.9	1215.5	77.9	1293.4	1293
5 yr	532.8				
10 yr	686.8				
25 yr	897.6				
50 yr	1049.7				
100 yr	1215.5				

Project: 12563 & 12599 Hwy 50
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Catchment 201 Modified Rational Calculations - 2-Year Storm Event

Control Criteria

2 yr: Control Post-Development Peak Flows to Target Flow Rate

2 yr: Uncontrolled Post-Development Flow:

Q_{post}= 280.8 L/s

2 yr: Controlled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	85.72	600	0.281	138.5
15	69.05	900	0.226	158.6
20	58.06	1200	0.190	168.2
25	50.24	1500	0.165	171.9
30	44.38	1800	0.145	171.7
35	39.81	2100	0.130	168.9
40	36.14	2400	0.118	164.1
45	33.13	2700	0.109	158.0
50	30.60	3000	0.100	150.8
55	28.46	3300	0.093	142.7
60	26.62	3600	0.087	133.9
Required Storage Volume:				**171.9**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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Catchment 201 Modified Rational Calculations - 5-Year Storm Event

Control Criteria

5 yr: Control Post-Development Peak Flows to Target Flow Rate

5 yr: Uncontrolled Post-Development Flow:

Q_{post} = 359.30 L/s

5 yr: Controlled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	109.68	600	0.359	185.6
15	90.91	900	0.298	223.0
20	77.89	1200	0.255	246.2
25	68.29	1500	0.224	260.6
30	60.92	1800	0.200	269.2
35	55.06	2100	0.180	273.8
40	50.28	2400	0.165	275.4
45	46.32	2700	0.152	274.7
50	42.96	3000	0.141	272.2
55	40.09	3300	0.131	268.4
60	37.60	3600	0.123	263.4
Required Storage Volume:				**275.4**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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Catchment 201 Modified Rational Calculations - 10-Year Storm Event

Control Criteria

10 yr: Control Post-Development Peak Flows to Target Flow Rate

10 yr: Uncontrolled Post-Development Flow:

Q_{post} = 439.51 L/s

10 yr: Uncontrolled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	134.16	600	0.440	233.7
15	111.40	900	0.365	283.4
20	95.47	1200	0.313	315.3
25	83.68	1500	0.274	336.2
30	74.58	1800	0.244	349.8
35	67.34	2100	0.221	358.3
40	61.44	2400	0.201	363.0
45	56.52	2700	0.185	364.9
50	52.37	3000	0.172	364.7
55	48.81	3300	0.160	362.6
60	45.72	3600	0.150	359.2
Required Storage Volume:				**364.9**

Peak Flow
$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Storage
$$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$$

Project: 12563 & 12599 Hwy 50
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Catchment 201 Modified Rational Calculations - 25-Year Storm Event

Control Criteria

25 yr: Control Post-Development Peak Flows to Target Flow Rate

25 yr: Uncontrolled Post-Development Flow:

Q_{post}= 512.60 L/s

25 yr: Controlled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	156.47	600	0.513	277.6
15	131.98	900	0.432	344.1
20	114.29	1200	0.374	389.3
25	100.90	1500	0.331	420.8
30	90.39	1800	0.296	443.0
35	81.93	2100	0.268	458.6
40	74.95	2400	0.246	469.3
45	69.10	2700	0.226	476.2
50	64.13	3000	0.210	480.3
55	59.84	3300	0.196	482.0
60	56.11	3600	0.184	481.7
Required Storage Volume:				**482.0**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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Catchment 201 Modified Rational Calculations - 50-Year Storm Event

Control Criteria

50 yr: Control Post-Development Peak Flows to Target Flow Rate

50 yr: Uncontrolled Post-Development Flow:

Q_{post} = 577.20 L/s

50 yr: Controlled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	176.19	600	0.577	316.3
15	149.09	900	0.488	394.6
20	129.36	1200	0.424	448.5
25	114.33	1500	0.375	486.8
30	102.50	1800	0.336	514.4
35	92.93	2100	0.304	534.3
40	85.04	2400	0.279	548.6
45	78.40	2700	0.257	558.5
50	72.75	3000	0.238	565.0
55	67.88	3300	0.222	568.8
60	63.63	3600	0.208	570.4
65	59.90	3900	0.196	570.3
70	56.58	4200	0.185	568.6
75	53.63	4500	0.176	565.6
80	50.97	4800	0.167	561.5
85	48.57	5100	0.159	556.5
90	46.40	5400	0.152	550.8
95	44.41	5700	0.145	544.3
100	42.59	6000	0.140	537.1
105	40.92	6300	0.134	529.5
110	39.37	6600	0.129	521.3
115	37.94	6900	0.124	512.7
120	36.62	7200	0.120	503.7
Required Storage Volume:				**570.4**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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Catchment 201 Modified Rational Calculations - 100-Year Storm Event

Control Criteria

100 yr: Control Post-Development Peak Flows to Target Flow Rate

100 yr: Uncontrolled Post-Development Flow:

Q_{post} = 643.85 L/s

100 yr: Controlled Post-Development Flow:

Qpump = 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	196.54	600	0.644	356.3
15	166.89	900	0.547	447.1
20	145.13	1200	0.475	510.5
25	128.46	1500	0.421	556.3
30	115.28	1800	0.378	589.8
35	104.59	2100	0.343	614.6
40	95.75	2400	0.314	632.8
45	88.31	2700	0.289	646.1
50	81.95	3000	0.268	655.4
55	76.47	3300	0.251	661.7
60	71.69	3600	0.235	665.4
65	67.47	3900	0.221	667.1
70	63.74	4200	0.209	667.0
75	60.40	4500	0.198	665.4
80	57.40	4800	0.188	662.6
85	54.69	5100	0.179	658.7
90	52.23	5400	0.171	653.9
95	49.98	5700	0.164	648.3
100	47.93	6000	0.157	642.0
105	46.03	6300	0.151	635.1
110	44.29	6600	0.145	627.6
115	42.67	6900	0.140	619.6
120	41.17	7200	0.135	611.1
Required Storage Volume				**667.1**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d)$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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Catchment 202 Modified Rational Calculations - 2-Year Storm Event

Control Criteria

2 yr: Control Post-Development Peak Flows to Target Flow Rate

2 yr: Uncontrolled Post-Development Flow:

Q_{post}= 451.46 L/s

2 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	85.72	600	0.281	138.5
15	69.05	900	0.226	158.6
20	58.06	1200	0.190	168.2
25	50.24	1500	0.165	171.9
30	44.38	1800	0.145	171.7
35	39.81	2100	0.130	168.9
40	36.14	2400	0.118	164.1
45	33.13	2700	0.109	158.0
50	30.60	3000	0.100	150.8
55	28.46	3300	0.093	142.7
60	26.62	3600	0.087	133.9
Required Storage Volume:				**171.9**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

Project: 12563 & 12599 Hwy 50
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Catchment 202 Modified Rational Calculations - 5-Year Storm Event

Control Criteria

5 yr: Control Post-Development Peak Flows to Target Flow Rate

5 yr: Uncontrolled Post-Development Flow:

Q_{post} = 577.65 L/s

5 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	109.68	600	0.578	316.6
15	90.91	900	0.479	385.9
20	77.89	1200	0.410	432.3
25	68.29	1500	0.360	464.5
30	60.92	1800	0.321	487.5
35	55.06	2100	0.290	504.0
40	50.28	2400	0.265	515.6
45	46.32	2700	0.244	523.6
50	42.96	3000	0.226	528.8
55	40.09	3300	0.211	531.8
60	37.60	3600	0.198	532.8
Required Storage Volume:				**532.8**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

Project: 12563 & 12599 Hwy 50
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Created By: AR
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Catchment 202 Modified Rational Calculations - 10-Year Storm Event

Control Criteria

10 yr: Control Post-Development Peak Flows to Target Flow Rate

10 yr: Uncontrolled Post-Development Flow:

Q_{post} = 706.60 L/s

10 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	134.16	600	0.707	394.0
15	111.40	900	0.587	483.0
20	95.47	1200	0.503	543.4
25	83.68	1500	0.441	586.1
30	74.58	1800	0.393	617.1
35	67.34	2100	0.355	639.8
40	61.44	2400	0.324	656.6
45	56.52	2700	0.298	668.8
50	52.37	3000	0.276	677.4
55	48.81	3300	0.257	683.3
60	45.72	3600	0.241	686.8
Required Storage Volume:				**686.8**

Peak Flow
$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Storage
$$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$$

Project: 12563 & 12599 Hwy 50
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/26/2022

Catchment 202 Modified Rational Calculations - 25-Year Storm Event

Control Criteria

25 yr: Control Post-Development Peak Flows to Target Flow Rate

25 yr: Uncontrolled Post-Development Flow:

Q_{post}= 824.10 L/s

25 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	156.47	600	0.824	464.5
15	131.98	900	0.695	580.6
20	114.29	1200	0.602	662.4
25	100.90	1500	0.531	722.1
30	90.39	1800	0.476	767.0
35	81.93	2100	0.431	801.1
40	74.95	2400	0.395	827.4
45	69.10	2700	0.364	847.7
50	64.13	3000	0.338	863.3
55	59.84	3300	0.315	875.1
60	56.11	3600	0.296	883.9
Required Storage Volume:				**897.6**

Peak Flow
$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Storage
$$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$$

Project: 12563 & 12599 Hwy 50
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/26/2022

Catchment 202 Modified Rational Calculations - 50-Year Storm Event

Control Criteria

50 yr: Control Post-Development Peak Flows to Target Flow Rate

50 yr: Uncontrolled Post-Development Flow:

Q_{post} = 927.97 L/s

50 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	176.19	600	0.928	526.8
15	149.09	900	0.785	661.7
20	129.36	1200	0.681	757.6
25	114.33	1500	0.602	828.2
30	102.50	1800	0.540	881.7
35	92.93	2100	0.489	922.9
40	85.04	2400	0.448	954.9
45	78.40	2700	0.413	979.9
50	72.75	3000	0.383	999.5
55	67.88	3300	0.358	1014.8
60	63.63	3600	0.335	1026.5
Required Storage Volume:				**1049.7**

Peak Flow
$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Storage
$$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$$

Project: 12563 & 12599 Hwy 50
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 11/13/2020
Updated: 1/26/2022

Catchment 202 Modified Rational Calculations - 100-Year Storm Event

Control Criteria

100 yr: Control Post-Development Peak Flows to Target Flow Rate

100 yr: Uncontrolled Post-Development Flow:

Q_{post} = 1035.12 L/s

100 yr: Controlled Post-Development Flow:

