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Servicing and Stormwater Management Report

Nestwise Inc.

60 Dean Avenue, Barrie, Ontario

March 2025

The Jones Consulting Group Ltd.
 #1-229 Mapleview Drive East, Barrie ON L4N 0W5
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Report Prepared By:

Will Stevenson, B.Eng.
Engineering Designer

Report Reviewed By:



Michael Flis, P.Eng.
Project Manager



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Servicing and Stormwater Management Report Multi-Storey Apartment Building – Residential Development 60 Dean Avenue, Barrie, Ontario

1. Introduction

1.1. General

The Jones Consulting Group Ltd. (JCG) was retained by Nestwise Inc. (Client) to provide engineering services for a proposed 0.67 hectare (ha) residential development located at 60 Dean Avenue, in the City of Barrie (City). The proposed development will include a 122 unit, multi-level apartment building with seven (7) storeys, above and below grade parking, as well as landscaped areas.

This Servicing and Stormwater Management Report has been prepared in support of the 60 Dean Avenue Site Plan by the Jones Consulting Group, dated February 27th, 2025 to demonstrate how the lands will be serviced by the surrounding municipal infrastructure within the Dean Avenue Right-of-Way. A copy of the Site Plan is provided in **Appendix D**.

In particular, this report examines the existing and proposed servicing infrastructure in relation to:

- Sanitary Servicing
- Water Servicing
- Stormwater Management
- Roads and Grading
- Utility Servicing

1.2. Location and Description of Existing Site

The site is located on the north side of Dean Avenue, between Big Bay Point Road and Madelaine Drive. The site is currently a vacant parcel of land municipally known as 60 Dean Avenue. The legal description of the property is Block 132, Plan 51M-672, Part 2, Plan 51R – 44470, City of Barrie, County of Simcoe. The blocks were created as part of the Barrie Heritage Subdivision. The location of the proposed development lands is shown overleaf in **Figure 1**. The property is adjacent to an



apartment complex currently under development to the east, the Painswick Barrie Public Library to the west, existing commercial land to the north, existing residential and Dean Avenue to the south.

The site is currently undeveloped and was stripped during the construction of the Barrie Heritage Subdivision. It is currently vegetated with pasture type ground cover, with two (2) topsoil piles. The site topography generally ranges in elevation from 249m to 254m and slopes in a south-westerly direction towards the vacant portion of the library lands and Dean Avenue at a general gradient of 2%.

Existing municipal services completed as part of the Barrie Heritage Subdivision front the proposed development lands and include sanitary, water and storm infrastructure. Secondary utilities such as hydro, gas, telephone and cable are also available within the Dean Avenue Right of Way.

A Geotechnical investigation of the subject lands was undertaken by GEI Consultants Canada Ltd. Their results indicate that the surface cover makeup is between 0.075m and 0.76m of topsoil. A layer of silty sand fill with trace gravel and clay was encountered. The sand fill extended to depths of 0.8m to 1.5m. Lastly, a deposit of till which is predominantly comprised of sand with varying percentages of silt, trace gravel and clay, with occasional cobbles and boulders was encountered at all the boreholes. The till extended beyond the final depths investigated at each borehole.

Groundwater was encountered during the drilling of the boreholes. The static groundwater ranged in elevation from approximately 1.7m to 2.3m below existing ground. A copy of the completed Geotechnical Report prepared by GEI Consultants Canada Inc. can be found under separate cover. Refer to "Preliminary Geotechnical Investigation & Report, 60 Dean Avenue, Proposed Residential Building, Barrie, Ontario", dated February 27th, 2025. Based on the Soil Survey of Simcoe County Report No. 29, the soils on the site are represented by Bondhead sandy loam, which corresponds to a hydrologic soil group of AB. See Soils Map in **Appendix C**.



Figure 1: Site Location Plan

1.3. Proposed Land Use

The development lands are currently zoned Residential Apartment (RA2-1)(SP-658)(H-164). The current site plan consists of a seven (7) storey apartment building. The proposal includes 122 residential units with underground parking, surface parking, and landscaped areas. Access to the building is provided via a privately owned internal roadway shared with the Barrie Public Library - Painswick that connects to Dean Avenue. The site entrance incorporates full-movement access / egress to the municipal right-of-way. The site will be serviced by privately owned water, sanitary and storm infrastructure connected to existing municipal infrastructure, located within Dean Avenue.



2. Supporting Documents

The following documents have been referenced in the preparation of this Report:

- 60 Dean Avenue Conceptual Site Plan, Jones Consulting Ltd, February 27th 2025;
- Barrie Heritage Subdivision, As Constructed Design Drawings, prepared by RG Robinson and Associates (Barrie) Ltd., March 2001;
- City of Barrie, Stormwater Infrastructure Design Standard, 2023;
- City of Barrie, Drinking Water Infrastructure Design Standard, 2024;
- City Of Barrie, Sanitary Infrastructure and Design Standard, 2024;
- Fire Underwriters Survey, Water Supply for Public Fire Protection, 2020;
- Ministry of the Environment (MOE), Stormwater Management Planning and Design Manual, March 2003;
- MOE, Design Guidelines for Drinking Water Systems, 2008;
- MOE, Design Guidelines for Sewage Works, 2008;
- Ontario Regulation 350/06, 2006 Ontario Building Code;
- GEI, Preliminary Geotechnical Investigation and Report, February 27th 2025;
- GEI, Hydrogeological Investigation and Report, March 4th 2025;
- 60 Dean Avenue Traffic Impact Study, JD Northcote Engineering Inc., February 14, 2025;
and
- 60 Dean Avenue Noise Feasibility Study, R. Bouwmeester & Associates, March 7, 2025.

Copies of pertinent reference drawings from the City of Barrie have been included in **Appendix D**, for reference.



3. Sanitary Servicing

3.1. General

Based on the Barrie Heritage Subdivision As-Constructed Drawings, an existing 250mm diameter sanitary main runs west along Dean Avenue. Flow from site will be conveyed through a 200mm diameter sanitary lateral that will tee into the existing sanitary main flowing along Dean Avenue at an invert elevation of 245.91m. Refer to "Barrie Heritage Subdivision, Plan and Profile, Dean Street, STA 0+360 to STA 1+680" As-Constructed Drawing No. P-19 by R.G. Robinson and Associates Ltd., dated February 2003, provided in **Appendix D**.

The site is part of the City of Barrie's Painswick Sanitary Drainage Area. The surrounding developments are principally serviced by Lovers Creek Trunk Sanitary Sewer.

The proposed sanitary servicing is detailed on **Drawing GS-1** and **Drawing SAN-1**. Refer to **Appendix D**. Sewage flows from the proposed building will be collected via a proposed 200mm diameter PVC sanitary service and will tee into the existing sanitary main along Dean Avenue between the existing municipal sanitary maintenance holes SAP24069 and SAP24070.

3.2. Sanitary Service Design Flows

The City Of Barrie, Sanitary Infrastructure and Design Standard, 2024, provides theoretical design criteria for future developments and their projected sanitary loading demands. Specifically, the Guidelines criteria provide average estimated daily sewage flow rates based on the building unit types and the projected person per unit (PPU). The apartment style building has been assigned a PPU of 1.67 and an average daily demand of 225L/day/person.

Based on the proposed development plan the analytical sanitary load forecast can be calculated with the following equation based on the total number of units and the estimated population of 204 people (122 units x 1.67 PPU).

$$Q_d = Q_p + Q_i = \left[\frac{PQM}{86400} \right] + [Ix A]$$

Where: Q_d = Total peak sewage flow (L/s)

Q_p = Peak domestic sewage flow (L/s)



Q_i = Extraneous sewage flow (L/s)

P = Design population (204 people)

Q = Average daily flow (225 L/person/day)

A = Area of Development (ha)

I = Units of extraneous flow (0.10 L/s/ha - Refer to City of Barrie Sanitary Infrastructure Design Standard (2023), includes peaking factor.

M = Peaking Factor;

Harmon Peaking Factor:

$$M = 1 + \frac{14}{\frac{P}{1000}^{0.5} + 4} \quad (2.0 < M)$$

Therefore:
$$M = 1 + \frac{14}{\left[\frac{204}{1000}\right]^{0.5} + 4}$$

$$M = 4.14$$

$$Q_d = \frac{204 * 225 * 4.14}{86400} + 0.10 * 0.667$$

$$Q_d = 2.27 \text{ L/s} \leftarrow \text{total peak sewage flow}$$

Babbitt Peaking Factor:

$$M = \frac{5}{\frac{P}{1000}^{0.2}} \quad (2.0 < M)$$

Therefore:
$$M = \frac{5}{\frac{204}{1000}^{0.2}}$$

$$M = 6.87$$



$$Q_d = \frac{204 * 225 * 6.87}{86400} + 0.10 * 0.667$$

$Q_d = 3.72 \text{ L/s} \leftarrow$ total peak sewage flow

As per correspondence with Darrin Tone, P.Eng. with the City of Barrie Stormwater and Wastewater Planning, there is existing capacity in the downstream sanitary sewer network for the proposed development of 122 high-density units at 60 Dean Avenue. This capacity assessment was completed by the CAM department and is based on the "City-wide All Pipes – Existing Conditions – Calibrated – PCSWMM" model from 2023. Correspondence with the city is included in **Appendix A**.

In order to confirm the proposed sanitary infrastructure within the development lands has been appropriately sized, a sanitary sewer design sheet has been completed. Refer to **Appendix A**. The design sheet demonstrates that the proposed sewers have been appropriately sized to convey the required flows, in addition to meeting the minimum (0.6m/s) and maximum (3.0m/s) velocity requirements stipulated by the Ministry of Environment.

4. Water Servicing and Distribution

4.1. General

According to the Barrie Heritage Subdivision General Servicing Drawing, an existing 150mm diameter watermain is located within the Dean Avenue right-of-way fronting the development lands. A 150mm diameter water service for fire protection and a 100mm diameter water service for domestic use, both complete with valves and 19mm blow-offs, have been proposed to connect to the existing watermain on Dean Avenue to service the development lands. Refer to the General Servicing Plan **Drawing GS-1** found in **Appendix D**.

The proposed building will be equipped with sprinklers and will include a fire department connection. There is an existing municipal hydrant located within 45m of the buildings Fire Department connection, located near the southeastern corner of the site along Dean Avenue. The proposed domestic and fire water servicing is detailed on **Drawing GS-1**. Refer to **Appendix D**.



4.2. Domestic Water Service Design Flows

Similar to Section 3.2 of this Report, the Average Daily Demand (ADD) of 45,900L/day or 0.531L/s for the proposed development is based on the projected population and the average daily flow per person (204 people x 225L/day/person). In order to determine the appropriate water distribution design flows for the Maximum Daily Demand (MDD) and Peak Hour Demand (PHD), the ADD is multiplied by the Ministry of the Environment standard peaking factors. Refer to Table 3-3 Peaking Factors for Drinking-Water Systems serving fewer than 500 people, Design Guidelines for Drinking-Water Systems 2008 prepared by the Ministry of Environment attached in **Appendix B**. The peaking factors and corresponding flows are summarized below:

Maximum Daily Demand Factor: 3.6

Maximum Daily Demand: $0.531\text{L/s} \times 3.6 = 1.91\text{L/s}$

Peak Hourly Demand Factor: 5.4

Peak Hourly Demand: $0.531\text{L/s} \times 5.4 = 2.87\text{L/s}$

4.3. Fire Water Supply Design Flows

Current City of Barrie policy requires that fire flows for the proposed building be calculated by applying the Fire Underwriters Survey (FUS) method. The calculations are based on Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 2020). An estimate of the required fire flow is given by the following formula:

$$F = 220C\sqrt{A}$$

Where:

- F= Required fire flow (L/min.)
- C= Coefficient related to the type of construction
- A= Total effective floor area (m²)

The fire flows calculated from the above formula are adjusted based on three building factors, including; occupancy contents, sprinklers and exposure. The original calculated fire flow is then increased or decreased based on these factors. The total calculated fire flow is outlined below.

