FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

Prepared for:
1000679027 Ontario Inc.

DEVNEX
Real estate development manager

5-Lot Severance

161 Heathwood Heights Drive
Aurora, ON L4G 4X2

April 30, 2025
Project No.: 25-002

SITEPLANTECH INC.
YOUR URBAN REDEVELOPMENT SOURCE

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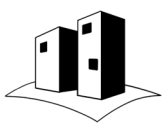
Table of Contents

LIST OF TABLES

APPENDICES

Submission History

Submission	Date	Issued For	Issued To
1	Apr. 30, 2025	OPA	Aurora



1.0 INTRODUCTION

All background information summarized in the following sections are found in **Appendix A**.

1.1 Purpose

SITEPLANTECH was retained by 1000679027 Ontario Inc. to outline the manner in which sanitary, storm and water services will be managed for the proposed development located at 161 Heathwood Heights Drive in the Town of Aurora.

The purpose of this report is to prepare a Function Servicing and Stormwater Management (SWM) Report with preliminary engineering plans in support of an Official Plan Amendment.

1.2 Background Information

The following documents were requested and made available to SITEPLANTECH for our review and forms the basis of this report:

- Ali Shakeri, Arcica Inc. (2025, April 17), 161 Heathwood Heights Drive, Site Plan [A1a].
- Z. Zeng, Manadrin Surveyors Limited, (2024, May 31), Surveyor's Real Property Report, Part 1 – Plan of Survey of Lot 22 R-Plan 65M-2431, [2024-105].
- N Hatami, Geomaple Geotechnics Inc., (2025, March 7), Hydrogeological Investigation Report, [Project 2024-10-150].
- P.E.K. Van Steen, Macrotech Limited Municipal Engineers, Heathwood Heights Drive STA. 2+50 to STA. 5+00, As-built U/G (1990 Feb.) (Dwg. No. 83135-102).

1.3 Site Description

The subject site is approximately 0.256 hectares and is currently occupied by an existing residential dwelling. The site is bounded by:

- Heathwood Heights Drive to the north;
- Low density residential dwellings to the east; A woodlot to the south; and,
- Tilston Grove to the west.

The site is not located within a Lake Simcoe and Region Conservation Authority regulated area.

1.4 Proposed Development

The proposed development will consist of severing the lot into five (5) single detached residential dwellings each having a driveway accessing Heathwood Heights Drive. Please refer to the site plan and site statistics in **Appendix A** for additional information.

1.5 Easements and Land Conveyances

According to the information provided to SITEPLANTECH, there are no easements registered on title nor has the municipality requested additional land conveyances.

2.0 TERMS OF REFERENCE AND METHODOLOGY

2.1 Terms of Reference

This report and supporting engineering drawings were prepared in accordance with the Lake Simcoe and Region Conservation Authority's stormwater management guidelines and the Town of Aurora's design standards.

2.2 Methodology: Stormwater Management

The modified rational method will be used to calculate runoff rates and target release rates from the site based on Intensity-Duration-Frequency (IDF) rainfall curves taken from the Town of Aurora's Design Criteria Manual for Engineering Plans (Section E2.05, Table E-3), outlined below:

Table 1: IDF Data

Return Period	A	B	C
2-Year	647.7	4.0	0.784
5-Year	929.8	4.0	0.798
100-Year	1,770.0	4.0	0.820

We will provide a detailed account of the pre- and post-development conditions and comment on opportunities to meet the requirements outlined below:

- Water quantity: Control the post-development flows to the allowed pre-development flows as per existing conditions; and,
- TSS removal: Long-term average of 80% TSS removal is required.

2.3 Methodology: Sanitary Drainage

The sanitary sewage discharge from the site will be determined using sanitary sewer design sheets that consider the land use and building statistics as supplied by the design team. The calculated values provide peak sanitary flow discharge that will include infiltration.

The proposed sanitary discharge flows from the site will be calculated based on the Town's criteria (Section C2.02) shown in the following **Table 2** below.

Table 2: Sanitary Flow Criteria

Use	PPU	Flow
Single	3.8	400 L/c/d

The existing and proposed site generated flows will be compared, and recommendations will be made to address servicing options and needs, if applicable.

2.4 Methodology: Water Supply

The proposed domestic water demands from the site will be determined in accordance with the Town's design criteria (Section F2.05) summarized in **Table 3** below.

Table 3: Water Demands Criteria

Use	PPU	Flow
Single	3.8	400 L/c/d

Fire suppression calculations, in accordance with the Fire Underwriters Survey (FUS) Guidelines, will be undertaken to determine the minimum flow required at 140 KPa for fire protection, the results of which will be compared to the hydrant flow test to confirm adequate supply.

3.0 STORMWATER MANAGEMENT

All calculations and figures pertaining to the information summarized in the following sections are found in **Appendix B**.

3.1 Existing Drainage System

The following storm sewer infrastructure is located within the vicinity of the subject site:

- An existing 375 mm concrete storm sewer is located diagonally along Heathwood Heights Dr. and drains west to a watercourse passed Tilston Grove.

Surface drainage from this property is split. In general, the western part flows directly to Tilston Grove road while the southern part of the site also drains to Tilston Grove, but via the woodlot to the south.

Refer to the pre-development drainage area **Plan 201** for the existing site drainage details.

3.2 Allowable Release Rate

The allowable release rate from the site was derived from drainage areas reflecting the existing conditions noted on **Plan 201**.

The calculated allowable release rates can therefore be summarized as per **Table 4** below:

Table 4: Allowable Release Rate

ID 101 (To Woodlot)	Area (Ha)	Runoff C	Rate (L/s)
2-year	0.180	0.413	13.3
5-year	0.180	0.413	18.4
100-year	0.180	0.413	32.7
ID 102 (To Tilston Grove)	**Area (Ha)**	**Runoff C**	**Rate (L/s)**
2-year	0.076	0.486	6.6
5-year	0.076	0.486	9.1
100-year	0.076	0.486	16.2

3.3 Post-Development Release Rate and Quantity Control

A post-development drainage **Plan 202** and run-off calculations were prepared based on the proposed site development and **Plan 401**, the summary of which is found in **Table 5** below:

Table 5: Post-Development Run-Off

ID 201 (To Woodlot)	Area (Ha)	Runoff C	Rate (L/s)
2-year	0.180	0.413	20.3
5-year	0.180	0.413	27.9
100-year	0.180	0.413	49.8
ID 202 (To Tilston Grove)	**Area (Ha)**	**Runoff C**	**Rate (L/s)**
2-year	0.076	0.486	5.0
5-year	0.076	0.486	6.9
100-year	0.076	0.486	12.3

In order to meet the allowable release rate from the post-drainage area ID 201 and ID 202 temporary storage of stormwater will be necessary as summarized in **Table 6** below:

Table 6: Required Storage Summary

Storm Event	Allow. Release Rate (L/s)	Calculated Run-Off (L/s)	Required Storage (m^3)
ID 201 (Woodlot)			
2-year	13.3	20.3	6.3
5-year	18.4	27.9	8.6
100-year	32.7	49.8	15.4
ID 202 (Tilston Grove)			
2-year	6.6	5.0	-
5-year	9.1	6.9	-
100-year	16.2	12.3	-

The storm sewers fronting the site are not intended for direct connection and the existing topography varies, therefore storage of stormwater options are limited. Taking the existing landform into consideration (refer to **Section 6.0** below), the required storage noted in the above table for each drainage area will be provided by an infiltration trench which will intercept the surface drainage from ID 201, which will be located approximately 0.5m offset from the proposed tree protection zone. The trenches were sized to provide enough storage such that peak flows from the 100-year post-development storm event are attenuated to the allowable flows.

Please refer to stage storage calculations and **Plan 401** for details.

3.4 Infiltration Trench Sizing

According to the Geotechnical investigation by GCE, the soil on site is composed of sandy silt till which generally has an infiltration rate ranging between 35 to 108mm/hr. Assuming a rate of

45mm/hr , in order to store the required volume of 15.4m^3 in area ID 201, the trench area will need to be approximately 35.7m^2 with a depth of 1.08m. Based on this area we have an expected drawdown time of 24 hrs, which is less than the MECP guideline of 48 hrs. As per the Ontario Stormwater management plan and SWMP design (4.0), the infiltration trench will have a cover of 0.9m (refer to the soil cover diagram in **Appendix B**). Refer to detail on **Plan 401**.

3.5 Quality Control

As per LSRCA's requirements quality controls must achieve a minimum of 80% total suspended solids (TSS) removal. The development will consist of peaked roofs, grassed areas and asphalt driveways each having an effective removal rate as outlined in **Table 7** below:

Table 7: Effective TSS Removal Rate

Surface Type	Effective Removal Rate
Asphalt	0%
Roof	80%
Grassed Areas	100%

Based on the Effective TSS removal calculations, the proposed development will achieve a net TSS removal of 88%, therefore no treatment is required.

3.6 Volume Control

Per Section 2.2.2 of the LSRCA's design standards, this application is considered a "major application" due to the creation of 4 or more lots therefore volume reduction techniques to retain 25mm from impervious areas should be considered. Based on the site plan, approximately 500m^2 of new impervious areas will be constructed, consisting of both roof and asphalt surfaces. Accordingly, to meet the volume control guidelines, 12.5m^3 should be retained on site. However, we consider this development as a "site with restrictions" and propose the following alternative:

- Retain an equivalent runoff volume from a 5mm event from the pervious surfaces. Based on the proposed impervious areas, this amount to retaining approximately 2.5m^3
- Volume reduction will be achieved within the sand bed of the infiltration trench and could be supplemented with rainwater harvesting.

3.7 Phosphorus Loading

The Lake Simcoe Region Conservation Authority (LSRCA) requires an analysis of the pre- and post-development phosphorous loading from the proposed development. This analysis was conducted using the MECP Phosphorous Budget Tool using agreed upon pre-development land-uses and considers the proposed LIDs.

In addition to the proposed LIDs, erosion and sediment control procedures will be implemented to reduce sediment transportation during construction. Refer to **Section 7.0** below for additional details.

Considering the above, a net reduction of approximately 42% in phosphorous loading for the proposed development is achieved; a summary of the Phosphorous Budget Tool results is outlined in **Table 8** below:

Table 8: Post Development P-Load Summary

Stage	P-Load (kg/yr)
Pre-development	0.03
Post-development	0.03
BMP credits	0.01
Post-Development P-Load	0.02
Construction P-Load	0.00
Net Post-Development P-Load	**0.02**

The proposed development meets the LSRCA's May 2023 Phosphorous Offsetting Policy.

3.8 Storm Servicing

It is proposed to discharge roof leaders at grade and direct flows to the rear-yard LIDs. Should sump pumps be required, these will outlet to the rear yards.

4.0 SANITARY DRAINAGE

All calculations and figures pertaining to the information summarized in the following sections are found in **Appendix C**.

4.1 Existing Sanitary Drainage System

The following sanitary sewer infrastructure is located within the vicinity of the subject site:

- A 200 mm diameter PVC sewer located approximately 1.5m from the Tilston Grove road centreline. This sewer drains south.

There are no existing sanitary sewers fronting the proposed development on Heathwood Heights Drive.

4.2 Existing Sanitary Flows

Based on the Town's criteria outlined in **Section 2.3** above, the existing dwelling contributes a peak sanitary flow of approximately 0.1L/s. This flow is directed to the existing sanitary infrastructure at Tilston Grove via a 125mm sanitary lateral.

4.3 Proposed Sanitary Flows

The proposed sanitary discharge flow from the site was calculated based on the criteria outlined in **Section 2.3**, and the number of units to be constructed. Based on the current information, a total peak design flow of 0.4 L/s was calculated for the subject property, representing a net sanitary flow increase of 0.3 L/s.

4.4 Receiving Sewer Capacity

As requested by the Town of Aurora, a capacity assessment of the receiving infrastructure's first 3 sewer segments, based on the Town of Aurora's GIS data, was prepared to determine the adequacy of the existing infrastructure to support the flows generated by the proposed development. Specifically, the following sewer segments were analyzed (numbered as per the sanitary drainage **Plan 301**):

- MH4260-09 – MH4340-01 – A 200mm sanitary sewer with a gradient of 0.66%.
- MH4340-01 – MH4340-02 – A 200mm sanitary sewer with a gradient of 0.23%.
- MH4340-02 – MH4340-03 – A 200mm sanitary sewer with a gradient of 0.42%.

The sewer analysis was based on the following criteria and assumptions:

- Upstream sewer limits determined from the Town of Aurora's GIS data.
- Existing residential flows were evaluated using the Town's criteria of 400 L/cap/day
- I/I flow of 0.26 L/s/ha.
- All known development applications have been included in the capacity assessment.

The results of the analysis show that, under the proposed conditions, the Town's infrastructure would operate at a maximum of about 79% capacity (between MH4340-01 and MH4340-02 due to the segment being relatively flat). Please refer to the sanitary design sheet included in the appendix and on **Plan 301**. Based on our calculations, the local Town infrastructure is adequate to support the proposed development without surcharging.

4.5 Proposed Sanitary Connection

As there are no sanitary sewers along the frontage of the new proposed lots, the following options were considered:

Sewer Extension

A westward extension of the existing sanitary sewer east of the existing site on Heathwood Heights Drive was considered, however due to the relatively high existing invert and the negative road grade (traveling westbound), it was determined that this sewer cannot be extended to service the proposed development.

Pumping

Since it was determined that the Heathwood Heights Drive sewer could not be extended, consideration was made to pumping the sanitary sewage to the existing sewer east of the site frontage. Although technically feasible, this would require the municipality to take ownership of a pumpstation and forcemain servicing only 5 units. Furthermore, this option would considerably financially impact the development, rendering it not feasible.

New Infrastructure

The only feasible option is to construct a new municipal sanitary sewer along Heathwood Heights Drive which would service all 5 new lots.

In light of the above options, it is therefore proposed to construct a new 150mm PVC saniatary sewer sloped at 2% and connecting tot eh existing Tilston Grove infrastructure with a drop structure. This sewer would be sufficiently deep to provide gravity drainage to all the proposed units. The five (5) proposed lots would therefore outlet to the new 150mm sanitary sewer on Heathwood Heights Drive. Each home will be connected to the new sanitary sewer via 125mm PVC connections with a slope of 2.0%. Refer to **Drawing 101** found in **Appendix E** for additional information.

5.0 WATER SUPPLY

All calculations and figures pertaining to the information summarized in the following sections are found in **Appendix D**.