Qpump= 0.050 m^3/s

Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
10	196.54	600	1.035	591.1
15	166.89	900	0.879	746.1
20	145.13	1200	0.764	857.2
25	128.46	1500	0.677	939.9
30	115.28	1800	0.607	1002.9
35	104.59	2100	0.551	1051.8
40	95.75	2400	0.504	1090.3
45	88.31	2700	0.465	1120.7
50	81.95	3000	0.432	1144.9
55	76.47	3300	0.403	1164.1
60	71.69	3600	0.378	1179.2
65	67.47	3900	0.355	1190.9
70	63.74	4200	0.336	1199.9
75	60.40	4500	0.318	1206.5
80	57.40	4800	0.302	1211.1
85	54.69	5100	0.288	1214.0
90	52.23	5400	0.275	1215.4
95	49.98	5700	0.263	1215.5
100	47.93	6000	0.252	1214.5
105	46.03	6300	0.242	1212.4
110	44.29	6600	0.233	1209.5
115	42.67	6900	0.225	1205.8
120	41.17	7200	0.217	1201.3
Required Storage Volume				**1215.5**

Peak Flow
$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d)$

Storage
$S_d = (Q_{uncont} - Q_{pump}) \bullet T_d$

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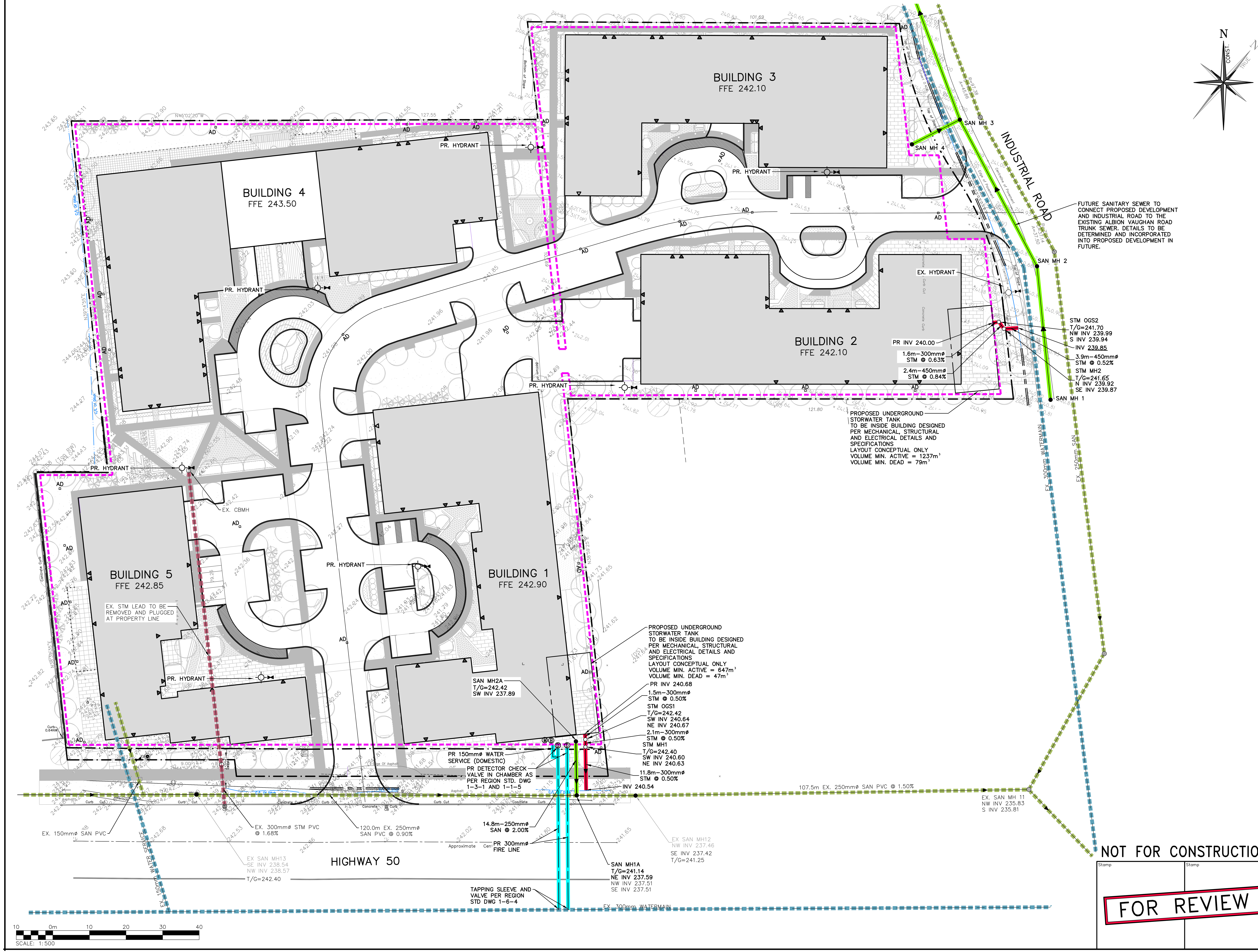
CONSULTING ENGINEERS

