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.:
Region of Peel File No.: T-22011Ba
Region of Peel File No.: T-22005Ca

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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

R.J. Burnside & Associates Limited

Report Prepared By:

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

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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.

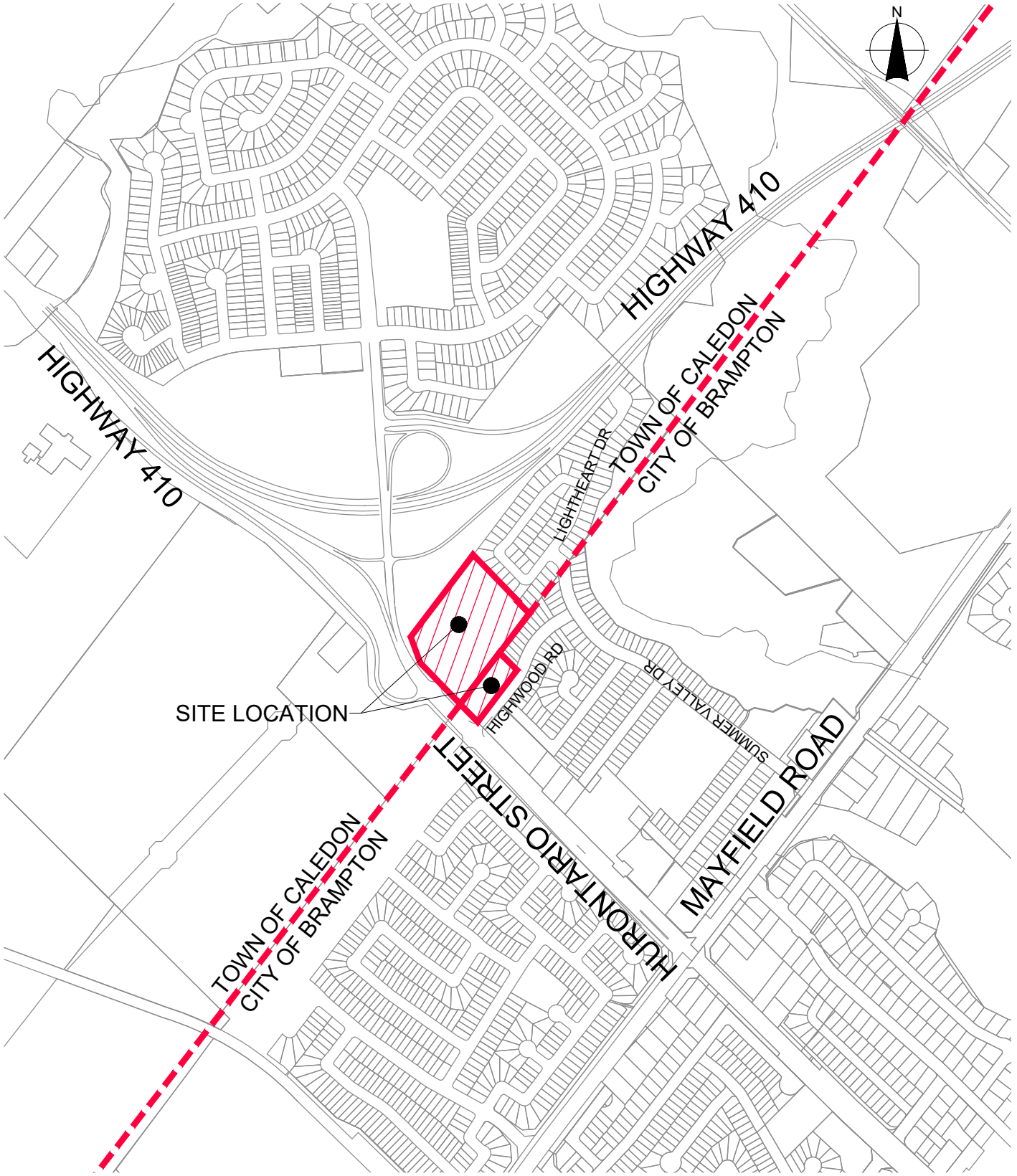

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Figure Title

ARGO SUMMER VALLEY

SITE LOCATION PLAN

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/05/30	**FIG 1**
Scale		Project No.	
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File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\0543371 - SITE LOCATION PLAN - FIG 1.dwg Date Plotted: May 30, 2023 - 12:59 PM

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Figure Title

ARGO SUMMER VALLEY

EXISTING SITE CONTEXT

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
KT	LN	23/05/30	**FIG 2**
Scale		Project No.	
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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 12211-12233 Hurontario Street, Caledon, Geotechnical Investigation, EXP Services Inc., February 4, 2022 (Revised May 18, 2022).
- 12197 Hurontario Street, Brampton and 12211-12233 Hurontario Street, Caledon, Hydrogeological Investigation and Water Balance Assessment, EXP Services Inc., June 8, 2022.

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 4.

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 May 2022. 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.

3.2 Groundwater Conditions

As part of the Geotechnical Investigation, monitoring wells were installed in 4 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 1 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.

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.

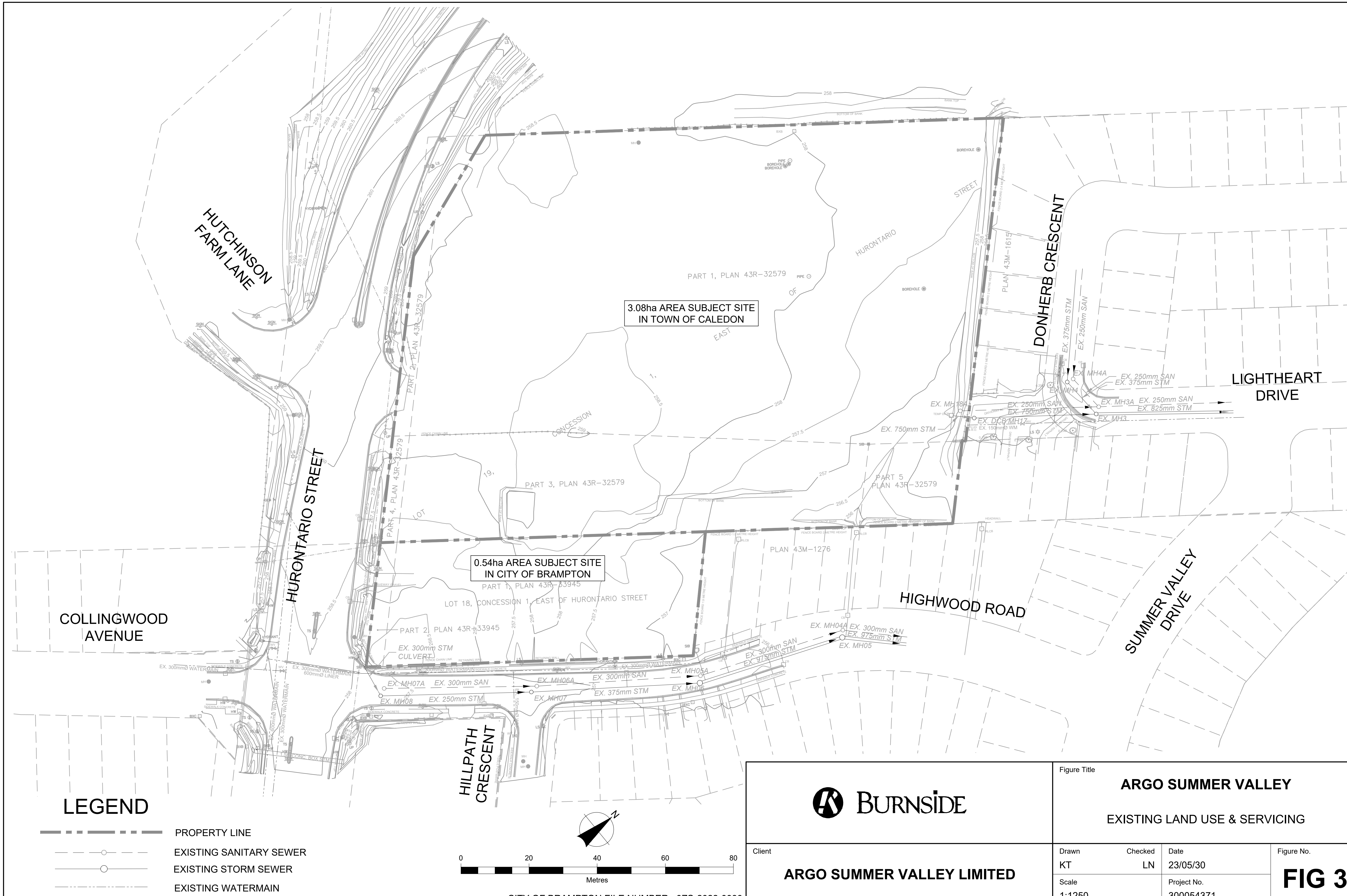

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Figure Title

ARGO SUMMER VALLEY

EXISTING LAND USE & SERVICING

Client	Drawn	Checked	Date	Figure No.
ARGO SUMMER VALLEY LIMITED	KT	LN	23/05/30	**FIG 3**
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4.0 Proposed Development

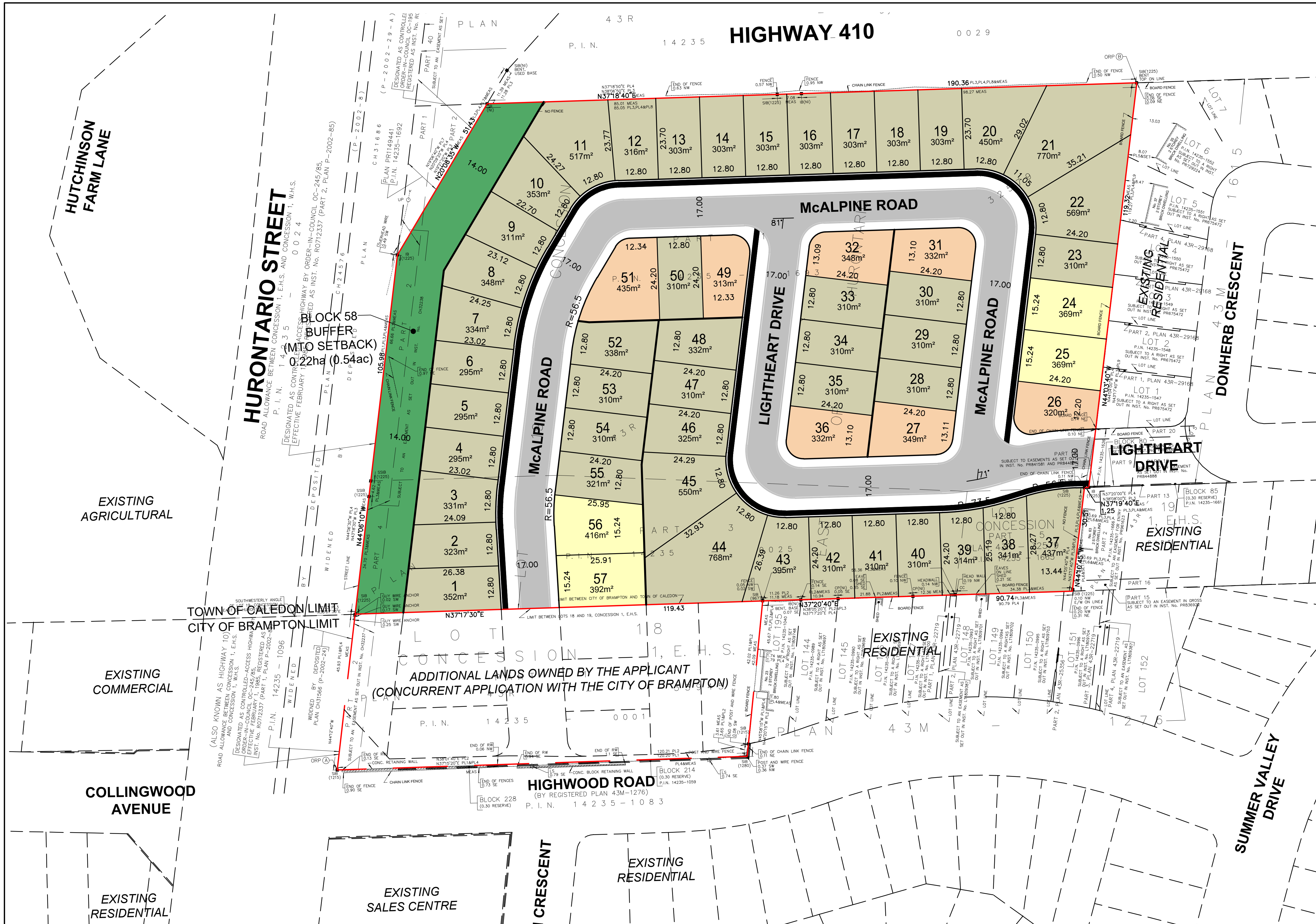
The Summer Valley DPOS has been prepared by Glenn Schnarr and Associates Inc. and is included as Figure 4. The DPOS features a mix of residential areas, buffer (MTO setback), and required road allowances and widenings.