5.1 Existing System

The following water infrastructure is located within the vicinity of the subject site:

- A 200 mm diameter ductile iron watermain located within the north boulevard of Heathwood Heights Drive; and,
- A 200 mm diameter ductile iron watermain located within the east boulevard of Tilston Grove.

The existing house is service from the Heathwood Heights Drive infrastructure via a 19mm water connection, the material of which is unknown.

A hydrant flow test was carried out within the vicinity of the site to determine flow and pressure conditions on Hendon Avenue. The test was carried out by Watermark Environmental Ltd. on April 15, 2025 and can be found in **Appendix D**. The test results indicate the watermain is operating at a static pressure of approximately 380 KPa (55 PSI), and our calculations confirm that the available flow at 150 KPa (21.7 PSI) is approximately 21,675 L/min (5,726 USPGM).

5.2 Existing Water Demands

Based on the criteria outlined in **Section 2.4** above, the existing average day domestic water consumption from the municipal infrastructure is approximately 0.02 L/s (maximum day demand of 2,668 L/d).

5.3 Proposed Water Supply Requirements

Based on the criteria outlined in **Section 2.4** above, the proposed average day domestic water consumption will be approximately 0.1L/s (maximum day demand of 13,338 L/d) from the Heathwood Heights Drive infrastructure.

Water Supply for Public Fire Protection calculations, as per the Fire Underwriters Survey (FUS), were undertaken to determine the minimum requirement to provide adequate fire suppression. According to our calculations, a minimum fire suppression flow of approximately 6,200 L/min will be required for the subject development. However this is below the Town's minimum required flow of 7,000 L/min (1,849 USGPM). As per the supporting calculations, the FUS + Max Day flow of 7,010 L/min (1,852 USGPM) is available at a pressure which exceeds the minimum requirements.

The infrastructure is therefore adequate to support the proposed development.

5.4 Proposed Water Connection

Each lot will be serviced with a 25mm diameter watermain and will connect to the existing 200mm watermain on Heathwood Heights Drive in accordance with Town standard W-101 with a curb stop at the property line.

Please refer to **Drawing 101** found in **Appendix E** for additional details.

6.0 SITE GRADING

All drawings pertaining to the information summarized in the following sections are found in **Appendix E**.

6.1 Existing Grades

As per the pre-development drainage plan referenced in **Section 2.4**, the existing grading of the site is such that the overland flow is split in two directions – approximately one third the site is comprised of drainage ID 101 (0.180 ha) which drains south towards the woodlot while drainage ID 102 (0.0.76 ha) drains west to Tilston Grove.

Within the proposed disturbed areas, the topography varies significantly throughout the site ranging from a low point of approximately 304.50 near the southwest corner to a high point of approximately 309.50 along the east property limit.

6.2 Proposed Grades

Due to the proposed tree protection zones (TPZ), it will be necessary to limit grading to areas outside of the TPZ and any existing conditions within or outside of the TPZ beyond our boundary will remain.

The lots will be generally graded as split draining lot as shown on **Figure 202**. Drainage from the front lawns will be directed to Heathwood Heights Drive, while roofs and rear yards will be directed towards to woodlot. The finished floor elevations will vary to accommodate the sloping lands and are expected to range between 308.27 to 310.09.

All existing grades will be met at the property limits and at the edge of the tree protection zones and retaining walls where required will be constructed outside of the TPZ. All surface grades will be designed to provide 2.0% - 5.0% slope throughout the development.

The development of this site and will not adversely impact adjacent lands.

Please refer to **Drawing 401** found in **Appendix C** for additional information.

7.0 EROSION AND SEDIMENT CONTROL

To ensure stormwater runoff during the construction phase does not transport sediment to the existing municipal infrastructure, the following measures will be implemented throughout the construction period:

- Temporary catch basin sediment control devices are proposed on Heathwood Heights Drive and Tilston Grove.
- Temporary sediment control fencing will be erected around the site perimeter.
- Temporary construction access (mud mat) will be built at the construction entrance currently proposed from Hendon Avenue.
- All proposed erosion and sedimentation control measures shall be inspected promptly after every storm event and shall be repaired or replaced if/where damaged.

As a measure of best management practice, the following shall be implemented as part of the construction activities:

- All precipitation accumulated within the site excavation during the duration of construction shall be dealt with as part of the on-site short-term groundwater dewatering program.
- All waste material, including any hazardous contaminated excess soils, shall be removed and disposed of off-site by the owner in accordance with the Ministry of the Environment, Conservation and Parks (MECP) regulations and all other applicable statutory requirements.

The above measures will be designed and constructed in accordance with the "Erosion and Sediment Control Guideline for Urban Construction" document (December 2019). These measures, as well as any additional information pertaining to ESC Controls, are detailed on **Drawing 601** found in **Appendix F**. All reasonable measures will be taken to ensure sediment loading to the adjacent properties and municipal right-of-way is minimized both during and following construction.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This report is to be read in conjunction with the application submission material for the project proposal known as 161 Heathwood Heights Drive. We conclude and recommend the following:

8.1 Stormwater Management

Peak runoff rates for the proposed development were designed to be less than or equal to the allowable release rate by providing total on-site storage of 15.4m^3 in the form of trench storage.

Quality controls are not required as the proposed development can achieve a net TSS removal of 88% without additional treatment.

8.2 Sanitary Drainage

The sanitary discharge from the proposed development will be directed to a new municipal sewer to be constructed by the developer on Heathwood Heights Drive. The downstream sanitary review of the first 3-sewer segments downstream of the proposed connection concludes that the existing infrastructure will continue to flow without surcharging and is adequate to support the proposed development.

8.3 Water Supply

According to the calculations and hydrant flow tests presented in this report, the existing municipal infrastructure is adequate to support the proposed development.

8.4 Site Grading

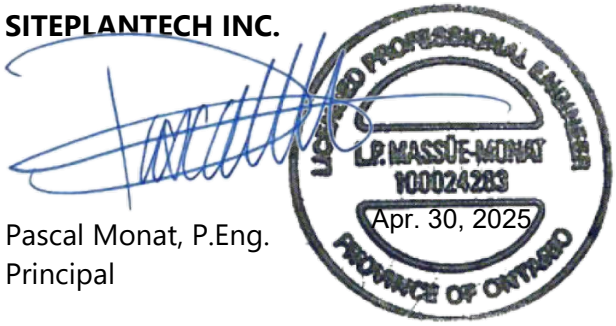
The proposed grading is compatible with existing elevations at the property limit and will not adversely affect adjacent properties.

8.5 Erosion and Sediment Control

ESC measures were designed as per the "Erosion and Sediment Control Guideline for Urban Construction" document (December 2019). Provided that these measures are well maintained during construction, these will be adequate to keep sediments from entering the municipal infrastructure during construction

Respectfully submitted,

SITEPLANTECH INC.



Pascal Monat, P.Eng.
Principal

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Appendix A

Background Information

HEATHWOOD HEIGHTS DRIVE

TILSTON GROVE

CENTRELINE OF ROAD

BOUNDARY OF THE ENTIRE LOT

CURB CUT

CONCRETE CURB

CONCRETE SIDEWALK

HYDRO TRANSFORMER

SIGN

N72°35'45"E 63.09

N17°17'45"W

N70°49'10"E

58'-10 1/2" 17.95

49'-2 1/2" 15.00

18'-8" 5.69

PROPOSED DRIVEWAY

SOD

PORCH

PROPOSED DETACHED DWELLING

15'-0" 4.57

39'-0" 11.89

5'-1" 1.55

5'-1 1/2" 1.56

4'-11" 1.50

DECK

ENTIRELY SODDED BACKYARD

LINE OF 10m BUFFER

LINE OF EXISITING DWELLING TO BE DEMOLISHED

DRIPLINE

B.R.W.

WALKWAY

WALKOUT

WOOD DECK

FRAME SHED

TRAIL

CURB CUT

C.L.F.

W.O.F.

B.O.G.

T.O.B.

LOT #1

FIN. MAIN FL. : **309.09**
FIN. FIRST FL. : **308.29**
T/FDN WALL : SEE GRADING PLAN
T/BASEMENT SLAB : **305.74**
USF : SEE GRADING PLAN OR 4' BELOW GRADE WHICHEVER DEEPER

Zoning Data Matrix	Proposed
R3	
Lot Frontage	17.95 m
Lot Area	6436.2 s.f. - 597.94 m2
Lot Coverage	1950.0 s.f. -181.16 m2 (30.30%)
Height	10 m

LOT #2

FIN. MAIN FL. : **309.37**
FIN. FIRST FL. : **308.57**
T/FDN WALL : SEE GRADING PLAN
T/BASEMENT SLAB : **306.02**
USF : SEE GRADING PLAN OR 4' BELOW GRADE WHICHEVER DEEPER

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5356.2 s.f. - 497.61 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (36.41%)
Height	10 m

LOT #3

FIN. MAIN FL. : **309.90**
FIN. FIRST FL. : **309.10**
T/FDN WALL : SEE GRADING PLAN
T/BASEMENT SLAB : **306.55**
USF : SEE GRADING PLAN OR 4' BELOW GRADE WHICHEVER DEEPER

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5281.1 s.f. - 490.63 m2
Lot Coverage	1950.0 s.f. -181.16 m2 (36.92%)
Height	10 m

LOT #4

FIN. MAIN FL. : **310.42**
FIN. FIRST FL. : **309.62**
T/FDN WALL : SEE GRADING PLAN
T/BASEMENT SLAB : **307.07**
USF : SEE GRADING PLAN OR 4' BELOW GRADE WHICHEVER DEEPER

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5206.1 s.f. - 483.66 m2
Lot Coverage	1950.0 s.f. -181.16 m2 (37.46%)
Height	10 m

LOT #5

FIN. MAIN FL. : **310.82**
FIN. FIRST FL. : **310.02**
T/FDN WALL : SEE GRADING PLAN
T/BASEMENT SLAB : **307.47**
USF : SEE GRADING PLAN OR 4' BELOW GRADE WHICHEVER DEEPER

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5279.5 s.f. - 490.48 m2
Lot Coverage	1950.0 s.f. -181.16 m2 (36.94%)
Height	10 m

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST VERSION OF THE OBC
2. VERIFY ALL DIMENSION BEFORE CONSTRUCTION.
3. DO NOT SCALE DRAWINGS.
4. ALL DIMENSIONS AND INFORMATION SHALL BE CHECKED AND VERIFIED ON THE JOB AND ANY VARIANCES OR DISCREPANCIES MUST BE REPORTED TO THE ARCHITECT BY PHONE AND SUBSEQUENT WRITTEN CONFIRMATION PRIOR TO COMMENCEMENT OF THE WORK.
5. USE ONLY LATEST VERSION OF DRAWINGS
6. ALL STRUCTURAL DESIGN MUST BE REVIEWED AND APPROVED BY CERTIFIED STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION

ONTARIO ASSOCIATION OF ARCHITECTS
Ali Shakeri
ALI SHAKERI-NEZHAD
LICENCE 9786

revisions:
SEP 20, 2024 - SITE PLAN1

project: 161 HEATHWOOD HEIGHT DRIVE

drawing: SITE PLAN

scale: 1/16" = 1'-0"

page: A1a

ALI SHAKERI
416-821-3960

ARCICA INC.
326 SHEPPARD AVENUE EAST, SUITE 200
TORONTO, ONTARIO, CANADA, M2N 3B4
WWW.ARCICA.COM

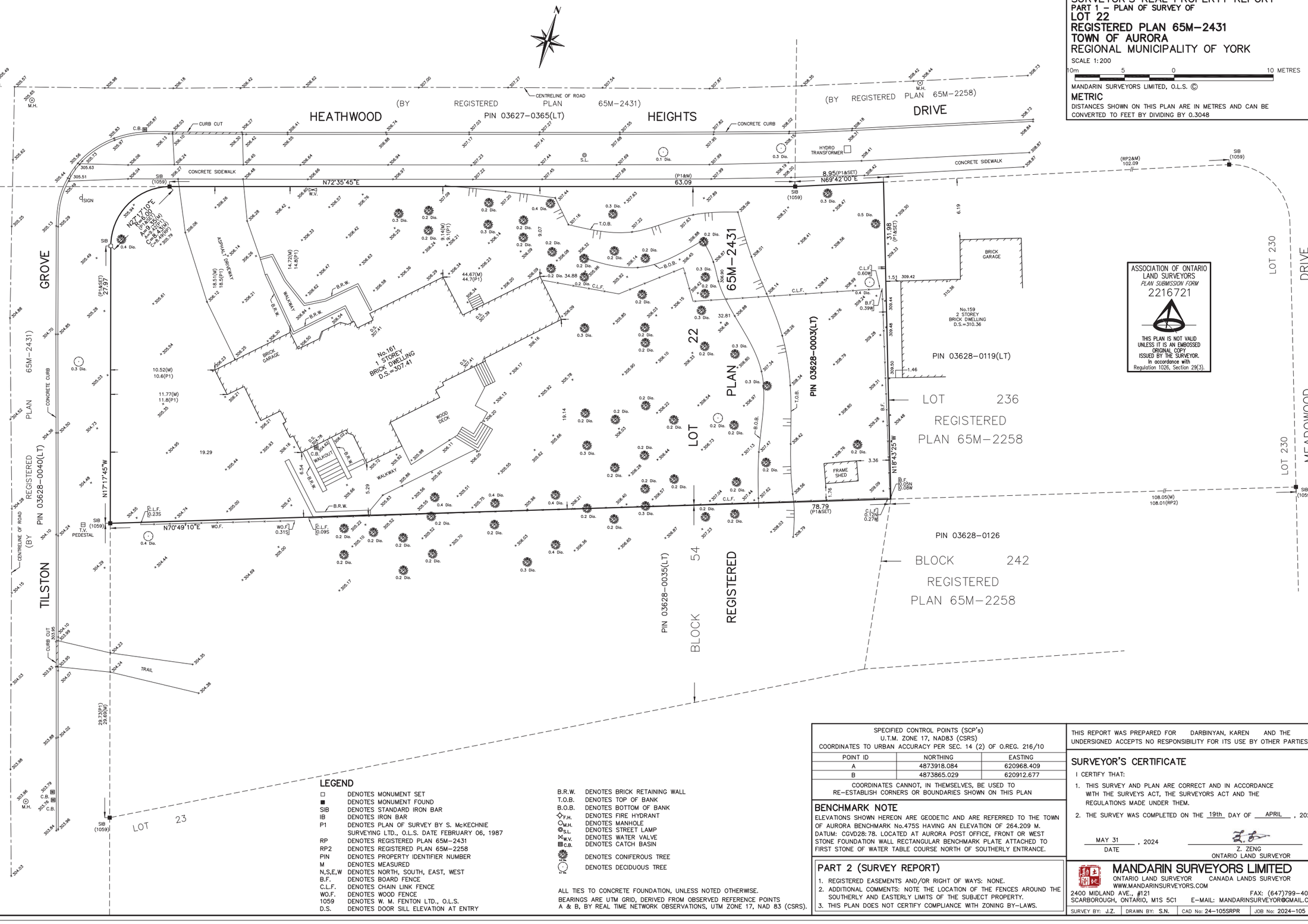
SURVEYOR'S REAL PROPERTY REPORT
PART 1 – PLAN OF SURVEY OF
LOT 22
REGISTERED PLAN 65M–2431
TOWN OF AURORA
REGIONAL MUNICIPALITY OF YORK

SCALE 1:200

10m 5 0 10 METRES

METRIC

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



ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2216721

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR. In accordance with Regulation 1026, Section 29(3).