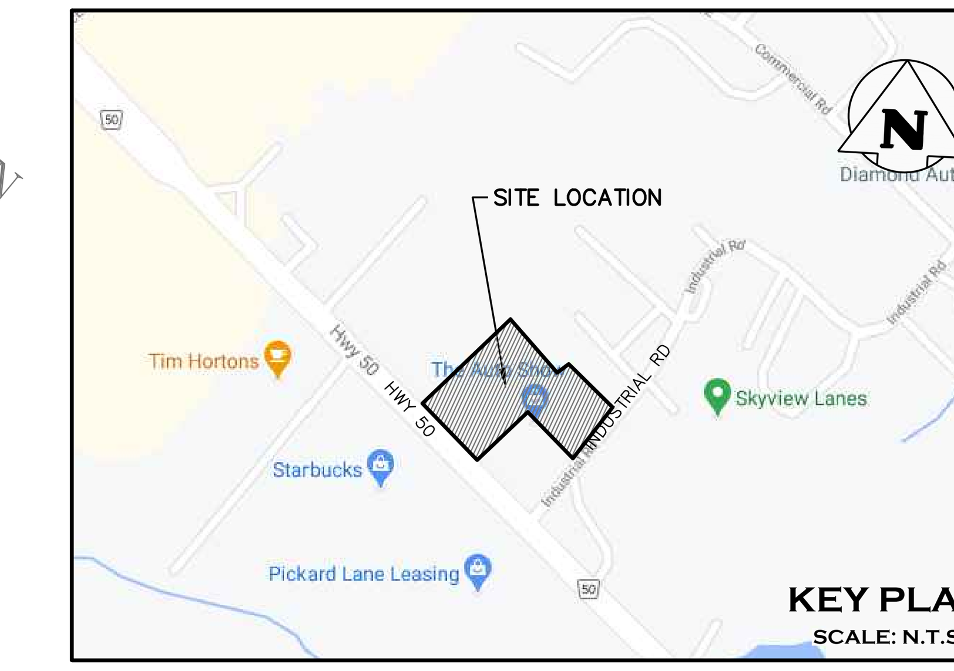
Project: 12563 & 12599 Hwy 50 & 2 Industrial Road
Project No.: 1986-5779
Created By: AR
Checked By: MB
Date: 1/26/2022

WATER BALANCE CALCULATIONS

Catchment	Land Use	Area (m^2)	Required Abstraction (mm)	Initial Abstraction (mm)	Abstraction Deficit (mm)	Water Balance Deficit (m^3)
Catchment 201	Impervious	11,700	5	1	4	46.8
	Pervious	1,300		5	0	0.0
Catchment 202	Impervious	18,810		1	4	75.2
	Pervious	2,090		5	0	0.0
UC1	Impervious	146		1	4	0.6
	Pervious	5		5	0	0.0
UC2	Impervious	144		1	4	0.6
	Pervious	6		5	0	0.0
UC3	Impervious	283		1	4	1.1
	Pervious	147		5	0	0.0
UC4	Impervious	370		1	4	1.5
	Pervious	130		5	0	0.0
Site Total		**35,130**	**175.7**	-	-	**125.8**

FIGURES


BUILDING 3
FFE 242.10
BUILDING 4
FFE 243.50
BUILDING 2
FFE 242.10
BUILDING 1
FFE 242.90
BUILDING 5
FFE 242.85
INDUSTRIAL ROAD
HIGHWAY 50
PR. HYDRANT
EX. HYDRANT
SAN MH 1
SAN MH 2
SAN MH 3
SAN MH 4
FUTURE SANITARY SEWER TO CONNECT PROPOSED DEVELOPMENT AND INDUSTRIAL ROAD TO THE EXISTING ALBION VAUGHAN ROAD TRUNK SEWER. DETAILS TO BE DETERMINED AND INCORPORATED INTO PROPOSED DEVELOPMENT IN FUTURE.
PROPOSED UNDERGROUND STORWATER TANK TO BE INSIDE BUILDING DESIGNED PER MECHANICAL, STRUCTURAL AND ELECTRICAL DETAILS AND SPECIFICATIONS LAYOUT CONCEPTUAL ONLY VOLUME MIN. ACTIVE = 1237m³ VOLUME MIN. DEAD = 79m³
PROPOSED UNDERGROUND STORWATER TANK TO BE INSIDE BUILDING DESIGNED PER MECHANICAL, STRUCTURAL AND ELECTRICAL DETAILS AND SPECIFICATIONS LAYOUT CONCEPTUAL ONLY VOLUME MIN. ACTIVE = 647m³ VOLUME MIN. DEAD = 47m³
EX. STM LEAD TO BE REMOVED AND PLUGGED AT PROPERTY LINE
EX. CBMH
107.5m EX. 250mmø SAN PVC @ 1.50%
EX. 150mmø SAN PVC
EX. 300mmø STM PVC @ 1.68%
120.0m EX. 250mmø SAN PVC @ 0.90%
14.8m–250mmø SAN @ 2.00%
PR 300mmø FIRE LINE
TAPPING SLEEVE AND VALVE PER REGION STD DWG 1-6-4
EX. 300mm WATERMAIN
PR 150mmø WATER SERVICE (DOMESTIC)
PR DETECTOR CHECK VALVE IN CHAMBER AS PER REGION STD. DWG 1-3-1 AND 1-1-5
SAN MH2A T/G=242.42 SW INV 237.89
SAN MH1A T/G=241.14 NE INV 237.59 NW INV 237.51 SE INV 237.51
EX SAN MH 11 NW INV 235.83 S INV 235.81
STM OGS2 T/G=241.70 NW INV 239.99 S INV 239.94
STM MH2 T/G=241.65 N INV 239.92 SE INV 239.87
SCALE: 1:500



LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN & GATE VALVE
- EXISTING STORM SEWER & MANHOLE
- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED WATERMAIN & GATE VALVE
- EXISTING FIRE HYDRANT & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- Ⓜ PROPOSED WATER METER PER MECHANICAL DETAILS AND SPECIFICATIONS
- Ⓑ PROPOSED BACK FLOW PREVENTOR PER MECHANICAL DETAILS AND SPECIFICATIONS
- Ⓓ PROPOSED DETECTOR CHECK VALVE IN CHAMBER INSTALLED PER MECHANICAL DESIGN AND SPECIFICATIONS
- PROPOSED STORM SEWER & MANHOLE
- AD□ PROPOSED AREA DRAIN PER MECHANICAL DETAILS AND SPECIFICATIONS
- PROPOSED SANITARY SEWER & MANHOLE

NOTE:
ALL STORM SEWER COMPLETE WITH INSULATION.

