FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

1511 PLAINS ROAD WEST

CITY OF BURLINGTON

PREPARED FOR:

NEW HORIZON DEVELOPMENT GROUP

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
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DECEMBER 2024

CFCA FILE NO. 2472-6716

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	December 19, 2024	Issued for First Submission (ZBA)

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1.0 Introduction

C.F. Crozier & Associates Inc. was retained by New Horizon Development Group to prepare a Functional Servicing and Stormwater Management report to support the Zoning By-Law Amendment (ZBA) for the property located at 1511 Plains Road West in the City of Burlington. This report demonstrates that the proposed site can be developed in accordance with City of Burlington and Halton Region guidelines from a functional servicing and stormwater management perspective.

The following reports and design standards were referenced during the preparation of this report:

- Regional Municipality of Halton, Water & Wastewater Linear Design Manual, October 2019, Version 5.
- City of Burlington, Stormwater Management Design Guidelines, May 21, 2021.
- Ministry of the Environment, Design Guidelines for Sewage Works (PIBS 6879), 2008.
- Ministry of the Environment, Design Guidelines for Drinking-Water System (PIBS 6881e), 2008.
- Ministry of the Environment, Stormwater Management Planning & Design Manual (PIBS 4329e), March 2003.
- LANHACK Consultants Inc., Functional Servicing & Stormwater Management Report for Light-Duty Industrial (Mini-Storage) Development, 1497, 1499, 1505, & 1511 Old Plains Road West, Burlington, Ontario, June 15, 2018.
- Halton Region & City of Burlington - Water Supply Agreement, November 17, 2011.
- Fire Underwriters' Survey, Water Supply for Public Fire Protection, 2020.
- Halton Region & City of Burlington Record Drawings.
- Watermark Solutions Ltd., Hydrant flow Test Report, November 8, 2024.

2.0 Site Description

2.1 Existing Conditions

The existing property covers an area of approximately 1.18 ha. The site lies within a mixed land use area including both residential and commercial buildings and is bound by a carpool lot to the north, Old Plains Road West to the south, Plains Road West to the east and Highway No. 6 to the west. The proposed development area has no existing buildings and is primarily covered in grass and trees.

A.T. McLaren Limited was retained by New Horizon Development Group to prepare a topographic survey of the subject site. A copy of the topographic survey is included in **Appendix A** for reference. Additionally, record drawings obtained from Halton Region is included in **Appendix A** for reference.

2.2 Proposed Development Concept

The proposed development includes the construction of ten (10) residential townhouse blocks. There is a total of 75 residential units, one (1) at-grade parking space per home and eleven (11) at-grade visitor parking spaces. Site access will be provided via Old Plains Road West. Residential unit information was obtained from the latest site plan and statistics provided by Graziani + Corazza Architects (December 4, 2024), which is included in **Appendix A** for reference.

In post-development conditions, the site will dedicate an approximate 10 meters width (0.09 ha) along the western limit adjacent to Highway No. 6. The remaining site lands (1.09 ha) consist of a development area portion (0.96 ha) and a 14 meter wide Ministry of Transportation (MTO) setback (0.13 ha), which is adjacent to the land dedication along the west limit. All private blocks and proposed infrastructure will be within the development area (0.96 ha) of the site lands, while the MTO setback area (0.13 ha) will not include any underground and/or at-grade infrastructure.

The proposed population for the subject site was calculated using the equivalent population density factors from the Regional Municipality of Halton – Water and Wastewater Linear Design Manual (October 2019). **Table 1** below summarizes the proposed population for the subject property.

Table 1: Estimated Proposed Population Density

Unit Type	Number of Units	Development Area (ha)	Equivalent Population Density	Population
Townhomes	75	0.96	135	130
			Site Total	**130**

The total estimated population for the proposed development is 130 persons.

3.0 Water Servicing

The following section of the report analyses the existing and proposed water servicing demands for the subject site. The Regional Municipality of Halton – Water and Wastewater Linear Design Manual (October 2019) and the Fire Underwriters' Survey (FUS) was referenced to calculate the domestic and fire flow demands for the subject site.

3.1 Existing Water Servicing

Based on Halton Region record drawings, the following water services exists in the proximity of the subject property:

- A 150 mm diameter PVC watermain located along Old Plains Road West.
- A 300 mm diameter PVC watermain located along Plains Road West.

The location of the existing water services is shown on the Site Servicing Plan – C102.

Based on pre-development conditions, there is no existing water demand from the subject site.

3.2 Proposed Water Servicing

The proposed water service is to connect to the existing 300 mm diameter PVC watermain along Plains Road West and will consist of one (1) connection. The connection is proposed to be a 200 mm fire service watermain, which will split at the property line to provide a 150 mm domestic service watermain as per Halton Region standard drawing RH 409.010 (greater than 4.5m service).

The proposed fire and domestic water services will be equipped with a property line valve and box per Halton Region standards. A network of separate fire and domestic watermains is proposed to provide domestic flows and fire protection to all townhomes within the subject site. The proposed water metering, backflow preventers, and internal building water servicing will be installed per the mechanical details and specifications for each townhome respectively. The site is proposed to be serviced by private hydrants located around the development to provide full coverage of each townhouse block. Refer to the Site Servicing Plan - C102 for further details about the proposed watermain layout.

3.3 Domestic Water Demand

The domestic water demand for the subject site was calculated with reference to the Halton Region – Water and Wastewater Linear Design Manual – Section 2 (October 2019). An average residential daily water demand of 37.125 m^3/ha/day was used with the occupancy densities described in **Table 1**. A summary of the results is presented in **Table 2**, with detailed calculations provided in **Appendix B.**

Table 2: Proposed Domestic Water Demand

Land Use	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum Hourly Demand (L/s)
Residential	0.41	0.93	1.65

As shown in **Table 2**, it is proposed that following development will have an estimated maximum daily demand of 0.93 L/s and a maximum hourly demand of 1.65 L/s.

3.4 Fire Flow Demand

The FUS method was used to estimate the fire flow requirements for the proposed development. Flow requirements were calculated based on Type I – Fire Resistive Construction that considers the single largest townhouse with the most aggressive exposure factor. The estimated effective area was calculated to be 1,800 m^2, as calculated based on three (3) floors per townhouse as per the latest site statistics prepared by Graziani + Corazza Architect.

The proposed building is to be of fire-resistive construction containing limited-combustible contents with an automatic sprinkler protection system. Exposure charges were included in the calculations to account for neighboring townhomes in proximity to the most critical townhouse block. As a result, the fire flow demand is calculated to be 83.33 L/s (5,000 L/min). Detailed calculations are included in **Appendix B** for reference. Additionally, an email from the architect confirming the construction type and the sprinkler system has been included in **Appendix B** for reference.

Hydrant flow tests were performed by Watermark Solutions Ltd. on November 8th, 2024, on the existing 300 mm watermain along Plains Road West and on the existing 150 mm watermain along Old Plains Road West. The result from the hydrant flow test along Plains Road West indicates that at 20 psi residual pressure, a maximum of 85 L/s (1,352 USGPM) projected flow is available within the existing 300 mm diameter PVC watermain. A detailed report of the hydrant flow test is provided in **Appendix B**.

Based on the hydrant flow test result, the existing water network along Plains Road West does meet the required maximum day demand plus fire flow demand of 84.26 L/s at a residual pressure of 20 psi.

3.5 Bridgeview Community Water Supply Agreement

The City of Hamilton supplies water to the Bridgeview Community through a Water Supply Agreement between the City of Hamilton and Halton Region refer to **Appendix B** for extracts of the agreement. This agreement identifies a maximum rate of 1,000,000 L/day or 5,550 L/min to be supplied. Based on a review of the current land uses within the Bridgeview Community, it is estimated that there is a population of approximately 450 people, using Regional water demand criteria this equates to an approximate daily demand of 300,000 L/day.

The proposed development is estimated to generate an average daily demand of 35,424 L/day and a maximum day demand of 80,352 L/day. Therefore, it is anticipated that the proposed development does not exceed the maximum water supply rate under the conditions of the Water Supply Agreement.

4.0 Sanitary Servicing

The following section of the report analyses the existing and proposed sanitary servicing conditions for the subject site. The Halton Region – Water and Wastewater Linear Design Manual – Section 3 (October 2019) was referenced to calculate the existing and proposed sanitary demands for the subject site.

4.1 Existing Sanitary Servicing

Based on Halton Region record drawings, the following sanitary sewers exists in the proximity of the subject property:

- A 200 mm diameter sanitary sewer flowing northeast along Old Plains Road West.
- A 200 mm diameter sanitary sewer flowing southeast along Plains Road West.

The location of the existing sanitary services is shown on the Site Servicing Plan – C102.

Based on pre-development conditions, the existing sanitary demand within the subject site was calculated to be 0.34 L/s, which is strictly infiltration flow.

4.2 Design Sanitary Flow

A unit sewage flow of 0.275 m^3/capita/day was used with the occupancy densities described in **Table 1**. A modified peaking factor was applied to the unit sewage flow plus an infiltration flow was added to the resulting unit sewage flow to obtain the total estimated design sewage flow. **Table 3** below summarizes the results and **Appendix C** contains detailed design calculations.

Table 3: Proposed Sanitary Design Flows

Unit Sewage Flow (L/s)	**Modified Harmon Peaking Factor**	**Peak Flow** (L/s)	**Infiltration Flow** (L/s)	**Total Peak Flow** (L/s)
0.41	4.10	1.69	0.27	1.96

As shown in **Table 3**, the total peak sanitary flow for the proposed development is estimated to be 1.96 L/s.

4.3 Proposed Sanitary Servicing

The subject site is proposed to be serviced by a 200 mm diameter sanitary service connection to the existing 200 mm diameter sanitary sewer along Old Plains Road West. The proposed 200 mm diameter sanitary sewer connection includes a manhole within the Old Plains Road West right-of-way. A private network of 150-200 mm sanitary sewers is proposed throughout the site to provide sanitary drainage to all townhomes within the subject site. Residential units will be serviced with individual sanitary leads per Halton Region condominium/townhome standards. Plumbing internal to each residential unit shall be installed per mechanical details and specifications. Refer to the Site Servicing Plan – C102 for further details about the proposed sanitary layout.

A downstream sanitary drainage analysis was undertaken to confirm if the existing sanitary infrastructure downstream of the site can accommodate the proposed sanitary design flows. The Sanitary Drainage Area Plan (**Figure 1**) illustrates the sanitary drainage areas upstream and downstream of the proposed connection location and a sanitary sewer design sheet was prepared to check the capacity of the existing sewers.

As per the sanitary sewer design sheet included in **Appendix C**, all upstream and downstream sanitary sewers have adequate capacity to accommodate the sanitary design flows from the proposed development.

4.4 Bridgeview Community Sanitary Pump Station

The proposed development, as well as the Bridgeview Community, is tributary to the Bridgeview Sanitary Pumping Station located at Plains Road West and Spring Gardens Road. Based on the current Bridgeview population estimated at 450 people, a total average rate of 1.4 L/s and peak rate of 5.7 L/s is expected to be generated and discharged to the SPS. This is consistent with correspondence from rom Halton Region, which states an average inflow rate of 1.1 L/s. Additionally, Halton Region noted that the peak hourly rate of the SPS was observed during the October 20, 2011 rainfall event, at a rate of 13.3 L/s. Considering the average versus wet weather peak flow rate and that the SPS was originally constructed in 1964, the pumping station may be receiving a significant rate of stormwater (inflow and infiltration (I/I)) during wet weather events. An email from Halton Region is included in

Appendix C for reference. It is recommended that Halton Region provide current pump station data including during more recent wet weather events.

As described in Section 4.2, the proposed development is estimated to generate a peak sanitary design flow rate of 1.96 L/s which is within the SPS capacity during peak dry weather conditions. If wet weather flows conditions are still impacting station capacity, then catchment-wide flow monitoring and/or field investigations of the sewers and manholes may be able to identify sources of I/I. If these sources could be identified and removed, there is the potential to gain capacity within the Bridgeview Sanitary Pumping Station to service the subject development without requiring upgrades at the SPS itself. Removal of I/I sources to the pumping station would endeavor to, at minimum, offset the proposed development peak flow rate. Further discussion and review with Halton Region is requested prior to proceeding with field investigations.

5.0 Stormwater Drainage Conditions

5.1 Existing Drainage Conditions

As per the A.T. McLaren Limited topographic survey, the subject site currently comprises of vacant lot with grass and tree coverage. The land generally slopes from north to south.

Based on Halton Region record drawings, the following storm sewers exists in the proximity of the subject property:

- An existing ditch with a concrete storm culvert flowing southeast along the northern property limit fronting Plains Road West.
- An existing ditch flowing southeast along the southwestern property limit fronting Highway No. 6.
- An existing ditch flowing southwest along the southern property limit fronting Old Plains Road West.
- A 2.0x2.0m box culvert located perpendicular to the southern property limit fronting Old Plains Road West.

All the above-mentioned ditches and the subject site's overland storm flows are observed to drain to the existing 2.0x2.0m box culvert, which discharges to a drainage ditch located south of Old Plains Road West. The location of the existing ditches and storm culverts are shown on the Site Servicing Plan – C102.

Note that there are no external drainage areas that drain onto the subject site. The right-of-way of Plains Road West and Highway No. 6 drain independently towards the 2.0x2.0m box culvert and do not add to the drainage area of the proposed development.

Table 4 provides a breakdown of the pre-development site area and the associated runoff coefficient with the existing drainage conditions shown on the Pre-Development Drainage Plan (**Figure 2**).

Table 4: Pre-Development Land Areas & Runoff Coefficients

Catchment No.	Outlet Location	Pervious Area (ha) (RC = 0.25)	Weighted Runoff Coefficient (RC)
101 (Site Area)	Existing 2.0x2.0m Box Culvert	0.96	0.30
102 (Buffer Zone)	Existing 2.0x2.0m Box Culvert	0.22	0.30

5.2 Proposed Drainage Conditions

The site will be graded to promote overland storm drainage away from the buildings and conveyed to proposed catch basins within the private roadways. Storm sewers will then convey storm flows in a southernly direction through the site, which will ultimately discharge to the existing ditch along Old Plains Road West and be received by the 2.0x2.0m box culvert.

Table 5 provides a breakdown of the post-development site areas and associated runoff coefficient with the proposed drainage conditions shown on the Post-Development Drainage Plan (**Figure 3**).

Table 5: Post-Development Land Areas & Runoff Coefficients

Catchment No.	Outlet Location	Pervious Area (m^2) (RC = 0.30)	Roof Area(m^2) (RC = 0.90)	Impervious Area (m^2) (RC = 0.90)	Weighted Runoff Coefficient (RC)
201 (Controlled)	Existing 2.0x2.0m Box Culvert	1801	3765	3872	0.79
202 (Uncontrolled)	Old Plains Road West Existing Ditch	155	0	0	0.30
203 (Buffer Zone)	Existing 2.0x2.0m Box Culvert	2235	0	0	0.30

6.0 Stormwater Management

As the subject site is located within the City of Burlington, the proposed stormwater management drainage design must comply with the City of Burlington – Stormwater Management Design Guidelines (May 21st, 2020) and the Ministry of the Environment (MOE) – Stormwater Management Planning and Design Manual (March, 2003). The following guidelines were applied to the subject site:

Stormwater Quantity Control

Controlling the post-development peak flows for the 2-year through 100-year storm event to the pre-development levels.

Stormwater Quality Control

Water quality control requirements is to provide an "enhanced" level water quality protection of 80% Total Suspended Solids (TSS) removal, which the treatment unit shall treat a minimum of 90% of the runoff volume that occurs for the subject site on a long-term average basis.

Water Balance

Retain runoff generated from a minimum of 5mm depth of rainfall from all site surfaces through infiltration, evapotranspiration, water harvesting and reuse.

6.1 Stormwater Quantity Control

The Modified Rational Method (MRM) was used to determine the pre-development and post-development stormwater flow rates for the site using the City of Burlington's intensity, duration and frequency (IDF) rainfall data. These peak stormwater flow rates were then used to determine the required stormwater quantity control for the proposed development.

According to the City of Burlington's Stormwater Management Design Guidelines (May 21st, 2020), storm events from 2-year to 100-year must be controlled to pre-development flow rates. The target release rate for the 100-year storm event is 130.41 L/s, using a runoff coefficient of 0.30 over Catchment 101. An upstream orifice plate (200 mm diameter) will reduce the 100-year storm flows to 128.28 L/s, requiring a detention volume of 127.71 m³. A portion of the site will drain uncontrolled flows to the existing ditch along Old Plains Road (Catchment 202), which leads to a 2.0x2.0m box culvert. Controlled flows are designed to accommodate these uncontrolled flows, ensuring total flows from Catchment 201 do not exceed the allowable release rates for Catchment 101.

Catchment 203 will have the same post-development flows as the allowable release rate for each storm event compared to pre-development conditions from Catchment 102.

A summary of the flows and required storage volumes have been provided in **Table 6**. Detailed calculations can be found in **Appendix D**.

Table 6: Summary of Peak Stormwater Flow Rates & Required Storage

Storm Event (year)	Peak Flow Rates				Storage Volume	
	Pre-Development (Allowable) (L/s)	**Post-Development Controlled** (L/s)	**Post-Development Uncontrolled** (L/s)	**Post-Development Total Flows** (L/s)	**Required 100-Year Active Storage** (m^3)	**Provided 100-Year Tank Storage** (m^3)
2	62.65	61.62	1.01	62.63	127.71	140.00
5	80.97	79.63	1.31	80.94		
10	92.96	91.44	1.50	92.95		
25	108.20	106.44	1.75	108.19		
50	119.32	117.39	1.93	119.32		
100	130.41	128.28	2.11	130.39		

A total of 140.00 m^3 of active detention storage will be provided on-site by the underground stormwater management tank, which is greater than the 100-year required active storage volume for Catchment 201. The ultimate stormwater outlet directs flows to the existing 2.0x2.0m storm box culvert as per pre-development conditions. Refer to **Appendix D** for the orifice calculations and incremental storage tables for the system. Refer to the Site Servicing Plan – C102 for the proposed size and location of the underground stormwater management tank along with the proposed storm sewer system.

6.2 Stormwater Quality Control

As outlined in the City of Burlington and the MOE stormwater management guidelines, an "Enhanced Level of Protection" of 80% TSS removal is required to treat runoff leaving the subject site. Water quality levels from Catchment 201 will be achieved through the implementation of a Stormceptor that will provide the enhanced level of protection for the site. The Stormceptor unit will be placed downstream of the proposed stormwater management tank and the orifice control, and upstream of the proposed outlet location. A sizing report, verification statement, and a standard specification sheet will be provided in the subsequent submission, which will be prepared by the manufacturer. Additionally, runoff generated on the roof of the townhomes and landscaped areas is considered 'clean' and inherently meets 80% levels of TSS removal. Note that all on-site catch basins have sumps to capture sediment. Quality control calculations for Catchment 201 and a shop drawing for a typical Stormceptor model EFO4 are included in **Appendix D**.

6.3 Water Balance

The required retention volume for the 5 mm rainfall across the total post-development area of the site is 48.0 m^3. After accounting for initial abstraction, the water balance deficit is determined to be 31.3 m^3. Water balance will be met using dead storage within the bottom of the underground stormwater management tank, which will infiltrate into the underlaying soil. Detailed water balance calculations are included in **Appendix D**.

7.0 Conclusions & Recommendations

Based on the information contained within this report, we offer the following conclusions:

1. Water servicing is proposed to be provided by the existing 300 mm diameter PVC watermain along Plains Road West through a single connection. The connection is proposed to be a 200 mm diameter fire service, which will split to a 150 mm diameter domestic service at the property line.
2. Sanitary servicing is proposed to be provided by the existing 200 mm diameter sanitary sewer along Old Plains Road West through a single connection. The proposed service connection is designed as a 200 mm diameter sanitary sewer via manhole connection.
3. The site will be graded to mimic pre-development conditions and discharge stormwater towards Old Plains Road West. Stormwater runoff will be captured by on-site catch basins, conveyed by internal storm sewers, and attenuated by orifice controls in conjunction with an

underground storage tank. All storm flows from the site discharges to the existing 2.0x2.0m box culvert along Old Plains Road West as per pre-development conditions.

4. Water quality objective will be met using landscaping features and a Stormceptor unit to achieve 80% TSS removal on-site.
5. Site water balance objective will be achieved through ground infiltration.

Based on the above conclusions, we recommend the approval of the Zoning By-Law Amendment from the perspective of functional servicing and preliminary stormwater management.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

J.P. Labonte

J.P. Labonte, E.I.T.
Engineering Intern

C.F. CROZIER & ASSOCIATES INC.



