BURNSIDE

Functional Servicing Report
Argo Summer Valley

Argo Summer Valley Limited
4990 Palladium Way, Suite 105
Burlington ON L7M 0W7

City of Brampton File No.: OZS-2022-0030
Town of Caledon File No.: POPA 2022-0005, RZ 2022-0008, 21T-22005C
Region of Peel File No.: T-22011Ba
Region of Peel File No.: T-22005Ca

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November 2023
300054371.0000

Distribution List

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0	Yes	--	City of Brampton
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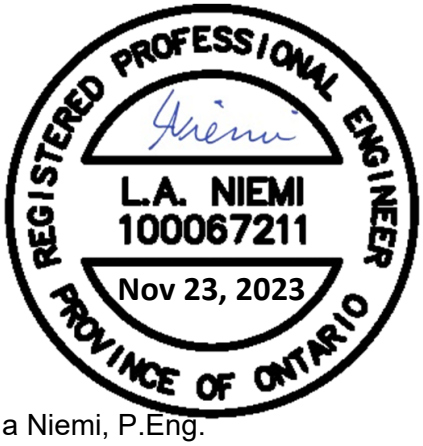
0	Yes	--	Region of Peel
0	Yes	--	Toronto Region Conservation Authority
0	Yes	--	Argo Summer Valley Limited

Record of Revisions

Revision	Date	Description
0	June 16, 2022	Draft Plan of Subdivision Application
1	November 4, 2022	Revised Per Region of Peel Comments
2	May 30, 2023	Revised as Per Received Comments
3	November 23, 2023	Revised for Final Submission

R.J. Burnside & Associates Limited

Report Prepared By:



Lorena Niemi, P.Eng.
Executive Vice President, Land Development
LN:rk

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Disclaimer

1.0 Introduction

1.1 General

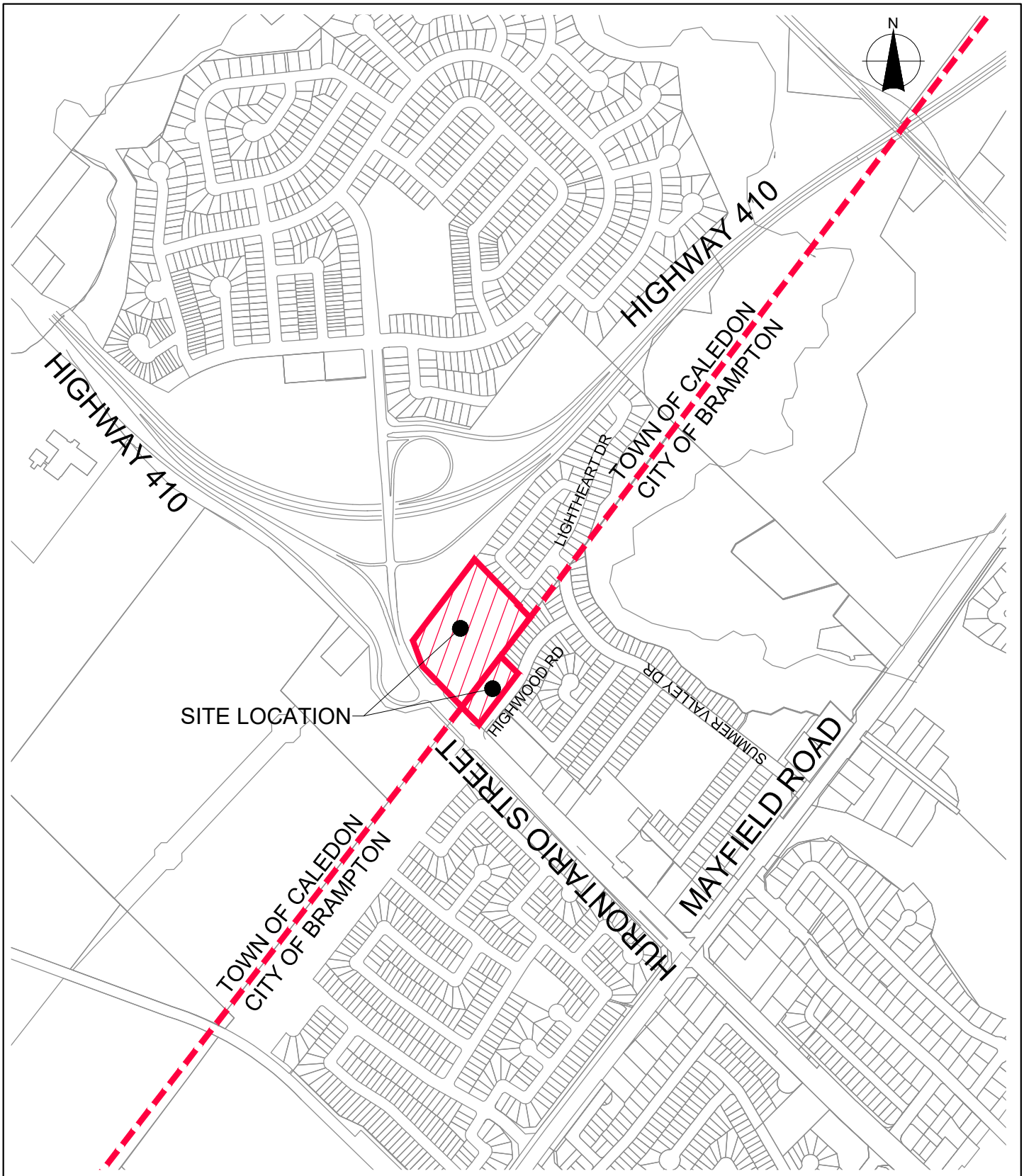
R.J. Burnside & Associates Limited (Burnside) has been retained by Argo Summer Valley Limited (Argo) to prepare a Functional Servicing Report (FSR) in support of an Application for Official Plan Amendment, Zoning By-Law Amendment and Draft Plan of Subdivision for lands which lie within both the City of Brampton (City) and the Town of Caledon (Town). This Functional Servicing and Preliminary Stormwater Management Report is intended to demonstrate that the subject lands can be developed and connect to municipal servicing in accordance with applicable regulatory requirements and site-specific criteria established through the completion of previous servicing studies for the area.

1.2 Site Location and Context

The subject site is an approximately 3.62 ha infill area at the south limits of Caledon and the north limits of Brampton, as identified on Figure 1. The site is legally described as Part of Lot 19, Concession 1, E.H.S., Town of Caledon and Part of Lot 18, Concession 1, E.H.S., City of Brampton, Regional Municipality of Peel. The site is bounded by Hurontario Street to the west, the Highway 410 corridor to the north, Highwood Road and The Creek's Edge Subdivision to the south, and Reinhart Estates to the east, both of which are adjacent to the Etobicoke Creek Valley to the east. An overview and context of the area, including an aerial photo, is presented in Figure 2.

1.3 Existing Land Use

Currently, the majority of the existing site is disturbed and vacant. Historically, the site was occupied by a number of buildings and a parking area for the Reinhart Auction lands, which have since been demolished / decommissioned. There are no natural features within the property, though there are a number of manmade swales and drains around the perimeter of the site.



CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

SITE LOCATION PLAN

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 1**
Scale		Project No.	
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File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\054371 - SITE LOCATION PLAN - FIG 1.dwg Date Plotted: November 20, 2023 - 3:56 PM

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

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Figure Title

ARGO SUMMER VALLEY

EXISTING SITE CONTEXT

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 2**
Scale		Project No.	
N.T.S.		300054371	

1.4 Objectives

The purpose of this Functional Servicing and Preliminary Stormwater Management Report is to provide the following context and assessment in support of the proposed Draft Plan of Subdivision(s) (DPOS) and associated applications:

- Calculate proposed sanitary design flows and demonstrate the adequacy of the existing sanitary sewer system to accommodate the proposed development.
- Calculate proposed water demand and demonstrate the adequacy of the existing water distribution system (pressure and flow) to service the proposed development.
- Confirm existing and proposed drainage patterns for the site.
- Develop a stormwater management plan that demonstrates confirmation of capacity and accommodation of the proposed development within the existing drainage system, including any relevant site-specific stormwater management measures.

All the above will be completed in accordance with accepted engineering practices and criteria of the governing approval agencies.

2.0 Background Information and Documentation

2.1 Previous Studies

The site has been considered for development and accommodated in the design of downstream infrastructure as identified in various studies for developments in both the City and the Town. This FSR has been prepared in accordance with the information and recommendations provided in the following documents:

- Functional Servicing Report, Donal JV Limited (Reinhart Auction Lands) Draft Plan 21T-99002C, Charlton Engineering Limited, Revised September 2001.
- Creek's Edge Subdivision Pond Design Brief, Schaeffers Consulting Engineers, Revised September 1997.
- Town of Caledon, City of Brampton, and Region of Peel Development Design Standards.

2.2 Additional Studies

The following studies are being completed in conjunction with, and provide guidance to, this Functional Servicing and Preliminary Stormwater Management Report.

- 12197 Hurontario Street, Brampton and 12211, 12213 & 12233 Hurontario Street, Caledon, Geotechnical Investigation, Proposed Residential Development (Summer Valley) EXP Services Inc., February 4, 2022 (Revised October 20, 2023).
- 12197 Hurontario Street, Brampton and 12211, 12213 & 12233 Hurontario Street, Caledon, Hydrogeological Investigation and Water Balance Assessment, EXP Services Inc., November 11, 2023.

3.0 Existing Site Conditions

The subject property covers a total area of 3.62 ha, 3.08 ha of which are in the Town, with the remaining 0.54 ha located in the City. The existing site is vacant and largely disturbed by previous land use and remediation works. The site is relatively flat, sloping very gently from an elevated central area to various low-lying areas in the east and west. There is a total of approximately 3 m of fall in each direction from the central high point at an elevation of 259 m above sea level. The east portion of the site drains towards multiple constructed swale / drainage draws and existing storm sewer inlets along the south and east limits of the property. The west portion of the site drains towards an existing storm sewer inlet at the southwest limits of the site adjacent the Hurontario Street and Highwood Road intersection. The existing site conditions are identified on Figure 3.

3.1 Soil Conditions

Based on the Ontario Soils Mapping database, the subject property is located within a single soil formation, Chinguacousy Clay Loam. The soil formation is an imperfectly draining soil with smooth, gently sloping surfaces.

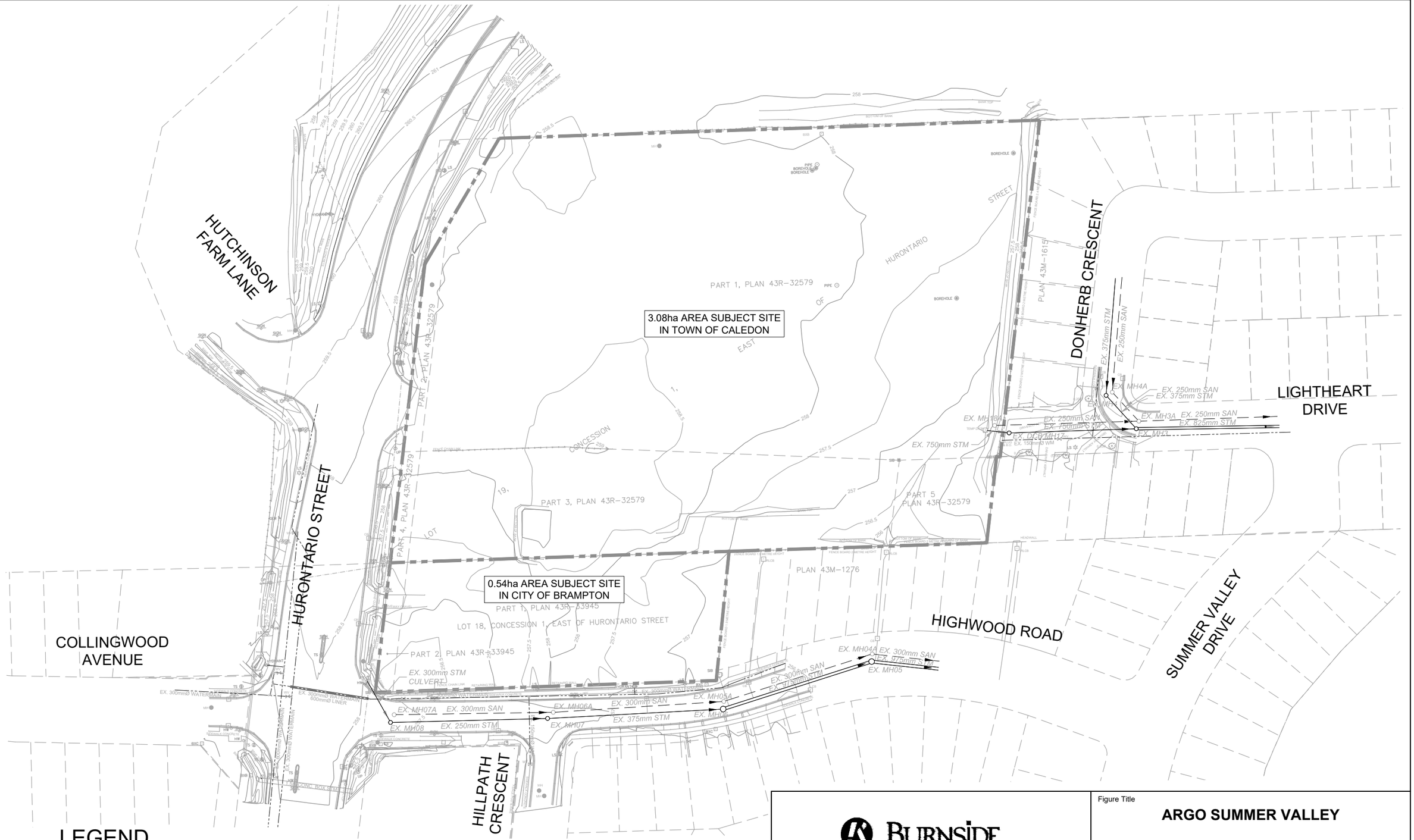
A Geotechnical Investigation was completed for the study area by EXP Services Inc. in February 2022, updated in October 2023. Based on the findings of the investigation, the site is covered by a surficial layer of topsoil, asphalt, and granular materials with some pockets of fill. The native materials beneath the surficial cover comprise sandy silt till in portions, to depths ranging from 4.2 to 8.1 m below the surface with clayey silt till below the sand or fill layers. The clayey silt till extends 8.1 m below existing grade where the boreholes were terminated. As a result of the historical land uses and activities, the top layer of soil is defined as reworked / disturbed. The completed geotechnical investigation should be read in conjunction with the FSR.

3.2 Groundwater Conditions

As part of the Geotechnical Investigation, monitoring wells were installed in four of the borehole locations. During the completion of the drilling program, groundwater was observed at depths ranging from 7.0 to 8.0 m below the ground surface, except for one borehole that remained dry. Additional measurements in the installed monitoring wells were taken following the initial drilling operation, and groundwater depths were measured at depths ranging from 1.6 to 6.5 m below grade. The completed hydrogeological investigation should be read in conjunction with the FSR.

3.3 Environmental Features

The subject property has been historically used for a variety of purposes, including residential, and a combination of residential and commercial purposes. The site is currently vacant and disturbed with no environmental features present.



CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

EXISTING LAND USE & SERVICING

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 3**
Scale		Project No.	
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4.0 Proposed Development

The Summer Valley DPOS has been prepared by Glenn Schnarr and Associates Inc. and is included as Figure 4. The DPOS features a mix of residential areas, buffer (MTO setback), and required road allowances and widenings.

The proposed DPOS connects to the surrounding road network at an intersection with Highwood Road opposing Hillpath Crescent, and through an extension of Lightheart Drive at the east limits of the site, which will provide road and infrastructure connectivity to the adjacent development.

The table below summarizes the proposed land use for the site, including population projections, based on City, Town, and Region design criteria.

Table 1: Argo Summer Valley Land Use and Population Projection

Land Use	Net Area (ha)	Units	PPU	Population
City of Brampton				
Detached – 12.20 m	0.08	2	4.202	8.40
Detached – 12.80 m	0.04	1	4.202	4.20
Detached – 15.24 m	0.26	5	4.202	21.0
Buffer (MTO Setback)	0.05			
Road Widening	0.04			
17.0 m ROW (length 43 m)	0.07			
Subtotal	**0.54**	**8**		**34 (33.6)**
Town of Caledon				
Detached – 12.20 m	0.24	7	4.202	29.41
Detached – 12.80 m	1.65	46	4.202	193.29
Detached – 15.24 m	0.15	4	4.202	16.81
Buffer (MTO Setback)	0.22			
17.0 m ROW (length 426 m)	0.82			
Subtotal	**3.08**	**57**		**239 (239.20)**
Total	**3.62**	**65**		**274 (273.13)**

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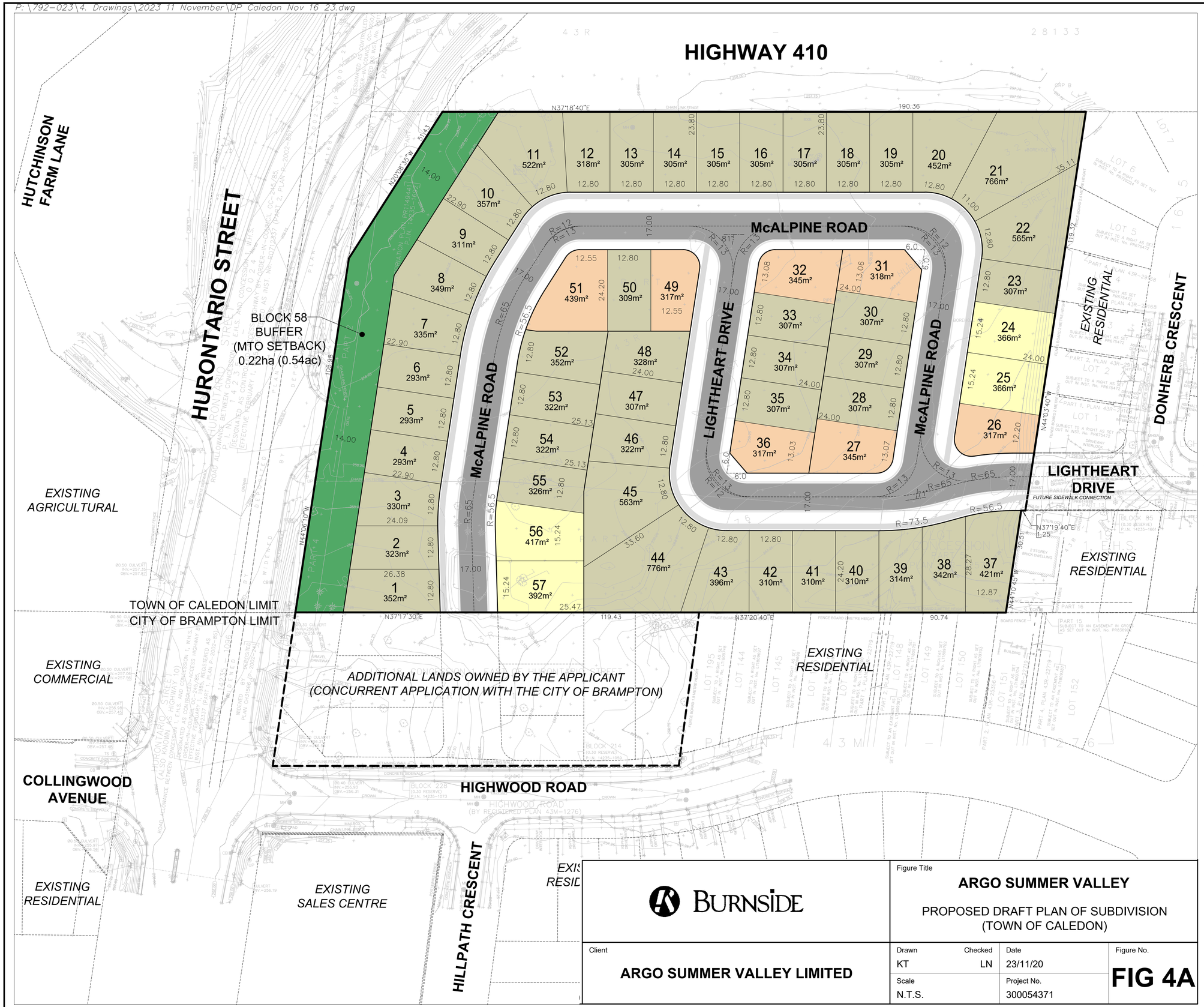

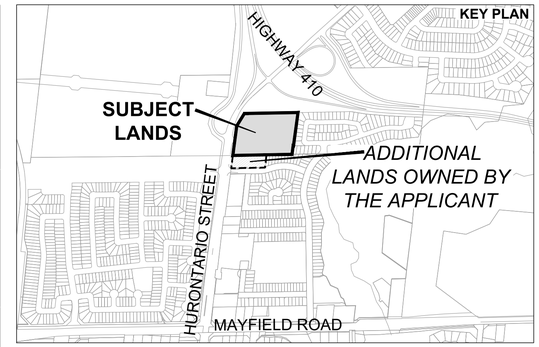

DRAFT PLAN OF SUBDIVISION

ARGO SUMMER VALLEY LIMITED

FILE # 21T-22005C

PART OF LOT 19, CONCESSION 1, E.H.S.
(GEOGRAPHIC TOWNSHIP OF CHINGUACOUSY)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

OWNERS CERTIFICATE

I HEREBY AUTHORIZE GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF CALEDON FOR APPROVAL.

SIGNED: _____ DATE: FEB. 15, 2022

MR. GOOD BUCK, A.S.O.
ARGO SUMMER VALLEY LIMITED

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED: ~~A.U. KUMARANAYAKE~~ DATE: FEB. 18, 2022

A. U. KUMARANAYAKE, O.L.S.
R-PE SURVEYING LTD.

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J & L ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS	DENSITY (UPHA)
DETACHED - 12.20m (40')	1-57	0.24	0.59	7	29.17
DETACHED - 12.80m (42')		1.65	4.08	46	27.88
DETACHED - 15.24m (50')		0.15	0.37	4	26.67
BUFFER (MTO SETBACK)	58	0.22	0.54		
17.0m LOCAL R.O.W. (LENGTH: 473m)		0.82	2.03		
TOTAL	**58**	**3.08**	**7.61**	**57**	**27.94**

NOTES

- ALL DAYLIGHT RADII ARE 5.0m, UNLESS OTHERWISE DENOTED
- PAVEMENT & SIDEWALK ILLUSTRATION IS DIAGRAMMATIC

BURNSIDE

Figure Title
ARGO SUMMER VALLEY
PROPOSED DRAFT PLAN OF SUBDIVISION
(TOWN OF CALEDON)

Client
ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 4A**
Scale: N.T.S.		Project No.: 300054371	

SCALE 1:500
(24 x 36)
NOVEMBER 16, 2023

ARGO DEVELOPMENT CORP
GSAI
Glen Schnarr & Associates Inc.

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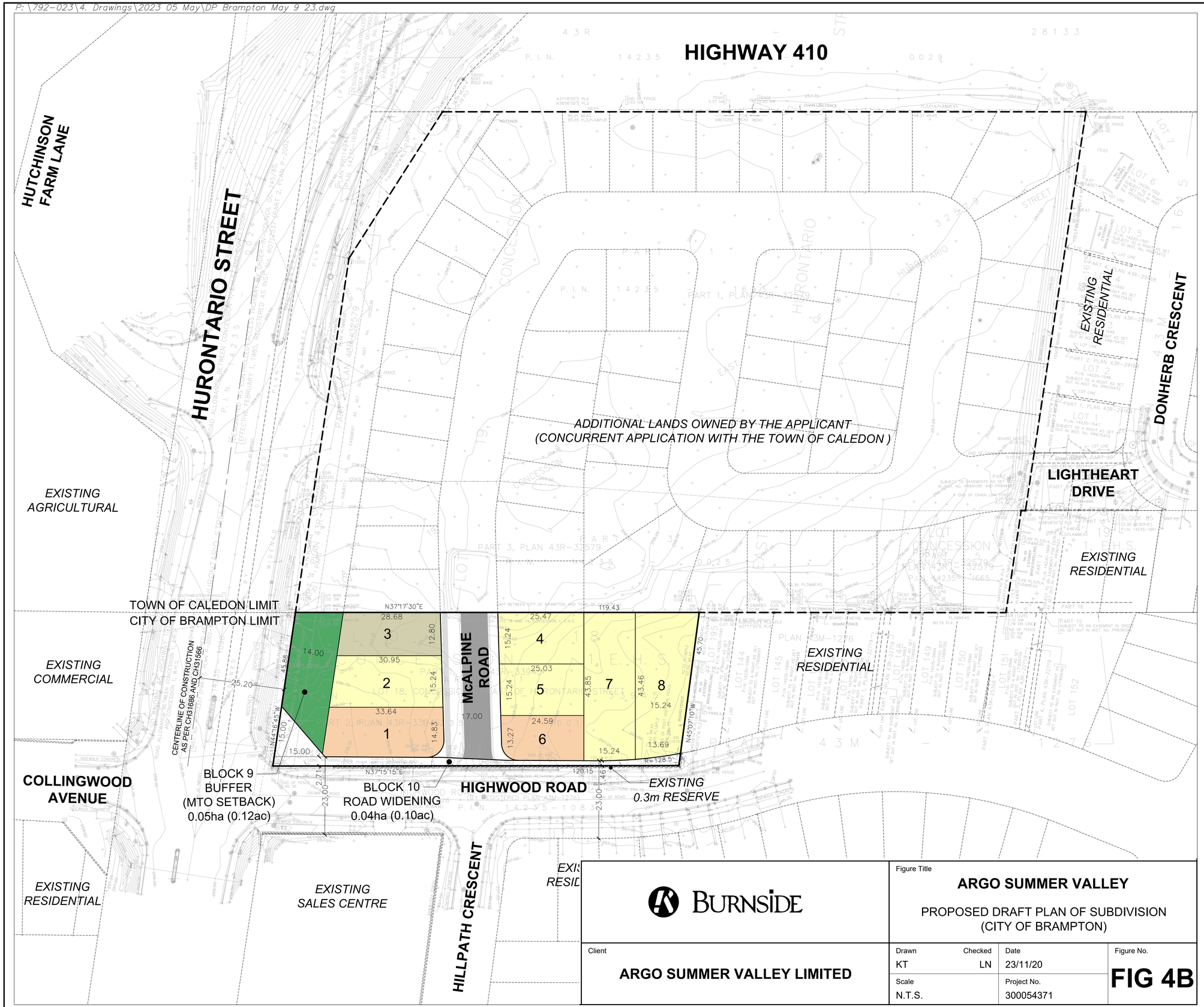

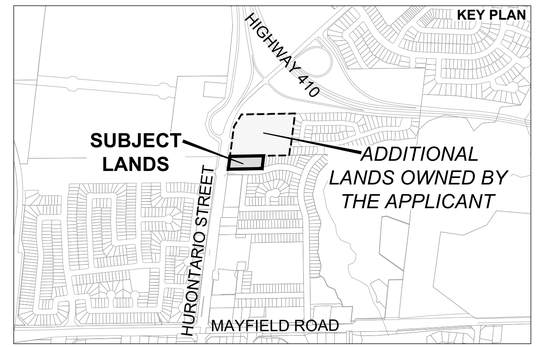

DRAFT PLAN OF SUBDIVISION

ARGO SUMMER VALLEY LIMITED

FILE # 21T-22011B

PART OF LOT 18, CONCESSION 1, E.H.S.
(GEOGRAPHIC TOWNSHIP OF CHINGUACOUSY)
CITY OF BRAMPTON
REGIONAL MUNICIPALITY OF PEEL

OWNERS CERTIFICATE

I HEREBY AUTHORIZE GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF BRAMPTON FOR APPROVAL.

SIGNED: _____ DATE: FEB. 15, 2022

MR. GOOD BUCK, A.S.O.
ARGO SUMMER VALLEY LIMITED

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED: ~~FLUKA KUMBANAYAKE~~ DATE: FEB. 18, 2022

A. U. KUMARANAYAKE, O.L.S.
R-PE SURVEYING LTD.

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J & L ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS	DENSITY (UPHA)
DETACHED - 12.20m (40')	1-8	0.08	0.20	2	25.00
DETACHED - 12.80m (42')		0.04	0.10	1	25.00
DETACHED - 15.24m (50')		0.26	0.64	5	19.23
BUFFER (MTO SETBACK)	9	0.05	0.12		
ROAD WIDENING	10	0.04	0.10		
17.0m LOCAL R.O.W. (LENGTH: 43m)		0.07	0.17		
TOTAL	**10**	**0.54**	**1.33**	**8**	**21.05**

NOTES

- ALL DAYLIGHT RADII ARE 5.0m, UNLESS OTHERWISE DENOTED
- PAVEMENT & SIDEWALK ILLUSTRATION IS DIAGRAMMATIC

BURNSIDE

Figure Title
ARGO SUMMER VALLEY
PROPOSED DRAFT PLAN OF SUBDIVISION
(CITY OF BRAMPTON)

Client
ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 4B**
Scale: N.T.S.		Project No.: 300054371	

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(24 x 36)
MAY 9, 2023

GSAI
Glen Schnarr & Associates Inc.

5.0 Roads

The proposed development includes a 17 m Right-of-Way (ROW) cross section, with connection to Highwood Road directly opposing Hillpath Crescent and an extension of Lightheart Drive. The 17 m ROW proposed throughout the development will be consistent with the City Standard Drawing Std. 200 for a minor local road with 8 m wide pavement on 17 m ROW. A copy of the Std. 200 is included in Appendix B.

The site was historically planned as an extension of the Creek's Edge subdivision to the south, which has been designed and constructed with the City standard roads. The adjacent Donal JV site, including the existing Lightheart Drive, was also constructed with 17 m ROWs with 8 m of pavement. The adoption of the proposed road design standard in both the Town and City portions of the site will be in line with adjacent road design standards and is considered appropriate.

6.0 Wastewater Servicing

6.1 Existing Municipal System

The proposed DPOS is located within the servicing area of the Etobicoke Creek West Shed trunk sanitary sewer. Based on the As-Constructed drawings for the surrounding subdivision lands, as provided by the Region of Peel, the infrastructure systems of the adjacent subdivisions were designed and constructed with consideration to development of the subject site.

Along the south property frontage, there is an existing 300 mm diameter sanitary sewer extended within Highwood Road, which drains to a 375 mm sanitary sewer immediately downstream of the site, with ultimate discharge point into the 450 mm diameter sanitary trunk sewer on Summer Valley Drive. The As-Constructed Plan and Profile drawing for Highwood Road is included in Appendix A. As identified, EX.MH06A is situated at the intersection of Highwood Road and Hillpath Crescent, which provides connection opportunity for the proposed DPOS. The downstream invert elevation of the sanitary sewer at EX.MH06A is 252.07 m.

At the east limits of the site, there is an existing 250 mm sanitary sewer extended from Lightheart Drive to the site, which also drains to the 450 mm sanitary trunk sewer on Summer Valley Drive. The sanitary sewer is a 250 mm diameter sewer terminating at EX.MH18A, which is located within the subject site. The downstream invert elevation of the existing sanitary sewer is situated at 253.92 m. The As-Constructed Plan and Profile drawing for Lightheart Drive and Highwood Road, including the existing sanitary infrastructure, is included Appendix A.

Appendix A includes a copy of the Creek's Edge Subdivision Sanitary Drainage Plan (Part I) which identifies drainage areas at a density of 50 ppha on the north side of Highwood Road to the City limits as directly tributary to the existing infrastructure (MH7A through 5A). In addition, an external area of 3.0 ha of 50 ppha from the Town is accommodated on Highwood Road in the sanitary plug with connection to MH5A.

As identified on the External Tributary Area inset on the As-Constructed drawing, an area of 88.25 ha to the northwest, in addition to the 3.0 ha noted above, has been accommodated within the sanitary sewer system on Highwood Road. The plan also identifies a drainage area of 12.96 ha immediately to the north of Summer Valley Drive, and an additional area of 80.22 ha to the northeast as accommodated within the Summery Valley Drive trunk sewer. The subject lands within the Town fall within the identified external drainage areas for the existing system.

6.2 Design Criteria

The proposed sanitary sewers will be designed and constructed to current Region of Peel and Ministry of Environment Conservation and Parks criteria and specifications. The sanitary design criteria are as follows:

- Residential Flow Rate - 290 L per capita per day
- Infiltration / Inflow - 0.260 L/sec/ha
- Peaking Factor - Harmon Peaking Factor Formula
- Population Density - Varies:
  - Single Detached - 4.202 ppu

6.3 Proposed Sanitary Servicing

The proposed development will utilize the existing and available connections and Region infrastructure at the east and south limits of the site. The proposed development will drain to the existing sanitary sewer on Highwood Road via direct service connection for the lots fronting Highwood Road and via a sanitary sewer connection to EX.MH06A at the intersection of Highwood and Hillpath Crescent. The remainder of the site will flow to the eastern site limits at the extension of Lightheart Drive and connect to the existing sanitary sewer network at EX.MH18A. Figure 5 identifies the proposed drainage boundaries, the total drainage areas, and the calculated drainage densities for the three connection points. Table 2 summarizes the sanitary drainage area and flow calculation parameters for the proposed DPOS.

Table 2: Proposed Sanitary Drainage Area Details

Drainage Connection	Drainage Area (ha)	Population	Flow (L/s)
Highwood EX.MH06A	0.90	80	1.35
Highwood Direct Service Connection	0.14	9	0.15
Lightheart Drive EX.MH18A	2.28	185	3.19
Total Area	**3.32**	**274**	

As identified on the As-Constructed Drainage Plan, 3.0 ha of external flow, and the direct frontage of the subject property on Highwood Road, were accommodated at 50 ppha in the Creek's Edge Subdivision. Per the summary above, the proposed development will contribute a total of 1.02 ha and 89 people to the existing Highwood Road system, which is less than the design population of 150 people.