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	0.07	2	4.202	8.40
Detached – 12.80 m	0.04	1	4.202	4.20
Detached – 15.24 m	0.27	5	4.202	21.0
Buffer (MTO Setback)	0.05			
Road Widening	0.04			
17.0 m ROW (length 43 m)	0.08			
Subtotal	**0.54**	**8**		**34 (33.6)**
Town of Caledon				
Detached – 12.20 m	0.25	7	4.202	29.41
Detached – 12.80 m	1.64	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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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
OPEN SPACE (MTO SETBACK)	58	0.22	0.54		
17.0m LOCAL R.O.W. (LENGTH: 470m)		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

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Client
ARGO SUMMER VALLEY LIMITED

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

Drawn	Checked	Date	Figure No.
KT	LN	23/05/30	FIG 4A
Scale		Project No.	
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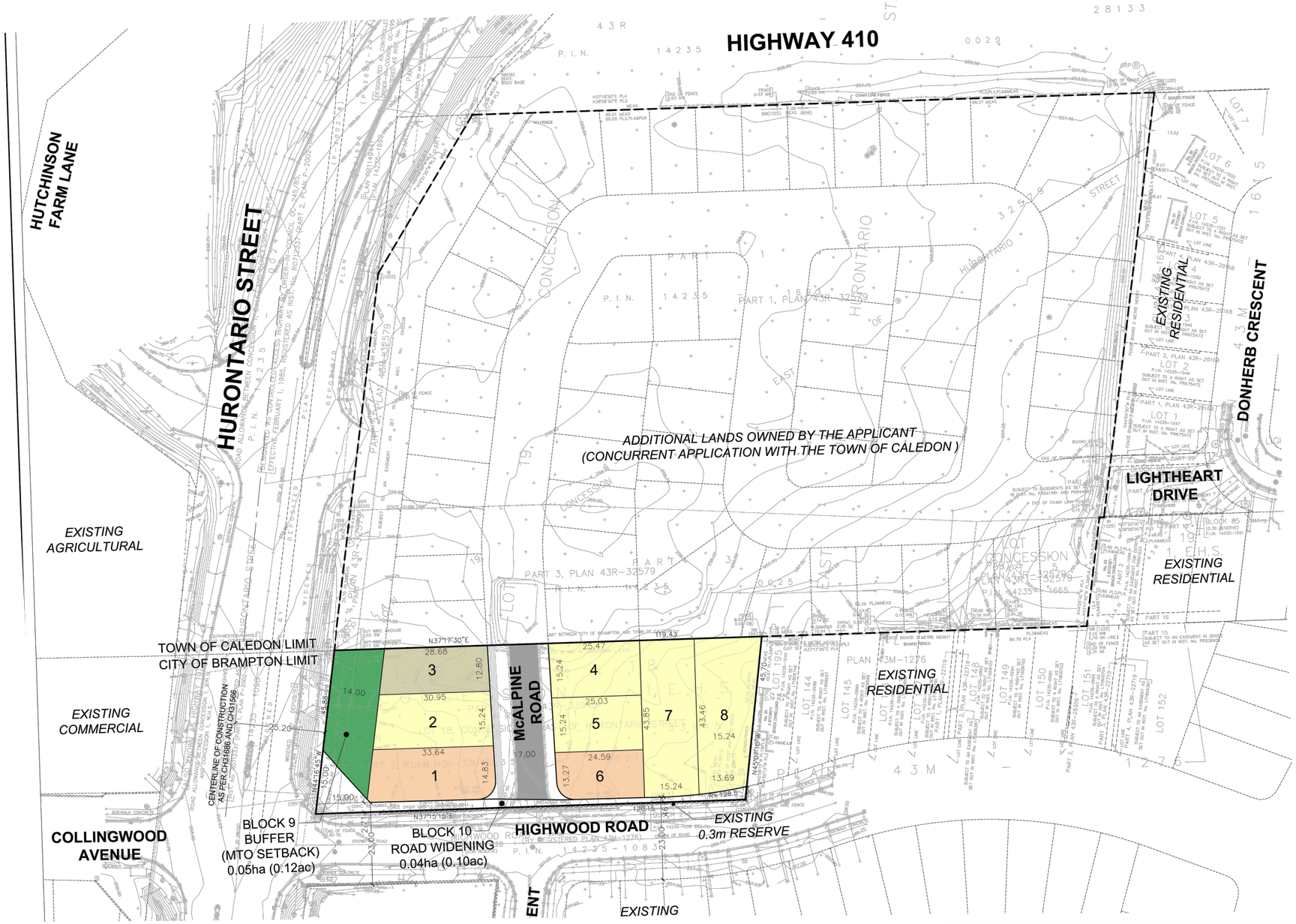

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LAND USE SCHEDULE

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

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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	23/05/30	FIG 4B
Scale		Project No.	
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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 litres 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 3 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.

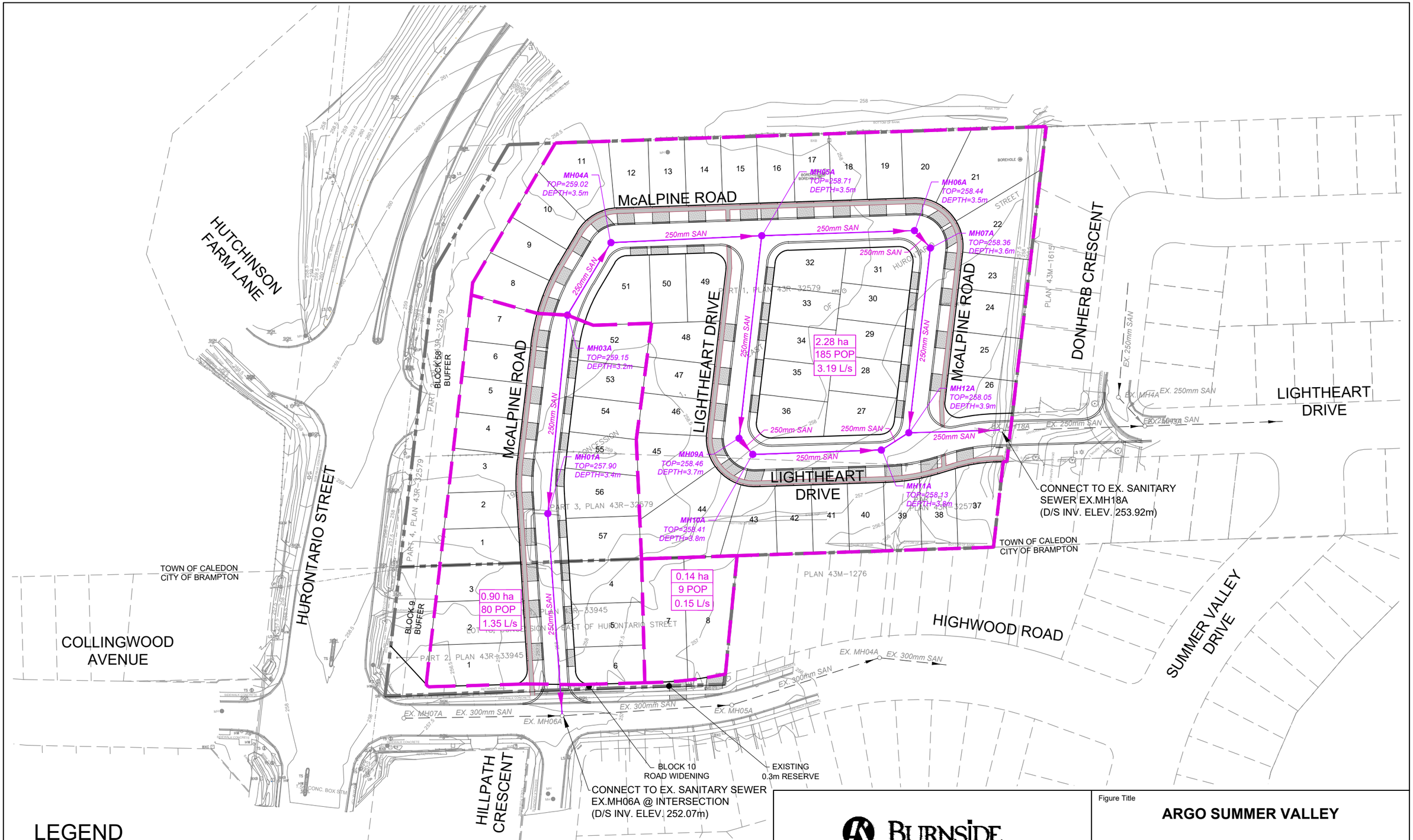
The remainder of the subject site will drain to the existing sanitary sewer on Lightheart Drive and the trunk on Summer Valley Drive. The total drainage area falls within the planned capacity of the Summer Valley Drive trunk system with a density of 50 ppha equivalent to 115 people. The proposed catchment 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.



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- 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

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Figure Title
ARGO SUMMER VALLEY
PROPOSED SANITARY SERVICING PLAN

Client
ARGO SUMMER VALLEY LIMITED

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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 litres 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

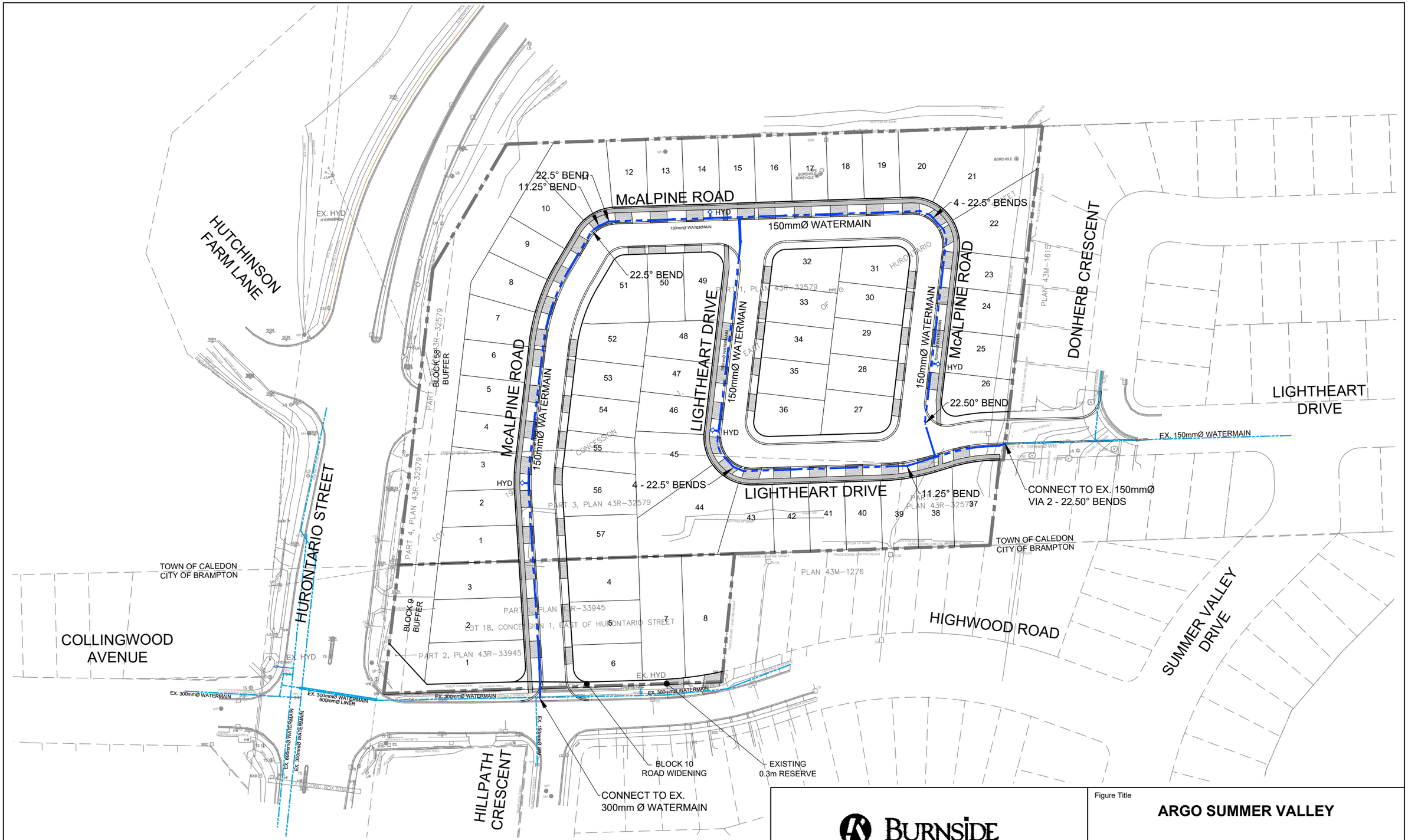
The proposed water servicing of the subject property includes two connections to the existing municipal water system, one to the 300 mm main on Highwood Road and one at the plug of the 150 mm main extended from Lightheart Drive. The proposed connections create a looped system for the proposed development. 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 4 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 cu.m/day
Maximum Day Demand	1.77 L/s or 152.95 cu.m/day
Peak Hour Demand	5.31 L/s or 458.86 cu.m/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.



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- PROPERTY LINE
- EXISTING WATERMAIN
- PROPOSED WATERMAIN

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Figure Title

ARGO SUMMER VALLEY

PROPOSED WATERMAIN DISTRIBUTION

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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.

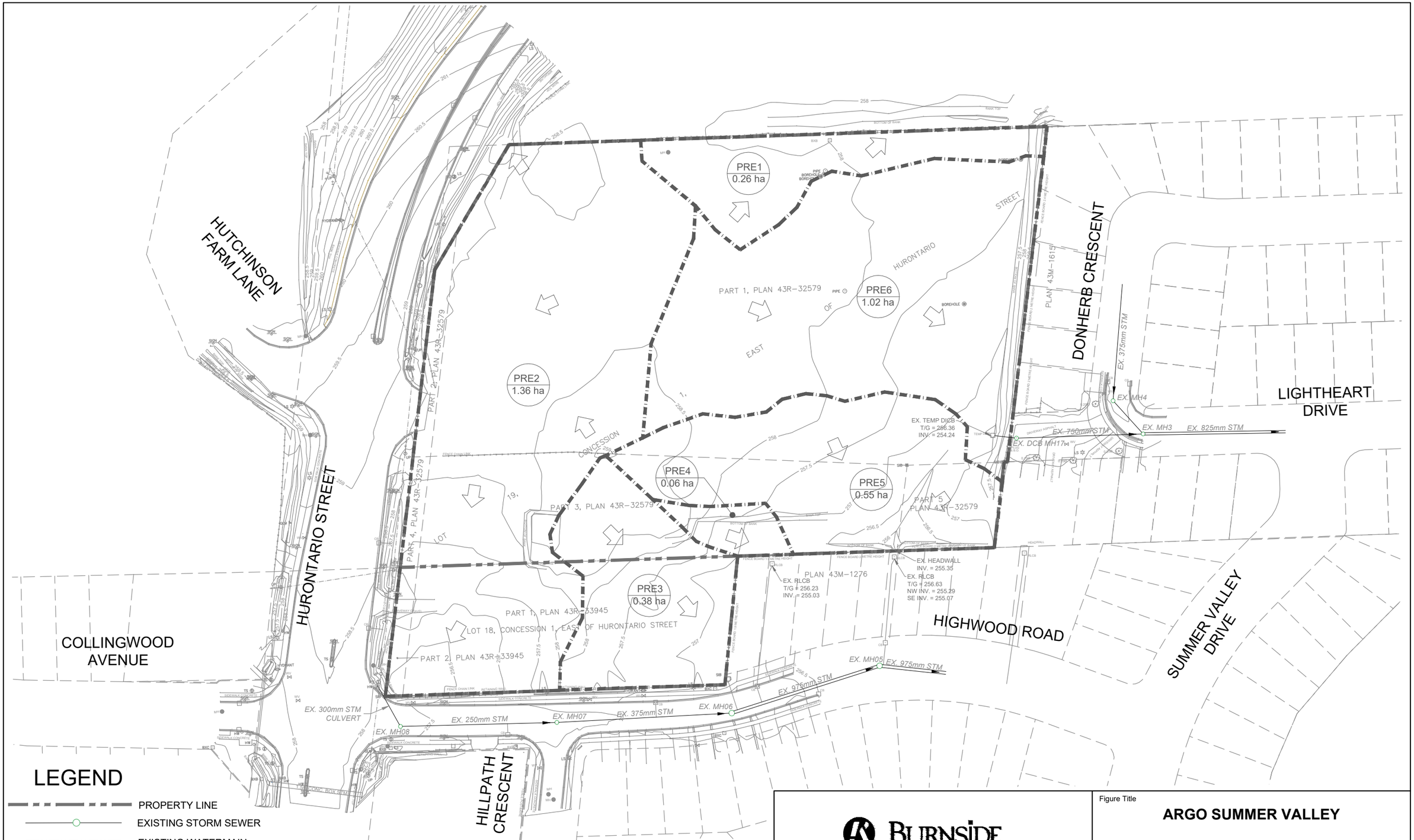
Along the south property limits, there is an existing 375 mm diameter storm sewer on Highwood Road along the frontage of the subject site which drains to a 975 mm storm sewer immediately downstream of the site. The storm sewer on Highwood Road discharges into the 1,350 mm diameter storm trunk on Summer 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 253.21 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. 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 is situated at 253.92 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 lots 151 and 152, with discharge to the storm sewer on Highwood Road at EX.MH04A.

