



URBANTECH®

FUNCTIONAL SERVICING BRIEF

**1240 BRITANNIA ROAD
RESIDENTIAL DEVELOPMENT**

City of Mississauga

Prepared for

National Homes (1240 Britannia) Inc.

Project #: 20-249

October 2020

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1. INTRODUCTION

Urbantech has been retained as consulting engineers by National Homes (1240 Britannia) Inc. and directed to complete a Functional Servicing Brief in support of a proposed residential development at municipal address 1240 Britannia Road in the City of Mississauga in support of zoning by-law amendment site plan applications. The legal description of the site is Part of Lot 5, Concession 3, west of Hurontario Street.

The location of the subject site is shown in **Figure 1**. The 2.15 ha site is located south of Britannia Road and north of Galesway Boulevard between Cabrera Crescent and Candlebrook Court. The site is bounded by:

- Britannia Road to the north
- Galesway Boulevard to the south
- To the east by lots along the west side of Candlebrook Court
- To the west by lots along the east side of Cabrera Crescent

This report provides an assessment of the impact of the current site plan concept on existing infrastructure. The concepts presented in this report are in general conformance with the latest standards and criteria prepared by the City of Mississauga (roads, grading and storm drainage) and Peel Region (water distribution and sanitary drainage).

1.1. Purpose

The purpose of this report is as follows:

- Discuss the optimal site grading strategy for the site;
- Identify site specific stormwater management (SWM) requirements to ensure that the development project is in conformance with City standards;
- Evaluate various SWM practices that meet the requirements of the City and recommend a preferred strategy;
- Provide documentation of the proposed SWM strategy along with the technical information necessary for the sizing of the proposed SWM practices.
- For stormwater quality control, Level 1 Protection (Enhanced – 80% Average Annual Removal of Total Suspended Solids) for all developments is required.
- Determine an appropriate storm sewer system outlet which will work in accordance with the site's SWM strategy;
- Determine the site's sanitary sewage strategy and an appropriate outlet point, and;
- Determine an appropriate water service connection for the proposed development.

2. EXISTING CONDITIONS

2.1. Land Use

The subject site contains an existing one storey brick and vinyl siding dwelling (No. 1240) with a wood shed and an inground pool and a one storey aluminium siding dwelling (No. 1310).

2.2. Grading and Drainage

The pre-development drainage pattern was determined from *Plan of Survey Showing Topographic Information of Part of Lot 5, Concession 3, West of Hurontario Street ... Registered Plan 43M-1563, City of Mississauga, Regional Municipality of Peel*, by J.D. Barnes Limited, dated January 14, 2020.

The current existing drainage pattern is split between a northwesterly flow toward Britannia Road West (0.53 ha) and a westerly flow toward an existing interceptor swale draining southward to Galesway Boulevard near the west property line (1.40 ha). Additionally, a small portion drains southwesterly toward Galesway Boulevard via sheet flow (0.22 ha). The existing grade within the site is typically 2.0%.

Prior to construction of the interceptor swale and development to the west, the historic drainage pattern saw a majority of site drainage conveyed northwesterly toward Britannia Road West. An inset shown on City of Mississauga Drawing C-37271 *Storm Drainage Areas* (included in Appendix A) shows that, historically, an area of 2.30 ha, with a runoff coefficient of 0.30, drained to Britannia Road West of which the property contained approximately 1.75 ha.

The historic drainage areas are shown in **Figure 2** and the current existing drainage areas are shown in **Figure 3**. Both **Figure 2** and **Figure 3** contain the J.D. Barnes survey as a background. The delineation of the current existing drainage areas in **Figure 3** reflects the topographical information in the survey while the historical drainage areas in **Figure 2** incorporate the pattern shown in the Drawing C-37271 inset to provide a best estimate of the historical drainage boundaries.

Table 1 provides the pre-development drainage patterns for historical and current existing conditions:

Table 1: Pre-Development Drainage Pattern

Drainage Direction	Historical	Current Existing
Toward Britannia Road West	1.75	0.53
To Galesway Blvd via Inceptor Swale and DICB	N/A	1.40
To Galesway Boulevard	0.40	0.22
Total to Galesway Boulevard	0.40	1.62
TOTAL	2.15	2.15

2.3. Civil Infrastructure

Based on the City of Mississauga plan and profile drawings, the existing municipal infrastructure surrounding the site are as follows:

- Galesway Boulevard
 - 375 mm storm sewer, stub to Galesway Boulevard
 - 450 mm storm sewer on Galesway, downstream of stub connection, flows westerly
 - 250 mm PVC sanitary sewer, flows westerly
 - 300 mm PVC watermain

- Britannia Road West
 - 1050 mm concrete storm sewer, flows westerly
 - 250 mm PVC sanitary sewer, flows westerly

- Cabrera Crescent
 - 300 mm concrete storm sewer, flows westerly
 - 150 mm PVC watermain

The storm, sanitary, and watermain sewers along Galesway Boulevard and Britannia Road West will service the proposed development.

3. PROPOSED CONDITIONS

3.1. Land Use

The proposed development will consist of sixty-one (61) 3-storey, standard townhouses and forty-five (45) 3-storey, dual-front townhouses for a total of 106 units (excluding secondary suites). There are six (6) affordable units provided as secondary suites in Lots 18, 23, 26, 30, 32 and 36. The proposed development also includes internal private laneways (7.0 m in width), and at-grade visitor parking spaces. Vehicular access is provided by one (1) private driveway off Galesway Boulevard.

3.2. Grading and Drainage

The proposed grading design for the site is generally influenced by boundary conditions and will match existing grades along all property lines. The site grading design takes into consideration the following requirements and constraints:

- Conform to the City of Mississauga's design criteria;
- Minimize cut and fill operations and work towards a balanced site;
- Match existing boundary conditions;
- Provide overland flow conveyance for major storm conditions;
- Reduce or eliminate (where possible) the need for retaining walls;
- Maximize the self-contained portion of the site conveying runoff to the storm sewer system(s);
- Provide suitable cover on proposed servicing; and
- Achieve SWM and environmental objectives required for development of the site.

Generally, the internal roads are graded with slopes falling within the range of 0.5% – 2.0%. Minor storm drainage flows are self-contained within the site boundaries into proposed catchbasins and rear-lot catchbasins. During major storm events, some drainage will be directed overland from the site to Galesway Boulevard via the proposed driveways. The proposed grading design matches existing property line grades on all sides of the property. The relatively small rear lot areas facing Britannia Road West and Galesway Boulevard will drain uncontrolled to the right-of-ways (ROWs) of those streets. The Brief accounts for uncontrolled drainage.

Refer to **Drawing GR-1** and **Drawing STM-1** for details.

4. STORM DRAINAGE AND STORMWATER MANAGEMENT

4.1. Storm Sewer Design

Storm servicing infrastructure for the site has been designed in accordance with the latest City of Mississauga standards and specifications and will consist of storm sewers of 300 mm – 450 mm diameter and catchbasin leads of 250 mm – 300 mm diameter.

The proposed storm connection to Galesway Boulevard is a 450 mm diameter concrete sewer at 0.8% slope to a proposed maintenance hole on the existing 450 mm diameter concrete storm sewer. This connection is proposed in place of the existing plug and 375 mm connection;

Refer to the included **Storm Sewer Design Sheet** and to **Drawing STM-1** for details.

Table 2 provides the post-development drainage pattern:

Table 2: Post Development Drainage Pattern

Discharge Location	Controlled Area to Storm Sewer (ha)	Uncontrolled Area (Rear Lot Drainage) (ha)	Total Drainage Area to Discharge Location (ha)
Galesway Blvd	1.77	0.24	2.01
Britannia Rd W	-	0.14	0.14
Total	1.77	0.38	2.15

4.2. SWM Quantity Control

The Modified Rational Method was used to determine the amount of storage required to control the release rate at the discharge location. The target release rate to Galesway Boulevard is 0.112 m³/s, the capacity of the existing 375mm diameter stub connection from the property, as determined from City of Mississauga Storm Sewer Design Calculations for the Mattamy Country Club North, Phase 3 Subdivision, File No. T-M98012-PH3.

The Modified Rational Method methodology is consistent with the City of Mississauga Development Requirements Manual, Section 8 – Storm Drainage Design Requirements (January 2020) including the following:

- 10-year design storm event with rainfall intensity calculated from City of Mississauga Intensity-Duration-Frequency (IDF) parameters;
- Initial Time of Concentration of 15 minutes; and
- Runoff coefficient of 0.65 for “compact or dense housing (e.g. townhouses)”.

The uncontrolled runoff flow rate from rear lot areas was subtracted from the target release rate to determine the maximum orifice release rate. Beginning with the initial time of concentration, a suitable range of storm durations were analyzed to determine the required storage volume to achieve the maximum orifice release rate component of the target release rate. **Table 3** provides a summary of the runoff rates, release rates and required storage volumes for the discharge location.

Table 3: Release Rates and Required Storage

Discharge Location	Max. Post Dev. Runoff Rate (m³/s)	Target Release Rate (m³/s)	Uncontrolled Runoff Rate (m³/s)	Max. Orifice Release Rate (m³/s)	Required Storage (m³)
Galesway Boulevard	0.318	0.112	0.042	0.070	244

The required storage to achieve the target release rates is 244 m³. The required volume will be stored within the active storage component of an underground cistern to be located within the proposed 590 m² outdoor amenity area. The active storage within the cistern would have a depth of approximately 1.5 m and an area of 164 m². Design details of the proposed cistern including its connections to the storm sewer system will be confirmed at a later design stage. Refer to **Drawing STM-1** for the conceptual location of the proposed cistern.

Refer to the following calculations provided in **Appendix A**:

- **SWM Calculations, Allowable Offsite Flow Rate;**
- **SWM Design Calculations, Modified Rational 10-Year Post Development;**
- **SWM Design Calculations, Orifice Design and Minimum Cistern Sizing;** and
- **SWM Design Calculations, Cistern Storage and Schematic.**

4.3. SWM Quality Control

Enhanced (Level 1) water quality protection through the removal of 80% of total suspended solids (TSS) will be provided by an oil / grit separator to be located at each proposed discharge location. Proposed sizing for the oil / grit separators has been performed using the PCSWMM for Stormceptor Sizing Tool created by Imbrium Systems. The sizing is considered preliminary and the recommended oil / grit separator may be a Stormceptor model or approved equivalent.

Table 4 provides the preliminary oil / grit separator sizing:

Table 4: Preliminary Oil / Grit Separator Sizing for Water Quality

Discharge Location	Oil / Grit Separator Model	Provided TSS Removal
Galesway Boulevard	Stormceptor STC 4000	80%

Refer to the included **Stormceptor Sizing Report**.

4.4. Water Balance and Low Impact Development

For this site, the minimum on-site runoff retention will require the proposed development to retain all runoff from the first 5 mm of rainfall through infiltration, evapotranspiration or rainwater reuse, per CVC SWM Criteria (Section 4.2).

The 5 mm rainfall volume for the proposed development is 107 m³. Allowance has been made for an initial abstraction of 5 mm for pervious surfaces. Based on converting the runoff coefficient of 0.65 to an imperviousness of 64%, the initial abstraction volume is 38 m³. The remaining storage requirement of 69 m³ is proposed to be retained on-site through one or more of the following techniques:

- sump storage within the underground cistern proposed in Section 4.2;
- infiltration galleries located within the proposed outdoor amenity area; or
- a sub-surface infiltration trench located under the proposed parking along the east side of Street 'A'.