Fire Flow: 167 L/s

Refer to **Appendix B** for detailed supporting calculations.



4.4. Water System Analysis

The City of Barrie and Ministry of Environment require that the proposed water servicing be designed to ensure the following operating pressures are maintained at all times throughout the system:

Minimum Operating Pressure during MDD: 50 Psi

Minimum Operating Pressure during MDD + Fire Flow: 20 Psi

Maximum Operating Pressure: 90 Psi

In order to ensure the above noted targets are achieved, the proposed distribution system was skeletonised and modeled using the Bentley - WaterCAD software. A digital copy of the model is included in **Appendix B**. The water usage demands (refer to Section 4.2 & 4.3) were placed at the proposed water service, fire service location. Existing distribution system flows/pressures were determined through a field investigation (Hydrant Flow Test) undertaken by Troy Life and Fire Safety Ltd. on November 17, 2017. A copy of the flow test results can be found in **Appendix B**.

The hydrant flow test results were used to simulate the existing flow/pressure patterns at the connection point of the system by assigning a pump and reservoir in the model. A total of three (3) scenarios were created to ensure the appropriate operating pressures are maintained. The scenarios included Maximum Daily Demand (MDD), Peak Hour Demand (PHD) and MDD + Fire Flow at the Building Fire Service. A summary of the determined pressures are outlined in **Table 1**, below.

Table 1: Summary of WaterCAD Model Pressures Results

Scenario Name	Pressure Range (PSI)
MDD	81 to 82
PHD	81 to 82
MDD + Fire Flow at Building Fire Service	55 to 72

The model reveals that during the MDD and PHD condition, the resultant pressure within the distribution system ranged from 81 to 82 Psi. During the MDD plus Fire Flow scenario at the building



service, the lowest pressure corresponded to 55. Under no scenario did the pressure in the system exceed 90 Psi. It is important to note that due to proposed building height, it is anticipated that internal pumps will be utilized to maintain appropriate system pressures on the upper floors, however, this will be confirmed by the Building's Mechanical Design Team.

A schematic of the model and summary of the pressures are included in **Appendix B**. The analysis verifies that the appropriate system flows and required operating pressures will be maintained in the system at all times.

5. Stormwater Management

5.1. Overview

The site falls within the Lovers Creek sub-watershed of the larger Lake Simcoe watershed. The site is located outside the regulated limits of the Lake Simcoe Region Conservation Authority (LSRCA), and as such, a permit from the LSRCA will not be required for this development proposal.

As previously noted, the proposed development lands were created as part of the Barrie Heritage Subdivision. The design and construction of the subdivision included a Stormwater Management (SWM) facility (located west of Grace Crescent) to provide the required quality control (MOE "Enhanced" Level 1 treatment) and quantity control (post to pre attenuation for the 2 to 100 year design storms) in accordance with City, MOE and LSRCA requirements. The SWM facility was designed to service 60 Dean Avenue in its developed condition. Accordingly, the Barrie Heritage Subdivision design set out the allowable rational coefficient for the development lands. Through discussion with City Staff, we are of the understanding that the existing SWM infrastructure, including the SWM facility, is currently functioning appropriately and there are no downstream capacity concerns.

5.2. Low Impact Development

A Low Impact Development (LID) measure, an infiltration gallery, is being proposed for 60 Dean Avenue in an effort to reduce the reliance on end-of-pipe facilities and better mimic the natural hydrologic cycle. An infiltration gallery is proposed in series with the storm sewer network where stormwater runoff is collected from the site's building rooftop. The facility has been designed to



have a volume and footprint to capture and infiltrate the stormwater runoff generated from the 25mm Water Quality Event on the LID's upstream catchment.

The infiltration gallery is located within the parking lot to the north of the building and will be comprised of Stormtech SC-310 chambers surrounded by a clear stone media (void ratio of 0.4) and wrapped in a non-woven filter fabric. This LID will feature an ETV verified isolator row at the first run of chambers to provide additional removal of pollutants upon entry to the facility. The infiltration gallery will have an open bottom to allow the entire footprint area to be utilized for infiltration and has been designed to provide greater than 1m of separation to the recorded high-groundwater level. The LID will have an overflow outlet with a reverse slope pipe that discharges at an elevation of 250.20m. The LID was designed to have dimensions of 15.00m x 8.05m x 0.71m (L x W x H), which was determined to store a volume of 46.01m³. This exceeds the volume of rainfall produced by the 25mm Water Quality Event within the LID's upstream drainage area; 44.95m³ (0.18ha x 25mm x 10). For details on the upstream drainage area of the LID, labelled Catchment 202, refer to **Drawing SWM-2** in **Appendix D**. In addition, discrete event modelling of the LID determined a 24.10hr drawdown period over the course of this simulation, falling within the desired 24-48hr period. The LID drawdown period was calculated utilizing an infiltration rate of 12mm/hr for Sandy Loam type soils. For further details, Refer to **Drawing LID-1** and **Drawing LID-2** in **Appendix D**.

5.3. Stormwater Management Quality Control

As stipulated in the City of Barrie Stormwater Infrastructure Design Standard guidelines, quality control is required to provide 80% removal of Total Suspended Solids (TSS) and a best-efforts approach to minimize phosphorous from storm runoff leaving the site. The existing SWM Pond located west of Grace Crescent provides the necessary TSS removal. To lessen the burden on the existing SWM system, the low impact development (LID) technique of a subsurface storage chamber is proposed. The proposed infiltration gallery will reduce the quantity of pollutants being discharged into the downstream SWM system through sedimentation, filtering and soil adsorption.

5.4. Stormwater Management Quantity Control

As per the City of Barrie requirements, pre-to-post quantity control is to be provided if the site is not in an approved master drainage plan. The subject site, 60 Dean Avenue is part of Block 132 of the Barrie Heritage Subdivision. The existing SWM Pond located west of Grace Crescent provides the necessary pre-to-post peak flow attenuation for the subject lands. The site is currently



undeveloped and was stripped during the construction of the Barrie Heritage Subdivision. There are no external drainage areas that contribute flow to the proposed development lands. Based on the “Barrie Heritage Subdivision, Storm Drainage Plan” prepared by RG Robinson and Associates (Barrie) Ltd., 48 Dean Avenue (Barrie Public Library – Painswick) and 60 Dean Avenue (subject site) make up Block 132. The maximum allowable runoff coefficient for Block 132 to be serviceable by the SWM controls installed for the Barrie Heritage Subdivision was determined to be 0.80. For details refer to R.G. Robinson **Drawing G-6** in **Appendix D**.

The post development drainage conditions were derived from the proposed Site Servicing and Site Grading Plans, accompanying this report. The overland post-development drainage patterns are shown on **Drawing SWM-2** (Refer to **Appendix D**). In order to determine the overall runoff coefficient for the proposed development, a weighted mean calculation was completed using the proposed landscape/impervious areas and applicable runoff coefficients. The runoff coefficients are based on Table 3.2 of the City of Barrie Stormwater Infrastructure Design Standard, 2023. Based on a hydrologic soil group type of AB and an average slope of 2 to 4%, the landscape and impervious runoff coefficients correspond to a value of 0.10 and 0.95, respectively. **Table 2** below summarizes the determined overall runoff coefficient for the proposed development lands and the existing Barrie Public Library – Painswick lands to the west.

Table 2: Summary of Overall Catchment Areas and Runoff Coefficient

	Landscape Area (ha)	Impervious Area (ha)	Total Area (ha)	Weighted Runoff Coefficient
48 Dean Ave (ex.)	0.297	0.646	0.943	0.68
60 Dean Ave (prop.)	0.189	0.478	0.667	0.72
Block 132 Total	0.485	1.125	1.610	0.69

The determined weighted runoff coefficient of 0.69 for the proposed development lands is less than the allowable coefficient of 0.80. Accordingly, on-site quantity control SWM features will not be required, as the storm runoff can be adequately accommodated by the existing downstream SWM facility and storm sewer infrastructure.



5.5. Phosphorous Budget

In accordance with City of Barrie Stormwater Infrastructure Design Standard guidelines, pre-to-post development phosphorous loading calculations have been undertaken for the site. The analysis has been completed using the Phosphorous Budget Tool created by Hutchinson Environmental Sciences Ltd., Greenland International Consulting Ltd. and Stoneleigh Associates Inc. Members of The Jones Consulting Group Ltd. have been trained by Hutchinson Environmental Sciences Ltd. to complete a phosphorous analysis within the City's watersheds using the Phosphorous Budget Tool. Supporting software print-outs are provided in *Appendix C*.

The site's proposed LID system consists of a subsurface infiltration gallery. Stormwater from one portion of the site flows into the subsurface storage until full, before overflowing back into the site's internal storm sewers. The remainder of the site's stormwater runoff is conveyed to the existing wet pond located west of Grace Crescent. The Phosphorus removal rates for each BMP are as per the values provided in the LSRCA's *Phosphorus Loading Tool* and combine to give a 64% potential phosphorous reduction factor. The individual anticipated Phosphorus removal rates are summarized below:

- | | |
|--|------------|
| - Subsurface Infiltration Gallery | 25% |
| - Existing Wet Detention Pond | 63% |
| - Treatment Train – Infiltration Gallery & Wet Detention Pond | 72% |

The values calculated for the proposed development are summarized as follows:

Pre-Development Loading: 0.11 kg/year

Post-Development Loading: 1.12 kg/year

Post-Development with BMPs: 0.39 kg/year

The pre-development condition is based on predominantly grass vegetative cover with very few trees or shrubs and the post development condition is based on the proposed residential development plan. The analysis reveals that in the pre-development condition, the total phosphorous load exported off site is 0.11 kg per year. In the post-development condition, without the consideration of BMP's the total phosphorous export is 1.12 kg per year. With the consideration of BMP's, the total phosphorous load exported off site is reduced to 0.39 kg per year. This corresponds to net reduction of phosphorous loadings of approximately 65% in the post-development condition with BMP's over the post-development condition without the consideration of BMP's.



5.6. Water Balance

The primary objective of completing a hydrogeologic water balance assessment is to capture and manage annual rainfall on the development site to preserve the pre-development hydrology (water balance) through a combination of infiltration, evapotranspiration, absorbent landscaping, rainwater reuse and/or other LID practices. Various site-specific characteristics contribute to the ability to achieve water balance. They include, but are not limited to: soil permeability, the ability to collect and direct drainage into the ground, groundwater table elevations and seasonal fluctuations. Best efforts will be made via the SWM Plan to maintain groundwater recharge while considering site specific characteristics.

In accordance with City of Barrie Stormwater Infrastructure Design Standard guideline 4.1.3, the water balance between the pre- and post-development conditions must provide a minimum infiltration equivalent to the first 5mm of any given rainfall event, which is 33.5m³ (0.67ha x 5mm x 10). The volume stored by the proposed LID is 46.01m³, which exceeds the minimum infiltration volume required by the City of Barrie.