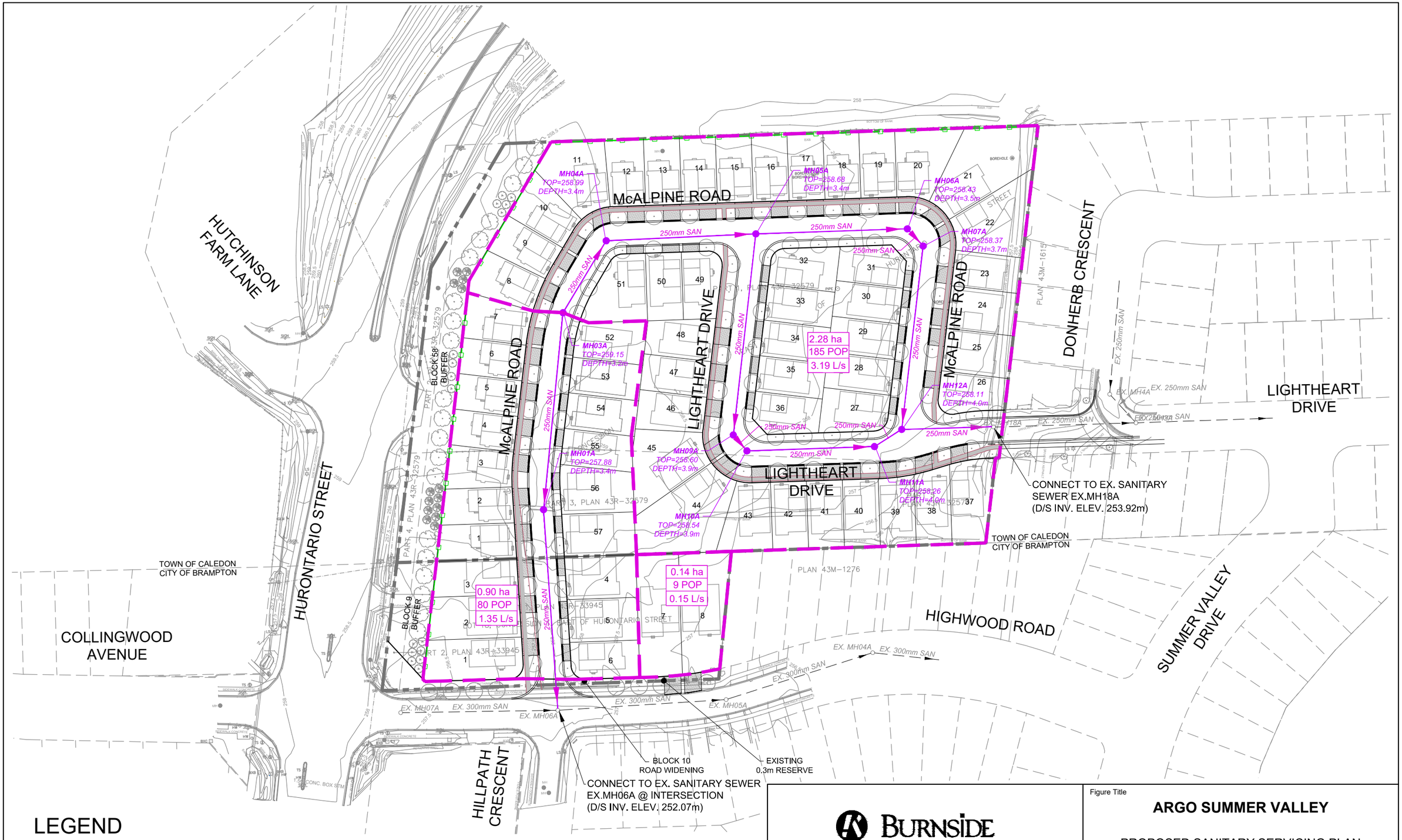
The remainder of the subject site will drain to the existing sanitary sewer on Lightheart Drive and the trunk on Summer Valley Drive. The total drainage area falls within the planned capacity of the Summer Valley Drive trunk system with a density of 50 ppha equivalent to 115 people. The proposed catchment to Lightheart Drive and the Summer Valley trunk will contribute a total population of 185 people, in addition to the Highwood Road contribution of 89 people. This total

exceeds the Region planned capacity for the site-specific drainage area of 3.32 ha at 50 ppha, 166. However, the planned capacity of the trunk sewer includes the MTO lands, and the area occupied by Highway 410, immediately to the north of the subject site. As this area will not be developed at the planned population density, there is residual capacity within the trunk sewer, sufficient to accommodate the proposed development at the increased density. Accounting for the MTO lands along the north property boundary and the area of the Highway, there is over 8.6 ha of area that will not contribute flow to the sanitary sewer. This area alone creates additional planned capacity in the trunk, equivalent to 430 people, which is more than sufficient to accommodate the proposed development in the trunk sewer.

As noted in Table 2, the total flow contribution to the Lightheart Drive sanitary sewer is 3.19 L/s. The existing sanitary sewer is a 250 mm pipe at 0.76% in Lightheart Drive, which drains approximately 3 ha of existing development. The sewer has a capacity of 51.8 L/s, sufficient to accommodate more than 30 ha of development at 100 ppha, indicating that there is more than sufficient capacity in the local system to accommodate the proposed development.

Based on the above, the proposed DPOS falls within the available capacity of the existing sanitary system.

The local sewers servicing the development site will follow the alignment of the roads. At the south site boundary, connection to the existing system will be made at EX.MH06A at the intersection of McAlpine Road and Highwood Road. At the east side of the site, the sanitary sewer will follow the proposed extension of Lightheart Drive to provide connection to the existing sanitary EX.MH18A.



LEGEND

- PROPERTY LINE
- EXISTING SANITARY SEWER
- PROPOSED SANITARY
- PROPOSED SANITARY MANHOLE

0.90 ha — DRAINAGE AREA (HECTARES)
80 POP — POPULATION
1.35 L/s — TOTAL FLOW

0 25 50 75 100
Metres

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title
ARGO SUMMER VALLEY
PROPOSED SANITARY SERVICING PLAN

Client
ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 5**
Scale		Project No.	
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7.0 Water Servicing

7.1 Existing Water Services

Water supply is provided by the Region of Peel water distribution system. The subject site is located within Pressure Zone 7, the southern boundary of which runs along Mayfield Road. Along Highwood Road there is an existing 300 mm diameter watermain on the north side of the road across the frontage of the subject site. Additionally, there is an existing 300 mm diameter watermain on Summer Valley Drive which feeds the 150 mm diameter watermain on Lightheart Drive. A 150 mm watermain with plug and blow off is extended from Lightheart Drive to the east limit of the subject property.

7.2 Water Design Criteria

Water servicing for the subject lands will be designed in accordance with the Region of Peel standards and specifications to ensure that adequate pressures and flows are achieved. Watermain design flows will be based on the following criteria:

- Average Day Demand - 280 L per capita per day
- Population Density - Per 2020 DC By-Law Update (4.202 ppu)
- Peaking Factor - Per Region of Peel criteria
- Design Flow - Greater of Max. Day plus Fire or Peak

7.3 Proposed Water Servicing

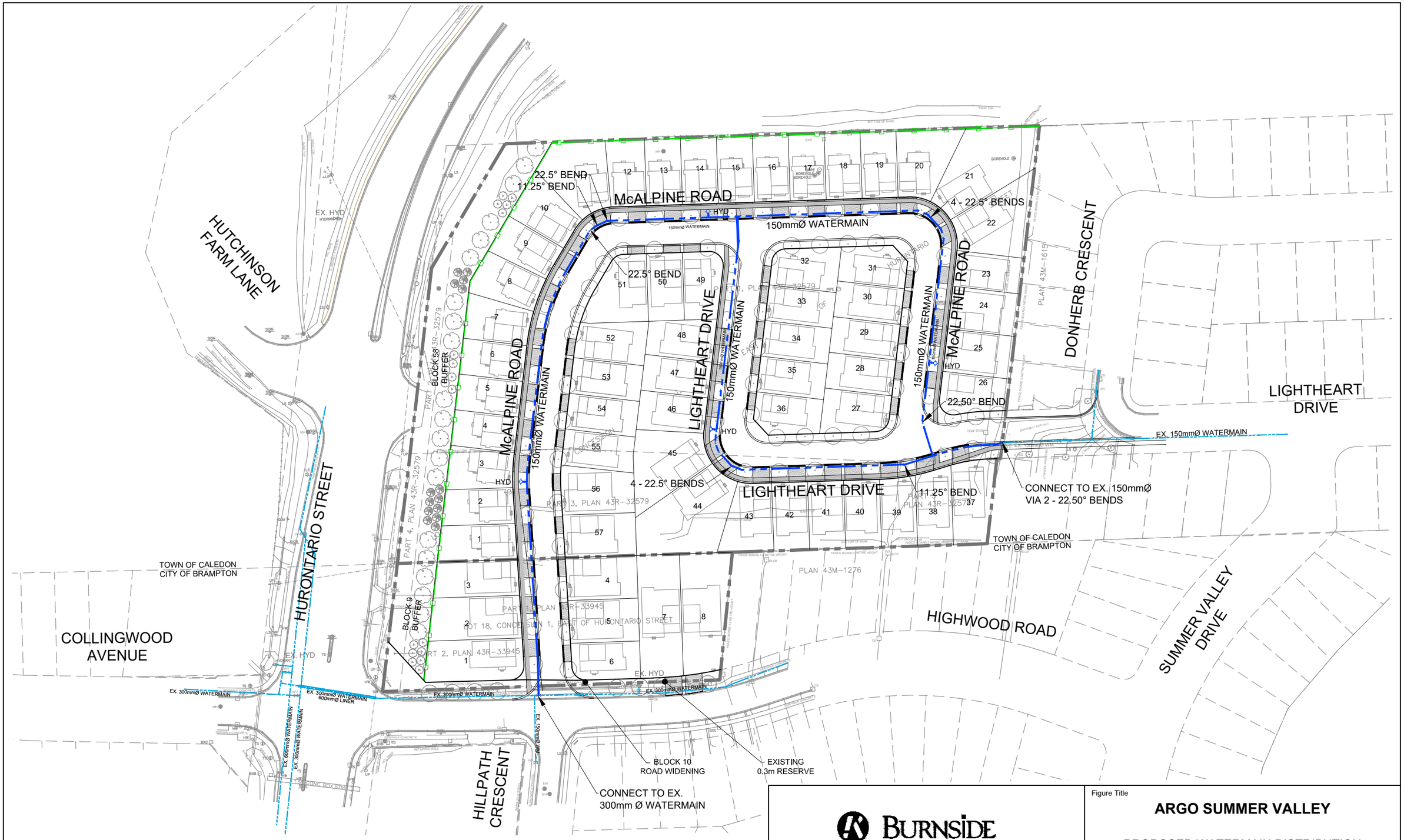
The proposed water servicing of the subject property includes two connections to the existing municipal water system, one to the 300 mm main on Highwood Road and one at the plug of the 150 mm main extended from Lightheart Drive. The proposed connections create a looped system for the proposed development. The connection at Highwood Road is consistent with the location of the proposed intersection identified in the DPOS. Given the proximity of the trunk mains to the subject site, the connections to Highwood Road watermain with the additional connection to the Lightheart Drive watermain is sufficient to provide services to the DPOS.

The proposed fire demand for the development has been calculated based on the Fire Underwriters Survey criteria, while the proposed domestic water demand has been calculated using the Region of Peel's Watermain Design Criteria. Additionally, hydrant flow testing was completed on October 18, 2022, on Highwood Road. Based on this testing, it can be expected that the available fire flow at the sampling location would be approximately 218 L/s at a minimum residual pressure of 20 PSI. Table 3 summarizes the results of the completed demand calculations. Refer to Appendix D for detailed calculations as well as the hydrant flow test results.

Table 3: Domestic Water and Fire Demand Summary

Average Day Demand	0.89 L/s or 76.48 m^3/day
Maximum Day Demand	1.77 L/s or 152.95 m^3/day
Peak Hour Demand	5.31 L/s or 458.86 m^3/day
Fire Flow Required	117 L/s

Figure 6 depicts the proposed water servicing distribution network for the DPOS. The internal water main distribution network is proposed to follow the internal road alignments and will be designed in accordance with Municipal standards within the proposed ROW. Based on the Draft Plan configuration, the connection to Lightheart Drive will be accommodated through the ROW connection through the extension of Lightheart Drive to the plug location at the property boundary. The water main is proposed to be a 150 mm diameter main with final sizing to be confirmed through consultation with the Region during the detailed design process.



LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN
- PROPOSED WATERMAIN

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

PROPOSED WATERMAIN DISTRIBUTION

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 6**
Scale		Project No.	
1:1250		300054371	

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8.0 Grading and Storm Drainage

8.1 Existing Municipal System

The proposed DPOS is located within the Etobicoke Creek watershed. Based on the As-Constructed drawings and stormwater management reports for the surrounding subdivision lands, the infrastructure systems of the adjacent subdivisions were designed and constructed with consideration to development of the subject site.

Along the south property limits, there is an existing 375 mm diameter storm sewer on Highwood Road along the frontage of the subject site which drains to a 975 mm storm sewer immediately downstream of the site. The storm sewer on Highwood Road discharges into the 1,350 mm diameter storm trunk on Summer Valley Drive which conveys drainage to a quality control stormwater management facility located adjacent to Etobicoke Creek, north of Mayfield Road. The As-Constructed Plan and Profile drawing for Highwood Road is included in Appendix A. As identified, EX.MH07 is situated at the intersection of Highwood Road and Hillpath Crescent, which provides connection opportunity for the proposed DPOS. The downstream invert elevation of the storm sewer at EX.MH07 is 253.99 m.

At the east limits of the site there is an existing 750 mm storm sewer extended from Lightheart Drive to an existing ditch inlet catch basin within the subject site as part of the Donal JV Subdivision development. This storm sewer also drains to the 1,350 mm storm trunk sewer on Summer Valley Drive. The downstream invert elevation of the existing storm sewer at STM DCBMH17 is situated at 254.17 m. The As-Constructed Plan and Profile drawing for Lightheart Drive and Highwood Road, including the existing storm infrastructure, is included Appendix A.

Appendix A includes a copy of the Creek's Edge Subdivision Storm Drainage Plan (Part I) which identifies drainage areas, with a runoff coefficient of 0.50, on the north side of Highwood Road to the City limits as directly tributary to the existing storm infrastructure (EX.MH08 through EX.MH06). In addition, an external future development area of 15.58 ha with a runoff coefficient of 0.50, from the Town of Caledon, north of Summer Valley Drive is accommodated with the storm infrastructure on Summer Valley Drive. Under existing conditions 7.25 ha, including the subject site, with a runoff coefficient of 0.25 is accommodated within an RLCB between existing lots 151 and 152, with discharge to the storm sewer on Highwood Road at EX.MH04A.

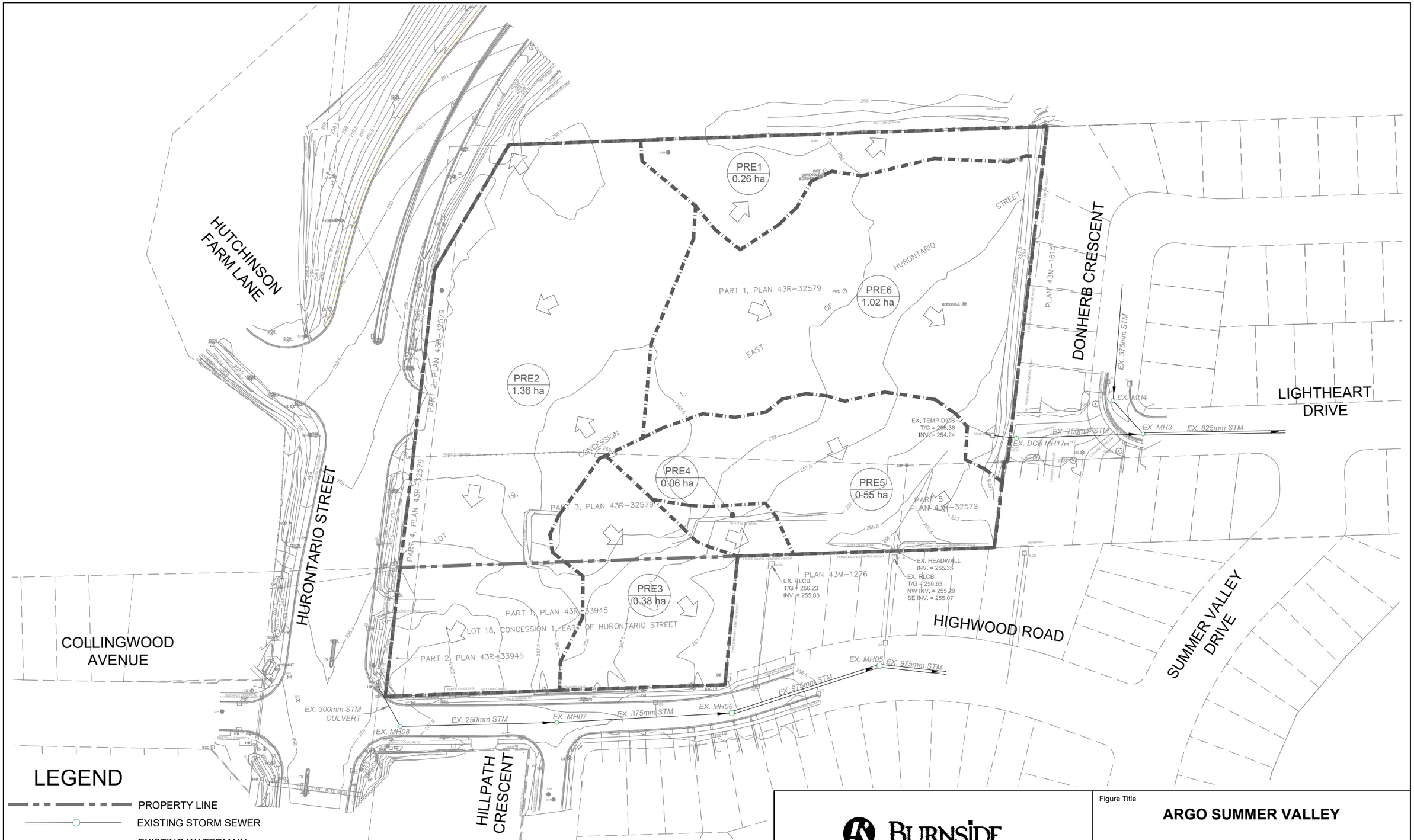
The storm sewer drainage plan for the adjacent Donal JV Subdivision is also included in Appendix A. As identified on that plan, the infrastructure within the Donal JV subdivision has been designed to accommodate 4.48 ha of developed area with a runoff coefficient of 0.75 to the storm sewer on Lightheart Drive and the continued accommodation of 2.76 ha of drainage area at 0.30 runoff coefficient to the RLCB between lots 151 and 152.

8.2 Existing Site Drainage

The existing site is relatively flat, sloping very gently from an elevated central area to various low-lying areas in the east and west. There are a total of six sub-catchment areas within the site with various outlets to the existing surrounding drainage system. Figure 7 identifies the existing sub-catchment drainage areas and sizes and discharge points as summarized in Table 4 below.

Table 4: Existing Storm Drainage Area Details

Drainage Connection	Catchment ID	Drainage Area (ha)
MTO Drainage Ditch (North)	PRE1	0.26
Hurontario Drainage Ditch / Highwood Road	PRE2	1.36
975 mm Highwood Road Storm via CB	PRE3	0.38
975 mm Highwood Road Storm via RLCB (Lot 144)	PRE4	0.06
975 mm Highwood Road Storm via RLCB (Lot 148)	PRE5	0.55
Subtotal to Highwood Road Storm Sewer		2.35
750 mm Lightheart Drive Storm via DICB	PRE6	1.02
Total Area		**3.63**



LEGEND

- PROPERTY LINE
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- EXISTING OVERLAND FLOW
- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- PRE1 / 1.00 ha — CATCHMENT ID / DRAINAGE AREA

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title: **ARGO SUMMER VALLEY**

EXISTING SITE DRAINAGE

Client: **ARGO SUMMER VALLEY LIMITED**

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 7**

Scale: 1:1250 | Project No.: 300054371

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8.3 Grading and Drainage

The proposed grading for the site takes into consideration the following requirements and constraints:

- Conformance to the Town and City's grading and drainage criteria.
- Provision for adequate cover over proposed services.
- Provision for emergency overland flow conveyance to the external ROW while maintaining a maximum ponding depth of 0.30 m.
- Provision for berming along the north and west property boundaries to meet the requirements of the noise study.

It is proposed that pavement grades of 0.5% be implemented for the subdivision, which is in keeping with the City of Brampton minimum standard but less than the Town of Caledon Standard of 0.75%. The proposed use of 0.5% centerline road grades results in less fill for the overall development and a better interface between the proposed lots on the east and south side of the development with the existing lots in Caledon and Brampton. In these area split drainage is required, even with 0.5% road grades. Additional grade would result in a more significant elevation difference between the lots. Detailed design will confirm the minimum gutter grades of 0.75% along all bends. Additionally, the capacity of the overland flow route will be confirmed, and 100 year capture areas will be identified, as required, to ensure the major system drainage remains within the identified ROW limits.

The general intent of the grading and drainage approach is to direct storm drainage up to the 100-year return storm, to the existing outlets at the south and east limits of the property with discharge to the existing municipal storm sewer and ROWs extended on Highwood Road and Lightheart Drive. Emergency overflows in excess of the 100-year return event will spill to the designated Major System overland flow routes.

The majority of the lots within the development are proposed to be back to front draining lots. In localized areas at the interface with the existing developments to the east and south, Lots 22 through 26 and 37 through 44, within the Town of Caledon, are proposed as split draining lots with the inclusion of RLCBs within the proposed development. The lots along the east property boundary are graded with an internal overland flow route along the rear property line with discharge to Lightheart Drive.

For the lots along the south property boundary, the grade differential between the proposed Lightheart Drive and the existing rear lot lines in the adjacent subdivision eliminates the ability to provide an overland flow route internal to the proposed development site. The natural outlet for these areas is to the south, into the City of Brampton, where there are existing headwalls and RLCBs sized for the capture and conveyance of external flow. For this area, the associated RLCBs in Lots 37, 40 and 42 will be sized to capture and convey the 100 year flows such that only emergency overland flow will discharge to the existing infrastructure in the City of

Brampton. Under existing conditions, the existing site drains to these outlets uncontrolled in all storm events. Accordingly, it was felt that it would be acceptable to continue to allow emergency flows to discharge per the existing drainage patterns. The alternative would be the introduction of a significant retaining wall with a typical height of approximately 2.5 m along the entire property line, creating an undesirable situation for both the proposed development and the existing lots. Capture calculations for the RLCBs are included in Appendix C.

The preliminary grading has been identified on Drawing G1, including the identification of the overland flow routes for the site.

8.4 Proposed Storm Servicing

The proposed development will utilize the existing and available connections and municipal infrastructure at the east and south limits of the site. The proposed development will drain to the existing storm sewer on Highwood Road via direct service connection for the lots fronting Highwood Road and via a storm sewer connection to EX.MH07 at the intersection of Highwood and Hillpath Crescent. A portion of the subject property, to be conveyed as MTO setback limits, will drain directly to the existing drainage system along Hurontario Street. The remainder of the site will connect to the existing 750 mm diameter storm sewer located at the eastern limits of the site, at the extension of Lightheart Drive. Figure 8 identifies the proposed drainage boundaries, the total drainage areas, and the calculated runoff coefficients for the proposed sub-catchments. Table 5 summarizes the storm sewer drainage area and runoff coefficients for the proposed DPOS.

Table 5: Proposed Storm Sewer Drainage Area Details

Drainage Connection	Catch. ID	Drainage Area (ha)	Runoff Coeff.
MTO Drainage Ditch (North)	N/A		
Hurontario Drainage Ditch/Highwood Road	POST1	0.269	0.25
Highwood Road MH07	POST2	0.524	0.62
Highwood Road Storm Sewer direct connection	POST3	0.087	0.50
Subtotal to Highwood Road Storm Sewer (excl. Hurontario)		0.611	0.60
Lightheart Drive Storm Sewer	POST4	2.707	0.61
Total Area		**3.587**	

As identified on the As-Constructed Drainage Plan, the direct frontage of the subject property on Highwood Road, was accommodated in the Creek's Edge Subdivision as single detached lots, totaling 0.52 ha, excluding the required 0.02 ha conveyance of the Highwood Road ROW. Under proposed conditions, POST2 and POST3 will drain to that designated stretch of storm sewer with a slight increase in area and runoff coefficients from the original design.

In total, the proposed drainage area from the development site designed to discharge directly to Highwood Road is approximately 0.091 ha larger than the As-Constructed design, with a slightly increased runoff coefficient. To confirm capacity in the existing system, the relevant pipes were included in the storm sewer design sheet for the proposed development (Appendix C). It was identified that the existing 375 mm storm sewer on Highwood Road would require upsizing to a 600 mm storm sewer to accommodate the developed conditions. The remainder of the Highwood Road storm sewer downstream of the 375 mm pipe has more than sufficient capacity to accommodate the proposed increase in drainage area. The downstream pipe is an oversized 975 mm sewer, sized to accommodate a significant external drainage area under predevelopment conditions.

The post development drainage areas to the Hurontario Drainage system and Lightheart Drive are below the accommodated drainage areas per the as constructed information. The confirmation calculations are included in Appendix C. The table below specifically outlines the pre- and post-development discharge rates to the Hurontario catchment area. There is no additional post development flow proposed to the MTO catchment to the north of the site.

Table 6: Hurontario Storm Flows

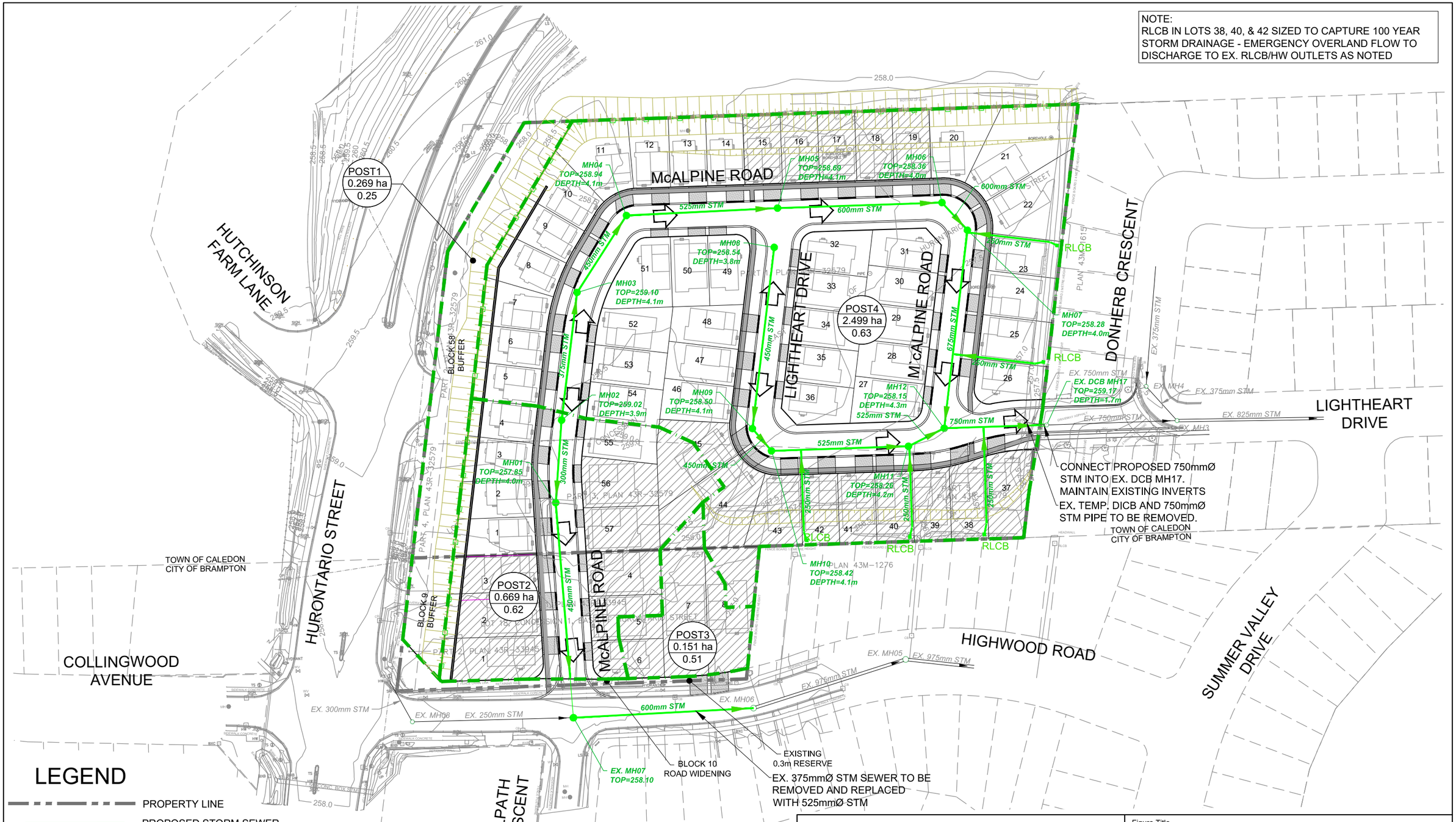
Catchment	2 year	5 year	10 year	25 year	100 year
PRE2	74.8	98.8	114.8	143.4	173.4
POST1	14.8	19.6	22.7	26.7	32.7

As noted in the table above, the post development flow rates to the MTO / Hurontario lands are significantly less than the predevelopment flow rates as a result of the proposed grading and drainage plan for the development. Detailed calculations are included in Appendix C.

Based on the above and with the proposed upgrade of the noted storm sewer, the proposed DPOS falls within the available capacity of the existing storm drainage system.

The local storm sewers servicing the development site will follow the alignment of the roads for the majority of the sewer lengths. The sewers will be designed to accommodate the 10-year storm flow per the Town and City design criteria. At the east limits of the site, the storm sewer will be extended within the extension of Lightheart Drive, to provide connection to the existing 750 mm sewer. This proposed sewer is designed to convey the minor flows to the existing storm sewer system with some localized 100 year capture points in the RLCBs. The storm sewer depth ranges from 3.9 m to 4.11 m, providing sufficient depth and cover to ensure that the HGL conditions can accommodate gravity connections of the foundation drainage system. The major system flow will be conveyed via the ROW to the designated outlets. The proposed storm sewer drainage areas and identified RLCB areas are outlined on Figure 9 to support the design sheet calculations for the sewer sizing.

NOTE:
RLCB IN LOTS 38, 40, & 42 SIZED TO CAPTURE 100 YEAR STORM DRAINAGE - EMERGENCY OVERLAND FLOW TO DISCHARGE TO EX. RLCB/HW OUTLETS AS NOTED



LEGEND

- PROPERTY LINE
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- MAJOR OVERLAND FLOW ROUTE
- POST -DEVELOPMENT DRAINAGE BOUNDARY
- LOTS WITH SOAK AWAY PITS FOR 5mm RETENTION

POST1 / 1.00 ha / 0.50 — CATCHMENT ID / DRAINAGE AREA (HECTARES) / RUNOFF COEFFICIENT

0 25 50 75 100
Metres

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Client
ARGO SUMMER VALLEY LIMITED

Figure Title
ARGO SUMMER VALLEY
PROPOSED STORMWATER DRAINAGE AREA PLAN

Drawn	Checked	Date	Figure No.
KT	LN	23/11/20	**FIG 8**
Scale		Project No.	
1:1250		300054371	

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NOTE:
RLCB IN LOTS 38, 40, & 42 SIZED TO CAPTURE 100 YEAR STORM DRAINAGE - EMERGENCY OVERLAND FLOW TO DISCHARGE TO EX. RLCB/HW OUTLETS AS NOTED

McALPINE ROAD
LIGHTHEART DRIVE
McALPINE ROAD
DONHERB CRESCENT
LIGHTHEART DRIVE
HUTCHINSON FARM LANE
HURONTARIO STREET
McALPINE ROAD
HIGHWOOD ROAD
SUMMER VALLEY DRIVE
COLLINGWOOD AVENUE
HILLPATH CRESCENT
TOWN OF CALEDON
CITY OF BRAMPTON
BLOCK 58 BUFFER
BLOCK 9 BUFFER
PART 3, PLAN 43R-32579
PART 4, PLAN 43R-32579
PART 2, PLAN 43R-33945
PLAN 43M-1615
PLAN 43M-1276
LOT 18, CONCESSION 1, EBHS

MH01 TOP=257.85 DEPTH=4.0m
MH02 TOP=259.01 DEPTH=3.9m
MH03 TOP=259.10 DEPTH=4.1m
MH04 TOP=258.97 DEPTH=4.0m
MH05 TOP=258.69 DEPTH=4.1m
MH06 TOP=258.36 DEPTH=4.0m
MH07 TOP=258.28 DEPTH=4.0m
MH08 TOP=258.54 DEPTH=3.8m
MH09 TOP=258.50 DEPTH=4.1m
MH10 TOP=258.42 DEPTH=4.1m
MH11 TOP=258.26 DEPTH=4.2m
MH12 TOP=258.15 DEPTH=4.3m
EX. DCB MH17 TOP=259.17 DEPTH=1.7m
EX. MH07 TOP=258.10

525mm STM
600mm STM
450mm STM
375mm STM
300mm STM
675mm STM
250mm STM
750mm STM
EX. 300mm STM
EX. 250mm STM
EX. 375mm STM
EX. 750mm STM
EX. 825mm STM
EX. 975mm STM

RLCB

CONNECT PROPOSED 750mmØ STM INTO EX. DCB MH17. MAINTAIN EXISTING INVERTS

EX. TEMP. DICB AND 750mmØ STM PIPE TO BE REMOVED.