Rob Babic, P.Eng
Project Manager

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APPENDIX A

Background Information

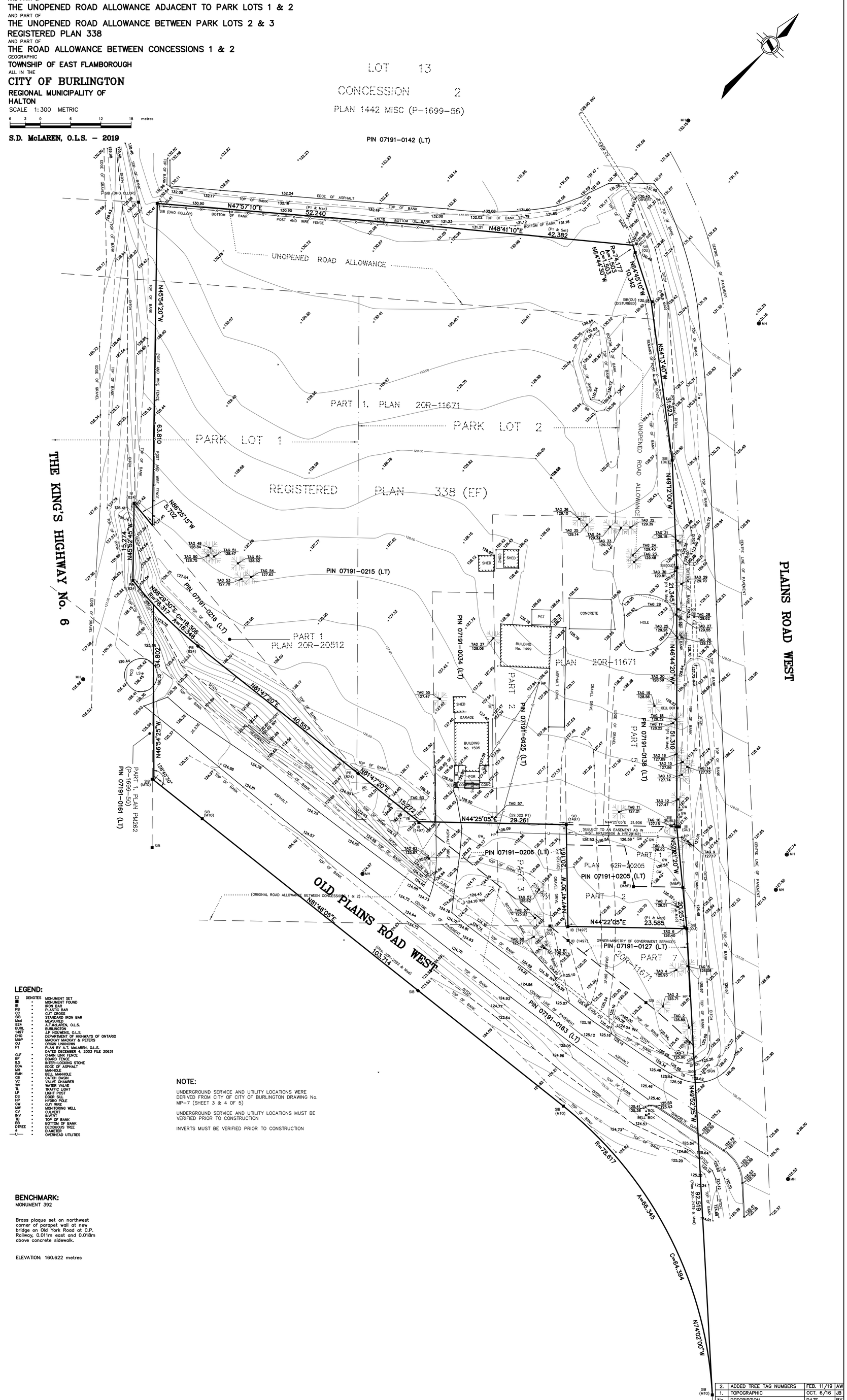
TOPOGRAPHIC SURVEY
OF PART OF
PARK LOTS 1 & 2
AND PART OF
THE UNOPENED ROAD ALLOWANCE ADJACENT TO PARK LOTS 1 & 2
AND PART OF
THE UNOPENED ROAD ALLOWANCE BETWEEN PARK LOTS 2 & 3
REGISTERED PLAN 338
AND PART OF
THE ROAD ALLOWANCE BETWEEN CONCESSIONS 1 & 2
GEOGRAPHIC
TOWNSHIP OF EAST FLAMBOROUGH
ALL IN THE
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF
HALTON
SCALE 1:300 METRIC

6 3 0 6 12 18 metres

S.D. McLAREN, O.L.S. – 2019

LOT 13
CONCESSION 2
PLAN 1442 MISC (P-1699-56)

PIN 07191-0142 (LT)



LEGEND:

□	DENOTES	MONUMENT SET
■	"	MONUMENT FOUND
IB	"	IRON BAR
PB	"	PLASTIC BAR
CC	"	CUT CROSS
SIB	"	STANDARD IRON BAR
Meas	"	MEASURED
824	"	A.T.McLAREN, O.L.S.
BURL	"	BURLINGTON
1497	"	J.P. NOUWENS, O.L.S.
DHO	"	DEPARTMENT OF HIGHWAYS OF ONTARIO
M&P	"	MACKAY MACKAY & PETERS
OU	"	ORIGIN UNKNOWN
P1	"	PLAN BY A.T. McLAREN, O.L.S. DATED DECEMBER 4, 2003 FILE 30631
CLF	"	CHAIN LINK FENCE
BF	"	BOARD FENCE
ILS	"	INTER-LOCKING STONE
EOA	"	EDGE OF ASPHALT
MH	"	MANHOLE
BMH	"	BELL MANHOLE
CB	"	CATCH BASIN
VC	"	VALVE CHAMBER
WV	"	WATER VALVE
TL	"	TRAFFIC LIGHT
LP	"	LIGHT POST
DS	"	DOOR SILL
HP	"	HYDRO POLE
GW	"	GUY WIRE
MW	"	MONITORING WELL
CV	"	CULVERT
INV	"	INVERT
TB	"	TOP OF BANK
BB	"	BOTTOM OF BANK
DTREE	"	DECIDUOUS TREE
ø	"	DIAMETER
—U—	"	OVERHEAD UTILITIES

NOTE:

UNDERGROUND SERVICE AND UTILITY LOCATIONS WERE DERIVED FROM CITY OF CITY OF BURLINGTON DRAWING No. MP-7 (SHEET 3 & 4 OF 5)

UNDERGROUND SERVICE AND UTILITY LOCATIONS MUST BE VERIFIED PRIOR TO CONSTRUCTION

INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION

BENCHMARK:
MONUMENT 392

Brass plaque set on northwest corner of parapet wall at new bridge on Old York Road at C.P. Railway, 0.011m east and 0.018m above concrete sidewalk.

ELEVATION: 160.622 metres

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

BEARING NOTE:
BEARINGS ARE GRID AND ARE REFERRED TO UTM ZONE 17, NAD83 (CSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999704050

SURVEYOR'S CERTIFICATE:
I. CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM
2. THE SURVEY WAS COMPLETED ON THE 4th DAY OF MAY, 2018

FEBRUARY 11, 2019
DATE

S. DAN McLAREN, O.L.S.

No.	DESCRIPTION	DATE	BY
2.	ADDED TREE TAG NUMBERS	FEB. 11/19	AW
1.	TOPOGRAPHIC	OCT. 6/16	JB

REVISIONS

© S.D. McLAREN, O.L.S. – 2016. NO PERSON MAY COPY REPRODUCE, DISTRIBUTE OR ALTER THIS PLAN IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF S.D. McLAREN, O.L.S.

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527-8559 FAX (905) 527-0032

Drawn	Checked	Crew Chief	Scale	Dwg.No.
JB	DG	MWF	1:300	35116

Plains Road West, Burlington



Legend

Water Control Valve
- System
- SystemDP
- Zone
- ZoneDP

Water Service Valve
- CurbStop
- PropertyLine
- Secondary
- TappingValve

Water Hydrant

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

Water Chamber
- Chamber

Notes:

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Information Valid as of: 5/8/2023

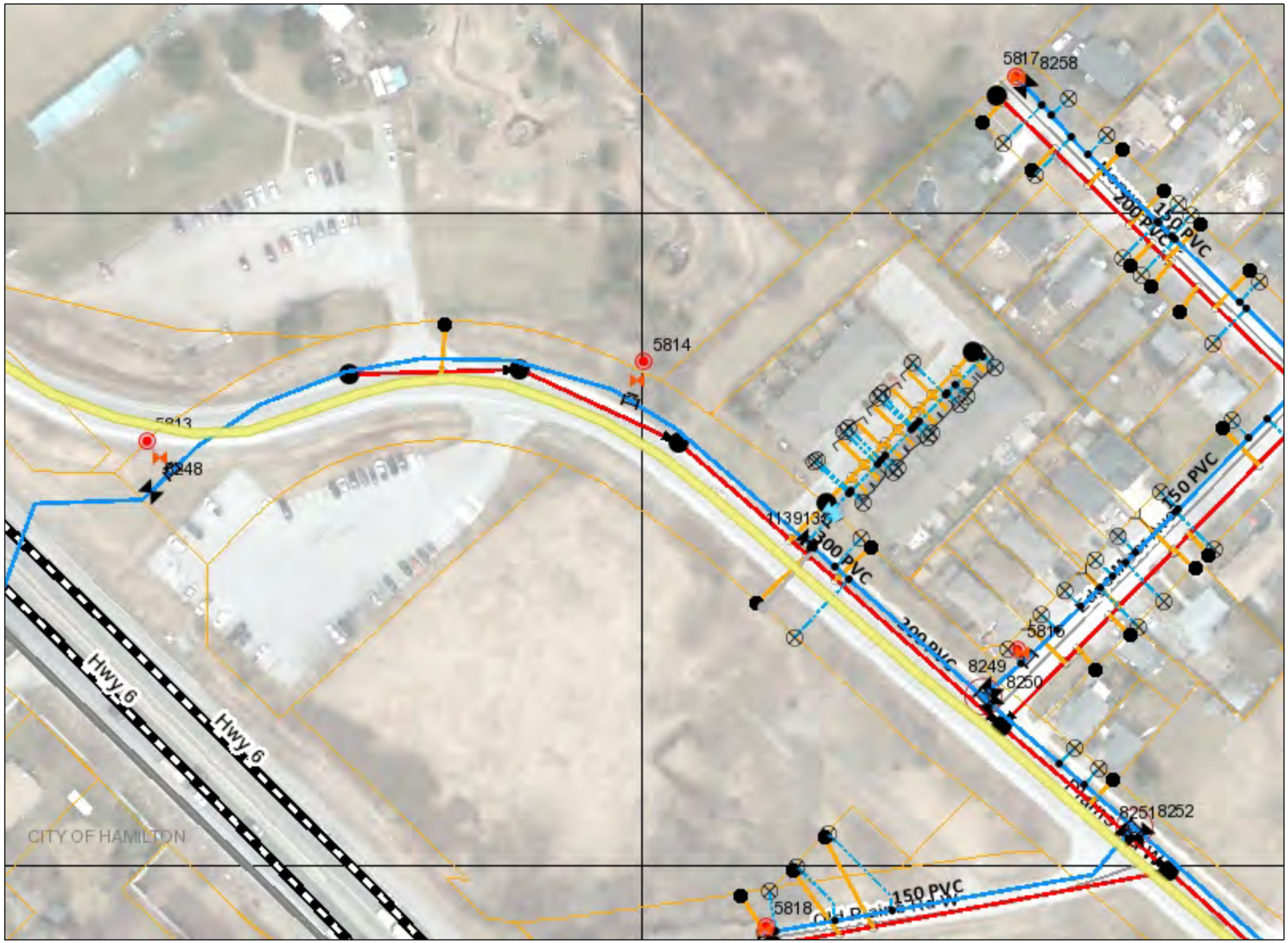
77.7 0 38.86 77.7 Metres

1: 1,555

REGIONAL MUNICIPALIY OF HALTON, ITS EMPLOYEES, OFFICERS AND AGENTS ARE NOT REPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES, WHETHER DUE TO THEIR NEGLIGENCE OR OTHERWISE. ALL INFORMATION SHOULD BE VERIFIED.

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Plains Road West, Burlington



Legend

Water Control Valve
- System
- SystemDP
- Zone
- ZoneDP

Water Service Valve
- CurbStop
- PropertyLine
- Secondary
- TappingValve

Water Hydrant

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

Water Chamber
- Chamber

Notes:

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Information Valid as of: 5/8/2023

77.7 0 38.86 77.7 Metres

1: 1,555

REGIONAL MUNICIPALIY OF HALTON, ITS EMPLOYEES, OFFICERS AND AGENTS ARE NOT REPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES, WHETHER DUE TO THEIR NEGLIGENCE OR OTHERWISE. ALL INFORMATION SHOULD BE VERIFIED.

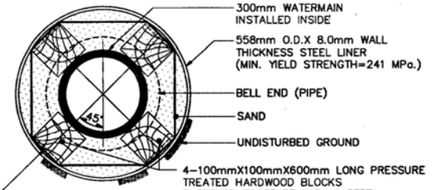
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J.HAMID — OWNER (TYP.)
F.B. 127.31 — FIN. BASEMENT ELEV. (TYP.)
1492 — MUNICIPAL ADDRESS (TYP.)
BUILDING ENVELOPE (TYP.)

SANITARY SEWER DATA

MH. NO.	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	NORTHING	EASTING	REMARKS
1	0+082.364	16.166 L	1001.01	N 4794335.6825	E 589464.3887	
2	0+123.312	0	1001.01	N 4794337.2540	E 589508.2585	

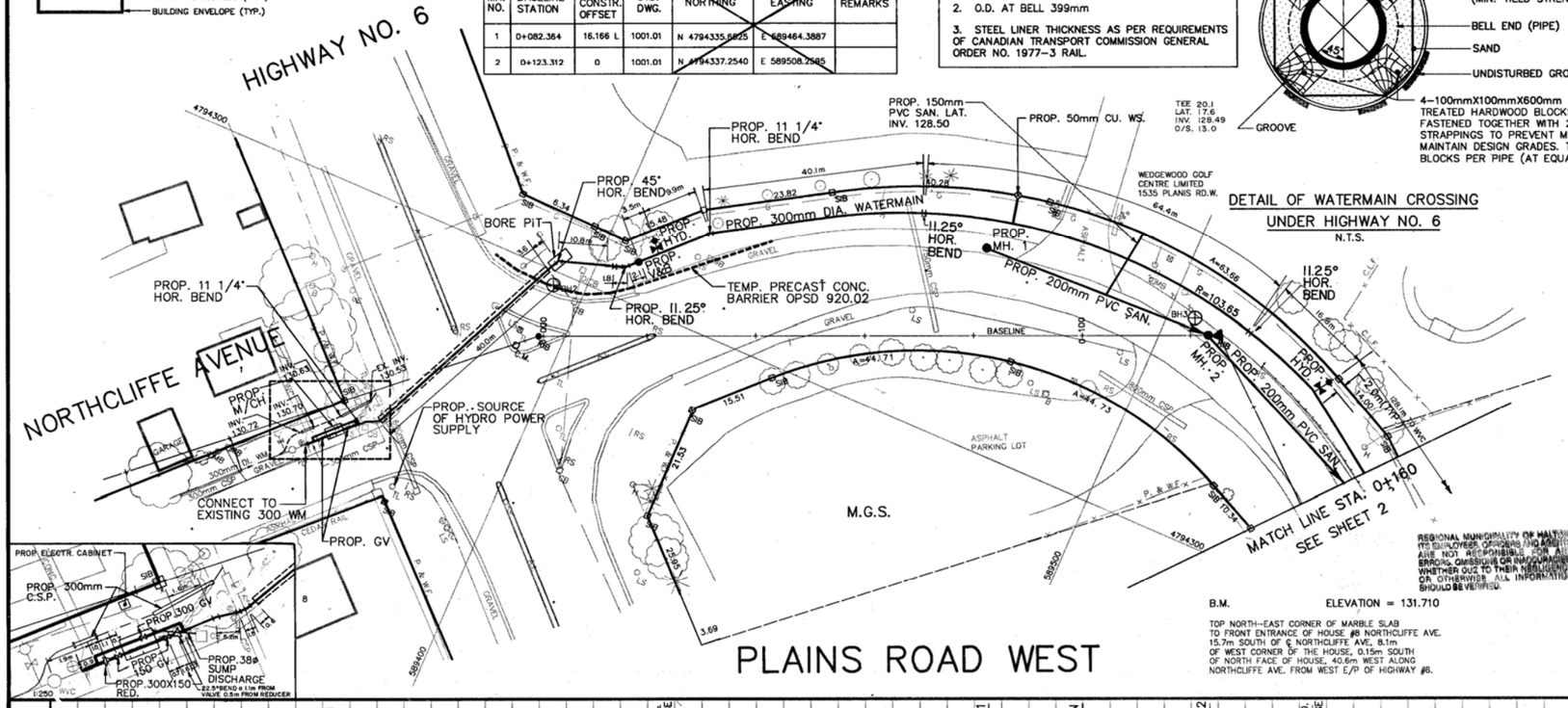
NOTE:
1. ALLOW MIN. OF 40mm CLEAR BETWEEN BELL O.D. OF PIPE & I.D. OF STEEL LINER PIPE.
2. O.D. AT BELL 399mm
3. STEEL LINER THICKNESS AS PER REQUIREMENTS OF CANADIAN TRANSPORT COMMISSION GENERAL ORDER NO. 1977-3 RAIL.



DRAWING REGISTRATION

TYPE ONE: PL-PLAN&PROFILE; PL-PLAN; PR-PROFILE; DE-DETAIL; GA-GEOLAYOUT; ME-MECHANICAL; EL-ELECTRICAL; AR-ARCHITECTURAL
TYPE TWO: C-AS CONSTRUCTED; D-DESIGN DRG; L-LEGAL PLAN
STATUS: O-OBSOLETE; S-SUPERCEDED; C-CURRENT; E-EASEMENT
REMARKS



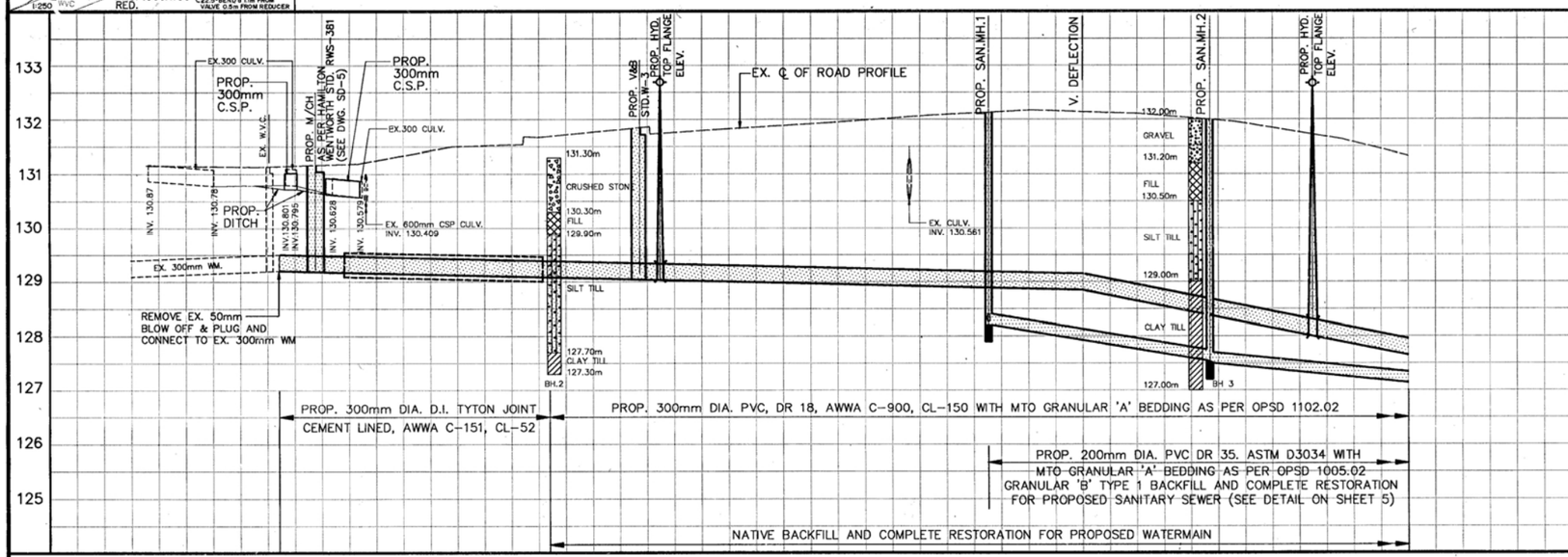


DETAIL OF WATERMAIN CROSSING UNDER HIGHWAY NO. 6
N.T.S.

WATERMAIN DATA

ITEM	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	INVERT ELEV.	NORTHING	EASTING	REMARKS
300X200 REDUCER	0+047.407	5.863 R		129.195	N 4794251.8364	E 589363.0736	EXISTING 300mm WM
℄ GV	-0+043.674	5.365 R		129.095	N 4794254.3964	E 589366.2504	GATE VALVE
℄ M/CH	-0+041.254	5.221 R		129.090	N 4794256.2556	E 589368.0953	METER CHAMBER
℄ GV	-0+038.677	5.006 R		129.084	N 4794258.0879	E 589363.9179	GATE VALVE
11.25° BEND	-0+036.225	4.924 R		129.079	N 4794259.8540	E 589371.6658	
STEEL LINER	-0+035.896	4.288 R		129.102	N 4794260.2333	E 589371.8598	
STEEL LINER	0+000.885	12.279 L		129.012	N 4794299.7230	E 589392.0621	
45° BEND	0+002.815	13.898 L		129.001	N 4794301.1462	E 589393.1994	
22.5° BEND	0+015.143	12.740 L		128.977	N 4794305.8910	E 589405.0065	
℄ V&B	0+018.479	13.677 L	W3	128.970	N 4794307.7034	E 589406.7924	VALVE & BOX
300X300X150 TEE	0+022.220	15.171 L	1105.01	128.962	N 4794310.5719	E 589409.6169	HYD. LATERAL C/W ANCHORED TEE & 150 GV
11.25° BEND	0+031.689	18.955 L		128.943	N 4794317.7910	E 589416.8943	
V. DEFLECTION	0+100.000	17.396 L		128.850	N 4794343.7732	E 589480.0973	GRADE CHANGE
300X300X150 TEE	0+142.360	11.284 L	1105.01	128.390	N 4794335.4245	E 589530.3944	

ALL VERTICAL & HORIZONTAL BENDS TO HAVE RESTRAINED JOINTS (SEE CHART ON SHEET NO.2)



ISSUED
FEB 01 1994
HALTON REGION PUBLIC WORKS

B - 6803

EXISTING ℄ ELEVATIONS: 131.157 | 131.131 | 131.190 | 131.500 | 131.538 131.880 | 131.672 | 131.855 131.732 | 131.620 | 131.935 | 132.077 | 132.171 | 132.107 | 131.955 | 131.633

PROPOSED SANITARY INVERT: 11.0m-0.20% | SAN. MH.1 (OPSD. 1001.01) 200 SE 128.170 | 44.3m-200mm SAN. @ 1.50% | SAN. MH.2 (OPSD. 1001.01) 200 NW 127.540 200 SE 127.430 | 42.2m-200mm SAN. @ 1.00%

PROPOSED WATERMAIN INVERT: 129.163 | LINER | 40.0m-600mm STEEL LINER @ 0.20% SEE DETAIL ABOVE | LINER 129.012 129.051 WM | 100.5m @ 0.20% | 128.850 | 60.0m @ 1.97% | 127.667

CHAINAGE: 0+080 | 0+060 | 0+040 | 0+020 | 0+000 | 0+020 | 0+040 | 0+060 | 0+080 | 0+100 | 0+120 | 0+140 | 0+160

No.	DATE	BY	REVISIONS	MANU/CAD
2	95-12-4	J.L.	AS CONSTRUCTED	✓
1	93-12-10	S.K.	ELECTRICAL CABINET ADDED	✓

DESIGN R.B.B. | CHECKED | DATE SEPTEMBER 1992
DRAWN S.K. | CHECKED
SCALE Horiz. 10 5 0 10 Vert. 1.0 0.5 0 1.0
REFERENCES
APPROVALS
MUNICIPAL
FIELD NOTES
REGIONAL
Commissioner of Public Works
Director of Design & Construction 94 01 13
STAMP: REGISTERED PROFESSIONAL ENGINEER R.P.HYLKEMA 93-02-16 PROVINCE OF ONTARIO