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.



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

0 25 50 75 100 Metres

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	23/05/30	**FIG 7**
Scale: 1:1250		Project No.: 300054371	

File: \\MONTY\Shared Work Areas\054371 - Argo Summer Valley\07_Figures\054371 - PRE DEVELOPMENT CONDITIONS.dwg Date Plotted: May 30, 2023 - 1:07 PM

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**

8.3 Grading and Drainage Design Criteria

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.

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.

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. 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 525 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.

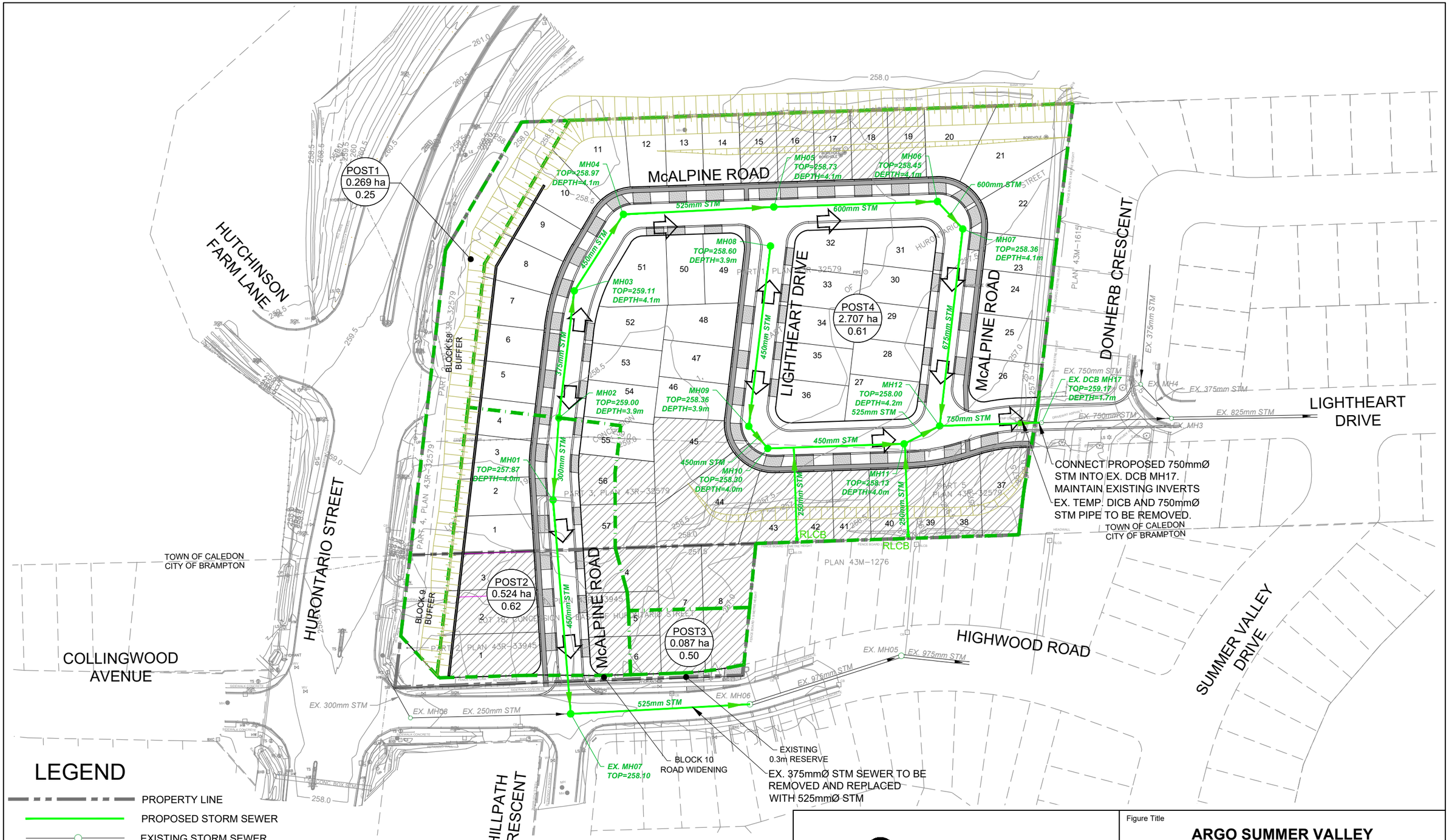
Table 6: Hurontario Storm Flows

Catchment	2yr	5yr	10yr	25yr	100yr
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 existing sewer is designed to convey both the major and minor flows to the existing storm sewer system. The 100-year capture points will be identified as part of the detailed design work. 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 basement connections. The major system flow will be conveyed via the ROW to the designated outlets.



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

Figure Title: **ARGO SUMMER VALLEY**

PROPOSED DRAINAGE AND STORM SERVICING PLAN

Client: **ARGO SUMMER VALLEY LIMITED**

Drawn	Checked	Date	Figure No.
KT	LN	23/05/30	**FIG 8**
Scale: 1:1250		Project No.: 300054371	

File: \\MONTY\Shared Work Areas\054371 - Argo Summer Valley\07_Figures\054371 - POST DEVELOPMENT CONDITIONS.dwg Date Plotted: May 30, 2023 - 1:08 PM

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 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.

The existing facility was reviewed to confirm sufficient accommodation for the proposed development in the sections following.

9.2.1 Stormwater Quality Control

Based on a review of the Donal JV stormwater management report, the existing stormwater management pond sufficiently services 27.226 ha of drainage area at a runoff coefficient of 0.50 or equivalent impervious area of 43%. The permanent pool provided in the existing facility is 1,594 m^3 and the required permanent pool for the noted area is 1,579 m^3, which includes treatment for a 0.54 ha portion of the subject site at 43% impervious. The existing facility is insufficiently sized to provide quality control for the entirety of the proposed development, however, the available constructed capacity in the pond will be part of a proposed treatment train approach for the site.

The target TSS removal efficiency of 80%, for Level 1 quality control, is proposed to be achieved through a number of measures to be implemented in the development as follows:

- Inclusion of extra depth topsoil within the grassed areas to provide infiltration of the 5 mm runoff event.
- Installation of CB Shield in the catch basin inlets throughout the development site.

- Installation of an Oil Grit Separator upstream of each of the proposed connection points to the existing storm system.
- Utilization of the design / constructed capacity within the existing SWM facility.

The tables below provide a summary of the proposed quality treatment measures for the subject site and the associated TSS removal rates.

Table 7: Proposed Treatment Train Lightheart Connection

Sub catchment Description	Area (ha)	Control Type TSS Removal Efficiency				Total Eff.
		Infiltration	CB Shield	OGS	SWM Pond	
POST 4						
Pervious Area	0.84	80%	0%	50%	0%	90%
Roof/Driveway	12.7	0%	50%	50%	0%	75%
ROW	0.6	0%	50%	50%	0%	75%
Total	2.71					80%

Table 8: Proposed Treatment Train Highwood Road Connection

Sub catchment Description	Area (ha)	Control Type TSS Removal Efficiency				Total Eff.
		Infiltration	CB Shield	OGS	SWM Pond	
POST 2a						
Pervious Area	0.09	80%	0%	50%	70%	97%
Roof/Driveway	0.18	0%	50%	50%	70%	93%
ROW	0.08	0%	50%	50%	70%	93%
POST 2b						
Pervious Area	0.04	80%	0%	50%	0%	90%
Roof/Driveway	0.09	0%	50%	50%	0%	75%
ROW	0.04	0%	50%	50%	0%	75%
POST 3						
Pervious Area	0.03	80%	0%	0%	0%	80%
Roof/Driveway	0.06	0%	50%	0%	0%	0%
Total	0.61					80%

Catchment Post 2a is the equivalent portion of the drainage area that is accommodated in the constructed conditions of the existing SWM Pond, designed to provide Level 2 quality control. The design area was prorated to reflect the increased imperviousness of the proposed conditions.

With the implementation of the above noted treatment train measures, the proposed site will meet the requirements for Level 1 quality control for both connection points.

9.2.1.1 Cash In Lieu Alternative

For a more comprehensive watershed solution, that could be implemented as part of an overall City stormwater management SWM retrofit/improvement program, an OGS could be introduced either immediately upstream or on the extended detention outlet

downstream of the existing stormwater management facility. This solution would provide additional polishing of the stormwater runoff, resulting in a net TSS removal efficiency of 83% for the entire subwatershed. Further, an OGS upstream of the pond would reduce the maintenance requirements on the facility. This comprehensive solution would eliminate the need for site-specific measures and provide a consolidated stormwater management system for the watershed. It is within the City's discretion to accept Cash In Lieu (CIL) for stormwater management at the established rate of $30,000 per developable hectare, the resultant contribution for the subject site would be $108,600.

In lieu of the implementation of site-specific OGS units and the CB Shield to an upstream portion of the catchment, as identified above, it is our recommendation that the City accept the CIL as a payment contribution to the overall City Stormwater Management Retrofit/Improvement Program which could implement the in-line, downstream OGS unit. The single OGS unit in combination with the existing stormwater management facility would provide more effective overall treatment and Level 1 water quality results for the entire subwatershed watershed discharging to Etobicoke Creek. The localized unit will reduce the operations and maintenance requirements for both the City and Town and effectively fulfil the intent of the CLI-ECA in a consolidated solution.

9.2.2 25 mm Extended Detention

The existing stormwater management pond has an available active storage of 3,407 m^3 for the provision of the 25 mm extended detention requirements for the drainage area. In the original pond design, the portion of the subject site within the City was accommodated in the facility as single family residential, with a runoff coefficient of 0.50 or 43% impervious. Through the development of the Donal JV lands adjacent to the subject property, the pond was confirmed to have sufficient capacity to accommodate the Donal JV lands with a surplus volume of 396 m^3.

The SCS method was applied to calculate the increased volume of runoff generated from the subject site during the 25 mm rainfall event. The calculations are based on the proposed development drainage areas and the associated imperviousness to each of the designated outlets, taking into account that a portion of the site has already been accommodated within the facility equivalent to 0.54 ha at 43% and 1.02 ha at 7% (equivalent to a runoff coefficient of 0.25). Detailed calculations for extended detention requirements are included in Appendix C.

Table 9: Proposed Development Extended Detention

Drainage Area Description	Area (ha)	Percent Imp.
Proposed Development Site	3.332	60%
Site Drainage Currently Accommodated in Pond (Highwood)	0.544	43%
Site Drainage Currently Accommodated in Pond (Lightheart)	1.021	7%
Increased Drainage to Pond	2.775	49%

Based on the increased area and impervious outlined above, the SCS method calculates that the site will generate 346 m^3 of runoff in the 25 mm event. This is within the available extended detention / active storage capacity of the facility; therefore, the pond is sufficiently sized to provide the required extended detention for the proposed development.

9.2.3 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.

9.2.4 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 100 m^3 of the calculated 166 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 9 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.