BLOCK 10 ROAD WIDENING

EXISTING 0.3m RESERVE

EX. 375mmØ STM SEWER TO BE REMOVED AND REPLACED WITH 600mmØ STM

LEGEND

- PROPERTY LINE
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- MAJOR OVERLAND FLOW ROUTE
- POST -DEVELOPMENT DRAINAGE BOUNDARY
- LOTS WITH SOAK AWAY PITS FOR 5mm RETENTION
- RLCB CATCHMENT AREAS
- 1.00 / 0.51 — DRAINAGE AREA (HECTARES) / RUNOFF COEFFICIENT
- 1.00 — RLCB CATCHMENT AREA (HECTARES)

0 25 50 75 100
Metres

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Client: ARGO SUMMER VALLEY LIMITED

Figure Title: ARGO SUMMER VALLEY
PROPOSED STORM SEWER DRAINAGE AREA PLAN

Drawn	Checked	Date	Figure No.
MM	ET	23/11/20	FIG 9
Scale		Project No.	
1:1250		300054371	

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9.0 Stormwater Management

9.1 Existing Stormwater Management System

The surrounding subdivision development areas discharge to the existing stormwater management facility located adjacent to Etobicoke Creek at the south limits of the Creek's Edge subdivision. The existing pond was designed as a quality and erosion control facility with the provision of Level 2 quality control and 25 mm retention for the proposed drainage area. The pond design was established through the Creek's Edge subdivision by Schaeffers Consulting Engineers and further confirmed as part of the Charlton Engineering Limited review for the Donal JV lands immediately to the east of the subject site.

The ultimate drainage area established for the facility in the original design report totaled 39.38 ha comprised of 20 ha of Creeks Edge subdivision, 15.58 ha of external development to the north of Creeks Edge, including the Donal JV lands and the subject site, 1.10 ha of Hurontario Street corridor and 9.70 ha of undeveloped lands west of Hurontario Street. The drainage area is identified below.

The existing stormwater management pond is constructed with a permanent pool volume of 1,594 m^3 and an active storage of 3,407 m^3 for the 25 mm extended detention. The As-Constructed information, taken from the above noted reports, is included in Appendix A for reference.

9.2 Proposed Stormwater Management

The overall post-development drainage plan for the site is identified on Figure 8. Most of the development site will drain to the proposed storm sewer system on either Highwood Road or Lightheart Drive as outlined above. These sewers are tributary to the existing Creek's Edge stormwater management pond.

9.2.1 Stormwater Criteria

The proposed stormwater management design will need to meet the requirements of the Town's Consolidated Linear Infrastructure Environmental Compliance Application (CLI ECA) with respect to the quality control measures as follows:

- Water Quality: Control 90th percentile storm event and if conventional methods are necessary, then enhanced, normal or basic levels of protection (80%, 70%, or 60% respectively) for suspended solids removal based on the receiver. Based on consultation with both the Town and City, the site will be required to achieve Level 1 or 80% TSS removal
- Erosion Control: Detain the 25 mm storm event for over 24 or 48 hours.
- Water Quantity: Per Master Stormwater Management Plan for surrounding areas the site is not subject to water quantity controls.

- Water Balance: Recharge must meet pre-development conditions on property or control the runoff from the 90th percentile storm event.

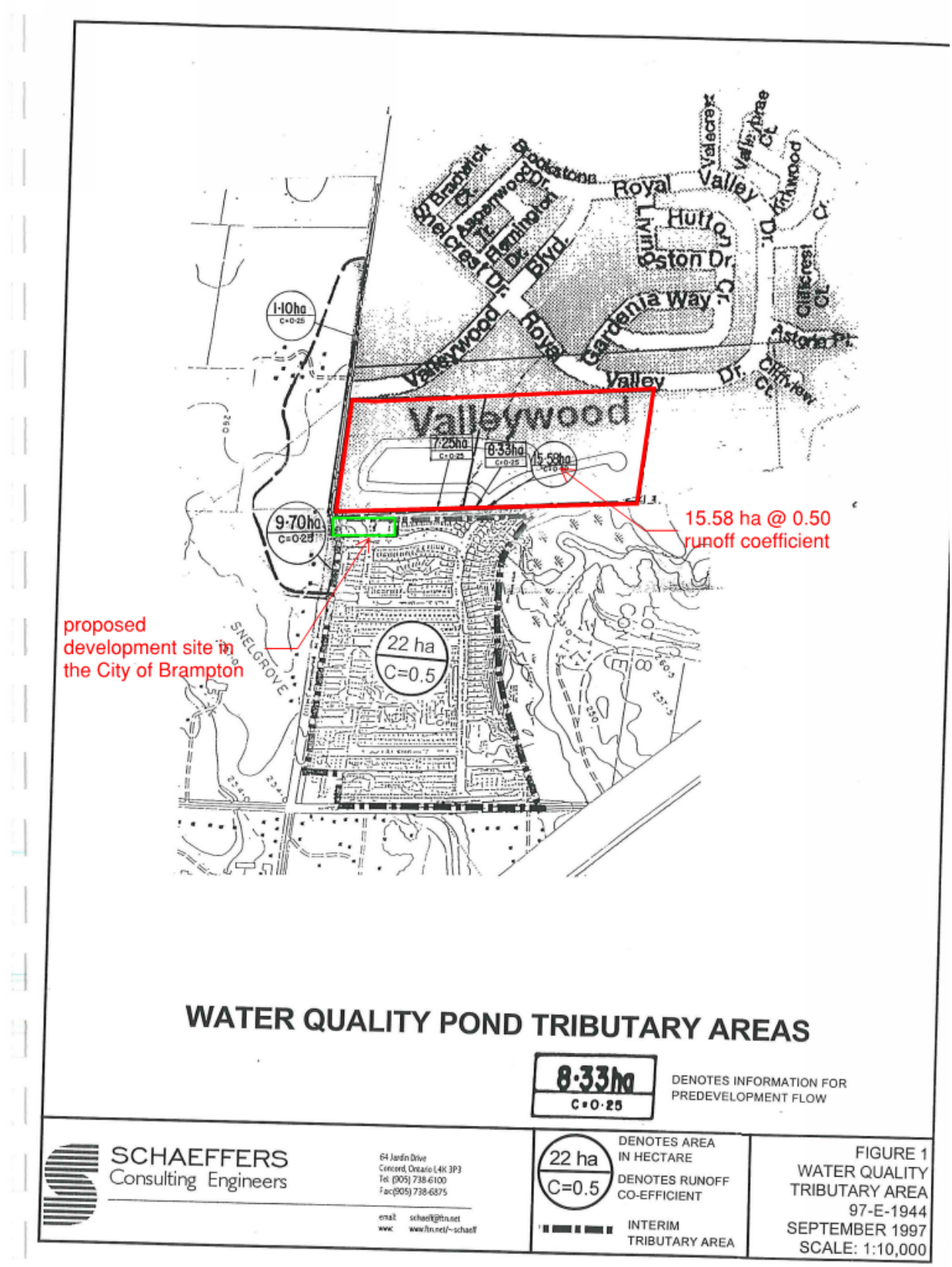
The proposed approach to meet the above noted criteria has been established with consideration to the design and construction of the subdivision infrastructure in the adjacent Creek's Edge Subdivision (Brampton) and Donal JV Subdivision (Caledon) and in accordance with the approved reports and documents submitted for each.

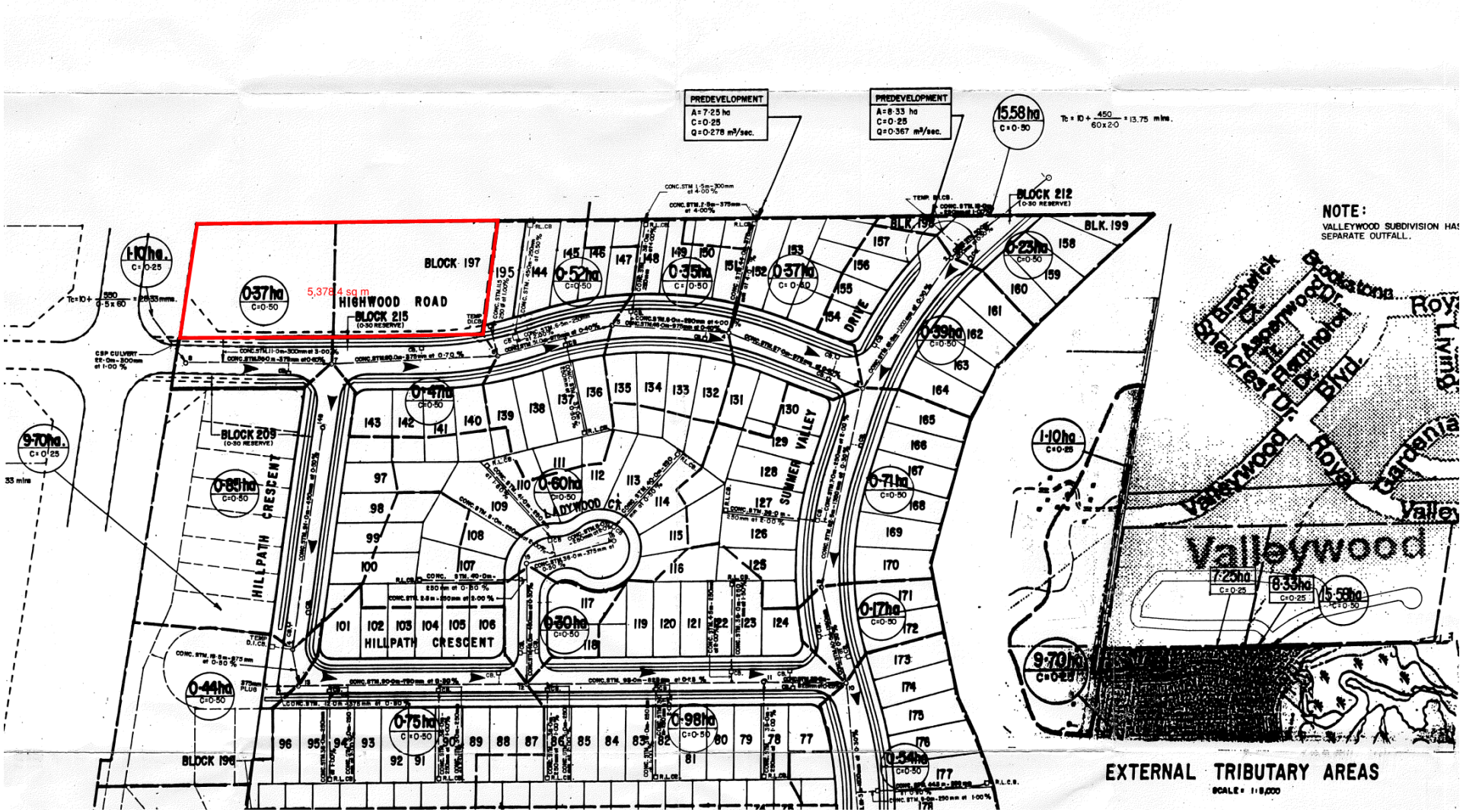
9.2.2 Stormwater Quality Control

The stormwater management facility for the Creek's Edge subdivision was designed with consideration to the development of external area. The stormwater management facility drainage area and the storm sewer drainage plan include the identification of 15.89 ha of external drainage, from the Town of Caledon as contributing to the storm sewer on Summer Valley Drive and an additional 0.54 ha of drainage area fronting Highwood Road in the City of Brampton. The 0.54 ha portion of the site is depicted on the drainage area plans for the existing Creeks Edge storm sewer system below. It includes portions of two sub catchments (0.37 ha and 0.47 ha sub catchments) less the existing Highwood Road and development on the south side of Highwood.

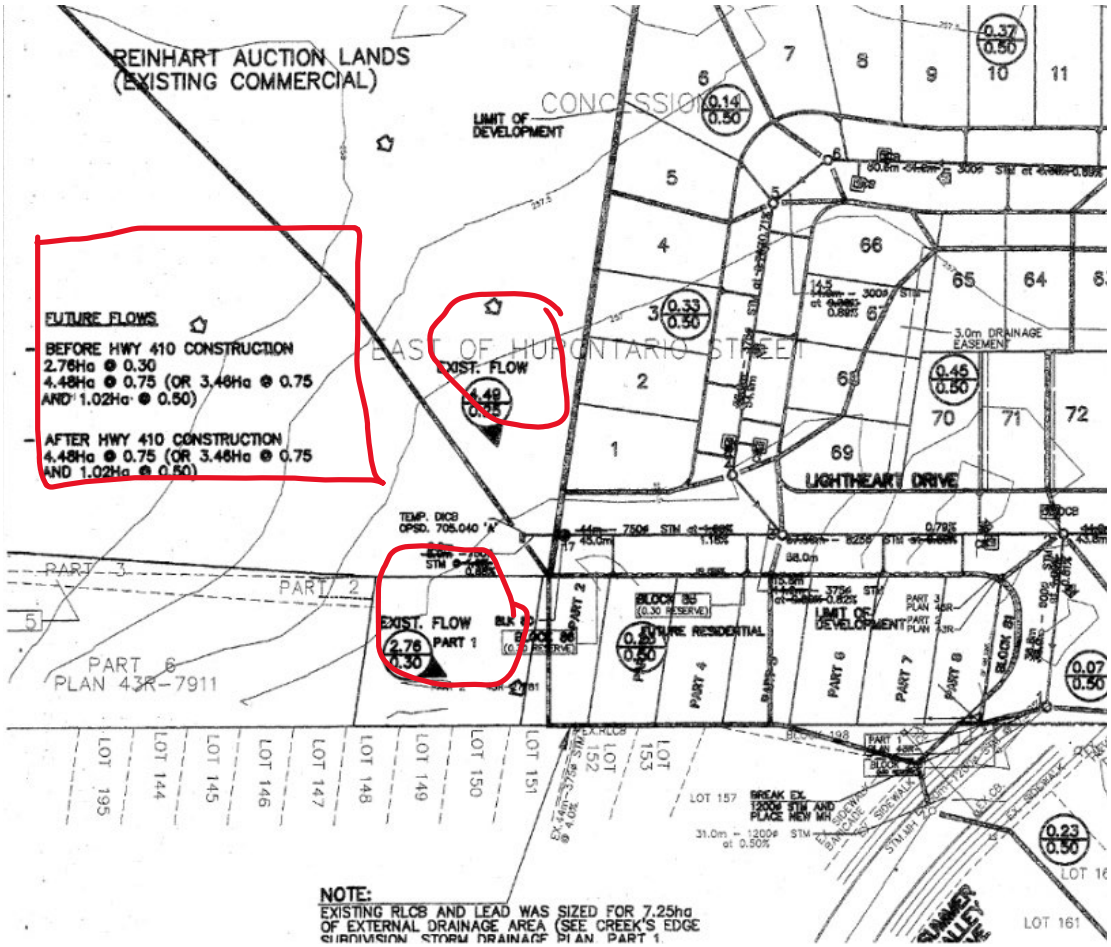
The 15.89 ha drainage area in the Town of Caledon includes land, immediately north of the subject site, that has been developed for the Highway 410 extension and Hurontario interchange. These lands were developed with site specific stormwater management controls and will not drain to the existing system. The drainage plans developed for the proposed highway expansion are included in Appendix A for reference.

The proposed 3.32 ha development site, within both the Town and the City, is part of the external drainage areas identified on the drainage maps. Clips from the As-Constructed drainage plans are included for reference below. The full drainage area mapping is included in Appendix A.


Valleywood
Royal Valley Dr.
Huttonville Dr.
Livingston Dr.
Gardenia Way Cr.
Valleywood Blvd.
Astoria Pl.
Cliffcrest Cr.
Cliffview Cr.
Valleycrest Cr.
Valleyview Cr.
Brookstone Dr.
Broadstreet Cr.
Aspenwood Dr.
Flamingo Dr.
Bellegrove Cr.
1·10ha C=0·25
7·25ha C=0·25
8·33ha C=0·25
15·58ha C=0·50
9·70ha C=0·25
22 ha C=0.5
15.58 ha @ 0.50 runoff coefficient
proposed development site in the City of Brampton
SNELGROVE
WATER QUALITY POND TRIBUTARY AREAS
8·33ha C=0·25
DENOTES INFORMATION FOR PREDEVELOPMENT FLOW
SCHAEFFERS Consulting Engineers
64 Jardin Drive
Concord, Ontario L4K 3P3
Tel: (905) 738-6100
Fax:(905) 738-6875
email: schaeff@tn.net
www: www.tn.net/~schaeff
22 ha C=0.5
DENOTES AREA IN HECTARE
DENOTES RUNOFF CO-EFFICIENT
INTERIM TRIBUTARY AREA
FIGURE 1
WATER QUALITY TRIBUTARY AREA
97-E-1944
SEPTEMBER 1997
SCALE: 1:10,000


PREDEVELOPMENT
A=7·25 ha
C=0·25
Q=0·278 m³/sec.
PREDEVELOPMENT
A=8·33 ha
C=0·25
Q=0·367 m³/sec.
15.58ha
C=0·50
BLOCK 212
(0·30 RESERVE)
BLK. 198
BLK. 199
BLOCK 197
5,378.4 sq.m
HIGHWOOD ROAD
BLOCK 215
(0·30 RESERVE)
0·37ha
C=0·50
0·52ha
C=0·50
0·35ha
C=0·50
0·37ha
C=0·50
0·23ha
C=0·50
0·39ha
C=0·50
1·10ha.
C=0·25
0·47ha
C=0·50
BLOCK 209
(0·30 RESERVE)
0·85ha
C=0·50
9·70ha.
C=0·25
0·60ha
C=0·50
LADYWOOD CT.
0·71ha
C=0·50
1·10ha
C=0·25
0·30ha
C=0·50
0·17ha
C=0·50
0·44ha
C=0·50
0·75ha
C=0·50
0·98ha
C=0·50
0·54ha
C=0·50
9·70ha
C=0·25
HILLPATH CRESCENT
SUMMER VALLEY
DRIVE
BLOCK 196
NOTE:
VALLEYWOOD SUBDIVISION HAS
SEPARATE OUTFALL.
Valleywood
7·25ha
C=0·25
8·33ha
C=0·25
15·58ha
C=0·50
EXTERNAL TRIBUTARY AREAS

As identified, the proposed development site falls within the drainage area originally anticipated for the stormwater management pond design completed by Schaeffers Consulting Engineers as part of the Creek's Edge Subdivision. This is further confirmed in the subsequent studies for the Donal JV Lands, in the Town of Caledon, completed by Charlton Engineering Limited. The clip below is from the As-Constructed drainage area plan for the adjacent Donal JV Subdivision which includes an allowance for external flows from the subject site:



The Donal JV report confirmed that the stormwater management facility was constructed with 1594 m^3 of permanent pool with a normal water level of 241.60 m and an active storage volume of 3407 m^3 to an elevation of 242.20 m. Further, the calculations in the report identify the watershed parameters, draining to the stormwater management facility for both the Creek's Edge and Donal JV subdivisions for assessment of the stormwater management facility capacity.

The site-specific parameters for the proposed Summer Valley development are based on the proposed draft plans as well as a detailed review of the proposed unit types for each lot per the proposed lot coverage depicted on Figure 8. The detailed calculations

for the impervious percentages and runoff coefficients are included in Appendix C and reflective of the specific unit sitings for the lots. The following table identifies the parameters for the existing development, the subject property, and the total pond drainage area to be applied to the capacity review calculations.

Table 7: Pond Drainage Area Parameters

	Ex. Creeks Edge plus Donal JV	Proposed Summer Valley	Total
Drainage Area to Pond (ha)	27.226	3.3191	30.0
Runoff Coefficient	0.5	0.62	0.51
Total Impervious	43%	60%	44.9%
Connected Impervious	30%	40%	31.1%
Curve Number	72	72	72

Note the total is not a direct sum of existing and proposed as 0.54 ha portion of the subject property was included in the original Creek's Edge subdivision drainage area. All other values have been prorated to reflect the proposed development.

Based on the above information the resultant permanent pool requirement for the total drainage area is 59.93 m^3/ha or 1798 m^3 for provision of Level 2 (70% TSS removal) quality control. This exceeds the available 1594 m^3 permanent pool in the facility. However, the pond will still provide a degree of quality control, albeit less than the design requirement of 70%.

With the additional drainage area, the available storage in the permanent pool is 53.13 m^3/ha, resulting in a treatment efficiency of 68.5% in the facility. With the inclusion of OGS units upstream of the connection points in both the Town of Caledon and the City of Brampton, each providing 50% TSS removal, the treatment train results in an overall removal of 84% TSS for the proposed development site, which exceeds the requirement of Level 1 or 80% TSS removal for the development lands. The detailed calculations are included in Appendix C and the as constructed full scale drainage maps are included in Appendix A.

9.2.3 25 mm Extended Detention

The SCS method is an alternative approach for calculating the runoff volumes for the quality design storm in lieu of modelling. For assessment of the subject site, the SCS calculation approach was calibrated through comparison of the SWM Hymo modelling that was completed for the Donal JV subdivision, against an SCS calculation for the same area. With the incorporation of the parameters applied to the Hymo modelling to the SCS calculation, the resultant 25 mm volume for the Donal JV assessment was calculated at 3010 m^3, compared to the SWM Hymo runoff volume of 3011 m^3,

confirming the SCS methodology appropriately reflects the previously modelled conditions.

Utilizing the parameters for the overall drainage area to the existing facility, including the proposed development site, the 25 mm runoff volume from the catchment is calculated to be 3411 m^3, through the SCS method. This volume is 4 m^3 higher than the noted active storage capacity in the pond, but well within design tolerances given the depth associated with 4 m^3 is less than 0.5mm. Therefore, the pond is sufficiently sized to provide the volume requirements for the extended detention of the 25 mm event.

9.2.3.1 Diversion Structure Requirements

The existing pond includes a diversion structure, upstream of the facility, designed to direct the 25 mm storm flows to the facility and bypass the flows exceeding the 25 mm event directly to Etobicoke Creek. The existing diversion structure was sized as a 900 mm pipe, to divert the quality flow generated from the fully developed drainage area, including the subject site, to the stormwater management facility. For the interim conditions associated with the Creeks Edge subdivision development only, the 900 mm pipe was fitted with a 600 mm orifice, at the time of construction, to control the discharge to the pond to the quality control flow rate of 0.84 cm. The remainder of the flow will bypass the facility and discharge directly into Etobicoke Creek.

The inclusion of the subject site will result in an increased peak flow for the quality storm which will need to be directed to the control facility. Based on a two-hour Chicago storm, the Donal JV modelling established the quality storm hydrograph duration to be 1 hour and 22 minutes. Applying this duration to the quality control volume for the subject site and existing drainage area, results in a calculated peak flow runoff of 1.04 cms.

With the increase in the 25 mm runoff rate associated with the addition of the development lands, the 600 mm diameter orifice is insufficient to convey the full 25 mm event. The orifice will need to be replaced with a 715 mm diameter orifice to allow for appropriate diversion flow to be conveyed to the pond. This will need to be completed as part of the subdivision infrastructure.

9.2.3.2 Outlet Control Structure Requirements

The existing outlet control structure for the stormwater management facility includes a 100 mm diameter orifice sized to provide 48 hour extended detention for the Creeks Edge and Donal JV subdivisions. The calculations for the additional extended detention volume confirm that the 100 mm diameter orifice will continue to provide the control necessary for 48 hours of extended detention. Therefore, no outlet structure updates are required to accommodate the proposed development site.

The supporting calculations, Donal JV SWM Hymo modelling, Creeks Edge diversion and extended detention calculations are included in Appendix C.

9.2.4 Annual Water Balance

A water balance assessment, utilizing the Thornthwaite and Mather method was completed as part of the Hydrogeological study prepared by EXP for the proposed development. As identified in the report and given the historical land use and site coverage, the post development conditions and associated pervious areas, result in an increase in the annual infiltration volume. This is based on the available greenspace and the discharge of roof leaders at grade allowing for greater volumes of water to infiltrate on an annual basis. No further mitigation measures are required or proposed. The details of the calculations are further identified in the EXP report.

9.2.5 5 mm Retention

The proposed development includes the implementation of extra depth topsoil in the available greenspace areas within the lots. The additional topsoil will provide full 5 mm retention for the direct rainfall as well as additional 1.5 mm retention of the rooftop runoff to be directed to the rear yards. As identified in the EXP report, the groundwater table elevation is lowest at the southern limits of the site, in the areas of the sandy silt till and in a small band along the north property boundary. It is proposed that roof leader soak away pits be implemented in these areas to promote infiltration of the 5 mm runoff from the proposed rooftop. The soak away pits will be incorporated in lots 15-19, 37-45, 56 and 57 on the Caledon DPOS and lots 1 through 8 on the Brampton DPOS, as identified on Figure 8. With the implementation of the proposed measures, approximately 105 m^3 of the calculated 165 m^3 will be retained on site. Detailed calculations are included in Appendix C.

10.0 Erosion and Sediment Control

The following general Erosion and Sediment Control (ESC) measures will be implemented as part of the proposed construction works associated with the development of the DPOS. A detailed ESC Plan will be established during the detailed design approvals process. Figure 10 outlines a preliminary ESC Plan for the site. The ESC measures noted below are intended to mitigate the impacts associated with the construction activities on the surrounding environment. The ESC measures listed below are applicable to all construction activities within the subject property:

1. ESC measures will be implemented prior to, and maintained during, the construction phases to prevent entry of sediment into the storm drainage system.

2. Sediment control fence consisting of non-woven material shall be installed and maintained to prevent sediment from leaving the proposed construction areas. Location of fencing will be established based on the site staging and proposed construction work.

3. The Contractor shall maintain a supply of silt fence, clear stone, straw bales, and filter fabric on site for emergency use.

4. No sediment-laden water or deleterious substances will be released to the existing storm sewer system at any time. Dewatering discharge containing sediment-laden water must be discharged to a sediment bag positioned in a vegetated area and allowed to discharge into existing established vegetation at least 30 m from any feature or existing storm catch basin.

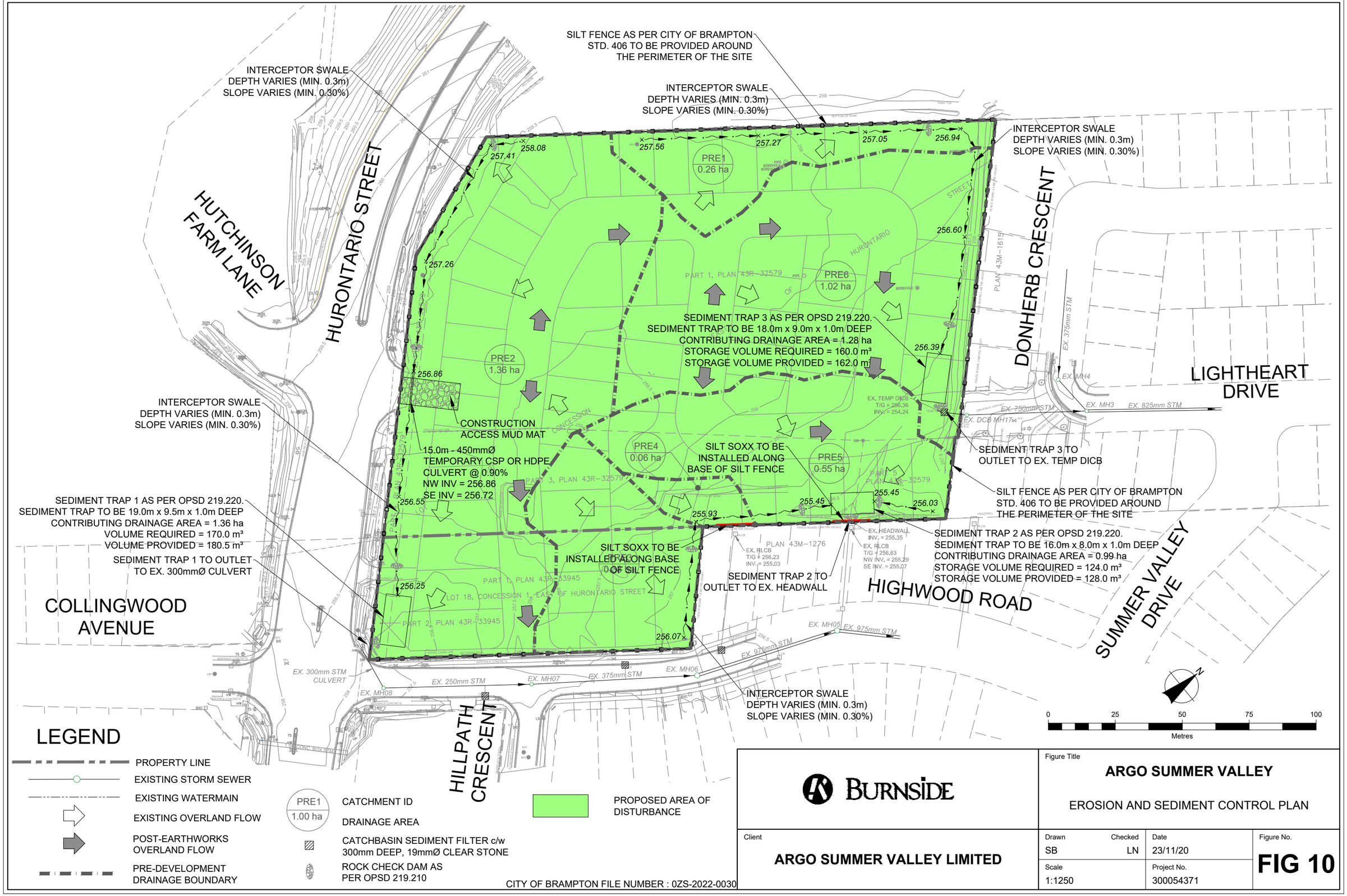
5. Removal of vegetative cover will be staged and restricted to a period immediately preceding the commencement of earth works in each stage.

6. Disturbed areas will be temporarily or permanently stabilized or restored as the work progresses.

7. If site construction activities are interrupted, and / or inactivity exceeds 30 days, all stripped and / or bare soil areas are to be stabilized using either erosion control matting (e.g., jute), sodding / seeding / mulching, or other approved methods to the satisfaction of the site inspector.

8. All damaged erosion and sediment control measures should be repaired and / or replaced within 48 hours of the inspection.

9. After hours contact numbers are to be posted on site for emergencies.



LEGEND

- PROPERTY LINE
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- EXISTING OVERLAND FLOW
- POST-EARTHWORKS OVERLAND FLOW
- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- PRE1 / 1.00 ha — CATCHMENT ID / DRAINAGE AREA
- CATCHBASIN SEDIMENT FILTER c/w 300mm DEEP, 19mmØ CLEAR STONE
- ROCK CHECK DAM AS PER OPSD 219.210
- PROPOSED AREA OF DISTURBANCE

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

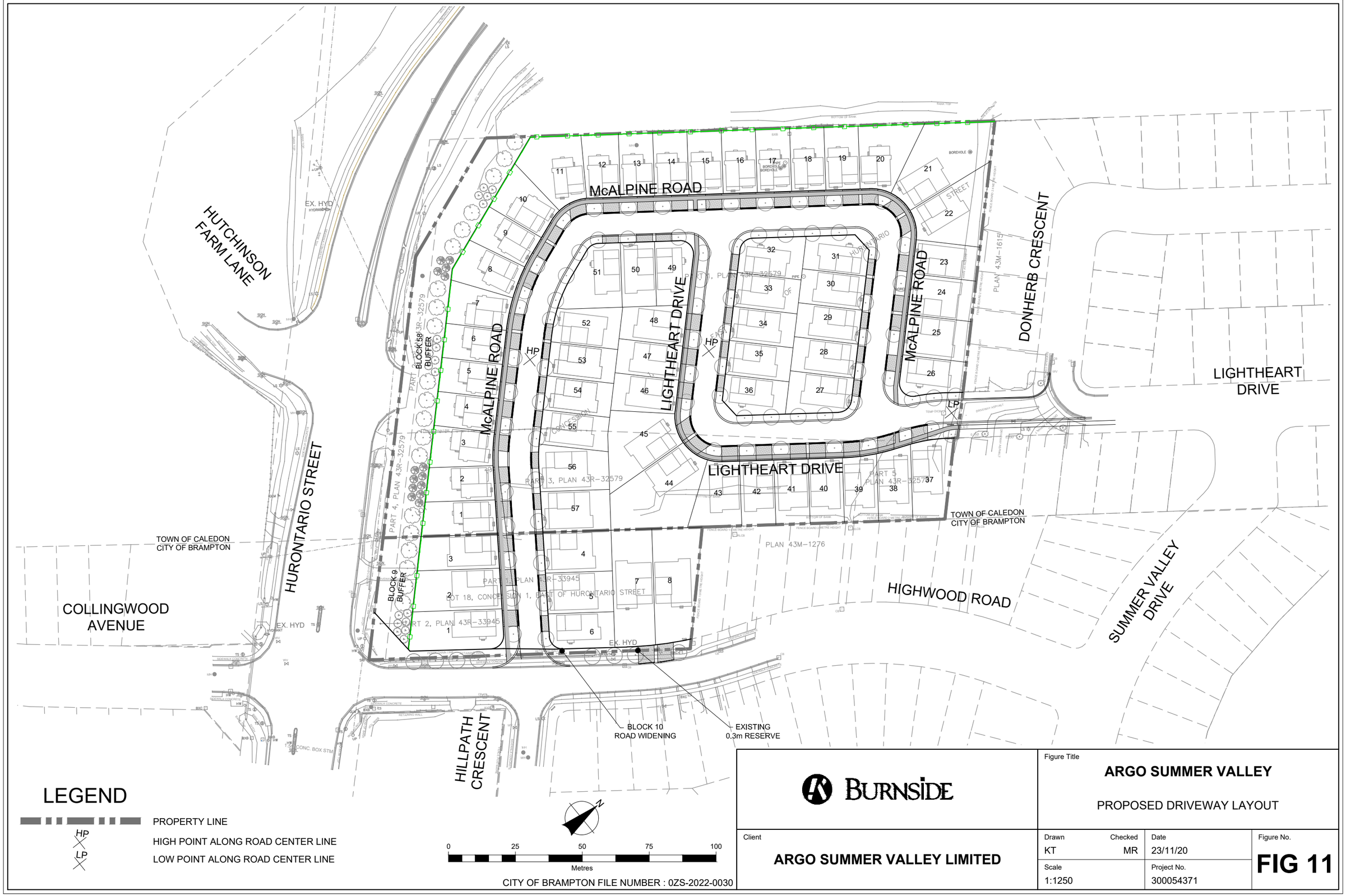
EROSION AND SEDIMENT CONTROL PLAN

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
SB	LN	23/11/20	**FIG 10**
Scale		Project No.	
1:1250		300054371	

File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\0543371 - ESC.dwg Date Plotted: November 20, 2023 - 3:59 PM



LEGEND

PROPERTY LINE

HP HIGH POINT ALONG ROAD CENTER LINE

LP LOW POINT ALONG ROAD CENTER LINE

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

PROPOSED DRIVEWAY LAYOUT

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	MR	23/11/20	**FIG 11**
Scale		Project No.	
1:1250		300054371	

File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\0543371 - PROPOSED DRIVEWAY LAYOUT.dwg Date Plotted: November 20, 2023 - 3:59 PM

11.0 Conclusions

This Functional Servicing and Stormwater Management Report is intended to satisfy Town, City, Region of Peel and Toronto Region Conservation Authority requirements for a review of site servicing and stormwater management in support of the planning applications for the Argo Summer Valley DPOS. Based on a review of all the materials available, the following conclusions and / or recommendations are made:

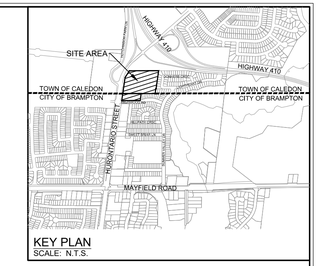
- The existing 450 mm diameter trunk sewer, located on Summer Valley Drive, is sufficiently sized to accommodate the proposed development.
- Sanitary servicing is available through the existing MHs at the south and east limits of the site via the Highwood Road and Lightheart Drive sanitary system.
- Direct connections will be made to the existing sanitary sewer for the lots fronting Highwood Road, as intended in the Creek's Edge subdivision design.
- The DPOS will be serviced through an internal system of gravity draining sanitary sewers with connection to the existing sanitary system at existing available MHs.
- A 300 mm distribution water main exists along Highwood Road and a 150 mm diameter water main has been extended to the site from Lightheart Drive to service the proposed development.
- Internal distribution mains extended via the local road system within the DPOS will serve the development with connection to the 300 mm main on Highwood Road and extension of the 150 mm main from Lightheart Drive, providing security of service and sufficient flow and pressure for the proposed DPOS.
- The existing 1,350 mm diameter trunk sewer located on Summer Valley Drive is sufficiently sized to accommodate the proposed development.
- Storm servicing is available through the existing MHs at the south and east limits of the site via the Highwood Road and Lightheart Drive storm drainage system.
- The proposed development requires upsizing of the existing 375 mm storm sewer on Highwood Road to a 600 mm storm sewer.
- Direct connections will be made to the upsized storm sewer for the lots fronting Highwood Road, as intended in the Creek's Edge subdivision design.
- The proposed storm drainage system will be sized in accordance with City and Town Requirements, with the provision of 10-year flow capacity within the storm sewer system. The storm sewers will provide gravity drainage to the existing storm sewer infrastructure on Highwood Road and Lightheart Drive.
- The proposed development will include a treatment train approach to addressing quality control for the site through the installation of OGS units at the connection points to the existing storm sewer system and utilizing the existing treatment efficiency in the existing stormwater management facility in the adjacent subdivision. The proposed measures result in achieving 84% TSS removal for the subject site.