LEGEND

□	DENOTES MONUMENT SET
■	DENOTES MONUMENT FOUND
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
P1	DENOTES PLAN OF SURVEY BY S. McKECHNIE SURVEYING LTD., O.L.S. DATE FEBRUARY 06, 1987
RP	DENOTES REGISTERED PLAN 65M–2431
RP2	DENOTES REGISTERED PLAN 65M–2258
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
M	DENOTES MEASURED
N,S,E,W	DENOTES NORTH, SOUTH, EAST, WEST
B.F.	DENOTES BOARD FENCE
C.L.F.	DENOTES CHAIN LINK FENCE
WO.F.	DENOTES WOOD FENCE
1059	DENOTES W. M. FENTON LTD., O.L.S.
D.S.	DENOTES DOOR SILL ELEVATION AT ENTRY

B.R.W.	DENOTES BRICK RETAINING WALL
T.O.B.	DENOTES TOP OF BANK
B.O.B.	DENOTES BOTTOM OF BANK
F.H.	DENOTES FIRE HYDRANT
M.H.	DENOTES MANHOLE
S.L.	DENOTES STREET LAMP
W.V.	DENOTES WATER VALVE
C.B.	DENOTES CATCH BASIN
	DENOTES CONIFEROUS TREE
	DENOTES DECIDUOUS TREE

ALL TIES TO CONCRETE FOUNDATION, UNLESS NOTED OTHERWISE.

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A & B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17, NAD 83 (CSRS).

SPECIFIED CONTROL POINTS (SCP's)
U.T.M. ZONE 17, NAD83 (CSRS)
COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
A	4873918.084	620968.409
B	4873865.029	620912.677

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN

BENCHMARK NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE TOWN OF AURORA BENCHMARK No.475S HAVING AN ELEVATION OF 264.209 M. DATUM: CGVD28:78. LOCATED AT AURORA POST OFFICE, FRONT OR WEST STONE FOUNDATION WALL RECTANGULAR BENCHMARK PLATE ATTACHED TO FIRST STONE OF WATER TABLE COURSE NORTH OF SOUTHERLY ENTRANCE.

PART 2 (SURVEY REPORT)

1. REGISTERED EASEMENTS AND/OR RIGHT OF WAYS: NONE.
2. ADDITIONAL COMMENTS: NOTE THE LOCATION OF THE FENCES AROUND THE SOUTHERLY AND EASTERLY LIMITS OF THE SUBJECT PROPERTY.
3. THIS PLAN DOES NOT CERTIFY COMPLIANCE WITH ZONING BY–LAWS.

THIS REPORT WAS PREPARED FOR DARBINYAN, KAREN AND THE UNDERSIGNED ACCEPTS NO RESPONSIBILITY FOR ITS USE BY OTHER PARTIES.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 19th DAY OF APRIL , 2024

MAY 31 , 2024
DATE

Z. ZENG
ONTARIO LAND SURVEYOR

MANDARIN SURVEYORS LIMITED
ONTARIO LAND SURVEYOR CANADA LANDS SURVEYOR
WWW.MANDARINSURVEYORS.COM
2400 MIDLAND AVE., #121 FAX: (647)799–4068
SCARBOROUGH, ONTARIO, M1S 5C1 E–MAIL: MANDARINSURVEYOR@GMAIL.COM

SURVEY BY: J.Z.	DRAWN BY: S.N.	CAD No: 24–105SRPR	JOB No: 2024–105

SEE DRWG. Nº 118

SEE DRWG. Nº 117

SEE DRWG. Nº 101

SEE DRWG. Nº 103

SEE DRWG. Nº 115

HILLARY PLACE

HEATHWOOD HEIGHTS

WILLIAMSON TERRACE

TILSTON GROVE

DRIVE

BLOCK 52

BLOCK 55

BLOCK 49

15

10

6

21

34

35

36

37

22

TWIN 20·0m - 900mm ø CONC. ST. @ 4·50 %
CL. III. 150mm MIN. SEPARATION BETWEEN BARRELS. BEDDING AS M.T.C. STD. DD-823, CL. B-I (WITH CRUSHER RUN LIMESTONE.) MOD. WITH GRAN. MAT'L TO 150mm ABOVE BARREL; COMPACTION BETWEEN BARRELS TO BE BY VIBRATORY TOOL WITH MOISTURE CONTENT OF MATERIAL TO SATISFACTION OF ENGINEER.

STRAW BALE SILTATION TRAP SET TO SUIT SHAPE OF EXISTING CREEK. (SEE TYPICAL DETAIL DRWG. 83135-500)

3:1 SODDED SLOPES TO SUIT FINISHED GRADES; ALL DISTURBED AREAS TO BE FINE GRADED, TOPSOILED AND SODDED AND/OR SEEDED ON SLOPES FLATTER THAN 4:1 TO TOWN SATISFACTION.

0·3m GABION MATS TO TOWN SATISFACTION, SET TO SUIT EXISTING CREEK INVERTS AND SIDESLOPES. (SEE DRWG. Nº 83135-501 FOR TYPICAL GABION INSTALLATION.)

HEADWALL AS PER M.T.C. STD. DD-801-B (MOD.) WITH GRATES AS PER M.T.C. STD. DD-803 INV.@ HEADWALL 301·620 SUBJECT TO FIELD ADJUSTMENT TO SUIT EX. INVERT.

34 m² TEMPORARY SWALE, 3:1 MAX. SIDESLOPES, SODDED & PEGGED. (PHASE 2)

HEADWALL AS PER M.T.C. STD. DD-801-B WITH OUTLET GRATE AS PER M.T.C. STD. DD-803 INV.@ HEADWALL 300·040, SUBJECT TO FIELD ADJUSTMENT TO SUIT EXISTING INVERT.

16m - SODDED CHANNEL @ 0·20 %; 1·3 m FLAT BOTTOM, 3:1 SIDESLOPES UP TO EX. GROUND.

STRAW BALE SILTATION TRAP SET TO SUIT SHAPE OF EXISTING CREEK. (SEE TYPICAL DETAIL DRWG. 83135-500)

SPROUTED RIP RAP 15m MIN. LENGTH FROM END OF OUTLET, SET TO SUIT INV. & SIDESLOPES OF TEMPORARY SWALE. (PHASE 2)

STRAW BALE SILTATION TRAP TO SUIT SHAPE OF TEMPORARY SWALE. (PHASE 2) (SEE CONSTRUCTION DETAILS DRWG. Nº 83135-500)

TEMPORARY 61·0m - 500mm ø C.M.P. @ 2·10 % (PHASE 2) (TO BE REMOVED UNDER PHASE 3 WORKS)

20·0m - 1050mm ø CONC. ST. @ 0·20 %, CL. III. BEDDING AS M.T.C. STD. DD-823, CL. B-I (WITH CRUSHER RUN LIMESTONE)

TEMPORARY MOUNDING 2m ø TOP, 3:1 SIDESLOPES DOWN TO EX. GROUND. (PHASE 2)

TEMPORARY 61·0m - 500mm ø C.M.P. @ 2·10 % (G.R.16) - PHASE 2 (TO BE REMOVED AND DISPOSED OFF SITE UNDER PHASE 3 CONSTRUCTION)

TEMPORARY SWALE (PHASE 2)

NOTE: SEMI-CIRCULAR WEIR TO BE INSTALLED IN C.M.P. OUTLET PIPE TO PROVIDE SILT TRAP (PHASE 2)

* C.B. TO HAVE 28·3 ℓ/s (1 c.f.s.) ORIFICE OUTLET CONTROL DEVICE.

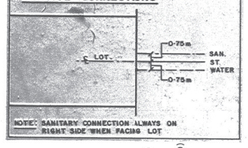
NOTE: SERVICE LOCATIONS MODIFIED.

NOTE: R/S = RISER TO 3m BELOW ℄ GRADE.

NOTES RE: PHASE 3 CONSTRUCTION.

ALL TEMPORARY PHASE 2 STORM SEWER CONSTRUCTION FROM MH. 28 WESTERLY AS MARKED ON THIS DRAWING TO BE REMOVED UNDER PHASE 3 CONSTRUCTION. PHASE 3 - 450 mm ø STORM WESTERLY FROM MH. 28 TO BE INSTALLED IN MANHOLE WITH MANHOLE WALLS AND BENCHING RECONSTRUCTED TO TOWN SATISFACTION.

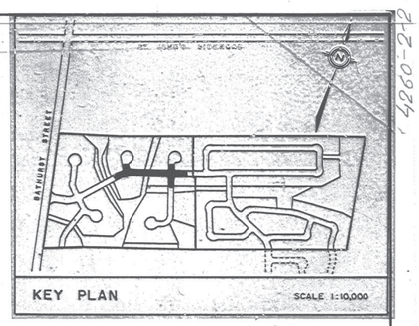
SERVICE CONNECTIONS



NOTE: SANITARY CONNECTION ALWAYS ON RIGHT SIDE WHEN FACING LOT

PAVEMENT DESIGN

40 mm H.L. - 3 SURFACE ASPHALT
50 mm H.L. - 4 BINDER ASPHALT
150 mm - 19 mm CRUSHER-RUN LIMESTONE - BASE
300 mm - 50 mm CRUSHER-RUN LIMESTONE - SUB BASE



GENERAL NOTES

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS.

1. SEWER PIPE MATERIAL
   Concrete pipe smaller than 450 mm diameter shall be CSA-A-257-1, concrete pipe 450 mm Dia. and larger shall be CSA-A-257-1 with rubber gaskets conforming to CSA-A-257-3. Polyvinyl chloride pipe shall conform to CSA B-137-3, ASTM D2729 or ASTM 3034 with solvent welded joints, "T" joints, D.I. cast iron couplings, "Ring Tite" couplings or approved equal and shall be compatible with Johns Manville materials.
   Asbestos cement pipe shall be ASTM C428 with "Ring Tite" couplings or equal and conform to AWWA std. C400.
   All class of pipe shown as per MTC std. Dwgs. DD-823 A.
2. Sewer pipe shall be bedded as per MTC Class B-I except that the granular material shall be 19 MM crusher run limestone. All sewer pipe not located in road allowance to be bedded as per MTC class A, Modified as noted.
3. All trenches are to be backfilled with native material and compacted to at least 95% standard proctor density. In addition, all structures within the travelled portion of the road shall have 1:4 from trench tapers from from line to subgrade.
4. MANHOLES
   Steps shall be aluminium alloy 65-S2-4 (Aluminum of Canada specification) or approved equal. Frames and covers shall be Dominion Wheel Foundries design Std.379 or approved equal. Manholes are to be set to base course grade and then adjusted to final grade using NODOLOK rings prior to placement of top course asphalt.
5. Catchbasins
   Frames and covers shall be as per MTC std. Dwg. DD713-B or approved equal.
   Single catchbasin lead - min. 250MM Diameter.
   Double catchbasin lead - Min. 300 MM Diameter.
   All catchbasins shall be stamped using hot mix asphalt.
   All catchbasins & catchbasin manholes to be SUMPED.
6. Service Connections
   Sanitary - 125 MM Diameter PVC SDR 28, with Crowle fitting installed on property line and marker painted black.
   Storm - 150 MM Diameter CONC. C14-S2, marker painted white.
   Water - 19 MM Diameter, Type K soft copper ASTM B-88, marker painted blue.
   - Services in driveways are to have frost stops.
   Connection locations are as shown; for typical location see construction detail sheets.
7. WATERMAINS AND APPURTENANCES SHALL BE AS PER TOWN OF AURORA MATERIAL SPECIFICATIONS. 100 MM to 300 MM Diameter - watermain shall be: Ductile Iron ANSI Spec. A21.4-1976 cement lined and coal tar coated with approved form of electrochemical corrosion protection.
   50 MM Diameter watermain shall be Type 'K' soft copper.
   Watermain to be bedded in Granular 'A' from 150 MM below invert to 300 MM above obvert.
8. Where watermains and service connections cross above sewers sufficient vertical separation shall be maintained to allow for proper bedding and structural support of the watermain and sewer main. When vertical separation is less than the specified bedding depth, the watermain or service connection shall pass under the sewer with a vertical separation of at least 0.5 metre between crown of watermain and the invert of the sewer.
9. All crossing pipes shall be supported.
10. Watermains shall have a 2.5 M horizontal clearance from other pipes.
11. Water services shall have a 1.2 metre horizontal clearance from other utilities.
12. Valve boxes shall be telescopic type.
13. Hydrants to have drainage pipe, be painted Tremco yellow, be equipped with chains, and have a secondary valve.
14. Concrete sidewalk shall be 125 MM depth.

BENCHMARK MTC-474-S
SAINT ANDREWS COLLEGE WEST SIDE YONGE STREET. TABLET SET HORIZONTALLY IN STONE PLINTH OF DUNLOP HALL 3·75m NORTH OF SOUTHEAST CORNER OF BUILDING.
ELEVATION 262·12

No.	DESCRIPTION	DATE	BY
5	'AS CONSTRUCTED' U/G	FEB. 90	PVS
4	SERVICE LOCATIONS REVISED	JUNE 1986	RLP
3	TILSTON & HEATHWOOD W/M O/S TO 300mm TO BLK 55	MAY 1986	RLP
2	PHASE 3 CONSTRUCTION ADDED	JUNE/84	W.C.W.
1	STORM SEWER, MH.1 TO TEMPORARY OUTFALL REVISED	JUNE/84	W.C.W.