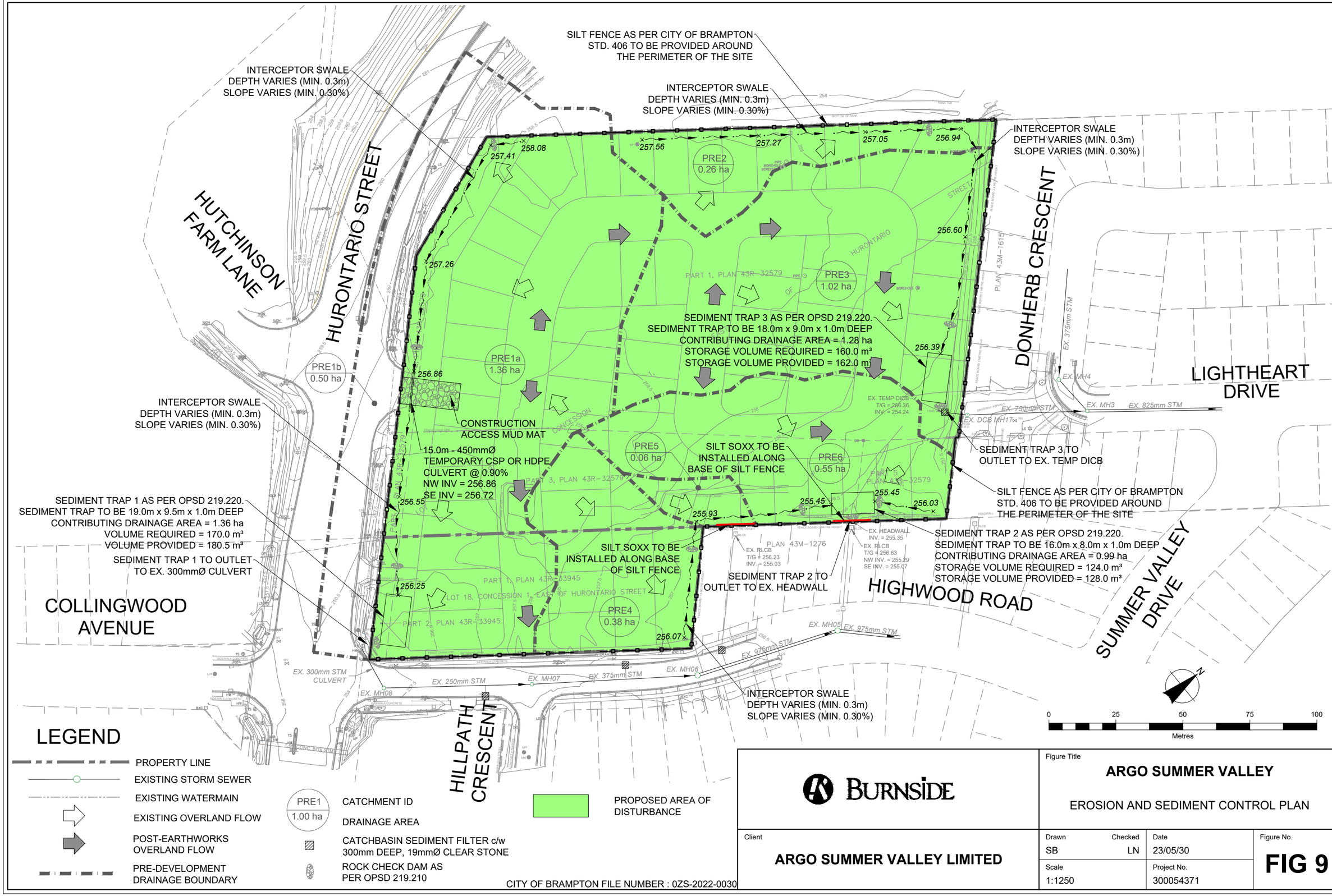
5. Removal of vegetative cover will be staged and restricted to a period immediately preceding the commencement of earth works in each stage.

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.



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

BURNSIDE

Figure Title

ARGO SUMMER VALLEY

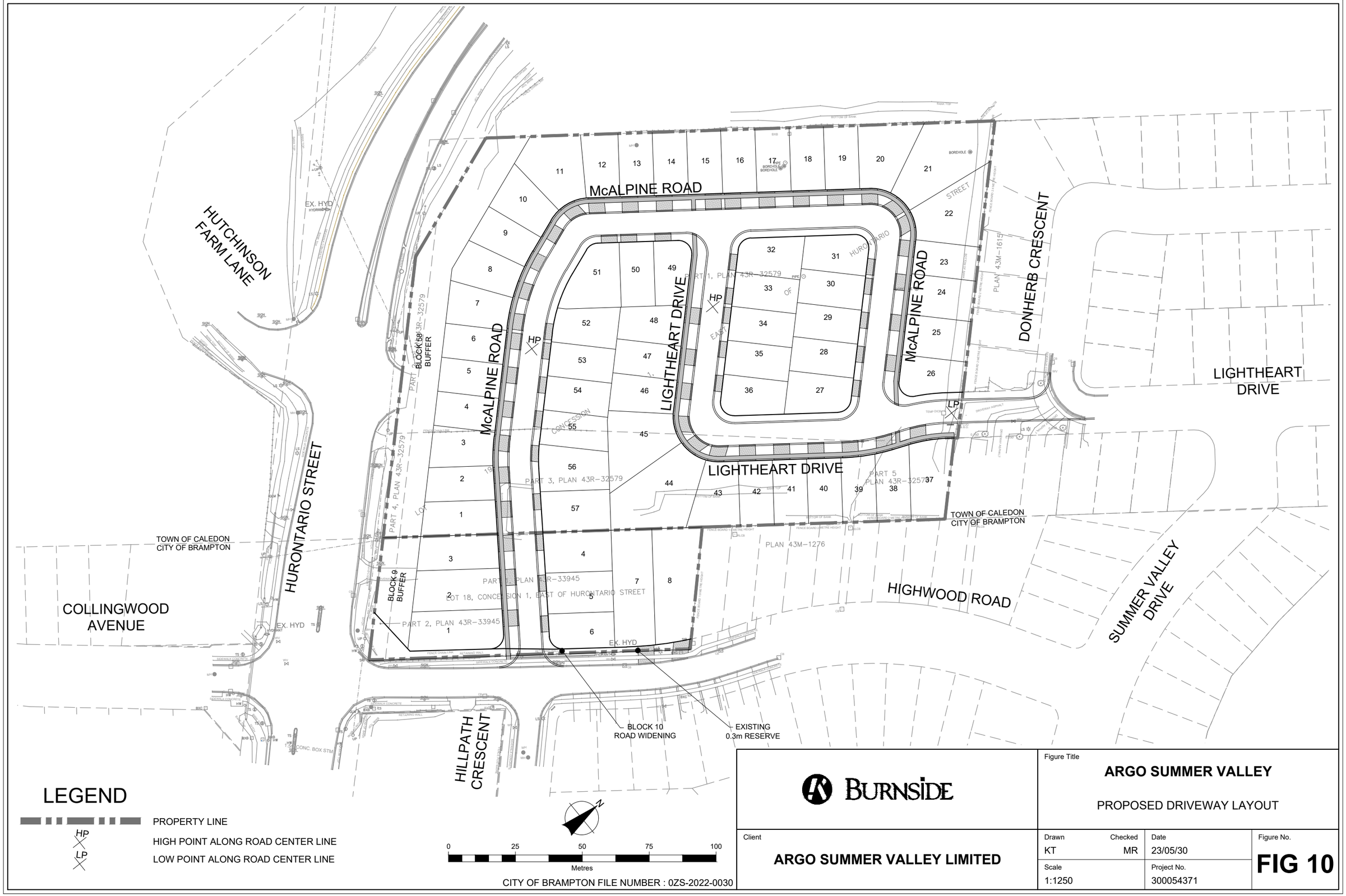
EROSION AND SEDIMENT CONTROL PLAN

Client

ARGO SUMMER VALLEY LIMITED

Drawn	Checked	Date	Figure No.
SB	LN	23/05/30	**FIG 9**
Scale		Project No.	
1:1250		300054371	

File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\0543371 - ESC.dwg Date Plotted: May 30, 2023 - 1:09 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	23/05/30	**FIG 10**
Scale		Project No.	
1:1250		300054371	

File: \\MONTY\Shared Work Areas\0543371 - Argo Summer Valley\07_Figures\0543371 - PROPOSED DRIVEWAY LAYOUT.dwg Date Plotted: May 30, 2023 - 1:10 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 525 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 implementation of extra depth topsoil, CB Shields, OGS units and utilizing the available capacity in existing stormwater management facility in the adjacent subdivision. The proposed measures result in achieving 80% TSS removal for the subject site.
- As an alternative to site specific quality control measures, a Cash In Lieu contribution to an overall stormwater management retrofit/improvement program, with the implementation of an in-line OGS enhancement to the existing SWM facility would achieve Level 1 quality control to the broader subwatershed, including the proposed development.

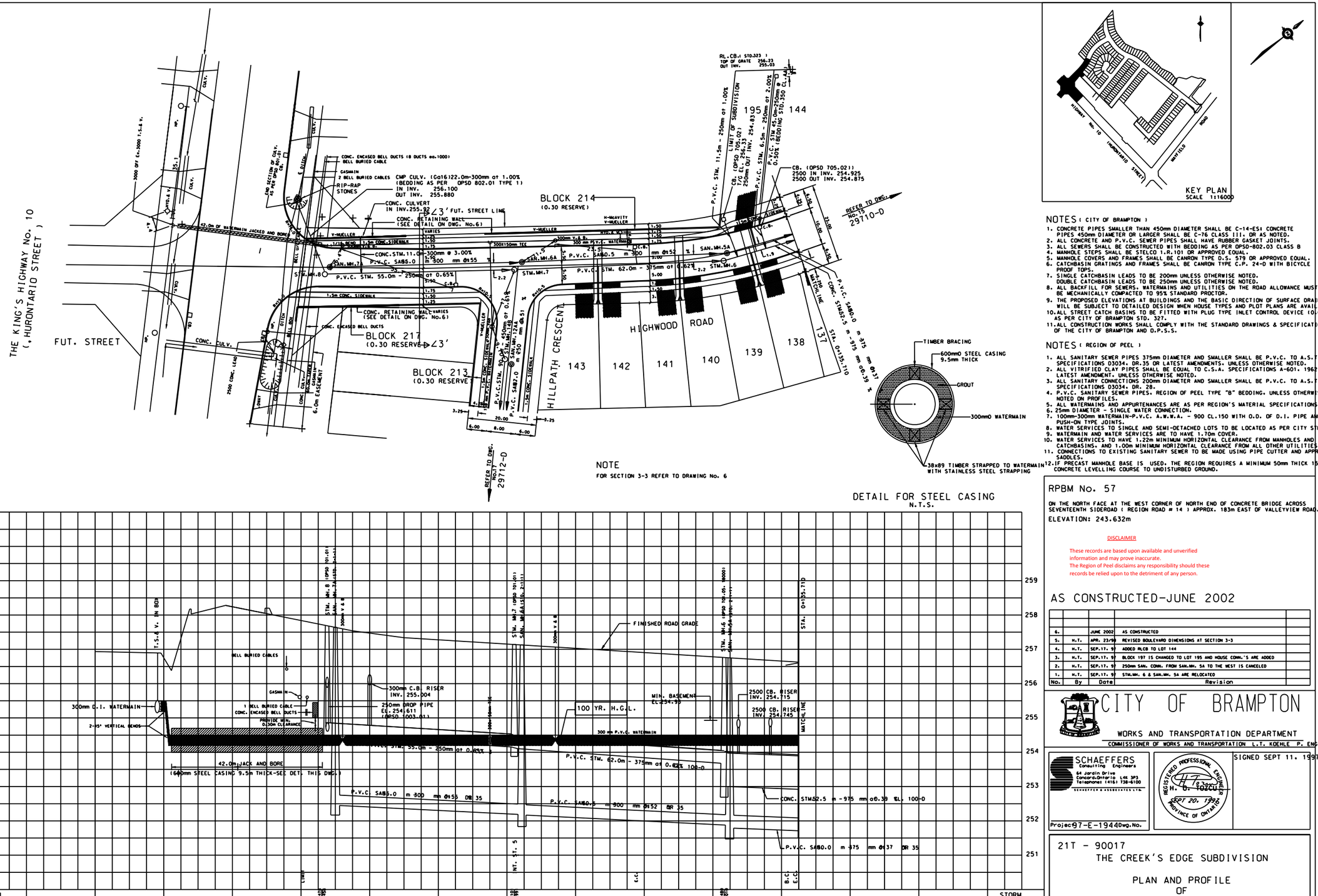
- The existing stormwater management pond is sufficiently sized to accommodate the increase in 25 mm runoff generated from the proposed development. The pond will provide sufficient erosion control for the DPOS development.
- ESC measures will be included in the detailed design, prior to the commencement of any earthworks activity.

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.

KEY PLAN
SCALE 1:16000

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-601. 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		

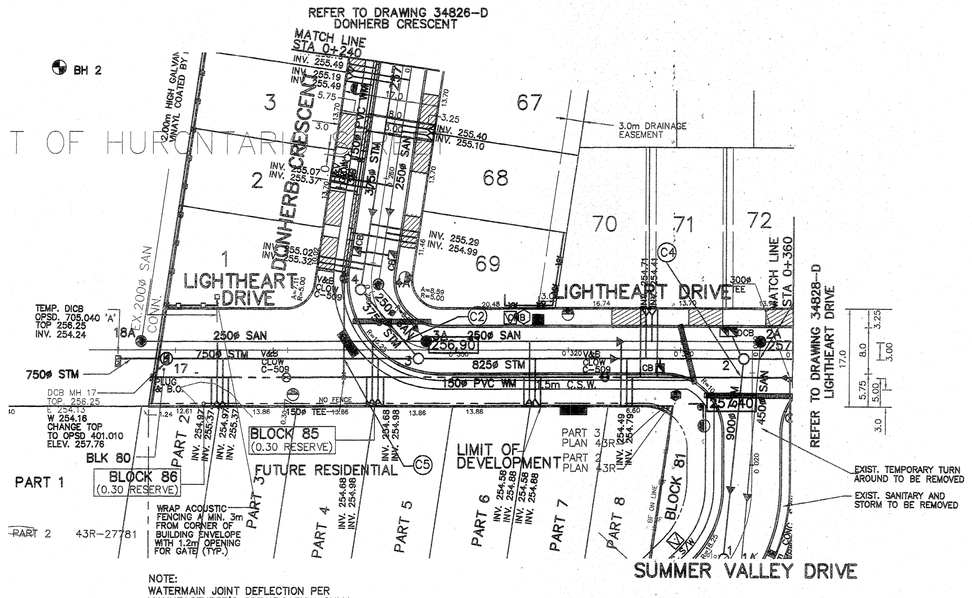
CONSTRUCTION NORTH

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.