- The existing stormwater management pond is sufficiently sized to accommodate the increase in 25 mm runoff generated from the proposed development. The pond will provide sufficient erosion control for the DPOS development.
- The existing 600 mm orifice in the diversion MH at the stormwater management facility will need to be upsized to a 715 mm orifice to convey the additional flow for treatment in the stormwater management pond. The existing extended detention release orifice is sufficiently sized to provide 48 hours of extended detention for the additional volume.
- Details of the stormwater management system will be finalized during the detailed design stage of the subdivision.
- ESC measures will be included in the detailed design, prior to the commencement of any earthworks activity.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Drawings



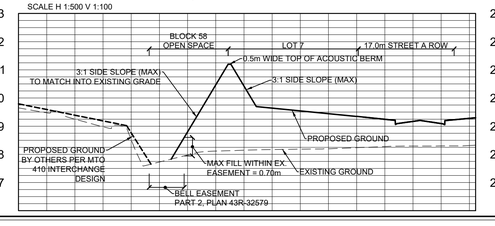
KEY PLAN
SCALE: N.T.S.

LEGEND

- PROPERTY LINE
- 14.0m MTO SETBACK
- 258.87 — PROPOSED GRADE
- 2.0% — PROPOSED SLOPE
- 256.57 EX — EXISTING GRADE
- 258.87 — MTO INTERCHANGE GRADE
- 258.87 — PROPOSED RJB ADJUSTED MTO INTERCHANGE GRADE
- OVERLAND FLOW ROUTE
- FD — FRONT DRAINAGE UNITS
- SD — SPLIT DRAINAGE UNITS
- LO — LOOK OUT UNITS
- WO — WALK OUT UNITS
- APPROXIMATE LOCATION OF SOAKAWAY PIPE (MIN. AREA 1.125 SQ.M.) SET MIN 5m FROM BUILDING AND 0.5m FROM LOT LINE
- EMERGENCY OVERLAND FLOW FROM 100 YEAR CAPTURE AREAS

McALPINE ROAD
LIGHTHEART DRIVE
DONHERB CRESCENT
HURONTARIO STREET
HUTCHINSON FARM LANE
HILLPATH CRESCENT
HIGHWOOD ROAD
SUMMER VALLEY DRIVE
COLLINGWOOD AVENUE
BLOCK 58 BUFFER
BLOCK 9 BUFFER
BLOCK 10 ROAD WIDENING
EXISTING 0.3m RESERVE
3:1 SLOPE TO MATCH INTO EXISTING GRADE
3:1 SLOPE TO TOP OF BERM ELEVATION
2.4m ACOUSTIC FENCE
14.0m MTO SETBACK (TYP.)
LEGAL HURONTARIO STREET DRIVEWAY ACCESSES TO BE REMOVED
TOWN OF CALEDON
CITY OF BRAMPTON
PLAN 43M-1615
PLAN 43M-1276
PLAN 43R-33945
PLAN 43R-32579
NOTE:
RLCB IN LOTS 38, 40, & 42 SIZED TO CAPTURE 100 YEAR STORM DRINAGE - EMERGENCY OVERLAND FLOW TO DISCHARGE TO EX. RLCB/HW OUTLETS AS NOTED

XSECT A-A
SCALE H 1:500 V 1:100



0 5.0 10.0 20.0 30.0 40.0
Metres

BURNSIDE

Figure Title: **ARGO SUMMER VALLEY**
PRELIMINARY GRADING PLAN

Client: **ARGO SUMMER VALLEY LIMITED**

Drawn	Checked	Date	Figure No.
KT	LN	23/05/30	**G1**
Scale: 1:500		Project No.: 300054371	

CITY OF BRAMPTON FILE NUMBER : 0ZS-2022-0030

BURNSIDE	Figure Title: ARGO SUMMER VALLEY	PRELIMINARY SERVICING PLAN
Client: ARGO SUMMER VALLEY LIMITED	Drawn: KT; Checked: LN; Date: 23/05/30; Scale: 1:500; Project No. 300054371	Figure No. S1

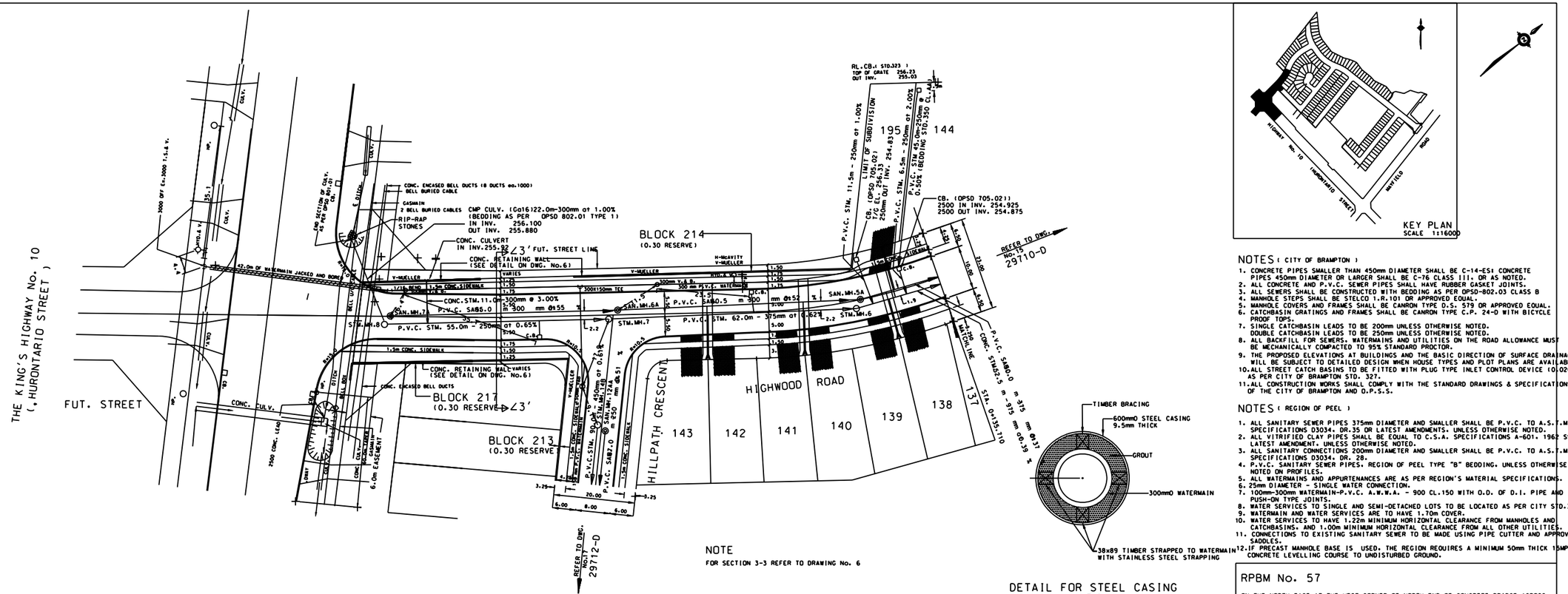
CITY OF BRAMPTON FILE NUMBER : OZS-2022-0030

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

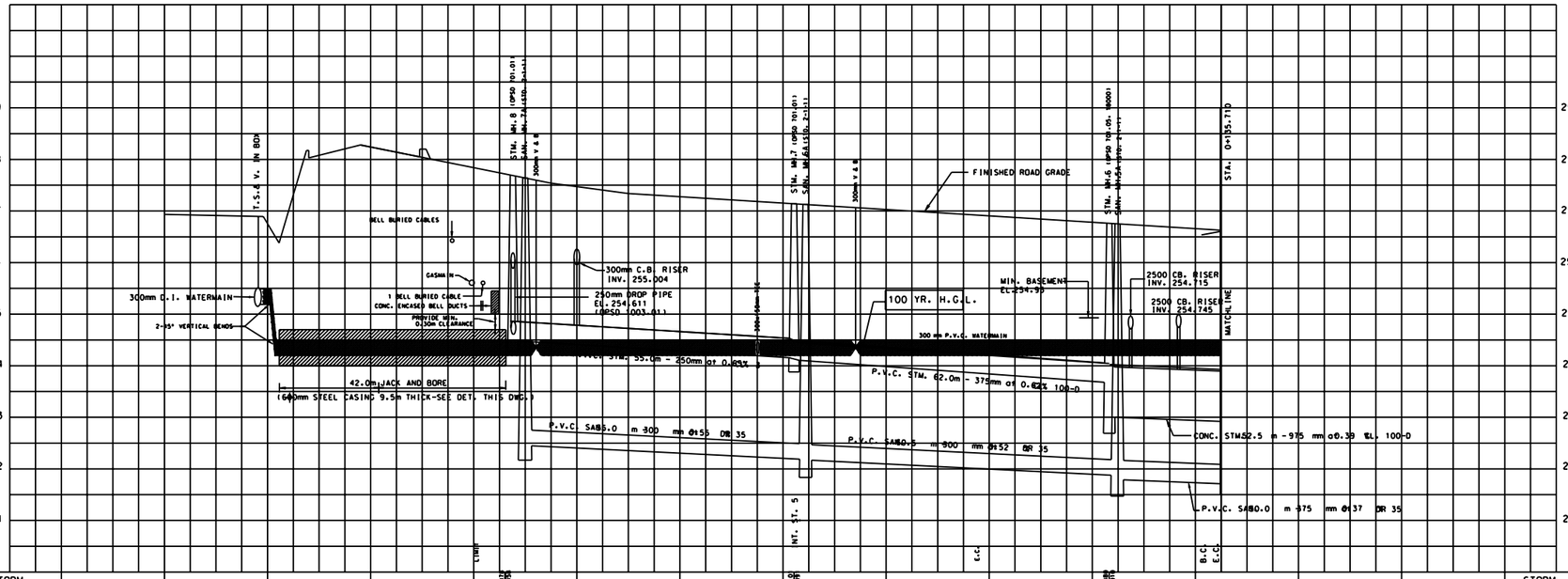
As Constructed Drawings



NOTE

FOR SECTION 3-3 REFER TO DRAWING No. 6

DETAIL FOR STEEL CASING
N.T.S.



NOTES (CITY OF BRAMPTON)

1. CONCRETE PIPES SMALLER THAN 450mm DIAMETER SHALL BE C-14-ES: CONCRETE PIPES 450mm DIAMETER OR LARGER SHALL BE C-76 CLASS III. OR AS NOTED.
2. ALL CONCRETE AND P.V.C. SEWER PIPES SHALL HAVE RUBBER GASKET JOINTS.
3. ALL SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD-802.03 CLASS B
4. MANHOLE STEPS SHALL BE STELCO 1-R-101 OR APPROVED EQUAL.
5. MANHOLE COVERS AND FRAMES SHALL BE CANRON TYPE D.S. 579 OR APPROVED EQUAL.
6. CATCHBASIN GRATINGS AND FRAMES SHALL BE CANRON TYPE C.P. 24-D WITH BICYCLE PROOF TOPS.
7. SINGLE CATCHBASIN LEADS TO BE 200mm UNLESS OTHERWISE NOTED. DOUBLE CATCHBASIN LEADS TO BE 250mm UNLESS OTHERWISE NOTED.
8. ALL BACKFILL FOR SEWERS. WATERMAINS AND UTILITIES ON THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR.
9. THE PROPOSED ELEVATIONS AT BUILDINGS AND THE BASIC DIRECTION OF SURFACE DRAINAGE WILL BE SUBJECT TO DETAILED DESIGN WHEN HOUSE TYPES AND PLOT PLANS ARE AVAILABLE.
10. ALL STREET CATCH BASINS TO BE FITTED WITH PLUG TYPE INLET CONTROL DEVICE (0.026cms). AS PER CITY OF BRAMPTON STD. 327.
11. ALL CONSTRUCTION WORKS SHALL COMPLY WITH THE STANDARD DRAWINGS & SPECIFICATIONS OF THE CITY OF BRAMPTON AND O.P.S.S.

NOTES (REGION OF PEEL)

1. ALL SANITARY SEWER PIPES 375mm DIAMETER AND SMALLER SHALL BE P.V.C. TO A.S.T.M. SPECIFICATIONS D3034. DR.35 OR LATEST AMENDMENTS. UNLESS OTHERWISE NOTED.
2. ALL VITRIFIED CLAY PIPES SHALL BE EQUAL TO C.S.A. SPECIFICATIONS A-60.1 1962 SS OR LATEST AMENDMENT. UNLESS OTHERWISE NOTED.
3. ALL SANITARY CONNECTIONS 200mm DIAMETER AND SMALLER SHALL BE P.V.C. TO A.S.T.M. SPECIFICATIONS D3034. DR. 28.
4. P.V.C. SANITARY SEWER PIPES. REGION OF PEEL TYPE "B" BEDDING. UNLESS OTHERWISE NOTED ON PROFILES.
5. ALL WATERMAINS AND APPURTENANCES ARE AS PER REGION'S MATERIAL SPECIFICATIONS.
6. 25mm DIAMETER - SINGLE WATER CONNECTION.
7. 100mm-300mm WATERMAIN-P.V.C. A.W.W.A. - 900 CL.150 WITH O.D. OF D.I. PIPE AND PUSH-ON TYPE JOINTS.
8. WATER SERVICES TO SINGLE AND SEMI-DETACHED LOTS TO BE LOCATED AS PER CITY STD.356
9. WATERMAIN AND WATER SERVICES ARE TO HAVE 1.70m COVER.
10. WATER SERVICES TO HAVE 1.22m MINIMUM HORIZONTAL CLEARANCE FROM MANHOLES AND CATCHBASINS. AND 1.00m MINIMUM HORIZONTAL CLEARANCE FROM ALL OTHER UTILITIES.
11. CONNECTIONS TO EXISTING SANITARY SEWER TO BE MADE USING PIPE CUTTER AND APPROVED SADDLES.
12. IF PRECAST MANHOLE BASE IS USED. THE REGION REQUIRES A MINIMUM 50mm THICK 15MPa CONCRETE LEVELLING COURSE TO UNDISTURBED GROUND.

RPBM No. 57

ON THE NORTH FACE AT THE WEST CORNER OF NORTH END OF CONCRETE BRIDGE ACROSS SEVENTEENTH SIDEROAD (REGION ROAD # 14) APPROX. 183m EAST OF VALLEYVIEW ROAD.

ELEVATION: 243.632m

DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate. The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.

AS CONSTRUCTED-JUNE 2002

No.	By	Date	Revision
6.		JUNE 2002	AS CONSTRUCTED
5.	H.T.	APR. 23/98	REVISED BOULEVARD DIMENSIONS AT SECTION 3-3
4.	H.T.	SEP.17. 97	ADDED MLCB TO LOT 144
3.	H.T.	SEP.17. 97	BLOCK 197 IS CHANGED TO LOT 195 AND HOUSE CONN.'S ARE ADDED
2.	H.T.	SEP.17. 97	250mm SAN. CONN. FROM SAN.MH. 5A TO THE WEST IS CANCELED
1.	H.T.	SEP.17. 97	STM.MH. 6 & SAN.MH. 5A ARE RELOCATED

Checked

CITY OF BRAMPTON

WORKS AND TRANSPORTATION DEPARTMENT

COMMISSIONER OF WORKS AND TRANSPORTATION L.T. KOEHLE P. ENG.

SCHAEFFERS Consulting Engineers
64 Jardin Drive
Concord, Ontario L4K 3P3
Telephone (416) 738-6100

SIGNED SEPT 11. 1997

REGISTERED PROFESSIONAL ENGINEER H. G. TOZER SEPT 20. 1997 PROVINCE OF ONTARIO

Project 97-E-19440 wg. No.

21T - 90017
THE CREEK'S EDGE SUBDIVISION

PLAN AND PROFILE
OF
HIGHWOOD ROAD
(FROM STA. 0+135.710 E.C. TO STA. 0+279.586 LIMIT)

Surveyed By	Date	Contract No.	
Drawn By A.M.R. / H.R.	Checked B&J.	Drawing No.	Sheet No.
Designed By P.S./H.T.	Checked By H.T.	29709-D	14
Scale: v:1:50 h:1:500	Date JULY 1997		

29709_d.dgn 2009-08-20 1:15:30 PM

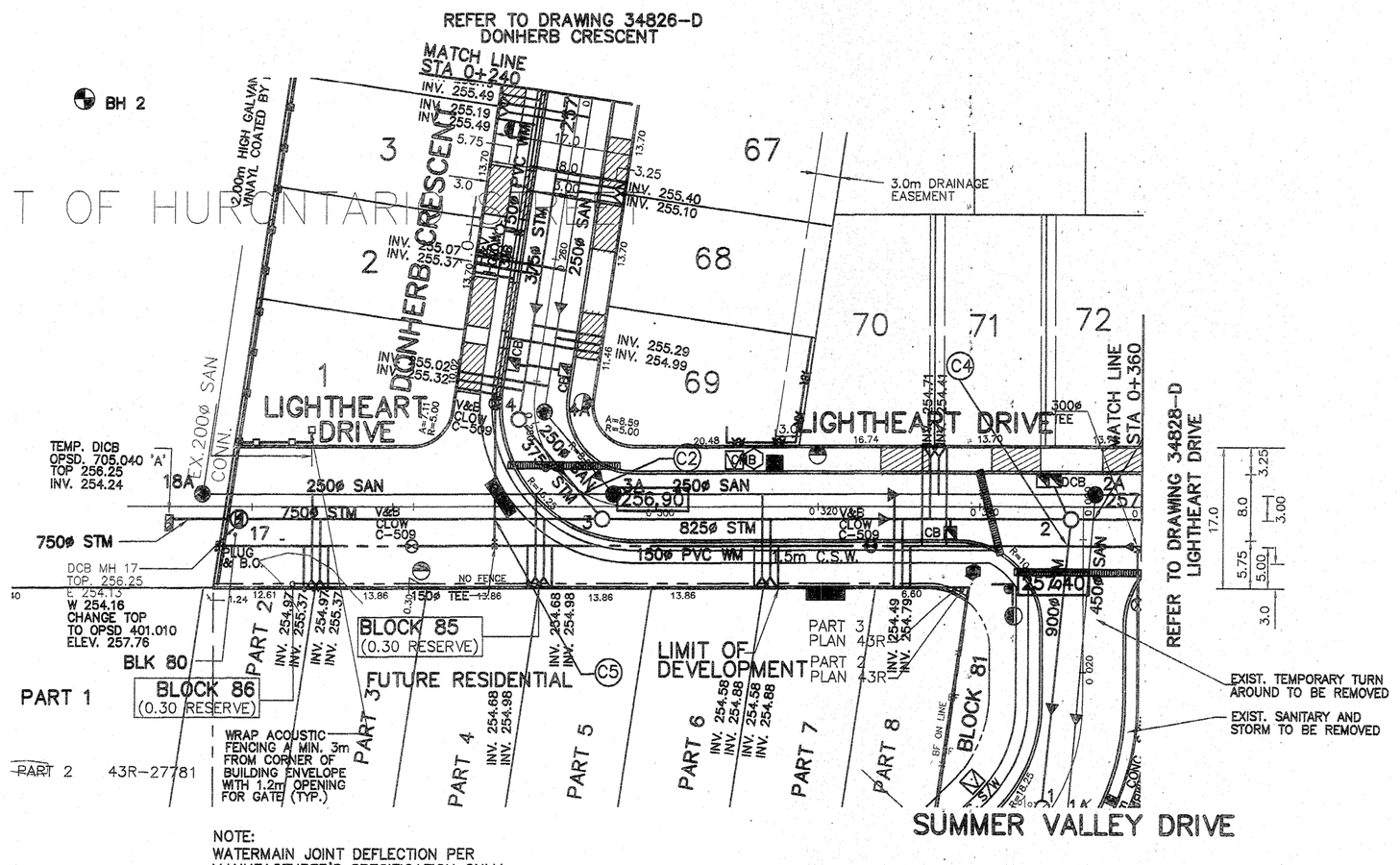
CONSTRUCTION NORTH

NOTES:

1. ALL CONCRETE AND PLASTIC SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
2. ALL SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH OPSD 802.03 CLASS 'B' UNLESS OTHERWISE NOTED.
3. PLASTIC SEWER PIPES SHALL BE CONSTRUCTED WITH ULTRA RIB OR APPROVED EQUAL UP TO THE MAXIMUM DIAMETER OF 800MM.
4. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT TOWN OF CALEDON, O.P.S.D AND REGION OF PEEL STANDARD DRAWINGS AND SPECIFICATIONS.
5. SINGLE CATCHBASIN LEADS TO BE 250MM UNLESS OTHERWISE NOTED. DOUBLE CATCHBASIN LEADS TO BE 300MM UNLESS OTHERWISE NOTED.
6. ALL BACKFILL FOR SEWERS, WATERMAINS AND UTILITIES ON THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED TO 95 % STANDARD PROCTOR DENSITY EXCEPT FOR TOP 0.3M WHICH MUST BE COMPACTED TO 98%
7. AN ASPHALT PRESERVATIVE SEALER SUCH AS RE-CLAMITE (OR ANOTHER APPROVED EQUIVALENT) SHALL BE APPLIED AFTER THE ONE YEAR MAINTENANCE PERIOD FOR THE TOP COURSE ASPHALT.
8. ALL BACKFILL FOR WATERMAINS IN FILL AREAS MUST BE 100% STANDARD PROCTOR DENSITY.
9. EXIST. SANITARY SEWER, WATERMAIN & APPURTENANCES WITHIN DONAL JV SUBDIVISION SHALL BE REMOVED & TRENCHES BACKFILLED WITH ENGINEERED BACKFILL.

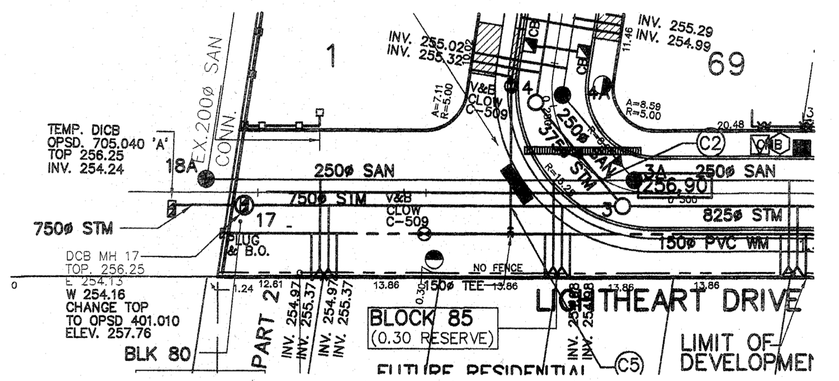
PAVEMENT DESIGN

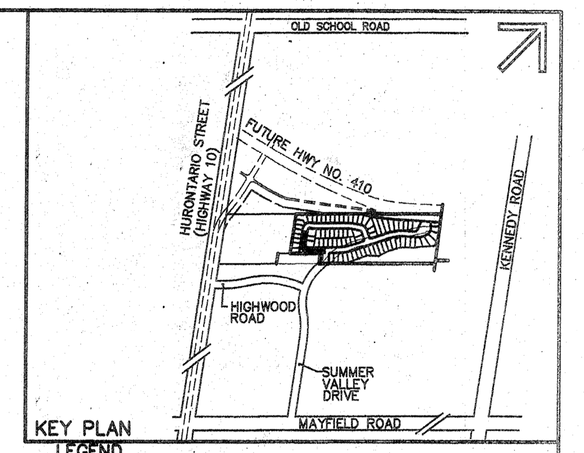
HL3 – 40mm
HL8 – 65mm
GRANULAR 'A' 150mm
GRANULAR 'B' 300mm



NOTE:
WATERMAIN JOINT DEFLECTION PER MANUFACTURER'S SPECIFICATION ONLY. NO BARREL DEFLECTION IS ALLOWED.

CROSSING No.		
C1	SAN OBV 251.~~00~~89	STM INV. 253.~~00~~39
C2	SAN OBV 253.~~00~~91	STM INV. 254.~~00~~31
C3	SAN OBV 252.~~00~~15	STM INV. 254.~~00~~41
C4	STM OBV 253.~~00~~96	WM INV. 255.01
C5	STM OBV 254.~~67~~53	WM INV. 255.65
C6	STM OBV 254.~~00~~87	WM INV. 256.11





LEGEND

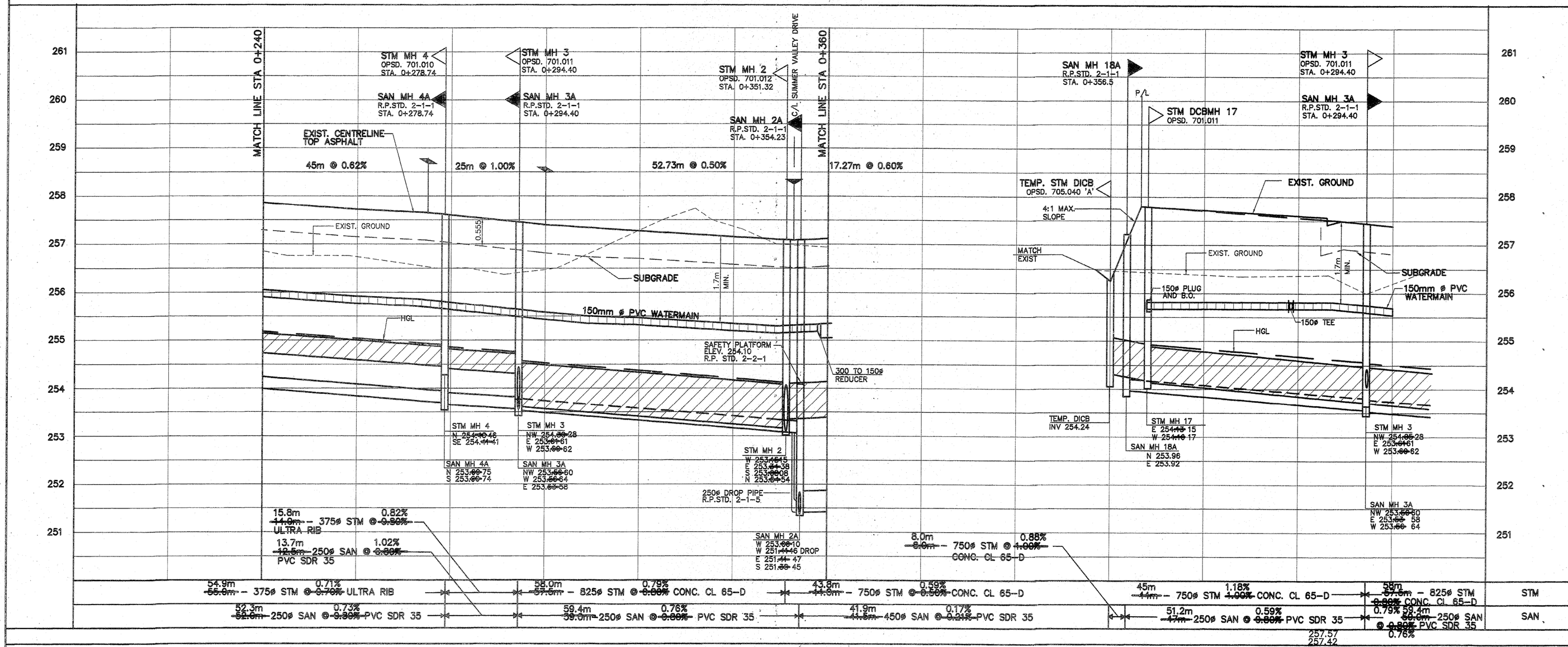
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM CATCHBASIN
- PROPOSED FIRE HYDRANT MODEL 33B, MANUFACTURER CLOW
- PROPOSED VALVE AND BOX/VALVE AND CHAMBER MODEL C-509, MANUFACTURER CLOW
- PROPOSED WATER SERVICE / PROPOSED SANITARY SERVICE / PROPOSED STORM SERVICE
- GALVANIZED STEEL VINYL COATED ACCOUSTICAL FENCE BY HOMELAND. FOR DETAIL REFER TO DWG. DET-4
- SCREEN FENCE FOR DETAIL REFER LANDSCAPE ARCHITECT DRAWINGS
- BLACK VINYL CHAIN LINK FENCE
- RETAINING WALL SEE DETAIL ON DWG. DET-4
- CMB COMMUNITY MAILBOX PAD LOCATION (2.0m x 1.8m c/w 2.0m CURB DEPRESSION) (WITHOUT SIDEWALK) FOR DETAIL SEE DWG.GA1
- CMB COMMUNITY MAILBOX PAD LOCATION (2.0m x 1.8m c/w 1.0m CONC. ACCESS) (WITH SIDEWALK) FOR DETAIL SEE DWG. GA1
- STOP SIGN
- LIGHT STANDARD
- TRANSFORMER
- NO EXIT SIGN
- NO DUMPING AND TRESPASSING SIGN
- 100mm UTILITY DUCTS (2.5m BEYOND BC OR EC 0.5 BEHIND CURB)
- HGL
- BH 1 BORE HOLE
- M MAILBOX
- STREET NAME SIGN

APPROVED FOR CONSTRUCTION

THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.

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

DATE: _____ APPROVED BY: _____
H. MUNTZ, P.ENG
TOWN ENGINEER



SUBMISSIONS: 1st ___ 2nd ___ 3rd ___
DATE: JULY 28/03 Interim ___ Final ___

REVISIONS

DATE	DETAILS	INIT.
JAN./03	REVISED AS PER CITY OF BRAMPTON, REGION OF PEEL	GJ
	TOWN OF CALEDON COMMENTS	
MAY./03	2ND SUBMISSION REVISION	GJ
JULY./03	REVISED AS PER TOWN OF CALEDON COMMENTS	GJ
AUG.15/03	REVISED AS PER TOWN OF CALEDON FINAL COMMENTS	GJ
OCT./05	AS CONSTRUCTED	GJ
OCT./06	REVISED AS CONSTRUCTED	GJ
JAN./07	REVISED AS CONSTRUCTED	GJ

BENCHMARK No. 01-728393 ELEV. 258.978m

TWO AND ONE HALF STORY RED BRICK HOUSE ON EAST SIDE OF HIGHWAY 10, 0.5KM SOUTH MAYFIELD ROAD AND 28.3M EAST OF CENTERLINE OF HIGHWAY 10. TABLET IS IN SOUTH FACE OF CONCRETE FOUNDATION, 0.49M WEST OF SOUTHWEST CORNER AND 0.24M BELOW BRICKWORK.