No.	ISSUE / REVISION	YYYY/MMM/DD
1.	ISSUED FOR SECOND SUBMISSION	2022/JAN/31
0.	ISSUED FOR SUBMISSION	2021/FEB/12

BENCHMARK:

TOWN OF CALEDON BM. No.758057
ELEVATION – 251.929 m

BEARING NOTE:

BEARING ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF PEEL STANDARD CONDOMINIUM PLAN, No.876, HAVING A BEARING OF N44°57'45"W.

SURVEY NOTES:

SURVEY COMPLETED BY COMPANY ERTL SURVEYORS (2020)
PROJECT No.: 20036

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY SRN ARCHITECTS
DRAWING No.: A110 & A301, (JANUARY 27, 2022)
PROJECT No.: S20023

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

NOT FOR CONSTRUCTION

Stamp

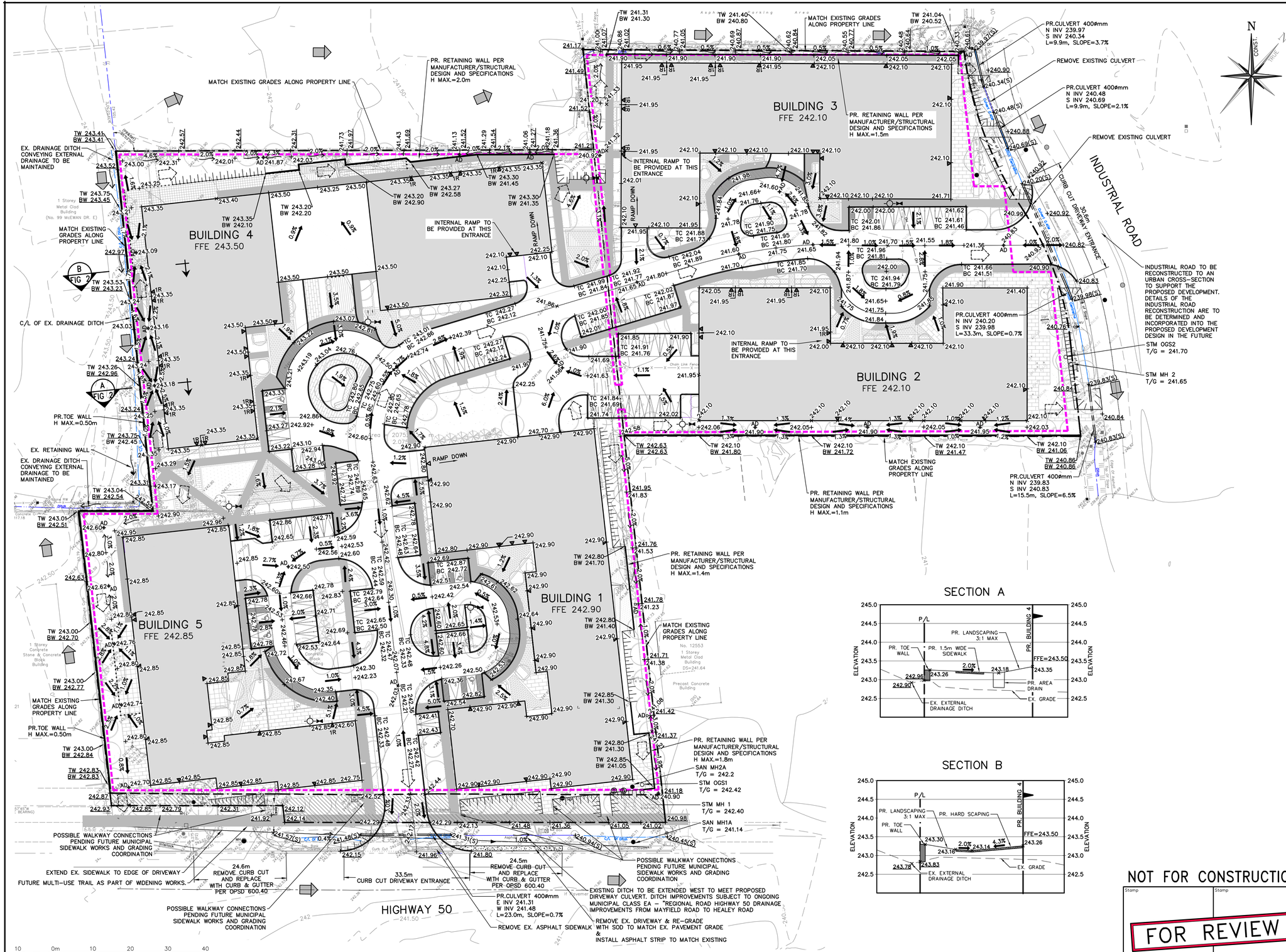
FOR REVIEW

Project
12563 & 12599 Hwy 50
& 2 INDUSTRIAL ROAD
TOWN OF CALEDON

Drawing
PRELIMINARY SITE SERVICING PLAN

CROZIER
CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
J.B.	J.B./M.B.	1986–5779	
Check M.B.	Check N.C.	Scale 1:500	Dwg. FIG_1