A site-specific water balance in accordance with the SIS recommendations has been completed for 60 Dean Avenue by GEI and excerpts are included in **Appendix C** of this Report. GEI completed a pre- to post-development water balance to estimate the infiltration volume deficit that would need to be mitigated via the proposed SWM Plan. The infiltration and runoff volume as calculated in the GEI Water Balance Assessment are presented in **Table 3** below.

Table 3 - Summary of Water Balance Calculations by GEI

Condition	Permeable Areas	Impermeable Areas	Average Annual Infiltration Volume (m ³ /year)	Average Annual Runoff Volume (m ³ /year)
Pre-Development Land Use	100%	0%	1,030	1,258
Post-Development Land Use	42%	58%	431	3,538
Pre- to Post-Development Change		%	-58	+ 181
		m ³ /year	-598	+ 2,280



The results summarized in the table above indicate that there is an increase in total runoff volume and a deficit in infiltration volume from pre- to post-development without accounting for LID's. The SWM Plan herein is intended to mitigate or reduce the water balance deficit as outlined above. Runoff generated from this development is directed to the proposed Low Impact Development (LID) infiltration gallery.

Upon review of the Environmental Canada Daily Climate Normals for the Barrie WPCC from the years 1979 to 2008, a statistical analysis of rainfall data was completed and it is noted that on an annual average over that time period, this gauge has received **928.1mm** of total precipitation, comparable to the mean average annual precipitation of 939mm for Hewitts Creek, published in the LSRCA Climate Data Set, April 2017 and comparable to average annual precipitation of 914mm by GEI in their water balance calculations.

A continuous data set of precipitation and temperature for a one-year period (June 2005-May 2006) was used for the continuous model simulation in the OTTHYMO hydrologic model to estimate the annual infiltration capability of the proposed LID's. The continuous data set has a total annual precipitation of **984.3mm**, comparable to the mean annual precipitations noted above.

Reviewing the results of the OTTHYMO Post-Development Continuous model simulation, it is estimated that approximately **36.7%** of the annual runoff generated from the site is captured and retained by the proposed infiltration gallery. The annual infiltration efficiency was calculated from the infiltration and precipitation values from the continuous OTTHYMO model. The outputs of the OTTHYMO Continuous Model can be found in **Appendix C**. This annual capture efficiency is applied to the post-development annual runoff volume calculated by GEI (3,538m³), resulting in a total post-development infiltration volume of 1298 m³/a (3,538 m³ x 36.7%). The revised annual infiltration volume results in eliminating the infiltration deficit of 599 m³/a to a surplus of **268 m³/a**.

In summary, the proposed stormwater management plan achieves the water balance criteria for the subject lands by fully mitigating the infiltration deficit established in GEI's pre-to-post-development water balance calculations.



5.7. Minor and Major Stormwater Conveyance

In accordance with City of Barrie Stormwater Infrastructure Design Standard guidelines in terms of minor event conveyance (i.e. storm events less than or equal to the 5 year event) runoff will discharge to Dean Avenue via the proposed storm sewer network. Refer to **Drawings GS-1** and **STM-1** in **Appendix D** for details. The corresponding storm sewer design sheet is provided in **Appendix C**. In the event that a blockage to the storm sewer network was to occur, site grading has been completed to safely direct flows overland to Dean Avenue without causing flooding to the proposed buildings or adjacent properties. The post development overland flow route is shown on **Drawing SWM-2, Appendix D**.

5.8. Erosion and Sediment Control

During construction, the majority of the development's natural features will be removed and the topsoil stripped within the development area. The exposed surface will be susceptible to erosion, increasing the potential for sediment runoff. To minimize local and downstream impacts from erosion and sedimentation during construction, the following measures have been recommended:

- Excess earth and topsoil is to be stockpiled away from the site outlet and/or removed from site. Stockpiles shall be seeded or covered with erosion control if left for periods of greater than 30 days.
- Temporary sediment control fencing should be erected around the perimeter of all grading activities;
- Temporary sediment fabric and stone filters should be installed on catch basins until surface cover has been stabilized;
- Temporary rock flow check dams should be installed within drainage cut-off swales;
- A temporary construction access mud mat should be installed at the construction access to reduce the amount of materials that may be transported off site;
- Temporary drainage swale shall direct runoff to the proposed sediment trap and Hickenbottom outlet. The Hickenbottom outlet will help filter runoff directed to the municipal storm sewer system;



- Construction during drier months should be monitored for wind-borne transport of sediments. At the direction of the engineer, the contractor may be directed to water down exposed earth areas with an aqueous solution of calcium chloride or suitable alternative;
- All disturbed areas not under immediate construction for 30 days, or not intended for building activities within a 3-month time period, should be stabilized with hydro-seeding.

Detailed Erosion and Sediment Control Plans (**Drawings ESC-1 & ESC-2**) have been prepared and submitted with this Report and identify the location and details of the temporary devices. Refer to **Appendix D**.

6. Secondary Utilities

All secondary utility services will be co-coordinated and a Composite Utility Plan provided to indicate all underground locations once feedback from each utility company is provided. Electrical (Alectra), Natural Gas (Enbridge Consumer Gas), Telephone (Bell Canada) and Cable (Rogers Cable) are all available within the adjacent Right of Ways. At this time we do not foresee any limitations in servicing the development with secondary utilities; however, formal confirmation from each service provider is still required.

7. Conclusions

The development of the subject site to include the proposed Dean Avenue Residential Apartment Building has been fully examined for serviceability in this Report. The development lands can be appropriately serviced with proposed infrastructure and existing municipal infrastructure. Through proper execution of the proposed site servicing described herein and on the accompanying drawings, it is evident that the proposed development can become a functional part of the City of Barrie.

This Servicing & Stormwater Management Report is respectfully submitted,

THE JONES CONSULTING GROUP LTD.



Appendix A

Supporting Calculations – Sanitary Servicing

- Sanitary Sewer Design Sheet
- Correspondence with Darrin Tone, P.Eng., City of Barrie on existing sanitary sewer capacity



SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET 1 of 1

FILE NO PRA-24067 (50)

CONTRACT / PROJECT 60 Dean Avenue

DATE Mar-25

$n \geq 0.013$
 $M = 5/P^{0.2}$ Babbitt
 $M = 1 + [14/(4 + P^{0.5})]$ Harmon
 $Q_p = P * q * M / 86.4$
 $Q_i = I * A$
 $Q_{tot} = Q_p + Q_i$
 $Q_{Commercial}$

Numbers in blue or text in red are equations
 (Harmon or Babbitt peaking factor where; $M \geq 2$), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; $q = 225$ L/day/person; $P =$ population in thousands) 225 litres/person/day
 (Peak extraneous flow: $I = 0.1$ L/s/ha over development area)

(Total peak flow as the sum of peak population flow and peak extraneous flow)
 See Note 1.

AREA - STREET	MAINTENANCE HOLE		DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBIT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q _p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q _i (l/s)	Q _{tot} (l/s)	L (m)	D (mm)	S (%)	Q _f FULL (l/s)	d/D ⁽²⁾	d/D ⁽³⁾ >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial ⁽¹⁾ (m/s)	Velocity ⁽⁴⁾ > 0.6 (m/s)
	FROM	TO																						
1A - 60 Dean Avenue	Building	SAN MH1	122		1.67	204	204	6.873	4.145	6.873	3.647	0.67	0.67	0.067	3.713	8.0	200	2.00	46.384	0.191	Ok	1.476	0.878	Ok
1B -	SAN MH1	Dean Avenue Main				0	204	6.873	4.145	6.873	3.647	0.67	0.67	0.067	3.714	13.8	200	2.00	46.384	0.191	Ok	1.476	0.878	Ok
Date: March 2025			CALCULATED BY: WS									CHECKED BY: MF												

- (1) without extraneous flow
- (2) with extraneous flow
- (3) d/D>0.5 for pipes 375 and less, d/D>0.7 for pipes greater than 375
- (4) Velocity check based on the lesser of full flow or partial velocity

Numbers in Blue are cell formulas

From: Darrin Tone <Darrin.Tone@barrie.ca>
Sent: January 29, 2025 4:31 PM
To: Duncan Richardson <DRichardson@jonesconsulting.com>
Subject: 60 Dean Ave (south of Library) - Sanitary Sewer Capacity

Hi Duncan,

It is understood that 48 Dean Avenue will be (or has been) severed into two lots, with the new lot being 60 Dean Avenue. Based on the 60 Dean Ave proposed development concept of 122 high density residential units (1.67 ppu), there is existing capacity in the downstream sanitary sewer network for this development. The capacity assessment was completed by the CAM department and is based on the 'City-wide All Pipes - Existing Conditions - Calibrated - PCSWMM' model, which was finalized in 2023. Should the proposed development concept increase significantly from 122 high density residential units, the sanitary capacity assessment will need to be re-examined to confirm capacity. Please keep me informed if as the project advances if you are contemplating additional units.

Cheers,

Darrin Tone, P.Eng.
Engineer - Stormwater and Wastewater Planning
Corporate Asset Management



City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5
Office: 705-739-4220 x5291 | Fax: 705-739-4247
www.barrie.ca

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Appendix B

Supporting Calculations – Water Servicing

- Table 3-3 – Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People
- Proposed Building – Fire Flows Calculations
- 70 Dean Fire Flow Test
- Estimated Water Demands & Fire Flows
- 60 Dean Avenue WaterCAD Schematic
- FlexTable: Junction Table – Scenario: MDD
- FlexTable: Junction Table – Scenario: PHD
- FlexTable: Junction Table – Scenario: MDD+FF @ Building Fire Service

develop the source of supply to meet more than the projected maximum daily flow, the storage volume can be reduced accordingly.

Average daily domestic consumption rates can vary from less than 180 L/(cap·d) [48 USgal/(cap·d)] to more than 1,500 L/(cap·d) [396 USgal/(cap·d)]. These values represent the average flow over a 24 hour period and do not reflect the fact that there are maximum day and peak hour/instantaneous demands in the system each day which will exceed the average value by a significant amount. It is essential that the source of supply and the distribution system be capable of meeting these maximum and peak demand rates without overtaxing the source or resulting in excessive pressure loss in the distribution system.

In general, small systems have higher peaking factors for maximum day and peak hour demand than large systems. The minimum rate, maximum day and peak rate factors for the system should be based on existing flow data or data from a similar nearby system where available. Table 3.3 provides peaking factors for use with average day demand when actual data are not available.

Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People



DWELLING UNITS SERVICED	EQUIVALENT POPULATION	NIGHT MINIMUM HOUR FACTOR	MAXIMUM DAY FACTOR	PEAK HOUR FACTOR
10	30	0.1	9.5	14.3
50	150	0.1	4.9	7.4
100	300	0.2	3.6	5.4
150	450	0.3	3.0	4.5
167	500	0.4	2.9	4.3

3.4.5.2 Outdoor Water Use

For outdoor water use, it should be assumed that a maximum of 25% of the homeowners could be using an outdoor tap at any one time at a rate of 20 L/min (5.3 USgpm) for one hour per day. Where fire protection is provided, then this outdoor use need not be considered.