Urbtech Engineering Inc.
FOR AS-CONSTRUCTED ONLY

LICENSED PROFESSIONAL ENGINEER
MAR 23 2007
TOMASZ ZENTUK
PROVINCE OF ONTARIO

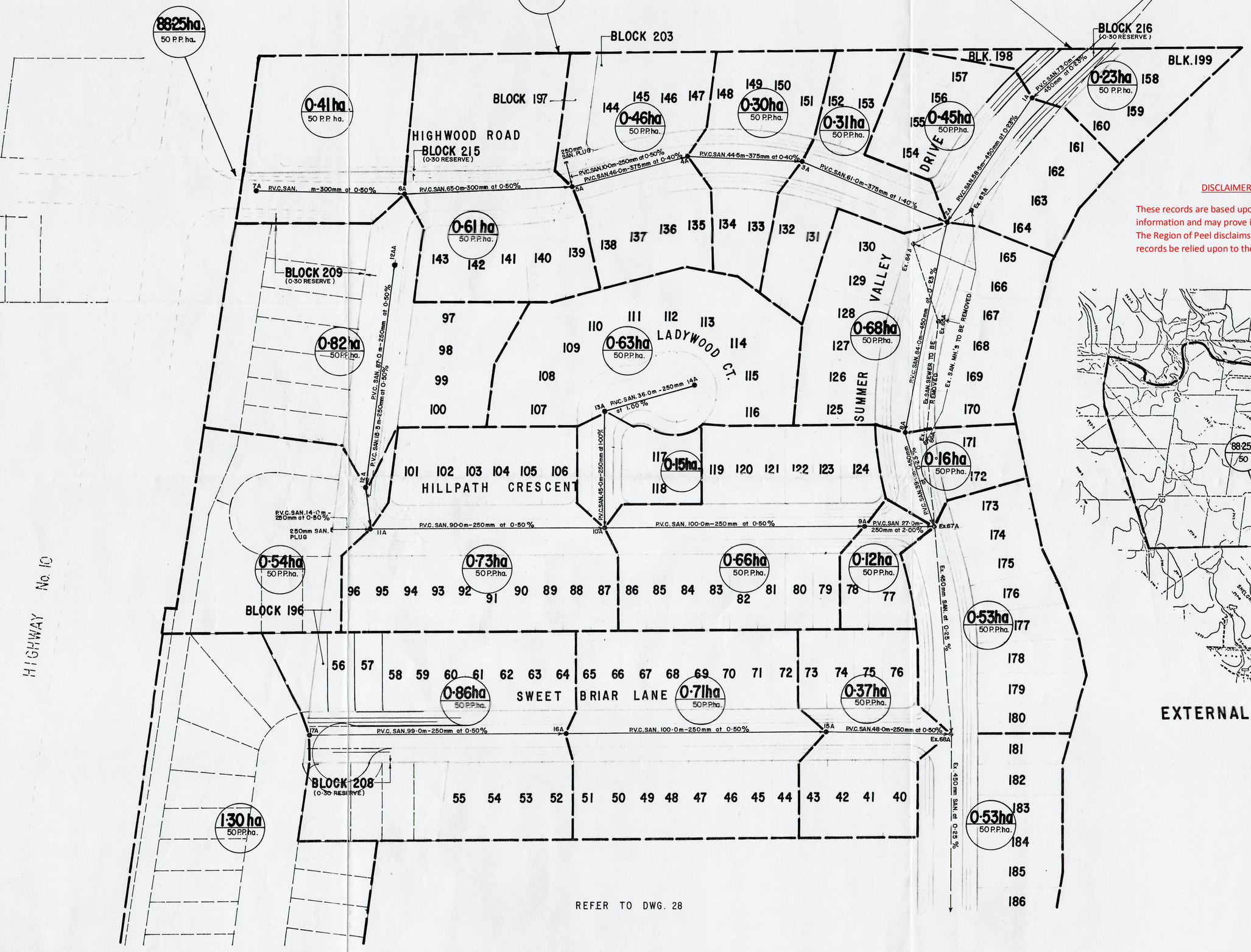
Charlton Engineering Limited
1140 Burnhamthorpe Road West, Suite 105, Mississauga, Ontario, L5C 4E9
Telephone: 905 896 7364 Fax: 905 896 9433

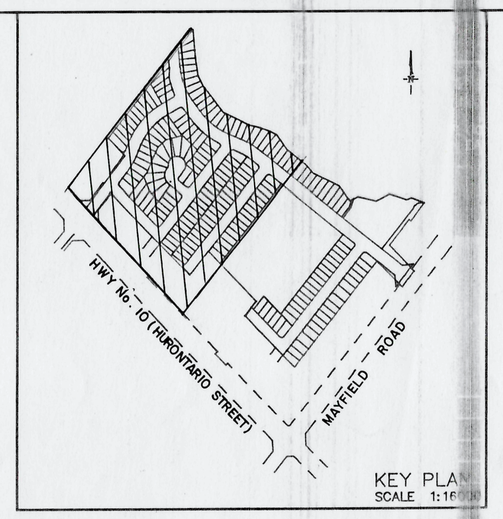
1360287 ONTARIO LIMITED
DONAL JV LIMITED
RESIDENTIAL SUBDIVISION
21T-99002/C 43M-1615

REGION OF PEEL
Town of Caledon

DONHERB CRESCENT
STA 0+240 TO STA 0+280
LIGHTHEART DRIVE
STA 0+280 TO STA 0+360

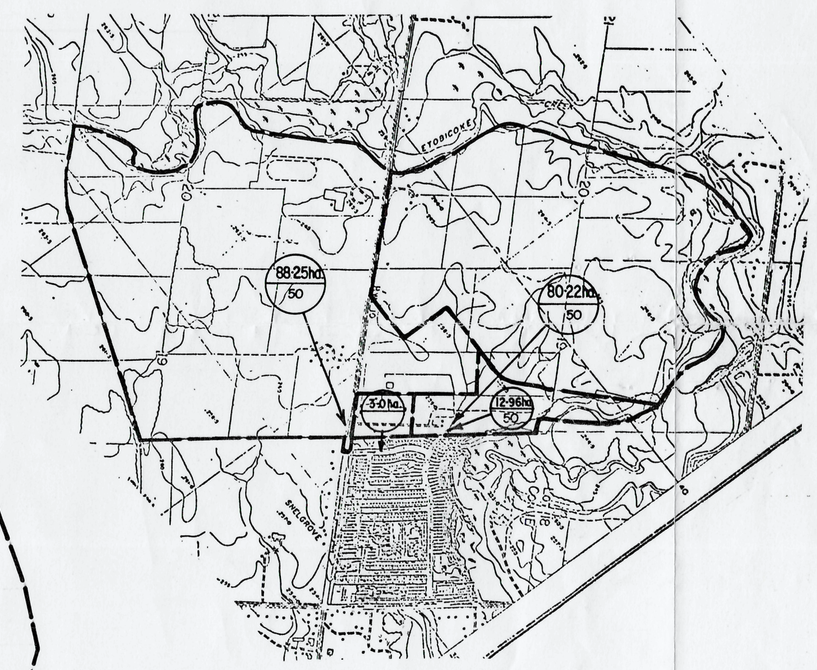
SCALE H 1:500 V 1:50	AREA CALEDON		PROJECT No. 00-113
DRAWN BY G.J.	CHECKED BY A.J.		PLAN No. P2
DATE NOV./02	SHEET 2 OF 5		34827-D





DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



LEGEND:

0·45ha 50 P.P.ha — DENOTES AREA IN HECTARES; DENOTES POPULATION PER HECTARE

C-07

RPBM No. 57

ON THE NORTH FACE AT THE WEST CORNER OF NORTH END OF CONCRETE BRIDGE ACROSS SEVENTEENTH SIDEROAD (REGION ROAD # 14) APPROX. 183m EAST OF VALLEYVIEW ROAD.
ELEVATION: 243.632m

B-31
T-90017

No.	By	Date	Revision	Checked

CITY OF BRAMPTON
ENGINEERING DEPARTMENT
COMMISSIONER OF PUBLIC WORKS — L.T. KOEHLE P. ENG.

SCHAEFFER AND ASSOCIATES LTD.
Consulting Engineers
64 Jardin Drive
Concord, Ontario L4K 3P3
Telephone: (416) 738-8100

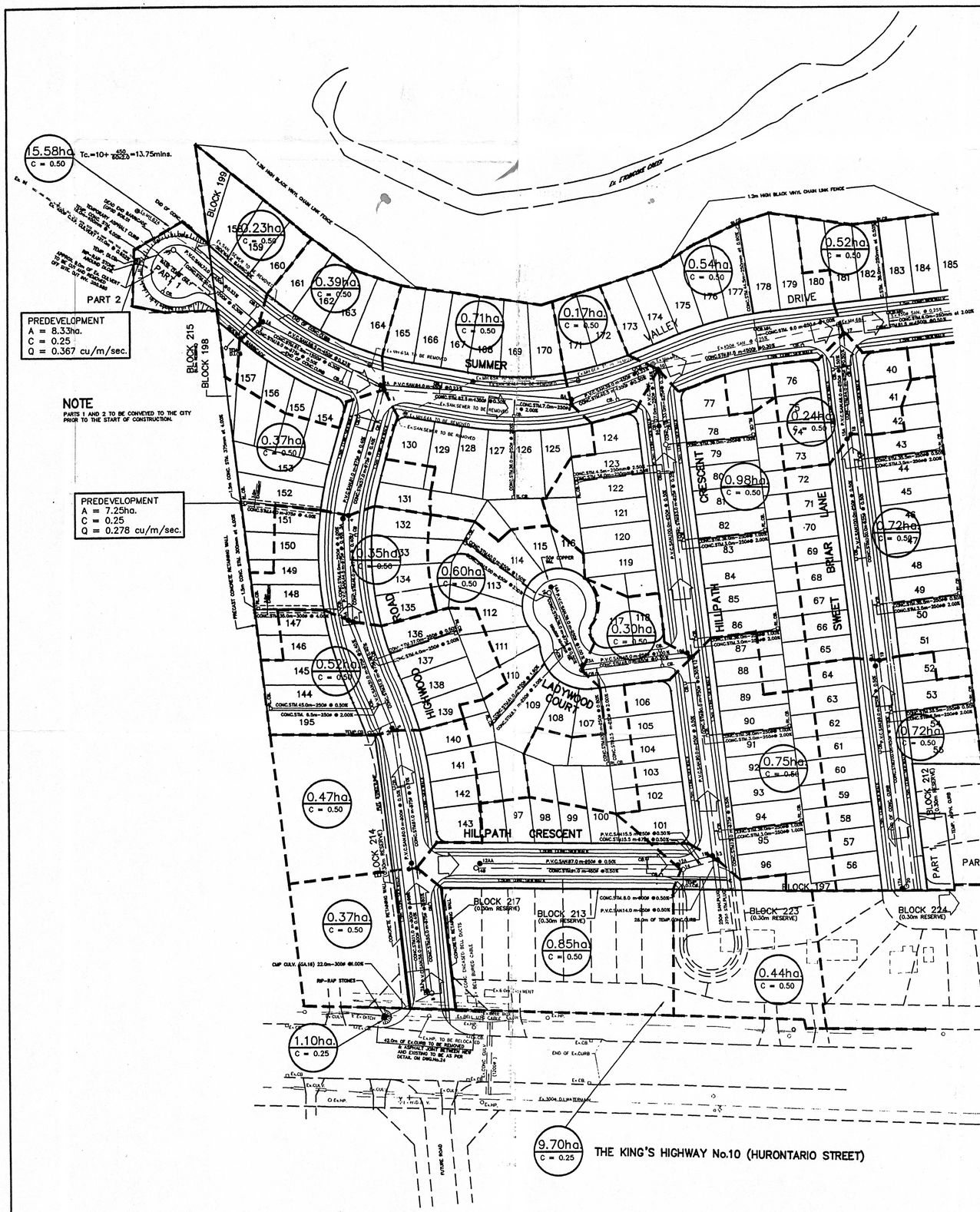
REGISTERED PROFESSIONAL ENGINEER — A. R. STEEDMAN — PROVINCE OF ONTARIO
REGISTERED PROFESSIONAL ENGINEER — H. O. TOZCU — PROVINCE OF ONTARIO

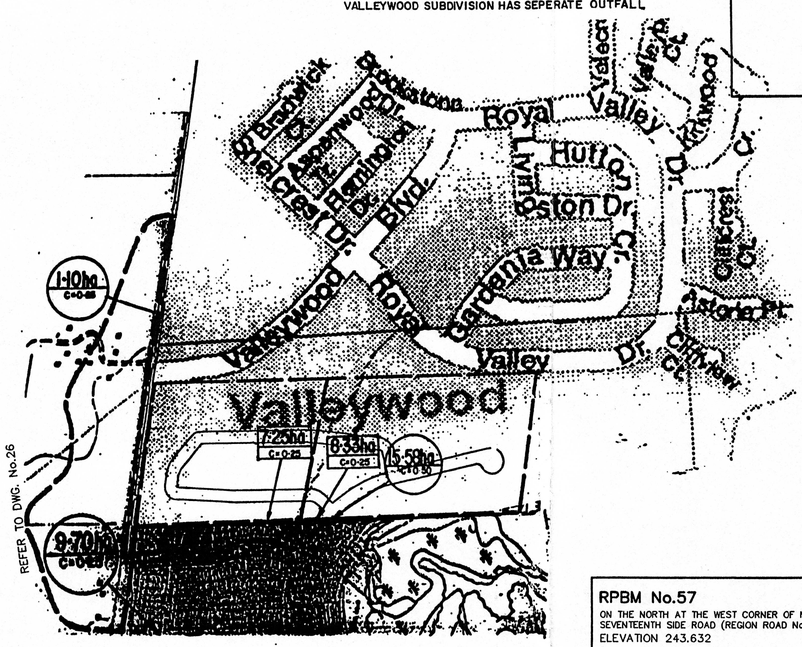
Project 97-E-1944 Dwg.No.

21T-90017B

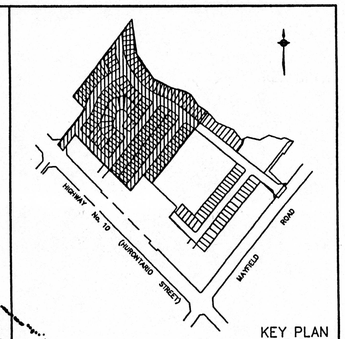
CREEK'S EDGE SUBDIVISION
SANITARY DRAINAGE PLAN
(PART I)

Surveyed By	Date	Contract No.	
Drawn By S.S.	Checked By M.J.	Drawing	Sheet No. 27
Designed By P.S./H.T.	Checked By		
Scale: 1:1000	Date JULY 1997		





EXTERNAL TRIBUTARY AREAS
SCALE 1:5000



KEY PLAN
SCALE 1:16000

RPBM No.57

ON THE NORTH AT THE WEST CORNER OF NORTH END OF CONCRETE BRIDGE ACROSS SEVENTEENTH SIDE ROAD (REGION ROAD No.14) APPROXIMATELY 183m EAST OF VALLEYVIEW RD.
ELEVATION 243.632

LEGEND

- 0.52ha / C = 0.50 — DENOTES AREA IN HECTARE / DENOTES RUN-OFF COEFFICIENT
- DASHED LINE DENOTES POSTDEVELOPMENT AREAS
- 8.33ha. / C = 0.25 — DENOTES INFORMATION FOR PREDEVELOPMENT FLOW

No.	By	Date	Revision	Checked
2.	H.T.	SEP.17, 97	ADDED LOT 195 AND REARLOT CATCHBASIN TO LOT 144	
1.	H.T.	SEP.17, 97	REVISED EXTERNAL DRAINAGE AREAS	

CITY OF BRAMPTON
WORKS AND TRANSPORTATION DEPARTMENT
COMMISSIONER OF WORKS AND TRANSPORTATION L.T. KOEHLE P. ENG.

SCHAEFFERS
Consulting Engineers
84 Jardin Drive
Concord,Ontario L4K 3P3
Telephone: (416) 738-6100
SCHAEFFER & ASSOCIATES LTD.

REGISTERED PROFESSIONAL ENGINEER
H. T. TOZER
OCT 11, 1997
PROVINCE OF ONTARIO

SIGNED SEPT. 11/1997

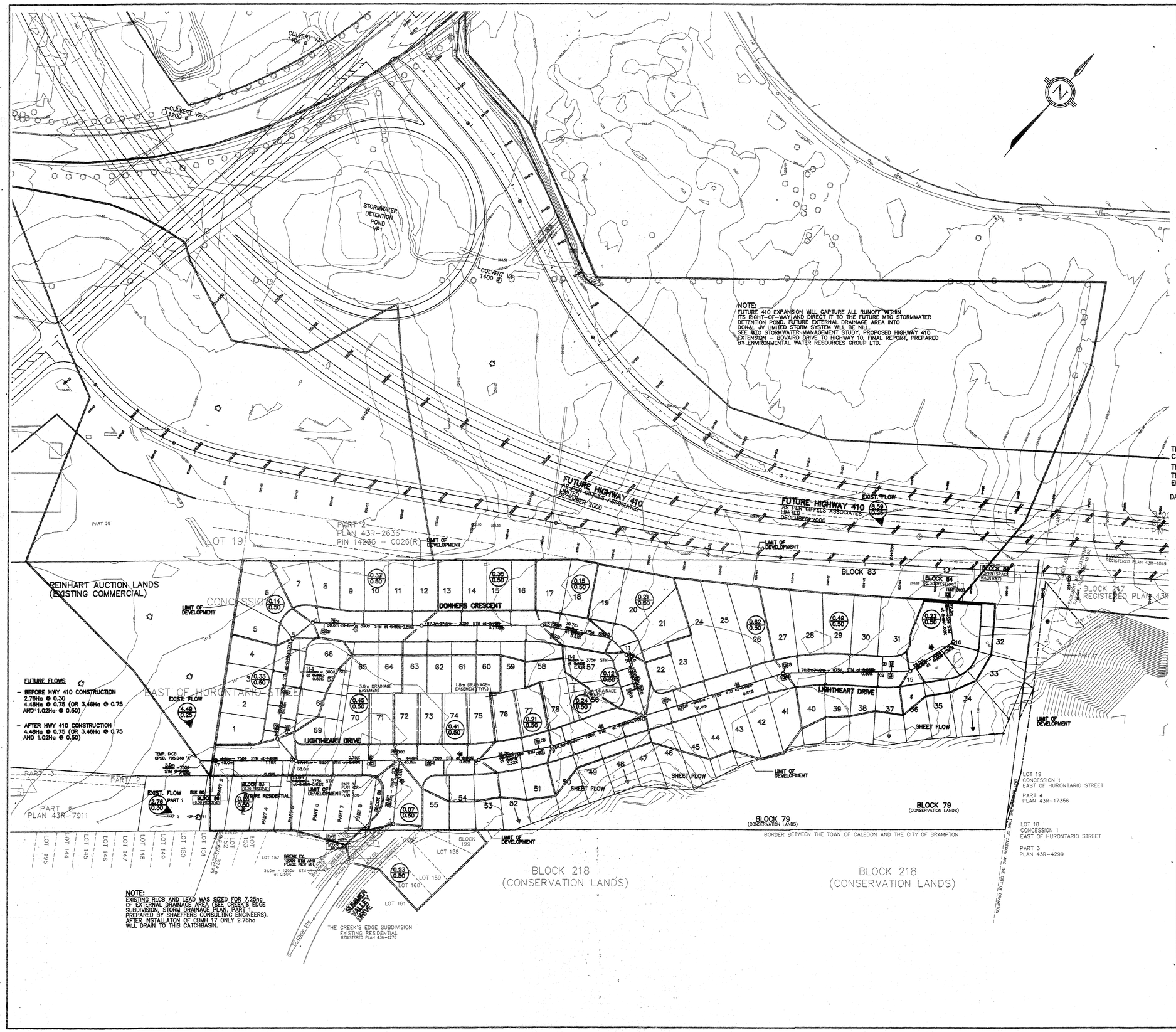
Project 97-E-1944 DWG. No.

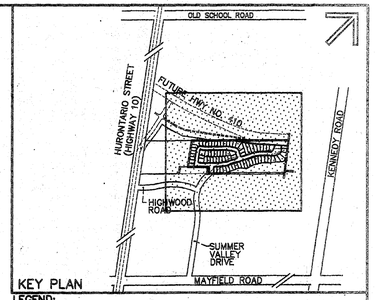
21T-90017

THE CREEK'S EDGE SUBDIVISION

STORM DRAINAGE PLAN AND OVERLAND FLOW (PART I)

Surveyed By :	Date :	Contract No.	
Drawn By : M.F.K.	Checked By : M.J.	Drawing No.	Sheet No. 25
Designed By : H.T	Checked By : A.R.S.		
Scale : 1:1000	Date : JULY 1997		





KEY PLAN

LEGEND:

- 0.00 / 0.00 — AREA (HECTARES) / RUN OFF COEFICIENT
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN
- DIRECTION OF FLOW
- OVERLAND FLOW ROUTE

APPROVED FOR CONSTRUCTION

THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.

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

DATE: _____ APPROVED BY: _____
H. MUNTZ, P.ENG
TOWN ENGINEER

SUBMISSIONS: 1st ___ 2nd ___ 3rd ___
DATE: JULY 28/03 interim ___ Final _x_

REVISIONS

DATE	DETAILS	INIT.
JAN./03	REVISED AS PER CITY OF BRAMPTON, REGION OF PEEL TOWN OF CALEDON COMMENTS	GJ
MAY./03	2ND SUBMISSION REVISION	GJ
JULY./03	REVISED AS PER TOWN OF CALEDON COMMENTS	GJ
AUG./03	REVISED FINAL HYDRO/TRCA	GJ
AUG.15/03	REVISED AS PER TOWN OF CALEDON FINAL COMMENTS	GJ
SEPT./03	REVISED BERM AT BLOCK 83	GJ
OCT./03	REVISED NOISE FENCE	GJ
JAN./07	REVISED AS CONSTRUCTED	GJ

BENCHMARK No. 01-728393 ELEV. 258.978m
TWO AND ONE HALF STORY RED BRICK HOUSE ON EAST SIDE OF HIGHWAY 10, 0.5KM SOUTH MAYFIELD ROAD AND 28.3M EAST OF CENTERLINE OF HIGHWAY 10. TABLET IS IN SOUTH FACE OF CONCRETE FOUNDATION, 0.49M WEST OF SOUTHWEST CORNER AND 0.24M BELOW BRICKWORK.

Urbtech Engineering Inc.

FOR AS-CONSTRUCTED ONLY
APR 23 2007
LICENSED PROFESSIONAL ENGINEER
TOMASZ ZENTUX
PROVINCE OF ONTARIO

Charlton Engineering Limited
1140 Burnhamthorpe Road West, Suite 105, Mississauga, Ontario, L5C 4E9
Telephone: 905 896 7364 Fax: 905 896 9433

1360287 ONTARIO LIMITED
DONAL JV LIMITED
RESIDENTIAL SUBDIVISION

21T-99002/C 43M-1615

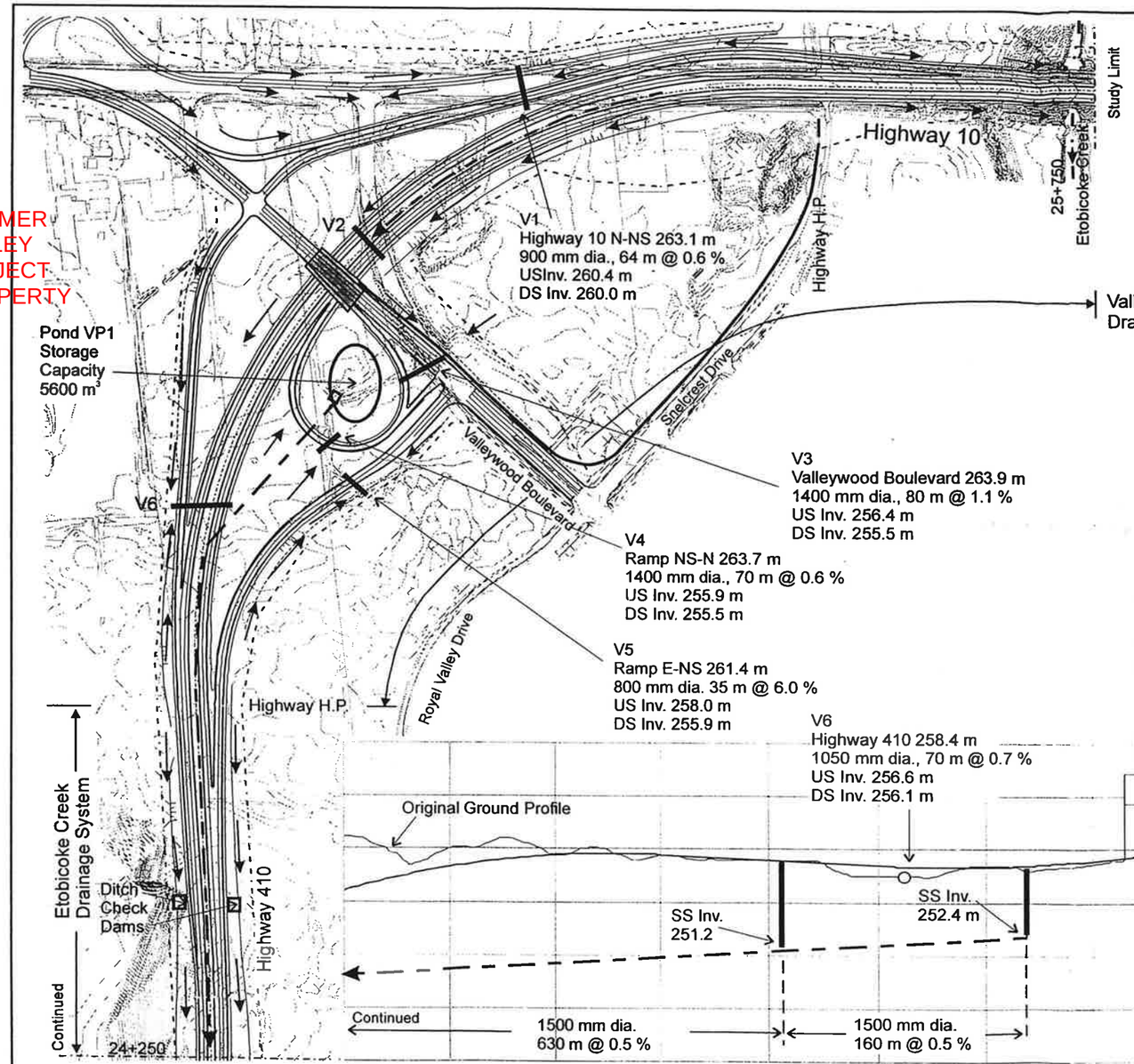
REGION OF PEEL

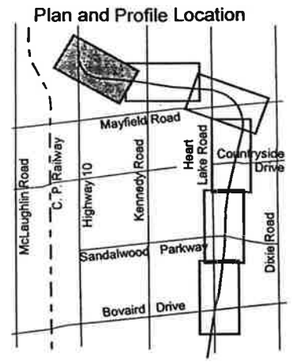
Town of Caledon

STORM DRAINAGE AREA PLAN

SCALE 1:1000	AREA CALEDON	PROJECT No. 00-113
DRAWN BY G.J.	CHECKED BY A.J.	PLAN No. D1
DATE NOV./02	SHEET 1 OF 1	

SUMMER VALLEY SUBJECT PROPERTY





Valleywood Interchange Drainage System

Ontario Ministry of Transportation

COLE, SHERMAN

EWRG Environmental Water Resources Group Ltd.

V1 - Culvert No. V1 Valleywood Interchange Drainage System

Flow Direction

Proposed Storm Sewer

Culvert, Plan

Culvert, Profile

Right of Way Boundaries

SS Storm Sewer

Inv. Invert

dia. diameter

External Drainage Area Boundary

Cut Section

Fill Section

VP1 - Pond No. VP1 Valleywood Interchange Drainage System

Scale

0 100 200 m

N

Figure Sum - 3f

Proposed Highway 410 Extension - Plan and Profile

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Brampton STD200

BRAMPTON
Flower City
brampton.ca

REV. 20

200

N.T.S

APPROVED: 2013/10/17

MINOR LOCAL

ORIGINAL: 89/09/01

8.0m PAVEMENT ON 17.0m R.O.W.

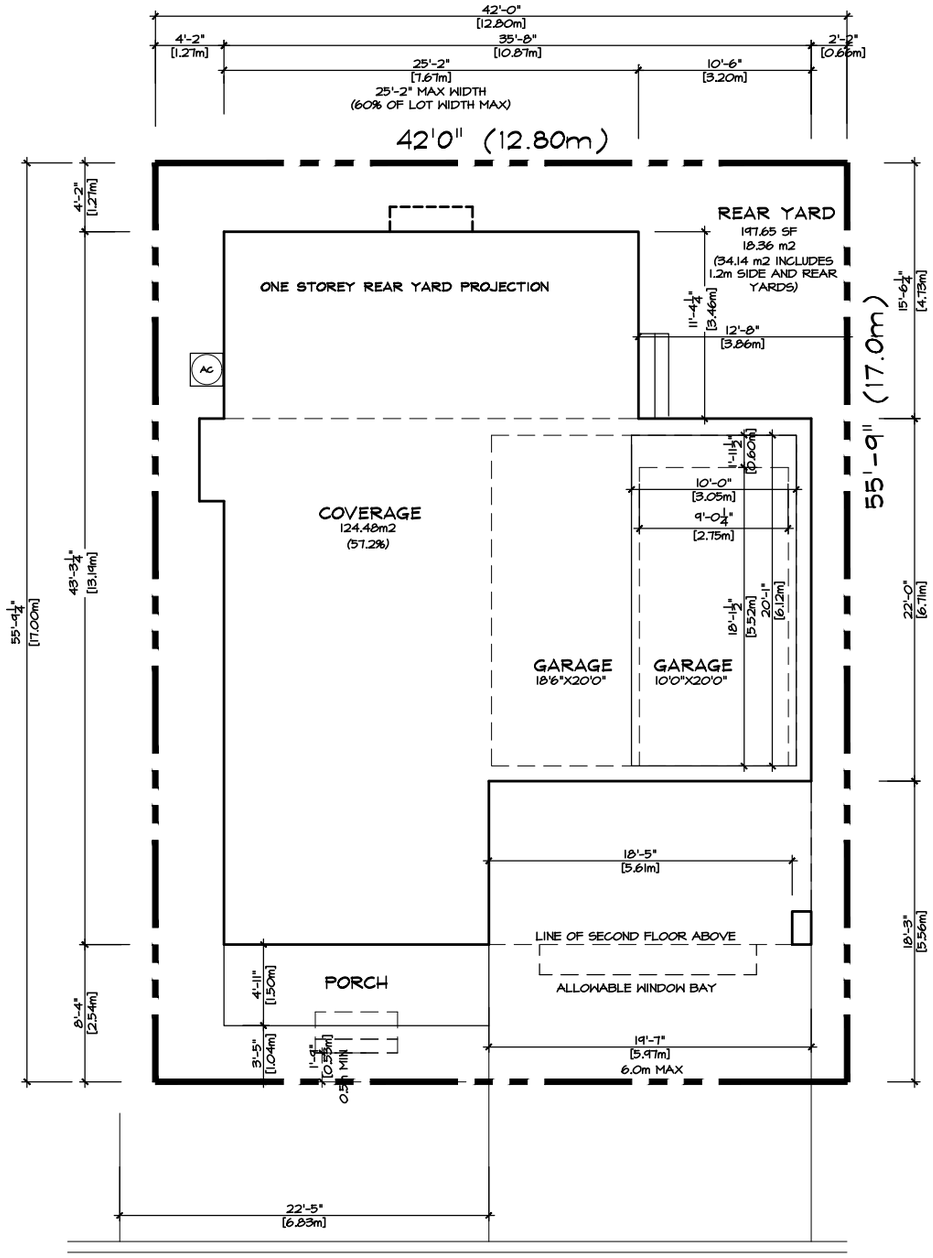
BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Design Calculations

12.80mX17.0m



MIN FRONT YARD TO HOUSE	2.5m
MIN FRONT YARD TO GARAGE	5.5m
MIN SIDEYARD	1.2m/0.6m
MIN REAR YARD	4.7m
ONE STOREY REAR YARD PROJECTION	60% MAX OF LOT WIDTH, 0.6m FROM SIDE LOT LINE, 3.5M MAX INTO REQUIRED REAR YARD
REQUIRED PARKING MIN	1 SPACE/ LOT
PARKING SPACE SIZES, INTERNAL AND PAD	SINGLE 2.75mX5.5m
PARKING SPACE SIZES, INTERNAL AND PAD	DOUBLE 5.5mX5.5m
ONE GARAGE STEP ALLOWED ENCROACHING INTO MIN PARKING SIZE	
MAX DRIVEWAY	6.0m WIDE MAX
REAR COURTYARD AMENITY AREA	18.0m2 MIN
MAX HEIGHT	3 STOREYS, OR 13.0m TO MIDPOINT OF ROOF AND AVE GRADE AT FRONT OF HOUSE
MAX BUILDING COVERAGE	60% OF LOT AREA INCLUDING CONC PORCH. DECKS AND LANDSCAPING NOT INCL.

ENCROACHMENTS

WINDOW BAY, FRONT AND REAR(SECOND FLOOR)	0.6mX4.0m
PORCH	2.0m MAX INTO FRONT
PORCH AND DECK STEPS	MIN 0.5m FROM LOT LINE
DECKS IN REAR YARD	MIN 1.2m FROM LOT LINE
UPPER DECKS,TERRACES AND BALCONIES	EQUAL TO MIN YARDS OF HOUSE AND PORCH IN FRONT YARD
FIREPLACES	WITH OR WITHOUT FOUNDATION, MAX 0.6m INTO 1.2m SIDE AND REAR YARD. MIN 0.2m FROM YARD.