REVISIONS

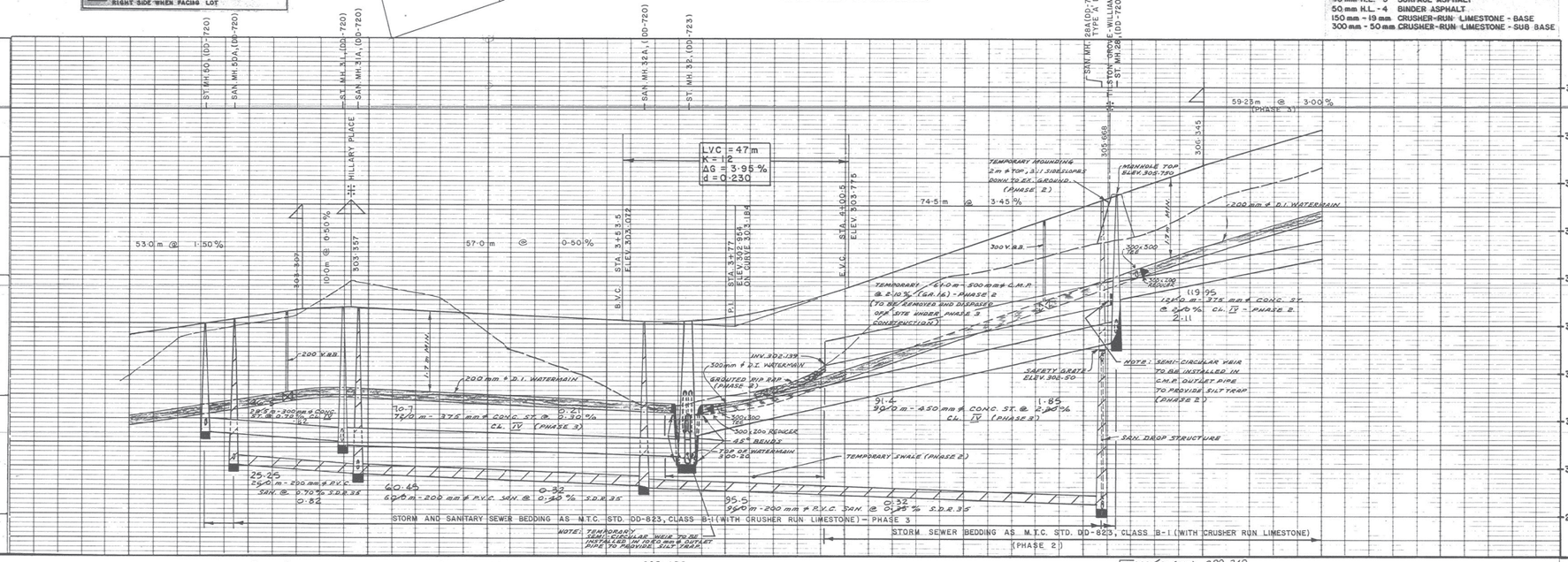
CORPORATION OF THE
TOWN OF AURORA

PLAN AND PROFILE OF
HEATHWOOD HEIGHTS DRIVE
STA. 2+50 TO STA. 5+00

MACROTECH LIMITED
Municipal Engineers
37 Corwin Crescent, Downsview, Ontario

DESIGN BY: P.V.S. | CHECKED BY: A.S. | PROJECT No.
DRAWN BY: W.C.W. | CHECKED BY: P.V.S.
SCALES: HORIZ. 1:500, VERT. 1:50 | DATE: JUNE 1984
APPROVED: William G. Walker, DIRECTOR OF PUBLIC WORKS | DATE: July 17th, 1984
DRAWING No. 83135-102

4860-23



4260-2-3

SEE DRWG. Nº 112

C.B. AS M.T.C. DD-702-B WITH BEEHIVE FRAME & GRATE GRATE ELEV. 308·430 OUTLET INV. 307·080

C.B. AS M.T.C. DD-702-B WITH BEEHIVE FRAME & GRATE GRATE ELEV. 308·550 OUTLET INV. 304·200

STRAW BALES SILTATION TRAPS (SEE CONSTRUCTION DETAILS DRWG Nº 83135-500)

EASTERLY LIMIT PHASE 3, ROAD, SIDEWALK, CURB AND WATERMAIN CONSTRUCTION

LIMIT PHASE 2 ROAD, SIDEWALK, CURB, AND WATERMAIN CONSTRUCTION

TRIBBLING CRESCENT

BUCK CRESCENT

HEATHWOOD HEIGHTS DRIVE

MEADOWOOD DRIVE

3·0m EASEMENT

39·0m - 250mm ϕ C.B. LEAD @ 2·00 % - CL. E.S. IN CONCRETE BEDDING AS M.T.C. STD. DD-823, CLASS A, MODIFIED TO COMPLETE CONCRETE ENCASEMENT TO 150mm OVER PIPE.

42·0m - 250mm ϕ C.B. LEAD @ 2·15 % - CL. E.S. IN CONCRETE BEDDING AS M.T.C. STD. DD-823, CLASS A, MODIFIED TO COMPLETE CONCRETE ENCASEMENT TO 150mm OVER PIPE.

1·5m EASEMENTS

2·0m - 300mm ϕ C.B. LEAD @ 10·00 % (CL. IV)

C.B. GRATE ELEV. 308·407 (INLET INV. 306·500 (250) OUTLET INV. 306·147 (300))

200mm x 150mm REDUCER

SEE DRWG. Nº 102

SEE DRWG. Nº 104

NOTE: DEPENDING ON TIMING OF CONSTRUCTION OF SERVICES IN WEST HALF OF SUBDIVISION AND ACCESS ROAD PROVISIONS, TEMPORARY CUL-DE-SAC AND/OR STEEL BEAM GUARDRAIL WITH CHECKBOARD SIGN MAY BE REQUIRED AT PHASE 2 WEST LIMIT; BUILDING PERMIT AVAILABILITY FOR LOTS 235 AND 236 ALSO DEPENDENT ON WEST HALF TIMING AND CUL-DE-SAC CONSTRUCTION ALL TO TOWN SATISFACTION.

NOTE: SERVICE LOCATIONS MODIFIED.

* C.B. TO HAVE 28·3 l/s (1 c.f.s.) ORIFICE OUTLET CONTROL DEVICE.

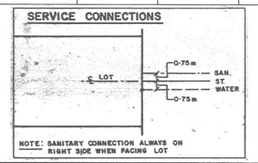
BLOCK 54 — BLOCK 242 — BLOCK 237

SEE DRWG. Nº 105

PAVEMENT DESIGN (STA. 5+00 TO STA. 6+75)

40 mm H.L. - 3	SURFACE ASPHALT
50 mm H.L. - 4	BINDER ASPHALT
150 mm - 19 mm	CRUSHER-RUN LIMESTONE - BASE
300 mm - 50 mm	CRUSHER-RUN LIMESTONE - SUB BASE

SERVICE CONNECTIONS



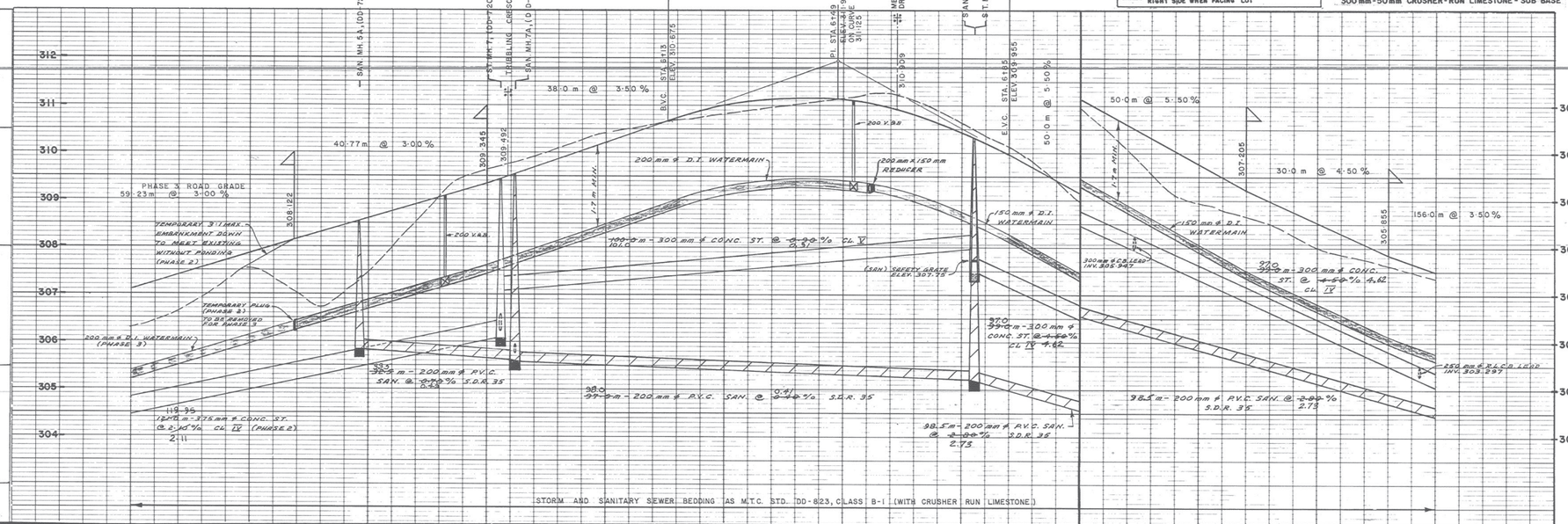
NOTE: SANITARY CONNECTION ALWAYS ON RIGHT SIDE WHEN FACING LOT

PAVEMENT DESIGN (STA. 6+75 TO STA. 7+75)

35 mm H.L. - 3	SURFACE ASPHALT
50 mm H.L. - 4	BINDER ASPHALT
150 mm - 19 mm	CRUSHER-RUN LIMESTONE - BASE
300 mm - 50 mm	CRUSHER-RUN LIMESTONE - SUB BASE

R.W. NOTE: RISER TO 3m BELOW ℄ GRADE

LVC = 72m
K = 8
ΔG = 9·00 %
d = 0·81



SAN. MH. 5A - E. 305·~~922~~(200)

SAN. MH. 7A — W. 305·~~775~~(200) N. 305·~~525~~(200) E. 305·~~525~~(200)

SAN. MH. 8A — W. 305·~~775~~(200) E. 305·~~775~~(200)

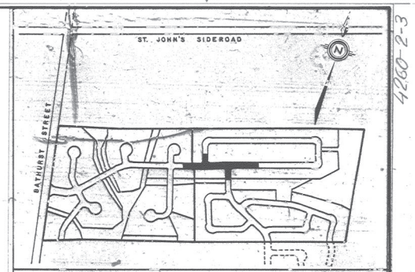
SAN. MH. 9A — W. 302·403 E. 302·273

ST. MH. 7 — W. 306·~~931~~ N. 306·~~681~~(375) E. 307·~~931~~(300) 306·016

ST. MH. 8 — W. 307·~~931~~(300) E. 307·~~931~~(300)

ST. MH. 9 — E. 302·876 W. 302·396 N. 303·256

	SANITARY SEWER	STORM SEWER	EX. ℄ ELEVATION	℄ CHAINAGE
			306·65	5+00
			307·58	5+25
			307·09	P.I. 5+44·225
			306·72	5+50
			307·97	5+75
			309·48	S.T.A. 5+79·212
			309·76	
			309·91	
			310·42	6+00
			310·69	6+25
			310·90	P.I. 6+40·189
			311·10	6+50
			311·22	C.S. 6+60·281
			310·66	6+75
			309·82	7+00
			308·54	7+25
			307·10	7+50
			306·51	
			306·05	
			308·64	7+75



KEY PLAN SCALE 1:10,000

4260-2-3

GENERAL NOTES

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS.

1. SEWER PIPE MATERIAL
   Concrete pipe smaller than 450 mm diameter shall be Ss CSA-A-257-F, concrete pipe 450 mm Dia. and larger shall be CSA-A-257-1 with rubber gaskets conforming to CSA-A-257-4.
   Polyvinyl chloride pipe shall conform to CSA-B-137-3, ASTM D2729 or ASTM 3034 with solvent welded joints, "T" joints, T.V. cast iron couplings, "Ring Tite" couplings or approved equal and shall be compatible with Johns Manville materials.
   Asbestos cement pipe shall be ASTM C428 with "Ring Tite" couplings or equal and conform to OMAA std. 0400.
   All class of pipe shown as per MTC std. Dwg. DD-822-A
2. Sewer pipe shall be bedded as per MTC Class B-1 except that the granular material shall be 19 MM crusher run limestone. All sewer pipe not located in road allowance to be bedded as per MTC class A, Modified as noted.
3. All trenches are to be backfilled with native material and compacted to at least 95% standard proctor density. In addition, all structures within the travelled portion of the road shall have 1:1 frost tapers from frost line to subgrade.
4. MANHOLES
   Steps shall be aluminium alloy 65-S2-4 (Aluminum of Canada specification) or approved equal.
   Frames and covers shall be Dominion Wheel Foundries design Std.579 or approved equal.
   Manholes are to be set to base course grade and then adjusted to final grade using MODELOK rings prior to placement of top course asphalt.
5. Catchbasins
   Frames and covers shall be as per MTC std. Dwg. DD713-B or approved equal.
   Single catchbasin lead - min. 150MM Diameter.
   Double catchbasin lead - Min. 300 MM Diameter.
   All catchbasins shall be tamped using hot mix asphalt.
   All catchbasins & catchbasin manholes to be SUMPED in Fig. 3.
6. Service Connections
   Sanitary - 125 MM Diameter PVC SDR 28, with Cronale fitting installed on property line and marker painted black.
   Storm - 150 MM Diameter CSPC. Cl4-S5, marker painted white.
   Water - 19 MM Diameter, Type K soft copper ASTM B-88, marker painted blue.
   - Services in driveways are to have frost rings.
   Connection locations are as shown; for typical location see construction detail sheets.
7. WATERMAINS AND APPURTENANCES SHALL BE AS PER TOWN OF AURORA MATERIAL SPECIFICATIONS.
   100 MM to 300 MM Diameter - watermain shall be: Ductile Iron AWWI Spec., A21-4-1976 cement lined and coal tar coated with approved form of electrochemical corrosion protection.
   50 MM Diameter watermain shall be Type "K" soft copper.
   Watermain to be bedded in Granular 'C' from 150 MM below invert to 300 MM above obvert.
8. Where watermains and service connections cross above sewers sufficient vertical separation shall be maintained to allow for proper bedding and structural support of the watermain and sewer main. When vertical separation is less than the specified bedding depth, the watermain or service connection shall pass under the sewer with a vertical separation of at least 0.3 metre between crown of watermain and the invert of the sewer.
9. All crossing pipes shall be supported.
10. Watermains shall have a 2.5 M horizontal clearance from other pipes.
11. Water services shall have a 1.2 metre horizontal clearance from other utilities.
12. Valve boxes shall be telescopic type.
13. Hydrants to have drainage pits, be painted Tremco yellow, be equipped with chains, and have a secondary valve.
14. Concrete sidewalk shall be 125 MM depth.