LEGEND

- PROPERTY LINE
- x215.00 EXISTING GRADE
- x215.00 PROPOSED GRADE
- x215.00 PROPOSED GRADE (TO MATCH EXISTING)
- 2.0% PROPOSED MINOR FLOW DIRECTION
- 2.0% PROPOSED GRASSED SWALE
- BUILDING ENTRANCE (PERSONNEL DOOR)
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING MAJOR OVERLAND FLOW DIRECTION
- EXISTING FIRE HYDRANT & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- UNDERGROUND PARKING
- AR PROPOSED AREA DRAIN PER MECHANICAL DETAILS AND SPECIFICATIONS
- (D) PROPOSED DETECTOR CHECK VALVE IN CHAMBER INSTALLED PER MECHANICAL DESIGN AND SPECIFICATIONS
- 2R PROPOSED RISERS TO BE INCORPORATED BY ARCHITECT
- PROPOSED CURB CUT
- FUTURE WIDENING LIMITS PER SITE PLAN
- PROPOSED TOE WALL & RETAINING WALL

SECTION A

SECTION B

NOT FOR CONSTRUCTION

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No.	ISSUE / REVISION	YYYY/MMM/DD
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0.	ISSUED FOR SUBMISSION	2021/FEB/12

BENCHMARK:

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PROJECT No.: S20023

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Project

12563 & 12599 Hwy 50
& 2 INDUSTRIAL ROAD
TOWN OF CALEDON

Drawing

PRELIMINARY SITE GRADING PLAN

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
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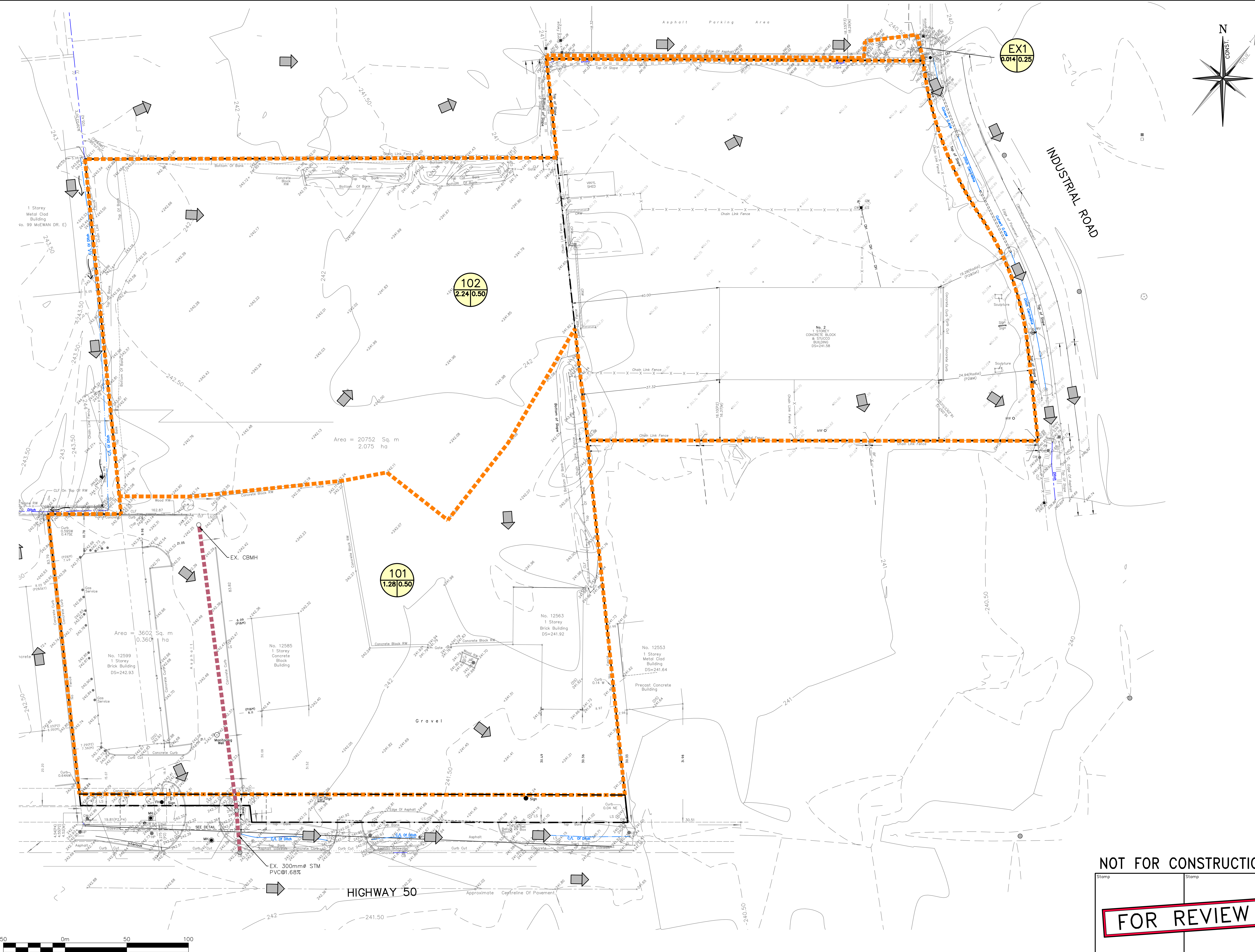
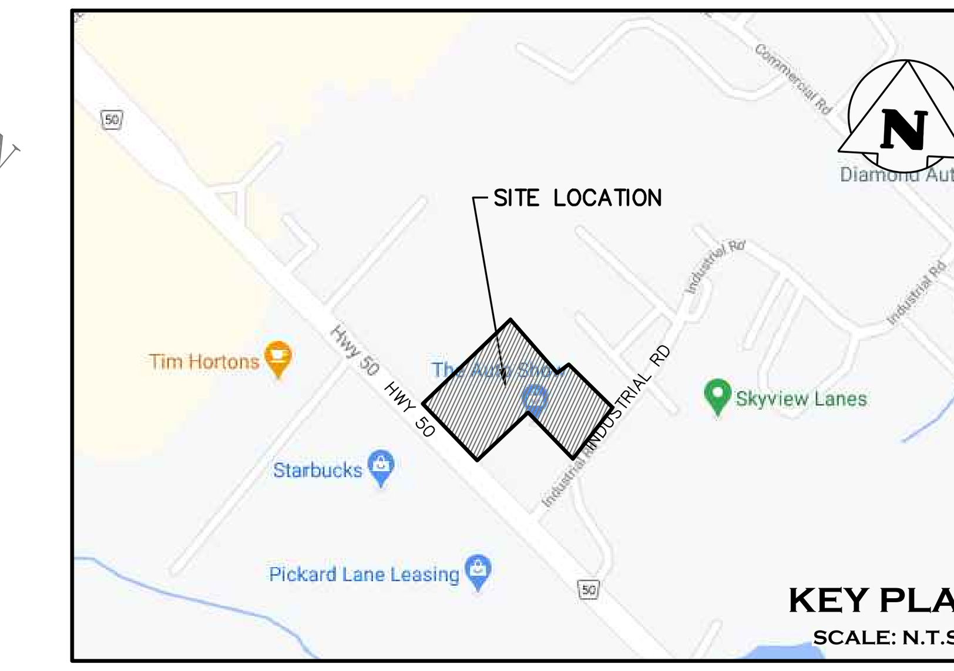
Drawn	Design	Project No.
J.B.	J.B./M.B.	1986-5779
Check	Check	Scale
M.B.	N.C.	1:500