3.4.5.3 Fire Protection

The decision as to whether or not fire protection will be provided via the communal water supply system is a municipal responsibility. In deciding upon

	Project:	60 Dean Avenue	Date:	February 2025	
	File No.:	PRA-24067	Designed:	WS	
	Subject:	Proposed Building - Fire Flow Calculations	Checked:	MF	
	Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Fire Protection" (Fire Underwriters Survey, 2020)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)
 C = coefficient related to the type of construction
 = 1.5 for wood frame construction (structure essentially all combustible).
 = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
 = 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)
 = 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be greater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

Building	GFA (m ²)	C	(1) Fire Flow "F"		(2) Occupancy Contents		(3) Sprinkler		(4) Exposure		Final Adjustment Fire Flow	
			(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	(L/min)	(L/s)
S2	8950	1.0	21,000	350	-15	17,850	-50	-8,925	7.50	1,339	10,000	167

Note: Based on 60 Dean Avenue Conceptual Site Plan prepared by Jones Consulting Group Ltd., dated February 27, 2025

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25% to 20%	Max exposure determined by
3 to 10m	20% to 15%	Linear interpolation of distance
10 to 20m	15% to 10%	and is calculated for all sides.
20 to 30m	10% to 5%	Max total charge shall not
30 to 45m	5% to 0%	exceed 75%.

Note: 10% Exposure charge applied to adjacent floor area separated by a fire wall or unpeared party wall.

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

- a) Same or poorer type of construction than fire building
- b) Same or greater height than the fire building
- c) Contains unprotected exposed openings
- d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

- (1) Basic Required Fire Flow (F) = 350 L/s
- (2) Building Occupancy Contents = -15 % Reduction
- (3) Sprinkler System Credit = -50 % Reduction
- (4) Exposure to building = 7.50 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	45.1	0.00	0.00	Exposure Greater than 30m; No Charge Assigned
South	44.5	0.00	0.00	Exposure Greater than 30m; No Charge Assigned
East	23.8	10.00	7.50	Conditions a), b) and c) are True; Assign 3/4 of Max Charge
West	40.7	0.00	0.00	Exposure Greater than 30m; No Charge Assigned
Total:			7.50	

Final Adjusted Fire Flow = Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjustment (4)
 = 10000 L/min or 167 L/s



Life & Fire Safety Ltd

FLOW TEST REPORT

OFFICE REPORT:

LOCATION: 70 Dean Avenue, Barrie, Ontario

DATE OF FLOW TEST: November 17, 2017

TIME OF FLOW TEST: 9:00 am

TEST BY: TROY LIFE & FIRE SAFETY

TEST CONDUCTED BY: Stefan Blasiak

WITNESSED BY: City of Barrie

FLOW NOZZLE TYPE (IE HOSE MONSTER/PLAY PIPE): Hose Monster

WATER MAIN SIZE (IF AVAILABLE): _____

HYDRANT ELEVATION COMPARED TO BUILDING: Same Elevation ±0

HYDRANT FLOW DATA:

STANDING PRESSURE (HYDRANT #1):

SIZE OF OPENING:

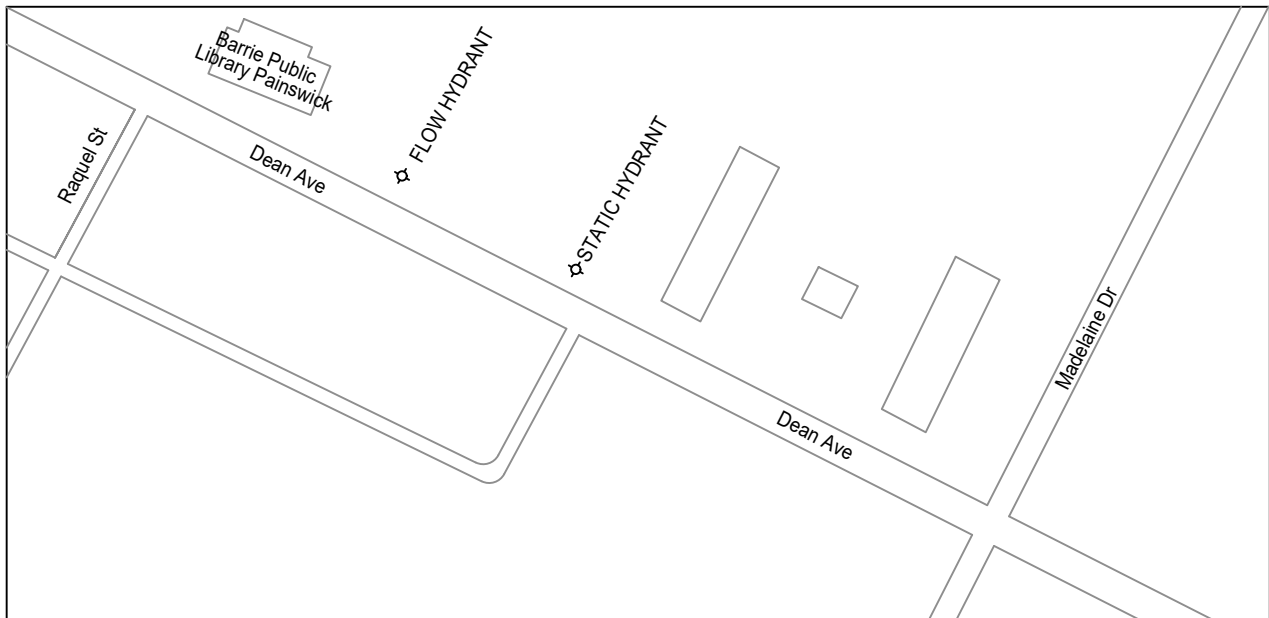
DISCHARGE COEFFICIENT:

PITO READING (HYDRANT #2):

FLOW USGPM:

RESIDUAL PRESSURE (HYDRANT #1):

DRAWING OF SITE



WATER SUPPLY GRAPH

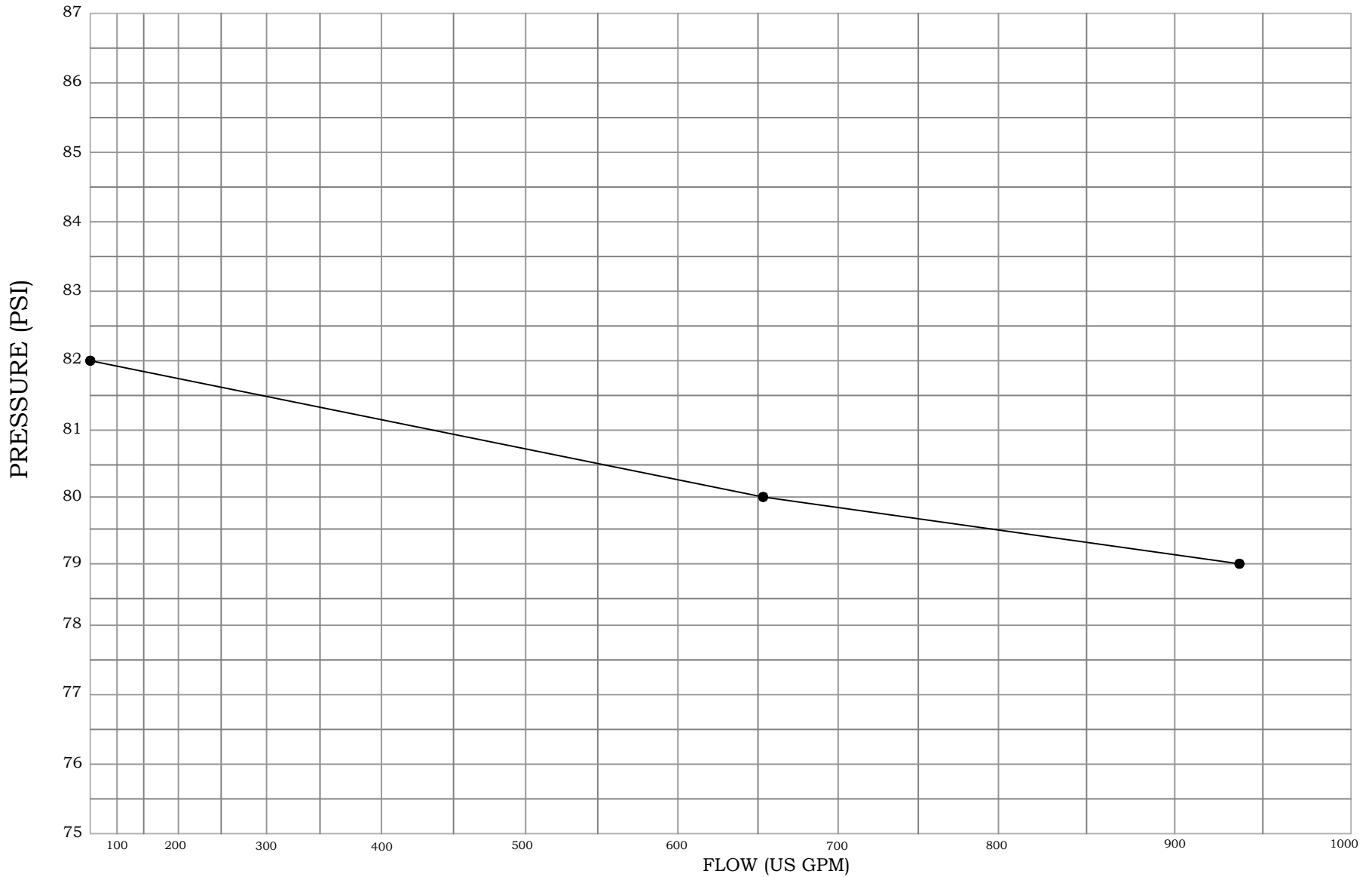
PROJECT:

LOCATION: 70 Dean Avenue, Barrie, Ontario

DATE OF FLOW TEST: November 17, 2017 TIME: 9:00 am

TEST BY: TROY LIFE & FIRE SAFETY

WITNESSED BY: City of Barrie



60 Dean Avenue, City of Barrie
 Estimated Water Demands & Fire Flows
 PRA-24067

3-4-25



Demand Nodes	Dwell Units	Density P.P.U.	Population	Average Demand		ADD (L/sec)	MDD Factor	MDD (L/sec)	PHD Factor	PHD (L/sec)
					L/cap/day					
Junction 3, Building 1	122	1.67	204	225		0.531	3.6	1.91	5.4	2.87
		Total	204							