Low impact development measures being considered for the proposed development include:

- the infiltration galleries and / or trenches at the above noted locations are also proposed to reduce stormwater runoff flowing to the storm sewer system;
- rain barrels for uses such as washing and irrigation; and
- roof leaders disconnected from the storm sewer system and instead discharging to pervious areas.

Design details of the proposed infiltration measures will be confirmed at a later design stage.

Refer to the **SWM Design Calculations, Water Balance** in **Appendix A** for the determination of the 5 mm retention volume. The sump storage within an underground cistern is included in the **SWM Design Calculations, Orifice Design and Minimum Cistern Sizing** in **Appendix A**.

5. WASTEWATER SERVICING

Wastewater servicing infrastructure for the site has been designed in accordance with the latest Region of Peel standards and specifications and will consist of 250 mm PVC wastewater sewers with slopes ranging from 0.5% – 1.0%. The wastewater connection for the site will be a 250 mm PVC sewer at a 1.0% slope to the existing 250 mm PVC wastewater sewer, via a proposed 1200 mm diameter maintenance hole, along Galesway Boulevard at the intersection with proposed Street 'A'. Refer to **Drawing SAN-1** for details.

Based upon the latest standards and criteria prepared by Peel Region, the current site plan concept projects a population of 307 and peak residential flow of 13.5 L/s, based on 2.7 persons/unit and an infiltration allowance of 0.2 L/s/ha. The existing wastewater sewers surrounding the site were designed with the development of this site considered, therefore there are no anticipated concerns related to capacity.

Refer to **Appendix B** for the Region of Peel Connection Tables and to **Appendix C** for the Sanitary Sewer Design Sheet.

6. WATER SERVICING

Water servicing infrastructure for the site has been designed in accordance with the latest Region of Peel standards and specifications. To supply water demands to the site, 200 mm PVC watermains are proposed internally. These watermain service will connect to the existing 300 mm PVC watermain along Galesway Boulevard at the intersection with proposed Street 'A' and to the existing 150 mm PVC watermain on Cabrera Crescent. Refer to **Drawing SP-1** for details.

There are two (2) existing fire hydrants in the immediate vicinity of the site: one on Galesway Boulevard and one on Cabrera Crescent. The results of hydrant testing are provided in **Appendix B**. A sufficient number of fire hydrants will be located within the site that will service the development with spacing that is within the Region of Peel's maximum hydrant spacing for a residential development area.

The existing watermains surrounding the site were designed with the development of this site considered, therefore there are no anticipated concerns related to capacity.

Refer to **Appendix B** for the Region of Peel Connection Tables and to **Appendix D** for the Water Demand and Fire Flow calculations.

7. EROSION AND SEDIMENT CONTROL

Erosion and sediment controls will be implemented for all construction activities undertaken during site works including topsoil stripping, bulk earthworks, foundation excavation and stockpiling of materials, conforming to ESC guidelines (2006). These measures will include:

- Installation of heavy-duty silt control fencing along the perimeter of the site at strategic locations.
- Provision of a temporary mud mat at the construction site entrance
- Preventing silt or sediment laden water from entering existing inlets on the adjacent ROWs (catchbasins/catchbasin maintenance holes) by wrapping their tops with filter fabric and using silt sacks.
- Maintaining sediment and erosion control structures in good repair until such time as the Engineer or the City approves their removal.

If required, site-specific measures will be determined during the detailed design / site alteration application stage.

8. CONCLUSIONS

This report has demonstrated that:

- The proposed site can be graded to match into existing grades at all property lines while adhering to City of Mississauga grading standards and specifications.
- Suitable storm sewer system outlets for the proposed development can be provided by connecting to the existing storm sewers along Galesway Boulevard and Britannia Road West.
- Water Quantity – the SWM pond downstream of the proposed development will provide adequate quantity controls.
- Water Quality – the SWM pond downstream of the proposed development will provide adequate quality controls.
- A suitable sanitary sewer system outlet for the proposed development can be provided by connecting to the existing sanitary sewer along Galesway Boulevard.
- A suitable water service connection can be provided for the proposed development by connecting to the existing watermains along Galesway Boulevard and Cabrera Crescent.
- Erosion Control – Measures and controls will be implemented for all construction activities undertaken during site works.

Report Prepared by:



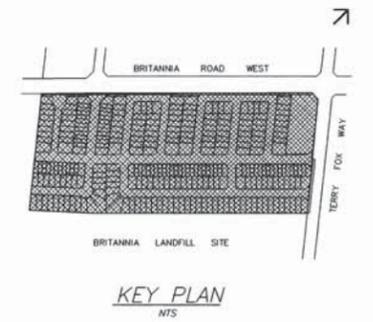
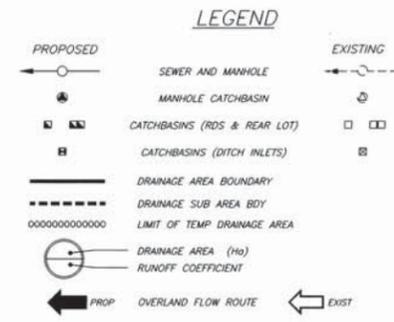
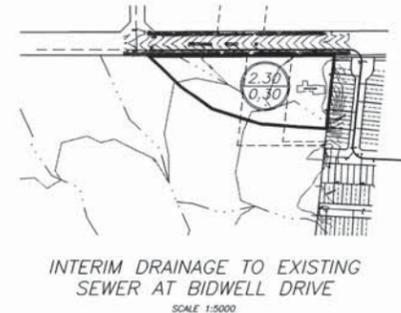
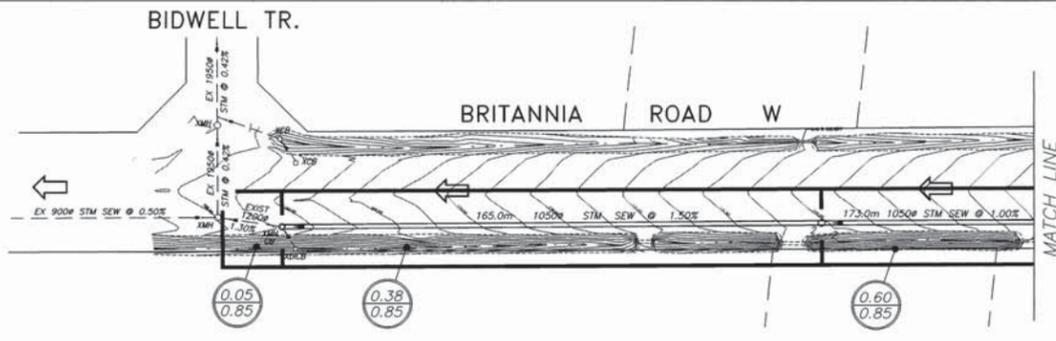
Brad Kargus, P. Eng.
Associate, Water Resources

Rob Merwin, P. Eng.
Senior Associate, Land Development



APPENDIX A

Storm Servicing Calculations



REVISIONS

Date	Details	Initial

Adamson Lawson Surbray Associates Limited
 Town Planners Engineering Consultants Project Managers
 57 Village Centre Place Mississauga, Ontario L4Z 1V9

GRAYLIGHT PROPERTIES LTD.
 (T-94032)
STORM DRAINAGE AREAS



SUBMISSIONS: FIRST: JUNE 4, 1999; SECOND: SEPTEMBER 24, 1999; INTERIM: PRE-SERVING: NOVEMBER 25, 1999; FINAL: APRIL 28, 2000.

CITY OF MISSISSAUGA
 Transportation and Works
 Scale: 1:1000; Date: JANUARY 1999; Area: 2.38 E; City/Region File: T-94032
 Project 98-06 Sheet ST 1



STORM SEWER DESIGN SHEET
10-YEAR STORM EVENT
NATIONAL HOMES (1240 BRITANNIA) INC.
 City of Mississauga

PROJECT DETAILS
 Project No: 20-249
 Date: 22-Oct-20
 Designed by: M.M.
 Checked by: B.K.

DESIGN CRITERIA

Min. Diameter =	250	mm	Rainfall Intensity =	$\frac{A}{(Tc+B)^c}$
Mannings 'n' =	0.013		A =	1010
Starting Tc =	15	min	B =	4.6
Factor of Safety =	20	%	c =	0.78