Dwg. FIG_2





KEY PLAN
SCALE: N.T.S.

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- STORM DRAINAGE CATCHMENT
- CATCHMENT I.D. (ID)
- AREA (ha) | RUNOFF COEFFICIENT (A | RC)
- EXISTING STORM SEWER & MANHOLE

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BENCHMARK:

TOWN OF CALEDON BM. No.758057
ELEVATION – 251.929 m

BEARING NOTE:

BEARING ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF PEEL STANDARD CONDOMINIUM PLAN, No.876, HAVING A BEARING OF N44°57'45"W.

SURVEY NOTES:

SURVEY COMPLETED BY COMPANY ERTL SURVEYORS (2020)
PROJECT No.: 20036

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY SRN ARCHITECTS
DRAWING No.: A110 & A301, (JANUARY 27, 2022)
PROJECT No.: S20023

DRAWING NOTES:

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FOR REVIEW

Project

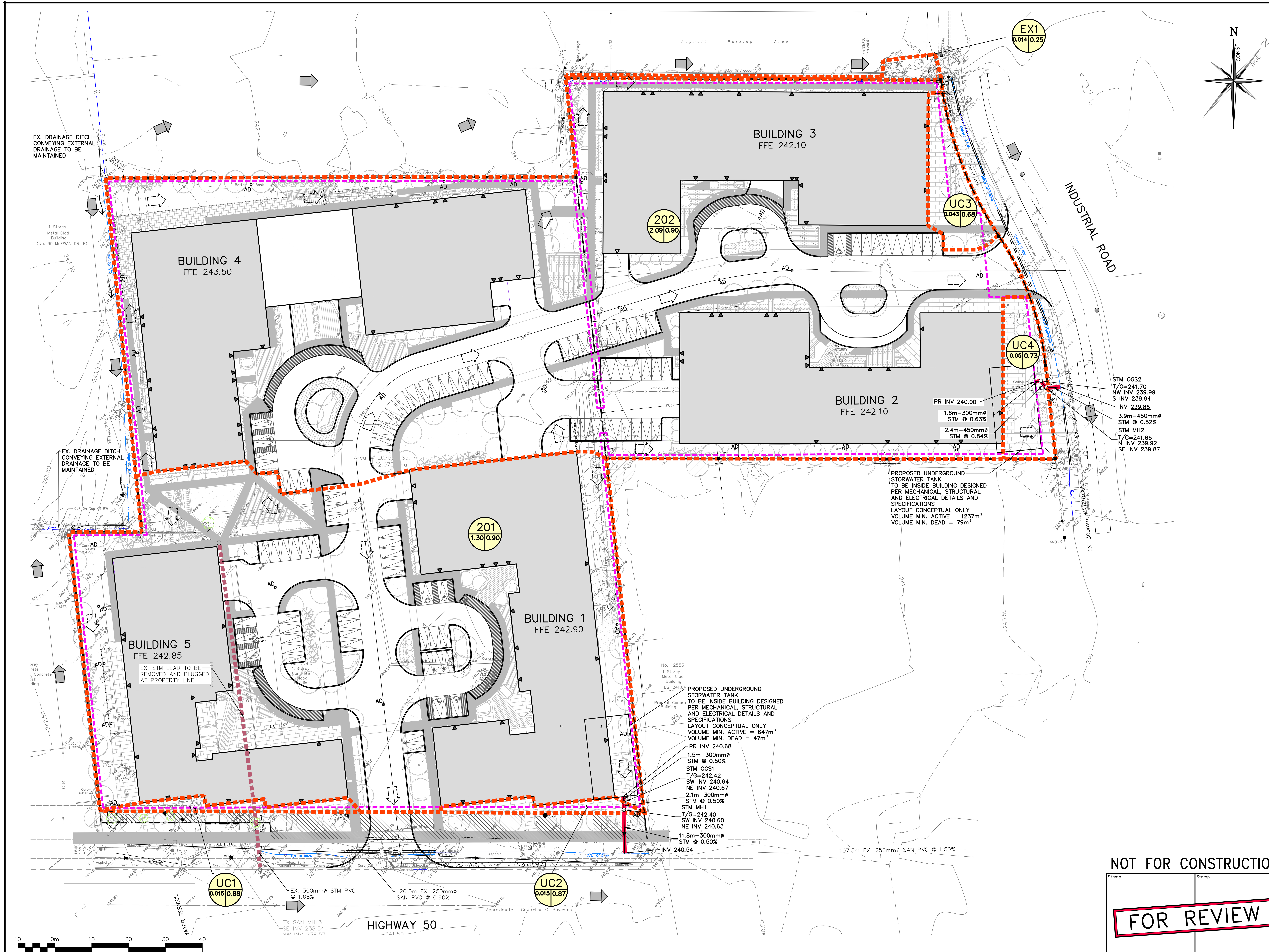
12563 & 12599 Hwy 50
& 2 INDUSTRIAL ROAD
TOWN OF CALEDON