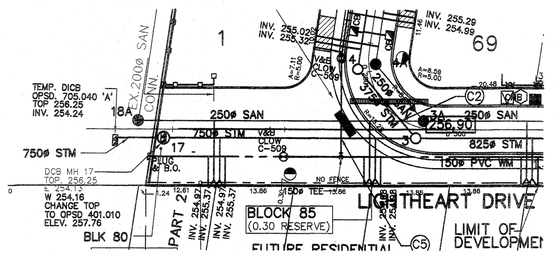
PAVEMENT DESIGN

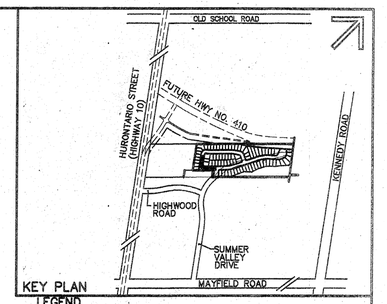
HL3 – 40mm
HL8 – 65mm
GRANULAR 'A' 150mm
GRANULAR 'B' 300mm



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

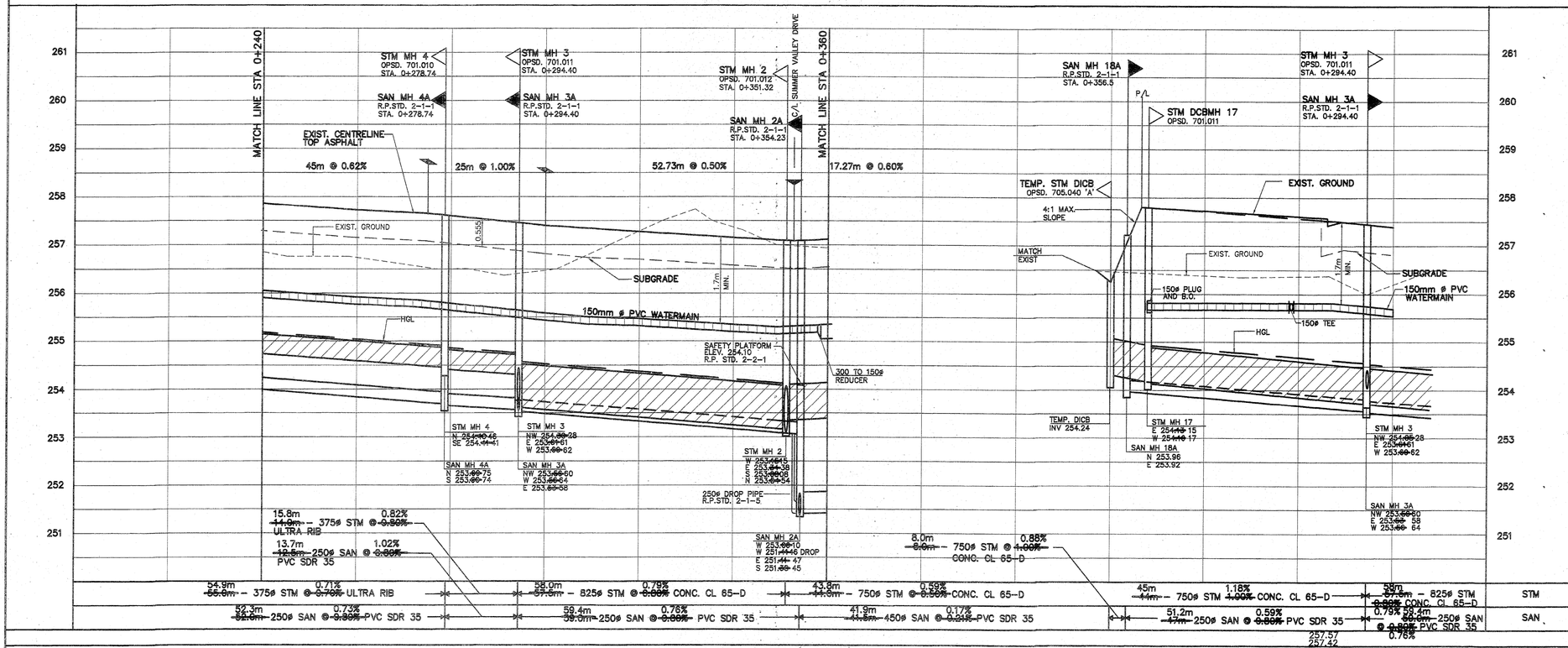
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM CATCHBASIN
- PROPOSED FIRE HYDRANT MODEL 33B, MANUFACTURER CLOW
- PROPOSED VALVE AND BOX/VALVE AND CHAMBER MODEL C-509, MANUFACTURER CLOW
- PROPOSED WATER SERVICE / PROPOSED SANITARY SERVICE / PROPOSED STORM SERVICE
- GALVANIZED STEEL 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 TOMASZ ZENTUK PROVINCE OF ONTARIO
APR 2 3 2008

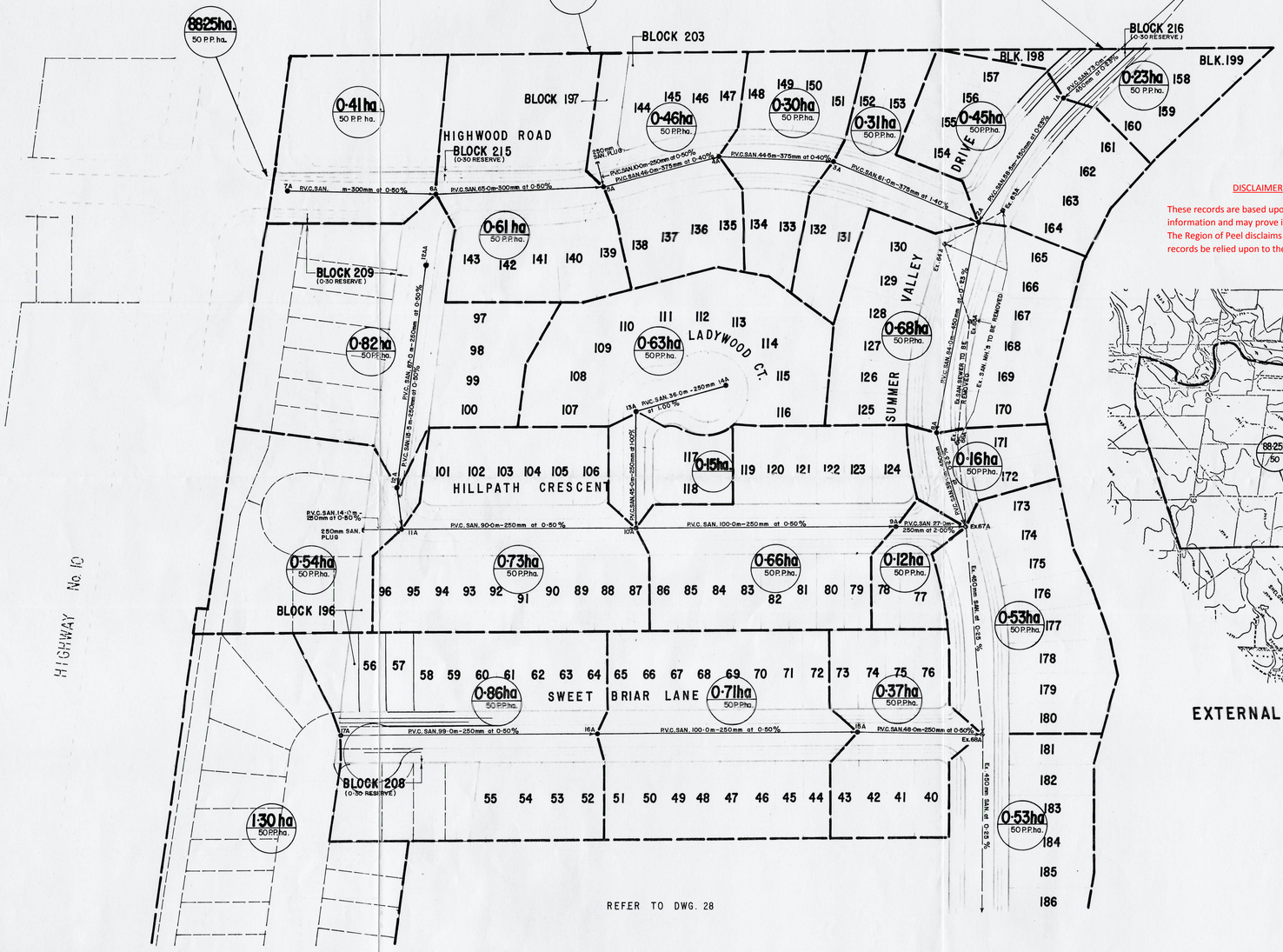
Charlton Engineering Limited
1140 Burnhamthorpe Road West, Suite 105, Mississauga, Ontario, L5C 4E9
Telephone: 905 896 7364 Fax: 905 896 9433

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

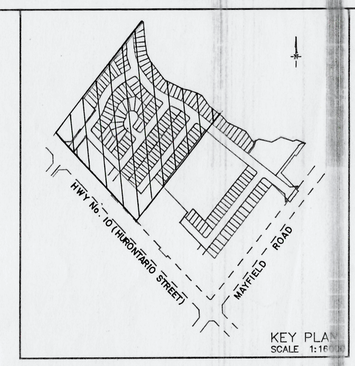
REGION OF PEEL
Town of Caledon

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

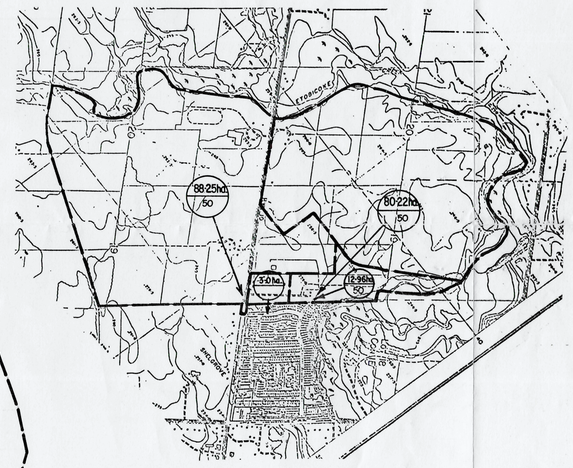


REFER TO DWG. 28



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.



EXTERNAL TRIBUTARY AREAS
SCALE 1: 15,000

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

PRINTED JUL 16

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

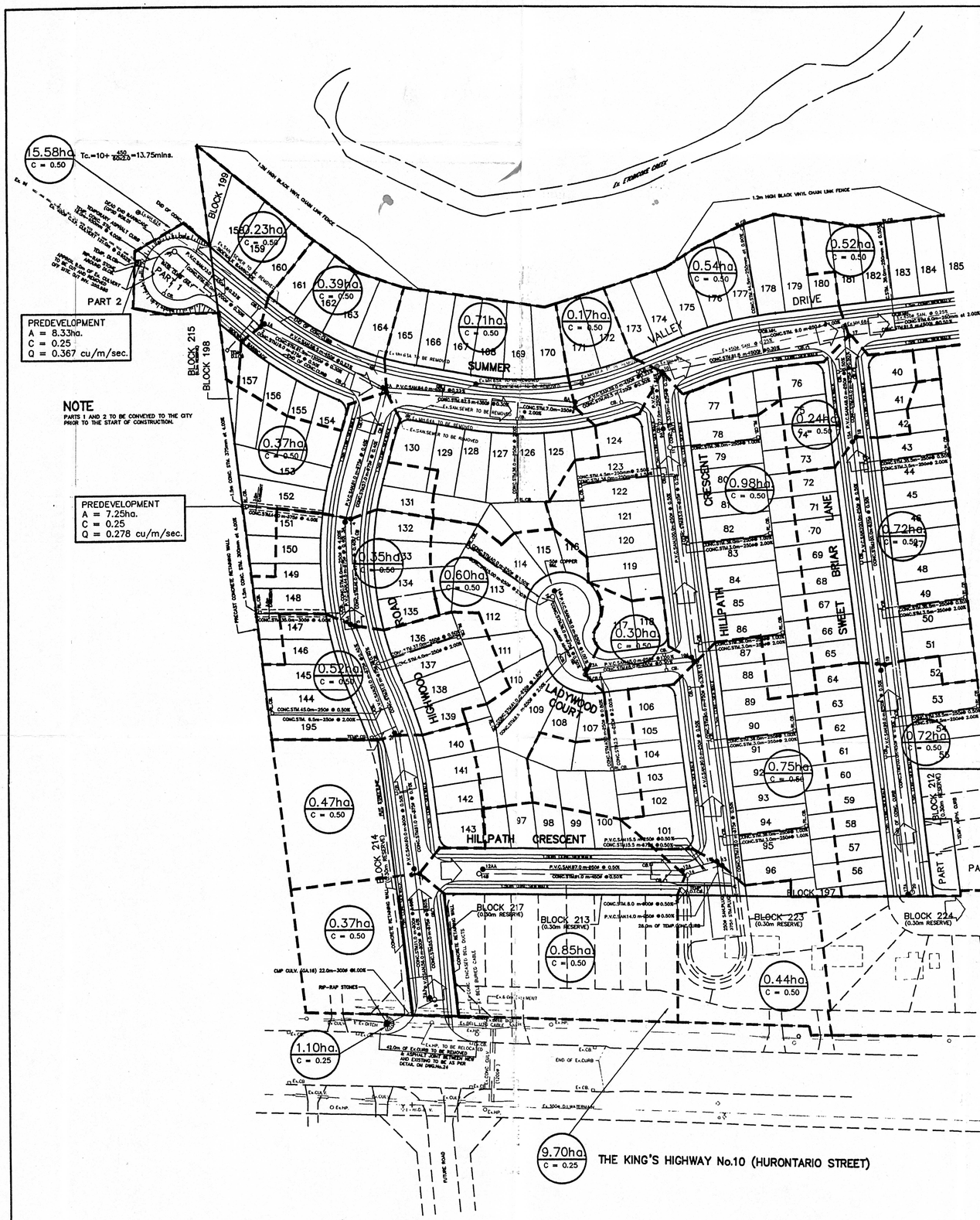
REGISTERED PROFESSIONAL ENGINEER — A. R. STEEDMAN — PROVINCE OF ONTARIO
REGISTERED PROFESSIONAL ENGINEER — H. O. TOZCU — PROVINCE OF ONTARIO

Project 97-E-1944 Dwg.No.