CONSULTANT: R.E.Winter & Associates Ltd. Consulting Engineers, Architect, Planners and Landscape Architects 200 Matheson Boulevard West, Mississauga, Ontario, L5R 3L7 Tel.(416) 890 0110 Fax (416) 890 0219

MUNICIPALITY: Halton

TITLE
PLAN & PROFILE OF
PROP.300mm & 150mm DIA. WATERMAIN & 200mm DIA. SANITARY SEWER
PLAINS ROAD WEST
HWY No.6 TO 160m EAST OF HWY No.6

Consultant File NO. 8936
Regional Drawing NO. B - 6803
CONTRACT NO. SW-1150-94
Drawing NO. 1
SHEET 1 OF 29

PR-1150 SHEET 1 OF 29

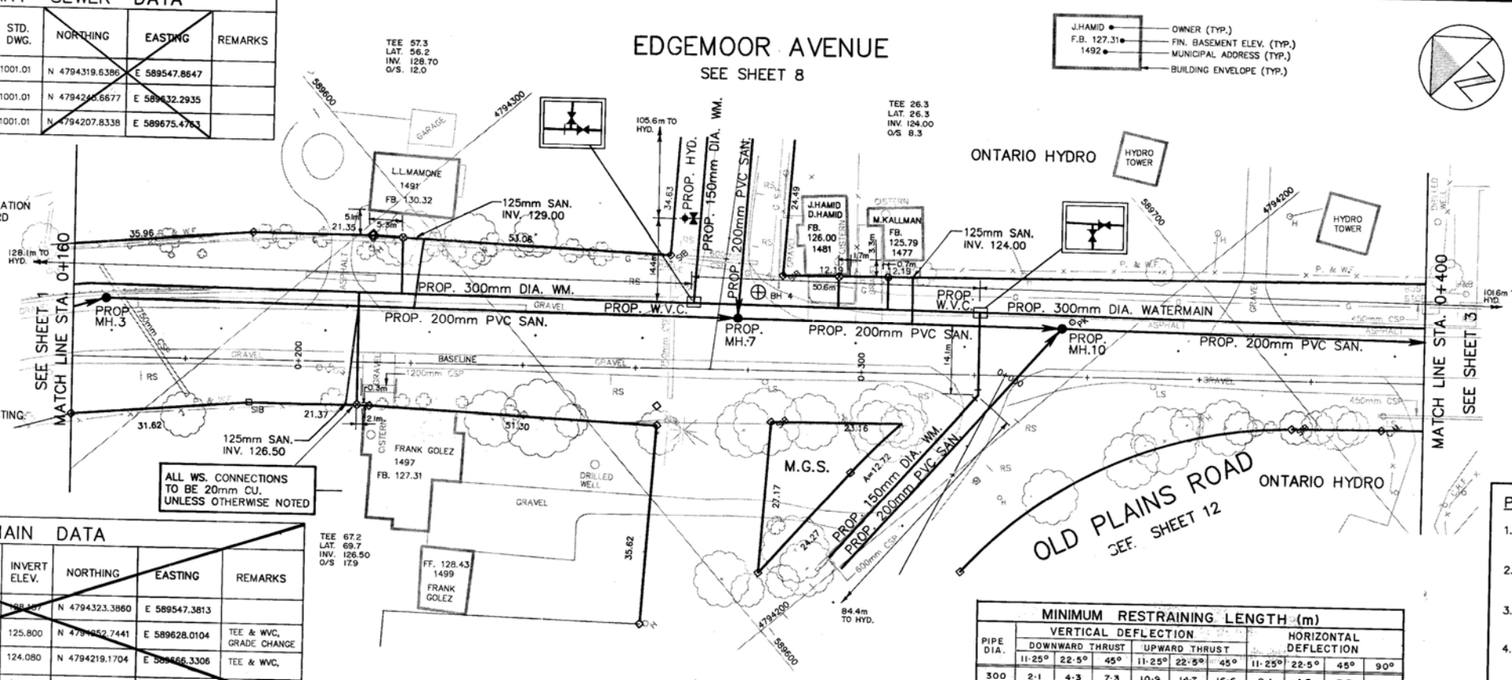
PLAINS ROAD WEST

SANITARY SEWER DATA

MH. NO.	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	NORTHING	EASTING	REMARKS
3	0+165.776	10.606 L	1001.01	N 4794319.6386	E 589547.8647	
7	0+278.018	9.260 L	1001.01	N 4794265.8677	E 589632.2935	
10	0+335.308	8.572 L	1001.01	N 4794207.8338	E 589675.4763	

GENERAL NOTES:

1. ALL SANITARY SEWER AND WATERMAIN INSTALLATION SHALL CONFORM TO ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS AS AMENDED BY THE REGIONAL MUNICIPALITY OF HALTON.
2. ALL DISTURBED AREAS ARE TO BE RESTORED TO THEIR ORIGINAL CONDITION.
3. ALL PROPOSED SANITARY SEWER SHALL BE PVC, DR 35, ASTM D3034 UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER LATERAL CONNECTIONS SHALL BE PVC, DR 28, ASTM D3034 UNLESS OTHERWISE NOTED.
5. THE CONTRACTOR SHALL PROVIDE TEMPORARY CAPS, PLUGS AND BLOW OFFS FOR WATERMAIN TESTING.
6. ALL WATER SERVICES SHALL BE 20mm DIA. COPPER AS PER OPSD-1104.01 UNLESS OTHERWISE NOTED.



ALL WS. CONNECTIONS TO BE 20mm CU. UNLESS OTHERWISE NOTED

WATERMAIN DATA

ITEM	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	INVERT ELEV.	NORTHING	EASTING	REMARKS
11.25° BEND	0+162.973	13.140 L		128.107	N 4794323.3860	E 589547.3813	
300X150X300 TEE & V. DEFLECTION	0+269.906	11.855 L	W2	125.800	N 4794252.7441	E 589628.0104	TEE & WVC, GRADE CHANGE
300X150X300 TEE	0+320.941	11.248 L	W2	124.080	N 4794219.1704	E 589666.3306	TEE & WVC,
V. DEFLECTION	0+369.906	10.876 L		122.400	N 4794187.1249	E 589703.2510	GRADE CHANGE

MINIMUM RESTRAINING LENGTH (m)

PIPE DIA.	VERTICAL DEFLECTION						HORIZONTAL DEFLECTION			
	DOWNWARD THRUST			UPWARD THRUST						
	11.25°	22.5°	45°	11.25°	22.5°	45°	11.25°	22.5°	45°	90°
300	2.1	4.3	7.3	10.9	14.7	16.6	2.1	4.3	7.3	11.9

NOTE: ALL JOINTS ENCOUNTERED WITHIN THE SPECIFIED RESTRAINING LENGTH OF BOTH SIDES OF THE DEFLECTION SHALL BE RESTRAINED.

PLAINS ROAD WEST TRAFFIC CONTROL

1. THE CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC AT ALL TIMES DURING WORKING HOURS.
2. THE CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC IN EACH DIRECTION DURING NON-WORKING HOURS.
3. THE CONTRACTOR SHALL LIMIT HIS EXCAVATION TO 20m (MAX.) AHEAD OF PIPE LAYING OPERATIONS.
4. ALL WASTEWATER MAINS AND WATERMAINS ON PLAINS ROAD WEST SHALL BE INSTALLED USING VERTICAL EXCAVATION. (TRENCH BOX AND/OR BRACED SHEATING)
5. SERVICE LATERALS ACROSS PLAINS ROAD WEST SHALL ONLY BE INSTALLED ONCE THE MAINLINE SEWERS AND WATERMAINS ARE INSTALLED AND THE EXCAVATION LIMITS ARE OPENED TO TRAFFIC. SERVICE CROSSINGS MUST BE COMPLETED AND REINSTATED THE SAME DAY.

DRAWING REGISTRATION

TYPE ONE: ☐ PL-PLAN/PROFILE ☐ PL-PLAN ☐ PR-PROFILE ☐ DE-DETAIL ☐ GA-GENERAL ☐ ME-MECHANICAL ☐ EL-ELECTRICAL ☐ AR-ARCHITECTURAL

TYPE TWO: ☐ C-AS CONSTRUCTED ☐ D-DESIGN 2MS ☐ L-LEGAL PLAN

STATUS: ☐ O-OBSOLETE ☐ S-SUPERSEDED ☐ C-CURRENT ☐ E-EASEMENT

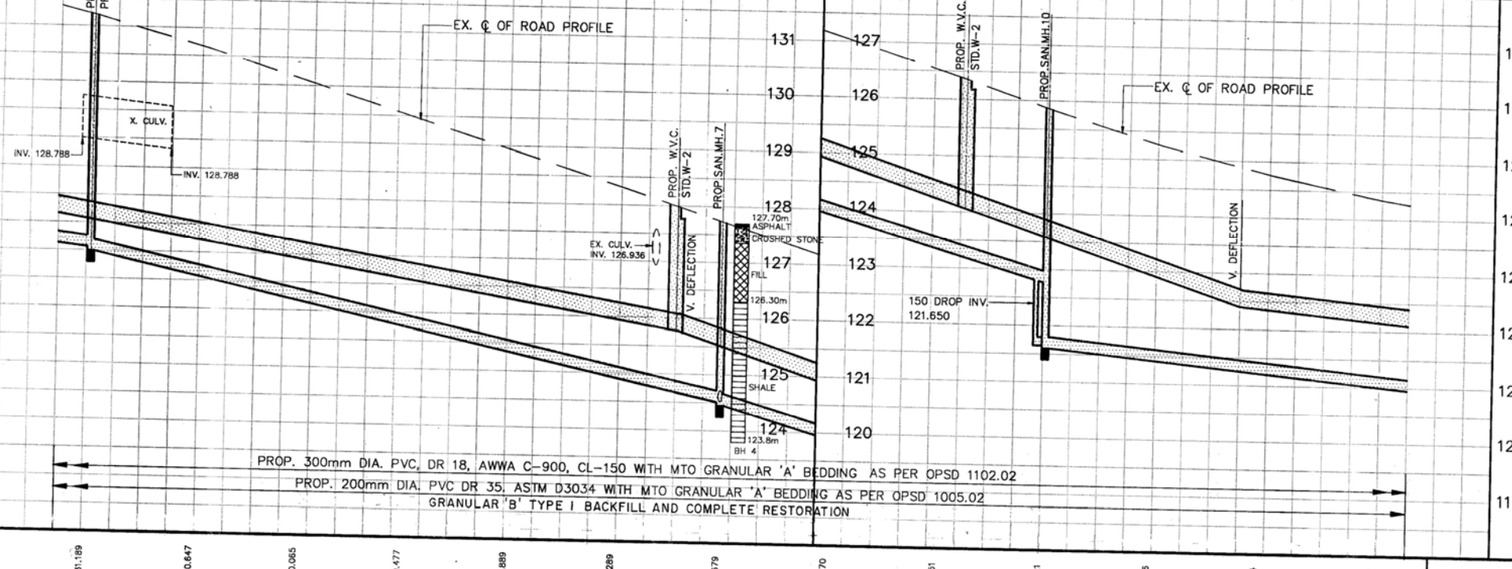
REMARKS

KEY PLAN N.T.S.

B.M. ELEVATION = 131.710

TOP NORTH-EAST CORNER OF MARBLE SLAB TO FRONT ENTRANCE OF HOUSE #8 NORTHCLIFFE AVE. 15.7m SOUTH OF ℄ NORTHCLIFFE AVE. 8.1m EAST OF WEST CORNER OF THE HOUSE, 0.15m SOUTH OF NORTH FACE OF HOUSE, 40.6m WEST ALONG NORTHCLIFFE AVE. FROM WEST E/P OF HIGHWAY #6.

REGIONAL MUNICIPALITY OF HALTON, ITS EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR NEGLIGENCE OR OTHERWISE. ALL INFORMATION SHOULD BE VERIFIED.



B - 6804

SAN MH.3 (OPSD.1001.01) 200 NW 127.035 200 S 126.880	111.9m – 200mm SAN. @ 2.20%	SAN. MH.7 (OPSD.1001.01) 200 N 124.480 200 E 124.500 200 S 124.290	57.3m – 200mm SAN. @ 2.75%	SAN MH.10 (OPSD.1001.01) 200 N 122.710 200 W 121.620 200 S 121.500	123.9m – 200mm SAN. @0.95%	EXISTING ℄ ELEVATIONS
127.667	110.0m @ 1.69%	125.800	100.0m @ 3.40%	122.400	30.0m @ 0.99% 122.103	PROPOSED SANITARY INVERT
						PROPOSED WATERMAIN INVERT
0+160 0+180 0+200 0+220 0+240 0+260		0+280 0+300 0+320 0+340 0+360 0+380			0+400	CHAINAGE

1	95-12-4	J.L.	AS CONSTRUCTED ✓
No.	DATE	BY	REVISIONS MANU CAD

DESIGN R.B.B. CHECKED — DATE SEPTEMBER 1992
DRAWN S.K. CHECKED
SCALE Horiz. 10 5 0 10 Vert. 1.0 0.5 0 1.0
REFERENCES
APPROVALS
MUNICIPAL ISSUED FEB 0 1 1994 HALTON REGION PUBLIC WORKS
FIELD NOTES
REGIONAL Commissioner of Public Works; Director of Design & Construction 94 01 13
STAMP: REGISTERED PROFESSIONAL ENGINEER R.P.HYLKEMA 93-02-12 PROVINCE OF ONTARIO

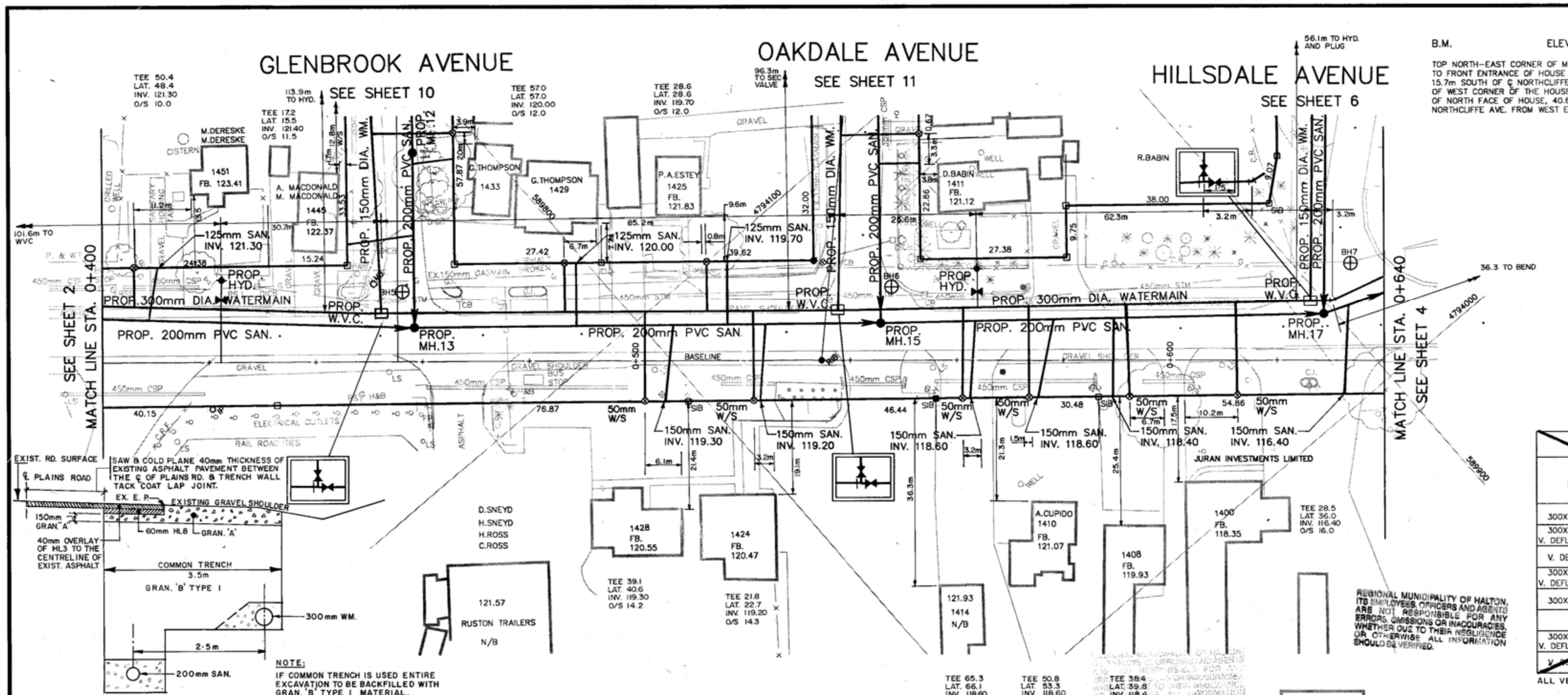
CONSULTANT
R.E.Winter & Associates Ltd.
Consulting Engineers, Architects, Planners and Landscape Architects
200 Matheson Boulevard West, Mississauga, Ontario, L5R 3L7
Tel:(416) 890 0110 Fax (416) 890 0319

MUNICIPALITY: Halton

TITLE
PLAN & PROFILE OF
PROP. 300mm DIA. WATERMAIN & 200mm DIA. SANITARY SEWER
PLAINS ROAD WEST
120m NORTH OF EDGEMOOR AVE TO 120m SOUTH OF EDGEMOOR AVE

Consultant File NO. 8936
Regional Drawing NO. B - 6804
CONTRACT NO. SW-1150-94
Drawing NO. 2
SHEET 2 OF 29

PZ-1150 2 OF 29



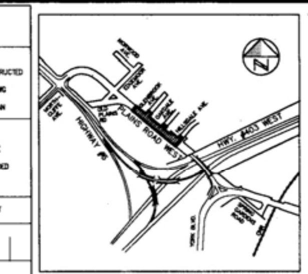
B.M. ELEVATION = 131.710

TOP NORTH-EAST CORNER OF MARBLE SLAB TO FRONT ENTRANCE OF HOUSE #8 NORTHCLIFFE AVE. 15.7m SOUTH OF ℄ NORTHCLIFFE AVE, 8.1m EAST OF WEST CORNER OF THE HOUSE, 0.15m SOUTH OF NORTH FACE OF HOUSE, 40.6m WEST ALONG NORTHCLIFFE AVE. FROM WEST E/P OF HIGHWAY #6.

DRAWING REGISTRATION

TYPE ONE	TYPE TWO
☐ PL-PLAN&PROFILE	☐ C-AS CONSTRUCTED
☐ PL-PLAN	☐ D-DESIGN DWG
☐ PR-PROFILE	☐ L-LEGAL PLAN
☐ DE-DETAIL	STATUS
☐ GA-GEN.ARRGT.	☐ O-OBSOLETE
☐ ME-MECHANICAL	☐ S-SUPERCEDED
☐ EL-ELECTRICAL	☐ C-CURRENT
☐ AR-ARCHITECTURAL	☐ E-EASEMENT

REMARKS



KEY PLAN N.T.S.

SANITARY SEWER DATA

MH. NO.	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	NORTHING	EASTING	REMARKS
13	0+458.595	6.405 L	1001.01	N 4794126.1364	E 589767.6771	
15	0+545.729	7.004 L	1001.01	N 4794068.9098	E 589834.2806	
17	0+628.697	8.823 L	1001.01	N 4794017.1111	E 589898.3073	

WATERMAIN DATA

ITEM	BASELINE STATION	℄ CONSTR. OFFSET	STD. DWG.	INVERT ELEV.	NORTHING	EASTING	REMARKS
300X150X300 TEE	0+422.262	10.032 L	1105.01	121.880	N 4794152.5067	E 589742.4217	HYD. LATERAL C/W ANCHORED TEE & 150 GV
300X150X300 TEE V. DEFLECTION,℄ WVC	0+450.578	9.154 L	W2	121.600	N 4794133.4361	E 589763.3718	TEE & WVC, GRADE CHANGE
V. DEFLECTION	0+507.620	10.729 L		120.760	N 4794097.6227	E 589807.6733	GRADE CHANGE
300X150X300 TEE V. DEFLECTION,℄ WVC	0+537.738	9.441 L	W2	119.200	N 4794076.9742	E 589829.8194	TEE & WVC, GRADE CHANGE
300X150X300 TEE	0+563.968	8.983 L	1105.01	119.078	N 4794060.2564	E 589850.0401	HYD. LATERAL C/W ANCHORED TEE & 150 GV
300X150X300 TEE V. DEFLECTION,℄ WVC	0+626.229	11.269 L	W2	118.760	N 4794020.5758	E 589898.0353	TEE & WVC, GRADE CHANGE
V. DEFLECTION	0+640.000	16.620 L		118.116	N 4794015.6800	E 589911.9091	GRADE CHANGE

ALL VERTICAL & HORIZONTAL BENDS TO HAVE RESTRAINED JOINTS (SEE CHART ON SHEET NO. 2)

REGIONAL MUNICIPALITY OF HALTON, ITS EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES, WHETHER DUE TO THEIR NEGLIGENCE OR OTHERWISE. ALL INFORMATION SHOULD BE VERIFIED.