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
<i>EXISTING DEVELOPMENT</i>																				
Whitehorn Avenue	EX 31	EX 32	0.12	0.45	0.05	11.65	73.83	2.390			2.390	34.0	0.72	1050	2.317	2.68	24.01	0.21	24.22	103%
Whitehorn Avenue	EX 32	EX		0.45		11.65	73.41	2.376			2.376	7.0	0.90	1050	2.591	2.99	24.22	0.04	24.26	92%
Cabrera Crescent	EX MH 6	EX MH 5	0.25	0.45	0.11	0.25	99.17	0.069			0.069	65.0	1.55	300	0.120	1.70	15.00	0.64	15.64	57%
Cabrera Crescent	EX MH 5	EX MH 4	0.03	0.45	0.01	0.26	96.73	0.071			0.071	12.5	1.00	300	0.097	1.37	15.64	0.15	15.79	73%
Cabrera Crescent	EX MH 4	EX MH 3	0.29	0.45	0.13	0.39	96.16	0.105			0.105	40.0	0.50	450	0.202	1.27	15.79	0.53	16.31	52%
Cabrera Crescent	EX MH 3	EX MH 2	1.06	0.45	0.48	0.87	94.27	0.228			0.228	97.0	0.50	525	0.304	1.40	16.31	1.15	17.47	75%
Galesway Boulevard	EX MH 8	EX MH 7	0.74	0.45	0.33	0.33	95.68	0.089			0.089	112.0	2.95	300	0.166	2.35	15.92	0.79	16.71	53%
<i>PROPOSED DEVELOPMENT</i>																				
Block 8	RLCB 1	CBMH 2	0.04	0.65	0.03	0.03	99.17	0.007			0.007	15.2	1.00	250	0.059	1.21	15.00	0.21	15.21	12%
Blocks 7	CBMH 2	MH 3	0.03	0.65	0.02	0.05	98.35	0.012			0.012	30.2	0.50	300	0.068	0.97	15.21	0.52	15.73	18%
Block 14	RLCB 4	CBMH 5	0.07	0.65	0.05	0.05	99.17	0.013			0.013	31.8	1.00	250	0.059	1.21	15.00	0.44	15.44	21%
Block 14	CBMH 5	MH 3	0.02	0.65	0.01	0.06	97.47	0.016			0.016	7.1	0.50	300	0.068	0.97	15.44	0.12	15.56	23%
Street 'C'	MH 3	MH 7	0.08	0.65	0.05	0.16	96.38	0.042			0.042	38.7	0.50	300	0.068	0.97	15.73	0.67	16.40	61%
Street 'B'	CBMH 6	MH 7	0.11	0.65	0.07	0.07	99.17	0.020			0.020	31.4	1.00	300	0.097	1.37	15.00	0.38	15.38	20%
Street 'B'	MH 7	MH 8	0.28	0.65	0.18	0.41	93.98	0.107			0.107	84.7	1.00	375	0.175	1.59	16.40	0.89	17.29	61%
Block 15	RLCB 9	CBMH 10	0.05	0.65	0.03	0.03	99.17	0.009			0.009	20.4	1.00	250	0.059	1.21	15.00	0.28	15.28	15%
Block 16	CBMH 10	MH 8	0.04	0.65	0.03	0.06	98.07	0.016			0.016	15.3	1.00	300	0.097	1.37	15.28	0.19	15.47	16%
Street 'A'	MH 8	MH 11	0.08	0.65	0.05	0.52	90.99	0.131			0.131	35.7	0.50	450	0.202	1.27	17.29	0.47	17.75	65%
Street 'A'	MH 11	MH 17	0.12	0.65	0.08	0.60	89.50	0.149			0.149	40.2	0.50	450	0.202	1.27	17.75	0.53	18.28	74%
Block 2	RLCB 14	CBMH 16	0.07	0.65	0.05	0.05	99.17	0.013			0.013	25.7	1.00	250	0.059	1.21	15.00	0.35	15.35	21%
Block 1	RLCB 15	CBMH 16	0.05	0.65	0.03	0.03	99.17	0.009			0.009	17.7	1.00	250	0.059	1.21	15.00	0.24	15.24	15%
Blocks 1 & 2	CBMH 16	MH 17	0.02	0.65	0.01	0.09	97.79	0.025			0.025	30.0	0.50	300	0.068	0.97	15.35	0.52	15.87	36%
Street 'A'	MH 17	TANK		0.65		0.69	87.88	0.168			0.168	6.0	0.50	525	0.304	1.40	18.28	0.07	18.35	55%
Street 'D'	MH 18	MH 19	0.09	0.65	0.06	0.06	99.17	0.016			0.016	24.5	2.00	300	0.137	1.93	15.00	0.21	15.21	12%
Street 'C'	MH 3	MH 19	0.12	0.65	0.08	0.18	96.38	0.049			0.049	39.4	0.50	300	0.068	0.97	15.73	0.68	16.41	71%
Street 'D'	MH 19	MH 22	0.07	0.65	0.05	0.29	93.94	0.075			0.075	28.0	2.00	300	0.137	1.93	16.41	0.24	16.65	55%
Block 13	RLCB 20	CBMH 21	0.06	0.65	0.04	0.04	99.17	0.011			0.011	18.4	1.00	250	0.059	1.21	15.00	0.25	15.25	18%
Block 13	CBMH 21	MH 22	0.02	0.65	0.01	0.05	98.18	0.014			0.014	8.8	0.50	300	0.068	0.97	15.25	0.15	15.40	21%
Street 'D'	MH 22	MH 23	0.22	0.65	0.14	0.48	93.11	0.124			0.124	64.0	2.00	375	0.248	2.25	16.65	0.48	17.12	50%

Urbantech Consulting, A Division of Leighton-Zec Ltd.
 2030 Bristol Circle, Suite 105
 Oakville, Ontario L6H 0H2
 TEL: 905.829.8818 FAX: 905.829.4804
 www.urbantech.com



URBANTECH®

Street 'D'	MH 23	TANK		0.65		0.48	91.52	0.122			0.122	5.0	0.50	450	0.202	1.27	17.12	0.07	17.19	61%
Block 12	RLCB 12	CBMH 13	0.04	0.65	0.03	0.03	99.17	0.007			0.007	20.9	1.00	250	0.059	1.21	15.00	0.29	15.29	12%
Block 12 & PARK	CBMH 13	TANK	0.10	0.65	0.07	0.07	99.17	0.018			0.018	14.4	0.50	300	0.068	0.97	15.00	0.25	15.25	26%
Street 'A'	TANK	MH 24		0.65		1.24	87.67	0.301	0.070	0.070	0.070	9.1	0.50	450	0.202	1.27	18.35	0.12	10.00	35%
Street 'A'	MH 24	STC 4000	0.09	0.65	0.06	0.06	124.77	0.020		0.070	0.090	26.1	0.50	450	0.202	1.27	10.00	0.34	10.34	45%
Street 'A'	STC 4000	MH 25		0.65			122.53			0.070	0.090	3.0	0.50	450	0.202	1.27	10.34	0.04	10.38	45%
Galesway Boulevard	MH 25	MH 26		0.65			99.17			0.070	0.090	13.5	0.50	450	0.202	1.27	15.00	0.18	15.18	45%
<i>EXISTING DEVELOPMENT</i>																				
Cabrera Crescent	STUB	MH 7	0.90	0.45	0.41	0.41	99.17	0.112	0.000	0.000	0.112	18.0	0.50	375	0.124	1.12	15.00	0.27	15.27	90%
<i>To be abandoned. Prop. development to connect by MH 10 - MH 11 as above. Flow to be controlled to ex. STUB - MH 7 capacity of 0.112 m³/s.</i>																				
Galesway Boulevard	MH 7	MH 2	0.71	0.45	0.32	0.95	93.98	0.249			0.249	87.0	1.40	450	0.337	2.12	16.40	0.68	17.08	74%
Galesway Boulevard	MH 2	MH 1	0.39	0.45	0.18	1.13	91.66	0.287			0.287	57.5	0.95	600	0.598	2.12	17.08	0.45	17.53	48%
Galesway Boulevard	MH 1	EX	0.12	0.45	0.05	1.18	90.20	0.296			0.296	33.0	0.95	600	0.598	2.12	17.53	0.26	17.79	49%
Whitehorn Avenue	EX	EX 34	0.27	0.45	0.12	12.96	73.33	2.639			2.639	77.0	0.90	1050	2.591	2.99	24.26	0.43	24.69	102%
Whitehorn Avenue	EX 34	EX 35	0.43	0.45	0.19	13.15	72.49	2.648			2.648	62.5	1.20	1050	2.991	3.45	24.69	0.30	24.99	89%
Condo Townhomes		EX 35	2.87	0.60	1.72	1.72														
Whitehorn Avenue	EX 35	EX	0.09	0.45	0.04	14.91	71.91	2.979			2.979	32.5	1.50	1050	3.344	3.86	24.99	0.14	25.13	89%



URBANTECH®

SWM CALCULATIONS 1: ALLOWABLE OFFSITE RELEASE RATE

Project Name: National Homes (1240 Britannia) Inc.
Municipality: City of Mississauga
Project No.: 20-249W

Prepared by: BK
Checked by: RBTM
Date: 16-Oct-20

Summary of Proposed Discharge Locations

Proposed Discharge Point	Ex. Pipe Cap. (m ³ /s)	Description
Galesway Boulevard	0.112	Control to capacity of existing stub (ex. 18m - 375mm pipe at 0.5%)

Method of Determining Runoff: Rational Method, $Q = 0.00278CIA$

Where: Q = Peak flow rate (litres/second)
 C = Runoff coefficient
 I = Rainfall intensity (mm/hour)
 A = Catchment area (hectares)

Rainfall intensity per City of Mississauga Development Requirements (Section 8), $I = A/(T+B)^C$:

Where: A, B and C = Parameters defined in Mississauga Development Requirements Section 8.1
 I = Rainfall intensity (mm/hour)
 T = Time of concentration (hours)

Return Period (Years)	10
A	1,010
B	4.6
C	0.78
T (min) **	15
I (mm/hr)	99.2

** The minimum initial time of concentration is 15 minutes.

The offsite allowable flow rate to the Galesway Boulevard storm sewer system is 0.112 L/s.



URBANTECH®

SWM DESIGN CALCULATIONS 2: MODIFIED RATIONAL, 10-YEAR POST DEVELOPMENT

Project Name: National Homes (1240 Britannia) Inc.
Municipality: City of Mississauga
Project No.: 20-249W

Prepared by: BK
Checked by: RBTM
Last Revised: 16-Oct-20

Target Release Rate to Galesway Blvd	
Stub to MH7	0.112 m ³ /s

Post Development Condition:	Area (m ²)	C
Controlled to Galesway Blvd	1.773	0.65
Uncontrolled to Britannia Rd W	0.139	0.65
Uncontrolled to Galesway Blvd	0.236	0.65
Total Site	2.148	0.65

IDF	A	B	C
10-Year	1,010	4.60	0.78

Uncontrolled Flow to Galesway Blvd			
10 Year (Post-Development)			
Time	Intensity	Storm	Runoff
(min)	10 year	Runoff	Volume
	(mm/hr)	(m ³ /s)	(m ³)
15	99.17	0.042	38.01

Maximum Orifice Release Rate = 0.069 m³/s
Total Release Rate = 0.111 m³/s

Time	Intensity	Storm	Orifice	Storage	Required
(min)	10-year	Runoff	Release	Accum.	Storage
	(mm/hr)	(m ³ /s)	Rate	Rate	Volume
			(m ³ /s)	(m ³ /s)	(m ³)
15	99.17	0.318	0.069	0.249	224.29
16	95.39	0.306	0.069	0.237	227.63
17	91.93	0.295	0.069	0.226	230.54
18	88.74	0.284	0.069	0.216	233.06
19	85.79	0.275	0.069	0.206	235.25
20	83.06	0.266	0.069	0.198	237.12
21	80.52	0.258	0.069	0.189	238.72
22	78.15	0.250	0.069	0.182	240.06
23	75.93	0.243	0.069	0.175	241.16
24	73.85	0.237	0.069	0.168	242.06
25	71.90	0.230	0.069	0.162	242.75
26	70.06	0.224	0.069	0.156	243.27
27	68.32	0.219	0.069	0.150	243.62
28	66.68	0.214	0.069	0.145	243.81
29	65.13	0.209	0.069	0.140	243.86
30	63.66	0.204	0.069	0.135	243.77
31	62.26	0.199	0.069	0.131	243.56
32	60.93	0.195	0.069	0.127	243.23
33	59.66	0.191	0.069	0.123	242.79
34	58.45	0.187	0.069	0.119	242.25
35	57.30	0.184	0.069	0.115	241.60
36	56.19	0.180	0.069	0.112	240.87
37	55.14	0.177	0.069	0.108	240.04
38	54.12	0.173	0.069	0.105	239.13
39	53.15	0.170	0.069	0.102	238.15
40	52.22	0.167	0.069	0.099	237.09
29					243.86



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SWM DESIGN CALCULATIONS 3: ORIFICE DESIGN AND MINIMUM CISTERN SIZING

Project Name: National Homes (1240 Britannia) Inc.
Municipality: City of Mississauga
Project No.: 20-249W

Prepared by: BK
Checked by: RBTM
Last Revised: 16-Oct-20

Orifice Control to Galesway Boulevard

Peak Discharge rate at maximum head, $Q = C_d A (2g H)^{0.5}$

Orifice Tube Diameter = 155 mm
 $C_d = 0.82$
 $A = 0.0189 \text{ m}^2$
 $g = 9.81 \text{ m/s}^2$
 $H = 1.00 \text{ m}$
 $Q = 0.069 \text{ m}^3/\text{s}$

Target release rate = 0.112 m^3/s
Uncontrolled Release Rate = 0.042 m^3/s
Max. Allowable Orifice Release Rate = 0.070 m^3/s

The peak discharge at maximum head is lower than the allowable municipal release rate (0.112 m^3/s). The flow rate to the municipal storm sewer system is 0.069 m^3/s .