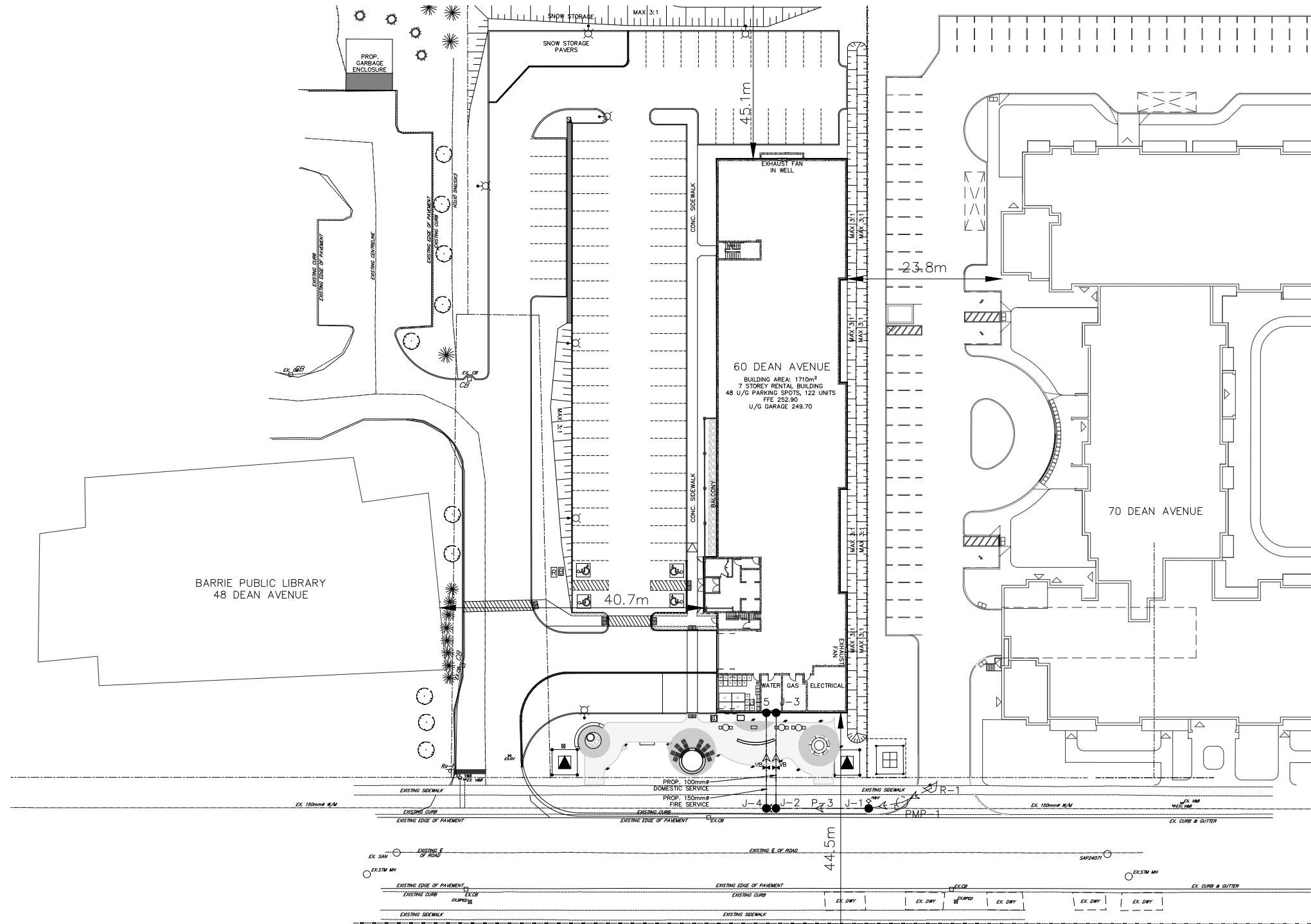
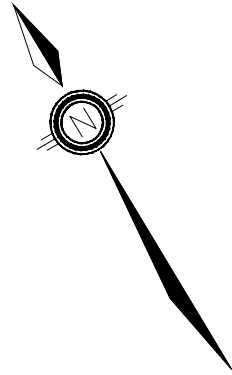
Demand Nodes	Fire Flow Demand L/sec
Junction 5, Building Fire Service	167

Troy Life & Fire Safety Hydrant Test Data Date: 11/17/2017
 Hydrant Test No. 1

Flow (USGPM)	Flow (L/s)	Pressure (PSI)	Head (m)
Hydrant Test			
0	0.00	82	57.63
654	41.26	80	56.23
940	59.30	79	55.52

$$Q_r = Q_f \times ((H_r^{0.54}) / (H_f^{0.54}))$$

Pstatic	82 psi
Hr	62 psi
Hf	3 psi
Qf	940 USGPM
Qr	4823.6289 USGPM
Qr	304.32371 L/s



229 Maplevue Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

NESTWISE INC.
60 DEAN AVENUE
WATERCAD SCHEMATIC

DRAWN BY:	CG	SCALE:	1:750	PROJECT No.	PRA-24067
CHECKED BY:	MF	DATE:	FEB 2025	DWG No.	WAT-1

Scenario: MDD
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
37	J-3	248.28	<None>	<Collection: 1 item>	1.91	305.51	81
43	J-5	248.28	<None>	<Collection: 0 items>	0.00	305.52	81
33	J-1	247.93	<None>	<Collection: 0 items>	0.00	305.52	82
35	J-2	247.90	<None>	<Collection: 0 items>	0.00	305.52	82
39	J-4	247.87	<None>	<Collection: 0 items>	0.00	305.52	82

G:\Eng_3D\PRA-24067\Design Dwgs\WaterCAD\PRA-24067-Water CAD.wtg

Scenario: PHD
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
37	J-3	248.28	<None>	<Collection: 1 item>	2.87	305.47	81
43	J-5	248.28	<None>	<Collection: 0 items>	0.00	305.49	81
33	J-1	247.93	<None>	<Collection: 0 items>	0.00	305.49	82
35	J-2	247.90	<None>	<Collection: 0 items>	0.00	305.49	82
39	J-4	247.87	<None>	<Collection: 0 items>	0.00	305.49	82

G:\Eng_3D\PRA-24067\Design Dwgs\WaterCAD\PRA-24067-Water CAD.wtg

Scenario: MDD+FF @ BUILDING FIRE SERVICE
Current Time Step: 0.000 h
FlexTable: Junction Table

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
43	J-5	248.28	<None>	<Collection: 1 item>	167.00	287.15	55
39	J-4	247.87	<None>	<Collection: 0 items>	0.00	292.66	64
37	J-3	248.28	<None>	<Collection: 1 item>	1.91	293.21	64
35	J-2	247.90	<None>	<Collection: 0 items>	0.00	293.22	64
33	J-1	247.93	<None>	<Collection: 0 items>	0.00	298.67	72

G:\Eng_3D\PRA-24067\Design Dwgs\WaterCAD\PRA-24067-Water CAD.wtg



Appendix C

Supporting Calculations – Stormwater Management

- Hydrology Design Writeup
- OTTHYMO Input Parameter Sheets for Catchments 201, 202, and 203
- Detailed Output for the 25mm 4hr Chicago Storm Event (Post-Dev-D)
- Water Balance Summary Results for the Continuous Simulation Modeling (Post-Dev-C)
- OTTHYMO Digital Modeling Files
- Subject Site Soils Map
- ADS Infiltration Gallery Specifications and Notes
- Storm Sewer Catchment Areas and Sizing
- Phosphorus Budget
- Excerpts from GEI's Hydrogeological Investigation – Pre-to-Post Development Water Balance



Hydrology Design Writeup

Table of Contents

1. OTTHYMO Model
2. Design Storms & Climatology
3. Modeling Approach and Rationale
4. Discretization
5. OTTHYMO Model Results

1. OTTHYMO Model

The development was hydrologically modelled using the latest version of Visual OTTHYMO Modeling (version 6.2) by *Civica Infrastructure*. OTTHYMO is a GIS-based hydrologic model capable of performing both event-based and continuous rainfall simulations for drainage and conveyance infrastructure design, SWM & LID design, water balance & erosion threshold calculations. Resulting infiltration rates obtained through Guelph Permeameter testing have been coded into the OTTHYMO model with an appropriate factor of safety.

2. Design Storms & Climatology

The rainfall events used for the OTTHYMO model simulations include the 25mm 4-hour Chicago (Water Quality) rainfall event and a continuous data set of daily precipitation and minimum and maximum temperatures for a one-year period. The 25mm single event is modeled to measure the proposed LID's response to the Water Quality Event and ensure that it is sized correctly to fully infiltrate the runoff volume within a desired drawdown period of 24-48 hours. The continuous



simulation is modeled to assess Runoff Volume Capture (for use in SWM quality control water balance calculations) and Post-Development Water Balance Mitigation on an annual basis.

The Continuous modeling simulation uses a data set of daily precipitation for a one-year period, representing a typical year. The continuous modeling simulation uses a data set of hourly precipitation obtained in the City of Barrie for a 12-month period from June 1st, 2005 to May 31st, 2006. To further the continuous model simulation, the corresponding sets of climatic data consisting of maximum and minimum daily temperatures, winds, etc. was coded into the Visual OTTHYMO model to simulate evapotranspiration processes.

3. Modeling Approach and Rationale

There are two (2) total OTTHYMO models designed to assess the performance of the proposed low impact development infrastructure. The models evaluated are listed below:

- *Post-Dev D*: Post-development Discrete Model (25mm 4hr Chicago Event)
- *Post-Dev C*: Post-development Continuous Model (1 year Precipitation and Temperature Data)

The 25mm water quality event and continuous event simulations were completed to assess a number of LID facility characteristics, including:

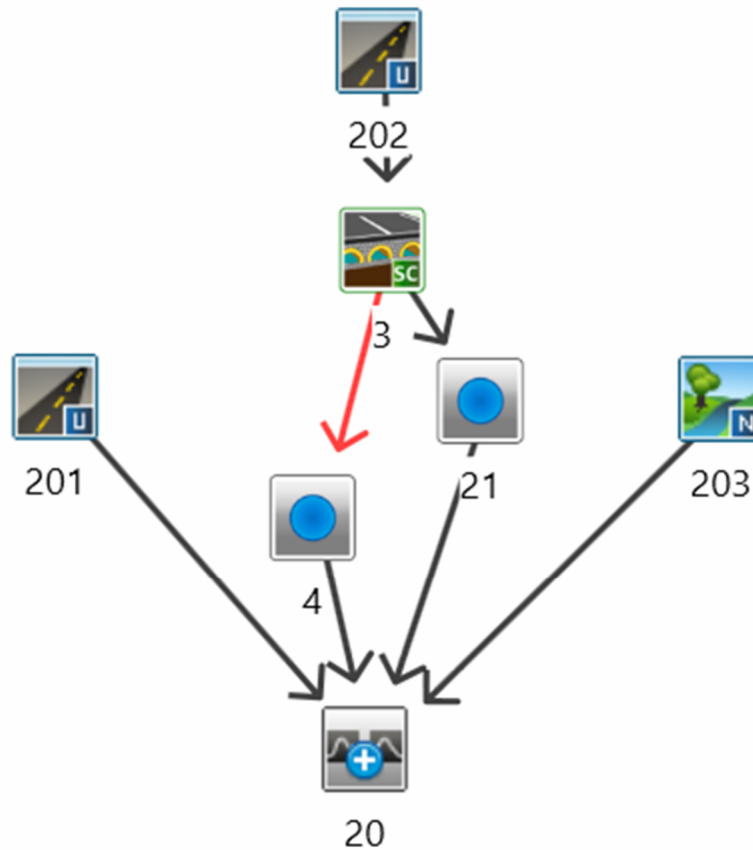
- the drawdown time during a typical 25mm event;
- the drawdown time between storm events producing runoff;
- sufficient redundant volume available if inter-event window is short (<48 hours);
- overflow from the LID
- total infiltration volume on a single event and annual basis; and
- total capture volume on a single event and annual basis.

4. Discretization

Model discretization for the *Post-Dev-D* and *Post-Dev-C* models, developed under the approach described previously, is summarized herein. Detailed OTTHYMO model input parameters have been provided in the following supporting calculations.

4.1 Post-Development Discrete Modeling

The Catchment areas used for the discrete post-development modeling are shown on **Drawing SWM-2** in **Appendix D**. The below figure shows the *Post-Dev-D* model schematic.



Post-Dev Model Schematic

The OTTHYMO *Post-Dev* model includes three (3) discrete catchments.

- **Catchment 201** is approximately 0.41 ha in size and represents internal developable lands within the development. This area is comprised of the proposed parking lot and the permeable areas bounding the parking lot to the north and to the west. Flows generated within catchment 201 flow offsite to the shared driveway between 48 Dean Avenue and the subject site.
- **Catchment 202** is approximately 0.18 ha in size and represents internal developable lands within the development. This area is comprised of the proposed building's roof and the northern portion of the proposed ditch bounding the east side of the subject site. Flows generated within catchment 202 flow into the proposed LID, with overflow joining the flows from catchment 201.