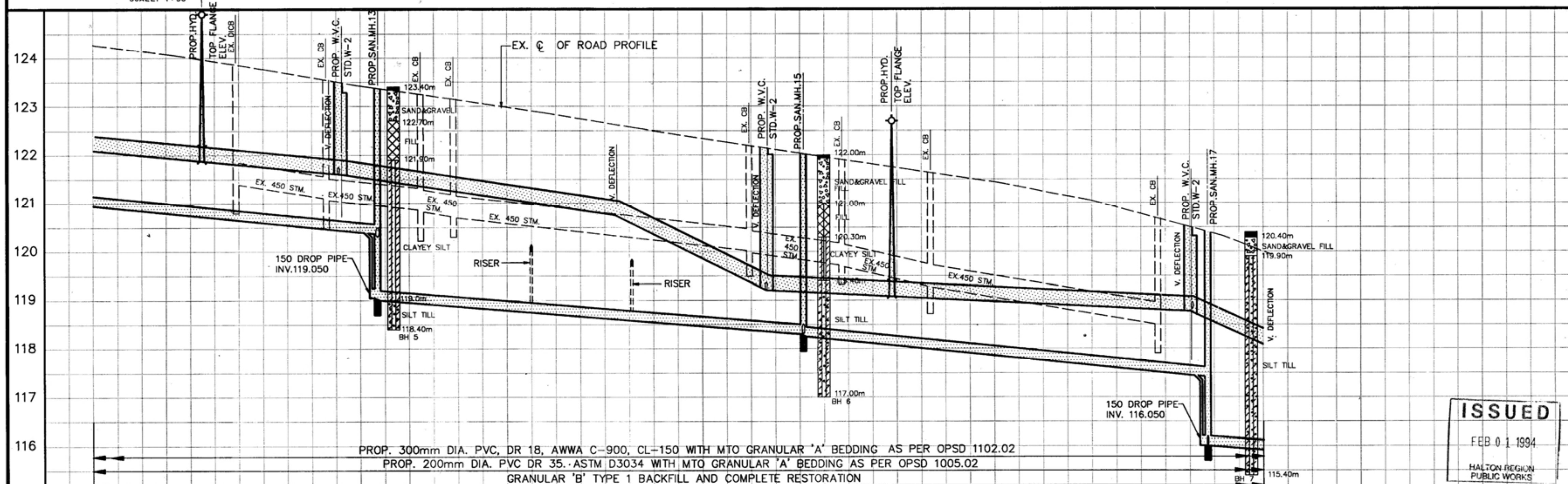
J.HAMID — OWNER (TYP.)
F.B. 127.31 — FIN. BASEMENT ELEV. (TYP.)
1492 — MUNICIPAL ADDRESS (TYP.)
— BUILDING ENVELOPE (TYP.)

EXIST. RD. SURFACE
℄ PLAINS ROAD
SAW & COLD PLANE 40mm THICKNESS OF EXISTING ASPHALT PAVEMENT BETWEEN THE ℄ OF PLAINS RD. & TRENCH WALL TACK COAT LAP JOINT.
EX. E. P.
EXISTING GRAVEL SHOULDER
150mm GRAN."A"
60mm HL8
GRAN. 'A'
40mm OVERLAY OF HL3 TO THE CENTRELINE OF EXIST. ASPHALT
COMMON TRENCH 3.5m
GRAN. 'B' TYPE I
300mm WM.
2.5m
200mm SAN.

NOTE:
IF COMMON TRENCH IS USED ENTIRE EXCAVATION TO BE BACKFILLED WITH GRAN. 'B' TYPE I MATERIAL.

TYPICAL CROSS SECTION FOR COMMON TRENCH INSTALLATION (2)
SCALE: 1:50

PLAINS ROAD WEST



ISSUED FEB 01 1994 HALTON REGION PUBLIC WORKS

EXISTING ℄ ELEVATIONS	124.063	123.758	123.428	123.151	122.873	122.553	122.258	121.972	121.699	121.422	121.062	120.545	120.316	119.929
PROPOSED SANITARY INVERT	123.9m 200mm SAN @ 0.95%		SAN MH 13 (OPSD.1001.01) 200 N 120.320 200 E 120.225 200 S 118.935	87.1m 200mm SAN @ 0.80%				SAN MH 15 (OPSD.1001.01) 200 N 118.250 200 E 118.260 200 S 118.205	83.6m 200mm SAN @ 1.00%			SAN MH 17 (OPSD.1001.01) 200 N 117.390 200 E 116.040 200 S 115.980	33.3m-200mm SAN @ 0.45%	
PROPOSED WATERMAIN INVERT	122.020	51.0m @ 0.99%	121.450	56.0m @ 1.51%	120.450	31.0m @ 5.00%	119.100	87.0m @ 0.50%				118.760	14.0m @ 4.60%	118.116
CHAINAGE	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	

No.	DATE	BY	REVISIONS	MANU	CAD
3	95-12-5	J.L.	AS CONSTRUCTED	✓	
2	94-01-21	B.S.	REV. TYP. ROAD CROSS SECTION	✓	
1	93-12-10	S.K.	GENERAL	✓	

DESIGN	R.B.B.	CHECKED	DATE SEPTEMBER 1992
DRAWN	S.K.	CHECKED	

SCALE Horiz. 10 5 0 10 Vert. 1.0 0.5 0 1.0

REFERENCES

FIELD NOTES

APPROVALS

MUNICIPAL

REGIONAL
Commisioner of Public Works
Director of Design & Construction
94 01 13

STAMP
REGISTERED PROFESSIONAL ENGINEER R.P.HYLKEMA 93.02.12 PROVINCE OF ONTARIO

CONSULTANT
R.E.Winter & Associates Ltd.
Consulting Engineers, Architect, Planners and Landscape Architects
200 Matheson Boulevard West, Mississauga, Ontario, L5R 3L7
Tel.(416) 890 0110 Fax (416) 890 0319

MUNICIPALITY
Halton

TITLE
PLAN & PROFILE OF
PROP. 300mm DIA. WATERMAIN & 200mm DIA. SANITARY SEWER
PLAINS ROAD WEST
60m NORTH OF GLENBROOK AVE TO HILLSDALE AVE

Consultant File NO. 8936
Regional Drawing NO. B - 6805
CONTRACT NO. SW-1150-94
Drawing NO. 3
SHEET 3 OF 29

B - 6805

PR-115C
3 OF 29

PROJECT STATISTICS
JOB No: 2079.22
DATE:

	TOTAL
01A. EXISTING SITE AREA	(m2)
INCLUDES DEDICATION	11818

	PHASE 1	PHASE 2	TOTAL	
01B. PROPOSED SITE AREA	(m2)	(m2)		
DEDICATION DEDUCTED	8223	2657	10880.00	

02. G.F.A. (m2)	PROPOSED	PROPOSED	TOTAL	By-Law 438-86 (amended by 1170-2011)
RESIDENTIAL	0	0	9975	
COMMERCIAL	0	0	0	
TOTAL	**0**	**0**	**9975**	

03. F.S.I	PROPOSED	PROPOSED	TOTAL	By-Law 438-86 (amended by 1170-2011)
	0.00	0.00		-

04. SETBACKS * (m)		PROPOSED		PROPOSED	TOTAL	By-Law 438-86 (amended by 1170-2011)
BELOW GRADE	NORTH	0.00	NORTH	0.00		0.00
	EAST	0.00	EAST	0.00		0.00
	SOUTH	0.00	SOUTH	0.00		0.00
	WEST	0.00	WEST	0.00		0.00
ABOVE GRADE	NORTH	0.00	NORTH	0.00		0.00
	EAST	0.00	EAST	0.00		0.00
	SOUTH	0.00	SOUTH	0.00		0.00
	WEST	0.00	WEST	0.00		0.00

05. UNIT BREAKDOWN	PROPOSED			PROPOSED			TOTAL	
RESIDENTIAL UNITS	Studio	0	0%	Studio	0	0%		
	1 Bedroom	17	33%	1 Bedrcom	8	33%	25	
	2 Bedroom	34	67%	2 Bedrcom	16	67%	50	
	3 Bedroom	0	0%	3 Bedrcom	0	0%	0	10%
TOTAL		**51**	100%		**24**	100%	75	

05. B.F UNIT BREAKDOWN	PROPOSED			PROPOSED			TOTAL	By-Law 569-2013
RESIDENTIAL UNITS	Studio	0	0%	Studio	0	0%		15%
	1 Bedroom	0	0%	1 Bedrcom	0	0%		15%
	2 Bedroom	0	0%	2 Bedrcom	0	0%		15%
	3 Bedroom	1	100%	3 Bedrcom	1	100%		15%
TOTAL		**1**			**1**			

06. PARKING	PROPOSED		PROPOSED		TOTAL	By-Law 438-86 (amended by 1170-2011)		
RESIDENTIAL						RATIO	# of UNITS	REQUIRED
	Studio		Studio			1	0	0
	1 Bedroom	1 51	1 Bedrcom	1 24		1	25	25.00
	2 Bedroom		2 Bedrcom			1	50	50.00
	3 Bedroom		3 Bedrcom			1	0	0.00
NON RESIDENTIAL/VISITOR		0.15 7.65		0.15 3.6		0.15	75	11.25
TOTAL		**58.65**		**27.6**	86.25			86.25

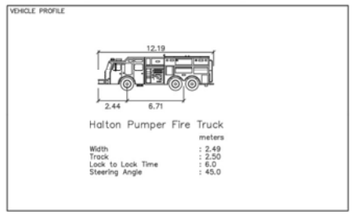
07. ESTABLISHED GRADE			TOTAL	

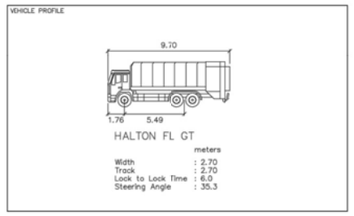
08. BUILDING HEIGHT (m)	PROPOSED		TOTAL	By-Law 438-86 (amended by 1170-2011)
TO MAIN ROOF SLAB	3 stry	3 stry		3 stry
TO MECH. PENTHOUSE	-	-		

09.AMENITY (m2)	PROPOSED	PROPOSED	TOTAL	By-Law 438-86 (amended by 1170-2011)
INDOOR	0	0		REQUIRED 25 M2 PER BEDROOM
OUTDOOR	0	0		
TOTAL	**0**	**0**		**0**

NOTES:
* setbacks to main building face
** actual unit count may vary cepeding on market demand









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ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
CONCORD, ONTARIO L4K 4L8
T 905.795.7601 F 905.795.2844
WWW.GC-ARCHITECTS.COM

PROPOSED RESIDENTIAL DEVELOPMENT

1511 OLD PLAINS ROAD

address
BURLINGTON ON

PROJECT ARCHITECT:	B.GRAZIANI
ASSISTANT DESIGNER:	C.KOTVA
DRAWN BY:	C.KOTVA/ RALANI
CHECKED BY:	____
PLOT DATE:	DEC.13.2024
JOB #	2079.22

STATISTICS

A101

TITLEBLOCK SIZE: 610 x 900



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

ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING D-SUITE 500 CONCORD, ONTARIO L4K 4L8
T.905.795.2601 F.905.795.2844 WWW.GC-ARCHITECTS.COM

PROPSED RESIDENTIAL DEVELOPMENT

1511 OLD PLAINS ROAD

address

BURLINGTON ON

PROJECT ARCHITECT:	B.GRAZIANI
ASSISTANT DESIGNER:	C.KOTVA
DRAWN BY:	C.KOTVA/ RALANI
CHECKED BY:	____
PLOT DATE:	DEC.13.2024
JOB #	2079.22

SITE PLAN - PHASE 1

1:250

A102

TITLEBLOCK SIZE: 610 x 900



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ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING D-SUITE 300 CONCORD, ONTARIO L4K 4L8
T.905.795.2601 F.905.795.2844 WWW.GC-ARCHITECTS.COM

PROPSED RESIDENTIAL DEVELOPMENT

1511 OLD PLAINS ROAD

address

BURLINGTON ON

PROJECT ARCHITECT:	B.GRAZIANI
ASSISTANT DESIGNER:	C.KOTVA
DRAWN BY:	C.KOTVA/ RALANI
CHECKED BY:	___
PLOT DATE:	DEC.13.2024
JOB #	2079.22

SITE PLAN - PHASE 2

1:250

A103

TITLEBLOCK SIZE: 610 x 900

APPENDIX B

Water Servicing Calculations

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-11

Existing Water Demand

Site Area (m^2): 11818
Site Area (ha): 1.18

Notes & References

Residential

Vacant		
Population Density:	0	persons/ha
Residential Area:	0.00	ha
Total Residential Population:	**0**	**persons**

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Design Parameters

Residential Average Demand (m^3/ha/day)
37.125

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Average Daily Demand = 0 m^3/day
Average Daily Demand = 0.00 L/s

Peaking Factor
Max. Day Demand = 2.25
Peak Hourly Demand = 4.00

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Land Use	Average Daily Water Demand (L/s)	Maximum Day Demand (L/s)	Peak Hourly Demand (L/s)
Residential	0.00	0.00	0.00

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-11

Proposed Water Demand

Site Area (m^2): 9593
Site Area (ha): 0.96

Notes & References

Residential

Residential: Townhomes		
Equivalent Population Density:	135	persons/ha
Residential Area:	0.96	ha
Total Residential Population:	**130**	**persons**

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Design Parameters

Residential Average Demand (m^3/ha/day)
37.125

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Average Daily Demand = 36 m^3/day
Average Daily Demand = 0.41 L/s

Peaking Factor
Max. Day Demand = 2.25
Peak Hourly Demand = 4.00

Halton Region - Water & Wastewater Linear Design Manual, Section 2 - (Oct. 2019)

Land Use	Average Daily Demand (L/s)	Maximum Day Demand (L/s)	Peak Hourly Demand (L/s)
Residential	0.41	0.93	1.65

CROZIER & ASSOCIATES Consulting Engineers

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-11

Water Supply for Public Fire Protection - 2020
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.

Area =	**1,800.00**	**sq.m**
C =	0.6	
Therefore F =	**5,600**	**L/min**
Rounded to nearest 1000 L/min:	**6,000**	**L/min**

Note: The effective area is calculated based on a single townhouse block with the most aggressive exposure factor and largest gross floor area per the site plan concept prepared by Graziani + Corazza Architects. Each townhouse block has three (3) floors.

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.

Credits		Charges	
Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0%		

Occupancy Category:	-15%	
	-900	**L/min reduction**
	5,100	**L/min**

Note: Fire flow 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.

Automatic Sprinkler Protection:	50%	(Credit)
NFPA 13 or Equivalent:	30%	(Credit)
No sprinkler protection	0%	(Null)
	-2,550	**L/min reduction**

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
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
Greater than 30 m	0%

Direction	Distance (m)	Charge (%)	Surcharge (L/s)
E	13	15%	765
W	9	20%	1,020
N	10	20%	1,020
S	+30	0%	-
			2,805 L/min surcharge

Determine the required fire flow for the proposed development:

No. 1	6,000	
No. 2	-900	reduction
No. 3	-2,550	reduction
No. 4	2,805	surcharge
Required Fire Flow:	**5,355**	**L/min**
Rounded to nearest 1000 L/min:	**5,000**	**L/min**
Convert to L/s:	**83.33**	**L/s**

December 10th, 2024

C.F. Crozier & Associates
211 Yonge Street, Suite 600
Toronto, ON M5B 1M4

Attention: Rob Babic

Re: Water Supply for Public Fire Protection
1511 Plains Road West
Burlington, ON
Our File No. 2079.22

Dear Mr. Rob Babic

This letter is to confirm that the above mentioned building is considered to be of Fire-resistive construction (Type I) (as defined by Fire Underwriters Survey "Water Supply for Public Fire Protection" 2020 edition), where all structural elements, walls, columns, arches, floors, and roofs are constructed with a minimum 2-hour fire resistance rating, and all materials used in the construction of the structural elements, walls, columns, arches, floors and roofs are constructed with non-combustilble materials.

Classification of Occupancy and Contents is "Limited Combustible Contents".
Vertical openings will be protected with a fire resistance rating of not less than one (1) hour.
An automatic sprinkler system will be designed and installed in accordance with NFPA 13 by a sprinkler consultant and contractor.

If you have any questions, please call.

Yours truly,
GRAZIANI + CORAZZA

A R C H I T E C T S I N C.

Domenic Biase
Principal

Hydrant Flow Test Report

Residual Hydrant Number _____

Operator: Lee Stansfield

Date: 08-Nov-24 Time: 9:40 AM

Witness: Halton Region

Residual Test Hydrant:	Dead End, Old Plains Road West
Hydrant Number:	
Owner:	Halton Region

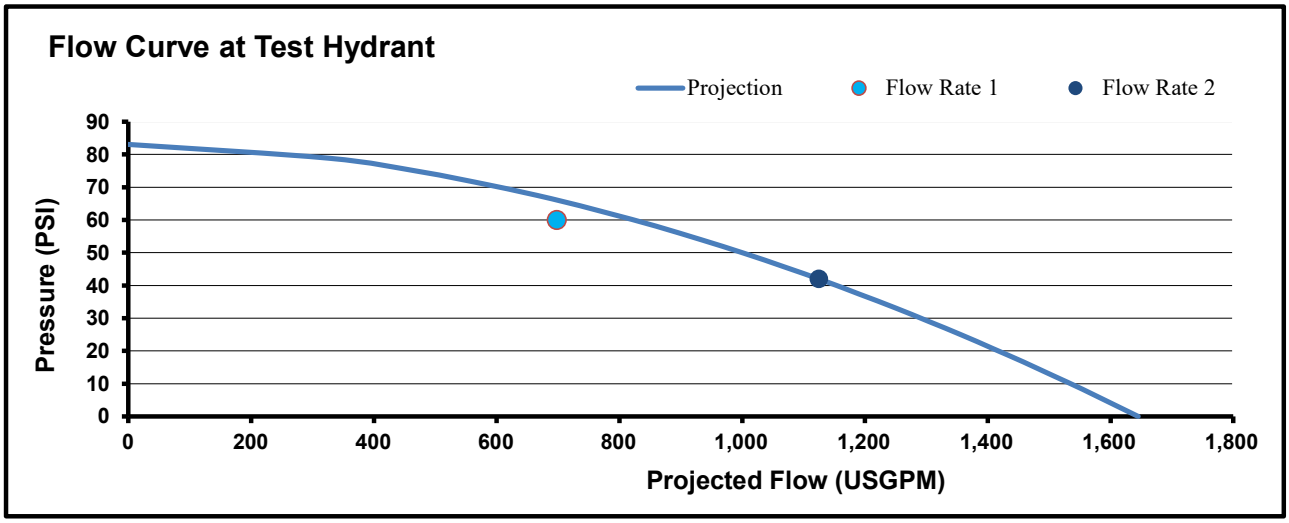
NFPA Colour Code: **CLASS A - GREEN**

STATIC PRESSURE:	83 psi	572 kPa	Pressure Drop
RESIDUAL PRESSURE 1:	60 psi	414 kPa	27.7%
RESIDUAL PRESSURE 2:	42 psi	290 kPa	49.4%

			Hydrant Number
Flow Hydrants:	A	803 Edgemoor Ave	
	B		
	C		

Hydrant No.	Flow Device	Outlet Dia. (in.)	Flow Rate 1 Reading (psi)	Flow Rate 1 (USGPM)	Flow Rate 2 Reading (psi)	Flow Rate 2 (USGPM)
A	Pitot	2.5	20	698	12	540
A	Pitot	2.5		0	14	584
A	HoseMonster	4"		0		
Total Flow (USGPM)				698		1124
Total Flow (L/second)				44		71
Available Flow At Test Hydrant at 20 ps			1,202	USGPM	1,418	USGPM
			76	L/second	89	L/second

Average Projection at 20 PSI 1,310 USGPM



Comments/Discrepencies/Diagram:

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

Hydrant Flow Test Report

Residual Hydrant Number _____

Operator: Lee Stansfield

Date: 08-Nov-24 Time: 9:55 AM

Witness: Halton Region

Residual Test Hydrant:	1s hydrant NW of 1491 Plains Rd W
Hydrant Number:	
Owner:	Halton Region

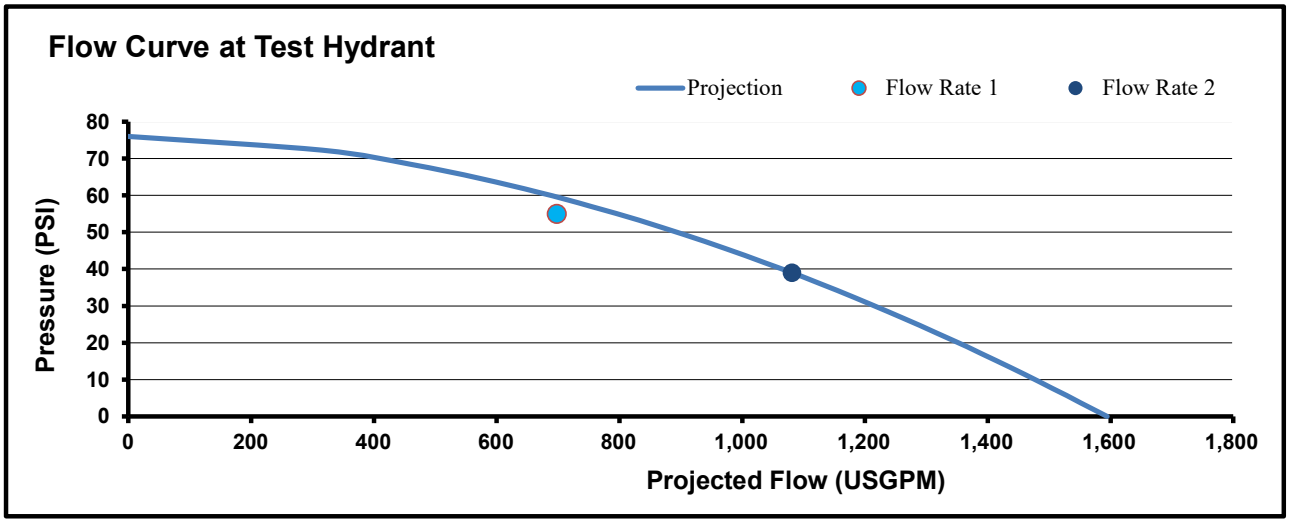
NFPA Colour Code: **CLASS A - GREEN**

STATIC PRESSURE:	76 psi	524 kPa	Pressure Drop
RESIDUAL PRESSURE 1:	55 psi	379 kPa	27.6%
RESIDUAL PRESSURE 2:	39 psi	269 kPa	48.7%

Flow Hydrants:			**Hydrant Number**
	A	1491 Plains Road W	
	B		
	C		

Hydrant No.	Flow Device	Outlet Dia. (in.)	Flow Rate 1 Reading (psi)	Flow Rate 1 (USGPM)	Flow Rate 2 Reading (psi)	Flow Rate 2 (USGPM)
A	Pitot	2.5	20	698	12	540
A	Pitot	2.5		0	12	540
A	HoseMonster	4"				
Total Flow (USGPM)				698		1081
Total Flow (L/second)				44		68
Available Flow At Test Hydrant at 20 ps			1,185	USGPM	1,352	USGPM
			75	L/second	85	L/second

Average Projection at 20 PSI: 1,268 USGPM



Comments/Discrepencies/Diagram:

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

Extract from Water Supply Agreement

WATER SUPPLY AGREEMENT

DATED: November 17th, 2011

BETWEEN:

CITY OF HAMILTON

- and-

THE REGIONAL MUNICIPALITY OF HALTON

Extract from Water Supply Agreement

THIS AGREEMENT made in sextuplicate this 17th day of November, 2011
BETWEEN:

CITY OF HAMILTON
(hereinafter called "**Hamilton**")

OF THE FIRST PART,

-and-

THE REGIONAL MUNICIPALITY OF HALTON,
(hereinafter called "**Halton**")

OF THE SECOND PART.