BENCHMARK MTC-474-S

SAINT ANDREWS COLLEGE WEST SIDE YONGE STREET. TABLET SET HORIZONTALLY IN STONE PLINTH OF DUNLOP HALL 3·75m NORTH OF SOUTHEAST CORNER OF BUILDING.
ELEVATION 262·12

No.	DESCRIPTION	DATE	BY
7	'AS CONST' 4/6 - PH 2	FEB-90	PVS
6	AS CONST. 4/4	NOV/86	R.A.C.
5	BUCK CRESCENT RENAMED TO TRIBBLING CRES.	NOV/84	W.C.W.
4	SAFETY GRATE ADDED TO SAN MH. 8A	JULY/84	W.C.W.
3	BUCK CRES WATERMAIN REVISED; AIR RELIEF VALVE DELETED, HYD # 128 RELOCATED - 10F 457/239	JULY/84	W.C.W.
2	PHASE 3 CONSTRUCTION ADDED	JUNE/84	W.C.W.
1	STORM SEWER MH. 7 TO TEMPORARY OUTFALL REVISED	JUNE/84	W.C.W.

REVISIONS

CORPORATION OF THE
TOWN OF AURORA

REGISTERED PROFESSIONAL ENGINEER P.E.K. VAN STEEN PROVINCE OF ONTARIO

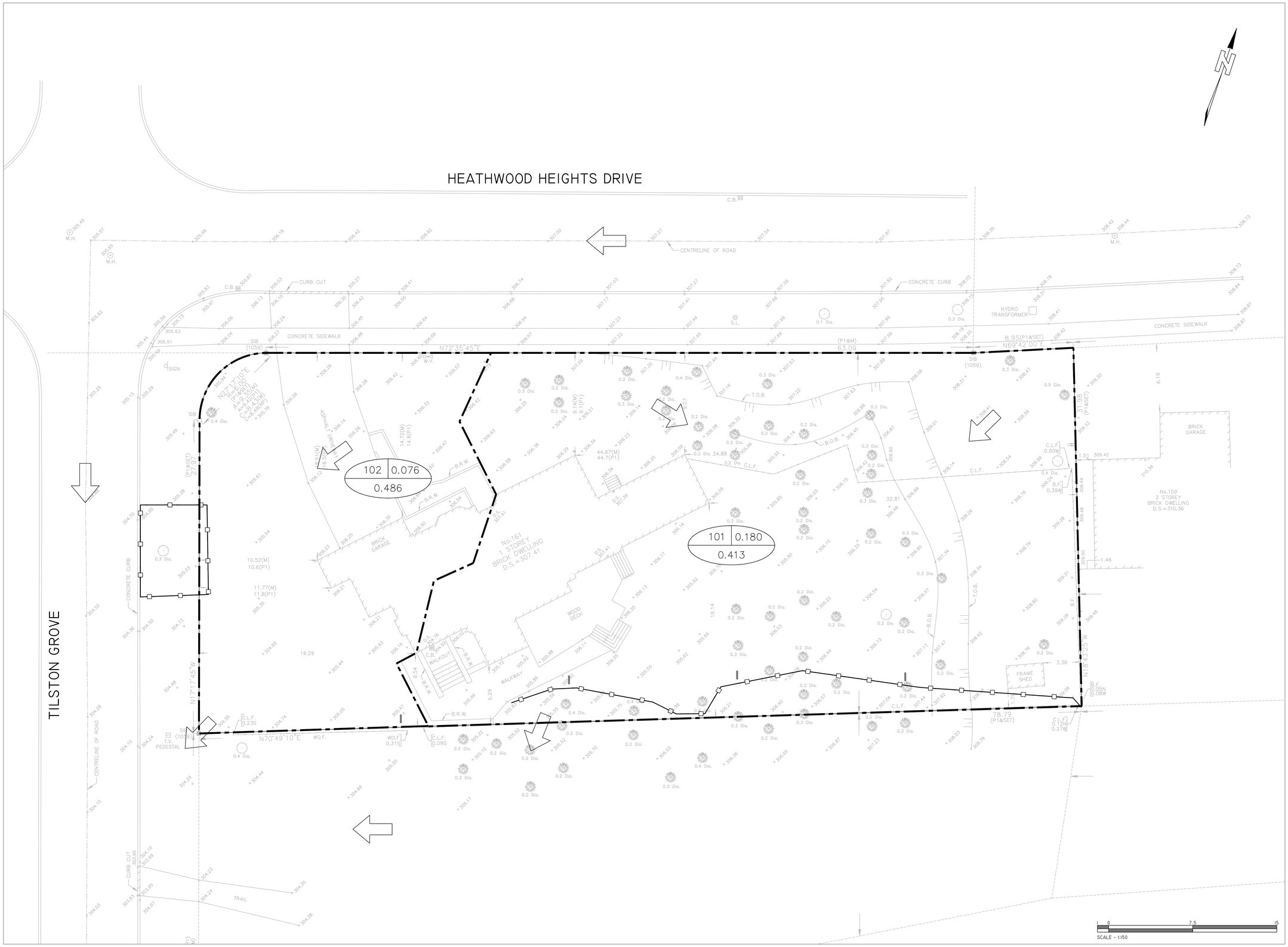
PLAN AND PROFILE OF
HEATHWOOD HEIGHTS DRIVE
STA. 5+00 TO STA. 7+75

MACROTECH LIMITED
Municipal Engineers
37 Corwin Crescent, Downsview, Ontario

DESIGN BY: P.V.S.		CHECKED BY: A.S.	PROJECT No.
DRAWN BY: W.C.W.		CHECKED BY: P.V.S.	
SCALES: HORIZ. 1:500 VERT. 1:50		DATE: FEB. 1984	
APPROVED William G. Walker DIRECTOR OF PUBLIC WORKS DATE: July 16, 1984			DRAWING No. 83135-103

Appendix B

Storm Data



LOCATION PLAN
N.T.S.

LEGEND

- DRAINAGE BOUNDARY
- ID — AREA (HA): 210 | 0.086 / 0.90 — C
- OVERLAND FLOW ROUTE
- TREE PROTECTION FENCE

SURVEY INFO.	BENCHMARK
MANDARIN SURVEYORS 2400 MIDLAND AVE. UNIT 121 SCARBOROUGH, ON M1S 5C1 PHONE: (416) 990-3001	ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE RELATED TO TOWN OF AURORA BENCHMARK NO. 675S HAVING A PUBLISHED ELEVATION OF 264.209 METERS.
SITE PLAN INFO.	**LIST OF DRAWINGS**
ARCICA INC. 326 SHEPPARD AVE. E. SUITE 200 TORONTO, ON M2N 3B4 PHONE: (416) 821-3960	001 - NOTES AND DETAILS 002 - DETAILS AND SECTIONS 101 - SERVICING PLAN 401 - GRADING PLAN 601 - ESC PLAN

NO.	ISSUE	MM/DD/YY	BY
1	ISSUED FOR REZONING	04/30/25	LPM

SITEPLANTECH INC.
50 ST CLEMENTS AVENUE
TORONTO, ON M4R 1G9
PHONE: (416) 270-7515

1000679027 ONTARIO INC.
161 HEATHWOOD HEIGHTS DRIVE
AURORA, ON

PRE-DEVELOPMENT DRAINAGE PLAN

PROJECT No.: 25-002

DRAWING: 201

Apr 22, 2025-9:29am By: pmandl
P:\25-002 - 161 Heathwood Heights Dr. - Aurora\Reports and Drawings\Drawings\Production Drawings\25-002 - BASE.dwg (201)

PRE-DEVELOPMENT
RUNOFF COEFFICIENT

Drainage Area 101 (to Woodlot)

Surface Type	C	A (Ha)	A*C
Roof/Hard Surfaces	0.900	0.034	0.031
Grass	0.300	0.146	0.044
Composite C		0.180	0.413

Drainage Area 102 (to Tilston Grove)

Surface Type	C	A (Ha)	A*C
Roof/Hard Surfaces	0.900	0.024	0.021
Grass	0.300	0.053	0.016
Composite C		0.076	0.486

Summary

Drainage Area	C	A (Ha)	A*C
101 (to Woodlot)	0.413	0.180	0.074
102 (to Tilston Grove)	0.486	0.076	0.037
TOTAL		0.256	0.435

PRE-DEVELOPMENT RUN-OF
CALCULATIONS

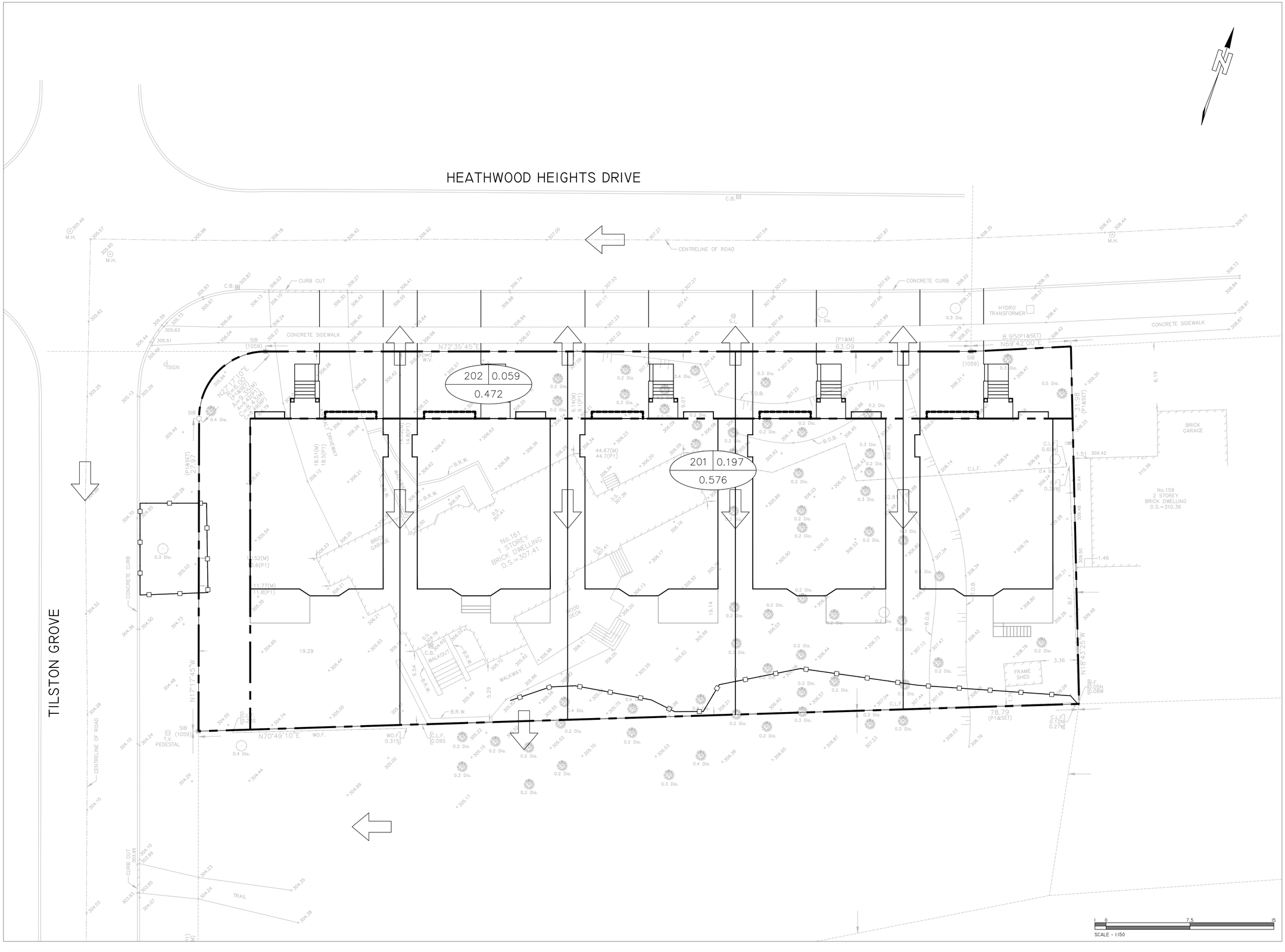
IDF set: Aurora

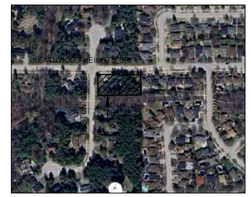
Return Period	*a*	T_c	*b*	*c*
2-Year	647.7	15	4.00	0.784
5-Year	929.8	15	4.00	0.798
100-Year	1770.0	15	4.00	0.820

Where: $I = \frac{a}{(t_c + b)^c}$ and: $Q = \frac{CIA}{360}$

Pre-Development Run-Off Volumes

ID 101	Area (Ha)	Composite C	I (mm/hr)*	Q (L/s)
2-Year	0.180	0.413	64.39	13.3
5-Year	0.180	0.413	88.70	18.4
100-Year	0.180	0.413	158.27	32.7
ID 102	**Area (Ha)**	**Composite C**	**I (mm/hr)***	**Q (L/s)**
2-Year	0.076	0.486	64.39	6.6
5-Year	0.076	0.486	88.70	9.1
100-Year	0.076	0.486	158.27	16.2





LOCATION PLAN
N.T.S.