Q4A ARCHITECTS

LOT MODULE STUDY

GTA, ONTARIO

GTA SINGLE
17.0m DEEP SCHEME A

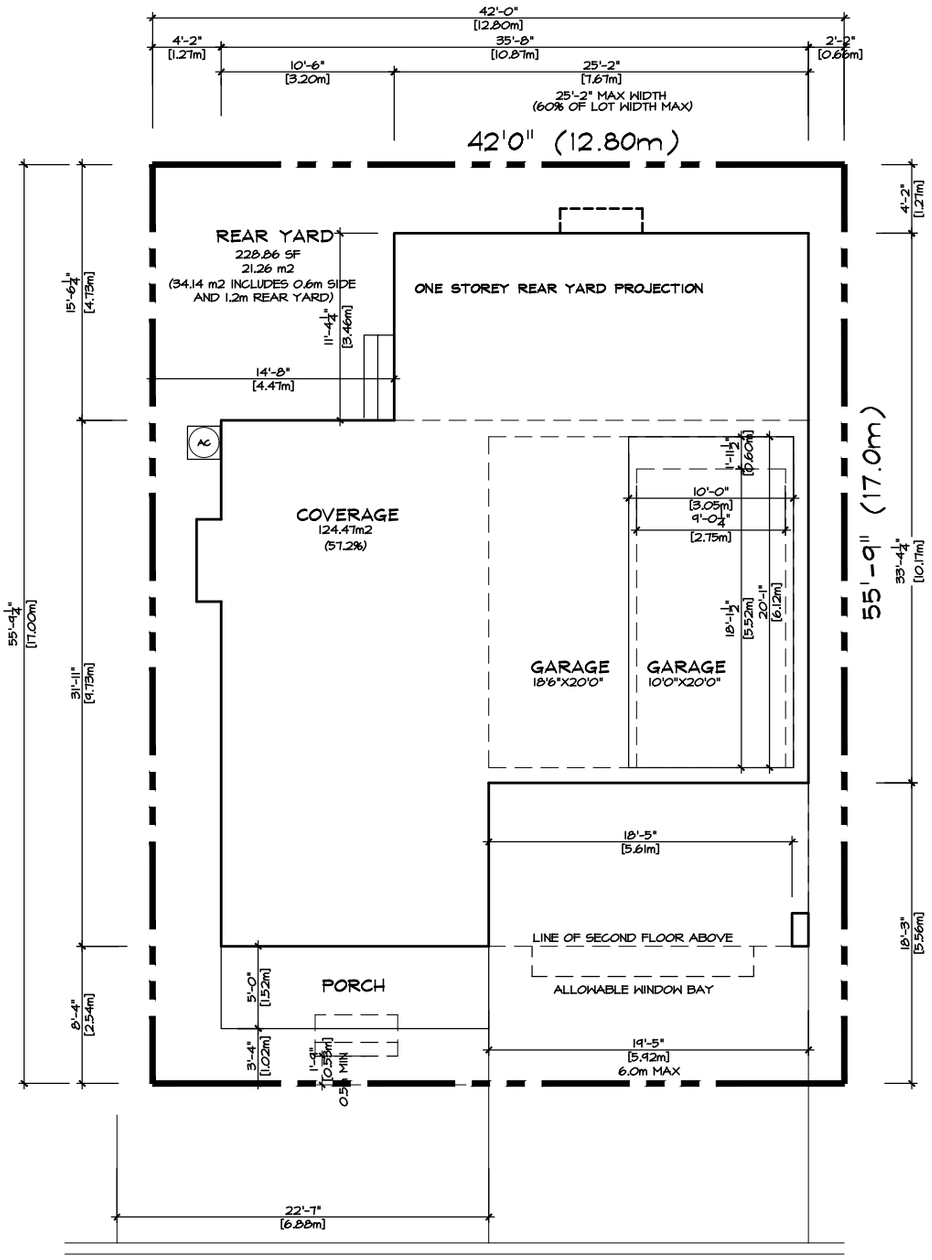
CAIVAN

Proj. No. 23008
Scale3/32" = 1'-0"

2023.07.27
Rev.

UNIT NAME
42' SINGLE

12.80mX17.0m



MIN FRONT YARD TO HOUSE	2.5m
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MIN REAR YARD	4.7m
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PARKING SPACE SIZES, INTERNAL AND PAD	DOUBLE 5.5mX5.5m
ONE GARAGE STEP ALLOWED ENCROACHING INTO MIN PARKING SIZE	
MAX DRIVEWAY	6.0m WIDE MAX
REAR COURTYARD AMENITY AREA	18.0m2 MIN
MAX HEIGHT	3 STOREYS, OR 13.0m TO MIDPOINT OF ROOF AND AVE GRADE AT FRONT OF HOUSE
MAX BUILDING COVERAGE	60% OF LOT AREA INCLUDING CONC PORCH. DECKS AND LANDSCAPING NOT INCL.

ENCROACHMENTS

WINDOW BAY, FRONT AND REAR(SECOND FLOOR)	0.6mX4.0m
PORCH	2.0m MAX INTO FRONT
PORCH AND DECK STEPS	MIN 0.5m FROM LOT LINE
DECKS IN REAR YARD	MIN 1.2m FROM LOT LINE
UPPER DECKS,TERRACES AND BALCONIES	EQUAL TO MIN YARDS OF HOUSE AND PORCH IN FRONT YARD
FIREPLACES	WITH OR WITHOUT FOUNDATION, MAX 0.6m INTO 1.2m SIDE AND REAR YARD. MIN 0.2m FROM YARD.

Q4A ARCHITECTS

LOT MODULE STUDY

GTA, ONTARIO

GTA SINGLE
17.0m DEEP SCHEME B

CAIVAN

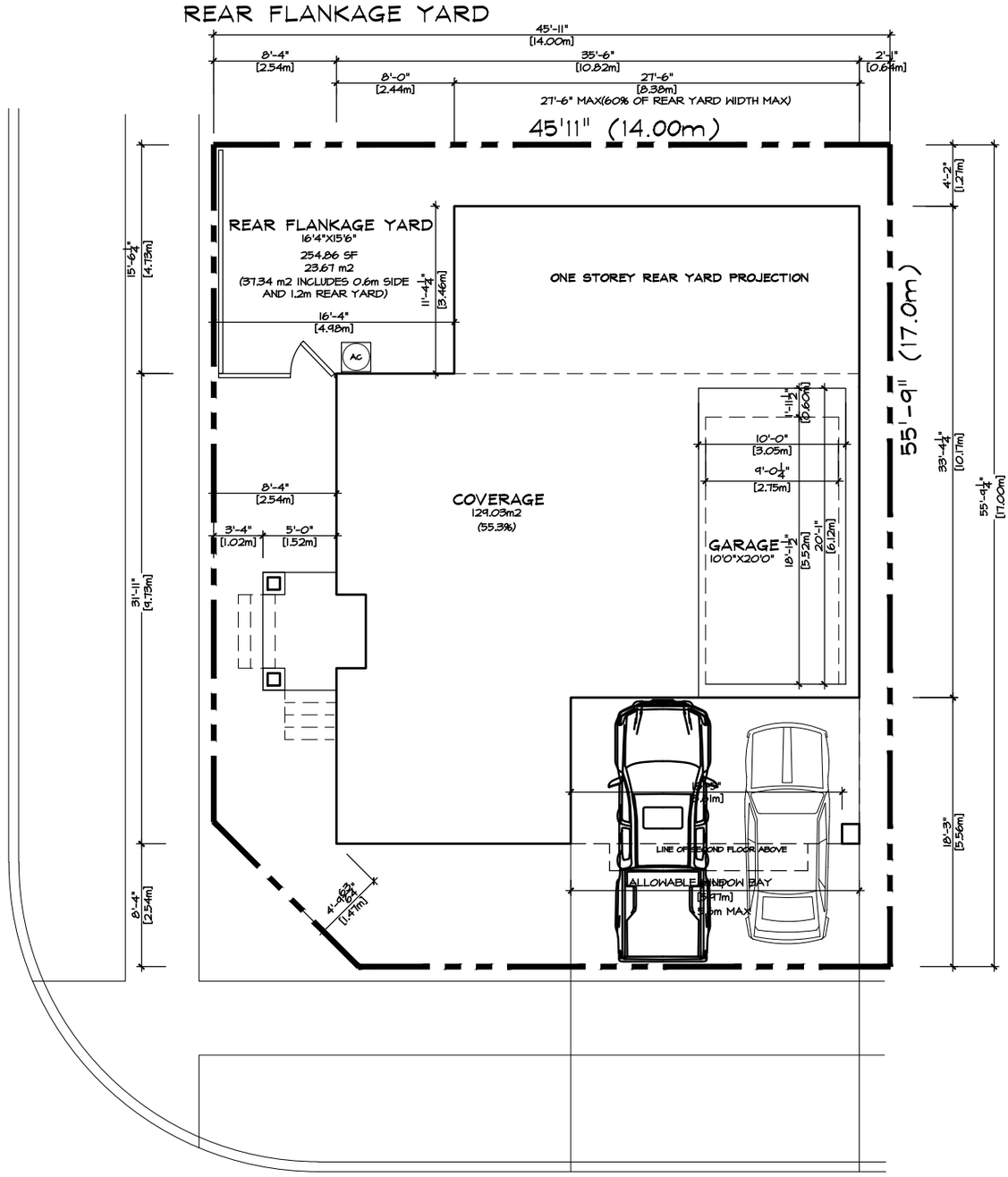
Proj. No. 23008
Scale3/32" = 1'-0"

2023.07.27
Rev.

UNIT NAME
42' SINGLE

SINGLE FAMILY DETACHED

CORNER LOT WITH FRONT YARD PARKING/GARAGE
REAR FLANKAGE YARD



MIN FRONT YARD (PORCH AND HOUSE)	2.5m
MIN FRONT YARD TO GARAGE	5.5m
MIN SIDEYARD	0.6m
MIN EXTERIOR SIDE/FLANKAGE YARD	2.5m
MIN REAR YARD	4.7m
ONE STOREY REAR YARD PROJECTION	60% MAX OF LOT WIDTH, 0.6m FROM SIDE LOT LINE, 3.5M MAX INTO REQUIRED REAR YARD
REQUIRED PARKING MIN	1 SPACE/ LOT
PARKING SPACE SIZES, INTERNAL AND PAD	SINGLE 2.75mX5.5m
ONE GARAGE STEP ALLOWED ENCROACHING INTO MIN PARKING SIZE	
MAX DRIVEWAY	6.0m WIDE MAX
REAR COURTYARD AMENITY AREA	23.0m2 MIN
MAX HEIGHT	3 STOREYS, OR 13.0m TO MIDPOINT OF ROOF AND AVE GRADE AT FRONT OF HOUSE
MAX BUILDING COVERAGE	60% OF LOT AREA INCLUDING CONC PORCH. DECKS AND LANDSCAPING NOT INCL.

ENCROACHMENTS

WINDOW BAY, FRONT,FLANKAGE AND REAR(SECOND FLOOR)	0.6mX4.0m
PORCH	2.0m MAX INTO FRONT, 1.5m INTO FLANKAGE
PORCH AND DECK STEPS	MIN 0.5m FROM LOT LINE
DECKS IN REAR YARD	MIN 1.2m FROM LOT LINE
UPPER DECKS,TERRACES AND BALCONIES	EQUAL TO MIN YARDS OF HOUSE AND PORCH IN FRONT YARD
FIREPLACES	WITH OR WITHOUT FOUNDATION, MAX 0.6m INTO 1.2m SIDE AND REAR YARD. MIN 0.2m FROM YARD.

Q4A ARCHITECTS

LOT MODULE STUDY

GTA, ONTARIO

GTA SINGLE CORNER
17.0m DEEP

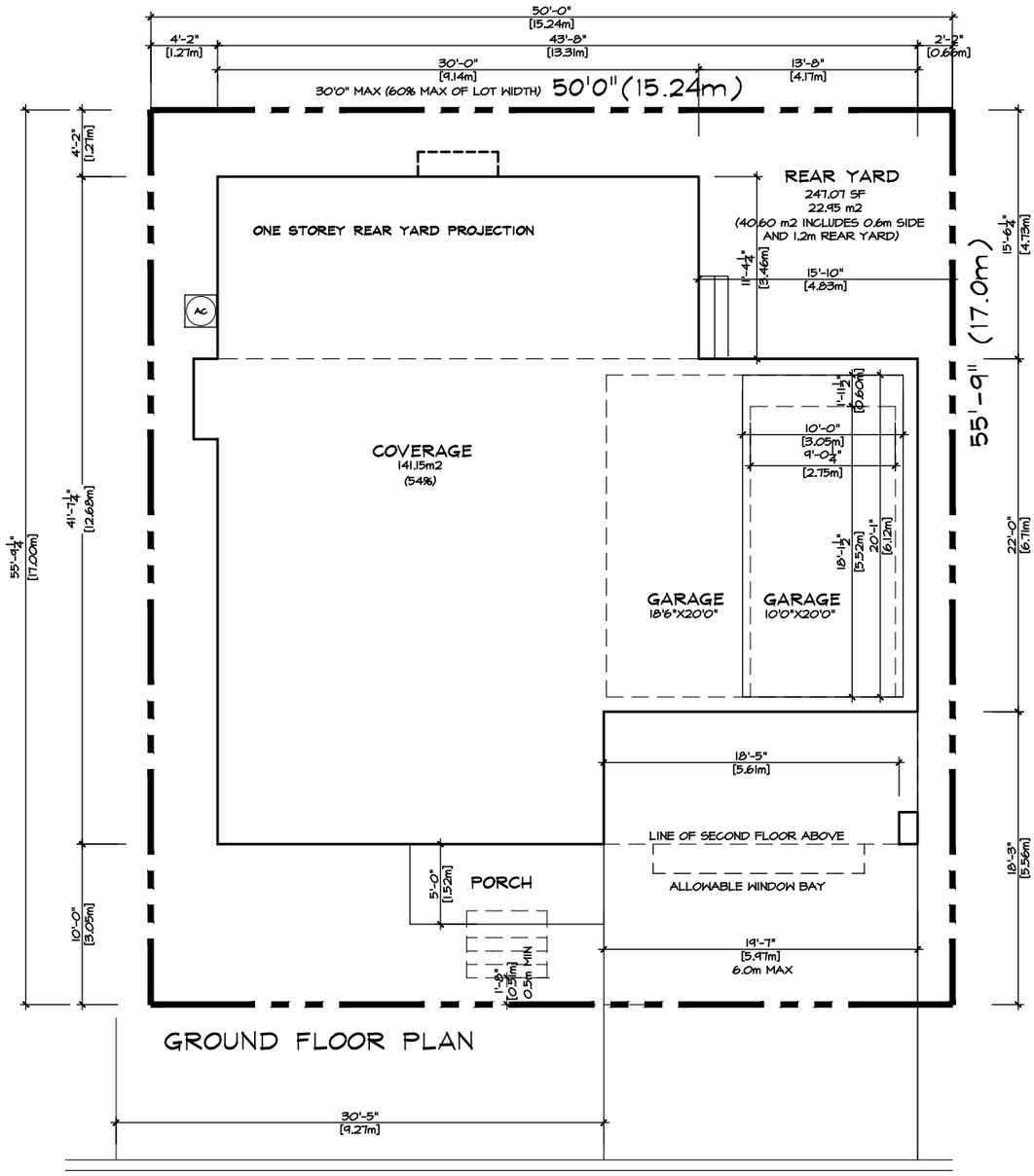
CAIVAN

Proj. No. 23008
Scale3/32" = 1'-0"

2023.07.27
Rev.

UNIT NAME
42' SINGLE

15.24mX17.0m



MIN FRONT YARD (PORCH AND HOUSE)	3.0m
MIN FRONT YARD TO GARAGE	5.5m
MIN SIDEYARD	1.2m/0.6m
MIN REAR YARD	4.7m
ONE STOREY REAR YARD PROJECTION	60% MAX OF LOT WIDTH, 0.6m FROM SIDE LOT LINE, 1.2m FROM REAR LOT LINE
REQUIRED PARKING MIN	1 SPACE/ LOT
PARKING SPACE SIZES, INTERNAL AND PAD	SINGLE 2.75mX5.5m
PARKING SPACE SIZES, INTERNAL AND PAD	DOUBLE 5.5mX5.5m
ONE GARAGE STEP ALLOWED ENCROACHING INTO MIN PARKING SIZE	
MAX DRIVEWAY	6.0m MAX WIDTH
REAR COURTYARD AMENITY AREA	22.0m2 MIN
MAX HEIGHT	3 STOREYS, OR 13.0m TO MIDPOINT OF ROOF AND AVE GRADE AT FRONT OF HOUSE
MAX BUILDING COVERAGE	60% OF LOT AREA INCLUDING CONC PORCH. DECKS AND LANDSCAPING NOT INCL.

ENCROACHMENTS	
WINDOW BAY, FRONT AND REAR(SECOND FLOOR)	0.6mX4.0m
PORCH	2.5m MAX INTO FRONT
PORCH AND DECK STEPS	MIN 0.5m FROM LOT LINE
DECKS IN REAR YARD	MIN 1.2m FROM LOT LINE
UPPER DECKS,TERRACES AND BALCONIES	EQUAL TO MIN YARDS OF HOUSE AND PORCH IN FRONT YARD
FIREPLACES	WITH OR WITHOUT FOUNDATION, MAX 1.0m INTO 1.2m SIDE AND REAR YARD. MIN 0.2m FROM YARD.

Q4A ARCHITECTS

LOT MODULE STUDY

GTA, ONTARIO

GTA SINGLE
17.0m DEEP SCHEME A

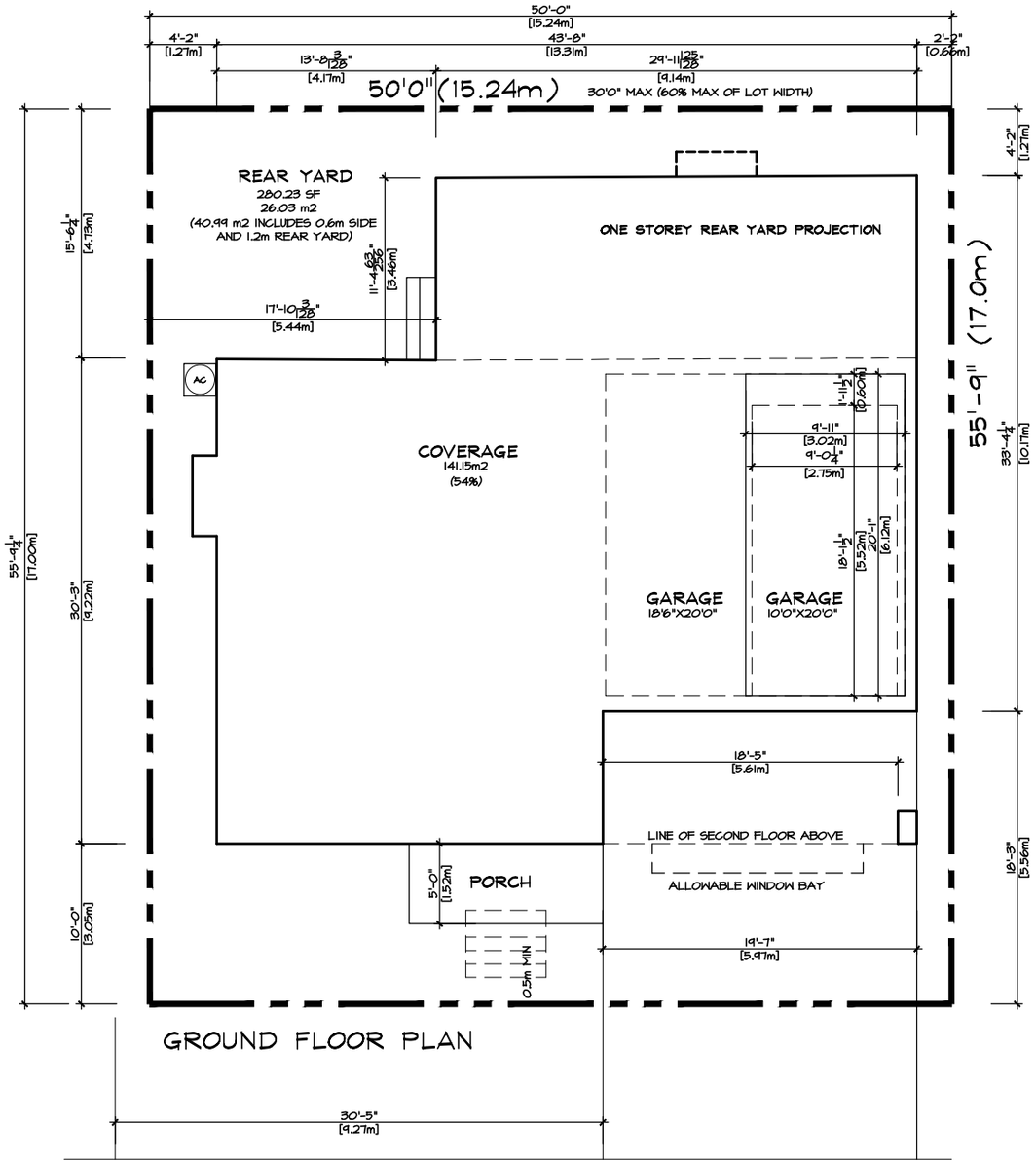
CAIVAN COMMUNITIES

Proj. No. 22009
Scale3/32" = 1'-0"

2023.03.24
Rev.

UNIT NAME
50' SINGLE

15.24mX17.0m



MIN FRONT YARD (PORCH AND HOUSE)	3.0m
MIN FRONT YARD TO GARAGE	5.5m
MIN SIDEYARD	1.2m/0.6m
MIN REAR YARD	4.7m
ONE STOREY REAR YARD PROJECTION	60% MAX OF LOT WIDTH, 0.6m FROM SIDE LOT LINE, 1.2m FROM REAR LOT LINE
REQUIRED PARKING MIN	1 SPACE/ LOT
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PARKING SPACE SIZES, INTERNAL AND PAD	DOUBLE 5.5mX5.5m
ONE GARAGE STEP ALLOWED ENCROACHING INTO MIN PARKING SIZE	
MAX DRIVEWAY	6.0m MAX WIDTH
REAR COURTYARD AMENITY AREA	22.0m2 MIN
MAX HEIGHT	3 STOREYS, OR 13.0m TO MIDPOINT OF ROOF AND AVE GRADE AT FRONT OF HOUSE
MAX BUILDING COVERAGE	60% OF LOT AREA INCLUDING CONC PORCH. DECKS AND LANDSCAPING NOT INCL.

ENCROACHMENTS

WINDOW BAY, FRONT AND REAR(SECOND FLOOR)	0.6mX4.0m
PORCH	2.5m MAX INTO FRONT, 2.3m INTO FLANKAGE
PORCH AND DECK STEPS	MIN 0.5m FROM LOT LINE
DECKS IN REAR YARD	MIN 1.2m FROM LOT LINE
UPPER DECKS,TERRACES AND BALCONIES	EQUAL TO MIN YARDS OF HOUSE AND PORCH IN FRONT YARD
FIREPLACES	WITH OR WITHOUT FOUNDATION, MAX 1.0m INTO 1.2m SIDE AND REAR YARD. MIN 0.2m FROM YARD.

Q4A ARCHITECTS

LOT MODULE STUDY

GTA, ONTARIO

GTA SINGLE
17.0m DEEP SCHEME B

CAIVAN COMMUNITIES

Proj. No. 22009
Scale3/32" = 1'-0"

2023.03.24
Rev.

UNIT NAME
50' SINGLE

NOTE:
Land department sign-off on this zoning matrix is to confirm that Architecture can use these building footprints for design of new TBSD Singles for Brampton and Caledon and Kleinberg. These will be heavily modified versions of the TASDs in Creekside and Bronte.

DocuSigned by:
Andrew Pinnson Jul-11-2022
6EA853D617134CE...

ZONING MATRIX TEMPLATE

COMPILED BY: P.MACDONALD REVIEWED BY:_____

PLEASE NOTE:

THIS PRELIMINARY ZONING INFORMATION IS BASED ON PARENT BY-LAW ZONING INFO SENT TO Q4 ARCHITECTS INC. BY KORSIAK ON JULY 22, 2021. AND BRAMPTON MZO ZONING RECEIVED APRIL 14, 2022

BY-LAW #	MZO + 22-2006 & 49-2006
ZONE	R1F & (R1F - 9.0 - 2556)
MIN. LOT WIDTH	9.0m INT. + CORNER MZO + (R1F - 9.0 - 2556)
MIN. LOT AREA	MZO 215m2, 225.0m2 (R1F - 9.0 - 2556)
MIN. CORNER LOT AREA	270.0m2 (R1F - 9.0 - 2556)
MIN. LOT DEPTH	MZO 24.0m, 25.0m (R1F - 9.0 - 2556)

SETBACKS:

FRONT YARD		
TO HOUSE		MZO 2.5m, 3.0m (R1F - 9.0 - 2556)
TO GARAGE		MZO 5.75m, 5.5m (R1F - 9.0 - 2556)
TO STAGGERED GARAGE		N/A
REAR YARD	0.6m To side of rear garage accessed for flankage	MZO, 6.0m (R1F - 9.0 - 2556)
INT. SIDE YARD 1 (House)		MZO, 1.2m (R1F - 9.0 - 2556) 21/10/01
INT. SIDE YARD 2 (Garage)		MZO, 0.6m (R1F - 9.0 - 2556)
MIN. BLDG SEPARATION		1.2m (R1F - 9.0 - 2556)
FLANKAGE TO HOUSE (Ext.)		3.0m (R1F - 9.0 - 2556)
DAY LIGHT TRIANGLE		1.0m (R1F - 9.0 - 2556)

ENCROACHMENTS:

PORCH & BALCONY
☒ COVERED OR UNCOVERED
☒ INCLUDING EAVES
☒ WITH OR W/O COLD CELLAR

FRONT YARD	2.0m (R1F - 9.0 - 2556)
SIDE YARD	
FLANKAGE YARD	2.0m (R1F - 9.0 - 2556)
REAR YARD	3.0m (6.13)

STEPS BEYOND PORCH/DECK _____

W.O.DECK INTO REAR
MAX. DECK HEIGHT (1 Storey)
MZO-TO WITHIN 3.5m OF REAR LOT LINE 3.0m (6.13) 4.5m SETBACK (R1F - 9.0 - 2556)

BAY/BOX WINDOWS

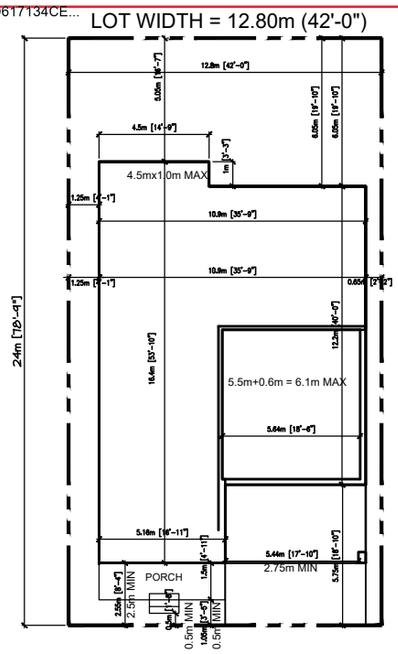
☒ WITH FOUNDATION ☒ CANTILEVERED
☐ NO WINDOW SEAT REQUIRED ☐ STACKED BAYS PERMITTED
☒ INCLUDING EAVES ☐ DOOR PERMITTED WITHIN BAY
☐ INCLUDED IN COVERAGE ☐ DEFINITION PROVIDED

WINDOW BAY PROJECTING MORE THAN 0.6m MUST HAVE WINDOWS ON THE SIDE. CAN HAVE ADOOR IN IT AND CAN BE 2-3 STOREYS IN HEIGHT

REAR	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FRONT	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FLANKAGE	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
AIR CONDITIONER	
FIREPLACE / CHIMNEY	0.5m IN ANY YARD (6.13)
ARCHITECTURAL ORNAMENTS	0.5m IN ANY YARD (6.13)

NUMBER OF PARKING	2 spaces required / unit
MIN. 1 CAR GARAGE	2.7mx5.4m (10.5c) - 1 Step encroacment allowed
MIN. 2 CAR GARAGE	5.4mx5.4m (10.5c)
MIN. PARKING SPACE	2.7mx5.4m (10.5c)
MIN. DRIVEWAY	2.75m (R1F - 9.0 - 2556)
MAX. DRIVEWAY	6.7m (10.9.1.1) for Lots 9.14m - 15.24m
MAX. BUILDING HEIGHT MEASURED FROM AVERAGE GRADE AROUND ALL 4 SIDES, TO MEAN ROOF (BETWEEN EAVE & RIDGE)	MZO 13.0m, 12.0m (R3E-6.0-2562)
MIN. LANDSCAPED AREA	N/A (R1F - 9.0 - 2556)
MAX. COVERAGE	

LOT WIDTH = 12.80m (42'-0")



APPROX. FIN. BASEMENT	850 S.F.
GROUND FLOOR AREA	1258 S.F.
SECOND FLOOR AREA (FLUSH W/ GARAGE FACE)	1658 S.F.
APPROX. THIRD FLOOR AREA	500 S.F.
TOTAL S.F.	4266 S.F.
SECOND FLOOR AREA (FRONT YARD SETBACK)	+ 197SF

ARCHITECTURAL CONTROL:

Guidelines Not Available

MAX. SETBACK FROM GARAGE TO SECOND FLOOR	
MAX. GARAGE PROJECTION BEYOND DWELLING FACE / PORCH	1.5m (R1F - 9.0 - 2556)
MAX. RECESSED 2ND FLOOR FROM GND FLR DWELLING WALL	
MAX. GARAGE DOOR WIDTH	3.7m MAX. (R3E-6.0 2562)
MAX. CORNER GARAGE WIDTH	2 CAR PERMITED. (R3E-6.0 2562)
MIN. AMENITY AREA ON BALCONY OR IN FRONT YARD	3.5m2 (R3E-6.0-2562)
MAX. UNITS PER TOWNHOUSE BLDG	16 (R3E-6.0-2562) 8 UNIT WIDE
TOWNHOUSE REAR YARD ACCESS	N/A

The purpose of the ZONING MATRIX TEMPLATE is to test zoning constraints on the proposed lot module. It is also used to identify potential zoning issues and/or required information.

Q4A ARCHITECTS

BRAMPTON, ONTARIO

LOT SIZE
12.8mX 24.0m

CAIVAN COMMUNITIES

Proj. No. 22015
Date 2022.06.08

Detached Single

42'

NOTE:
Land department sign-off on this zoning matrix is to confirm that Architecture can use these building footprints for design of new TBSD Singles for Brampton and Caledon and Kleinberg. These will be heavily modified versions of the TASDs in Creekside and Bronte.

DocuSigned by:
Andrew Pinnson Jul-11-2022
6EA853D617134CE...