- **Catchment 203** is approximately 0.08 ha in size and represents internal developable lands within the development. The area is comprised of the landscaped area bounding the south of the subject site, as well as the southern portion of the proposed ditch bounding the east side of the subject site.

This provides a total catchment area of approximately **0.67 ha** which matches the Site Plan total area.

The proposed LID infiltration gallery is modeled as a Chamber (#3) in the OTTHYMO model, with input parameters consistent with the LID dimensions described in the main body of the report.

The following Table illustrates the parameters coded into the post-development OTTHYMO models for the subject site.

Table: Post-Development OTTHYMO Model Parameters

NASHYD Catchments	Area (ha)	L (m)	S (%)	RC	CN*	la (mm)	 Tp (hr)	DT (min)
203	0.08	20	3.20	0.10	50	5.0	0.17	1
STANDHYD Catchments	Area (ha)	XIMP (%)	TIMP (%)	SLPP (%)	LGP (m)	SLPI (%)	LGI (m)	DT (min)
201	0.41	75	75	2.00	20	1.5	52.41	1
202	0.18	96	96	2.0	20	0.50	34.54	1
Storage Chamber	Manufacturer	Model	Number of Chambers	Depth of Stone Above Chamber (mm)	Depth of Stone Below Chamber (mm)	System Footprint (m²)	Voids in Stone (Porosity)	Max Storage Volume (m³)
#3	StormTech	SC-310	47	152	152	120.75	0.4	46.13

4.2 Post-Development Continuous Modeling

The Catchment areas and LID Chamber used for the continuous post-development modeling are the same as for the discrete post-development model, shown on **Drawing SWM-2** in **Appendix D**.



5. OTTHYMO Model Results

The hydrologic modeling results from the *Post-Dev-D* and *Post-Dev-C* models are summarized herein. From a review of the model output, with respect to the area draining to the LID (Catchment 202), the proposed infiltration gallery captured and infiltrated 100% of the total runoff volume during the 25mm Event and 77.2% of the annual runoff volume during the continuous event. On a total site basis, the proposed infiltration gallery captured and infiltrated 36.7% of the total annual precipitation. Refer to the OTTHYMO *Pre-Dev-D* and *Post-Dev-D* model results further in **Appendix C**.

OTTHYMO Input and Output Enclosed:

- OTTHYMO Input Parameter Sheets for Catchments 201, 202, and 203
- Detailed Output for the 25mm 4hr Chicago Storm Event (Post-Dev-D)
- Water Balance Summary Results for the Continuous Simulation Modeling (Post-Dev-C)
- OTTHYMO Digital Modeling Files

Weighted Curve Number Calculator			
Input:			
Catchment ID	201		
Hydrologic Soil Group	AB		
		Weighted	Weighted
Soil Texture	Bondhead Sandy Loam	Curve Number	Runoff 'C'
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.105	50.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.307	98.0	0.95
Calculated:			
Area	0.412	ha	
Average CN	86		
Average Pervious CN	50		
Average Runoff 'C'	0.73		

Initial Abstraction Calculator		
Input:		
Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm
Calculated:		
Total Average IA	2.76	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator		
Input:		
Fow Length Max El.	-	m
Flow Length Min. El.	-	m
Catchment Flow Length	20	m
Calculated:		
Catchment Ave. Slope	3.00	%
Imperviousness	74.53%	
Directly Connected Imperviousness	74.53%	
Calculated: RATIONAL COEFFICIENT		
5YR Rational 'C'	0.73	
Calculated: MTO DRAINAGE MANUAL		
25YR Rational 'C'	0.81	
50YR Rational 'C'	0.88	
100YR Rational 'C'	0.92	
Calculated: AIRPORT METHOD (Runoff Coef <0.4)		
Time of Concentration	3.72	min
Time of Concentration	0.06	hr
Time to Peak	0.04	hr
$T_c = 3.26 * (1.1 - C) * L^{0.5} * S^{-0.33}$		
Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)		
Time of Concentration	1.00	min
Time of Concentration	0.02	hr
Time to Peak	0.01	hr
$T_c = 0.057 * L * S^{-0.2} * A^{-0.1}$		
Use:		
Time of Concentration	0.02	hr
Time to Peak	0.01	hr

Post-Development OTTHYMO Modeling

Catchment Area Summary (201)					
	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.25	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.25	0.0000
Cultivated "A"	0.0000	66	0.00	0.22	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "A"	0.0000				
Weighted CN "A"			0.00		0.0000
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.1050	50	5.25	0.10	0.0105
Cultivated "AB"	0.0000	66	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.3072	98	30.10	0.95	0.2918
Impervious "AB" (Dis-Connectec	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.4121				
Weighted CN "AB"			85.77		0.7335
Wetlands "B"	0.0000	50	0.00	0.25	0.0000
Woods "B"	0.0000	60	0.00	0.25	0.0000
Pasture/Lawn "B"	0.0000	69	0.00	0.25	0.0000
Cultivated "B"	0.0000	74	0.00	0.35	0.0000
Impervious "B" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "B" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "B"	0.0000				
Weighted CN "B"			0.00		0.0000
Totals:	0.4121	Weighted CN	85.77	Weighted "C"	0.73

Weighted Curve Number Calculator			
Input:			
Catchment ID	202		
Hydrologic Soil Group	AB		
		Weighted	Weighted
Soil Texture	Bondhead Sandy Loam	Curve Number	Runoff 'C'
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.007	50.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.171	98.0	0.95
Calculated:			
Area	0.179	ha	
Average CN	96		
Average Pervious CN	50		
Average Runoff 'C'	0.91		

Initial Abstraction Calculator		
Input:		
Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm
Calculated:		
Total Average IA	2.12	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator		
Input:		
Fow Length Max El.	-	m
Flow Length Min. El.	-	m
Catchment Flow Length	40	m
Calculated:		
Catchment Ave. Slope	0.50	%
Imperviousness	95.88%	
Directly Connected Imperviousness	95.88%	
Calculated: RATIONAL COEFFICIENT		
5YR Rational 'C'	0.91	
Calculated: MTO DRAINAGE MANUAL		
25YR Rational 'C'	1.00	
50YR Rational 'C'	1.00	
100YR Rational 'C'	1.00	
Calculated: AIRPORT METHOD (Runoff Coef <0.4)		
Time of Concentration	4.79	min
Time of Concentration	0.08	hr
Time to Peak	0.05	hr
$T_c = 3.26 * (1.1 - C) * L^{0.5} * S^{-0.33}$		
Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)		
Time of Concentration	3.11	min
Time of Concentration	0.05	hr
Time to Peak	0.03	hr
$T_c = 0.057 * L * S^{-0.2} * A^{-0.1}$		
Use:		
Time of Concentration	0.05	hr
Time to Peak	0.03	hr

Post-Development OTTHYMO Modeling

Catchment Area Summary (202)					
	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.25	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.25	0.0000
Cultivated "A"	0.0000	66	0.00	0.22	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "A"	0.0000				
Weighted CN "A"			0.00		0.0000
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0074	50	0.37	0.10	0.0007
Cultivated "AB"	0.0000	66	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.1712	98	16.77	0.95	0.1626
Impervious "AB" (Dis-Connectec	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.1785				
Weighted CN "AB"			96.02		0.9150
Wetlands "B"	0.0000	50	0.00	0.25	0.0000
Woods "B"	0.0000	60	0.00	0.25	0.0000
Pasture/Lawn "B"	0.0000	69	0.00	0.25	0.0000
Cultivated "B"	0.0000	74	0.00	0.35	0.0000
Impervious "B" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "B" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "B"	0.0000				
Weighted CN "B"			0.00		0.0000
Totals:	0.1785	Weighted CN	96.02	Weighted "C"	0.91

Weighted Curve Number Calculator			
Input:			
Catchment ID	203		
Hydrologic Soil Group	AB		
		Weighted	Weighted
Soil Texture	Bondhead Sandy Loam	Curve Number	Runoff 'C'
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.076	50.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A
Calculated:			
Area	0.076	ha	
Average CN	50		
Average Pervious CN	50		
Average Runoff 'C'	0.10		

Initial Abstraction Calculator		
Input:		
Wetland	16	mm
Woods	10	mm
Pasture/Lawns	5	mm
Cultivated	7	mm
Impervious Areas	2	mm
Calculated:		
Total Average IA	5.00	mm
Average Pervious IA	5.00	mm

*Weighted Curve Numbers and Weighted Rational Coefficients are determined from the weighted average of the area and Curve Number or Rational Coefficient in a given soil type, i.e. Type A, B, C or D.

Time of Concentration Calculator		
Input:		
Fow Length Max El.	-	m
Flow Length Min. El.	-	m
Catchment Flow Length	20	m
Calculated:		
Catchment Ave. Slope	3.20	%
Imperviousness	0.00%	
Directly Connected	0.00%	
Imperviousness		
Calculated: RATIONAL COEFFICIENT		
5YR Rational 'C'	0.10	
Calculated: MTO DRAINAGE MANUAL		
25YR Rational 'C'	0.11	
50YR Rational 'C'	0.12	
100YR Rational 'C'	0.13	
Calculated: AIRPORT METHOD (Runoff Coef <0.4)		
Time of Concentration	9.93	min
Time of Concentration	0.17	hr
Time to Peak	0.11	hr
$T_c = 3.26 * (1.1 - C) * L^{0.5} * S^{-0.33}$		
Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)		
Time of Concentration	1.17	min
Time of Concentration	0.02	hr
Time to Peak	0.01	hr
$T_c = 0.057 * L * S^{-0.2} * A^{-0.1}$		
Use:		
Time of Concentration	0.17	hr
Time to Peak	0.11	hr

Post-Development OTTHYMO Modeling

Catchment Area Summary (203)					
	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.25	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.25	0.0000
Cultivated "A"	0.0000	66	0.00	0.22	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "A"	0.0000				
Weighted CN "A"			0.00		0.0000
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0764	50	3.82	0.10	0.0076
Cultivated "AB"	0.0000	66	0.00	0.22	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connectec	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0764				
Weighted CN "AB"			50.00		0.1000
Wetlands "B"	0.0000	50	0.00	0.25	0.0000
Woods "B"	0.0000	60	0.00	0.25	0.0000
Pasture/Lawn "B"	0.0000	69	0.00	0.25	0.0000
Cultivated "B"	0.0000	74	0.00	0.35	0.0000
Impervious "B" (Connected)	0.0000	98	0.00	0.90	0.0000
Impervious "B" (Dis-Connected)	0.0000	98	0.00	0.90	0.0000
Total Area "B"	0.0000				
Weighted CN "B"			0.00		0.0000
Totals:	0.0764	Weighted CN	50.00	Weighted "C"	0.10

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V   V   I   SSSSS U   U   A   L           (v 6.2.2019)
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A   L
VV    I   SSSSS UUUUU A   A   LLLLL

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000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y   Y   MM  MM  O   O
O   O   T   T   H   H   Y   M   M   O   O
000   T   T   H   H   Y   M   M   000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
 Output filename: C:\Users\wstevenson\AppData\Local\Civica\vh5\cbe7924d-fca9-46a8-8fc3-542674410179\f116e4e5
 Summary filename: C:\Users\wstevenson\AppData\Local\Civica\vh5\cbe7924d-fca9-46a8-8fc3-542674410179\f116e4e5

DATE: 03-04-2025 TIME: 04:29:17

USER:

COMMENTS: _____

 ** SIMULATION : WQE 25mm 4hr CHI **

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-----
| CHICAGO STORM | IDF curve parameters: A= 458.560
| Ptotal= 25.00 mm | B= 4.699
| | C= 0.781
| | used in: INTENSITY = A / (t + B)^C
| | Duration of storm = 4.00 hrs
| | Storm time step = 5.00 min
| | Time to peak ratio = 0.33

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.56	1.00	6.77	2.00	4.31	3.00	2.07
0.08	1.65	1.08	10.39	2.08	3.92	3.08	1.99
0.17	1.76	1.17	24.03	2.17	3.61	3.17	1.92
0.25	1.88	1.25	77.76	2.25	3.34	3.25	1.85
0.33	2.03	1.33	31.02	2.33	3.12	3.33	1.79
0.42	2.20	1.42	17.08	2.42	2.92	3.42	1.73
0.50	2.41	1.50	11.77	2.50	2.76	3.50	1.68
0.58	2.68	1.58	9.02	2.58	2.61	3.58	1.63
0.67	3.02	1.67	7.34	2.67	2.48	3.67	1.58
0.75	3.47	1.75	6.21	2.75	2.36	3.75	1.54
0.83	4.11	1.83	5.40	2.83	2.25	3.83	1.50
0.92	5.09	1.92	4.79	2.92	2.16	3.92	1.46