WHEREAS Halton and Hamilton are both municipal corporations governed in accordance with the Municipal Act, 2001 S.O. 2001, c. 25;

AND WHEREAS pursuant to the provisions of section 11 of the Municipal Act, 2001 S.O. 2001, c. 25, Halton has the exclusive responsibility in its jurisdiction for public utilities, including water distribution, production, treatment and storage;

AND WHEREAS pursuant to the provisions of section 10 of the Municipal Act, 2001 S.O. 2001, c. 25, Hamilton has the exclusive responsibility in its jurisdiction for public utilities, including water distribution, production, treatment and storage;

AND WHEREAS pursuant to the provisions of section 20 of the Municipal Act, 2001 S.O. 2001, c. 25, Halton and Hamilton are permitted to enter into this Agreement for the supply of water to an adjoining municipality;

AND WHEREAS Halton was in need of a secure supply of water to service the Bridgeview Community in the City of Burlington, in the Regional Municipality of Halton and entered into an Agreement with Hamilton for the provision of water to the Bridgeview Community in 1998;

AND WHEREAS Halton and Hamilton further agreed that Hamilton would service the North Aldershot and Snake Road Communities with a secure supply of water;

AND WHEREAS Halton constructed the necessary infrastructure to provide water service to the North Aldershot and Snake Road Communities;

AND WHEREAS Halton and Hamilton wish to amend and renew the agreements for the supply of water to the Communities (as defined below);

AND WHEREAS at a meeting held on September 14, 2011 Halton Regional Council resolved to approve Report No. PW-49-11 of the Planning & Public Works Committee;

AND WHEREAS at a meeting held on June 29, 2011 Hamilton City Council resolved to approve Item No. 14 of the Audit, Finance and Administration Committee Report No. 11-009;

NOW THEREFORE, WITNESSETH THAT in consideration of the mutual covenants and obligations contained herein and subject to the terms and conditions hereinafter set out, Hamilton and Halton hereto agree as follows:

ARTICLE – I

PIPELINE AND APPERTNANCES

1.01 Pipeline

All water provided by Hamilton to the Bridgeview, North Aldershot and Snake Road communities (the "**Communities**") with respect to this Agreement shall be provided through pipelines constructed by Halton (the "**Pipelines**").

1.02 Ownership of the Pipeline

All right, title and interest in the Pipelines and any related infrastructure located within Hamilton, together with any water meters supplied by Hamilton, shall be and remain vested in Hamilton. The chamber and valves related to each water meter shall be owned and maintained by Halton. The water meter shall be owned and maintained by Hamilton.

1.03 Future Pipelines

It is the intention of Hamilton and Halton that the terms of this Agreement shall apply to any communities that may need a supply of water from Hamilton in the future (in each case, a "**Future Community**").

In the event that Halton determines that the terms of this Agreement should apply to a Future Community:

(a) Halton shall request of Hamilton that this Agreement apply to a future agreement;

(b) Hamilton shall agree to such request, provided that:

(i) such application to a Future Community shall not affect Hamilton's ability to supply water to Hamilton's ratepayer in the same manner as then currently provided, in Hamilton's sole and absolute discretion;

(ii) an engineer shall confirm on Halton's behalf that such application to a Future Community will not result in an increase in the volume and flow rates described in section 2.05 of this Agreement;

(iii) Halton shall be responsible for all capital costs associated with the installation of Pipelines, related infrastructure and water meters required to serve a Future Community; and

(iv) this Agreement shall be read with all necessary grammatical and interpretive changes required such that all references herein shall also be a reference to the supply of water by Hamilton to any such Future Community.

ARTICLE – II

COVENANTS OF HALTON

2.01 Payment for Supply of Water

Halton shall pay for all water delivered through the Pipelines at the rate set out at subsection 4.02 of this Agreement.

2.02 Installation of Backflow Prevention Device

Halton shall be permitted to install a backflow prevention device at all Pipeline delivery points. The maintenance and operation of the backflow prevention device shall be the exclusive responsibility of Halton and it shall be the responsibility of Halton to ensure that said backflow prevention device meets any applicable standards (i.e. CSA.64.10).

2.03 Maintenance

Halton covenants and agrees to be fully responsible for: (a) all water meter chambers; and (b) the maintenance of all works and/or infrastructure associated with the said water supply which are located within Halton. Hamilton hereby agrees to provide access within a reasonable period of time to Halton for the said maintenance and Halton agrees to defend, indemnify and save harmless Hamilton from and against all claims, actions, losses, expenses, costs or damages of every nature and kind whatsoever arising as a result of such maintenance by Halton.

2.04 Connection Rights

Halton agrees and understands that Hamilton (including parties acting at the direction or request of Hamilton) shall at all times be permitted to connect service lines and lateral mains to the Pipelines.

2.05 Maximum Water Consumption Amount

Halton shall not withdraw water at any time that exceeds: (a) a maximum daily volume of 1,000,000 litres; or (b) a flow rate of 5,500 litres/minute.

2.06 Water Testing

Upon provision of not less than seven days prior written notice delivered to Hamilton, Halton shall be permitted access to the water meter(s) used in relation to the supply of water pursuant to this Agreement for the purposes of testing them and inspecting their operation.

ARTICLE – III

COVENANTS OF HAMILTON

3.01 Suitability of Pipelines

Hamilton warrants that the Pipelines are in good working order and are suitable for the purposes of this Agreement.

3.02 Maintenance of the Pipelines

Hamilton covenants and agrees to be fully responsible for the maintenance of all works and/or infrastructure associated with the said water supply which are located within Hamilton. Such maintenance shall be to the generally accepted standard for water pipeline maintenance in Hamilton.

3.03 Water Supply

Hamilton shall deliver water having the following characteristics and quality to the Delivery Point:

a) water meeting the Ministry of the Environment's water quality standards, as amended from time to time;
b) water meeting all standards of the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32, as amended from time to time;
c) water of the same quality as that supplied to consumers in Hamilton; and

APPENDIX C

Sanitary Servicing Calculations

CROZIER
CONSULTING ENGINEERS

Project: 1122 Islington Avenue
Project No.: 2169-6119
Created By: J.P.L.
Checked By: J.B.
Date: 2022-01-13

Existing Sanitary Design Flow

Site Area (m^2) : 822.56
Site Area (ha): 0.08

Residential: Single Family Dwelling		
Population Density:	3.5	persons/unit
Number of Units:	1	unit
Total Residential Population:	**4**	**persons**

Notes & References

City of Toronto - Design Criteria for Sewers and Watermains, Population Equivalents, Page 46 - (Jan. 2021)

Design Parameters

Average Residential Flow (L/capita/d)
240

City of Toronto - Design Criteria for Sewers and Watermains, Average Wastewater Flow, Page 53 - (Jan. 2021)

Existing Sanitary Design Flow:

Infiltration Flow (L/ha/s): 0.26

City of Toronto - Design Criteria for Sewers and Watermains, Infiltration Allowance, Page 37 - (Jan. 2021)

Average Daily Flow (L/s)	Harmon Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
0.01	4.00	0.04	0.02	0.06

Equations:

Harmon Peaking Factor
$$M = 1 + (14 / (4 + (P/1000)^{0.5}))$$

Project: 1122 Islington Avenue
Project No.: 2169-6119
Created By: J.P.L.
Checked By: J.B.
Date: 2022-01-13

Proposed Sanitary Design Flow

Site Area (m^2) : 808.13
Site Area (ha): 0.08

Residential: Townhouse		
Population Density:	2.7	persons/unit
Number of Units:	7	unit
Total Residential Population:	**19**	**persons**

Notes & References

Design Criteria for Sewers and Watermains, Population Equivalents, Page 46 - (Jan. 2021)

Design Parameters

Average Residential Flow (L/capita/d)
240

City of Toronto - Design Criteria for Sewers and Watermains, Average Wastewater Flow, Page 53 - (Jan. 2021)

Proposed Sanitary Design Flow:

Infiltration Flow (L/ha/s): 0.26

City of Toronto - Design Criteria for Sewers and Watermains, Infiltration Allowance, Page 37 - (Jan. 2021)

Average Daily Flow (L/s)	Harmon Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
0.05	4.00	0.21	0.02	0.23

Equations:

Harmon Peaking Factor
$$M = 1 + (14 / (4 + (P/1000)^{0.5}))$$

JP Labonte

From: Rob Babic
Sent: October 28, 2024 10:01 AM
To: Gamsa Sivanantham; JP Labonte
Subject: FW: PR3156A - Bridgeview PS - Inquiry

Follow Up Flag: Follow up
Flag Status: Flagged

FYI – for reference and inclusion in report appendix

Rob Babic, P.Eng
Project Manager, Land Development
DID: 905.876.7146

From: Pinlac, Esterlito <Esterlito.Pinlac@halton.ca>
Sent: Monday, May 29, 2023 3:39 PM
To: Rob Babic <rbabic@cfcrozier.ca>
Cc: Pessotto, Natasha <Natasha.Pessotto@halton.ca>; Ahmad, Tasfique <Tasfique.Ahmad@halton.ca>; Christopher Michieli <cmichieli@cfcrozier.ca>; Buchyns, Jeff <Jeff.Buchyns@halton.ca>; Bielawski, Magda <Magda.Bielawski@halton.ca>
Subject: RE: PR3156A - Bridgeview PS - Inquiry

Hi Rob,

We have flow information for Bridgeview Rd WWPS that can be summarized as follows:

1. Station capacity (permitted by MECP) = 13 L/s
2. Station inflow – average = 1.1 L/s
3. Station peak hourly flow = 13.3 L/s (October 20, 2011 event)
4. Station spare capacity = none
5. Emergency overflow = none

The station capacity does not improve over time while the peak hourly flow is the highest for at least a period of ten years.

Hope these are useful. If you require further information, please send us a request through our supervisor, Magda Bielawski (copied in this e-mail), preferably indicating the purpose for which the data will be used for and perhaps we already have the answers (or the information desired).

Regards,
Lito

Esterlito Pinlac, M.Eng., P.Eng.
Water/Wastewater Engineer
Water & Wastewater System Services
Public Works
Halton Region
905-825-6000, ext. 7641 | 1-866-442-5866

1511 Plains Road West: Sanitary Sewer Design Sheet

Project: 1511 Plains Road West
Project No.: 2472-6716
Date: 2024-12-11
Designed by: JPL
Checked by: RB

Location				Population						Total Area	Peaking Factor	Pop. flow	Extraneous flow	Design flow	Proposed/Existing Sewer							
Block/ROW	Catchment ID	From M.H.	To M.H.	Land Use	Population Density	Area (m^2)	No. of Units	Population	Cumulative Population	(ha)	M (min =2, max 4)	Q (p) L/s	Q (i) L/s	Q (d) L/s	Length m	Pipe Size (D) mm	Material	Manning's Roughness n	Slope %	Capacity Q (full) L/sec	FULL FLOW VEL. m/sec	Q (d) / Q (full) Ratio
Plains Road West	Q1	1	2	Commercial	1.1 person/100 m^2 (GFA)	1000.0	-	11	11	8.5	4.00	0.14	2.43	**2.57**	44.3	200	PVC	0.013	1.50%	40.2	1.28	6%
Plains Road West	Q2	2	3	Vacant	-	-	-	0	11	0.5	4.00	0.14	0.14	**0.28**	42.2	200	PVC	0.013	1.00%	32.8	1.04	1%
Plains Road West	Q3	3	7	Residential	3.5 person/unit	-	37	130	141	2.5	4.00	1.79	0.72	**2.50**	111.9	200	PVC	0.013	2.20%	48.6	1.55	5%
Old Plains Road West	S1	0	10	Residential	135 person/ha	0.96	-	130	130	0.96	4.10	1.69	0.27	**1.97**	83.2	200	PVC	0.013	1.00%	32.8	1.04	6%
Plains Road West	Q4	10	13	Vacant	-	-	-	0	270	1.0	4.00	3.44	0.29	**3.72**	123.9	200	PVC	0.013	0.95%	32.0	1.02	12%
Plains Road West	Q5	13	15	Residential	3.5 person/unit	-	26	91	361	2.8	4.00	4.60	0.80	**5.40**	87.1	200	PVC	0.013	0.80%	29.3	0.93	18%
Plains Road West	Q6	13	15	Commercial	1.1 person/100 m^2 (GFA)	4650.0	-	51	412	5.2	4.00	5.25	1.49	**6.74**	87.1	200	PVC	0.013	0.80%	29.3	0.93	23%
Plains Road West	Q7	21	22	Commercial	1.1 person/100 m^2 (GFA)	800	-	9	421	1.4	4.00	5.36	0.40	**5.76**	82.5	200	PVC	0.013	0.50%	23.2	0.74	25%
Plains Road West	Q8	23	25	Residential	3.5 person/unit	-	7	25	446	0.8	4.00	5.67	0.23	**5.90**	48.9	200	PVC	0.013	0.38%	20.2	0.64	29%

q = ave. daily per capita flow - employment	275	L/cap/day	Kav = (A_R + (0.80 * A_e)) / (AR + Ae)
2 = ave. daily per capita flow - residential	275	L/cap/day	Q (p) = P*q*M*(1/86.4)
i = unit of peak extraneous flow	0.286	L/ha/s	Q (i) = i*A (A = area in hectares)
Peaking Factor = M_{av}= K_{av} * (1+(14/(4+($p+p_e$)$^{1/2}$))))			Q (d) = Q (p) + Q (i)
Note: p and p_e are population in thousands			
Manning's Roughness Coefficient	0.013		

Change in Direction	Minimum Drop (mm)
0°	20
1° - 45°	50
46° - 90°	80

APPENDIX D

Stormwater Management Calculations

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - Runoff Coefficients

Notes & Refernces

Time of Concentration: T_c = **10** **mins**

Storm Data: City of Toronto

Return Period	A	B	C	I (mm/hr)
2-Yr	681.52	6.00	-0.780	78.39
5-Yr	802.04	5.00	-0.764	101.31
10-Yr	918.28	5.00	-0.763	116.31
25-Yr	1065.95	5.00	-0.762	135.38
50-Yr	1172.34	5.00	-0.761	149.30
100-Yr	1281.34	5.00	-0.761	163.18

Pre-Development Drainage Conditions

Land Use	Area (ha)	Area (m^2)	C	Weighted Average C
Catchment 101 to Ex. Box Culvert (Site Area)				
Pervious	0.96	9583.00	**0.30**	**0.30**
Total Sub-Catchment	**0.96**	**9583.00**	**-**	**0.30**
Catchment 102 to Ex. Box Culvert (Buffer Zone)				
Pervious	0.22	2235.00	**0.30**	**0.30**
Total Sub-Catchment	**0.22**	**2235.00**	**-**	**0.30**
Total Site Area	**1.18**	**11818.00**	**-**	**0.30**

Post-Development Drainage

Land Use	Area (ha)	Area (m^2)	C	Weighted Average C
Catchment 201 to Ex. Box Culvert (Controlled)				
Impervious Roof	0.38	3765.00	**0.90**	**0.36**
Other Impervious	0.39	3872.00	**0.90**	**0.37**
Pervious	0.18	1801.00	**0.30**	**0.06**
Total Sub-Catchment	**0.94**	**9438.00**	**-**	**0.79**
Catchment 202 to Old Plains Road West Ex. Ditch (Uncontrolled)				
Pervious	0.02	155.00	**0.30**	**0.30**
Total Sub-Catchment	**0.02**	**155.00**	**-**	**0.30**
Catchment 203 to Ex. Box Culvert (Buffer Zone)				
Pervious	0.22	2235.00	**0.30**	**0.30**
Total Sub-Catchment	**0.22**	**2235.00**	**-**	**0.30**
Development Site Area	**0.96**	**9593.00**	**-**	**0.84**
Total Site Area	**1.18**	**11828.00**	**-**	**0.69**

Equations:

Intensity
$I(T_d) = A * (T_c/60)^C$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - Release Rates

Peak Flows to Existing 2.0x2.0m Box Culvert

Pre-Development Drainage Conditions

Catchment 101 to Ex. Box Culvert (Site Area)

Storm Event	C	I (mm/hr)	A (ha)	Q_{pre_101} (m^3/s)	Q_{pre_101} (L/s)	$Q_{ALLOWABLE_101}$ (L/s)
2-Yr	0.30	78.39	0.96	0.06	62.65	62.65
5-Yr	0.30	101.31		0.08	80.97	80.97
10-Yr	0.30	116.31		0.09	92.96	92.96
25-Yr	0.30	135.38		0.11	108.20	108.20
50-Yr	0.30	149.30		0.12	119.32	119.32
100-Yr	0.30	163.18		0.13	130.41	130.41

Post-Development - Controlled Flows

Catchment 201 to Ex. Box Culvert

Storm Event	C	I (mm/hr)	A (ha)	Q_{post_201} (m^3/s)	Q_{post_201} (L/s)	Q_{ACTUAL_201} (L/s)
2-Yr	0.79	78.39	0.94	0.16	161.56	61.62
5-Yr	0.79	101.31		0.21	208.80	79.63
10-Yr	0.79	116.31		0.24	239.71	91.44
25-Yr	0.79	135.38		0.28	279.02	107.37
50-Yr	0.79	149.30		0.31	307.70	117.39
100-Yr	0.79	163.18		0.34	336.30	128.28

Peak Flows to Old Plains Road West - Existing Ditch

Post-Development - Uncontrolled Flows

Catchment 202 to Ex. Ditch

Storm Event	C	I (mm/hr)	A (ha)	Q_{post_202} (m^3/s)	Q_{post_202} (L/s)
2-Yr	0.30	78.39	0.02	0.00	1.01
5-Yr	0.30	101.31		0.00	1.31
10-Yr	0.30	116.31		0.00	1.50
25-Yr	0.30	135.38		0.00	1.75
50-Yr	0.30	149.30		0.00	1.93
100-Yr	0.30	163.18		0.00	2.11

Storm Event (years)	Peak Flows (L/s)				
	Pre-Development		Post-Development		
	$Q_{ALLOWABLE_101}$	Q_{TARGET}	Controlled Flows Q_{ACTUAL_201}	Uncontrolled Flows Q_{post_202}	Total Flows Q_{TOTAL}
2-Yr	62.65	130.41	61.62	1.01	62.63
5-Yr	80.97		79.63	1.31	80.94
10-Yr	92.96		91.44	1.50	92.95
25-Yr	108.20		106.44	1.75	108.19
50-Yr	119.32		117.39	1.93	119.32
100-Yr	130.41		128.28	2.11	130.39

Note: Q_{TOTAL} is equal to Q_{ACTUAL} + Q_{post_202}, which is less than or equal to the $Q_{ALLOWABLE_101}$.

Equations:

Peak Flow
$$Q_{post} = 0.00278 \cdot C_{post} \cdot i(T_d) \cdot A$$

Intensity

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Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 100-Yr Control Orifice

Target 100-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 130.41

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.50	0.60	61.99	123.78
1.00	1.10	87.67	124.28
1.50	1.60	107.37	124.78
2.00	2.10	123.98	125.28
2.141	2.24	128.28	125.42
2.50	2.60	138.61	125.78
3.00	3.10	151.85	126.28

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 50-Yr Control Orifice

Target 50-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 119.32

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.50	0.60	61.99	123.78
1.00	1.10	87.67	124.28
1.50	1.60	107.37	124.78
1.793	1.89	117.39	125.07
2.00	2.10	123.98	125.28
2.50	2.60	138.61	125.78
3.00	3.10	151.85	126.28

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 25-Yr Control Orifice

Target 25-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 108.20

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.50	0.60	61.99	123.78
1.00	1.10	87.67	124.28
1.474	1.57	106.44	124.75
1.50	1.60	107.37	124.78
2.00	2.10	123.98	125.28
2.50	2.60	138.61	125.78
3.00	3.10	151.85	126.28

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 10-Yr Control Orifice

Target 10-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 92.96

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.50	0.60	61.99	123.78
1.00	1.10	87.67	124.28
1.088	1.19	91.44	124.37
2.00	2.10	123.98	125.28
2.50	2.60	138.61	125.78
3.00	3.10	151.85	126.28
3.50	3.60	164.01	126.78

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 5-Yr Control Orifice

Target 5-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 80.97

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.25	0.35	43.83	123.53
0.50	0.60	61.99	123.78
0.75	0.85	75.92	124.03
0.825	0.92	79.63	124.11
1.00	1.10	87.67	124.28
1.25	1.35	98.02	124.53
1.50	1.60	107.37	124.78

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

CROZIER CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 2-Yr Control Orifice

Target 2-Yr Release Rate to Existing 2.0x2.0m Box Culvert (L/s) = 62.65

Orifice	
Diameter (mm)	200
Area (m^2)	0.031
Orifice Coefficient	0.63
Gravity (m^2/s)	9.81
K	1.0
D/S HGL (m)	N/A
Orifice Invert (m)	123.18

Effective Head (m)	Depth of Water At CTL MH (m)	Q_{ACTUAL_201} (L/s)	Elevation of Water (m)
0.00	0.10	0.00	123.28
0.15	0.25	33.95	123.43
0.30	0.40	48.02	123.58
0.494	0.59	61.62	123.77
0.60	0.70	67.91	123.88
0.75	0.85	75.92	124.03
0.90	1.00	83.17	124.18
1.05	1.15	89.83	124.33

Equations:

Orifice Flow

$$Q_O = \text{Orifice Coeff.} \bullet A \bullet (\text{Gravity} \bullet \text{Head} / K)^{0.5}$$

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 100-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**130.41 L/s**
Actual Release Rate ($Q_{ACTUAL\ 201}$) =	**128.28 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	127.71 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	1281.34
b=	5.00
c=	-0.761