21T-90017B

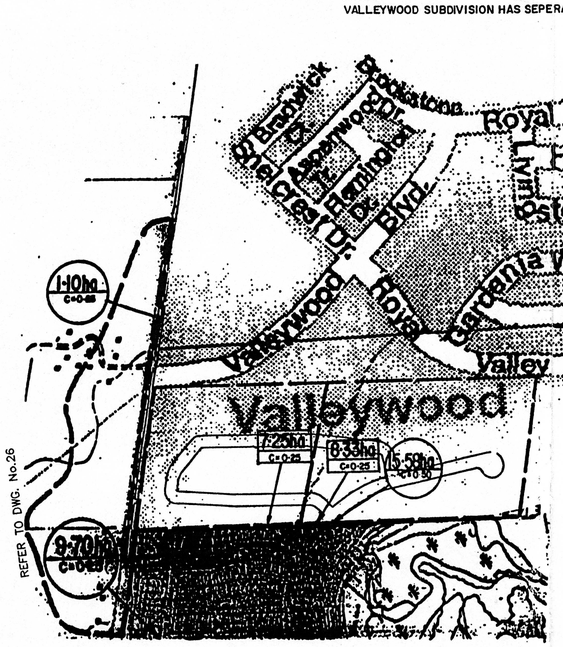
CREEK'S EDGE SUBDIVISION
SANITARY DRAINAGE PLAN
(PART I)

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		

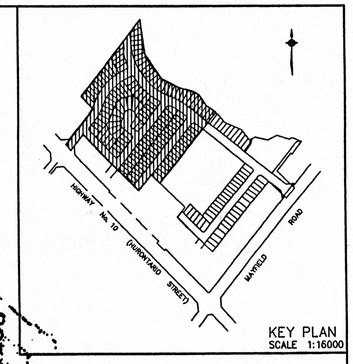


NOTE
PARTS 1 AND 2 TO BE CONVEYED TO THE CITY PRIOR TO THE START OF CONSTRUCTION.

NOTE
VALLEYWOOD SUBDIVISION HAS SEPERATE OUTFALL



EXTERNAL TRIBUTARY AREAS
SCALE 1:5000



KEY PLAN
SCALE 1:16000

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

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

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. TOZCU
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		

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Brampton STD200

NOTES:

1. LOCAL SOIL CONDITIONS MAY REQUIRE CHANGES IN THE DEPTHS OF MATERIALS TO BE PLACED.
2. FOR JOINT USE TRENCH DETAILS, SEE STD. No. 345.
3. BOULEVARD TO HAVE 150mm OF TOPSOIL AND 50mm OF SOD.
4. PAVEMENT STRUCTURE TO BE AS FOLLOWS:
   - 40mm HL3 ASPHALT
   - 65mm HL8 ASPHALT (80mm FOR ALL NEW SUBDIVISION ROADS)
   - 150mm GRANULAR "A" OR 130mm OF 20mm CRUSHER RUN LIMESTONE
   - 300mm GRANULAR "B" OR 225 mm OF 50mm CRUSHER RUN LIMESTONE
5. THE LOCATION OF THE LIGHTPOLE WILL DEPEND ON THE DESIGN SPEED AS OUTLINED IN THE ROADSIDE SAFETY MANUAL.

BRAMPTON
Flower City
brampton.ca

APPROVED: 2013/10/17

MINOR LOCAL

ORIGINAL: 8.0m PAVEMENT ON 17.0m R.O.W. 89/09/01

REV. 20

200

N.T.S

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Design Calculations

Project: **Argo Summer Valley**

Location: Town of Caledon/City of Brampton
Project #: 300054371
Designer: S. Breen
Date: 16-May-2023

Post-Dev Imperviousness / Runoff Coefficient Calculations

POST1 - HURONTARIO DRAINAGE SYSTEM
Total Area = 2692.0 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	2692.0	7%	188.4	
Impervious Area	0.0	100%	0.0	
	2692.0		7%	= I (comp)
		RC =	0.25	

POST2 - HIGHWOOD ROAD MH 7
Total Area = 5242.4 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	1900.0	7%	133.0	
Impervious Area:				
15.24m Lot Type	904.4	100%	904.4	
12.8x23m Lot Type	152.5	100%	152.5	
12.20m Lot Type	289.6	100%	289.6	
12.8x17m Lot Type	585.0	100%	585.0	
12.8x24.2m Lot Type	134.2	100%	134.2	
Rear-yard Ret. Wall	55.7	100%	55.7	
17.0m ROW (Imperv. Portion)	1221.0	100%	1221.0	
Total Impervious Area	3342.4		3342.4	
	5242.4		66%	= I (comp)
		RC =	0.66	

POST3 - HIGHWOOD ROAD DIRECT CONNECTIONS
Total Area = 870.9 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	326.6	7%	22.9	
Impervious Area:				
15.24m Lot Type	502.6	100%	502.6	
12.8x23m Lot Type	0.0	100%	0.0	
12.20m Lot Type	41.7	100%	41.7	
N/A	0.0	100%	0.0	
N/A	0.0	100%	0.0	
17.0m ROW (Imperv. Portion)	0.0	100%	0.0	
Total Impervious Area	544.3	100%	544.3	
	870.9		65%	= I (comp)
		RC =	0.66	

POST4 - LIGHTHEART DRIVE CONNECTION

Total Area = 27078.5 sq.m

Area ID	Area (sq.m)	Imperviousness	A x I	
Pervious Vegetated Area	11894.9	7%	832.6	
Impervious Area:				
15.24m Lot Type	619.4	100%	619.4	
12.8x24.2m Lot Type	4971.8	100%	4971.8	
12.20m Lot Type	1162.7	100%	1162.7	
12.8x17m Lot Type	2465.0	100%	2465.0	
N/A	0.0	100%	0.0	
N/A	0.0	100%	0.0	
N/A	0.0	100%	0.0	
N/A	0.0	100%	0.0	
17.0m ROW (Imperv. Portion)	5964.8	100%	5964.8	
Total Impervious Area	15183.6		15183.6	
	27078.5		59%	= I (comp)
		RC =	0.61	

Total Developed Drainage Area to Ex. Creek's Edge SWM Facility **33191.8 sq.m**
3.31918 ha

Average Imperviousness for Drainage to Ex. SWM Facility **60%**
Average Runoff Coefficient for Drainage to Ex. SWM Facility **0.62**

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. condit

Project: **Argo Summer Valley**

Location: City of Brampton/Town of Caledon
Project #: 300054371
Designer: S. Breen
Date: 16-May-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	13600	m^2	0.25

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	-120.5
100 year	51.3	-0.686	0.17	175.36 mm/hr	165.1	32.7	-132.4

Project: Argo Summer Valley
File: 300054371.0000
Designed by: S.Breen
Checked by: L.Niemi
Date: 16-May-23

BURNSIDE

PROPOSED CONDITIONS TO SWM FACILITY

Total Drainage Area= **300011.8** **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)

33191.8	DEVELOPED AREA

Total Area 3.32 ha

		Area
TIMP	60%	2.01 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=	**13.48 ha**	**Overall TIMP=**	**44.9 %**
Total XIMP=	**9.33 ha**	**Overall XIMP=**	**31.1 %**

Project: Argo Summer Valley
File: 300054371.0000
Designed by: S.Breen
Checked by: L.Niemi
Date: 16-May-23

Wet Pond Permament Pool Requirement

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

IMPERVIOUSNESS	44.93	%
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	44.93	124.82	3744.80
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	44.93	59.93	1797.93
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	44.93	27.45	823.43
55	35			
70	45			
85	55			
95.0	**62**	**Extrapolated**		

Project:	**Argo Summer Valley**
Project #:	300054371
Designed By:	L.Niemi
Date:	16-May-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 Single lot pervious areas to extra depth topsoil	0.84	80%	0%	50%	0%	90%
Post 4 Single lot impervious areas	1.27	0%	50%	50%	0%	75%
Post 4 ROW (with CB Shield)	0.60	0%	50%	50%	0%	75%
Subtotal Total Caledon Drainage Area	***2.71***	***Overall TSS Removal to Lightheart Drive:***				***80%***
Post 1 single lot pervious areas to extra depth topsoil incl. pond treatment	0.09	80%	0%	50%	70%	97%
Post 1 single lot impervious areas incl. pond treatment	0.18	0%	50%	50%	70%	93%
Post 1 ROW (with CB Shield) incl. pond treatment	0.08	0%	50%	50%	70%	93%
Post 1 single lot pervious areas to extra depth topsoil	0.04	80%	0%	50%	0%	90%
Post 1 single lot impervious areas	0.09	0%	50%	50%	0%	75%
Post 1 ROW (with GossTrap)	0.04	0%	50%	50%	0%	75%
Post 2 single lot pervious areas to extra depth topsoil	0.03	80%	0%	0%	0%	80%
Post 2 single lot impervious areas	0.06	0%	0%	0%	0%	0%
Subtotal Total Brampton Drainage Are	***0.61***	***Overall TSS Removal to Highwood Drive:***				***80%***
TOTAL SITE	**3.32**	**Overall TSS Removal FOR SITE:**				**80%**

Note - existing SWM pond has been designed and constructed to provide Level 2 control for 0.54ha of subject site at 42% impervious

	Area	Impervious
Post 2 to Highwood	0.52424	66%
Area treated in pond (equiv. to 0.54 @ 43	0.352	66%
Percentage of Post 2 treated	67%	

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: 16-May-23

BURNSIDE

Extended Detention Volume (as Constructed)	3407	cu.m
Ex. Extended Detention Volume req. (per Donal JV)	3011	cu.m
Extended Detention Volume Available	396	

Proposed Drainage to Pond:

Subtotal Drainage from Development	33191.8	60%
Less Previously Accomodated Drainage (in Creeks Edge)	5440	43%
Subtotal Proposed Net Increased Drainage from site	27751.8	64%
Less Impervious Area of site to DICBs in PRE 6 (runoff coeff 0.25)	10212	7%
Total Increased Drainage to Pond	17539.8	97%
Equivalent Area Increase	27751.8	49%

25 mm Runoff from Proposed Increased Contributing Area

Area	2.77518	ha
CN	81	
Impervious	0%	

Q = **(P-IA)^2/P-(IA-S)**
S = **-254+25400/CN**
T IMP = **49.0** % Site area

Pervious Area			**Impervious Area**		
P =	25	mm	P =	25	mm
IA =	5	mm	IA =	2.5	mm
CN =	81		CN =	99	
S =	59.6		S =	2.6	
Q =	5.0	mm	Q =	20.2	mm

	per	**imp**	**total**	
SCS Runoff Volume	5.0	20.2		mm
Drainage Area	1.4	1.4	2.78	ha
Runoff Volume	71	275	346	cu.m

Extended Detention Required	**346**	cu.m

5 mm Runoff Control/Retention

BURNSIDE

Project: Argo Summer Valley
File: 300054371.1000
Designed by: S.Breen
Checked by: L.Niemi
Date: ########

5mm Volume Retention

		Site Area	Required 5mm Volume Retention	Initial Abstraction*	Secondary Retention**	Provided Volume
POST1	Grassed Area	2692 m^2	13.46 m^3	5.0 mm	mm	13.46 m^3
	Paved Surface	0 m^2	0.00 m^3	1.5 mm	mm	0.00 m^3
	Roof Area	0 m^2	0.00 m^3	0.75 mm	mm	0.00 m^3
POST2	Grassed Area	1900 m^2	9.50 m^3	5.0 mm	mm	9.50 m^3
	Paved Surface	1273 m^2	6.37 m^3	1.5 mm	mm	1.91 m^3
	Roof Area	2069 m^2	10.35 m^3	0.75 mm	0.75 mm	3.10 m^3
POST3	Grassed Area	327 m^2	1.63 m^3	5.0 mm	mm	1.63 m^3
	Paved Surface	26 m^2	0.13 m^3	1.5 mm	mm	0.04 m^3
	Roof Area	518 m^2	2.59 m^3	0.75 mm	2.5 mm	1.68 m^3
POST4	Grassed Area	11895 m^2	59.47 m^3	5.0 mm	mm	59.47 m^3
	Paved Surface	6112 m^2	30.56 m^3	1.5 mm	mm	9.17 m^3
	Roof Area	9072 m^2	45.36 m^3	0.75 mm	0.81 mm	14.19 m^3
		33192 m^2	165.96 m^3			100.70 m^3

* Initial Abstraction - infiltration of direct rainfall or retention in extra depth topsoil for rooftops
** Secondary Retention - infiltration of discharged runoff within soakaway pits

Project:	**Argo Summer Valley**
Project #:	300054371.0000
Designed By:	S. Breen/L.Niemi
Date:	16-May-2023

BURNSIDE

Rear Yard Soakaway Pits

Total Drainage Area

Roof Area per Lot = 130 m^2 Maximum Lot Coverage

Roof Area to Soakaway Pit per Lot = 65 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 = $\frac{17.50}{17.50}$

= 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 = 65 m^2 Approximate

Min. Storage Volume Required per Lot = 0.33 m^3 Area (m^2) x Runoff (mm)/1000

Number of Lots in Infiltration Area = 24

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	0.33	9.3	0.16

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

Number of Lots = 24

Number of Soakaway Pits = 48 (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