LEGEND

DRAINAGE BOUNDARY

ID — AREA (HA)
210 | 0.086
0.90 — C

OVERLAND FLOW ROUTE

SURVEY INFO.	BENCHMARK
MANDARIN SURVEYORS 2400 MIDLAND AVE. UNIT 121 SCARBOROUGH, ON M1S 5C1 PHONE: (416) 990-3001	ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE RELATED TO TOWN OF AURORA BENCHMARK NO. 475S HAVING A PUBLISHED ELEVATION OF 264.209 METERS.
SITE PLAN INFO.	**LIST OF DRAWINGS**
ARCICA INC. 326 SHEPPARD AVE. E. SUITE 200 TORONTO, ON M2N 3B4 PHONE: (416) 821-3960	001 - NOTES AND DETAILS 002 - DETAILS AND SECTIONS 101 - SERVICING PLAN 401 - GRADING PLAN 601 - ESC PLAN

NO.	ISSUE	MM/DD/YY	BY
1	ISSUED FOR REZONING	04/30/25	LPM

SITEPLANTECH INC.
50 ST CLEMENTS AVENUE
TORONTO, ON M4R 1G9
PHONE: (416) 270-7515

1000679027 ONTARIO INC.
161 HEATHWOOD HEIGHTS DRIVE
AURORA, ON

POST-DEVELOPMENT
DRAINAGE PLAN

PROJECT No.: 25-002
DRAWING: 202

Apr 22, 2025-10:00am By: jmoot
P:\25-002 - 161 Heathwood Heights Dr. - Aurora\Reports and Drawings\Drawings\Production Drawings\25-002 - BASE.dwg (2X2)

POST-DEVELOPMENT
RUNOFF COEFFICIENT

Drainage Area 201 (to Woodlot)

Surface Type	C	A (Ha)	A*C
Roof/Hard Surfaces	0.900	0.091	0.081
Grass	0.300	0.106	0.032
Composite C		0.197	0.576

Drainage Area 202 (to Tilston Grove)

Surface Type	C	A (Ha)	A*C
Driveways	0.900	0.017	0.015
Grass	0.300	0.042	0.013
Composite C		0.059	0.472

Summary

Drainage Area	C	A (Ha)	A*C
201 (to Woodlot)	0.576	0.197	0.113
202 (to Tilston Grove)	0.472	0.059	0.028
TOTAL		0.256	0.552

POST-DEVELOPMENT
RUN-OFF CALCULATIONS

IDF set: Aurora

Return Period	*a*	T_c	*b*	*c*
2-Year	647.7	15	4.00	0.784
5-Year	929.8	15	4.00	0.798
100-Year	1770.0	15	4.00	0.820

Where: $$I = \frac{a}{(t_c + b)^c}$$

Post Development Run-Off

ID 201	Area (Ha)	Composite C	I (mm/hr)*	Q (L/s)
2-Year	0.197	0.576	64.39	20.3
5-Year	0.197	0.576	88.70	27.9
100-Year	0.197	0.576	158.27	49.8
ID 202	**Area (Ha)**	**Composite C**	**I (mm/hr)***	**Q (L/s)**
2-Year	0.059	0.472	64.39	5.0
5-Year	0.059	0.472	88.70	6.9
100-Year	0.059	0.472	158.27	12.3

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 201	
Area (Ha)	0.197
C	0.576
AC	0.11
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	32.7
Req. vol. (m^3)	15.4

Aurora	100-Year
a=	1770
b=	4
c=	0.820

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	**158.3**	**49.9**	**44.9**	**29.5**	**15.4**
16	151.7	47.8	45.9	31.4	14.5
17	145.8	46.0	46.9	33.4	13.5
18	140.3	44.2	47.8	35.4	12.4
19	135.3	42.6	48.6	37.3	11.3
20	130.7	41.2	49.4	39.3	10.1
21	126.4	39.8	50.2	41.3	8.9
22	122.4	38.6	50.9	43.2	7.7
23	118.6	37.4	51.6	45.2	6.4
24	115.2	36.3	52.3	47.2	5.1
25	111.9	35.3	52.9	49.1	3.8
26	108.8	34.3	53.5	51.1	2.4
27	105.9	33.4	54.1	53.1	1.0
28	103.2	32.5	54.7	55.0	-
29	100.6	31.7	55.2	57.0	-
30	98.2	31.0	55.7	58.9	-
31	95.9	30.2	56.2	60.9	-
32	93.7	29.5	56.7	62.9	-
33	91.6	28.9	57.2	64.8	-
34	89.7	28.3	57.6	66.8	-
35	87.8	27.7	58.1	68.8	-
36	86.0	27.1	58.5	70.7	-
37	84.2	26.5	58.9	72.7	-
38	82.6	26.0	59.3	74.7	-

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 201	
Area (Ha)	0.197
C	0.576
AC	0.11
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	18.4
Req. vol. (m^3)	8.6

Aurora	5-Year
a=	929.8
b=	4
c=	0.798

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	**88.7**	**28.0**	**25.2**	**16.5**	**8.6**
16	85.1	26.8	25.8	17.6	8.1
17	81.9	25.8	26.3	18.7	7.6
18	78.9	24.9	26.9	19.8	7.0
19	76.2	24.0	27.4	20.9	6.4
20	73.6	23.2	27.8	22.0	5.8
21	71.3	22.5	28.3	23.1	5.2
22	69.1	21.8	28.7	24.2	4.5
23	67.0	21.1	29.1	25.3	3.8
24	65.1	20.5	29.5	26.4	3.1
25	63.3	19.9	29.9	27.5	2.4
26	61.6	19.4	30.3	28.6	1.7
27	60.0	18.9	30.6	29.7	0.9
28	58.5	18.4	31.0	30.8	0.1
29	57.1	18.0	31.3	31.9	-
30	55.8	17.6	31.6	33.0	-
31	54.5	17.2	31.9	34.1	-
32	53.3	16.8	32.2	35.2	-
33	52.1	16.4	32.5	36.3	-
34	51.0	16.1	32.8	37.4	-
35	50.0	15.7	33.1	38.5	-
36	49.0	15.4	33.3	39.6	-
37	48.0	15.1	33.6	40.7	-
38	47.1	14.8	33.8	41.8	-

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 201	
Area (Ha)	0.197
C	0.576
AC	0.11
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	13.3
Req. vol. (m^3)	6.3

Aurora	2-Year
a=	647.7
b=	4
c=	0.784

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	**64.4**	**20.3**	**18.3**	**12.0**	**6.3**
16	61.9	19.5	18.7	12.8	5.9
17	59.5	18.8	19.1	13.6	5.5
18	57.4	18.1	19.5	14.4	5.1
19	55.4	17.5	19.9	15.2	4.7
20	53.6	16.9	20.3	16.0	4.3
21	51.9	16.4	20.6	16.8	3.8
22	50.4	15.9	20.9	17.6	3.4
23	48.9	15.4	21.3	18.4	2.9
24	47.5	15.0	21.6	19.2	2.4
25	46.2	14.6	21.9	20.0	1.9
26	45.0	14.2	22.1	20.8	1.3
27	43.9	13.8	22.4	21.6	0.8
28	42.8	13.5	22.7	22.4	0.3
29	41.8	13.2	22.9	23.2	-
30	40.8	12.9	23.1	24.0	-
31	39.9	12.6	23.4	24.8	-
32	39.0	12.3	23.6	25.6	-
33	38.2	12.0	23.8	26.4	-
34	37.4	11.8	24.0	27.2	-
35	36.6	11.5	24.3	28.0	-
36	35.9	11.3	24.5	28.8	-
37	35.2	11.1	24.7	29.6	-
38	34.6	10.9	24.8	30.4	-

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 202	
Area (Ha)	0.059
C	0.472
AC	0.03
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	16.2
Req. vol. (m^3)	0.0

Aurora	100-Year
a=	1770
b=	4
c=	0.820

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	158.3	12.3	11.1	14.6	-
16	151.7	11.8	11.3	15.6	-
17	145.8	11.3	11.6	16.5	-
18	140.3	10.9	11.8	17.5	-
19	135.3	10.5	12.0	18.5	-
20	130.7	10.2	12.2	19.5	-
21	126.4	9.8	12.4	20.4	-
22	122.4	9.5	12.6	21.4	-
23	118.6	9.2	12.7	22.4	-
24	115.2	9.0	12.9	23.4	-
25	111.9	8.7	13.1	24.3	-
26	108.8	8.5	13.2	25.3	-
27	105.9	8.2	13.4	26.3	-
28	103.2	8.0	13.5	27.3	-
29	100.6	7.8	13.6	28.2	-
30	98.2	7.6	13.8	29.2	-
31	95.9	7.5	13.9	30.2	-
32	93.7	7.3	14.0	31.1	-
33	91.6	7.1	14.1	32.1	-
34	89.7	7.0	14.2	33.1	-
35	87.8	6.8	14.3	34.1	-
36	86.0	6.7	14.4	35.0	-
37	84.2	6.6	14.6	36.0	-
38	82.6	6.4	14.7	37.0	-

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 202	
Area (Ha)	0.059
C	0.472
AC	0.03
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	9.1
Req. vol. (m^3)	0.0

Aurora	5-Year
a=	929.8
b=	4
c=	0.798

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	88.7	6.9	6.2	8.2	-
16	85.1	6.6	6.4	8.7	-
17	81.9	6.4	6.5	9.3	-
18	78.9	6.1	6.6	9.8	-
19	76.2	5.9	6.8	10.4	-
20	73.6	5.7	6.9	10.9	-
21	71.3	5.5	7.0	11.5	-
22	69.1	5.4	7.1	12.0	-
23	67.0	5.2	7.2	12.5	-
24	65.1	5.1	7.3	13.1	-
25	63.3	4.9	7.4	13.6	-
26	61.6	4.8	7.5	14.2	-
27	60.0	4.7	7.6	14.7	-
28	58.5	4.6	7.6	15.3	-
29	57.1	4.4	7.7	15.8	-
30	55.8	4.3	7.8	16.4	-
31	54.5	4.2	7.9	16.9	-
32	53.3	4.1	8.0	17.5	-
33	52.1	4.1	8.0	18.0	-
34	51.0	4.0	8.1	18.5	-
35	50.0	3.9	8.2	19.1	-
36	49.0	3.8	8.2	19.6	-
37	48.0	3.7	8.3	20.2	-
38	47.1	3.7	8.4	20.7	-

MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS

ID 202	
Area (Ha)	0.059
C	0.472
AC	0.03
T_c (min)	15.0
T incr. (min)	1
Q_1 (l/s)	6.6
Req. vol. (m^3)	0.0

Aurora	2-Year
a=	647.7
b=	4
c=	0.784

Notes:

Stage Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Rel. Vol. (m^3)	Storage (m^3)
15	64.4	5.0	4.5	5.9	-
16	61.9	4.8	4.6	6.3	-
17	59.5	4.6	4.7	6.7	-
18	57.4	4.5	4.8	7.1	-
19	55.4	4.3	4.9	7.5	-
20	53.6	4.2	5.0	7.9	-
21	51.9	4.0	5.1	8.3	-
22	50.4	3.9	5.2	8.7	-
23	48.9	3.8	5.2	9.1	-
24	47.5	3.7	5.3	9.5	-
25	46.2	3.6	5.4	9.9	-
26	45.0	3.5	5.5	10.3	-
27	43.9	3.4	5.5	10.7	-
28	42.8	3.3	5.6	11.1	-
29	41.8	3.3	5.7	11.5	-
30	40.8	3.2	5.7	11.9	-
31	39.9	3.1	5.8	12.3	-
32	39.0	3.0	5.8	12.7	-
33	38.2	3.0	5.9	13.1	-
34	37.4	2.9	5.9	13.5	-
35	36.6	2.9	6.0	13.9	-
36	35.9	2.8	6.0	14.3	-
37	35.2	2.7	6.1	14.7	-
38	34.6	2.7	6.1	15.0	-

INFILTRATION TRENCH
DIMENSION CALCULATION

Infiltration Trench Design Input

ID 201

Volume required	(V)	15.4	m^3
Percolation rate	(P)	45	mm/hr
Porosity	(n)	0.4	unitless
Drawdown time	(T)	24	hours

ID 202

Volume required	(V)	0.0	m^3
Percolation rate	(P)	0	mm/hr
Porosity	(n)	0	unitless
Drawdown time	(T)	0	hours

Soakaway Pit Dimensions (ID 201)

Trench area (m^2)

Where $A = \frac{1000V}{PnT}$

A = 35.7

Trench depth (m)

Where $D = \frac{PT}{1000}$

D = 1.08

Soakaway Pit Dimensions (ID 202)

Trench area (m^2)

Where $A = \frac{1000V}{PnT}$

A = 0.0

Trench depth (m)

Where $D = \frac{PT}{1000}$

D = 0

* Refer to Ontario Stormwater Management Plan SWMP design Figure 4.4 for soil cover.

EFFECTIVE TSS REMOVAL
CALCULATIONS

TSS Removal Summary

Drainage Area	Surface Type	A (Ha)	Removal Rate	Net for Treatment	Treatment Type	Effective Removal
201 (to Woodlot)	Asphalt	0.005	0%	100%		0.0%
	Roof	0.086	80%	20%	-	80.0%
	Grass	0.106	100%	0%	-	100.0%
202 (to Tilston Grove)	Asphalt	0.007	0%	100%	-	0.0%
	Roof	0.010	80%	20%	-	80.0%
	Grass	0.042	100%	0%	-	100.0%
Total		0.256				88%

VOLUME CONTROL
CALCULATIONS

Runoff Volume Summary

Surface type	A (Ha)	Depth (mm)	Vol. (m^3)	IA depth (mm)	IA Vol. (m^3)	Runoff Vol. (m^3)
Roof / Hardscape	0.050	5	2.5	0	0.0	2.5

Ontario

MINISTRY OF THE ENVIRONMENT

Database Version: V 2.0 Release Update
Update Date: 30-Mar-12

Project DEVELOPMENT Summary

DEVELOPMENT: 161 Heathwood Heights Dr.
Subwatershed: East Holland

Total Pre-Development Area (ha):	0.2556	Total Pre-Development Phosphorus Load (kg/yr):	0.03

Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Low Intensity Development	0.2556	0.13	0.03

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency		P Load (kg/yr)
Low Intensity Development	0.0778	0.13	NONE	0%	0.01
Low Intensity Development	0.1778	0.13	Soakaways - Infiltration trenches	60%	0.01

Post-Development Area Altered: **0.26**
Total Pre-Development Area: **0.26**
Unaffected Area: **0**

	P Load (kg/yr)
Pre-Development:	**0.03**
Post-Development:	**0.03**
Change (Pre - Post):	**0.00**
0% Net Reduction in Load	
Post-Development (with BMPs):	**0.02**
Change (Pre - Post):	**0.01**
42% Net Reduction in Load	