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	163.18	336.30	0.00	336.30	201.78	128.28	124.82
15	131.09	270.18	0.00	270.18	243.16	128.28	127.71
20	110.62	227.98	0.00	227.98	273.58	128.28	119.65
25	96.29	198.45	0.00	198.45	297.67	128.28	105.26
30	85.63	176.48	0.00	176.48	317.67	128.28	86.77
35	77.36	159.43	0.00	159.43	334.80	128.28	65.42
40	70.72	145.76	0.00	145.76	349.83	128.28	41.96
45	65.28	134.53	0.00	134.53	363.23	128.28	16.89
50	60.71	125.12	0.00	125.12	375.36	125.12	0.00
55	56.82	117.10	0.00	117.10	386.44	117.10	0.00
60	53.46	110.18	0.00	110.18	396.66	110.18	0.00
65	50.53	104.14	0.00	104.14	406.15	104.14	0.00
70	47.94	98.81	0.00	98.81	415.02	98.81	0.00
75	45.65	94.08	0.00	94.08	423.35	94.08	0.00
80	43.59	89.84	0.00	89.84	431.21	89.84	0.00
85	41.73	86.01	0.00	86.01	438.66	86.01	0.00
90	40.05	82.54	0.00	82.54	445.74	82.54	0.00
95	38.52	79.38	0.00	79.38	452.49	79.38	0.00
100	37.11	76.49	0.00	76.49	458.95	76.49	0.00
105	35.82	73.83	0.00	73.83	465.14	73.83	0.00
110	34.63	71.38	0.00	71.38	471.08	71.38	0.00
115	33.53	69.10	0.00	69.10	476.79	69.10	0.00
120	32.50	66.99	0.00	66.99	482.31	66.99	0.00
125	31.55	65.02	0.00	65.02	487.63	65.02	0.00
130	30.65	63.18	0.00	63.18	492.78	63.18	0.00
135	29.82	61.45	0.00	61.45	497.76	61.45	0.00
140	29.03	59.83	0.00	59.83	502.59	59.83	0.00
145	28.29	58.31	0.00	58.31	507.29	58.31	0.00
150	27.59	56.87	0.00	56.87	511.84	56.87	0.00
155	26.94	55.51	0.00	55.51	516.28	55.51	0.00
160	26.31	54.23	0.00	54.23	520.60	54.23	0.00

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 50-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**119.32 L/s**
Actual Release Rate (Q_{ACTUAL_201}) =	**117.39 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	116.83 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	1172.34
b=	5.00
c=	-0.761

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	149.30	307.70	0.00	307.70	184.62	117.39	114.18
15	119.94	247.20	0.00	247.20	222.48	117.39	116.83
20	101.21	208.59	0.00	208.59	250.31	117.39	109.44
25	88.10	181.57	0.00	181.57	272.35	117.39	96.27
30	78.35	161.47	0.00	161.47	290.65	117.39	79.34
35	70.78	145.87	0.00	145.87	306.32	117.39	59.80
40	64.71	133.36	0.00	133.36	320.07	117.39	38.33
45	59.72	123.09	0.00	123.09	332.33	117.39	15.38
50	55.54	114.48	0.00	114.48	343.43	114.48	0.00
55	51.99	107.14	0.00	107.14	353.56	107.14	0.00
60	48.91	100.81	0.00	100.81	362.91	100.81	0.00
65	46.23	95.28	0.00	95.28	371.60	95.28	0.00
70	43.87	90.41	0.00	90.41	379.71	90.41	0.00
75	41.76	86.07	0.00	86.07	387.34	86.07	0.00
80	39.88	82.19	0.00	82.19	394.53	82.19	0.00
85	38.18	78.70	0.00	78.70	401.35	78.70	0.00
90	36.64	75.52	0.00	75.52	407.82	75.52	0.00
95	35.24	72.63	0.00	72.63	414.00	72.63	0.00
100	33.96	69.98	0.00	69.98	419.91	69.98	0.00
105	32.78	67.55	0.00	67.55	425.57	67.55	0.00
110	31.69	65.30	0.00	65.30	431.00	65.30	0.00
115	30.68	63.22	0.00	63.22	436.23	63.22	0.00
120	29.74	61.29	0.00	61.29	441.28	61.29	0.00
125	28.86	59.49	0.00	59.49	446.15	59.49	0.00
130	28.05	57.80	0.00	57.80	450.86	57.80	0.00
135	27.28	56.22	0.00	56.22	455.42	56.22	0.00
140	26.56	54.74	0.00	54.74	459.84	54.74	0.00
145	25.88	53.35	0.00	53.35	464.13	53.35	0.00
150	25.25	52.03	0.00	52.03	468.30	52.03	0.00
155	24.64	50.79	0.00	50.79	472.36	50.79	0.00
160	24.07	49.62	0.00	49.62	476.31	49.62	0.00

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 25-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**108.20 L/s**
Actual Release Rate (Q_{ACTUAL_201}) =	**106.44 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	105.89 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	1065.95
b=	5.00
c=	-0.762

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	135.38	279.02	0.00	279.02	167.41	106.44	103.55
15	108.73	224.09	0.00	224.09	201.68	106.44	105.89
20	91.73	189.05	0.00	189.05	226.86	106.44	99.14
25	79.83	164.53	0.00	164.53	246.79	106.44	87.14
30	70.98	146.30	0.00	146.30	263.33	106.44	71.75
35	64.12	132.14	0.00	132.14	277.50	106.44	53.98
40	58.61	120.80	0.00	120.80	289.92	106.44	34.47
45	54.09	111.48	0.00	111.48	301.00	106.44	13.62
50	50.30	103.67	0.00	103.67	311.01	103.67	0.00
55	47.07	97.02	0.00	97.02	320.16	97.02	0.00
60	44.29	91.28	0.00	91.28	328.60	91.28	0.00
65	41.86	86.27	0.00	86.27	336.44	86.27	0.00
70	39.71	81.85	0.00	81.85	343.77	81.85	0.00
75	37.81	77.92	0.00	77.92	350.65	77.92	0.00
80	36.10	74.40	0.00	74.40	357.14	74.40	0.00
85	34.56	71.23	0.00	71.23	363.29	71.23	0.00
90	33.17	68.36	0.00	68.36	369.13	68.36	0.00
95	31.90	65.74	0.00	65.74	374.70	65.74	0.00
100	30.73	63.34	0.00	63.34	380.03	63.34	0.00
105	29.66	61.13	0.00	61.13	385.13	61.13	0.00
110	28.67	59.10	0.00	59.10	390.03	59.10	0.00
115	27.76	57.21	0.00	57.21	394.75	57.21	0.00
120	26.91	55.46	0.00	55.46	399.30	55.46	0.00
125	26.12	53.83	0.00	53.83	403.69	53.83	0.00
130	25.38	52.30	0.00	52.30	407.94	52.30	0.00
135	24.68	50.87	0.00	50.87	412.05	50.87	0.00
140	24.03	49.53	0.00	49.53	416.03	49.53	0.00
145	23.42	48.26	0.00	48.26	419.90	48.26	0.00
150	22.84	47.07	0.00	47.07	423.66	47.07	0.00
155	22.29	45.95	0.00	45.95	427.32	45.95	0.00
160	21.78	44.88	0.00	44.88	430.88	44.88	0.00

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Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 10-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**92.96 L/s**
Actual Release Rate (Q_{ACTUAL_201}) =	**91.44 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	90.92 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	918.28
b=	5.00
c=	-0.763

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	116.31	239.71	0.00	239.71	143.83	91.44	88.96
15	93.39	192.47	0.00	192.47	173.22	91.44	90.92
20	78.77	162.34	0.00	162.34	194.81	91.44	85.07
25	68.54	141.26	0.00	141.26	211.88	91.44	74.72
30	60.93	125.58	0.00	125.58	226.05	91.44	61.45
35	55.03	113.42	0.00	113.42	238.18	91.44	46.14
40	50.30	103.67	0.00	103.67	248.81	91.44	29.34
45	46.42	95.66	0.00	95.66	258.28	91.44	11.39
50	43.16	88.95	0.00	88.95	266.85	88.95	0.00
55	40.39	83.24	0.00	83.24	274.68	83.24	0.00
60	37.99	78.31	0.00	78.31	281.90	78.31	0.00
65	35.91	74.00	0.00	74.00	288.61	74.00	0.00
70	34.06	70.21	0.00	70.21	294.87	70.21	0.00
75	32.43	66.83	0.00	66.83	300.75	66.83	0.00
80	30.96	63.81	0.00	63.81	306.30	63.81	0.00
85	29.64	61.09	0.00	61.09	311.55	61.09	0.00
90	28.44	58.62	0.00	58.62	316.55	58.62	0.00
95	27.35	56.37	0.00	56.37	321.31	56.37	0.00
100	26.35	54.31	0.00	54.31	325.86	54.31	0.00
105	25.43	52.42	0.00	52.42	330.22	52.42	0.00
110	24.58	50.67	0.00	50.67	334.41	50.67	0.00
115	23.80	49.05	0.00	49.05	338.44	49.05	0.00
120	23.07	47.55	0.00	47.55	342.33	47.55	0.00
125	22.39	46.14	0.00	46.14	346.08	46.14	0.00
130	21.75	44.83	0.00	44.83	349.70	44.83	0.00
135	21.16	43.61	0.00	43.61	353.21	43.61	0.00
140	20.60	42.45	0.00	42.45	356.62	42.45	0.00
145	20.07	41.37	0.00	41.37	359.92	41.37	0.00
150	19.58	40.35	0.00	40.35	363.14	40.35	0.00
155	19.11	39.38	0.00	39.38	366.26	39.38	0.00
160	18.67	38.47	0.00	38.47	369.30	38.47	0.00

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 5-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**80.97 L/s**
Actual Release Rate (Q_{ACTUAL_201}) =	**79.63 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	79.18 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	802.04
b=	5.00
c=	-0.764

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	101.31	208.80	0.00	208.80	125.28	79.63	77.50
15	81.32	167.60	0.00	167.60	150.84	79.63	79.18
20	68.58	141.33	0.00	141.33	169.60	79.63	74.05
25	59.66	122.96	0.00	122.96	184.43	79.63	64.99
30	53.03	109.30	0.00	109.30	196.73	79.63	53.40
35	47.89	98.70	0.00	98.70	207.26	79.63	40.04
40	43.77	90.20	0.00	90.20	216.48	79.63	25.38
45	40.38	83.23	0.00	83.23	224.71	79.63	9.71
50	37.55	77.38	0.00	77.38	232.14	77.38	0.00
55	35.13	72.40	0.00	72.40	238.93	72.40	0.00
60	33.05	68.11	0.00	68.11	245.19	68.11	0.00
65	31.23	64.36	0.00	64.36	251.00	64.36	0.00
70	29.62	61.06	0.00	61.06	256.43	61.06	0.00
75	28.20	58.12	0.00	58.12	261.53	58.12	0.00
80	26.92	55.49	0.00	55.49	266.34	55.49	0.00
85	25.77	53.12	0.00	53.12	270.89	53.12	0.00
90	24.73	50.97	0.00	50.97	275.22	50.97	0.00
95	23.78	49.01	0.00	49.01	279.35	49.01	0.00
100	22.91	47.22	0.00	47.22	283.29	47.22	0.00
105	22.11	45.57	0.00	45.57	287.07	45.57	0.00
110	21.37	44.05	0.00	44.05	290.70	44.05	0.00
115	20.69	42.64	0.00	42.64	294.19	42.64	0.00
120	20.05	41.33	0.00	41.33	297.55	41.33	0.00
125	19.46	40.11	0.00	40.11	300.80	40.11	0.00
130	18.91	38.97	0.00	38.97	303.94	38.97	0.00
135	18.39	37.90	0.00	37.90	306.98	37.90	0.00
140	17.90	36.90	0.00	36.90	309.93	36.90	0.00
145	17.44	35.95	0.00	35.95	312.79	35.95	0.00
150	17.01	35.06	0.00	35.06	315.57	35.06	0.00
155	16.61	34.22	0.00	34.22	318.28	34.22	0.00
160	16.22	33.43	0.00	33.43	320.91	33.43	0.00

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Modified Rational Method Calculations - 2-Yr Detention Volume

Drainage Area =	0.94 ha
Runoff Coefficient =	0.79
Target Site Release Rate =	**62.65 L/s**
Actual Release Rate (Q_{ACTUAL_201}) =	**61.62 L/s**
Allowable Groundwater Pump Rate ($Q_{G.W.}$)=	**0.00 L/s**
Detention Volume Required =	62.16 m3
Detention Volume Provided =	0.0 m3
Pipe/MH/CB Storage Provided =	TBD

Rainfall Intensity
$I(T_d) = A * (T_c+B)^C$

City of Burlington IDF	
a=	681.52
b=	6.00
c=	-0.780

Time (T_c) (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{G.W.}$ (L/s)	Total Runoff (Q_{total}) (L/s)	Total Runoff Volume (m^3)	$Q_{Release}$ (L/s)	Detention Volume Required (m^3)
10	78.39	161.56	0.00	161.56	96.94	61.62	59.97
15	63.41	130.68	0.00	130.68	117.62	61.62	62.16
20	53.68	110.63	0.00	110.63	132.76	61.62	58.82
25	46.80	96.45	0.00	96.45	144.67	61.62	52.24
30	41.64	85.83	0.00	85.83	154.49	61.62	43.58
35	37.63	77.55	0.00	77.55	162.85	61.62	33.46
40	34.40	70.89	0.00	70.89	170.14	61.62	22.26
45	31.74	65.41	0.00	65.41	176.61	61.62	10.24
50	29.50	60.81	0.00	60.81	182.43	60.81	0.00
55	27.60	56.88	0.00	56.88	187.72	56.88	0.00
60	25.96	53.49	0.00	53.49	192.58	53.49	0.00
65	24.52	50.53	0.00	50.53	197.08	50.53	0.00
70	23.25	47.92	0.00	47.92	201.26	47.92	0.00
75	22.12	45.60	0.00	45.60	205.19	45.60	0.00
80	21.11	43.52	0.00	43.52	208.87	43.52	0.00
85	20.20	41.64	0.00	41.64	212.36	41.64	0.00
90	19.38	39.94	0.00	39.94	215.66	39.94	0.00
95	18.63	38.39	0.00	38.39	218.80	38.39	0.00
100	17.94	36.97	0.00	36.97	221.80	36.97	0.00
105	17.30	35.66	0.00	35.66	224.67	35.66	0.00
110	16.72	34.46	0.00	34.46	227.42	34.46	0.00
115	16.18	33.34	0.00	33.34	230.05	33.34	0.00
120	15.67	32.30	0.00	32.30	232.59	32.30	0.00
125	15.21	31.34	0.00	31.34	235.04	31.34	0.00
130	14.77	30.44	0.00	30.44	237.40	30.44	0.00
135	14.36	29.59	0.00	29.59	239.69	29.59	0.00
140	13.97	28.80	0.00	28.80	241.90	28.80	0.00
145	13.61	28.05	0.00	28.05	244.04	28.05	0.00
150	13.27	27.35	0.00	27.35	246.13	27.35	0.00
155	12.95	26.68	0.00	26.68	248.15	26.68	0.00
160	12.64	26.05	0.00	26.05	250.11	26.05	0.00

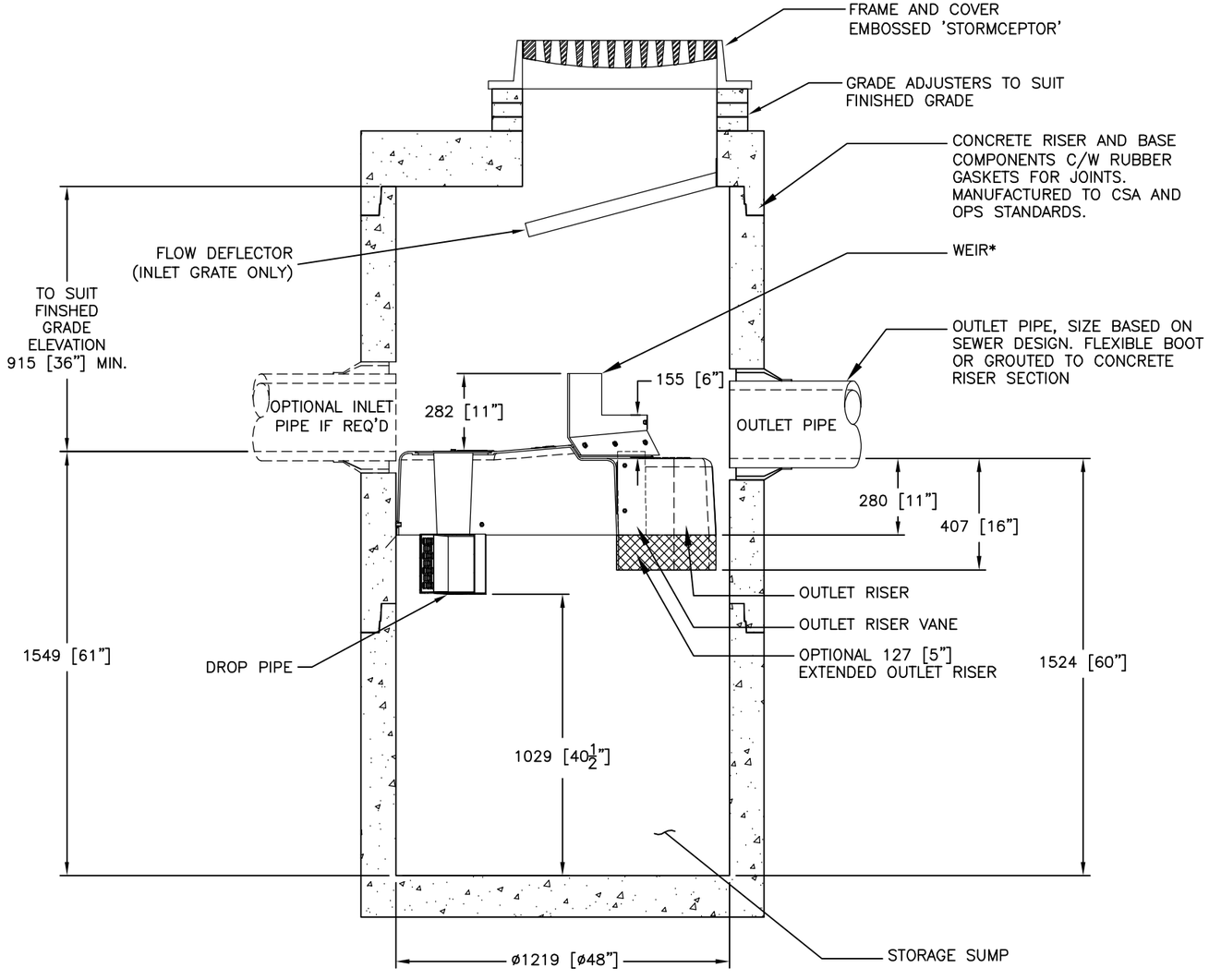
CROZIER
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Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
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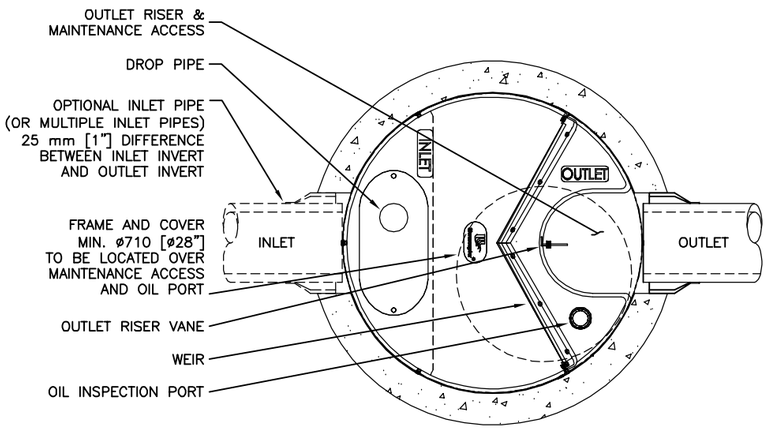
Water Quality Calculation - TSS Removal

Post-Development Drainage to Ex. 2.0x2.0m Box Culvert

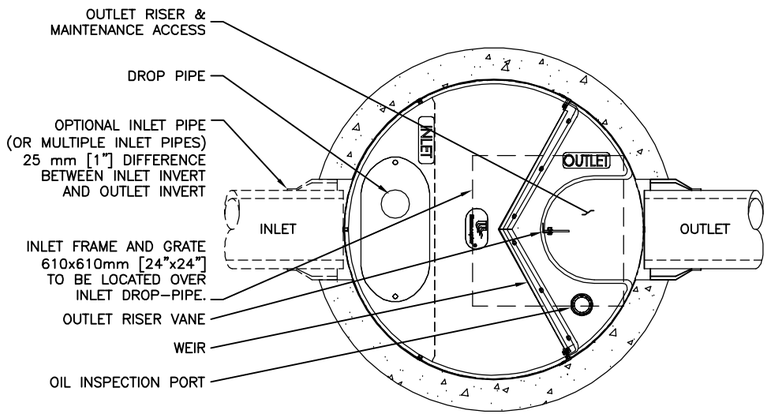
Land Use	Area (m^2)	Water Quality Target (%)	% of Total Development Area	TSS Removal Credit (%)	Total TSS Removal (%)
Impervious Roof	3,765.00	80.0%	39.9%	80.0%	31.9%
Asphalt Pavement	3,872.00		41.0%	0.0%	0.0%
Landscape	1,801.00		19.1%	80.0%	15.3%
Sub-Total	**9,438.00**	-	**100.0%**	**-**	**47.2%**
80% TSS Removal Credit of the Total TSS Removal					
Total	**9,438.00**	-	**100.0%**	**-**	**91.2%**



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO4
STRUCTURE ID	*
HYDROCARBON STORAGE REQ'D (L)	*
WATER QUALITY FLOW RATE (L/s)	*
PEAK FLOW RATE (L/s)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
DRAINAGE AREA (HA)	*
DRAINAGE AREA IMPERVIOUSNESS (%)	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

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MARK	DATE	REVISION DESCRIPTION	BY
1	6/8/18	UPDATES	JSK
0	5/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

imbrium®
7007 RIDGE ROAD, SUITE 550, HANOVER, MD 21076
USA: 888-279-9828 CA: 800-386-4801 INTL: +1-416-960-9900

DATE: 10/13/2017

DESIGNED:	DRAWN:
JSK	JSK
CHECKED:	APPROVED:
BSF	SP
PROJECT No.:	SEQUENCE No.:
EFO4	*

SHEET: 1 OF 1

CROZIER
CONSULTING ENGINEERS

Project: 1511 Plains Road West
Project No.: 2472-6716
Created By: JPL
Checked By: RB
Date: 2024-12-05

Water Balance Calculation - Initial Abstraction

Development Site Area = 9,593.00 m^2

Required Average Annual Rainfall Depth = 5 mm

Total Required 5mm Retention Volume = 48.0 m^3

Initial Abstraction Calculations:
*Initial abstraction values are provided by the City of Burlington

Land Type	**Area** (m^2)	***Initial Abstraction** (mm)	**Volume** (m^3)
Impervious Roof	3765.00	1	3.8
Other Impervious	3872.00	1	3.9
Pervious	1801.00	5	9.0
Total	**9438.00**	**-**	**16.6**

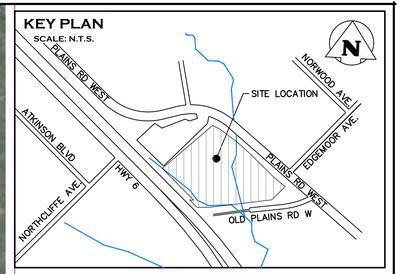
Total Volume Captured On-Site Through Initial Abstraction =	**16.6**	**m^3**
Retention Volume Required On-Site =	**31.3**	**m^3**

FIGURES & DRAWINGS



KEY PLAN

SCALE: N.T.S.