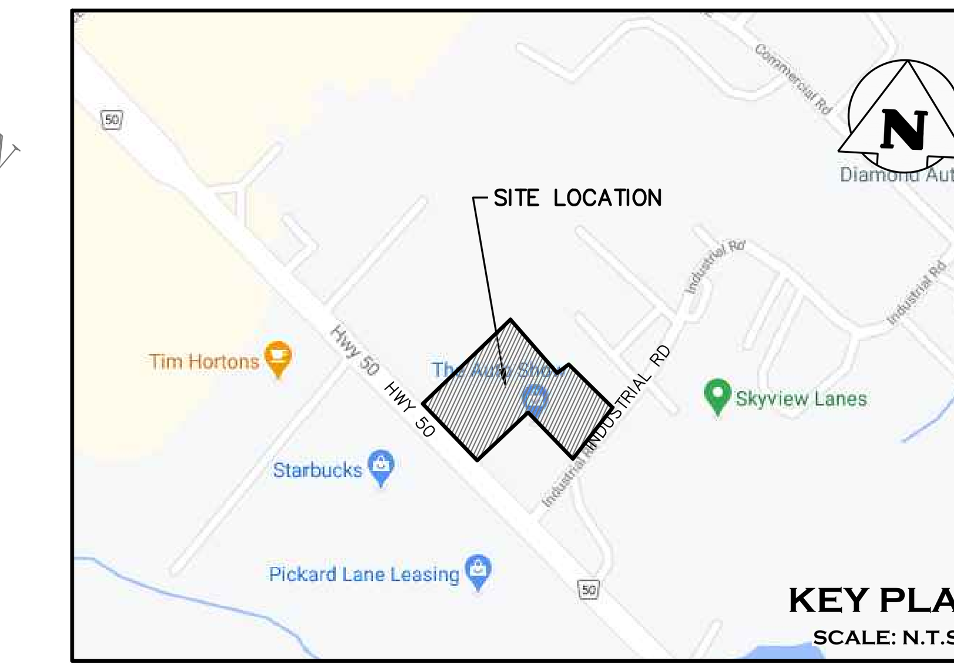
Drawing

PRE-DEVELOPMENT DRAINAGE PLAN

CROZIER
CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
J.B.	J.B./M.B.	1986–5779	
Check: M.B.	Check: N.C.	Scale: 1:500	Dwg.: FIG_ 3





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- STORM DRAINAGE CATCHMENT
- CATCHMENT I.D. — AREA (ha) | RUNOFF COEFFICIENT
- PROPOSED AREA DRAIN PER MECHANICAL DETAILS AND SPECIFICATIONS
- UNDERGROUND PARKING
- PROPOSED STORM SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE

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BENCHMARK:

TOWN OF CALEDON BM. No.758057
ELEVATION – 251.929 m

BEARING NOTE:

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SURVEY NOTES:

SURVEY COMPLETED BY COMPANY ERTL SURVEYORS (2020)
PROJECT No.: 20036

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SITE PLAN NOTES:

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DRAWING No.: A110 & A301, (JANUARY 27, 2022)
PROJECT No.: S20023

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Project

12563 & 12599 Hwy 50
& 2 INDUSTRIAL ROAD
TOWN OF CALEDON

Drawing

POST–DEVELOPMENT DRAINAGE PLAN

CROZIER
CONSULTING ENGINEERS
211 YONGE STREET
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TORONTO, ON M5B 1M4
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Drawn	Design	Project No.	
J.B.	J.B./M.B.	1986–5779	
Check: M.B.	Check: N.C.	Scale: 1:500	Dwg.: FIG_ 4