Minimum Cistern Sizing

Sump Storage = 69.0 m^3
Active Storage Req'd for Discharge to Galesway Blvd. = 243.9 m^3
Total Active Storage Required = 243.9 m^3
Total Cistern Volume Required = 312.89 m^3



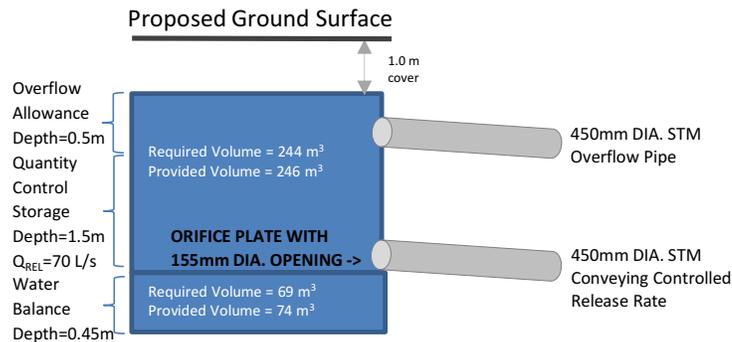
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SWM CALCULATIONS 4: CISTERN STORAGE AND SCHEMATIC

Project Name: National Homes (1240 Britannia) Inc.
Municipality: City of Mississauga
Project No.: 20-249W

Prepared by: BK
Checked by: RBTM
Date: 16-Oct-20

	Min. Req'd	Provided
Quantity Control		
Height for Quantity	1.50	1.50
Volume	244	246
Footprint (m ²)	163	164
Water Balance		
Height WB	0.42	0.45
Volume	69	74
Footprint (m ²)	163	164
Overflow Depth Allowance		
Height OVF	-	0.5
Total		
Total Cistern Height (m)	1.92	2.45
Total Storage Volume	313	320
Footprint (m ²)	163	164





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SWM DESIGN CALCULATIONS 5: WATER BALANCE

Project Name: National Homes (1240 Britannia) Inc. **Prepared by:** BK
Municipality: City of Mississauga **Checked by:** RBTM
Project No.: 20-249W **Last Revised:** 16-Oct-20

For this site, the minimum on-site runoff retention will require the site to retain all runoff from the first 5 mm of rainfall through infiltration, evapotranspiration or rainwater reuse, per CVC SWM Criteria (Section 4.2).

Site Area = 21475 m²
Required Water Balance Volume = 107.4 m³
Runoff Coefficient¹ = 0.65
Equivalent Imperviousness = 64% (based on $I = (C - 0.2) / 0.7$)

¹ Runoff Coefficient for Compact or dense housing (eg. Townhouses)
City of Mississauga, *Development Requirements Manual, Section 8*

Proposed Site Area Breakdown			
Cover	A (m ²)	IA (mm)	IA Volume (m ³)
Impervious	13,805	0	0.0
Pervious	7,669	5	38.3
Total	21,475		38.3

Total Initial Abstraction Volume = 38.3 m³

Required Reuse Volume = SWM Tank Sump Volume
= 69.0 m³

Brief Stormceptor Sizing Report - Galesway 2nd Sub

Project Information & Location			
Project Name	Britannia	Project Number	21717
City	Mississauga	State/ Province	Ontario
Country	Canada	Date	3/20/2020
Designer Information		EOR Information (optional)	
Name	Brad Kargus	Name	
Company	Urbantech Consulting	Company	
Phone #	905-829-8818	Phone #	
Email	bkargus@urbantech.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Galesway 2nd Sub
Target TSS Removal (%)	80
TSS Removal (%) Provided	81
Recommended Stormceptor Model	STC 4000

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 300	59
STC 750	69
STC 1000	70
STC 1500	71
STC 2000	75
STC 3000	76
STC 4000	81
STC 5000	82
STC 6000	84
STC 9000	88
STC 10000	88
STC 14000	91
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (ha)	1.773	TSS Removal (%)	80.0
Imperviousness %	64.00	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (L)	
Station Name	TORONTO PEARSON AP	Peak Conveyed Flow Rate (L/s)	
State/Province	Ontario	Water Quality Flow Rate (L/s)	
Station ID #	8733	Up Stream Storage	
Years of Records	44	Storage (ha-m)	Discharge (cms)
Latitude	43°41'N	0.000	0.000
Longitude	79°38'W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cms)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

APPENDIX B
Region of Peel Connection Tables and Hydrant Tests

REGION OF PEEL CONNECTION TABLES

Project Name: National Homes Britannia
Municipality: City of Mississauga
Project No.: 20-249
Date: 2020-10-16

Water Connection

Connection Point:		Prop. 300x200mm Tee on Ex. 300mm PVC WM on Galesway Blvd (Refer to Dwg. SP-1)	
Pressure Zone of Connection Point			4
Total Equivalent Population to be serviced			204
Total lands to be serviced (ha)			2.14
Hydrant flow test			
	5912 Cabrera Crescent		
		Pressurer (kPa)	Flow (l/s)
		Time	
	Minimum Water Pressure	500	139
	Maximum Water Pressure	545	0
	Hydrant flow test		
	1272 Galesway Boulevard		
		Pressurer (kPa)	Flow (l/s)
		Time	
	Minimum Water Pressure	479	139
	Maximum Water Pressure	524	0

No	Water Demands	Demand	Units
	Demand Type		
1	Average Day Flow	0.66	l/s
2	Maximum Day Flow	1.30	l/s
3	Peak Hour Flow	2.00	l/s
4	Fire Flow	550.00	l/s
Analysis			
5	Maximum Day Plus Fire Flow	551.300	l/s

Wastewater Connection

Connection Point:		Prop. MH1 on Ex. 250mm PVC SAN on Galesway Blvd (Refer to Dwg. SP-1)	
Total Equivalent Population to be Serviced			307
Total Lands to be Serviced			2.14
6	Wastewater Sewer Effluent (in l/s)		13.5



APPENDIX C
Sanitary Sewer Design Sheet

SANITARY SEWER DESIGN SHEET National Homes - (Britannia) Region of Peel	PROJECT DETAILS Project No: 20-249 Date: 16-Oct-20 Designed by: P.H. Checked by: B.K.	DESIGN CRITERIA Min. Flow = 13 l/s Min Diameter = 250 mm Mannings 'n' = 0.013 Min. Velocity = 0.75 m/s Max. Velocity = 3.50 m/s Factor of Safety = 15 % Avg. Domestic Flow = 302.8 l/c/d Infiltration = 0.200 l/s/ha Max. Peaking Factor = 4.00 Min. Peaking Factor = 1.50 Domestic Sewage flow for < 1000 ppl = 0.013m³/s (Region of Peel Std. 2-5-2)
--	--	---

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL							FLOW CALCULATIONS							PIPE DATA							
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	MIN. RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	PIPE LENGTH (m)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)	
Street B	9	8	0.11	0.11	6		2.7	17	17								0.0	17	4.00	0.2	13.0			13.0	1.00	250	24.7	59.5	1.21	0.96	22%
Street B	8	7	0.52	0.63	30		2.7	81	98								0.1	98	4.00	1.4	13.0			13.1	0.50	250	88.0	42.0	0.86	0.75	31%
Street A	7	6	0.11	0.74	2		2.7	6	104								0.1	104	4.00	1.5	13.0			13.1	0.50	250	37.2	42.0	0.86	0.75	31%
Street A	6	3	0.28	1.02	13		2.7	36	140								0.2	140	4.00	2.0	13.0			13.2	0.50	250	52.1	42.0	0.86	0.75	31%
Street D	5	4	0.09	0.09	4		2.7	11	11								0.0	11	4.00	0.2	13.0			13.0	1.00	250	21.2	59.5	1.21	0.96	22%
Street C	8	4	0.39	0.50	19		2.7	52	69								0.1	69	4.00	1.0	13.0			13.1	1.00	250	82.1	59.5	1.21	0.96	22%
Street D	4	3	0.54	1.13	27		2.7	73	153								0.2	153	4.00	2.1	13.0			13.2	0.50	250	106.1	42.0	0.86	0.75	31%
Street A	3	2	0.10	2.25	5		2.7	14	307								0.5	307	4.00	4.3	13.0			13.5	0.50	250	27.1	42.0	0.86	0.75	32%
Galesway Boulevard	2	1		2.25					307								0.5	307	4.00	4.3	13.0			13.5	1.00	250	11.7	59.5	1.21	0.96	23%

APPENDIX D

Water Demand and Fire Flow

WATER DEMAND CALCULATIONS

Project Name: National Homes Britannia
Block: 9,10 &11
Municipality: City of Mississauga
Project No.: 20-249
Date: 16-Oct-20

Fire Flow Calculations

Based on the *Water Supply for Public Fire Protection, 1999* by Fire Underwriters Survey

1 Estimate of Fire Flow

$$F = 220 C (A)^{1/2}$$

F = Fire Flow (L/min)

C = Construction Type Coefficient

= 1.5 wood frame constructon

A = Total flow area (m²)

= If vertical openings and exterior vertical communications are properly protected (one hour rating),
Largest Floor + 25% of two immediately adjoining floors

Floor	Area (m ²)	%
Level 1	1578.0	100%
Level 2	1578.0	100%
Level 3	1578.0	100%
Basement	1578.0	100%

$$= 6312 \text{ m}^2$$

F = 26218 L/min

= 26000 L/min, rounded to the nearest 1000 L/min

WATER DEMAND CALCULATIONS

Project Name: National Homes Britannia
Block: 9,10 &11
Municipality: City of Mississauga
Project No.: 20-249
Date: 16-Oct-20

2 Occupancy Reduction

15% for low hazard occupancies
 F = 22100 L/min

3 Sprinkler Reduction

0% No Sprinklers

F = 22100 L/min

4 Separation Charge

Direction	Separation	Charge
North (Block 1)	16.5	15%
East (Block 4)	16.4	15%
South (Block 6)	34.5	5%
West (block 6)	16.7	15%

Total Charge = 50%
 F = 11050 L/min

Required Fire Flow

F = 33150 L/min
 = 33000 L/min, rounded to the nearest 1000 L/min

Fire Flow Demand =	550.0 L/s
=	8718 USGPM

WATER DEMAND CALCULATIONS

Project Name: National Homes Britannia
Block: 9,10 &11
Municipality: City of Mississauga
Project No.: 20-249
Date: 16-Oct-20

Domestic Flow Calculations

Population = 204 persons, from Sanitary Calculations
Average Day Demand = 280 L/person/day, from ROP design criteria
= 0.66 L/s