LEGEND

- PROPERTY LINE
- EXISTING DITCH
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- SANITARY DRAINAGE AREA
- ID / A | PD — CATCHMENT I.D. / AREA (ha) | POPULATION

No.	ISSUE / REVISION	YYYY/MM/DD
1	ISSUED FOR OPA/ZBA SUBMISSION	2024/12/19

ELEVATION NOTE:

BENCHMARK MONUMENT 392, BRASS PLAQUE SET ON NORTHWEST CORNER OF PARAPET WALL AT NEW BRIDGE ON OLD YORK ROAD AT C.P. RAILWAY, 0.011m EAST AND 0.018m ABOVE CONCRETE SIDEWALK. ELEVATION: 160.622 m

BEARING NOTE:

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SURVEY NOTES:

SURVEY COMPLETED BY A.T. McLAREN LIMITED (2018/MAY/04)
DWG No: 35116
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 GRAZIANI & CORAZZA ARCHITECTS INC.
DRAWING No.: 2079.22 (2024/MAY/05)

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Project

1511 PLAINS ROAD WEST CITY OF BURLINGTON

Drawing

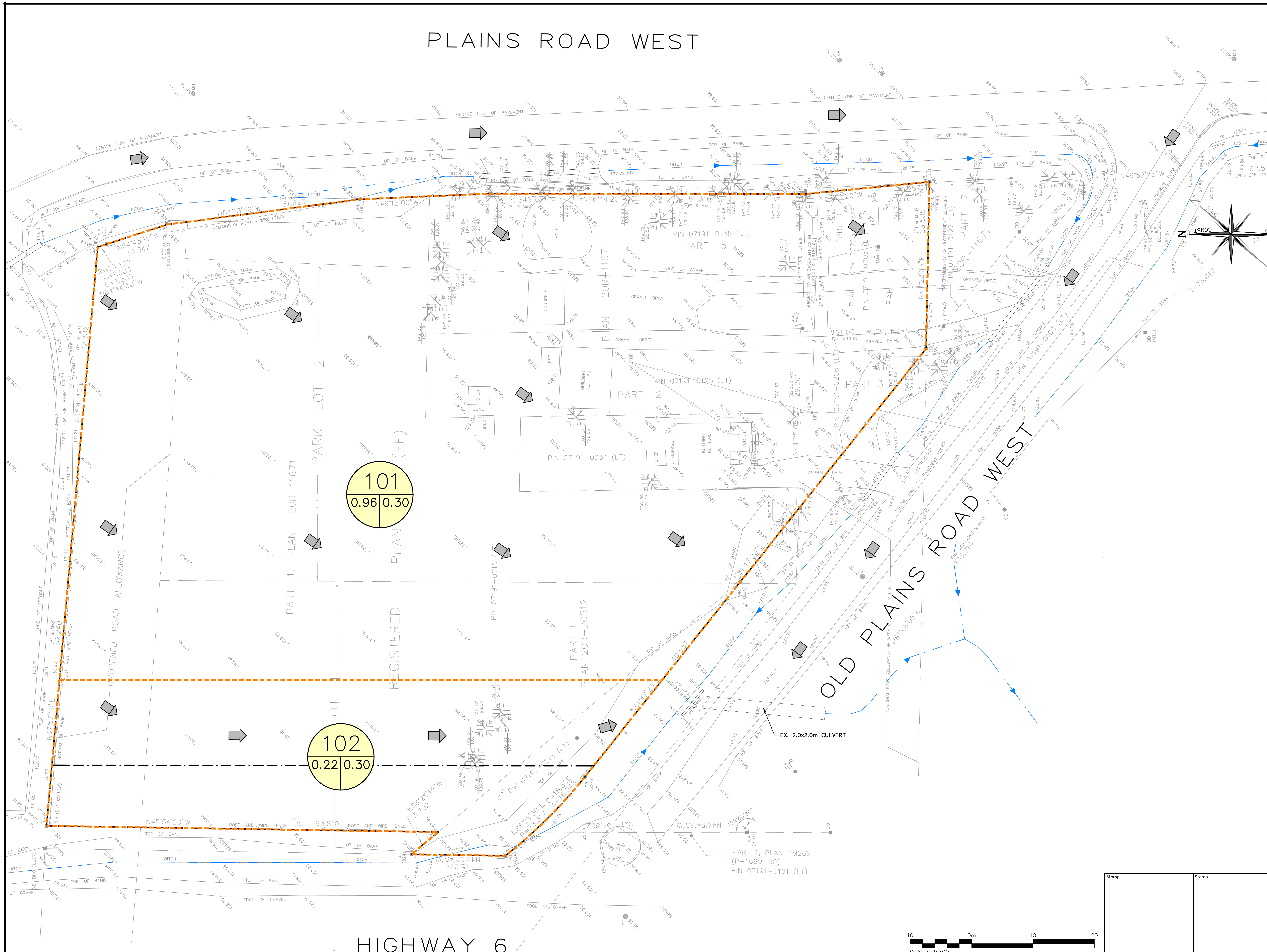
SANITARY DRAINAGE AREA PLAN

Stamp

Stamp

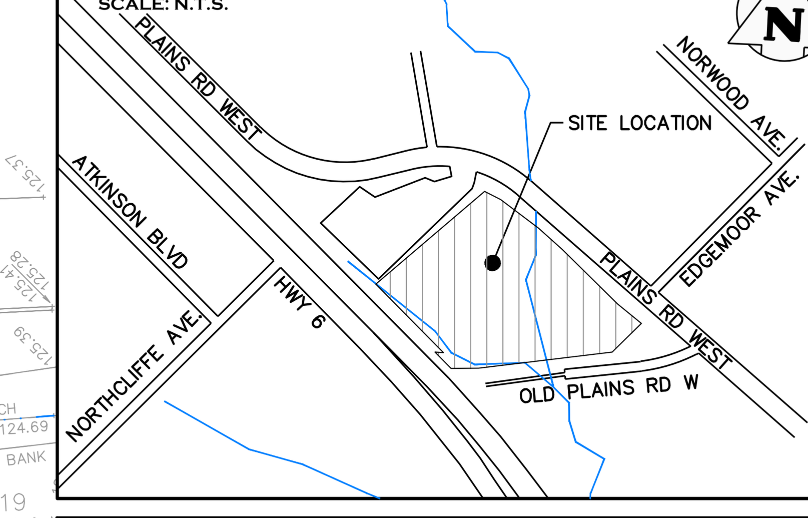
CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
A.A.	J.P.L.		2472–6716
Check	Check	Scale	Dwg.
R.B.	R.B.		FIGURE 1



KEY PLAN

SCALE: N.T.S.



LEGEND

- PROPERTY LINE
- EXISTING DITCH
- DRAINAGE AREA
- CATCHMENT I.D. (ID) — AREA (ha) | POPULATION (A | PD)
- EXISTING OVERLAND FLOW DIRECTION

No.	ISSUE / REVISION	YYYY/MM/DD
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Project

1511 PLAINS ROAD WEST
CITY OF BURLINGTON

Drawing

PRE-DEVELOPMENT
DRAINAGE PLAN

Stamp

Stamp

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Drawn	A.A.	Design	J.P.L.	Project No.	2472-6716
Check	R.B.	Check	R.B.	Scale 1:300	Dwg. FIGURE 2

PLAINS ROAD WEST

HIGHWAY 6

OLD PLAINS ROAD WEST

201
0.94 | 0.79

202
0.02 | 0.30

203
0.22 | 0.30

EX. 2.0x2.0m CULVERT

STACKED TOWN HOME 6 UNITS

PRIVATE TERRACES

PART 1, PLAN PM262 (P-1699-50) PIN 07191-0161 (LT)

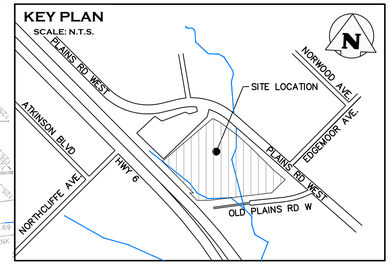
PIN 07191-0125 (LT) PART 2

PIN 07191-0206 (LT) PART 1

PIN 07191-0127 (LT) PART 7 OR-11671

KEY PLAN

SCALE: N.T.S.



LEGEND

- PROPERTY LINE
- EXISTING DITCH
- DRAINAGE AREA
- ID / A|PD — CATCHMENT I.D.; AREA (ha) | POPULATION
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION

No.	ISSUE / REVISION	YYYY/MM/DD
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Project

1511 PLAINS ROAD WEST CITY OF BURLINGTON

Drawing

POST-DEVELOPMENT DRAINAGE PLAN

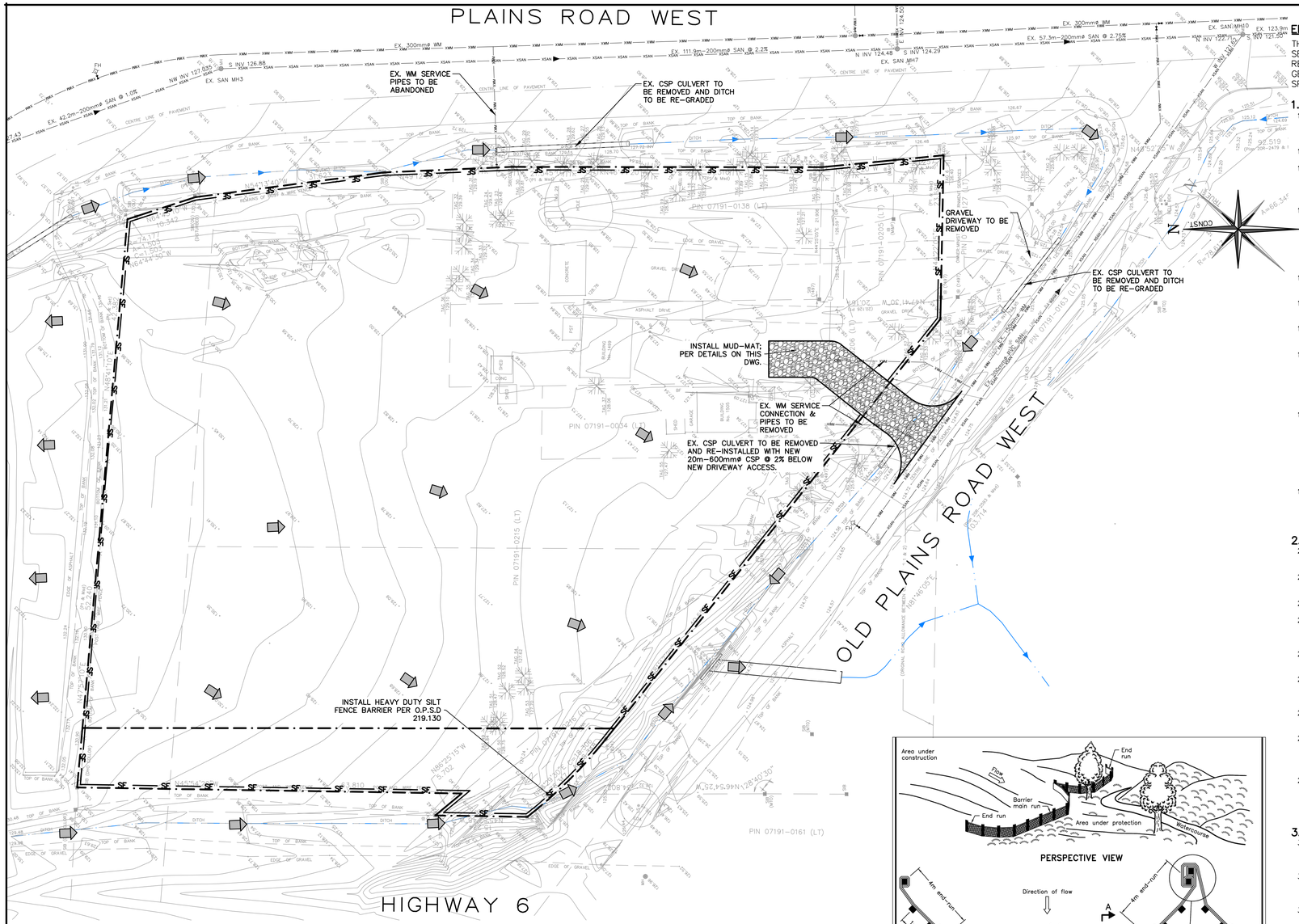
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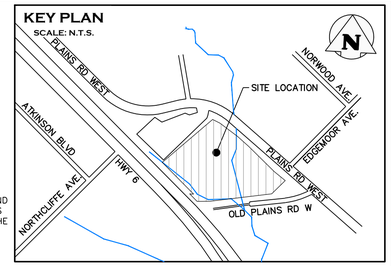
Stamp

Stamp

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Drawn	Design	Project No.
A.A.	J.P.L.	2472-6716
Check	Check	Scale / Dwg
R.B.	R.B.	1:300 / FIGURE 3





LEGEND

- PROPERTY LINE
- EXISTING DITCH
- EXISTING HYDRO POLE
- EXISTING FENCE
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- MUD-MAT; SEE DETAIL
- SF — LIGHT-DUTY SILT FENCE; SEE DETAIL
- HDSF — HEAVY-DUTY SILT FENCE; SEE DETAIL
- PR. ROCK CHECK DAM PER OPSD 219.210
- TEMPORARY CONVEYANCE SWALE
- TREE PROTECTION FENCING

EROSION AND SEDIMENT CONTROL GENERAL NOTES

THE FOLLOWING GENERAL NOTES ARE FOR REMOVALS AND EROSION AND SEDIMENT CONTROL WORKS ONLY. ADDITIONAL GENERAL NOTES ARE TO BE REFERENCED FROM THE SERVICING AND GRADING DRAWING. ALL NOTES AND GENERAL NOTES SHALL BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS.

1. GENERAL

1.1. CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE EPA 832/R-92-005, CHAPTER 3, AND THE "ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS".

1.2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES.

1.3. THE POSITION OF EXISTING POLES, OVERHEAD LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND OR ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES IS NOT GUARANTEED.

1.4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY UTILITY STAKEOUTS TO VERIFY THE LOCATION OF ANY HYDRO, BELL, CABLE TV OR GAS UTILITY LINES, AND WHERE REQUIRED, PROVIDE ADEQUATE PROTECTION OF EXISTING UTILITY LINES AND PLANT. BEFORE COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL EXISTING UTILITIES AND STRUCTURES, AND ASSUME ALL LIABILITY RESULTING FROM DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION.

1.5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE SURFACE DRAINAGE FOR THE DURATION OF THE CONSTRUCTION PERIOD.

1.6. ALL GEOTECHNICAL INFORMATION, INCLUDING BOREHOLE LOGS AND ENGINEERED-FILL SPECIFICATIONS, ARE TO BE OBTAINED FROM THE GEOTECHNICAL CONSULTANT.

1.7. CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL UTILITY LOCATIONS HAVE BEEN VERIFIED AND ALL PERMITS HAVE BEEN RECEIVED.

1.8. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION. EROSION AND SEDIMENT CONTROLS WILL BE INSPECTED WEEKLY, AFTER EVERY RAINFALL AND SNOWMELT EVENT AND DAILY DURING EXTENDED RAIN OR SNOWMELT PERIODS.

1.9. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.

1.10. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30m FRO THE WATER.

2. SITE CONTROL MEASURES

2.1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDITION OF THE SITE AT ALL TIMES.

2.2. IF CONSTRUCTION IS INTERRUPTED AND/OR INACTIVITY EXCEEDS 30 DAYS, STRIPPED/BARE AREAS WILL BE STABILIZED BY SEEDING.

2.3. THE DEVELOPMENT AREA FOR STRIPPING AND EXCAVATION IS APPROXIMATELY 0.06HA.

2.4. ALL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING THE SEDIMENTATION FENCING, CATCHBASIN CONTROL DEVICE, MUD MAT AND OTHER EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF ANY EARTH MOVING.

2.5. CONTRACTOR SHALL NOTIFY THE CONSULTANT 48 HOURS PRIOR TO THE COMMENCEMENT OF GRADING ACTIVITIES OF CONSTRUCTION.

2.6. ALL ROADSIDE CATCHBASINS TO HAVE SEDIMENT PROTECTION AS PER DETAIL ON THIS DRAWING. SEDIMENT PROTECTION BARRIER TO BE MAINTAINED ON A REGULAR BASIS OR TO THE SATISFACTION OF THE CITY OF BURLINGTON.

2.7. ALL SEDIMENT REMOVED FROM SEDIMENT TRAPS SHALL BE DISPOSED OFF-SITE IN LOCATIONS ACCEPTABLE TO AND IN ACCORDANCE WITH CITY REGULATIONS.

2.8. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES IN GOOD WORKING ORDER AT ALL TIMES. THE CONTRACTOR SHALL INSPECT SUCH DEVICES AT LEAST ONCE A WEEK AND AFTER EACH RAIN FALL EVENT, AND MAKE ALL NECESSARY REPAIRS AS REQUIRED.

2.9. ONGOING INSPECTION, MONITORING AND MAINTENANCE OF THE SILTATION CONTROL FENCE SHALL BE PROVIDED;RELOCATION OF THE SILTATION CONTROL FENCE SHALL BE UNDERTAKEN DURING THE COURSE OF CONSTRUCTION WHEN IT IS DEEMED NECESSARY BY THE PRACTITIONER OR WHEN IT IS RECOMMENDED BY THE ENVIRONMENTAL INSPECTOR.

3. TRAFFIC CONTROL AND MUD TRACKING

3.1. CONTRACTOR TO BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SIGNAGE. CONTRACTOR IS REQUIRED TO ADHERE TO ALL CONDITIONS SET OUT BY THE CITY OF BURLINGTON TRANSPORTATION DEPARTMENT.

3.2. DURING ALL CONSTRUCTION PHASES, MUD TRACKING CONTROL, CONSISTING OF FLUSHING AND SWEEPING ROADS, IS TO BE PROVIDED FOR ALL ROADS, AS WARRANTED, IN ACCORDANCE WITH THE CITY OF BURLINGTON MUD TRACKING CONTROL POLICY.

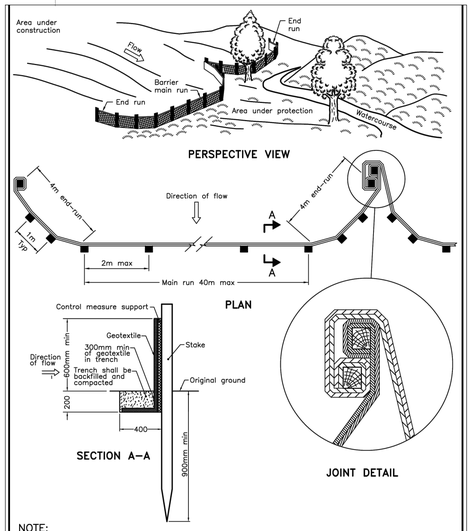
3.3. ALL CONSTRUCTION VEHICLES TO ENTER AND LEAVE THE SITE AT APPROVED LOCATIONS ONLY. ALL VEHICLES MUST TRAVEL OVER A VIBRATORY MUD MAT WHEN LEAVING THE SITE.

3.4. THE CONTRACTOR IS RESPONSIBLE FOR CLEANUP OF MUDTRACKING ON A DAILY BASIS OR ON A MORE FREQUENT BASIS IF DIRECTED BY THE CITY OR THE CONSULTANT.

3.5. CONTRACTOR TO LIMIT CONSTRUCTION ACTIVITIES WITHIN THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS. CONTRACTOR TO RESTORE ALL DISTURBED AREAS OUT SIDE THE WORKING AREA TO ORIGINAL CONDITIONS AND TO THE SATISFACTION OF THE CITY OF BURLINGTON.

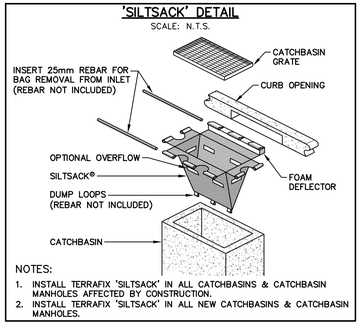
3.6. IF NECESSARY, TRUCKS SHALL BE WASHED DOWN BEFORE LEAVING THE SITE.

3.7. CONTRACTOR TO CONFORM TO ALL CITY OF BURLINGTON NOISE AND DUST CONTROL STANDARDS AND BY-LAWS. THE SITE MUST BE WET DOWN IF NECESSARY TO CONTROL DUST.

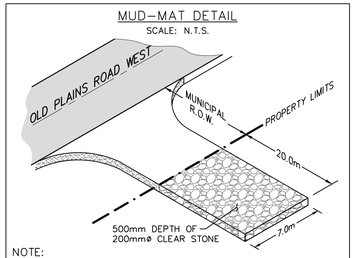


NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	3
HEAVY-DUTY SILT FENCE BARRIER			
		OPSD 219.130	



NOTES:
1. INSTALL TERRAFIX 'SILTSACK' IN ALL CATCHBASINS & CATCHBASIN MANHOLES AFFECTED BY CONSTRUCTION.
2. INSTALL TERRAFIX 'SILTSACK' IN ALL NEW CATCHBASINS & CATCHBASIN MANHOLES.



NOTE:
GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUAL) TO BE PLACED AS SEPARATION BARRIER BETWEEN EXISTING GROUND AND CLEAR STONE.