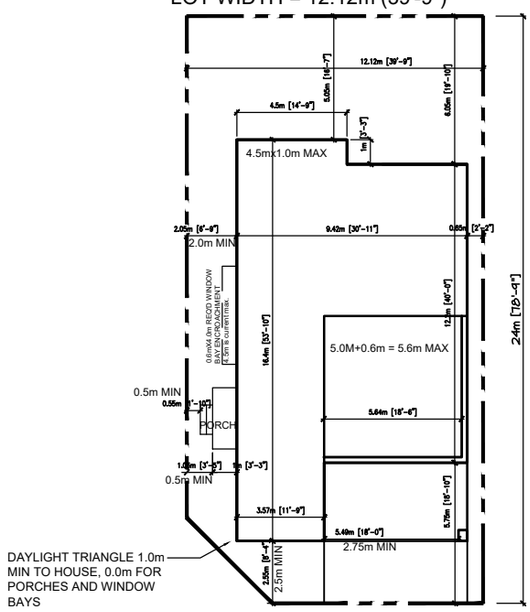
ZONING MATRIX TEMPLATE

COMPILED BY: P.MACDONALD REVIEWED BY:_____

PLEASE NOTE:
THIS PRELIMINARY ZONING INFORMATION IS BASED ON PARENT BY-LAW ZONING INFO SENT TO Q4 ARCHITECTS INC. BY KORSIAK ON JULY 22, 2021. AND BRAMPTON MZO ZONING RECEIVED APRIL 14, 2022

BY-LAW #	MZO + 22-2006 & 49-2006
ZONE	R1F & (R1F - 9.0 - 2556)
MIN. LOT WIDTH	9.0m INT. + CORNER MZO + (R1F - 9.0 - 2556)
MIN. LOT AREA	MZO 215m2, 225.0m2 (R1F - 9.0 - 2556)
MIN. CORNER LOT AREA	270.0m2 (R1F - 9.0 - 2556)
MIN. LOT DEPTH	MZO 24.0m, 25.0m (R1F - 9.0 - 2556)

LOT WIDTH = 12.12m (39'-9")



SETBACKS:

FRONT YARD		
TO HOUSE		MZO 2.5m, 3.0m (R1F - 9.0 - 2556)
TO GARAGE		MZO 5.75m, 5.5m (R1F - 9.0 - 2556)
TO STAGGERED GARAGE		N/A
REAR YARD	0.6m To side of rear garage accessed for flankage	MZO, 6.0m (R1F - 9.0 - 2556)
INT. SIDE YARD 1 (House)		MZO, 1.2m (R1F - 9.0 - 2556) 21/10/01
INT. SIDE YARD 2 (Garage)		MZO, 0.6m (R1F - 9.0 - 2556)
MIN. BLDG SEPARATION		1.2m (R1F - 9.0 - 2556)
FLANKAGE TO HOUSE (Ext.)		3.0m (R1F - 9.0 - 2556)
DAY LIGHT TRIANGLE		1.0m (R1F - 9.0 - 2556)

ENCROACHMENTS:

PORCH & BALCONY
☒ COVERED OR UNCOVERED
☒ INCLUDING EAVES
☒ WITH OR W/O COLD CELLAR

FRONT YARD	2.0m (R1F - 9.0 - 2556)
SIDE YARD	
FLANKAGE YARD	2.0m (R1F - 9.0 - 2556)
REAR YARD	3.0m (6.13)

STEPS BEYOND PORCH/DECK _____

W.O.DECK INTO REAR — MZO-TO WITHIN 3.5m OF REAR LOT LINE 3.0m (6.13) 4.5m SETBACK (R1F - 9.0 - 2556)

MAX. DECK HEIGHT (1 Storey)

BAY/BOX WINDOWS

☒ WITH FOUNDATION ☒ CANTILEVERED
☐ NO WINDOW SEAT REQUIRED ☐ STACKED BAYS PERMITTED
☒ INCLUDING EAVES ☐ DOOR PERMITTED WITHIN BAY
☐ INCLUDED IN COVERAGE ☐ DEFINITION PROVIDED

WINDOW BAY PROJECTING MORE THAN 0.6m MUST HAVE WINDOWS ON THE SIDE. CAN HAVE ADOOR IN IT AND CAN BE 2-3 STOREYS IN HEIGHT

REAR	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FRONT	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FLANKAGE	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
AIR CONDITIONER	
FIREPLACE / CHIMNEY	0.5m IN ANY YARD (6.13)
ARCHITECTURAL ORNAMENTS	0.5m IN ANY YARD (6.13)

NUMBER OF PARKING	2 spaces required / unit
MIN. 1 CAR GARAGE	2.7mx5.4m (10.5c) - 1 Step encroacment allowed
MIN. 2 CAR GARAGE	5.4mx5.4m (10.5c)
MIN. PARKING SPACE	2.7mx5.4m (10.5c)
MIN. DRIVEWAY	2.75m (R1F - 9.0 - 2556)
MAX. DRIVEWAY	6.7m (10.9.1.1) for Lots 9.14m - 15.24m
MAX. BUILDING HEIGHT	MZO 13.0m, 12.0m (R3E-6.0-2562)

MEASURED FROM AVERAGE GRADE AROUND ALL 4 SIDES, TO MEAN ROOF (BETWEEN EAVE & RIDGE)

MIN. LANDSCAPED AREA	N/A (R1F - 9.0 - 2556)
MAX. COVERAGE	

APPROX. FIN. BASEMENT	850 S.F.
GROUND FLOOR AREA	1031 S.F.
SECOND FLOOR AREA (FLUSH W/ GARAGE FACE)	1408 S.F.
APPROX. THIRD FLOOR AREA	500 S.F.
TOTAL S.F.	3789 S.F.
SECOND FLOOR AREA (FRONT YARD SETBACK)	+ 201 SF

ARCHITECTURAL CONTROL:

Guidelines Not Available

MAX. SETBACK FROM GARAGE TO SECOND FLOOR	
MAX. GARAGE PROJECTION BEYOND DWELLING FACE / PORCH	1.5m (R1F - 9.0 - 2556)
MAX. RECESSED 2ND FLOOR FROM GND FLR DWELLING WALL	
MAX. GARAGE DOOR WIDTH	3.7m MAX. (R3E-6.0 2562)
MAX. CORNER GARAGE WIDTH	2 CAR PERMITED. (R3E-6.0 2562)
MIN. AMENITY AREA ON BALCONY OR IN FRONT YARD	3.5m2 (R3E-6.0-2562)
MAX. UNITS PER TOWNHOUSE BLDG	16 (R3E-6.0-2562) 8 UNIT WIDE
TOWNHOUSE REAR YARD ACCESS	N/A

The purpose of the ZONING MATRIX TEMPLATE is to test zoning constraints on the proposed lot module. It is also used to identify potential zoning issues and/or required information.

Q4A ARCHITECTS

BRAMPTON, ONTARIO

CAIVAN COMMUNITIES

LOT SIZE
12.12 ~~13.12~~mX 24.0m

Proj. No. 22015
Date 2022.06.08

Corner Detached Single

41'

NOTE:
Land department sign-off on this zoning matrix is to confirm that Architecture can use these building footprints for design of new TBSD Singles for Brampton and Caledon and Kleinberg. These will be heavily modified versions of the TASDs in Creekside and Bronte.

DocuSigned by:
Andrew Pinnson Jul-11-2022
6EA853D617134CE...

ZONING MATRIX TEMPLATE

COMPILED BY: P.MACDONALD REVIEWED BY:_____

PLEASE NOTE:
THIS PRELIMINARY ZONING INFORMATION IS BASED ON PARENT BY-LAW ZONING INFO SENT TO Q4 ARCHITECTS INC. BY KORSIAK ON JULY 22, 2021. AND BRAMPTON MZO ZONING RECEIVED APRIL 14, 2022

BY-LAW #	MZO + 22-2006 & 49-2006
ZONE	R1F & (R1F - 9.0 - 2556)
MIN. LOT WIDTH	9.0m INT. + CORNER MZO + (R1F - 9.0 - 2556)
MIN. LOT AREA	MZO 215m2, 225.0m2 (R1F - 9.0 - 2556)
MIN. CORNER LOT AREA	270.0m2 (R1F - 9.0 - 2556)
MIN. LOT DEPTH	MZO 24.0m, 25.0m (R1F - 9.0 - 2556)

SETBACKS:

FRONT YARD	
TO HOUSE	MZO 2.5m, 3.0m (R1F - 9.0 - 2556)
TO GARAGE	MZO 5.75m, 5.5m (R1F - 9.0 - 2556)
TO STAGGERED GARAGE	N/A
REAR YARD (0.6m To side of rear garage accessed for flankage)	MZO, 6.0m (R1F - 9.0 - 2556)
INT. SIDE YARD 1 (House)	MZO, 1.2m (R1F - 9.0 - 2556) 21/10/01
INT. SIDE YARD 2 (Garage)	MZO, 0.6m (R1F - 9.0 - 2556)
MIN. BLDG SEPARATION	1.2m (R1F - 9.0 - 2556)
FLANKAGE TO HOUSE (Ext.)	3.0m (R1F - 9.0 - 2556)
DAY LIGHT TRIANGLE	1.0m (R1F - 9.0 - 2556)

ENCROACHMENTS:

PORCH & BALCONY
☒ COVERED OR UNCOVERED
☒ INCLUDING EAVES
☒ WITH OR W/O COLD CELLAR

FRONT YARD	2.0m (R1F - 9.0 - 2556)
SIDE YARD	
FLANKAGE YARD	2.0m (R1F - 9.0 - 2556)
REAR YARD	3.0m (6.13)

STEPS BEYOND PORCH/DECK	
W.O.DECK INTO REAR (MAX. DECK HEIGHT (1 Storey))	MZO-TO WITHIN 3.5m OF REAR LOT LINE 3.0m (6.13) 4.5m SETBACK (R1F - 9.0 - 2556)

BAY/BOX WINDOWS

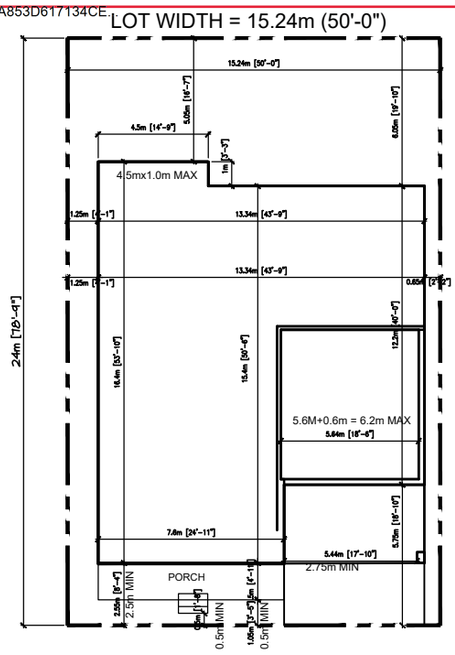
☒ WITH FOUNDATION
☐ NO WINDOW SEAT REQUIRED
☒ INCLUDING EAVES
☐ INCLUDED IN COVERAGE
☒ CANTILEVERED
☐ STACKED BAYS PERMITTED
☐ DOOR PERMITTED WITHIN BAY
☐ DEFINITION PROVIDED

REAR	WINDOW BAY PROJECTING MORE THAN 0.6m MUST HAVE WINDOWS ON THE SIDE. CAN HAVE ADOOR IN IT AND CAN BE 2-3 STOREYS IN HEIGHT	MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FRONT		MZO-1.0mX4.5m (R1F - 9.0 - 2556)
FLANKAGE		MZO-1.0mX4.5m (R1F - 9.0 - 2556)

AIR CONDITIONER	
FIREPLACE / CHIMNEY	0.5m IN ANY YARD (6.13)
ARCHITECTURAL ORNAMENTS	0.5m IN ANY YARD (6.13)

NUMBER OF PARKING	2 spaces required / unit
MIN. 1 CAR GARAGE	2.7mx5.4m (10.5c) - 1 Step encroacment allowed
MIN. 2 CAR GARAGE	5.4mx5.4m (10.5c)
MIN. PARKING SPACE	2.7mx5.4m (10.5c)
MIN. DRIVEWAY	2.75m (R1F - 9.0 - 2556)
MAX. DRIVEWAY	6.7m (10.9.1.1) for Lots 9.14m - 15.24m
MAX. BUILDING HEIGHT (MEASURED FROM AVERAGE GRADE AROUND ALL 4 SIDES, TO MEAN ROOF (BETWEEN EAVE & RIDGE))	MZO 13.0m, 12.0m (R3E-6.0-2562)
MIN. LANDSCAPED AREA	N/A (R1F - 9.0 - 2556)
MAX. COVERAGE	

LOT WIDTH = 15.24m (50'-0")



APPROX. FIN. BASEMENT	1050 S.F.
GROUND FLOOR AREA	1667 S.F.
SECOND FLOOR AREA (FLUSH W/ GARAGE FACE)	2066 S.F.
APPROX. THIRD FLOOR AREA	500 S.F.
TOTAL S.F.	5283 S.F.
SECOND FLOOR AREA (FRONT YARD SETBACK)	+ 198 SF

ARCHITECTURAL CONTROL: Guidelines Not Available

MAX. SETBACK FROM GARAGE TO SECOND FLOOR	
MAX. GARAGE PROJECTION BEYOND DWELLING FACE / PORCH	1.5m (R1F - 9.0 - 2556)
MAX. RECESSED 2ND FLOOR FROM GND FLR DWELLING WALL	
MAX. GARAGE DOOR WIDTH	3.7m MAX. (R3E-6.0 2562)
MAX. CORNER GARAGE WIDTH	2 CAR PERMITED. (R3E-6.0 2562)
MIN. AMENITY AREA (ON BALCONY OR IN FRONT YARD)	3.5m2 (R3E-6.0-2562)
MAX. UNITS PER TOWNHOUSE BLDG	16 (R3E-6.0-2562) 8 UNIT WIDE
TOWNHOUSE REAR YARD ACCESS	N/A

The purpose of the ZONING MATRIX TEMPLATE is to test zoning constraints on the proposed lot module. It is also used to identify potential zoning issues and/or required information.

Q4A ARCHITECTS

BRAMPTON, ONTARIO

LOT SIZE
15.24mX 24.0m

CAIVAN COMMUNITIES

Proj. No. 22015
Date 2022.06.08

Detached Single

50'

STORM SEWER DESIGN SHEET: (2/10/100 Year Storm)

Argo Summer Valley, City of Brampton

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Project #: 300054371.0
Date: 20-Nov-23
Designed: EDT
Checked: LN

Min. Diameter = 300 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 20 %

Rainfall Intensity = $\frac{A}{(Tc+B)^c}$ *where Tc is in minutes*

A =	1070	2221.0		4688.0	
B =	7.85 (2 Yr)	12.0 (10 Yr)		17.0 (100 Yr)	
C =	0.8759	0.908		0.962	

NOMINAL PIPE SIZE USED

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	YEAR STORM CAPTURE	2 YR 'AR'	10 YR 'AR'	100 YR AR'	ACCUM. AR' (2 YR)	ACCUM. AR' (10 YR)	ACCUM. 'AR' (100 YR)	2 YR RAINFALL INTENSITY (mm/hr)	10 YR RAINFALL INTENSITY (mm/hr)	100 YR RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
McAlpine Road	MH02	MH03	0.22	0.63	10.00		0.14			0.14		85.7	134.2	196.5	0.051			0.051	44.2	0.30	375	0.096	0.87	10.00	0.85	10.85	53%
McAlpine Road	MH03	MH04	0.17	0.63	10.00		0.11			0.25		82.3	129.6	190.8	0.089			0.089	31.4	0.30	450	0.156	0.98	10.85	0.53	11.38	57%
McAlpine Road	MH04	MH05	0.31	0.63	10.00		0.20			0.44		80.3	127.0	187.3	0.156			0.156	51.9	0.30	525	0.236	1.09	11.38	0.79	12.18	66%
McAlpine Road	MH05	MH06	0.26	0.63	10.00		0.16			0.60		77.5	123.2	182.4	0.207			0.207	56.5	0.30	600	0.336	1.19	12.18	0.79	12.97	62%
McAlpine Road	MH06	MH07	0.11	0.63	10.00		0.07			0.67		74.9	119.6	177.8	0.224			0.224	12.9	0.30	600	0.336	1.19	12.97	0.18	13.15	66%
McAlpine Road	RLCB	MH07	0.07	0.63	10.00		0.04			0.04		85.7	134.2	196.5	0.016			0.016	12.9	1.00	250	0.059	1.21	10.00	0.18	10.18	27%
McAlpine Road	RLCB	MH07	0.05	0.63	10.00		0.03			0.03		85.7	134.2	196.5	0.012			0.012	12.9	1.00	250	0.059	1.21	10.00	0.18	10.18	20%
McAlpine Road	MH07	MH12	0.39	0.63	10.00		0.25			1.00		74.4	118.8	176.7	0.329			0.329	88.4	0.30	675	0.460	1.29	13.15	1.15	14.29	71%
Lightheart Drive	MH08	MH09	0.42	0.63	10.00		0.26			0.26		85.7	134.2	196.5	0.098			0.098	62.7	0.30	450	0.156	0.98	10.00	1.06	11.06	63%
Lightheart Drive	MH09	MH10	0.05	0.63	10.00		0.03			0.30		81.5	128.5	189.4	0.106			0.106	10.1	0.40	450	0.180	1.13	11.06	0.15	11.21	59%
Lightheart Drive	RLCB	MH10	0.09	0.63	100.00			0.06			0.06	85.7	134.2	196.5	0.033			0.033	31.3	1.00	250	0.059	1.21	10.00	0.43	10.43	55%
Lightheart Drive	MH10	MH11	0.14	0.63	10.00		0.09			0.39	0.06	80.9	127.8	188.4	0.169			0.169	47.1	0.30	525	0.236	1.09	11.21	0.72	11.93	72%
Lightheart Drive	RLCB	MH11	0.05	0.63	100.00			0.03			0.03	85.7	134.2	196.5	0.018			0.018	31.3	1.00	250	0.059	1.21	10.00	0.43	10.43	30%
Lightheart Drive	MH11	MH12	0.04	0.63	10.00		0.02			0.41	0.09	78.3	124.3	183.9	0.188			0.188	13.8	0.30	525	0.236	1.09	11.93	0.21	12.15	80%
Lightheart Drive	RLCB	OGSMH02	0.03	0.63	100.00			0.02			0.02	85.7	134.2	196.5	0.010			0.010	31.3	1.00	300	0.097	1.37	10.00	0.38	10.38	11%
Lightheart Drive	MH12	OGSMH02	0.09	0.63	10.00		0.06			1.46	0.09	71.0	114.1	170.5	0.507			0.507	32.8	0.50	750	0.787	1.78	14.29	0.31	14.60	64%
Lightheart Drive	OGSMH02	EX.MH.1			10.00					1.46	0.11	70.1	112.9	168.9	0.511			0.511	1.8	0.55	750	0.826	1.87	14.60	0.02	14.62	62%
Lightheart Drive	EX.DCB MH17	EX. MH3	0.00	0.50	10.00	0.00	0.00	0.00	0.00	0.00	0.00	85.7	134.2	196.5	0.000	0.000	0.000	0.000	44.8	1.20	750	1.220	2.76	10.00	0.27	10.27	0%
Lightheart Drive	EX.MH3	EX.MH2	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.7	134.2	196.5	0.000			0.000	58.0	0.79	825	1.276	2.39	10.00	0.41	10.41	0%
Lightheart Drive	EX.MH2	EX.MH1 -	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.1	132.0	193.7	0.000			0.000	35.0	0.20	900	0.810	1.27	10.41	0.46	10.86	0%
External Area North of Lightheart Drive	EXT 1	EX.MH1	12.26	0.50	10.00		6.13			6.13		72.5	116.3	173.4	1.980			1.980								13.75	
Summer Valley Drive	EX.MH1	EX.MH2	0.23	0.50	10.00		0.12			6.25		72.5	116.3	173.4	2.017			2.017	51.2	0.43	1200	2.557	2.26	13.75	0.38	14.13	79%
Summer Valley Drive	EX.MH2	EXMH03	0.39	0.50	10.00		0.20			6.44		71.4	114.8	171.4	2.053			2.053	58.5	0.40	1200	2.466	2.18	14.13	0.45	14.57	83%
McAlpine Road	MH02	MH01	0.26	0.62	10.00		0.16			0.16		85.7	134.2	196.5	0.059			0.059	28.4	4.00	300	0.193	2.74	10.00	0.17	10.17	31%
McAlpine Road	MH01	OGSMH01	0.41	0.62	10.00		0.25			0.25		85.7	134.2	196.5	0.095			0.095	60.4	0.60	375	0.136	1.23	10.00	0.82	10.82	70%
McAlpine Road	OGSMH01	EXMH07			10.00							85.7	134.2	196.5					13.7	0.60	300	0.075	1.06	10.00	0.22	10.22	
External Area From Hwy 10	EXT 2	EXMH08	0.78	0.53	10.00		0.41			0.41		64.9	105.5	158.9	0.121			0.121								16.67	
Highwood Road	EXMH08	EXMH07	0.13	0.50	10.00		0.07			0.48		64.9	105.5	158.9	0.141			0.141	55.0	0.65	375	0.141	1.28	16.67	0.72	17.38	100%
Highwood Road	EXMH07	EXMH06	0.39	0.50	10.00		0.20			0.68		63.3	103.2	155.7	0.194			0.194	62.0	0.60	600	0.476	1.68	17.38	0.61	18.00	41%
Highwood Road	EXMH06	EXMH05	0.52	0.50	10.00		0.26			0.94		62.0	101.2	153.1	0.263			0.263	52.5	0.39	975	1.400	1.87	18.00	0.47	18.47	19%
Highwood Road	EXMH05	EXMH04	0.35	0.50	10.00		0.18			1.11		61.0	99.8	151.2	0.308			0.308	46.0	0.38	975	1.381	1.85	18.47	0.41	18.88	22%
External Area From North (RLCB)	EXT3	EXMH04	0.18	0.50	10.00		0.09			0.09		85.7	134.2	196.5	0.034			0.034	46.0	4.46	375	0.370	3.35	10.00	0.23	10.23	9%
Highwood Road	EXMH04	EXMH03	0.37	0.50	10.00		0.19			1.39		60.2	98.6	149.5	0.380			0.380	56.5	0.65	975	1.807	2.42	18.88	0.39	19.27	21%
Summer Valley Drive	EXMH03	EX.MH9	0.71	0.50	10.00		0.36			8.18		59.4	97.5	147.9	2.216			2.216	85.5	0.41	1350	3.418	2.39	19.27	0.60	19.87	65%
Summer Valley Drive	EX.MH9	EX.MH10	0.17	0.50	10.00		0.09			8.27		58.3	95.8	145.6	2.201			2.201	39.7	0.41	1350	3.418	2.39	19.87	0.28	20.14	64%
External Area to Hillpath	EXT4	EXT 5	9.70	0.25			2.43			2.43		176.0	232.6	306.8	1.567			1.567									
Hillpath Crescent	EXT 5	EX.MH10	3.92	0.50	10.00		1.96			4.39		176.0	232.6	306.8	2.833			2.833									
Summer Valley Drive	EX.MH10	EX.MH17	0.54	0.50	10.00		0.27			12.92		57.8	95.1	144.6	3.413			3.413	82.5	0.44	1500	4.689	2.65	20.14	0.52	20.66	73%
Sweet Briar Lane	EXT	EX.MH17	1.68	0.50	10.00		0.84			0.84		176.0	232.6	306.8	0.543			0.543									
Summer Valley Drive	EX.MH17	EX.MH21	0.52	0.50	10.00		0.26			14.02		56.9	93.7	142.7	3.650			3.650	92.5	1.85	1500	9.615	5.44	20.66	0.28	20.94	38%
Summer Valley Drive	EX.MH21	EX.MH22	0.39	0.50	10.00		0.20			14.22		56.4	93.0	141.7	3.672			3.672	82.0	0.48	1500	4.897	2.77	20.94	0.49	21.44	75%

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	YEAR STORM CAPTURE	2 YR 'AR'	10 YR 'AR'	100 YR AR'	ACCUM. AR' (2 YR)	ACCUM. AR' (10 YR)	ACCUM. 'AR' (100 YR)	2 YR RAINFALL INTENSITY (mm/hr)	10 YR RAINFALL INTENSITY (mm/hr)	100 YR RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
EXT AREA + STM Easement	EX.MH22	EX.MH31	7.75	0.50	10.00		3.88			18.09		139.9	91.7	55.6	4.610			4.610	47.0	1.22	1500	7.808	4.42	21.44	0.18	21.61	59%
STM Easement	EX.MH31	EX.MH32	0.10	0.50	10.00		0.05			18.14		139.3	91.3	55.3	4.601			4.601	33.0	1.06	1500	7.278	4.12	21.61	0.13	21.75	63%
STM Easement	EX.MH32	HEAD WALL			10.00					18.14		138.8	91.0	55.0	4.585			4.585	10.0	1.00	1500	7.069	4.00	21.75	0.04	21.79	65%

Project: **Argo Summer Valley**

Location: Town of Caledon/City of Brampton
Project #: 300054371
Designer: S. Breen
Date: 20-Nov-2023

Post-Dev Imperviousness / Runoff Coefficient Calculations

POST1 - HURONTARIO DRAINAGE SYSTEM
Total Area = 2692.3 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	2692.3	7%	188.5	
Impervious Area	0.0	100%	0.0	
	2692.3		7%	= I (comp)
		RC =	0.25	

POST2 - HIGHWOOD ROAD MH 7
Total Area = 6688.8 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	2919.6	7%	204.4	
Impervious Area:				
Within Lots (incl. driveway)	2551.4	100%	2551.4	
17.0m ROW (Imperv. Portion)	1217.8	100%	1217.8	
Total Impervious Area	3769.2		3769.2	
	6688.8		59%	= I (comp)
		RC =	0.62	

POST3 - HIGHWOOD ROAD DIRECT CONNECTIONS
Total Area = 1512.3 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	905.6	7%	63.4	
Impervious Area:				
Within Lots (incl. driveway)	606.6	100%	606.6	
17.0m ROW (Imperv. Portion)	0.0	100%	0.0	
Total Impervious Area	606.6	100%	606.6	
	1512.3		44%	= I (comp)
		RC =	0.51	

POST4 - LIGHTHEART DRIVE CONNECTION

Total Area = 24986.3 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	10487.1	7%	734.1	
Impervious Area:				
Within Lots (incl. driveway)	8994.4	100%	8994.4	
17.0m ROW (Imperv. Portion)	5504.8	100%	5504.8	
Total Impervious Area	14499.2		14499.2	
	24986.3		61%	= I (comp)
		RC =	0.63	

Total Developed Drainage Area to Ex. Creek's Edge SWM Facility	**33187.4**	**sq.m**
	3.3187397	**ha**
Average Imperviousness for Drainage to Ex. SWM Facility	**60%**	
Average Runoff Coefficient for Drainage to Ex. SWM Facility	**0.62**	
Total Site Area	**35879.74**	
Total Site Impervious	**0.56**	

Notes:

1 Calculations for ROW imperviousness assume half of a given lot or townhouse boulevard frontage is comprised of driveway.
2 Calculations assume all detached corner lots consist of 12.12m lot unit type.
3 Calculations assume minimum front-yard setback is used for all units.
4 It has been assumed that all entrances from Hurontario Street will be removed under post-dev. conditions.

Project: Argo Summer Valley
File: 300054371.0000
Designed by: S.Breen
Checked by: L.Niemi
Date: 20-Nov-23

BURNSIDE

PROPOSED CONDITIONS TO SWM FACILITY

Total Drainage Area= **300007.4** **m2** **or** **30.00** **ha**

Institutional Areas (m2)

Total Area= 0 ha

		Area
TIMP	65%	0.00 ha
XIMP	40%	0.00 ha

Commercial Areas(m2)

Total Area 0 ha

		Area
TIMP	90%	0.00
XIMP	90%	0.00

Medium Density Residential (m2)

33187.397	DEVELOPED AREA

Total Area 3.32 ha

		Area
TIMP	60%	1.99 ha
XIMP	40%	1.33 ha

Single Family

0	to Highwood

Total Area 0.00 ha

		Area
TIMP	59%	0.00 ha
XIMP	40%	0.00 ha

Low Density Residential (m2)

214560	Creeks Edge	less DPOS area
52260	Donal JV	

Total Area 26.68 ha

		Area
TIMP	43%	11.47 ha
XIMP	30%	8.00 ha

Parkland Areas(m2)

Total Area 0.00 ha

		Area
TIMP	10%	0.00 ha
XIMP	5%	0.00 ha

Total Area (less Residential)= 0.00 ha
Total Residential Area(if not able to directly measure)= 30.00 ha

Total Area (uncontrolled to pond) **30.00 ha**

TOTAL OVERALL DRAINGE AREA

Total TIMP=	**13.46 ha**	**Overall TIMP=**	**44.9 %**
Total XIMP=	**9.33 ha**	**Overall XIMP=**	**31.1 %**

Project: Argo Summer Valley
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BURNSIDE

Wet Pond Permament Pool Requirement

MOE Table 3.2 Water Quality Storage Requirements Based on Receiving Waters.

IMPERVIOUSNESS	44.87	%
Protection Level (1, 2, or 3)	2	

NOTE - 40 cu.m/ha has been removed from MOE table values for Ex. Detention Portion

Enhanced (Level 1) Protection

x	y	Known (x)	Calc (y)	
Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Total Permanent Pool Required (cu.m)
35	100	44.87	124.67	3740.25
55	150			
70	185			
85	210			
95.0	**236**	**Extrapolated**		

Normal (Level 2) Protection

x	y	Known (x)	Calc (y)	
Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Total Permanent Pool Required (cu.m)
35	50	44.87	59.87	1796.11
55	70			
70	90			
85	110			
95.0	**121**	**Extrapolated**		

Basic (Level 3) Protection

x	y	Known (x)	Calc (y)	
Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Imperviousness (%)	Permanent Pool StorageVolume (cu.m./ha)	Total Permanent Pool Required (cu.m)
35	20	44.87	27.40	822.07
55	35			
70	45			
85	55			
95.0	**62**	**Extrapolated**		

Pond Efficiency
Wet Pond - As Constructed

BURNSIDE

Project:	Argo Summer Valley
File:	300054371.0000
Designed by:	S.Breen
Checked by:	L.Niemi
Date:	20-Nov-23

CALCULATED POND REQUIREMENTS WITH INCLUSION OF SUMMER VALLEY DISCHARGE

Imperviousness	44.87	%
Level 2 Quality Volume Required:	2996	cum/ha
which includes:	1796	cum for Perm. Pool
	40	cum/ha for Ext. Det.
Site Contributing Drainage Area	30.00	ha
As Constructed Permanent Pool Details:		
Permanent Pool Required (per MOE)	1796	cu.m
Permanent Pool Provided	1594	cu.m (per Donal JV Report)
Pond Permanent Pool Deficiency	202	cu.m

MECP Pond Efficiency (Table 4 - Quality Control)

Wet Pond Design Parameters	Volume (cum/ha)	Treatment Efficiency (%)
Enhanced Permanent Pool Volume	120	80
Normal Permanent Pool Volume	58	70
Basic Permanent Pool Volume	26	60

Calculated PP Volume per ha of drainage	53.13	cu.m/ha
Interpolated Resultant Treatment Efficiency	**68.5**	**%**

Project:	**Argo Summer Valley**
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Date:	20-Nov-2023

BURNSIDE

TSS Removal Efficiency - Treatment Train

POST 4 to Caledon (Lightheart)		**Control**				
Area Description	**Drainage area (ha)**	**Infiltration**	**CB Shield**	**OGS**	**SWM Pond**	**Total Efficiency**
Post 4 Drainage Area (to pond)	2.50	0%	0%	50%	68%	84%
Subtotal Total Caledon Drainage Area	***2.50***	***Overall TSS Removal to Lightheart Drive:***				***84%***
Post 2 Drainage Area (to pond)	0.67	0%	0%	50%	68%	84%
Post 3 Drainage Area (to pond)	0.15	0%	0%	50%	68%	84%
Subtotal Total Brampton Drainage Are	***0.82***	***Overall TSS Removal to Highwood Drive:***				***84%***
TOTAL SITE	**3.32**	**Overall TSS Removal FOR SITE:**				**84%**

Note - existing SWM pond as constructed conditions will provide 68% TSS with addition of development area

EXTENDED DETENTION VOLUME CALCULATIONS
(based on minor drainage area)

Project: Argo Summer Valley
File: 300054371.0000
Designed by: S.Breen
Checked by: L.Niemi
Date: 20-Nov-23

Extended Detention Volume (as Constructed) 3407 cu.m

Ex. Extended Detention Volume req. (per Donal JV) - using SCS Method

Existing Total Drainage to Pond (per Donal JV Report)	27.23	ha
Existing Total Imperviousness of Drainage to Pond (per Donal JV)	43	%
Existing CN for Drainage Area	72	

25 mm Runoff total Contributing Area (SCS Method)

Q = **(P-IA)^2/P-(IA-S)**
S = **-254+25400/CN**
T IMP = **43.0** %

Pervious Area			**Impervious Area**		
P =	25	mm	P =	25	mm
IA =	3	mm	IA =	2.3	mm
CN =	72		CN =	99	
S =	98.8		S =	2.6	
Q =	4.0	mm	Q =	20.4	mm

	per	**imp**	**total**	
SCS Runoff Volume	4.0	20.4	11.05	mm
Drainage Area	15.5	11.7	27.23	ha
Runoff Volume	622	2388	3010	cu.m

Proposed Post Development Drainage to Pond - Updated to Include Summer Valley:

Total Drainage to Pond (with Summer Valley)	30.00	ha
Total Imperviousness of Drainage to Pond (with Summer Valley)	44.9	%
CN for Total Drainage Area	72	

25 mm Runoff total Contributing Area (SCS Method)

Q = **(P-IA)^2/P-(IA-S)**
S = **-254+25400/CN**
T IMP = **44.9** %

Pervious Area			**Impervious Area**		
P =	25	mm	P =	25	mm
IA =	3	mm	IA =	2.3	mm
CN =	72		CN =	99	
S =	98.8		S =	2.6	
Q =	4.0	mm	Q =	20.4	mm

	per	**imp**	**total**	
SCS Runoff Volume	4.0	20.4	11.4	mm
Drainage Area	16.5	13.5	30.00	ha
Runoff Volume	663	2745	3408	cu.m

Extended Detention Required per SCS Method	**3408**	cu.m
Extended Detention Provided	**3407**	cu.m
Extended Detention Deficit SCS Method	**1**	cu.m

Orifice Sizing Calculations
Existing Structures
Project: Argo Summer Valley
File: 300054371.0000
Designed by: S.Breen
Checked by: L.Niemi
Date: 20-Nov-23

BURNSIDE

Diversion Orifice Calculations - to convey quality peak flow to the pond

Extended Detention Volume Required			3408 cu.m
Qin =	**1.5*Runoff Volume/hydrograph duration**		Peak 25mm runoff flow rate
duration =	**82**	**mins**	Duration (from hymo modelling)
Calcualted 25 mm Runoff Peak Flow			1.04 cms
A =	**Q/C*(2*g*h)^0.5**		Orifice Area
h =	**0.54**	**m**	head (per Creek's Edge HGL)
C =	**0.8**		due to benching in MH
Calcualted Diversion Orifice Area			0.40 sq.m
Calculated Minimum Orifice Diameter			0.713 m
Proposed Diversion Orifice Diameter			**715 mm**

Extended Detention Orifice Calculations - to provide 48 hrs detention

Minimum Detention Time			48 hours
Q out ave =	**ED volume/detention time**		
Q out peak	**1.5*Q out ave**		
Calcualted 25 mm Average discharge			0.0197 cms
Calcualted 25 mm peak discharge			0.0296 cms
A =	**Q/C*(2*g*h)^0.5**		Orifice Area
h =	**1.6**	**m**	Extended Detention Depth
C =	**0.625**		submerged orifice
Calcualted Outlet Orifice Area			0.0084 sq.m
Calculated Maximum Orifice Diameter			0.1037 m
Proposed OUtlet Orifice Diameter			**100 mm**

Project:	**Argo Summer Valley**
Project #:	300054371.0000
Designed By:	S. Breen/L.Niemi
Date:	20-Nov-2023

BURNSIDE

Rear Yard Soakaway Pits

Total Drainage Area

Roof Area per Lot to Soakaway = 119 m^2 50% of Maximum Lot Coverage

Roof Area to Soakaway Pit per Lot = 119 m^2

Infiltration Rate

Infiltration Rate = 17.5 mm/hr * from exp report

Infiltration rate at the proposed bottom elevation of the infiltration gallery must be divided by a safety correction factor:

Ratio of mean measured infiltration rates = 17.50 / 17.50

= 1 therefore, safety correction factor is --------> 2.5

Design infiltration rate determined by dividing mean infiltration rate at bottom of infiltration trench by the safety correction factor:

Design Infiltration Rate = 7.0 mm/hr

Maximum Storage Depth

Maximum depth of storage determined by multiplying design infiltration rate desired drawdown time of 48hr divided by void ratio of

Maximum depth of storage= 0.84 m

Storage Required (5mm)

Runoff = 5 mm Runoff depth

Per Lot Rooftop Area to Soakaway = 119 m^2 Approximate

Min. Storage Volume Required per Lot = 0.59 m^3 Area (m^2) x Runoff (mm)/1000

Number of Lots in Infiltration Area = 23.5

Size Infiltration Gallery

Surface Area of Infiltration (m^2)	Required Volume of Infiltration (m^3)	Drawdown Time (hrs)	Min. Required Depth of Storage Trench (m)
5.0	0.59	17.0	0.30

Note: each lot assumed to have 2 trenches (one on each side for roof leader discharge

Number of Lots = 23.5

Number of Soakaway Pits = 47 (2 per lot)

Soakaway Pit design dimensions:
- 0.75 m wide
- 1.50 m long
- 0.8 m deep

Design Volume = 0.9 m^3

Void Ratio = 0.40

Total Storage Volume per Soakaway Pit = 0.36 m^3

Total Storage Volume per Lot = 0.72 m^3 Equivalent Runoff Depth 6.07 mm

TOTAL STORAGE VOLUME PROVIDED IN ALL TRENCHES 17 m^3

5 mm Runoff Control/Retention

Project: Argo Summer Valley
File:
Designed by: S.Breen
Checked by: L.Niemi
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5mm Retention achieved through Initial Abstration on all surfaces, accounting for ponding, infiltration evaporation and direction of flow to pervious surfaces as follows:

Grassed Area	5.0 mm	
Paved Surface	1.5 mm	
Roof tops	0.75 mm	* based on minimum of 50% of roof discharge to grass (rear only) and 1.5mm retention available in topsoil for roof discharge

Secondary measures are introduced to enhance 5mm retention including soakaway pits where feasible
Calculated secondary retention is based on the soakway pit design in relevant lots

Post2 - Rooftop Runoff Secondary Retention

Total Roof Area in Catchment		2551 sq.m
Roof Area to Soakaway in Rear Yard		856 sq.m
Volume to Soakaway (Area to Soakaway*depth)	6.07 mm	5.19 cu.m
Prorated Secondary Retention of Rooftop Runoff (Vol/Total Area)		**2.04 mm**

Post3 - Rooftop Runoff Secondary Retention

Total Roof Area in Catchment		559 sq.m
Roof Area to Soakaway in Rear Yard		279 sq.m
Volume to Soakaway (Area to Soakaway*depth)	6.07 mm	1.69 cu.m
Prorated Secondary Retention of Rooftop Runoff (Vol/Total Area)		**3.03 mm**

Post4 - Rooftop Runoff Secondary Retention

Total Roof Area in Catchment		8994 sq.m
Roof Area to Soakaway in Rear Yard		1239 sq.m
Volume to Soakaway (Area to Soakaway*depth)	6.07 mm	7.52 cu.m
Prorated Secondary Retention of Rooftop Runoff (Vol/Total Area)		**0.84 mm**

Site 5mm Volume Retention

		Site Area	Required 5mm Volume Retention	Initial Abstraction	Secondary Retention	Total Provided Volume
POST1	Grassed Area	2692 m^2	13.46 m^3	5.0 mm		13.46 m^3
	Paved Surface	0 m^2	0.00 m^3	1.5 mm		0.00 m^3
	Roof Area	0 m^2	0.00 m^3	0.75 mm		0.00 m^3
POST2	Grassed Area	2920 m^2	14.60 m^3	5.0 mm		14.60 m^3
	Paved Surface	1218 m^2	6.09 m^3	1.5 mm		1.83 m^3
	Roof Area	2551 m^2	12.76 m^3	0.75 mm	2.04 mm	7.11 m^3
POST3	Grassed Area	906 m^2	4.53 m^3	5.0 mm		4.53 m^3
	Paved Surface	26 m^2	0.13 m^3	1.5 mm		0.04 m^3
	Roof Area	581 m^2	2.90 m^3	0.75 mm	3.0 mm	2.20 m^3
POST4	Grassed Area	10487 m^2	52.44 m^3	5.0 mm		52.44 m^3
	Paved Surface	5652 m^2	28.26 m^3	1.5 mm		8.48 m^3
	Roof Area	8847 m^2	44.24 m^3	0.75 mm	0.84 mm	14.03 m^3
		33187 m^2	**165.94 m^3**			**105.24 m^3**

Project Name:	Argo Summer Valley
Job Number:	300054371
Designer:	LN
Date:	20-Nov-23

Capture Calculations for RLCB - Capacity confirmtion
RLCB to capture 100 year flow (from design sheet) with 50% blockage
Flow Range **0.013** **cms min** **0.037** **cms max**

Note: The capacity is based on a "sag" location assumption

Catchbasin Capacity		
Average Depth above grate =	0.100	m
Area of Orifice =	0.0036	m^2
Orifice Coefficient =	0.6	
Total Discharge, Q=	0.003	m^3/sec
Discharge Vel., V=	0.840	m/sec

Honeycomb Grating		
Grating Length =	0.762	m
Grating Width =	0.768	m

Catchbasin Opening		
Length =	0.616	m
Width =	0.622	m
Area =	0.383	m^2
Area Lost to Grating/Opening =	0.0006	m^2
Orifice Opening Area =	0.0036	m^2
Effective number of Openings =	91	
Grating Open Area =	0.328	m^2
Assumed Blockage =	**50.0**	**%**
Effective Grating Open Area =	0.164	m^2
Effective flow Capacity =	0.1377	m^3/sec
Number of Catchbasins =	1	
Catchbasin Capacity =	0.138	m^3/sec
Total Inlet Capacity =	**0.138**	m^3/sec

SUFFICIENT CAPACITY FOR FLOW RANGE yes

Project: **Argo Summer Valley**

Location: City of Brampton/Town of Caledon
Project #: 300054371
Designer: S. Breen
Date: 20-Nov-2023

Storm Flow Calculations

Pre Develpoment Flow to Hurontario Drainage system

Area ID	Existing Conditions		Pre-Development 'C'
PRE2	13600	m^2	0.25
TOTAL	1876800	m^2	#REF!

Post Develpoment Flow to Hurontario Drainage system

Area ID	Proposed Conditions		Post-Development 'C'
POST1	2692	m^2	0.25
TOTAL	2692	m^2	0.25

Runoff Equation

$Q = 2.78CIA$ (L/s)

where,
C = runoff coefficient
I = rainfall intensity (mm/hr)
A = area (ha)
2.78= conversion factor

Intensity Equation

$I = AT^C$

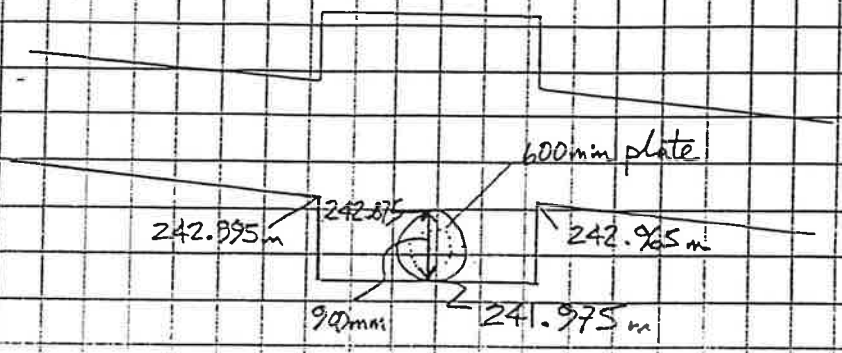
I= Rainfall Intensity (mm/hr)
T= Time of concentration (hours)

Pre-Development Stormwater Flows (Tc=10 min)

Return Period	A	C	T	I	Q (L/s)		
					PRE2	POST1	Increase
2 year	22.1	-0.714	0.17	79.43 mm/hr	74.8	14.8	-60.0
5 year	29.9	-0.701	0.17	104.99 mm/hr	98.8	19.6	-79.3
10 year	35.1	-0.695	0.17	121.93 mm/hr	114.8	22.7	-92.1
25 year	41.6	-0.691	0.17	143.48 mm/hr	135.1	26.7	-108.3
50 year	46.5	-0.688	0.17	159.52 mm/hr	150.2	29.7	-120.4
100 year	51.3	-0.686	0.17	175.36 mm/hr	165.1	32.7	-132.4

ORIFICE CALCULATIONS FROM THE CREEK'S EDGE SUBDIVISION STORMWATER MANAGEMENT REPORT.

Name: M.A.S. Title: FLOW SPLITTER MANHOLE Job: 1944 Date: Aug 22/97 Pg. 1



Interim Condition : A = 22ha

$Q_{25mm} = \frac{CiA}{360}$ where $i = 43C + 5.9$ mm/hr

C = 0.5

A = 22 ha

∴ i = 27.4 mm/hr

$= \frac{0.5(27.4)(22)}{360}$

$= 0.84\ m^3/s$

Using orifice equation : solve for dia.

$Q = 0.8\sqrt{2gh}\,A$ Use 0.8 due to benching

∴ d = 600mm

Ultimate Condition

$Q_{25mm} = \frac{CiA}{360}$: A = 39ha

$= 1.5\ m^3/s$

SCHAEFFERS Consulting Engineers
64 Jardin Drive
Concord, Ontario L4K 3P3
Tel. (905) 738-6100
Fax (905) 738-6875
email schaeff@on.net
www fis.net/~schaeff

Name: M.A.S. Title: FLOW SPLITTER MANHOLE Job: 0944 Date: Aug 2/97 Pg. 2

Check to ensure 900mm can capture flow at required head:

$h = 242.965 - 241.975 - 0.450$

$= 0.54$

$Q = 0.8\sqrt{2gh}\,A$

$d = 856\text{ mm} \leq 900\text{mm} \quad \therefore$ O.K.

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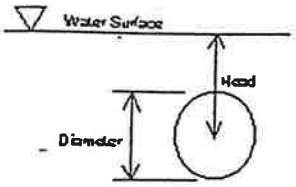
email schaeff@tin.net
www.tin.net/~schaeff

Orifice Solver

This orifice solver uses the Orifice Equation: Q = C x A x (2 x g x H) ^ (0.5) to solve for an unknown variable. Enter 2 known variables, and press the solve button of the unknown variable.



Head (m)	.54	Head
Flow (cms)	1.5	Flow
Diam. (mm)	856.	Diameter

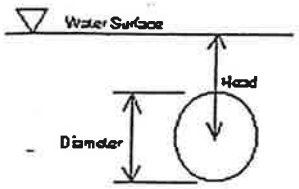
○ C = 0.625 (Submerged)

◉ C = 0.8 (unSubmerged)

Main Menu

Orifice Solver

This orifice solver uses the Orifice Equation: Q = C x A x (2 x g x H) ^ (0.5) to solve for an unknown variable. Enter 2 known variables, and press the solve button of the unknown variable.



Head (m)	.69	Head
Flow (cms)	0.84	Flow
Diam. (mm)	602.	Diameter

○ C = 0.625 (Submerged)

◉ C = 0.8 (unSubmerged)

Main Menu

Name: M.A.S. Title: ORIFICE CALCS Job: 91E1493 Date: July 15/97 Pg. 1

1) Detention time : 48 hours

$$Q_{ave} = \frac{3000\ m^3}{48\ hours}$$

$$= 0.017\ m^3/s$$

$$Q_{peak} = 1.5 \times 0.017\ m^3/s$$

$$= 0.026\ m^3/s$$

FROM ORIFICE SOLVER, (SEE ATTACHED)

$D = 100\ mm$

SCHAEFFERS
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64 Jardin Drive
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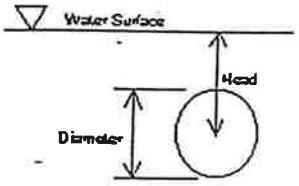
www. www.tbn.net/~schaeff

July 15/91
91 E 1443

Orifice Solver

This orifice solver uses the Orifice Equation: $Q = C \times A \times (2 \times g \times H) ^ {(0.5)}$ to solve for an unknown variable. Enter 2 known variables, and press the solve button of the unknown variable.



Head (m)	1.55	Head
Flow (cms)	.026	Flow
Diam. (mm)	98.0	Diameter

(•) C = 0.625 (Submerged)

( ) C = 0.8 (unSubmerged)

Main Menu

```
00001> ================================================================================
00002>
00003>  SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 =========
00004>  S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     =========
00005>  SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5     Ver.  3.0
00006>      S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Sept 1997
00007>  SSSSS   W W   M   M  H   H    Y    M   M   OOO          9      5 =========
00008>                                                       9   9      5 # 4243446
00009>       StormWater Management HYdrologic Model           999   5555  =========
00010>
00011>  ********************************************************************************
00012>  ************************** SWMHYMO-95w Ver/3.0 ***************************
00013>  *******  A single event and continuous hydrologic simulation model  *******
00014>  *******     based on the principles of HYMO and its successors      *******
00015>  *******                  OTTHYMO-83 and OTTHYMO-89.                  *******
00016>  ********************************************************************************
00017>  ********************************************************************************
00018>  ******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
00019>  *******                  Ottawa,  Ontario: (613) 727-5199           *******
00020>  *******                  Gatineau, Quebec: (819) 243-6858           *******
00021>  *******                  E-Mail: swmhymo@jfsa.Com                   *******
00022>  ********************************************************************************
00023>  ******* Licensed user: Charlton Engineering Limited                 *******
00024>  *******                 Mississauga          SERIAL#:4243446       *******
00025>  ********************************************************************************
00026>  ********************************************************************************
00027>  *******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
00028>  *******           Maximum value for ID numbers  :     10            *******
00029>  *******           Max. number of rainfall points:   5000            *******
00030>  *******           Max. number of flow points    :   5000            *******
00031>  ********************************************************************************
00032>  ********************************************************************************
00033>  *** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
00034>  ***------------------------------------------------------------------------***
00035>  ***    ID:  Hydrograph IDentification numbers, (1-10).                    ***
00036>  ***  NHYD:  Hydrograph reference numbers, (6 digits or characters).       ***
00037>  ***  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).     ***
00038>  *** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).      ***
00039>  *** TpeakDate_hh:mm is the date and time of the peak flow.             ***
00040>  ***  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).         ***
00041>  ***  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).         ***
00042>  ***    *:  see WARNING or NOTE message printed at end of run.            ***
00043>  ***   **:  see  ERROR  message printed at end of run.                    ***
00044>  ********************************************************************************
00045>  ********************************************************************************
00046>
00047> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00048>
00049>  ********************************************************************************
00050>  ********************   S U M M A R Y   O U T P U T   ********************
00051>  ********************************************************************************
00052>  *       DATE: 2001-05-27     TIME: 12:08:42     RUN COUNTER: 000177        *
00053>  ********************************************************************************
00054>  * Input   filename: I:\ANDRZEJ\00113-~1\SWM\25MMPST.DAT                      *
00055>  * Output  filename: I:\ANDRZEJ\00113-~1\SWM\25MMPST.out                      *
00056>  * Summary filename: I:\ANDRZEJ\00113-~1\SWM\25MMPST.sum                      *
00057>  * User comments:                                                            *
00058>  * 1:_____                                                                   *
00059>  * 2:_____                                                                   *
00060>  * 3:_____                                                                   *
00061>  ********************************************************************************
00062>
00063>
00064> *#*******************************************************************************
00065> *#  Project Name: [DONALD JV., CALEDON] Project Number: [00-113]
00066> *#                [FIRST FLUSH AND 2 to 100]
00067> *#                [Modified Curve Number (CN*) used]
```

```
00068> *#  Date       : 05-25-2001
00069> *#  Modeller   : [A.J.]
00070> *#  Company    : Charlton Engineering Limited
00071> *#  License #  :  4243446
00072> *#*****************************************************************************
00073>  RUN:COMMAND#
00074>  001:0001----------------------------------------------------------------------
00075>       START
00076>        [TZERO =    .00 hrs on        0]
00077>        [METOUT=   2    (1=imperial, 2=metric output)]
00078>        [NSTORM=   1 ]
00079>        [NRUN  =   1 ]
00080>  001:0002----------------------------------------------------------------------
00081>       READ STORM
00082>        Filename = storm.001
00083>        Comment  = * One inch storm over two hours for first flush volume
00084>        [SDT=10.00:SDUR=   2.00:PTOT= 25.00]
00085>  001:0003----------------------------------------------------------------------
00086>       DEFAULT VALUES
00087>        Filename = I:\ANDRZEJ\00113-~1\SWM\Brampton.val
00088>        ICASEdv  = 1 (read and print data)
00089>        FileTitle= File comment: [ Brampton]
00090>                   THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
00091>        Horton's infiltration equation parameters:
00092>        [Fo= 50.00 mm/hr] [Fc= 7.50 mm/hr] [DCAY= 2.00 /hr] [F=  .00 mm]
00093>        Parameters for PERVIOUS surfaces in STANDHYD:
00094>        [DPSP=   1.50 mm] [LGP=30.00 m] [MNP= .250]
00095>        Parameters for IMPERVIOUS surfaces in STANDHYD:
00096>        [DPSI=    .80 mm] [CLI= 1.50]   [MNI= .013]
00097>        Parameters used in NASHYD:
00098>        [Ia=   1.50 mm] [N= 3.00]
00099>  001:0004-------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00100>       DESIGN STANDHYD   01:RAINHA     5.23     .080 No_date    2:00   11.06 .442
00101>        [XIMP=.30:TIMP=.43]
00102>        [SLP= .60:DT= 2.00]
00103>        [LOSS= 2 : CN*=72.]
00104>  001:0005-------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00105>       DESIGN STANDHYD   02:EXSUB     22.00     .316 No_date    2:02   11.06 .442
00106>        [XIMP=.30:TIMP=.43]
00107>        [SLP= .60:DT= 2.00]
00108>        [LOSS= 2 : CN*=72.]
00109>  001:0006-------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00110>       ADD HYD           01:RAINHA     5.23     .080 No_date    2:00   11.06  n/a
00111>                       + 02:EXSUB     22.00     .316 No_date    2:02   11.06  n/a
00112>        [DT= 2.00]  SUM= 03:TOTAL     27.23     .395 No_date    2:00   11.06  n/a
00113>   ** END OF RUN :   1
00114>
00115> ***********************************************************************
00116>                                                  272,260 x 0.01106 = 3,011 m³
00117>
00118>
00119>
00120>
00121>  RUN:COMMAND#
00122>  002:0007----------------------------------------------------------------------
00123>       START
00124>        [TZERO =    .00 hrs on        0]
00125>        [METOUT=   2    (1=imperial, 2=metric output)]
00126>        [NSTORM=   1 ]
00127>        [NRUN  =   2 ]
00128> *#*****************************************************************************
00129> *#  Project Name: [DONALD JV., CALEDON] Project Number: [00-113]
00130> *#                [FIRST FLUSH AND 2 to 100]
00131> *#                [Modified Curve Number (CN*) used]
00132> *#  Date         : 05-25-2001
00133> *#  Modeller     : [A.J.]
00134> *#  Company      : Charlton Engineering Limited
```

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Water Demand Calculations and Hydrant Flow Testing

BURNSIDE

Argo Summer Valley Limited
Argo Summer Valley
300054371

Date: 5-May-2023
Revision: 1
Completed By: EDT / MR
Checked By: LN

BASE FIRE FLOW
An estimate of the fire flow for a given area may be determined by the formula:

F = 220 x C x sqrt(A)

where
F = the required fire flow in litres per minute
C = coefficient related to the type of construction
A = the total floor area in square metres (including all stories, but excluding basements at least 50% below grade) of the building considered

Proposed Homes/buildings:

C = 1.0 Ordinary construction
2 storey
200 m² footprint
A = 400 m² total floor area

F = 220 x 1 x sqrt(400)
= 4,400.00 L/min

Type of Construction Co-efficients

0.6	Fire-resistive construction
0.8	Non-combustible construction
1.0	Ordinary construction
1.5	Wood frame construction

OCCUPANCIES
Values may be reduced by as much as 25% for occupancies have low fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard. See Notes tab for examples of Occupancies and Hazard rankings.

Non-combustible	-25%
Limited combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Occupancy dwellings:	Limited combustible	-15%

F_o = F + F x (Occupancy factor)
= 4400 + 4400 x -0.15
= 3740.00 L/min

Note: The fire flow shall not be less than 2,000 L/min

SPRINKLERS
Fire flow may be reduced up to 50% for automatic sprinkler systems (enter as positives)

Base Sprinkler reduction	0%	Adequately design system conforming to NFPA 13 and other NFPA standards (max 30%)
Standard Credit	0%	Additional credit if the water supply is standard for both system and fire department hose lines required (max 10%)
Supervision Credit	0%	Additional credit if the system is supervised, including water flow and control valves (max 10%)
Total Reduction	**0%**	

$F_1 = F_o - (F_o \times 0)$
= 3740 - (3740 x 0)
= 3740.00 L/min

EXPOSURE
To the value obtained above, a percentage should be added for structures exposed within 45m by the fire area under consideration.
The percentage shall depend upon height, area, and construction of the building(s) being exposed, the separation, openings in the exposed buildings, length and height of exposure, and provision of automatic sprinklers and/or outside sprinklers in the buildings, the occupancy of the exposed buildings, and the effect of hillside locations on the possible spread of fire.
The charge in general for any one side should not exceed the following limits for separation. (see Exposure on the Notes tab)

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%
30.1 to 45 m	0%

Exposure	Type	Distance (m)	Charge	
North	Adjacent Dwelling	1	25%	
South	Adjacent Dwelling	1	25%	
East	Adjacent Dwelling	10	20%	
West	Adjacent Dwelling	22	10%	
		Total	**75%**	The total percentage shall not exceed 75%

$F_2 = F_1 - (F_o \times 0.75)$
= 3740 + (3740 x 0.75)
= 6,545.00 L/min

Note: The fire flow shall not exceed 45,000 L/min or be less than 2,000 L/min

Fire Flow Required = 7,000 L/min (Rounded to the nearest 1,000 L/min)
Fire Flow Required = 117 L/s
Average Area per hydrant = 13,500 m² (Interpolated from chart below)
Required Duration = 2.00 hours (Interpolated from chart below)

Standard Hydrant Distribution

Fire Flow required (L/min)	Average Area per Hydrant (m²)
2,000	16,000
4,000	15,000
6,000	14,000
8,000	13,000
10,000	12,000
12,000	11,000
14,000	10,000
16,000	9,500
18,000	9,000
20,000	8,500
22,000	8,000
24,000	7,500
26,000	7,000
28,000	6,500
30,000	6,000
32,000	5,500
34,000	5,250
36,000	5,000
38,000	4,750
40,000	4,500
42,000	4,250
44,000	4,000
46,000	3,750
48,000	3,500

Required Duration of Fire Flow

Fire Flow required (L/min)	Duration (hours)
2,000	1.00
3,000	1.25
4,000	1.50
5,000	1.75
6,000	2.00
8,000	2.00
10,000	2.00
12,000	2.50
14,000	3.00
16,000	3.50
18,000	4.00
20,000	4.50
22,000	5.00
24,000	5.50
26,000	6.00
28,000	6.50
30,000	7.00
32,000	7.50
34,000	8.00
36,000	8.50
38,000	9.00
40,000	9.50

Argo Summer Valley Water Demand Calculations

Prepared by:	EDT / MR
Checked by:	LN
Project No:	300054371
Date:	5/8/2023

Assumptions

Average Per Capita Water Consumption	280	L/cap/day	Region of Peel Public Work Watermain Design Criteria (June 2010)
Maximum Day Factor	2		Region of Peel Public Work Watermain Design Criteria (June 2010)
Peak Hour Factor	3		Region of Peel Public Work Watermain Design Criteria (June 2010)

Housing Summary	#	Persons Per Unit	Population
Single Detached	65	4.202	273
TOTAL	65		273

Average Day Demand	0.89	L/s	76.48	m3/day
Maximum Day Demand	1.77	L/s	152.95	m3/day
Peak Hour Demand	5.31	L/s	458.86	m3/day

novus
Fire Protection Consulting Inc.

October 27, 2022

sam.breen@rjburnside.com

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6

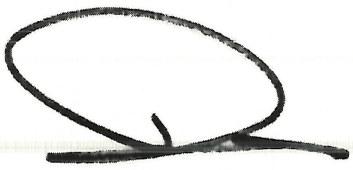
Attention: Mr. Sam Breen, Engineering Assistant

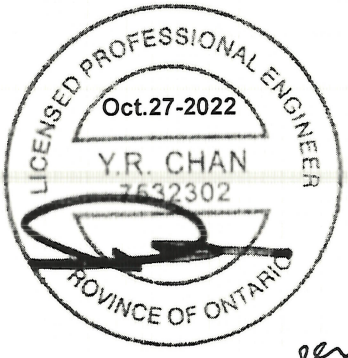
RE: HYDRANT FLOW TEST
HIGHWOOD ROAD AND DONHERB CRESCENT
BRAMPTON, ONTARIO
OUR PROJECT NO.: 22-370

As requested, hydrant water flow tests were performed at Highwood Road and Hurontario Street, Brampton by our Mr. P. Galsim on October 18th, 2022 at 2:00 p.m. and the following results were recorded. See attached.

Yours truly,

NOVUS FIRE PROTECTION CONSULTING INC.





Y.R. Chan, P. Eng.

YC:tc

Attach(s).

per Performed by: P. Galsim

c.c.: Ms. Lorena Niemi (Lorena.Niemi@rjburnside.com)
Mr. Edward Tjeerdsma (Edward.Tjeerdsma@rjburnside.com)
Mr. Aniceto Raposo (aniceto@novusfire.com)
Mr. Dominic Aversa (aversa@novusfire.com)
Mr. Pedro Galsim (pgalsim@novusfire.com)

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Fire Protection Consulting Inc.

JOB NO: 22-370

MAP PAGE: 574 LOC: B-2 MAPART EDITION: 2007
STREET: HIGHWOOD ROAD NO: 26
CROSS STREET: HURONTARIO STREET
CITY: BRAMPTON
TEST BY: NOVUS TIME: 2:00 PM DATE: OCT. 18/22

TEST DATA

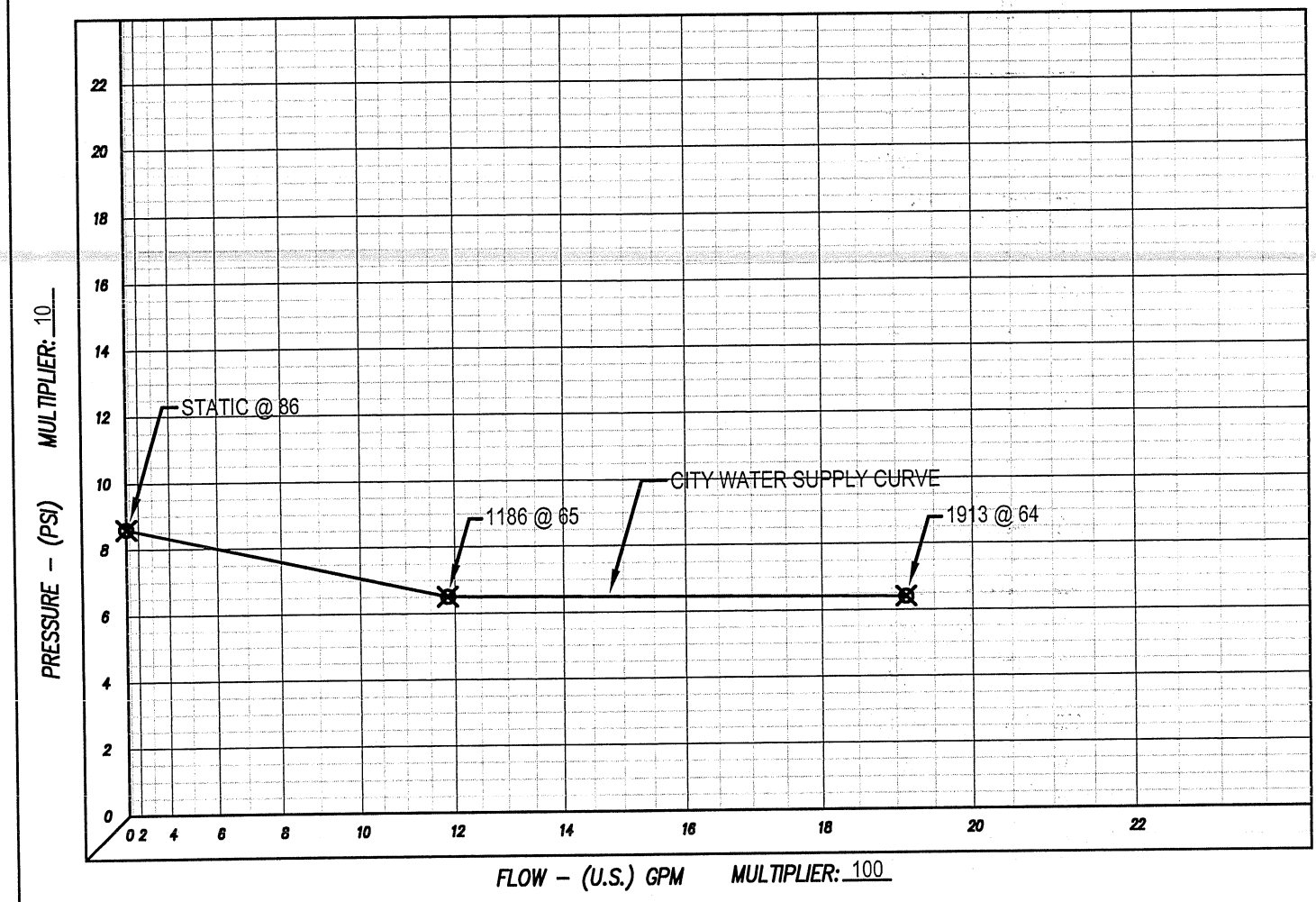
STATIC PRESSURE: 86 psi

Flow #1	1186	gpm (US)	65	psi
Flow #2	1913	gpm (US)	64	psi
Flow #3		gpm (US)		psi
Flow #4		gpm (US)		psi
Flow #5		gpm (US)		psi

PUMP DATA

CHURN PRESSURE: _____ psi

Flow #1		gpm (US)		psi
Flow #2		gpm (US)		psi
Flow #3		gpm (US)		psi
Flow #4		gpm (US)		psi
Flow #5		gpm (US)		psi



novus
Fire Protection Consulting Inc.

JOB NO: 22-370

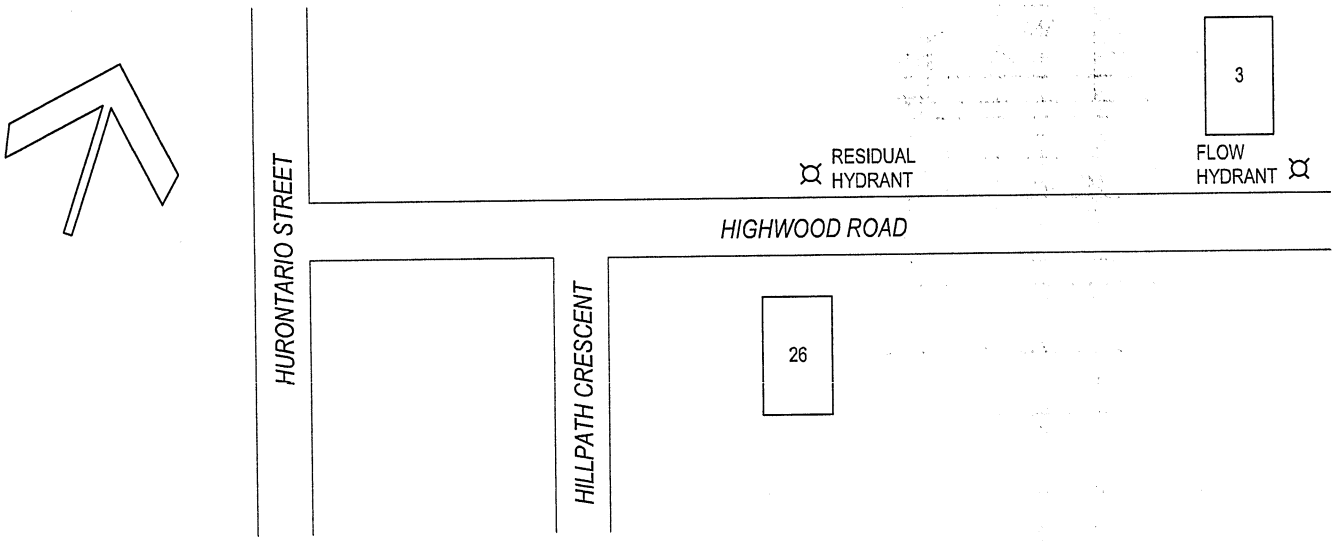
MAP PAGE: 574 LOC: B-2 MAPART EDITION: 2007
STREET: HIGHWOOD ROAD NO: 26
CROSS STREET: HURONTARIO STREET
CITY: BRAMPTON
TEST BY: NOVUS TIME: 2:00 PM DATE: OCT. 18/22

STATIC PRESSURE: 86 psi

TEST #	No. OF OUTLETS	ORIFICE SIZE	PITOT READING	FLOW (USGPM)	TOTAL FLOW (USGPM)	RESIDUAL PRESSURE (PSI)	HYDRANT TYPE	HYDRANT COEFF.
1	1	2 1/2	50	1186	1186	65		-
2	2	2 1/2	32+33	949+964	1913	64		-
3								
4								

WATER MAIN DATA:-
DIAMETER: 12"
TEST HYDRANT LOCATION
FLOW: 3 HIGHWOOD ROAD
FLOW:
RESIDUAL: 26 HIGHWOOD ROAD

COMMENTS: SPECIAL CONDITIONS



R.J. Burnside & Associates Limited