DEVELOPMENT: **161 Heathwood Heights Dr.**

Subwatershed: **East Holland**

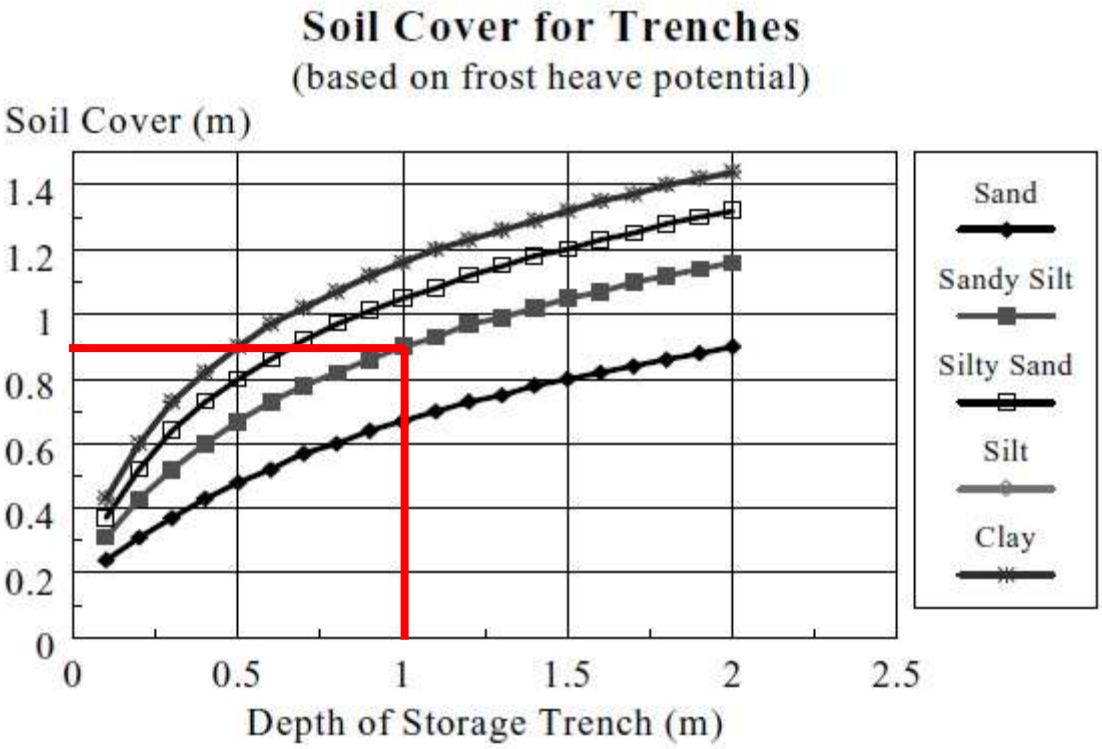
CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	**P Load (kg/yr)**
Pre-Development:	**0.03**
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	**0.02**
Post-Development + Amortized Construction:	**to be determined**
Pre-Development Load - Post-Development Load:	**0.01**
Conclusion:	**42% Reduction in Load**
Pre-Development Load - (Post-Development + Amortized Construction Load):	**to be determined**
Conclusion:	**to be determined**

Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:

Ontario Stormwater management plan and SWMP design (4.0)

Figure 4.4: Soil Cover for Trenches



Appendix C

Sanitary Data

SANITARY FLOW
CALCULATIONS

Existing Flows				
Residential Flow Determination				
Unit Type	No. Of Units	PPU		
Townhouse	1	3.8	4	persons
Average Residential Wastewater Flow			400	L/cap/day
Harmon Peaking Factor			4.0	
Proposed Development - Total Peak Flow			0.1	L/s
Site Area			0.26	ha
Infiltration (0.26 L/s/ha)			0.07	L/s
Total Proposed Peak Flow			**0.1**	**L/s**

Proposed Flows				
Residential Flow Determination				
Unit Type	No. Of Units	PPU		
Townhouse	5	3.8	19	persons
Average Residential Wastewater Flow			400	L/cap/day
Harmon Peaking Factor			4.0	
Proposed Development - Total Peak Flow			0.4	L/s
Site Area			0.26	ha
Infiltration (0.26 L/s/ha)			0.07	L/s
Total Proposed Peak Flow			**0.4**	**L/s**

SITEPLANTECH INC.

Existing Sanitary Conditions

Project No. 25-002

Date: 4-Apr-25

Designed By: LPM

Minimum Sewer Diameter (mm) =	200		
Mannings n =	0.013	Design Res. Flow Rate (l/cap/day) =	400
Minimum Velocity (m/s) =	0.60	Ex. Industrial Flow (l/cap/day) =	40
Maximum Velocity (m/s) =	3.65	Infiltration Rate (l/s/ha) =	0.26
Minimum Pipe Size (%) =	0.50	Max. Harmon Peaking Factor =	4.0
		ACTUAL PIPE SIZE USED	

161 Heathwood Heights Drive

Aurora, ON

LOCATION			RESIDENTIAL							FLOW CALCULATIONS										PIPE DATA					
STREET & (DRAINAGE ID)	MANHOLE		AREA	ACCUM. AREA	UNITS	DENSITY		RES. POP.	ACCUM. RES. POP.	INFIL.	TOTAL POP.	PEAKING FACTOR	AVG. DOM. FLOW	ACCUM. AVG. DOM. FLOW	PEAKED RES. FLOW	AVG. ICI FLOW	ACCUM. AVG. ICI FLOW	PEAKED ICI FLOW	TOTAL FLOW	LENGTH	PIPE DIA.	SLOPE	FULL FLOW CAP.	FULL FLOW VEL.	CAP.
	FROM	TO	(ha)	(ha)	(#)	PER UNIT (p/unit)	PER HA (p/ha)			(L/s)			(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m3/s)	(m/s)	(%)
External	EXT	MH 4260-09	25.96	25.960	91	3.8		346	346	6.7	346	4.00	1.60	1.60	6.40	0.00	0.00	0.00	13.15	0.0	0	0.00			
Tilston Grove	MH 4260-09	MH 4340-01	0.55	26.510	1	3.8		4	350	6.9	350	4.00	0.02	1.62	6.47	0.00	0.00	0.00	13.37	79.4	200	0.66	27.8	0.9	48%
	MH 4340-01	MH 4340-02	1.76	28.270	6	3.8		23	372	7.4	372	4.00	0.11	1.72	6.90	0.00	0.00	0.00	14.25	87.7	200	0.29	18.4	0.6	77%
	MH 4340-02	MH 4340-03	0.00	28.270	0			0	372	7.4	372	4.00	0.00	1.72	6.90	0.00	0.00	0.00	14.25	22.5	200	0.42	22.2	0.7	64%

SITEPLANTECH INC.

Proposed Sanitary Conditions

Project No. 25-002

Date: 4-Apr-25

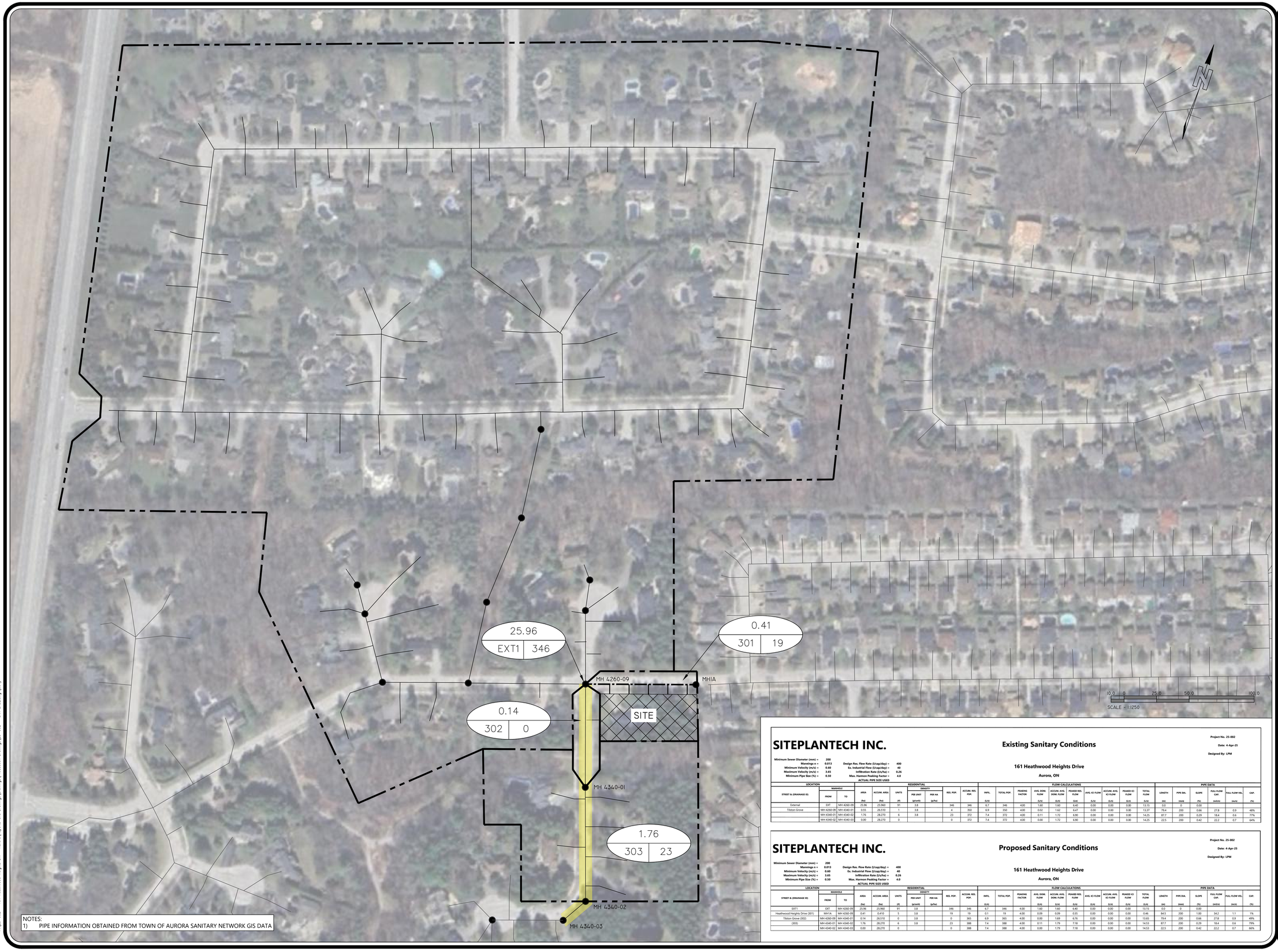
Designed By: LPM

Minimum Sewer Diameter (mm) =	200		
Mannings n =	0.013	Design Res. Flow Rate (l/cap/day) =	400
Minimum Velocity (m/s) =	0.60	Ex. Industrial Flow (l/cap/day) =	40
Maximum Velocity (m/s) =	3.65	Infiltration Rate (l/s/ha) =	0.26
Minimum Pipe Size (%) =	0.50	Max. Harmon Peaking Factor =	4.0
		ACTUAL PIPE SIZE USED	

161 Heathwood Heights Drive

Aurora, ON

LOCATION			RESIDENTIAL							FLOW CALCULATIONS										PIPE DATA					
STREET & (DRAINAGE ID)	MANHOLE		AREA	ACCUM. AREA	UNITS	DENSITY		RES. POP.	ACCUM. RES. POP.	INFIL.	TOTAL POP.	PEAKING FACTOR	AVG. DOM. FLOW	ACCUM. AVG. DOM. FLOW	PEAKED RES. FLOW	AVG. ICI FLOW	ACCUM. AVG. ICI FLOW	PEAKED ICI FLOW	TOTAL FLOW	LENGTH	PIPE DIA.	SLOPE	FULL FLOW CAP.	FULL FLOW VEL.	CAP.
	FROM	TO	(ha)	(ha)	(#)	PER UNIT (p/unit)	PER HA (p/ha)			(L/s)			(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m3/s)	(m/s)	(%)
EXT1	EXT	MH 4260-09	25.96	25.960	91	3.8		346	346	6.7	346	4.00	1.60	1.60	6.40	0.00	0.00	0.00	13.15	0.0	0	0.00			
Heathwood Heights Drive (301)	MH1A	MH 4260-09	0.41	0.410	5	3.8		19	19	0.1	19	4.00	0.09	0.09	0.35	0.00	0.00	0.00	0.46	84.5	200	1.00	34.2	1.1	1%
Tilston Grove (302)	MH 4260-09	MH 4340-01	0.14	26.510	0	3.8		0	365	6.9	365	4.00	0.00	1.69	6.76	0.00	0.00	0.00	13.65	79.4	200	0.66	27.8	0.9	49%
(303)	MH 4340-01	MH 4340-02	1.76	28.270	6	3.8		23	388	7.4	388	4.00	0.11	1.79	7.18	0.00	0.00	0.00	14.53	87.7	200	0.29	18.4	0.6	79%
	MH 4340-02	MH 4340-03	0.00	28.270	0			0	388	7.4	388	4.00	0.00	1.79	7.18	0.00	0.00	0.00	14.53	22.5	200	0.42	22.2	0.7	66%



NOTES:
1) PIPE INFORMATION OBTAINED FROM TOWN OF AURORA SANITARY NETWORK GIS DATA

SITEPLANTECH INC.

Existing Sanitary Conditions

161 Heathwood Heights Drive

Aurora, ON

Project No. 25-002
Date: 4-Apr-25
Designed By: LPM

Minimum Sewer Diameter (mm) = 200
Mannings n = 0.013
Minimum Velocity (m/s) = 0.60
Maximum Velocity (m/s) = 3.65
Minimum Pipe Size (%) = 0.50
Design Res. Flow Rate (l/cap/day) = 400
Ex. Industrial Flow (l/cap/day) = 40
Infiltration Rate (l/s/ha) = 0.26
Max. Harmon Peaking Factor = 4.0
ACTUAL PIPE SIZE USED

LOCATION			RESIDENTIAL						FLOW CALCULATIONS									PIPE DATA					
STREET & (DRAINAGE ID)	MANHOLE FROM	MANHOLE TO	AREA (ha)	ACCUM. AREA (ha)	UNITS (#)	DENSITY PER UNIT (p/unit)	DENSITY PER HA (p/ha)	RES. POP.	ACCUM. RES. POP.	INFIL. (L/s)	TOTAL POP.	PEAKING FACTOR	AVG. DOM. FLOW (L/s)	ACCUM. AVG. DOM. FLOW (L/s)	PEAKED RES. FLOW (L/s)	AVG. ICI FLOW (L/s)	ACCUM. AVG. ICI FLOW (L/s)	PEAKED ICI FLOW (L/s)	TOTAL FLOW (L/s)	LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAP. (m3/s)	FULL FLOW VEL. (m/s)	CAP. (%)
External	EXT	MH 4260-09	25.96	25.960	91	3.8		346	346	6.7	346	4.00	1.60	1.60	6.40	0.00	0.00	0.00	13.15	0.0	0	0.00			
Tilston Grove	MH 4260-09	MH 4340-01	0.55	26.510	1	3.8		4	350	6.9	350	4.00	0.02	1.62	6.47	0.00	0.00	0.00	13.37	79.4	200	0.66	27.8	0.9	48%
	MH 4340-01	MH 4340-02	1.76	28.270	6	3.8		23	372	7.4	372	4.00	0.11	1.72	6.90	0.00	0.00	0.00	14.25	87.7	200	0.29	18.4	0.6	77%
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SITEPLANTECH INC.