Use Peaking Factor the Greater of

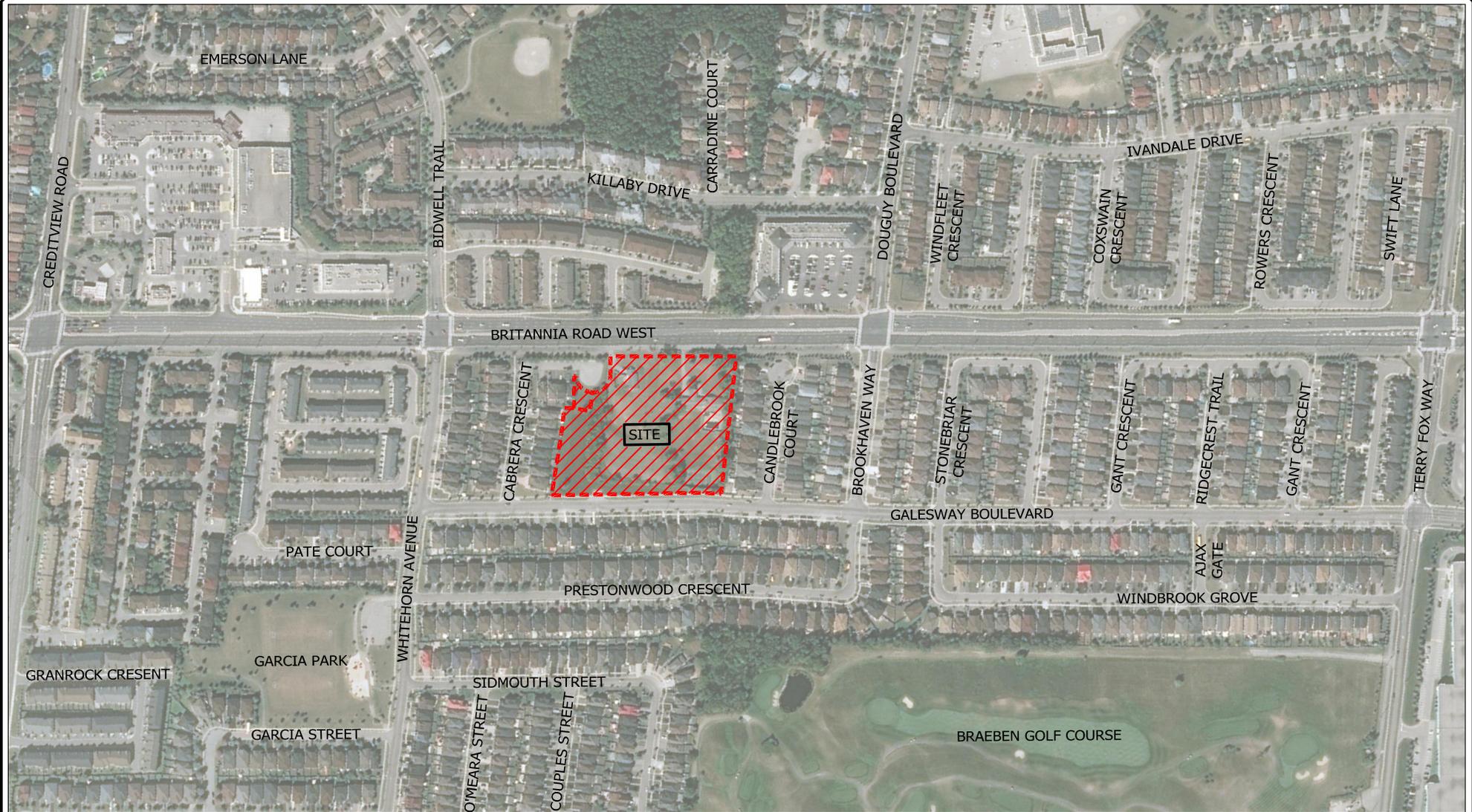
Max Daily Demand PF = 2 from ROP design criteria
Max Daily Demand = 1.3 L/s

or

Max Peak Hour PF = 3 from ROP design criteria
Max Hour Demand = 2.0 L/s

Domestic Flow
Demand = 2.0 L/s
= 31 USGPM

FIGURES AND DRAWINGS



**NATIONAL HOMES
BRITANNIA**

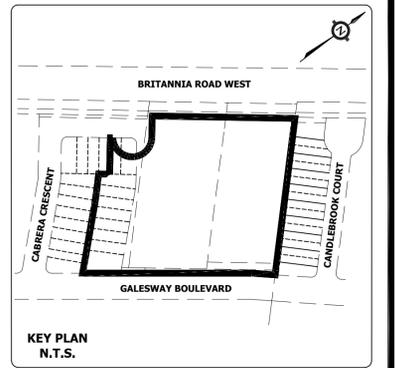
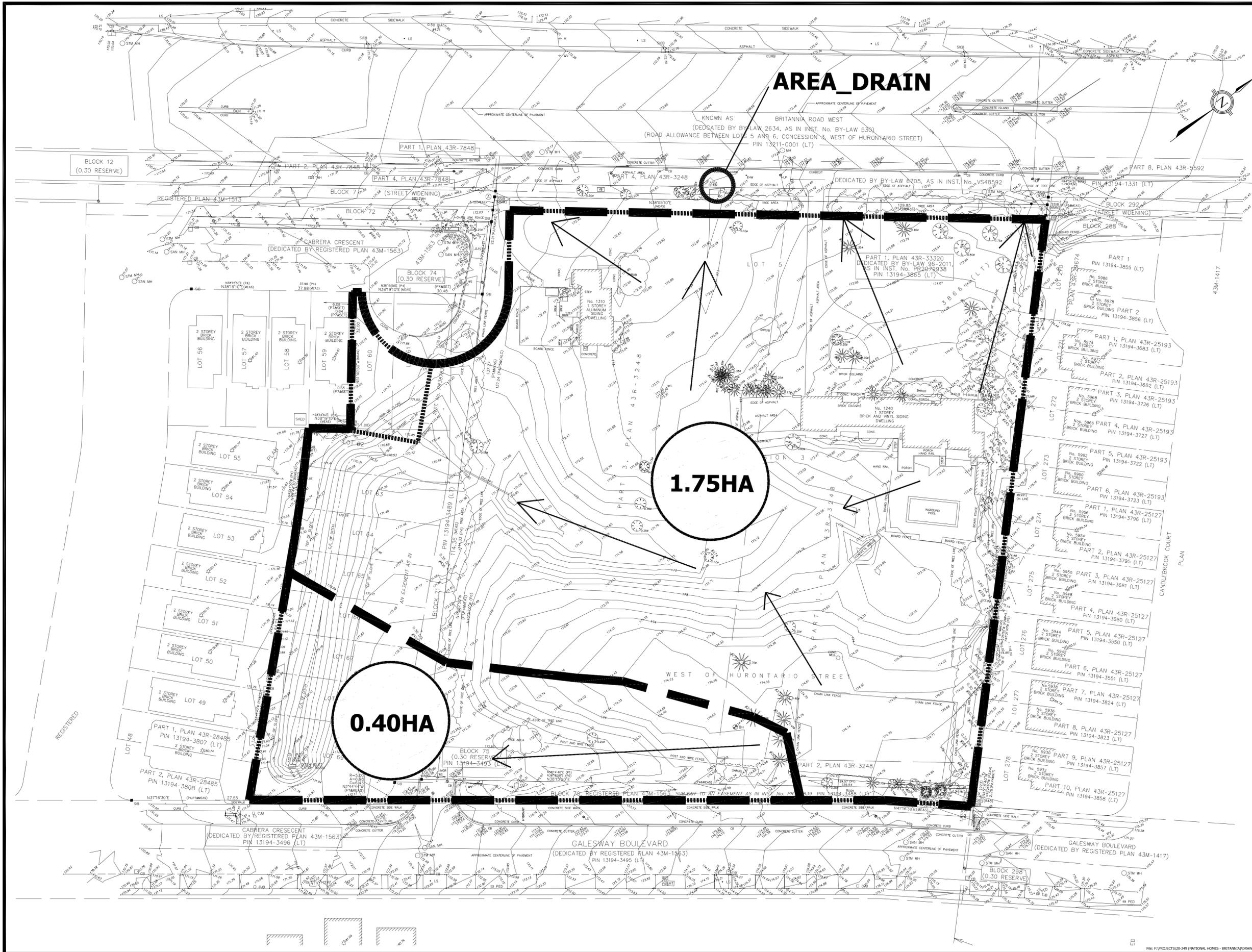


**urbantech
west**

Urbantech West, A Division of Leighton-Zec West Ltd.
2030 Bristol Circle, Suite 201 Oakville, Ontario L6H 0H2
tel: 905.829.8818 fax: 905.829.4804
www.urbantech.com

**FIGURE 1
SITE LOCATION PLAN**

PROJECT No.:	20-249	DATE:	MARCH 2020	SCALE:	N.T.S.
--------------	--------	-------	------------	--------	--------



- LEGEND**
- DENOTES SURVEY MONUMENT FOUND
 - DENOTES TELEPHONE MANHOLE
 - DENOTES SANITARY MANHOLE
 - DENOTES BORE HOLE
 - DENOTES HYDRO POLE
 - DENOTES TELEPHONE JUNCTION BOX
 - DENOTES TELEPHONE PRECAST
 - DENOTES CABLE TV JUNCTION BOX
 - DENOTES FIRE HYDRANT
 - DENOTES WATER VALVE
 - DENOTES ROOF PEAK ELEVATION
 - DENOTES SURVEY MONUMENT FOUND
 - DENOTES STANDARD IRON BAR
 - DENOTES SHORT STANDARD IRON BAR
 - DENOTES IRON BAR
 - DENOTES CUT CROSS
 - DENOTES CONCRETE PIN AND WASHER
 - DENOTES PLASTIC BAR
 - DENOTES WINGS
 - DENOTES WIT
 - DENOTES BOUNDARY PLAN BY R. AVIS SURVEYING INC. DATED MAY 5, 2019, PROJECT No. 3208-D
 - P1 DENOTES REGISTERED PLAN 43M-1417
 - P2 DENOTES REGISTERED PLAN 43M-1563
 - P3 DENOTES PLAN 43R-3248
 - P4 DENOTES MEASURES
 - P5 DENOTES W.B. STARR, O.L.S.
 - P6 DENOTES J.C. BEATON, O.L.S.
 - P7 DENOTES D.A.V. SEARLES SURVEYING INC.
 - P8 DENOTES M.M. GEOMETRICS ONTARIO LIMITED
 - P9 DENOTES RAY-PENTEK & EDWARDS SURVEYING LIMITED
 - P10 DENOTES CATONBACH
 - P11 DENOTES SINGLE CATCHBASIN
 - P12 DENOTES SIDE INLET CATCHBASIN
 - P13 DENOTES TELEPHONE MANHOLE
 - P14 DENOTES SANITARY MANHOLE
 - P15 DENOTES BORE HOLE
 - P16 DENOTES HYDRO POLE
 - P17 DENOTES TELEPHONE JUNCTION BOX
 - P18 DENOTES TELEPHONE PRECAST
 - P19 DENOTES CABLE TV JUNCTION BOX
 - P20 DENOTES FIRE HYDRANT
 - P21 DENOTES WATER VALVE
 - P22 DENOTES ROOF PEAK ELEVATION
 - P23 DENOTES SURVEY MONUMENT FOUND
 - P24 DENOTES STANDARD IRON BAR
 - P25 DENOTES SHORT STANDARD IRON BAR
 - P26 DENOTES IRON BAR
 - P27 DENOTES CUT CROSS
 - P28 DENOTES WITNESS
 - P29 DENOTES MEASURES
 - P30 DENOTES NORTH, SOUTH, EAST, WEST
 - P31 DENOTES PLAN OF SURVEY BY TARASOK MULLIAN KUBICKI LIMITED DATED FEBRUARY 5, 2019
 - P32 DENOTES PLAN 43R-3248
 - P33 DENOTES PLAN 43R-25193
 - P34 DENOTES PLAN 43R-25127
 - P35 DENOTES REGISTERED PLAN 43M-1417
 - P36 DENOTES PLAN 43R-3248
 - P37 DENOTES REGISTERED PLAN 43M-1563
 - P38 DENOTES TARASOK MULLIAN KUBICKI LIMITED, O.L.S.
 - P39 DENOTES WILLIAM B. STARR, O.L.S.
 - P40 DENOTES J.C. BEATON, O.L.S.
 - P41 DENOTES ANTON KIKAS, O.L.S.
 - P42 DENOTES D.A.V. SEARLES SURVEYING LTD., O.L.S.
 - P43 DENOTES M.M. GEOMETRICS ONTARIO LIMITED, O.L.S.
 - P44 DENOTES P. SALVA COMPANY LTD., O.L.S.
 - P45 DENOTES CATCH BASIN
 - P46 DENOTES DRAINAGE
 - P47 DENOTES DOOR SILL
 - P48 DENOTES ELECTRIC HAND WELL
 - P49 DENOTES FIRE HYDRANT
 - P50 DENOTES HYDRO LIGHT POLE
 - P51 DENOTES HYDRO GUYWIRE
 - P52 DENOTES LIGHT STANDARD
 - P53 DENOTES MANHOLE
 - P54 DENOTES BOLLARD
 - P55 DENOTES SANITARY MANHOLE
 - P56 DENOTES STORM MANHOLE
 - P57 DENOTES TRAFFIC SIGN
 - P58 DENOTES WARNING SIGN
 - P59 DENOTES WATER VALVE
 - P60 DENOTES WALK BOX
 - P61 DENOTES BELL PEDESTAL
 - P62 DENOTES CHAIN LINK FENCE
 - P63 DENOTES BRICK RETAINING WALL
 - P64 DENOTES BOTTOM OF CURB
 - P65 DENOTES CONCRETE
 - P66 DENOTES WOOD RETAINING WALL
 - P67 DENOTES CONCRETE RETAINING WALL
 - P68 DENOTES AIR CONDITIONER UNIT
 - P69 DENOTES BOARD FENCE
 - P70 DENOTES METAL GUARD RAIL
 - P71 DENOTES BRICK
 - P72 DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER 0.10 metres
 - P73 DENOTES #222 = TAGGED TREE NUMBER
 - P74 DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER 0.10 metres
 - P75 DENOTES #222 = TAGGED TREE NUMBER
 - P76 DENOTES SPOT ELEVATION