10 0m 10 20 30
SCALE: 1:400

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Project
1511 PLAINS ROAD WEST
CITY OF BURLINGTON

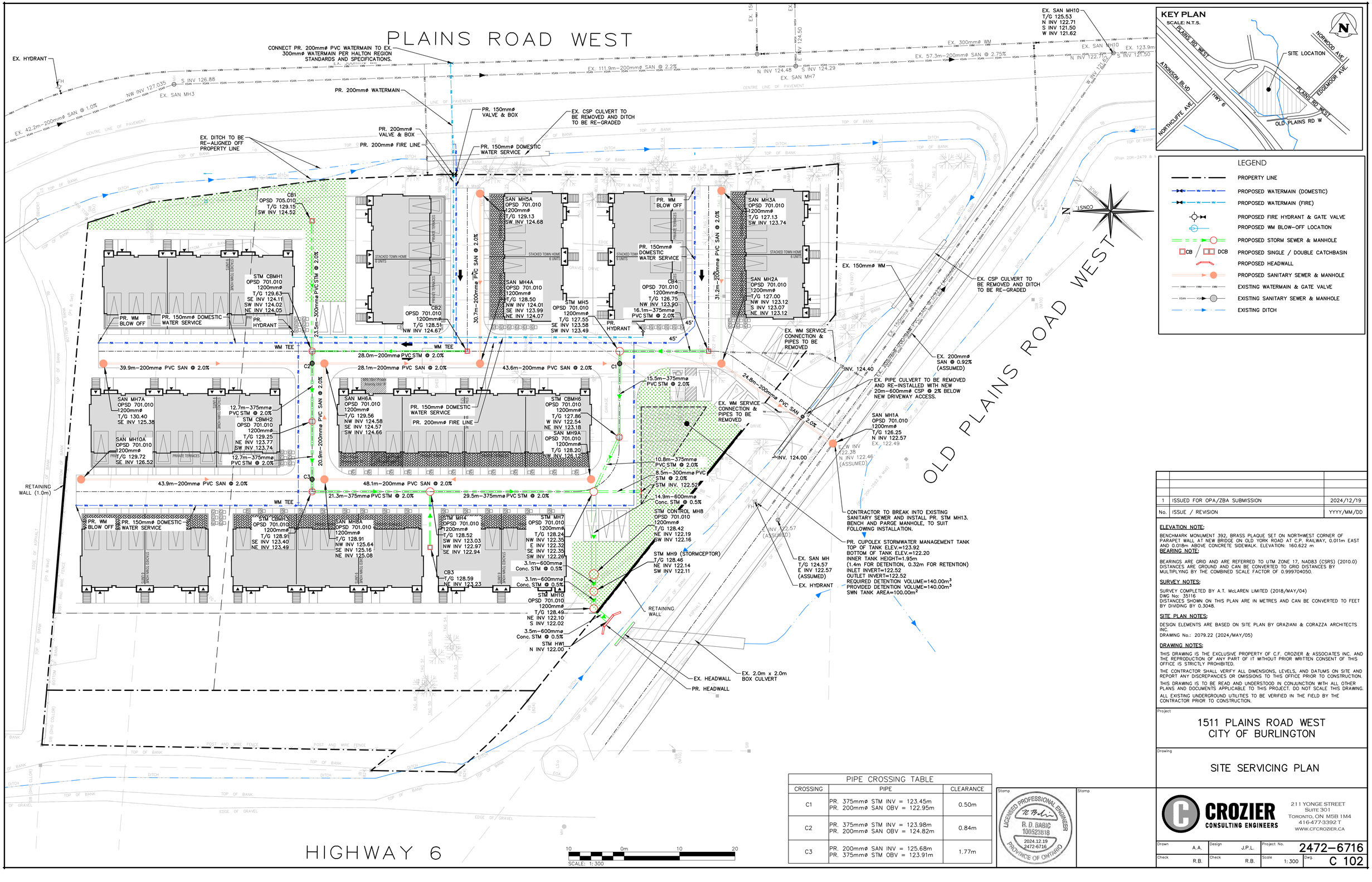
Drawing
REMOVALS, EROSION & SEDIMENT CONTROL PLAN

Stamp
LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.12.19
2472-6716
PROVINCE OF ONTARIO

Stamp

CROZIER CONSULTING ENGINEERS
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Drawn	Design	Project No.	
A.A.	J.P.L.		2472-6716
Check	Check	Scale	Dwg.
R.B.	R.B.	1: 400	C101



LEGEND

- PROPERTY LINE
- PROPOSED WATERMAIN (DOMESTIC)
- PROPOSED WATERMAIN (FIRE)
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED WM BLOW-OFF LOCATION
- PROPOSED STORM SEWER & MANHOLE
- CB / DCB — PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED HEADWALL
- PROPOSED SANITARY SEWER & MANHOLE
- EXISTING WATERMAIN & GATE VALVE
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING DITCH

PIPE CROSSING TABLE

CROSSING	PIPE	CLEARANCE
C1	PR. 375mmø STM INV = 123.45m PR. 200mmø SAN OBV = 122.95m	0.50m
C2	PR. 375mmø STM INV = 123.98m PR. 200mmø SAN OBV = 124.82m	0.84m
C3	PR. 200mmø SAN INV = 125.68m PR. 375mmø STM OBV = 123.91m	1.77m

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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 GRAZIANI & CORAZZA ARCHITECTS INC.
DRAWING No.: 2079.22 (2024/MAY/05)

DRAWING NOTES:

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Project

1511 PLAINS ROAD WEST
CITY OF BURLINGTON

Drawing

SITE SERVICING PLAN

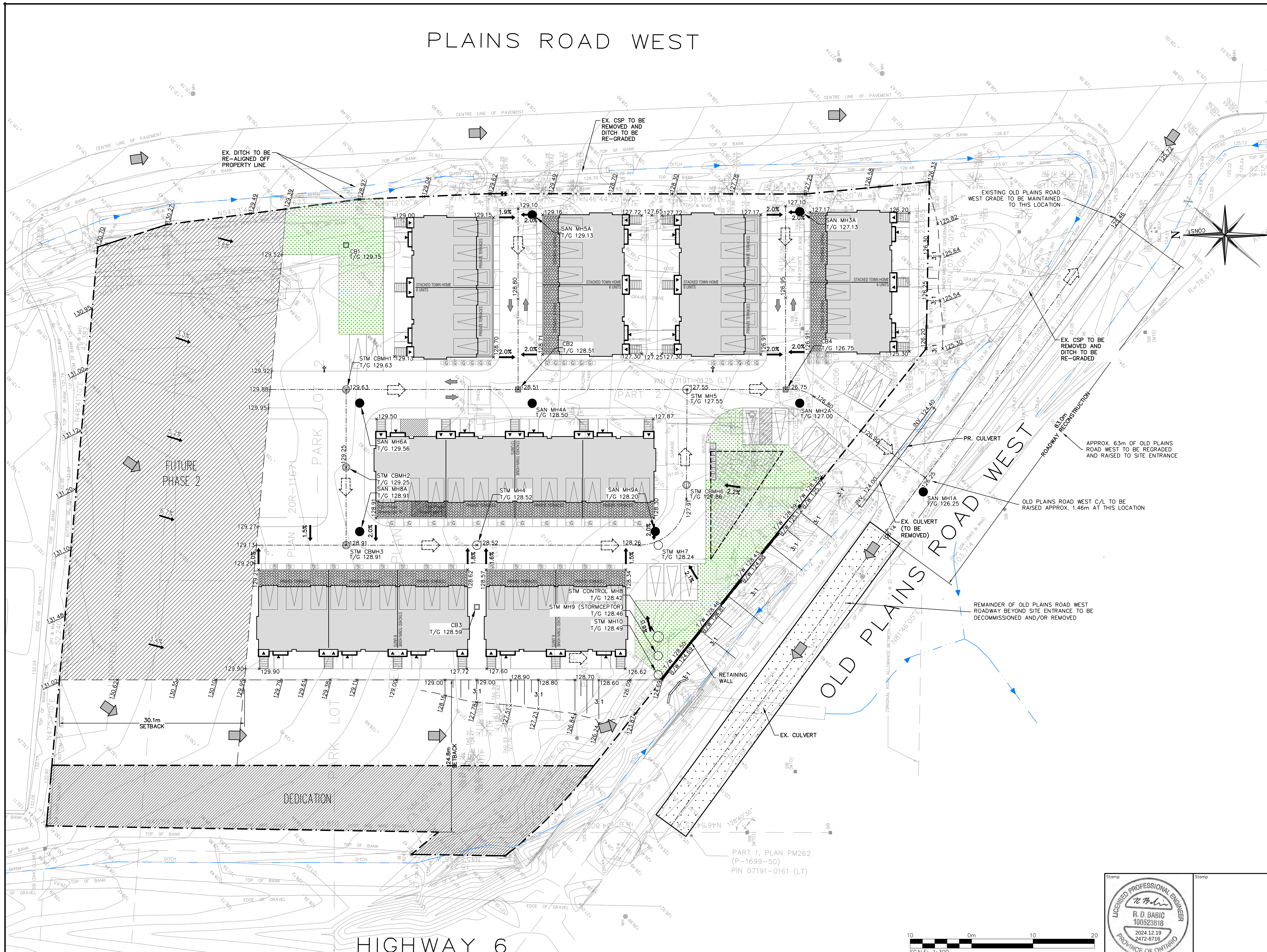
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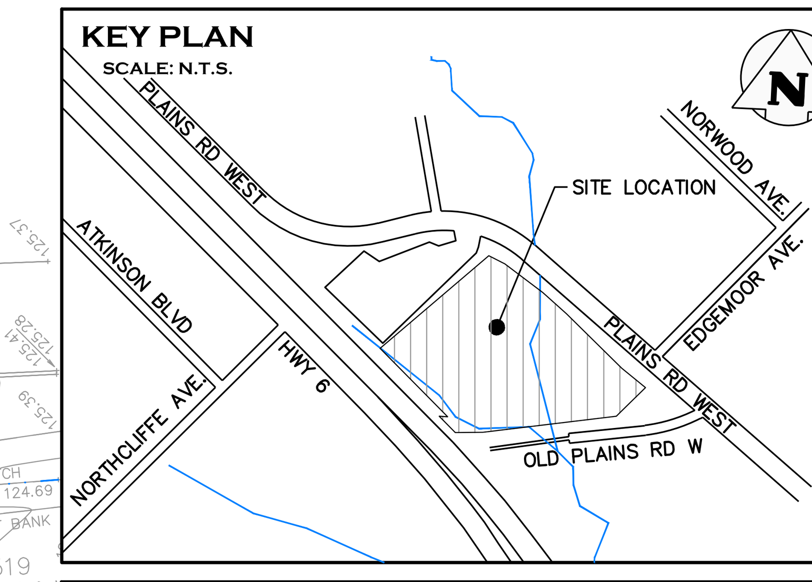
LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.12.19
2472-6716
PROVINCE OF ONTARIO

Stamp

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

Drawn	Design	Project No.	
A.A.	J.P.L.	2472-6716	
Check	Check	Scale	Dwg.
R.B.	R.B.	1: 300	C 102





LEGEND

- PROPERTY LINE
- EXISTING DITCH
- EXISTING FENCE
- ×260.00 EXISTING GRADE
- ×260.00 PROPOSED GRADE
- ×260.00 PROPOSED GRADE (TO MATCH EXISTING)
- ×TW/BW 260.00 TOP OF WALL/BOTTOM OF WALL PR. GRADE
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- CB / DCB PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED SLOPE (3:1 MAX.)
- PROPOSED RETAINING WALL
- PROPOSED HEADWALL
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- 2.0% PROPOSED MINOR FLOW DIRECTION
- PROPOSED ROADWAY TO BE DECOMMISSIONED

No.	ISSUE / REVISION	YYYY/MM/DD
1	ISSUED FOR OPA/ZBA SUBMISSION	2024/12/19

ELEVATION NOTE:

BENCHMARK MONUMENT 392, BRASS PLAQUE SET ON NORTHWEST CORNER OF PARAPET WALL AT NEW BRIDGE ON OLD YORK ROAD AT C.P. RAILWAY, 0.011m EAST AND 0.018m ABOVE CONCRETE SIDEWALK. ELEVATION: 160.622 m

BEARING NOTE:

BEARINGS ARE GRID AND ARE REFERRED TO UTM ZONE 17, NAD83 (CSRS) (2010.0) DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999704050.

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Project

1511 PLAINS ROAD WEST
CITY OF BURLINGTON

Drawing

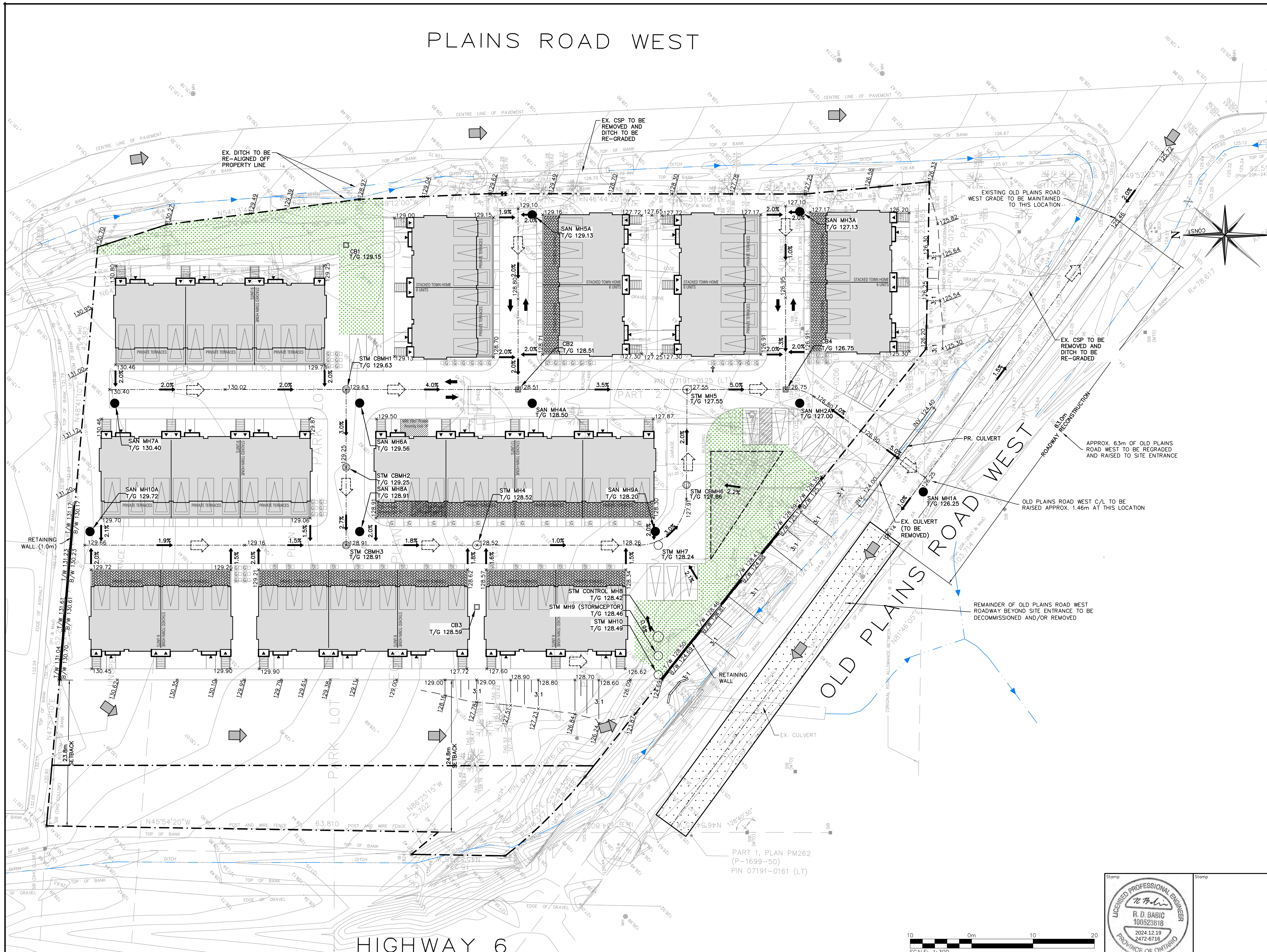
SITE GRADING PLAN
PHASE1

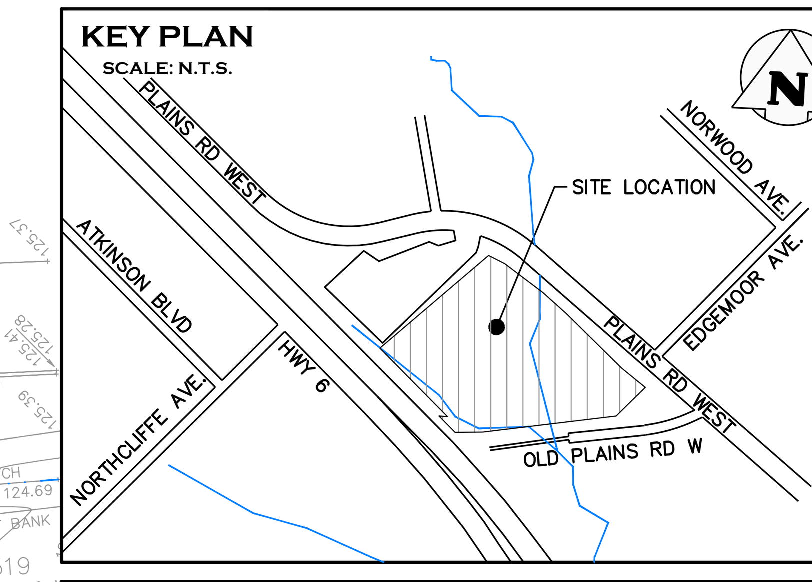
Stamp: LICENSED PROFESSIONAL ENGINEER R. D. BABIC 100523818 2024.12.19 2472-6716 PROVINCE OF ONTARIO

Stamp

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Drawn	A.A.	Design	J.P.L.	Project No.	2472–6716
Check	R.B.	Check	R.B.	Scale 1:300	Dwg. C103–1A





LEGEND

- PROPERTY LINE
- EXISTING DITCH
- EXISTING FENCE
- ×260.00 EXISTING GRADE
- ×260.00 PROPOSED GRADE
- ×260.00 PROPOSED GRADE (TO MATCH EXISTING)
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Project

1511 PLAINS ROAD WEST
CITY OF BURLINGTON

Drawing

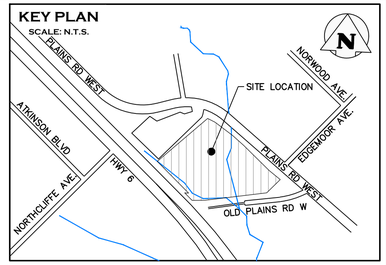
ULTIMATE SITE GRADING PLAN

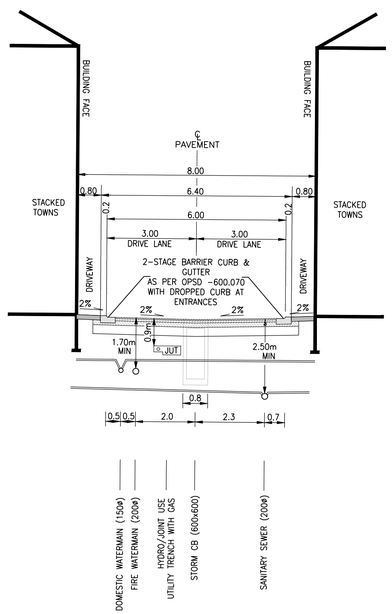
Stamp: LICENSED PROFESSIONAL ENGINEER R. D. BABIC 100523818 2024.12.19 2472-6716 PROVINCE OF ONTARIO

Stamp

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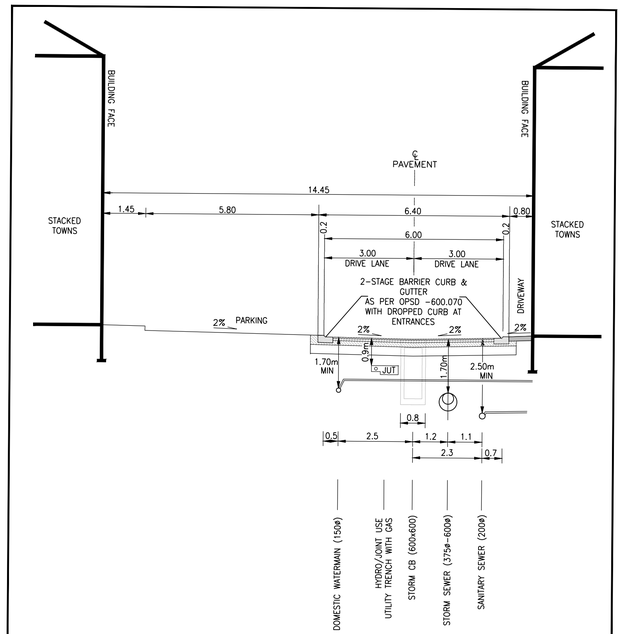
Drawn	A.A.	Design	J.P.L.	Project No.	2472–6716
Check	R.B.	Check	R.B.	Scale 1:300	Dwg. C103–U





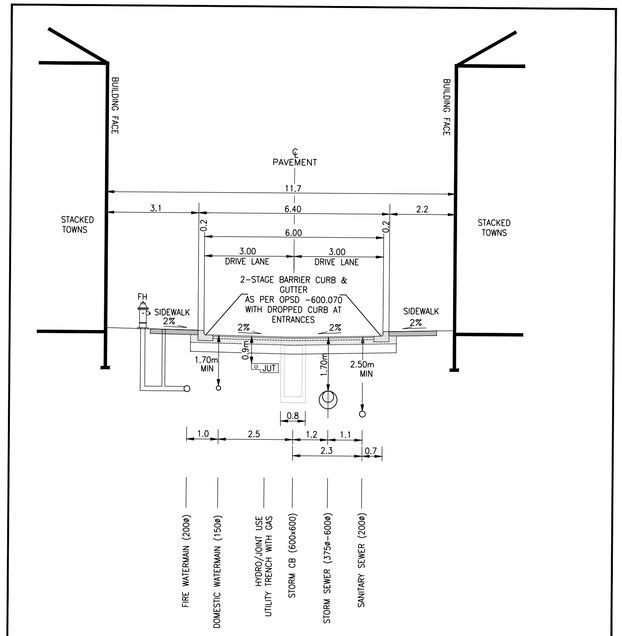
TYPICAL ROAD SECTION 1
6.0m PRIVATE RESIDENTIAL LANEWAY (DRIVEWAY & NO SIDEWALK)

SCALE: N.T.S



TYPICAL ROAD SECTION 2
6.0m PRIVATE RESIDENTIAL LANEWAY (DRIVEWAY & PARKING)

SCALE: N.T.S



TYPICAL ROAD SECTION 3
6.0m PRIVATE RESIDENTIAL LANEWAY (DRIVEWAY & SIDEWALK)

SCALE: N.T.S

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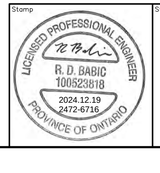
Project

1511 PLAINS ROAD WEST
CITY OF BURLINGTON

Drawing

TYPICAL ROAD SECTIONS

Stamp



Stamp

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Drawn	Design	Project No.	
A.A.	J.P.L.	2472-6716	
Check	Check	Scale	Dwg.
R.B.	R.B.	NTS	C104