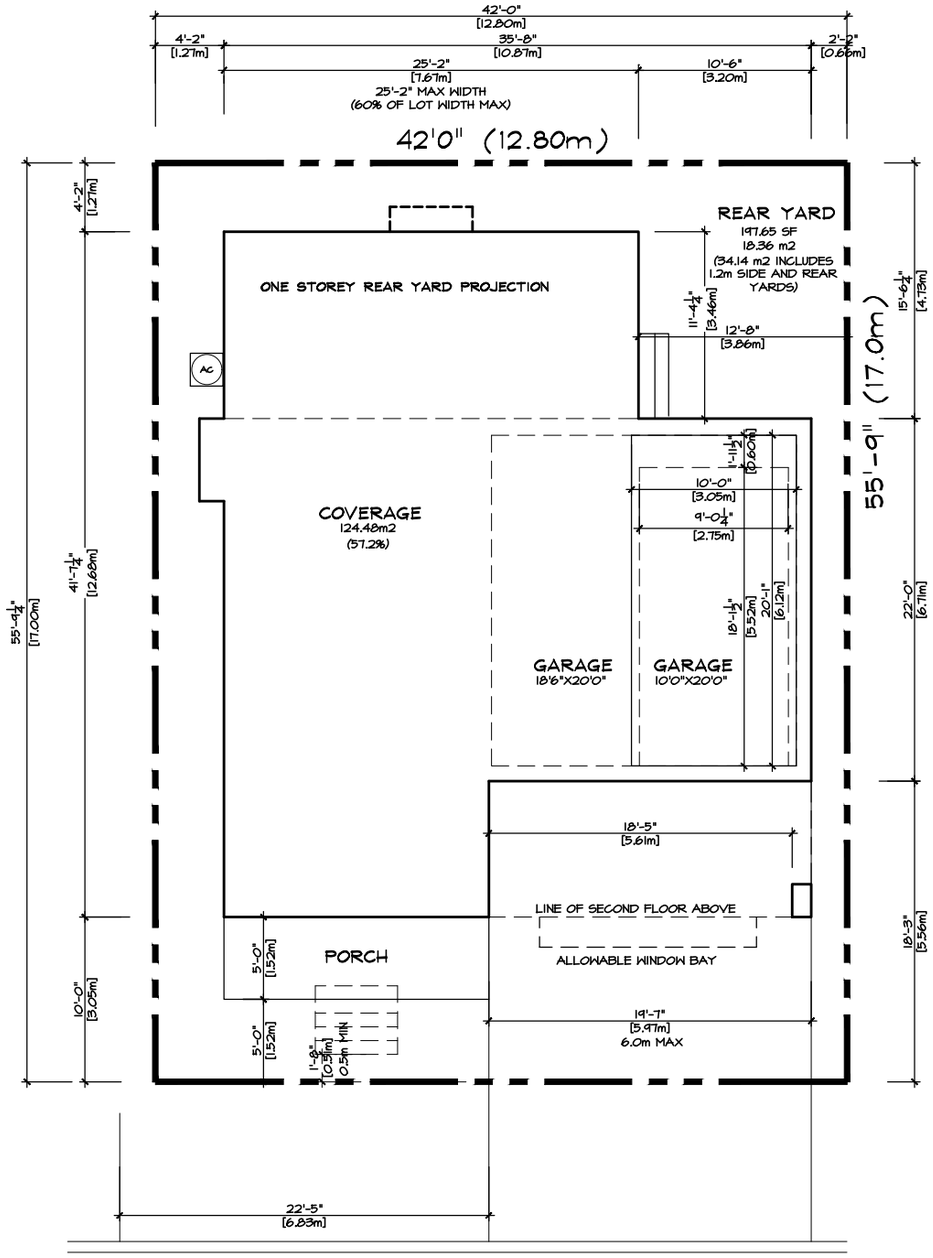
Void Ratio = 0.40

Total Storage Volume per Soakaway Pit = 0.36 m^3

Total Storage Volume per Lot = 0.72 m^3

TOTAL STORAGE VOLUME PROVIDED IN ALL TRENCHES 17 m^3

12.80mX17.0m



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, 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	2.5m 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

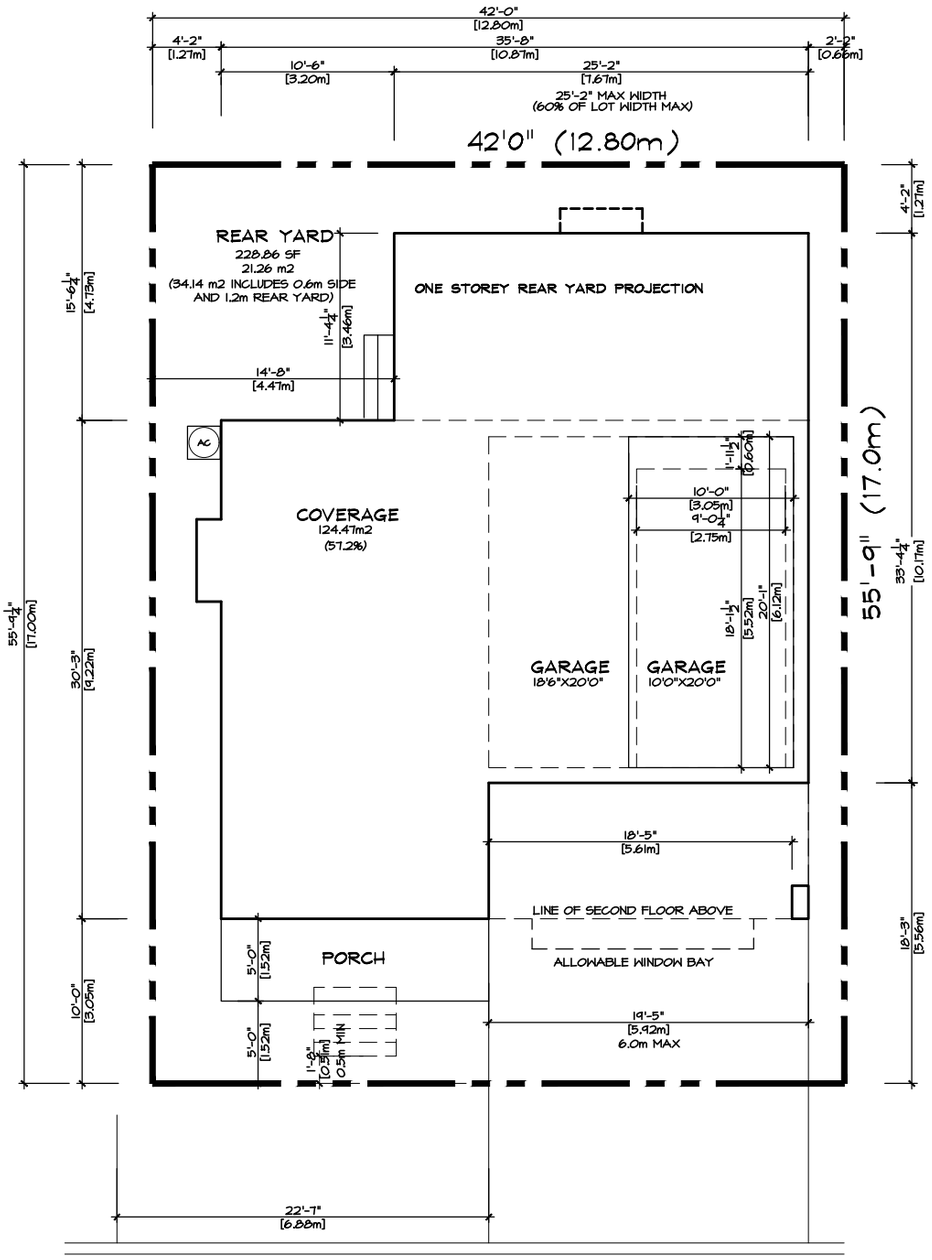
CAIVAN COMMUNITIES

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

2023.03.24
Rev.

UNIT NAME
42' SINGLE

12.80mX17.0m



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, 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	2.5m 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 B

CAIVAN COMMUNITIES

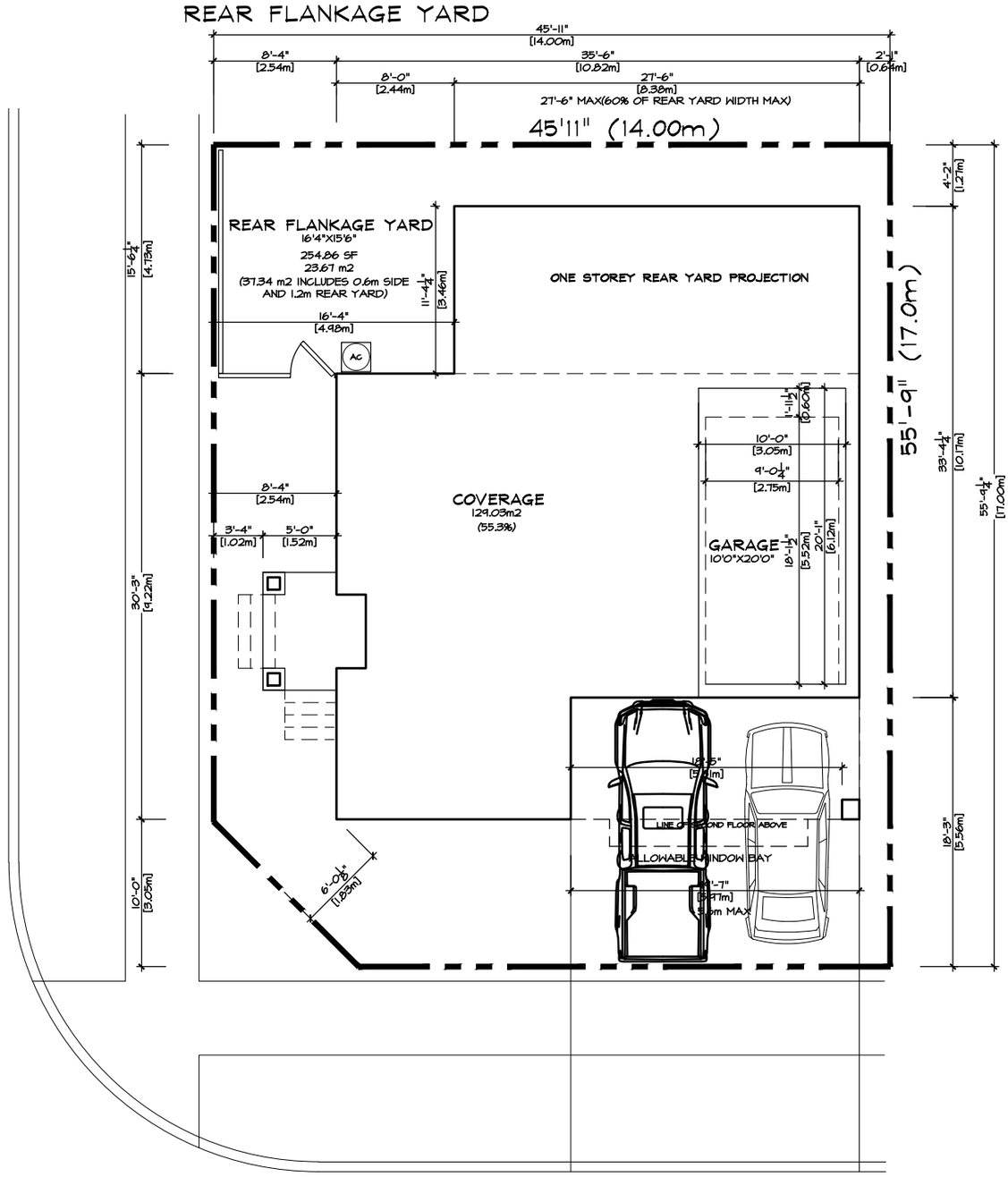
Proj. No. 22009
Scale3/32" = 1'-0"

2023.03.24
Rev.

UNIT NAME
42' SINGLE

SINGLE FAMILY DETACHED

CORNER LOT WITH FRONT YARD PARKING/GARAGE
REAR FLANKAGE YARD



MIN FRONT YARD (PORCH AND HOUSE)	3.0m
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 AT REAR	60% LOT WIDTH X 3.6m DEEP, ONE STOREY
PORCH	2.5m 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 1.0m 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 COMMUNITIES

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

2023.03.24
Rev.

UNIT NAME
42' SINGLE

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 ☒ INCLUDING EAVES

☒ COVERED OR UNCOVERED ☒ 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

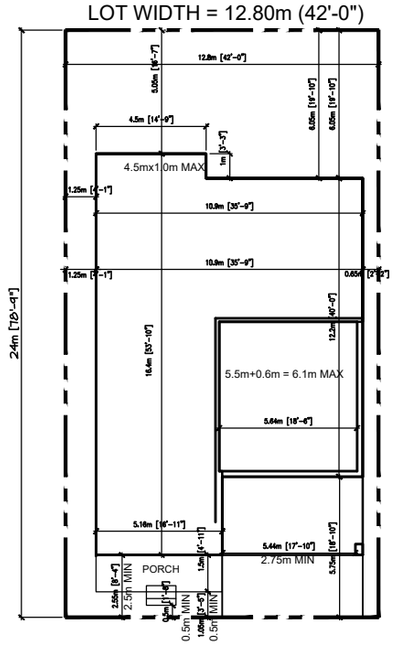
☐ INCLUDED IN COVERAGE ☐ DEFINITION PROVIDED

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'

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

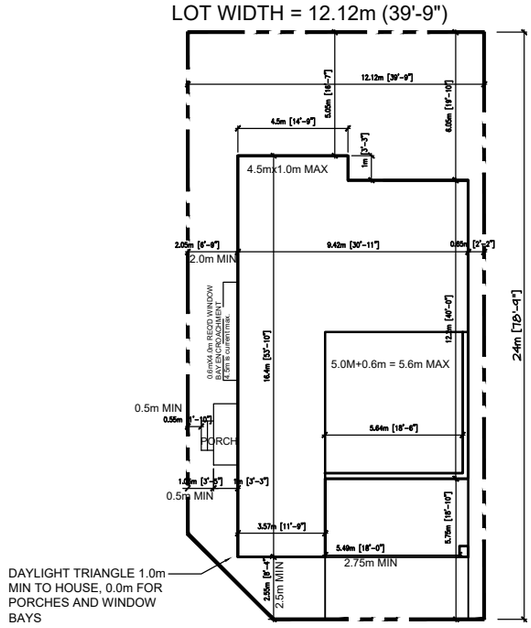
- ☒ WITH FOUNDATION
- ☐ NO WINDOW SEAT REQUIRED
- ☒ INCLUDING EAVES
- ☐ INCLUDED IN COVERAGE
- ☒ CANTILEVERED
- ☐ STACKED BAYS PERMITTED
- ☐ DOOR PERMITTED WITHIN BAY
- ☐ DEFINITION PROVIDED

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 = 12.12m (39'-9")



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

LOT SIZE **12.12mX 24.0m**

CAIVAN COMMUNITIES

Proj. No. 22015
Date 2022.06.08

Corner Detached Single

41'

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 ☒ INCLUDING EAVES

☒ COVERED OR UNCOVERED ☒ 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

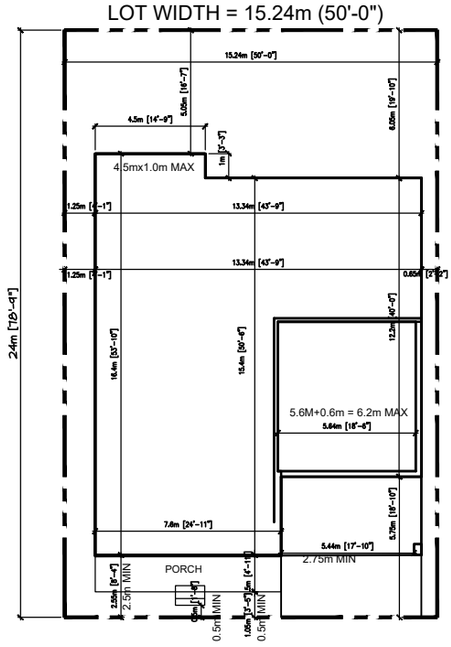
☐ INCLUDED IN COVERAGE ☐ DEFINITION PROVIDED