BENCHMARK
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF MISSISSAUGA BENCH MARK NO. 1077, HAVING AN ELEVATION OF 178.866 METRES.

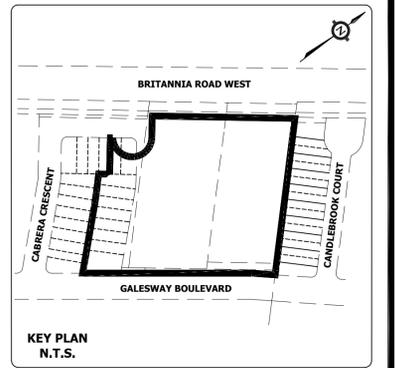
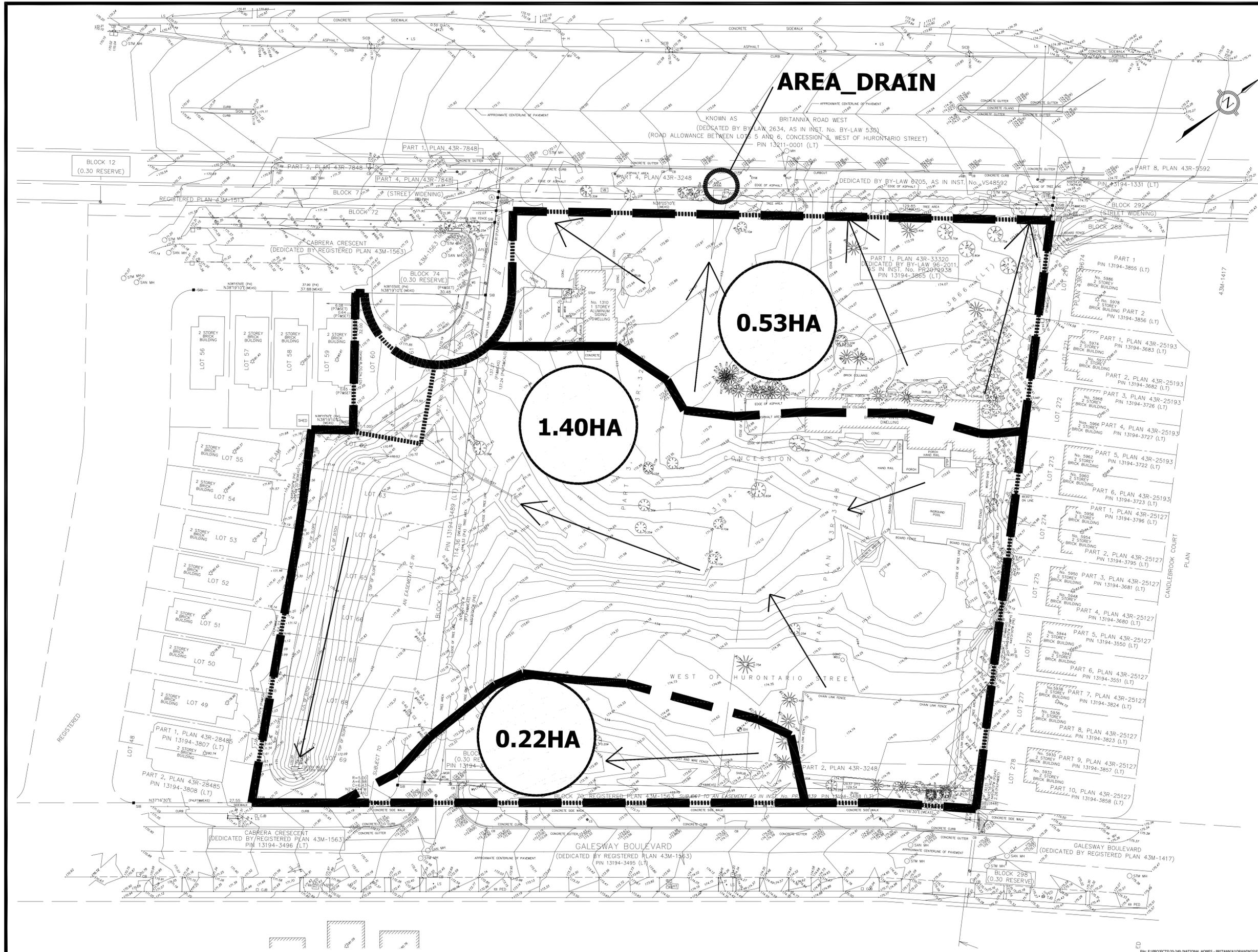


NATIONAL HOMES (BRITANNIA) CITY OF MISSISSAUGA

FIGURE 2 HISTORICAL DRAINAGE AREAS

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:400	FIG-2

File: P:\PROJECTS\20-249 (NATIONAL HOMES - BRITANNIA)\DRAWINGS\FIGURES\20-249 - HISTORICAL DRAINAGE AREAS PLAN.DWG - REVISED BY:cag/mmm - 15, October 15, 2020 4:53 PM



- LEGEND**
- DENOTES SURVEY MONUMENT FOUND
 - DENOTES TELEPHONE MANHOLE
 - DENOTES SANITARY MANHOLE
 - DENOTES BORE HOLE
 - DENOTES HYDRO POLE
 - DENOTES TELEPHONE JUNCTION BOX
 - DENOTES TELEPHONE PRECAST
 - DENOTES CABLE TV JUNCTION BOX
 - DENOTES FIRE HYDRANT
 - DENOTES WATER VALVE
 - DENOTES ROOF PEAK ELEVATION
 - DENOTES SURVEY MONUMENT FOUND
 - DENOTES SURVEY MONUMENT PLANTED
 - DENOTES STANDARD IRON BAR
 - DENOTES SHORT STANDARD IRON BAR
 - DENOTES IRON BAR
 - DENOTES CUT CROSS
 - DENOTES WITNESS
 - DENOTES MEASURED
 - DENOTES NORTH, SOUTH, EAST, WEST
 - DENOTES PLAN OF SURVEY BY TARASOK MULLAN KUBICKI LIMITED DATED FEBRUARY 5, 2019
 - DENOTES PLAN 43R-3248
 - DENOTES PLAN 43R-25193
 - DENOTES PLAN 43R-25127
 - DENOTES REGISTERED PLAN 43M-1417
 - DENOTES PLAN 43R-3220
 - DENOTES REGISTERED PLAN 43M-1563
 - DENOTES TARIASOK MULLAN KUBICKI LIMITED, O.L.S.
 - DENOTES WILLIAM B. STARR, O.L.S.
 - DENOTES J.C. BEATON, O.L.S.
 - DENOTES ANTON KIKAS, O.L.S.
 - DENOTES DAVID B. SEARLES SURVEYING LTD., O.L.S.
 - DENOTES M.M. GEOMETRICS ONTARIO LIMITED, O.L.S.
 - DENOTES P. SALVA COMPANY LTD., O.L.S.
 - DENOTES CATCH BASIN
 - DENOTES DRAINAGE
 - DENOTES DOOR SILL
 - DENOTES ELECTRIC HAND WELL
 - DENOTES FIRE HYDRANT
 - DENOTES HYDRO LIGHT POLE
 - DENOTES HYDRO GUYWIRE
 - DENOTES LIGHT STANDARD
 - DENOTES MANHOLE
 - DENOTES BOLLARD
 - DENOTES SANITARY MANHOLE
 - DENOTES SANITARY MANHOLE
 - DENOTES STORM MANHOLE
 - DENOTES TRAFFIC SIGN
 - DENOTES WARNING SIGN
 - DENOTES WATER VALVE
 - DENOTES WALK BOX
 - DENOTES BELL PEDESTAL
 - DENOTES CHAIN LINK FENCE
 - DENOTES BRICK RETAINING WALL
 - DENOTES BOTTOM OF CURB
 - DENOTES CONCRETE
 - DENOTES WOOD RETAINING WALL
 - DENOTES CONCRETE RETAINING WALL
 - DENOTES AIR CONDITIONER UNIT
 - DENOTES BOARD FENCE
 - DENOTES METAL GUARD RAIL
 - DENOTES BRICK
 - DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER 0.10 metres
 - DENOTES #222 = TAGGED TREE NUMBER
 - DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER 0.10 metres
 - DENOTES #222 = TAGGED TREE NUMBER
 - DENOTES SPOT ELEVATION

BENCHMARK
 ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF MISSISSAUGA BENCHMARK NO. 1077, HAVING AN ELEVATION OF 178.866 METRES.