Proposed Sanitary Conditions

161 Heathwood Heights Drive

Aurora, ON

Project No. 25-002
Date: 4-Apr-25
Designed By: LPM

Minimum Sewer Diameter (mm) = 200
Mannings n = 0.013
Minimum Velocity (m/s) = 0.60
Maximum Velocity (m/s) = 3.65
Minimum Pipe Size (%) = 0.50
Design Res. Flow Rate (l/cap/day) = 400
Ex. Industrial Flow (l/cap/day) = 40
Infiltration Rate (l/s/ha) = 0.26
Max. Harmon Peaking Factor = 4.0
ACTUAL PIPE SIZE USED

LOCATION			RESIDENTIAL						FLOW CALCULATIONS									PIPE DATA					
STREET & (DRAINAGE ID)	MANHOLE FROM	MANHOLE TO	AREA (ha)	ACCUM. AREA (ha)	UNITS (#)	DENSITY PER UNIT (p/unit)	DENSITY PER HA (p/ha)	RES. POP.	ACCUM. RES. POP.	INFIL. (L/s)	TOTAL POP.	PEAKING FACTOR	AVG. DOM. FLOW (L/s)	ACCUM. AVG. DOM. FLOW (L/s)	PEAKED RES. FLOW (L/s)	AVG. ICI FLOW (L/s)	ACCUM. AVG. ICI FLOW (L/s)	PEAKED ICI FLOW (L/s)	TOTAL FLOW (L/s)	LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAP. (m3/s)	FULL FLOW VEL. (m/s)	CAP. (%)
EXT1	EXT	MH 4260-09	25.96	25.960	91	3.8		346	346	6.7	346	4.00	1.60	1.60	6.40	0.00	0.00	0.00	13.15	0.0	0	0.00			
Heathwood Heights Drive (301)	MH1A	MH 4260-09	0.41	0.410	5	3.8		19	19	0.1	19	4.00	0.09	0.09	0.35	0.00	0.00	0.00	0.46	84.5	200	1.00	34.2	1.1	1%
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(303)	MH 4340-01	MH 4340-02	1.76	28.270	6	3.8		23	388	7.4	388	4.00	0.11	1.79	7.18	0.00	0.00	0.00	14.53	87.7	200	0.29	18.4	0.6	79%
	MH 4340-02	MH 4340-03	0.00	28.270	0			0	388	7.4	388	4.00	0.00	1.79	7.18	0.00	0.00	0.00	14.53	22.5	200	0.42	22.2	0.7	66%

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LOCATION PLAN
N.T.S.

LEGEND

DRAINAGE AREA BOUNDARY

AREA (ha)
1.89
ID EXT1 142 POP

REVIEWED INFRASTRUCTURE

EX. SAN & MH

PROP. SAN, MH & LATERAL

SURVEY INFO.

MANDARIN SURVEYORS
2400 MIDLAND AVE.
UNIT 121
SCARBOROUGH, ON
M1S 5C1
PHONE: (416) 990-3001

BENCHMARK

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE RELATED TO TOWN OF AURORA BENCHMARK NO. 4755 HAVING A PUBLISHED ELEVATION OF 264.209 METERS.

SITE PLAN INFO.

ARCICA INC.
326 SHEPPARD AVE. E.
SUITE 200
TORONTO, ON
M2N 3B4
PHONE: (416) 821-3960

LIST OF DRAWINGS

NO.	ISSUE	MM/DD/YY	BY
1	ISSUED FOR REZONING	04/30/25	LPM

SITEPLANTECH INC.
50 ST CLEMENTS AVENUE
TORONTO, ON M4R 1G9
PHONE: (416) 270-7515

1000679027 ONTARIO INC.
161 HEATHWOOD HEIGHTS DRIVE
AURORA, ON

SANITARY DRAINAGE PLAN

PROJECT No.: 25-002

DRAWING: 301

Appendix D

Water Data

EXISTING DOMESTIC FLOW
CALCULATION WORKSHEET

Residential Use

Unit Type	No. of Units	PPU	L/c/d	Avg. Day (L/d)
Detached home	1	3.8	390	1,482
Residential Use Avg. Day (L/d)				1,482

Peak Flows (Per Town of Aurora Design Standard Section 6.1)

Criteria	Peaking Factor	Flow
Avg. day (L/s)	1.00	0.02
Min (L/s)	0.65	0.01
Max Hr (L/hr)	5.00	309
Max Day (L/d)	1.80	2,668

PROPOSED DOMESTIC FLOW
CALCULATION WORKSHEET

Residential Use

Unit Type	No. of Units	PPU	L/c/d	Avg. Day (L/d)
Detached home	5	3.8	390	7,410
Residential Use Avg. Day (L/d)				7,410

Peak Flows (Per Section 6.1 of Aurora Standards)

Criteria	Peaking Factor	Flow
Avg. day (L/s)	1.00	0.09
Min (L/s)	0.65	0.06
Max Hr (L/hr)	5.00	1,544
Max Day (L/d)	1.80	13,338

FIRE FLOW
CALCULATION WORKSHEET

PROJECT INFORMATION			
Address	161 Heathwood Heigths Dr.	Notes:	Assumes ordinary construction
	Aurora, ON		
OBC Occupancy	Group C - Residential		
Dwelling Area	182.5m^2 (typ.)		
No. of Storeys	2		

BASE FLOW CALCULATION				CREDITS	CHARGES	Q (L/min)
A=	Effective area		365 m^2			
C=	Ordinary		1.0			
F=	Required fire flow	$F=220C\sqrt{A}$	4,203 L/min.			
"F" Rounded to nearest 1,000			4,000 L/min.			4,000

FLOW 'F' ADJUSTMENTS				CREDITS	CHARGES	Q (L/min)
Occupancy Adjustments (F')		%				
Combustible		0%	0			4,000
Exposure Adjustments (E)						
Exposure	Sep. (m)	Charge				
N	35	5%				
E	3	25%				
S	50	0%				
W	3	25%				
E = Total Exposure Charge		55%	2,200		2,200	6,200
Sprinkler Adjusments (S)						
Sprinklered as per NFPA 13		No	0			6,200
Standard Water Supply		No	0			6,200
Fully supervised watersupply		No	0			6,200
REQUIRED FLOW (F"=F'+E+S)			**(L/min)**			**6,200**
DESIGN FLOW (Per Aurora Design Standard F2.02)			**(L/min)**			**7,000**
			(USGPM)			1,849
			(L/s)			**117**

MUNICIPAL SUPPLY
CALCULATION WORKSHEET

Hydrant Flow Test Input

Location	Ports	P_s (PSI)	P_r (PSI)	Q_r (USGPM)
161 Heathwood Heights Dr.	1	55	53	1,034
	2	55	51	1,775

Theoretical Flow Calculation

Location	Ports	P_f (PSI)	Q_f (USGPM)
161 Heathwood Heights Dr.		20	5,726

Where $Q_f = Q_r \left[\frac{P_s - P_f}{P_s - P_r}\right]^{0.54}$

Max Day + Fire Check

Max Day (USGPM)	F'' (USGPM)	Max Day + F'' (USGPM)	Q_{20} (USGPM)	Check
2	1,849	1,852	5,726	**OK**

April 15, 2025
Reference No. 2025-033

Pascal Monat
SITEPLANTECH INC.
16 Elgin St #339
Thornhill, ON L3T 4T4

Dear Mr. Monat:

Re: Results Summary for Hydrant Flow Testing in the Town of Aurora

1 Introduction

Watermark Environmental Ltd. (Watermark Environmental) conducted one hydrant flow test at 161 Heathwood Heights Drive in the Town of Aurora. The testing location is shown in **Attachment 1**.

2 Testing Methodology

Watermark Environmental conducted one hydrant flow test to gauge flow rates of a section of the distribution system to establish the rate which would be equivalent to the flow at 20 PSI. The tests consisted of measuring flow rates from a flowing hydrant, as well as measuring residual pressure drops from an adjacent hydrant connected to the same line.

3 Results

The following table summarizes the results of the testing:

Table 1: Hydrant flow test Results

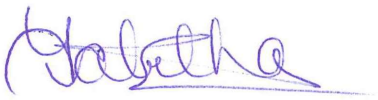
Test Date	Test location (Residual hydrant)	Test location (Flowing Hydrant)	Static Pressure (PSIG)	Flow Available @ 20 PSI (USGPM)
11-Apr-15	In front of 158 Heathwood Heights Dr.	NW corner of Heathwood Heights Dr. and Williamson Terrace	55	5,729*

Note: *The test did not reach the minimum 10 psi or 25% drop in pressure recommended by the AWWA-M17 and the NFPA 291 standard respectively. However, there does appear to be high flows in this section of the watermain.

Detailed results for the hydrant flow test are provided in **Attachment 1,** a photolog of the testing location is provided in **Attachment 2**.

Yours truly,

Watermark Environmental Ltd.



Tabitha Lee, M.A.Sc., P.Eng.
Principal

Gordon McCready, C. Tech., CAN-CISEC
Senior Environmental Technician

Attachment 1
Hydrant Flow Test Results

HYDRANT FLOW TESTING
161 Heathwood Heights Drive, Aurora, ON

GENERAL INFORMATION

Date of Testing:	April 11, 2025
Project Number:	2025-033
Site Location/Address:	161 Heathwood Heights Drive
Region/Municipality:	Town of Aurora
Hydrants Opened By:	Town of Aurora Operations
Tested By:	Gordon McCready, Peining Guan

HYDRANT TEST INFORMATION

Hydrant Test Location

HYDRANT FLOW TESTING
161 Heathwood Heights Drive, Aurora, ON

Test Data

Time of Test:	10:45 AM
Flow Hydrant Test Location:	In front of 158 Heathwood Heights Dr.
Residual Hydrant Test Location:	NW corner of Heathwood Heights Dr. and Williamson Terrace
Static Pressure (PSIG):	55

Static Pressure (PSIG)	# Outlet	Residual Hydrant Pressure (PSIG)	Flow Hydrant Pressure (PSIG)	Q1 Flow Rate (USGPM)	Q2 Flow Rate (USGPM)	Available Flow @ 20 PSI (USGPM)
55	1	53	38	1,034.25	1,775.76	5,728.87*
	2	51	28			

Calculations

Flow Rates:

FORMULA: Q= 29.84cd^2√p

Where:
c- coefficient of discharge
d- pipe diameter (inches)
p- pitot reading (psig)

Q1 - 1 Orifice(s): Q1= (29.84) (0.9) (2.5) ^2 √38 = **1,034.25 USGPM**
QT - 2 Orifice(s): QT= 2*(29.84) (0.9) (2.5) ^2 √28 = **1,775.76 USGPM**

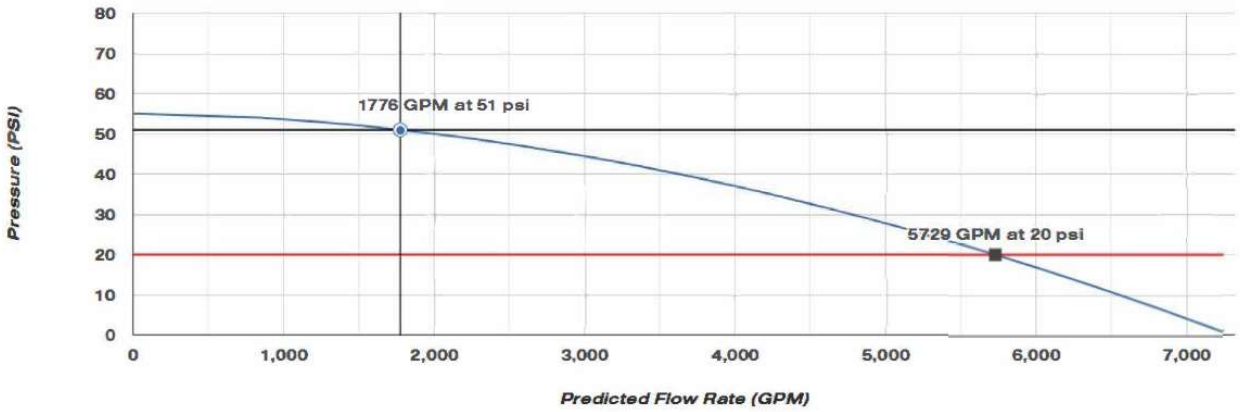
Flow Available at 20 PSI

FORMULA: Q_{avail} @ 20 psi = QT ((PS-PA) / (PS-PR)) $^{0.54}$

Where:
QT - flow total
PS - pressure Static
PA – pressure available
PR – pressure residual

Q_{avail} @ 20 PSI = **1,775.76** ((55-20) / (55-51)) $^{0.54}$ = **5,728.87 USGPM***

Test Results - Plot



Testing in accordance with NFPA 291 – Recommended Practice for Fire Flow Testing.

Note: *The test did not reach the minimum 10 psi or 25% drop in pressure recommended by the AWWA-M17 or the NFPA 291 standard respectively. However, there does appear to be high flows in this section of the watermain.

Attachment 2
Photolog

HYDRANT FLOW TESTING - Photolog

161 Heathwood Heights Drive, Aurora, ON

Flowing Hydrant Overview/Condition

NORTH VIEW

EAST VIEW

SOUTH VIEW

WEST VIEW

HYDRANT FLOW TESTING - Photolog

161 Heathwood Heights Drive, Aurora, ON

Residual Hydrant Overview/Condition

NORTH VIEW

EAST VIEW

SOUTH VIEW

WEST VIEW

HYDRANT FLOW TESTING - Photolog
161 Heathwood Heights Drive, Aurora, ON

Site Photos

WEST VIEW

SOUTHWEST VIEW

SOUTH VIEW

Appendix E

Preliminary Engineering Drawings