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'

BURNSIDE

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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

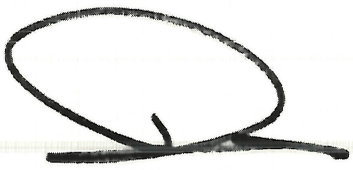
Attention: Mr. Sam Breen, Engineering Assistant

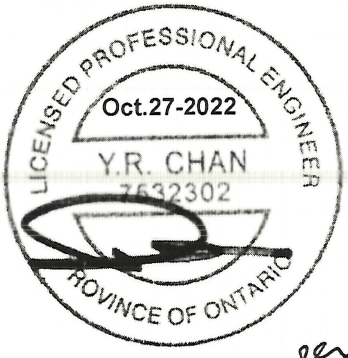
RE: HYDRANT FLOW TEST
HIGHWOOD ROAD AND DONHERB CRESCENT
BRAMPTON, ONTARIO
OUR PROJECT NO.: 22-370

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)

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

TEST DATA

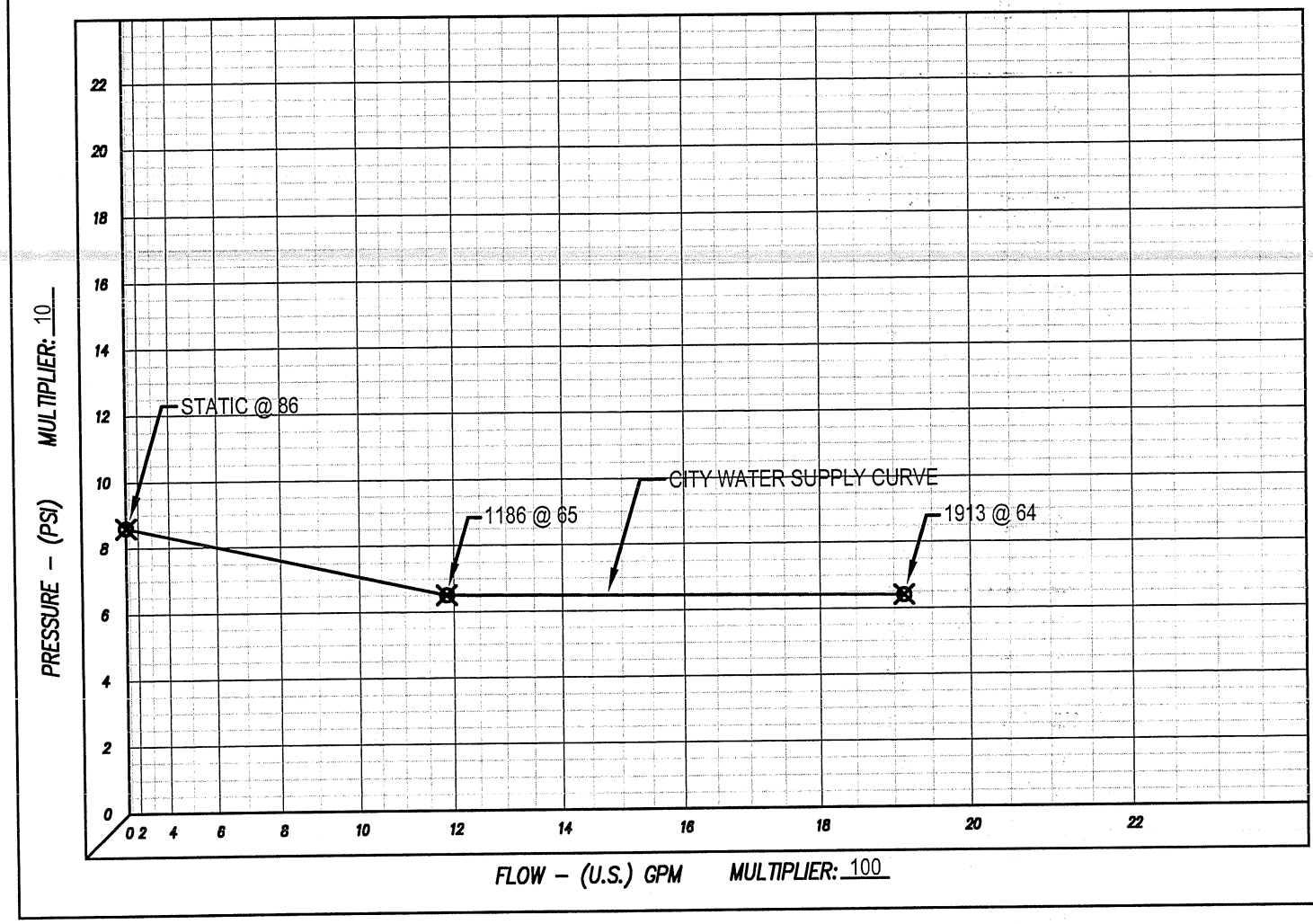
STATIC PRESSURE: 86 psi

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

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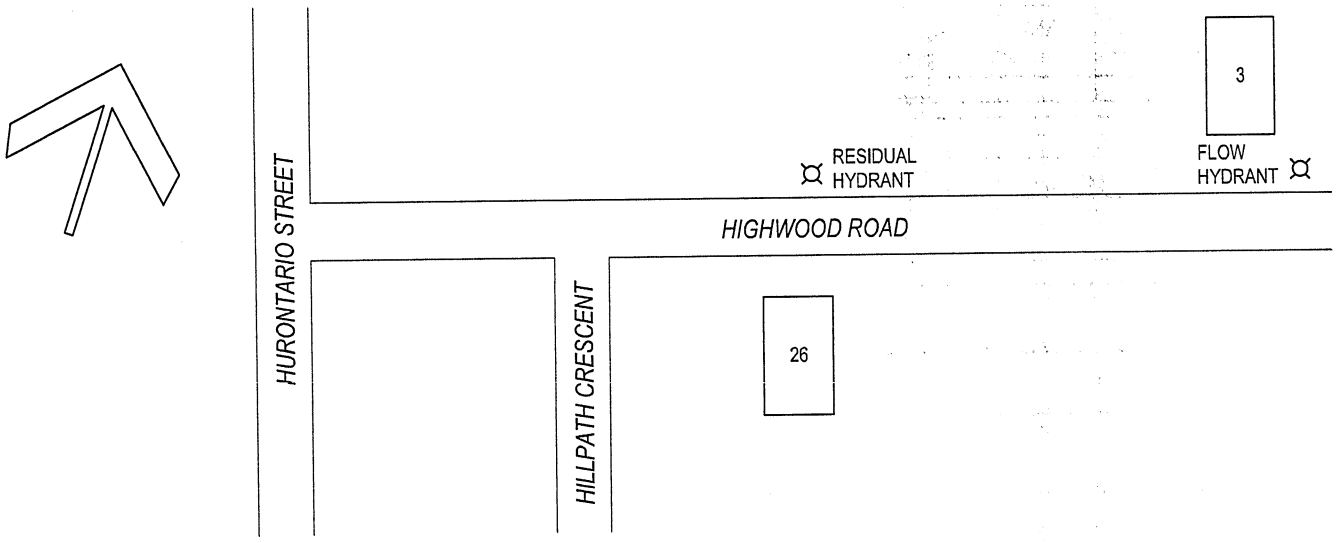
STREET: HIGHWOOD ROAD NO: 26
CROSS STREET: HURONTARIO STREET
CITY: BRAMPTON
TEST BY: NOVUS TIME: 2:00 PM DATE: OCT. 18/22

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

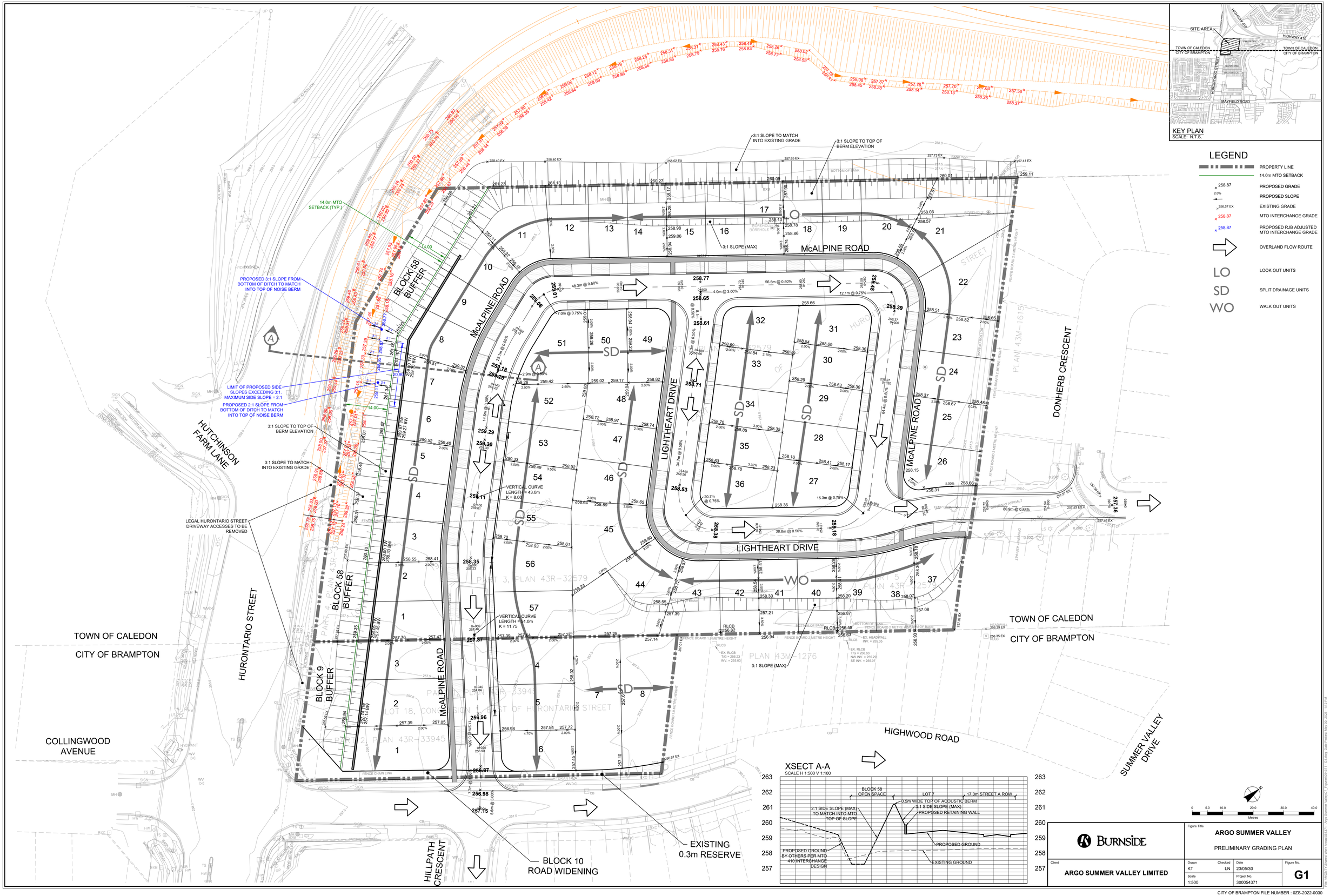
COMMENTS: SPECIAL CONDITIONS



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Drawings


KEY PLAN
SCALE: N.T.S.
SITE AREA
HIGHWAY 410
TOWN OF CALEDON
CITY OF BRAMPTON
TORBRAM ROAD
MAYFIELD ROAD
LEGEND
PROPERTY LINE
14.0m MTO SETBACK
PROPOSED GRADE
PROPOSED SLOPE
EXISTING GRADE
MTO INTERCHANGE GRADE
PROPOSED RJB ADJUSTED MTO INTERCHANGE GRADE
OVERLAND FLOW ROUTE
LO LOOK OUT UNITS
SD SPLIT DRAINAGE UNITS
WO WALK OUT UNITS
McALPINE ROAD
LIGHTHEART DRIVE
DONHERB CRESCENT
HUTCHINSON FARM LANE
HURONTARIO STREET
HIGHWOOD ROAD
SUMMER VALLEY DRIVE
HILLPATH CRESCENT
COLLINGWOOD AVENUE
TOWN OF CALEDON
CITY OF BRAMPTON
BLOCK 58 BUFFER
BLOCK 9 BUFFER
14.0m MTO SETBACK (TYP.)
3:1 SLOPE TO MATCH INTO EXISTING GRADE
3:1 SLOPE TO TOP OF BERM ELEVATION
3:1 SLOPE (MAX)
PROPOSED 3:1 SLOPE FROM BOTTOM OF DITCH TO MATCH INTO TOP OF NOISE BERM
LIMIT OF PROPOSED SIDE SLOPES EXCEEDING 3:1, MAXIMUM SIDE SLOPE = 2:1
PROPOSED 2:1 SLOPE FROM BOTTOM OF DITCH TO MATCH INTO TOP OF NOISE BERM
LEGAL HURONTARIO STREET DRIVEWAY ACCESSES TO BE REMOVED
VERTICAL CURVE LENGTH = 43.0m K = 8.00
VERTICAL CURVE LENGTH = 51.0m K = 11.75
BLOCK 10 ROAD WIDENING
EXISTING 0.3m RESERVE
XSECT A-A
SCALE H 1:500 V 1:100
BLOCK 58 OPEN SPACE
LOT 7
17.0m STREET A ROW
0.5m WIDE TOP OF ACOUSTIC BERM
3:1 SIDE SLOPE (MAX)
PROPOSED RETAINING WALL
2:1 SIDE SLOPE (MAX) TO MATCH INTO MTO TOP OF SLOPE
PROPOSED GROUND
PROPOSED GROUND BY OTHERS PER MTO 410 INTERCHANGE DESIGN
EXISTING GROUND
BURNSIDE
ARGO SUMMER VALLEY
PRELIMINARY GRADING PLAN
ARGO SUMMER VALLEY LIMITED
Drawn KT
Checked LN
Date 23/05/30
Scale 1:500
Project No. 300054371
Figure No. G1
Metres
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

File: \\MONTY\Shared Work Areas\054371 - Argo Summer Valley\07_Figures\054371 - S1.dwg Date Plotted: May 30, 2023 - 1:13 PM

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

R.J. Burnside & Associates Limited