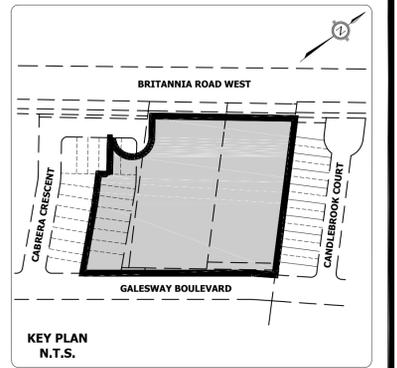
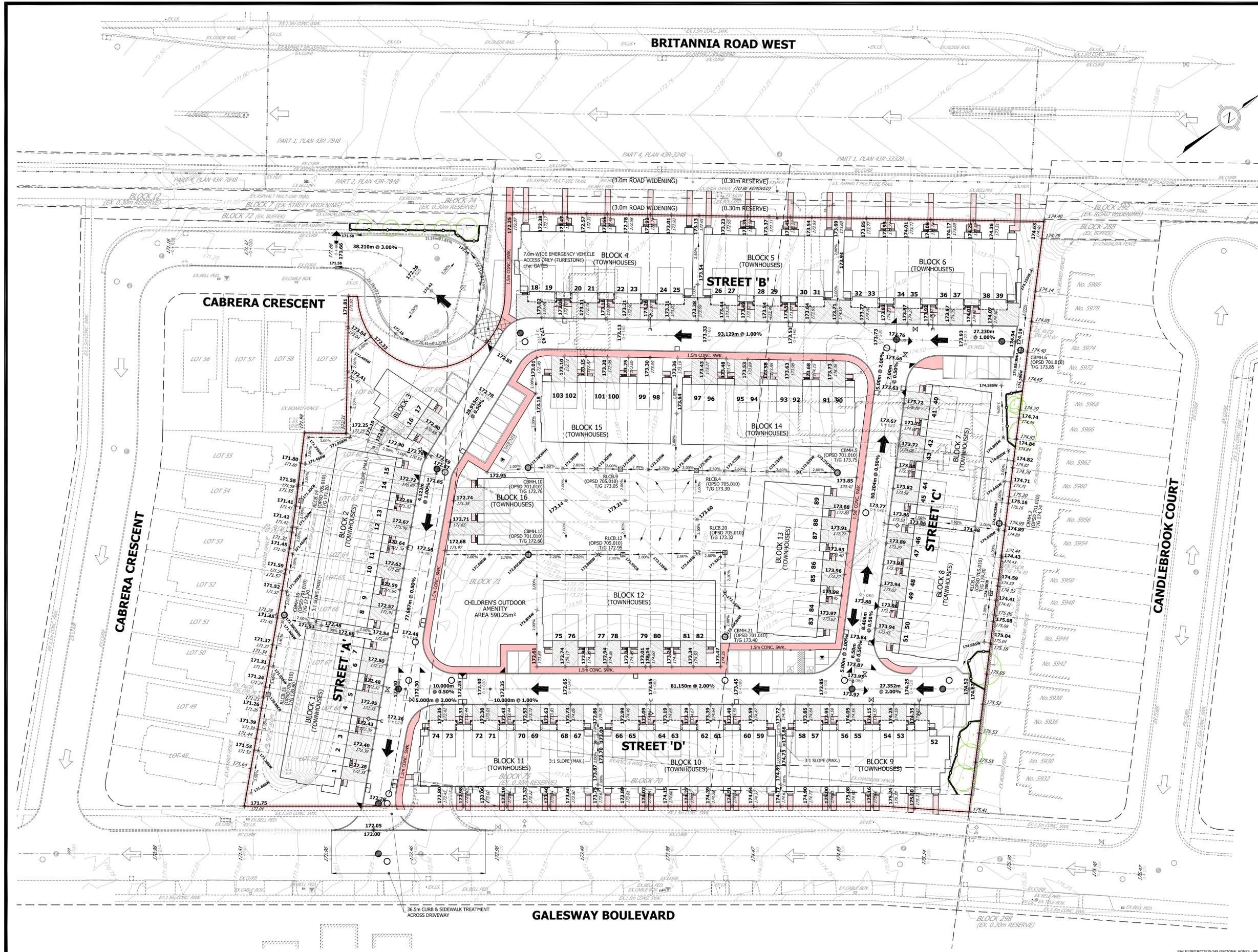


NATIONAL HOMES (BRITANNIA) CITY OF MISSISSAUGA

**FIGURE 3
 CURRENT EXISTING
 DRAINAGE AREAS**

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:400	FIG-3

FILE: P:\PROJECTS\20-249 (NATIONAL HOMES - BRITANNIA)\DRAWINGS\FIGURE\20-249 - CURRENT EXISTING DRAINAGE AREAS.PLAN.DWG - REVISED BY:cag/mmm - 15, October 15, 2020 4:53 PM



- LEGEND**
- PROPOSED STORM MANHOLE
 - PROPOSED SANITARY MANHOLE
 - EXISTING STORM MANHOLE
 - EXISTING SANITARY MANHOLE
 - SINGLE CATCHBASIN
 - DOUBLE CATCHBASIN
 - ⊕ HYDRANT & VALVE
 - ⊕ VALVE & BOX
 - ⊕ TRANSFORMER
 - CMB COMMUNITY MAILBOX
 - DRIVEWAY
 - MAXIMUM 3:1 (UNLESS OTHERWISE NOTED)
 - EXISTING CONTOUR AND ELEVATION
 - PROPOSED ELEVATION
 - EXISTING ELEVATION
 - SWALE ELEVATION
 - OVERLAND FLOW ROUTE
 - EXISTING OVERLAND FLOW ROUTE
 - WOOD PRIVACY FENCE
 - DECORATIVE METAL FENCE
 - TREE PROTECTION HOARDING FENCE
 - EXISTING OVERHEAD HYDRO
 - LIMIT OF PROPERTY
 - EXISTING TREE

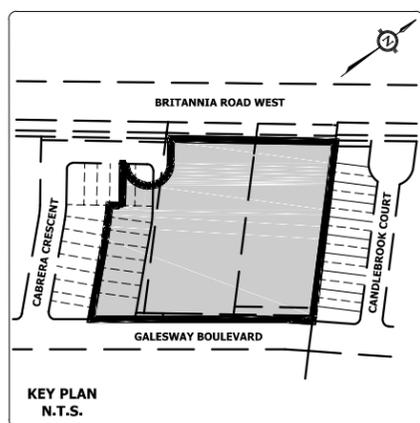
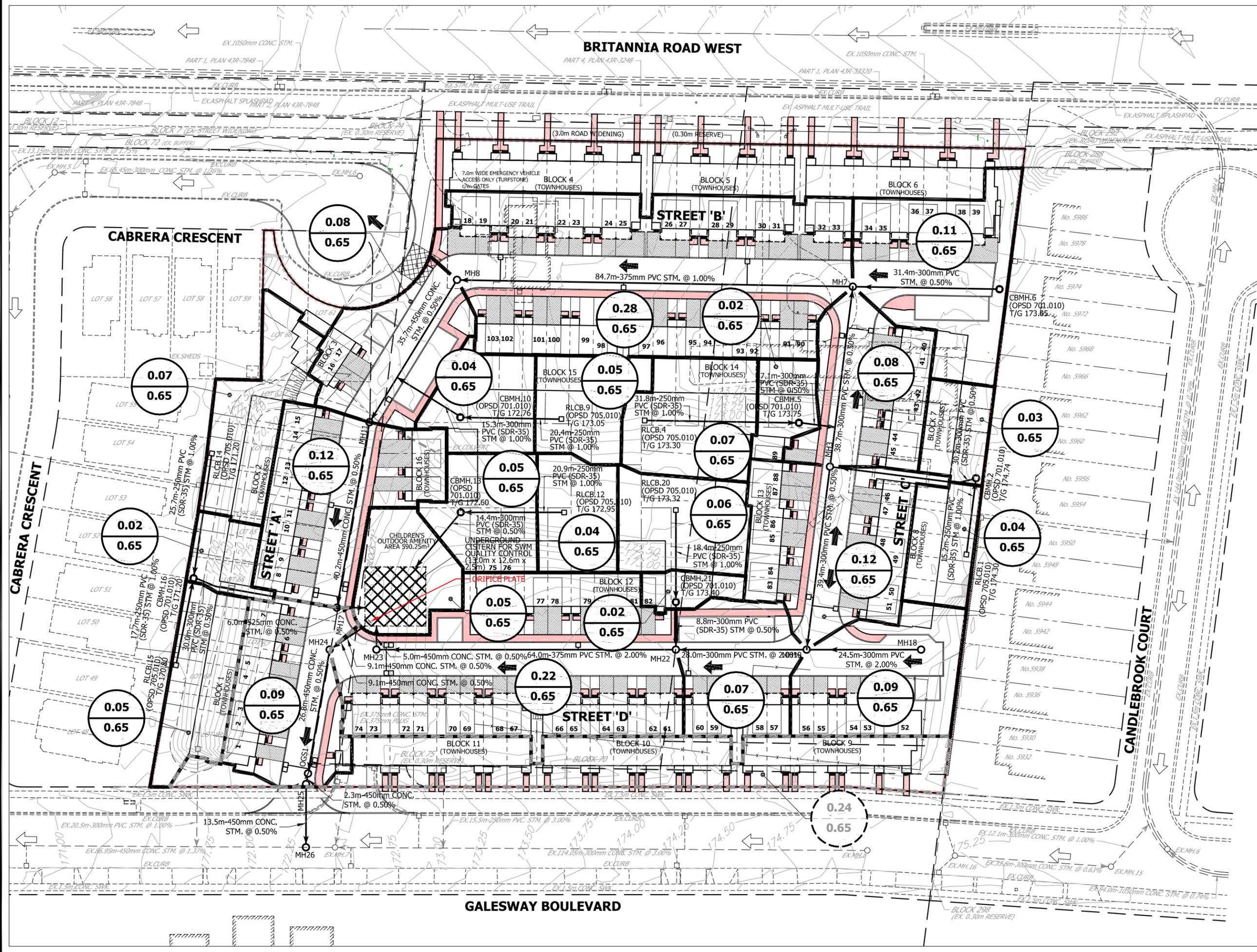
BENCHMARK
 ELEVATIONS SHOWN HEREON ARE REFERRED TO CITY OF MISSISSAUGA BENCHMARK NO. 1077, HAVING AN ELEVATION OF 178.885 METRES. BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A, B AND C, BY REAL-TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010).
 DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999794.
 FOR BEARING COMPARISONS, A ROTATION OF 0°32'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON P2, P3, P4, P5 AND P6.



NATIONAL HOMES (BRITANNIA)
 CITY OF MISSISSAUGA

PRELIMINARY GRADING PLAN

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:400	GR-1



- LEGEND**
- PROPOSED STORM MANHOLE
 - EXISTING STORM MANHOLE
 - STORM DRAINAGE AREA
 - UNCONTROLLED STORM DRAINAGE AREA
 - PROPOSED OVERLAND FLOW
 - EXISTING OVERLAND FLOW
 - 0.051 AREA ha
 - 0.65 RUNOFF COEFFICIENT
 - 0.051 UNCONTROLLED AREA ha
 - 0.65 RUNOFF COEFFICIENT
 - LIMIT OF PROPERTY



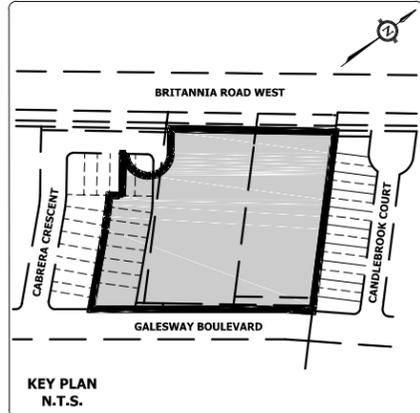
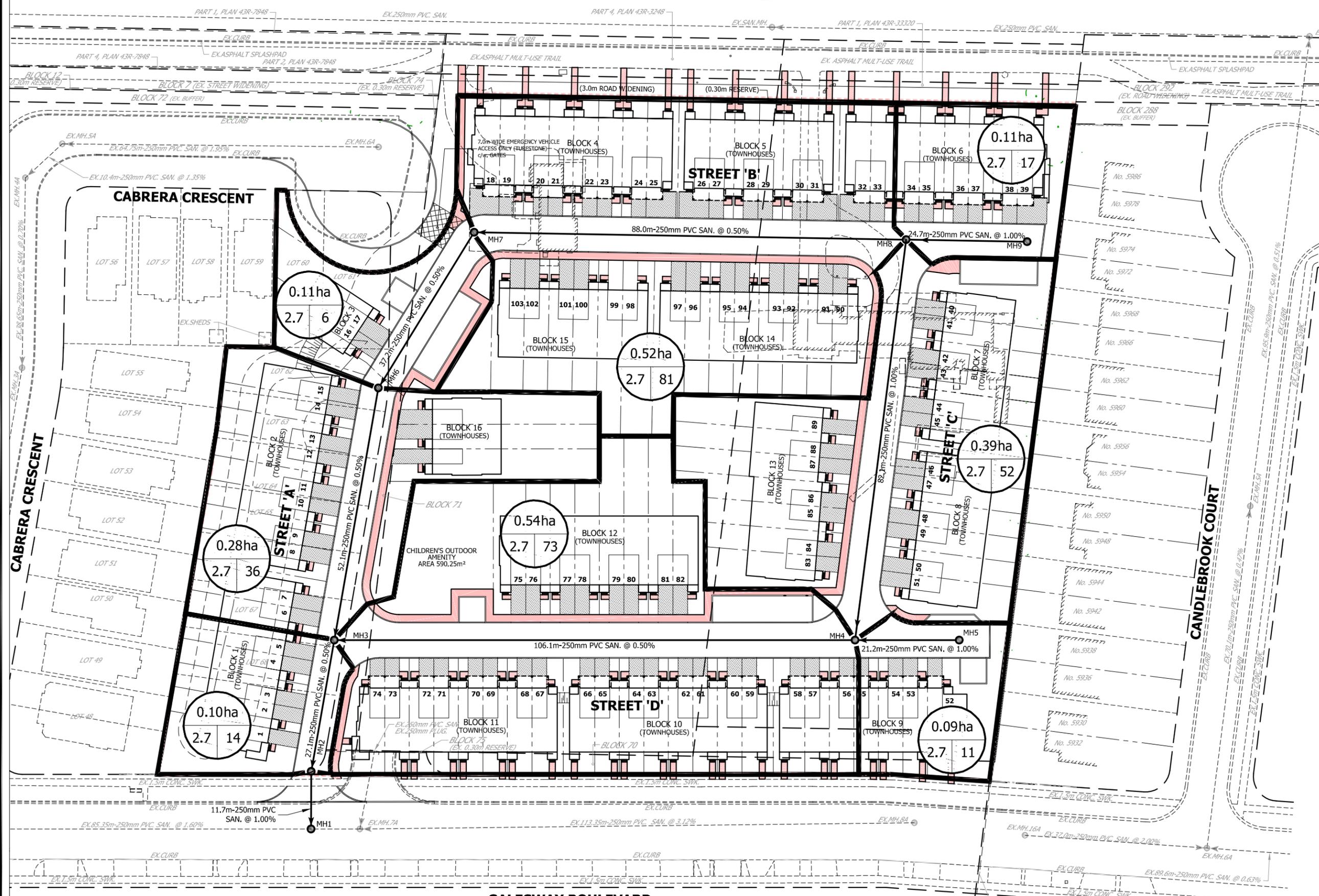
NATIONAL HOMES (BRITANNIA)
CITY OF MISSISSAUGA

PRELIMINARY STORM DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:750	STM-1

PROJECTS/20-249 NATIONAL HOMES - BRITANNIA/STORM DRAINAGE PLAN/20-249 - PRELIMINARY STORM DRAINAGE PLAN/20

BRITANNIA ROAD WEST



- LEGEND**
- PROPOSED SANITARY MANHOLE
 - EXISTING SANITARY MANHOLE
 - SANITARY DRAINAGE AREA
 - AREA ha
 - POPULATION
 - POPULATION PER UNIT
 - LIMIT OF PROPERTY

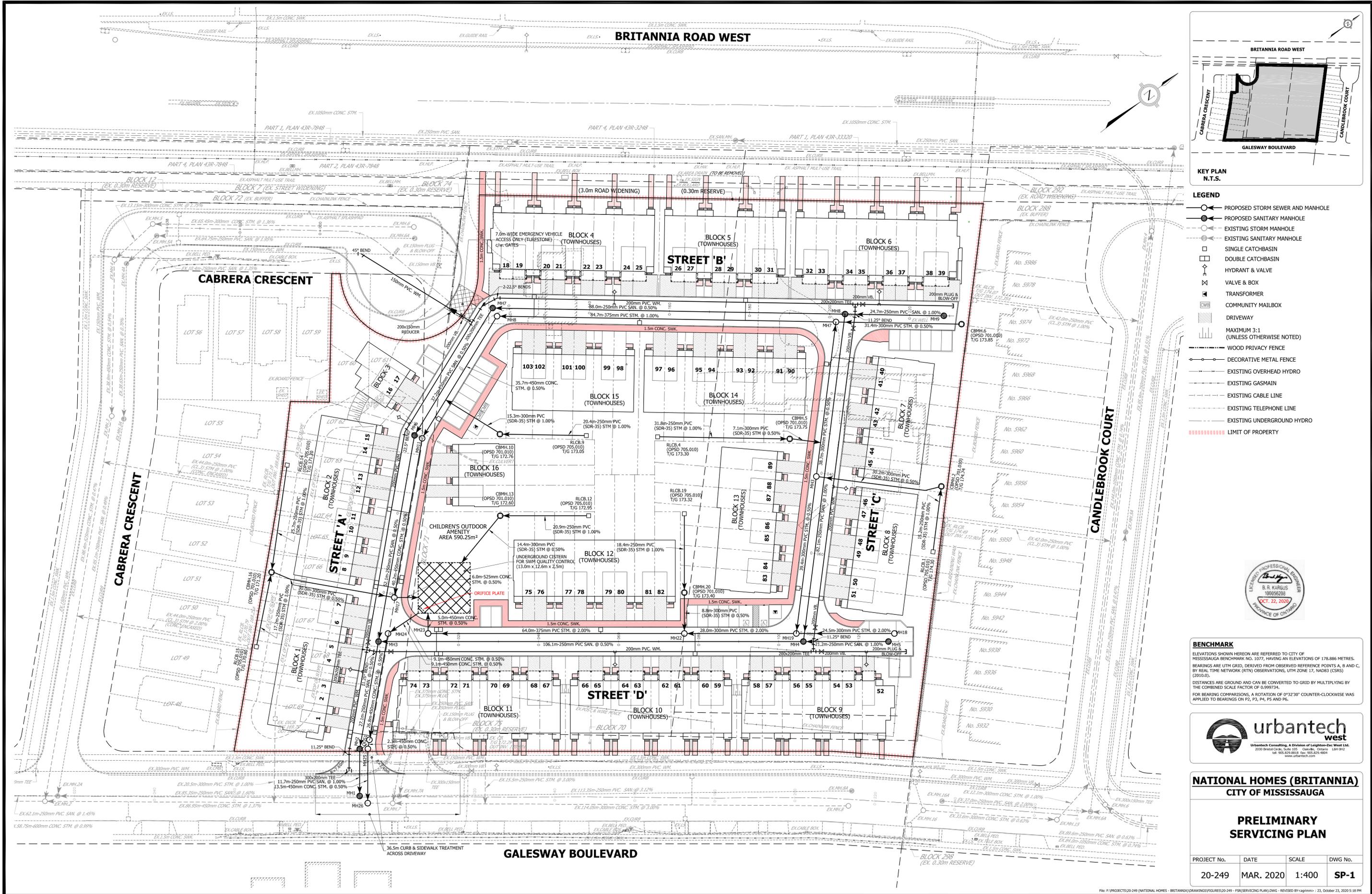


NATIONAL HOMES (BRITANNIA)
CITY OF MISSISSAUGA

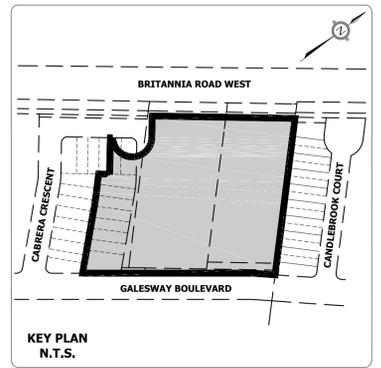
PRELIMINARY SANITARY DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:750	SAN-1

PROJECT: 20-249 NATIONAL HOMES - BRITANNIA (DRAWINGS: 20-249-01 - PRELIMINARY DRAINAGE PLAN)



BRITANNIA ROAD WEST



- LEGEND**
- PROPOSED STORM SEWER AND MANHOLE
 - PROPOSED SANITARY MANHOLE
 - EXISTING STORM MANHOLE
 - EXISTING SANITARY MANHOLE
 - SINGLE CATCHBASIN
 - DOUBLE CATCHBASIN
 - ⊕ HYDRANT & VALVE
 - ⊕ VALVE & BOX
 - ⊕ TRANSFORMER
 - ⊕ COMMUNITY MAILBOX
 - ▭ DRIVEWAY
 - ▭ MAXIMUM 3:1 (UNLESS OTHERWISE NOTED)
 - WOOD PRIVACY FENCE
 - DECORATIVE METAL FENCE
 - EXISTING OVERHEAD HYDRO
 - EXISTING GASMAIN
 - EXISTING CABLE LINE
 - EXISTING TELEPHONE LINE
 - EXISTING UNDERGROUND HYDRO
 - LIMIT OF PROPERTY



BENCHMARK
 ELEVATIONS SHOWN HEREON ARE REFERRED TO CITY OF MISSISSAUGA BENCHMARK NO. 1077, HAVING AN ELEVATION OF 178.886 METRES. BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A, B AND C, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010).
 DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999734.
 FOR BEARING COMPARISONS, A ROTATION OF 0°12'30" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON P2, P3, P4, P5 AND P6.



NATIONAL HOMES (BRITANNIA)
CITY OF MISSISSAUGA

PRELIMINARY SERVICING PLAN

PROJECT No.	DATE	SCALE	DWG No.
20-249	MAR. 2020	1:400	SP-1