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| CALIB |
| NASHYD ( 0203) | Area (ha)= 0.08 Curve Number (CN)= 50.0
| ID= 1 DT= 1.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.17

```

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----

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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	1.56	1.017	6.77	2.017	4.31	3.02	2.07
0.033	1.56	1.033	6.77	2.033	4.31	3.03	2.07
0.050	1.56	1.050	6.77	2.050	4.31	3.05	2.07
0.067	1.56	1.067	6.77	2.067	4.31	3.07	2.07
0.083	1.56	1.083	6.77	2.083	4.31	3.08	2.07
0.100	1.65	1.100	10.39	2.100	3.92	3.10	1.99

0.017	1.56	1.017	6.77	2.017	4.31	3.02	2.07
0.033	1.56	1.033	6.77	2.033	4.31	3.03	2.07
0.050	1.56	1.050	6.77	2.050	4.31	3.05	2.07
0.067	1.56	1.067	6.77	2.067	4.31	3.07	2.07
0.083	1.56	1.083	6.77	2.083	4.31	3.08	2.07
0.100	1.65	1.100	10.39	2.100	3.92	3.10	1.99
0.117	1.65	1.117	10.39	2.117	3.92	3.12	1.99
0.133	1.65	1.133	10.39	2.133	3.92	3.13	1.99
0.150	1.65	1.150	10.39	2.150	3.92	3.15	1.99
0.167	1.65	1.167	10.39	2.167	3.92	3.17	1.99
0.183	1.76	1.183	24.03	2.183	3.61	3.18	1.92
0.200	1.76	1.200	24.03	2.200	3.61	3.20	1.92
0.217	1.76	1.217	24.03	2.217	3.61	3.22	1.92
0.233	1.76	1.233	24.03	2.233	3.61	3.23	1.92
0.250	1.76	1.250	24.03	2.250	3.61	3.25	1.92
0.267	1.88	1.267	77.76	2.267	3.34	3.27	1.85
0.283	1.88	1.283	77.76	2.283	3.34	3.28	1.85
0.300	1.88	1.300	77.76	2.300	3.34	3.30	1.85
0.317	1.88	1.317	77.76	2.317	3.34	3.32	1.85
0.333	1.88	1.333	77.76	2.333	3.34	3.33	1.85
0.350	2.03	1.350	31.02	2.350	3.12	3.35	1.79
0.367	2.03	1.367	31.02	2.367	3.12	3.37	1.79
0.383	2.03	1.383	31.02	2.383	3.12	3.38	1.79
0.400	2.03	1.400	31.02	2.400	3.12	3.40	1.79
0.417	2.03	1.417	31.02	2.417	3.12	3.42	1.79
0.433	2.20	1.433	17.08	2.433	2.92	3.43	1.73
0.450	2.20	1.450	17.08	2.450	2.92	3.45	1.73
0.467	2.20	1.467	17.08	2.467	2.92	3.47	1.73
0.483	2.20	1.483	17.08	2.483	2.92	3.48	1.73
0.500	2.20	1.500	17.08	2.500	2.92	3.50	1.73
0.517	2.41	1.517	11.77	2.517	2.76	3.52	1.68
0.533	2.41	1.533	11.77	2.533	2.76	3.53	1.68
0.550	2.41	1.550	11.77	2.550	2.76	3.55	1.68
0.567	2.41	1.567	11.77	2.567	2.76	3.57	1.68
0.583	2.41	1.583	11.77	2.583	2.76	3.58	1.68
0.600	2.68	1.600	9.02	2.600	2.61	3.60	1.63
0.617	2.68	1.617	9.02	2.617	2.61	3.62	1.63
0.633	2.68	1.633	9.02	2.633	2.61	3.63	1.63
0.650	2.68	1.650	9.02	2.650	2.61	3.65	1.63
0.667	2.68	1.667	9.02	2.667	2.61	3.67	1.63
0.683	3.02	1.683	7.34	2.683	2.48	3.68	1.58
0.700	3.02	1.700	7.34	2.700	2.48	3.70	1.58
0.717	3.02	1.717	7.34	2.717	2.48	3.72	1.58
0.733	3.02	1.733	7.34	2.733	2.48	3.73	1.58
0.750	3.02	1.750	7.34	2.750	2.48	3.75	1.58
0.767	3.47	1.767	6.21	2.767	2.36	3.77	1.54
0.783	3.47	1.783	6.21	2.783	2.36	3.78	1.54
0.800	3.47	1.800	6.21	2.800	2.36	3.80	1.54
0.817	3.47	1.817	6.21	2.817	2.36	3.82	1.54
0.833	3.47	1.833	6.21	2.833	2.36	3.83	1.54
0.850	4.11	1.850	5.40	2.850	2.25	3.85	1.50
0.867	4.11	1.867	5.40	2.867	2.25	3.87	1.50
0.883	4.11	1.883	5.40	2.883	2.25	3.88	1.50
0.900	4.11	1.900	5.40	2.900	2.25	3.90	1.50
0.917	4.11	1.917	5.40	2.917	2.25	3.92	1.50
0.933	5.09	1.933	4.79	2.933	2.16	3.93	1.46
0.950	5.09	1.950	4.79	2.950	2.16	3.95	1.46
0.967	5.09	1.967	4.79	2.967	2.16	3.97	1.46
0.983	5.09	1.983	4.79	2.983	2.16	3.98	1.46
1.000	5.09	2.000	4.79	3.000	2.16	4.00	1.46

Max.Eff.Inten.(mm/hr)= 77.76 2.34
over (min) 5.00 6.00
Storage Coeff. (min)= 1.70 (ii) 5.02 (ii)
Unit Hyd. Tpeak (min)= 5.00 6.00
Unit Hyd. peak (cms)= 0.40 0.21

PEAK FLOW (cms)= 0.06 0.00 *TOTALS*
TIME TO PEAK (hrs)= 1.35 1.45 0.058 (iii)
RUNOFF VOLUME (mm)= 23.00 1.46 17.61
TOTAL RAINFALL (mm)= 25.00 25.00 25.00
RUNOFF COEFFICIENT = 0.92 0.06 0.70

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 50.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.17	0.01
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	0.50	2.00
Length (m)=	34.54	20.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	1.56	1.017	6.77	2.017	4.31	3.02	2.07
0.033	1.56	1.033	6.77	2.033	4.31	3.03	2.07
0.050	1.56	1.050	6.77	2.050	4.31	3.05	2.07
0.067	1.56	1.067	6.77	2.067	4.31	3.07	2.07
0.083	1.56	1.083	6.77	2.083	4.31	3.08	2.07
0.100	1.65	1.100	10.39	2.100	3.92	3.10	1.99
0.117	1.65	1.117	10.39	2.117	3.92	3.12	1.99
0.133	1.65	1.133	10.39	2.133	3.92	3.13	1.99
0.150	1.65	1.150	10.39	2.150	3.92	3.15	1.99
0.167	1.65	1.167	10.39	2.167	3.92	3.17	1.99
0.183	1.76	1.183	24.03	2.183	3.61	3.18	1.92
0.200	1.76	1.200	24.03	2.200	3.61	3.20	1.92
0.217	1.76	1.217	24.03	2.217	3.61	3.22	1.92
0.233	1.76	1.233	24.03	2.233	3.61	3.23	1.92
0.250	1.76	1.250	24.03	2.250	3.61	3.25	1.92
0.267	1.88	1.267	77.76	2.267	3.34	3.27	1.85
0.283	1.88	1.283	77.76	2.283	3.34	3.28	1.85
0.300	1.88	1.300	77.76	2.300	3.34	3.30	1.85
0.317	1.88	1.317	77.76	2.317	3.34	3.32	1.85
0.333	1.88	1.333	77.76	2.333	3.34	3.33	1.85
0.350	2.03	1.350	31.02	2.350	3.12	3.35	1.79
0.367	2.03	1.367	31.02	2.367	3.12	3.37	1.79
0.383	2.03	1.383	31.02	2.383	3.12	3.38	1.79
0.400	2.03	1.400	31.02	2.400	3.12	3.40	1.79
0.417	2.03	1.417	31.02	2.417	3.12	3.42	1.79
0.433	2.20	1.433	17.08	2.433	2.92	3.43	1.73
0.450	2.20	1.450	17.08	2.450	2.92	3.45	1.73
0.467	2.20	1.467	17.08	2.467	2.92	3.47	1.73
0.483	2.20	1.483	17.08	2.483	2.92	3.48	1.73
0.500	2.20	1.500	17.08	2.500	2.92	3.50	1.73
0.517	2.41	1.517	11.78	2.517	2.76	3.52	1.68
0.533	2.41	1.533	11.77	2.533	2.76	3.53	1.68
0.550	2.41	1.550	11.77	2.550	2.76	3.55	1.68
0.567	2.41	1.567	11.77	2.567	2.76	3.57	1.68
0.583	2.41	1.583	11.77	2.583	2.76	3.58	1.68
0.600	2.68	1.600	9.02	2.600	2.61	3.60	1.63
0.617	2.68	1.617	9.02	2.617	2.61	3.62	1.63
0.633	2.68	1.633	9.02	2.633	2.61	3.63	1.63
0.650	2.68	1.650	9.02	2.650	2.61	3.65	1.63
0.667	2.68	1.667	9.02	2.667	2.61	3.67	1.63
0.683	3.02	1.683	7.34	2.683	2.48	3.68	1.58
0.700	3.02	1.700	7.34	2.700	2.48	3.70	1.58
0.717	3.02	1.717	7.34	2.717	2.48	3.72	1.58
0.733	3.02	1.733	7.34	2.733	2.48	3.73	1.58
0.750	3.02	1.750	7.34	2.750	2.48	3.75	1.58
0.767	3.47	1.767	6.21	2.767	2.36	3.77	1.54
0.783	3.47	1.783	6.21	2.783	2.36	3.78	1.54
0.800	3.47	1.800	6.21	2.800	2.36	3.80	1.54
0.817	3.47	1.817	6.21	2.817	2.36	3.82	1.54
0.833	3.47	1.833	6.21	2.833	2.36	3.83	1.54
0.850	4.11	1.850	5.40	2.850	2.25	3.85	1.50
0.867	4.11	1.867	5.40	2.867	2.25	3.87	1.50
0.883	4.11	1.883	5.40	2.883	2.25	3.88	1.50
0.900	4.11	1.900	5.40	2.900	2.25	3.90	1.50
0.917	4.11	1.917	5.40	2.917	2.25	3.92	1.50
0.933	5.09	1.933	4.79	2.933	2.16	3.93	1.46
0.950	5.09	1.950	4.79	2.950	2.16	3.95	1.46
0.967	5.09	1.967	4.79	2.967	2.16	3.97	1.46
0.983	5.09	1.983	4.79	2.983	2.16	3.98	1.46
1.000	5.09	2.000	4.79	3.000	2.16	4.00	1.46

Max.Eff.Inten.(mm/hr)=	77.76	2.34
over (min)	5.00	4.00
Storage Coeff. (min)=	1.84 (ii)	3.28 (ii)
Unit Hyd. Tpeak (min)=	5.00	4.00
Unit Hyd. peak (cms)=	0.39	0.32

TOTALS
0.031 (iii)
1.35

PEAK FLOW (cms)=	0.03	0.00
TIME TO PEAK (hrs)=	1.35	1.38

RUNOFF VOLUME (mm)= 23.00 1.46 22.13
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.92 0.06 0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 50.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 CHAMBER(0003) | OUTFLOW: ON, UNDERDRAIN: OFF, INFIL: ON
 IN= 2--> OUT= 3 | CHAMBER:
 DT= 1.0 min | MAX STO VOL (cu.m.)= 46.13 Bottom Area(m2) = 120.75

DEPTH (mm)	STORAGE (cu.m.)	DEPTH (mm)	STORAGE (cu.m.)
0.00	0.00	381.00	27.41
25.00	1.23	406.00	29.37
51.00	2.45	432.00	31.26
76.00	3.68	457.00	33.05
102.00	4.91	483.00	34.71
127.00	6.13	508.00	36.15
152.00	7.36	533.00	37.50
178.00	9.73	559.00	38.77
203.00	12.08	584.00	40.00
229.00	14.40	610.00	41.22
254.00	16.68	635.00	42.45
279.00	18.93	660.00	43.68
305.00	21.12	686.00	44.90
330.00	23.27	711.00	46.13
356.00	25.37	0.00	0.00

DEPTH (m)	DISCHARGE (cms)	DEPTH (m)	DISCHARGE (cms)
0.000	0.000	0.559	0.030
0.279	0.010	0.762	0.040
0.406	0.020	1.300	0.050

NATIVE SOIL LAYER:
 Infiltration (m/hr) = 0.0120

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW:ID= 2	0.18	0.031	1.35	22.13
OUTFLOW:ID= 1	0.00	0.000	0.00	0.00
OVERFLOW:ID= 3	0.00	0.000	0.00	0.00

Volume Reduction Rate[(RVin-RVout)/RVin](%)= 100.00
 Time to reach Max storage (Hr)= 4.05
 Volume of water for drawdown in LID (cu.m.)= 34.92
 Volume of maximum water storage (cu.m.)= 34.97
 Calculated Drawdown Time (Hr)= 24.10

Junction Command(0004)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 3(0003)	0.00	0.00	0.00	0.00
OUTFLOW: ID= 2(0004)	0.00	0.00	0.00	0.00

Junction Command(0021)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 1(0003)	0.00	0.00	0.00	0.00
OUTFLOW: ID= 2(0021)	0.00	0.00	0.00	0.00

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ADD HYD (0020)				
1 + 2 = 3				
ID1= 1 (0201):	0.41	0.058	1.35	17.61
+ ID2= 2 (0203):	0.08	0.000	1.58	1.45

=====

ID = 3 (0020):	0.49	0.058	1.35	15.09
-----------------	------	-------	------	-------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0020)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0021 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0001 = HYDROGRAPH 0003

ID1= 3 (0020):	0.49	0.058	1.35	15.09
+ ID2= 2 (0021):	0.00	0.000	0.00	0.00

=====

ID = 1 (0020):	0.49	0.058	1.35	15.09
-----------------	------	-------	------	-------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0020)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)

*** W A R N I N G : HYDROGRAPH 0004 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001

ID1= 1 (0020):	0.49	0.058	1.35	15.09
+ ID2= 2 (0004):	0.00	0.000	0.00	0.00

=====

ID = 3 (0020):	0.49	0.058	1.35	15.09
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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

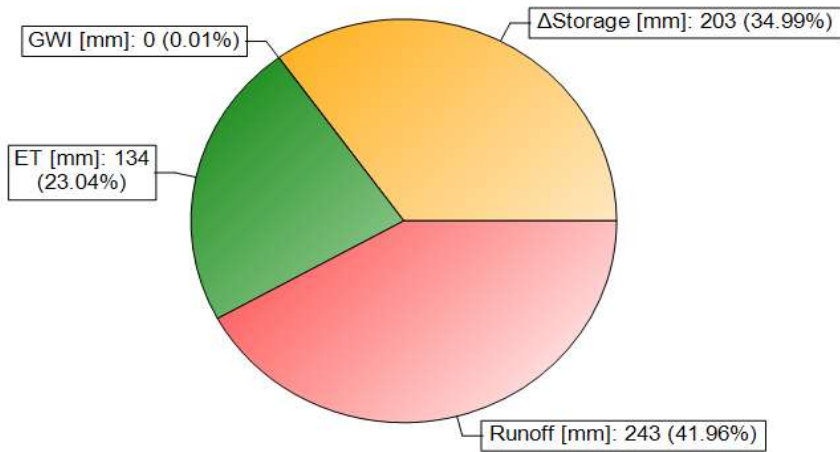
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OTTHYMO Continuous Simulation Modelling - 60 Dean Avenue

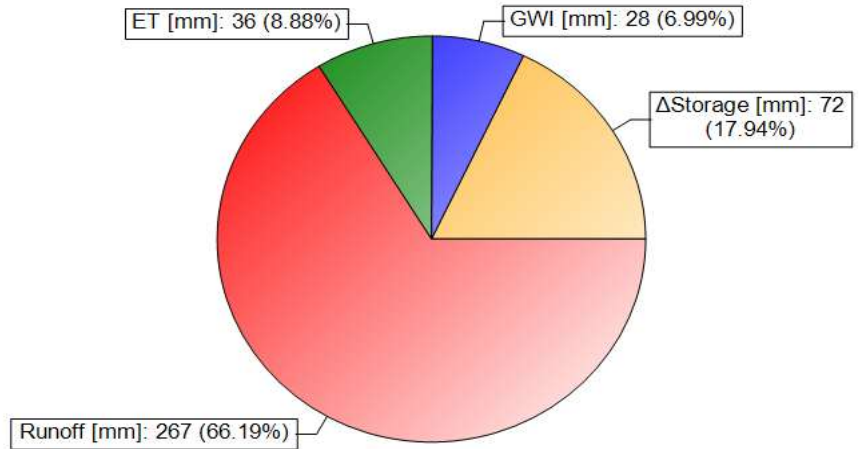
Addhyd 6 - Water Balance Output

Period	Precipitation (mm)	Rain (mm)	Snow (mm)	Snowmelt (mm)	ET (mm)	INFIL (mm)	GWI (mm)	Runoff (mm)	Δ Storage	Runoff Coef
2005	580.2	489.5	90.7	51.5	133.7	205.3	0.1	243.4	203.0	0.4
2006	404.1	241.8	162.3	367.5	35.9	156.2	28.3	267.5	72.5	0.7
Avg	492.2	365.6	126.5	209.5	84.8	180.8	14.2	255.5	137.8	0.5
Total	984.3	731.3	253.0	419.0	169.5	361.6	28.3	510.9	275.5	-

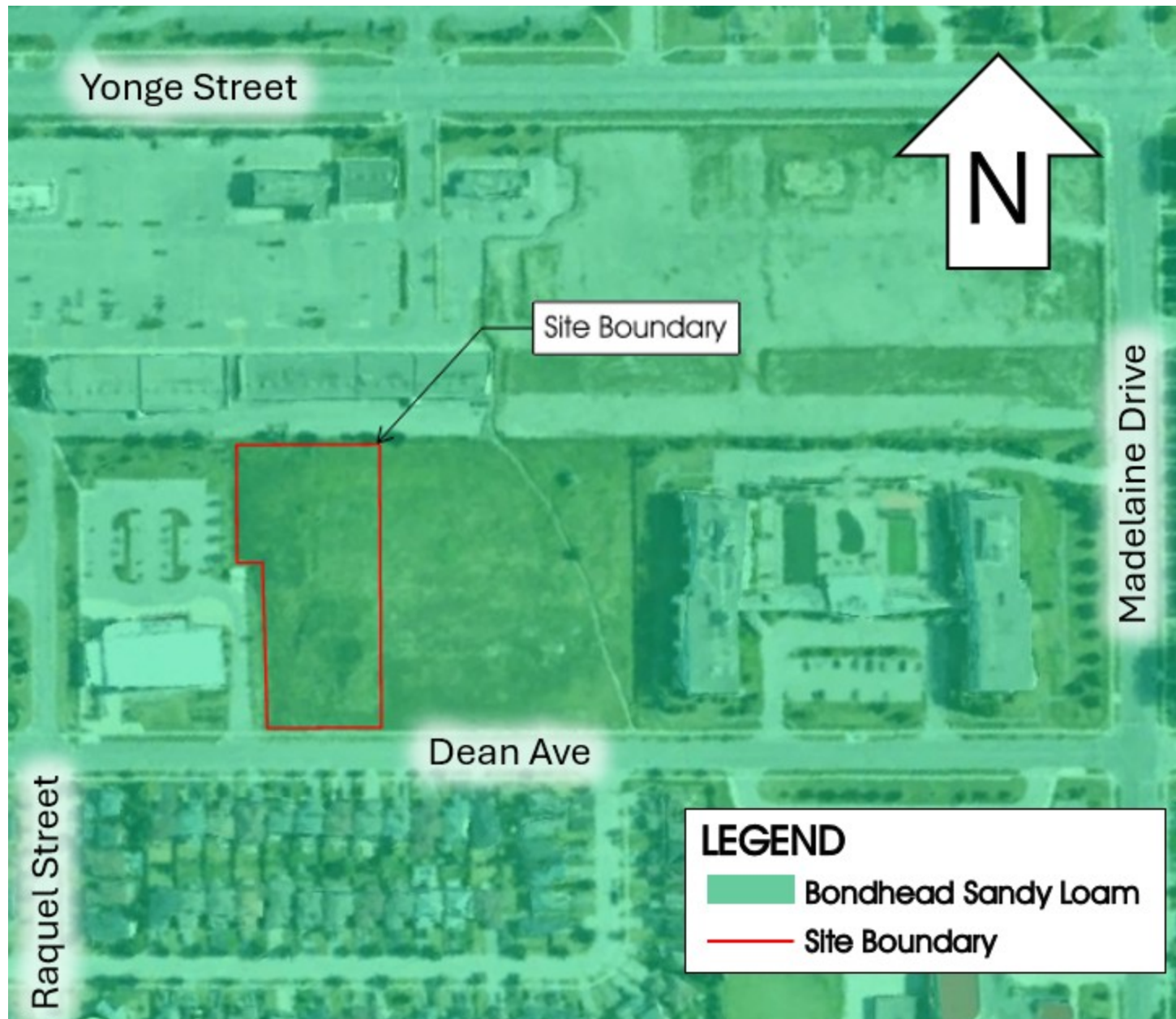
Water Balance
2005



Water Balance
2006



60 Dean Avenue Soil Map



PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



PRA-24067

BARRIE, ON, CANADA

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 50 mm (2").
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 80 mm (3") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

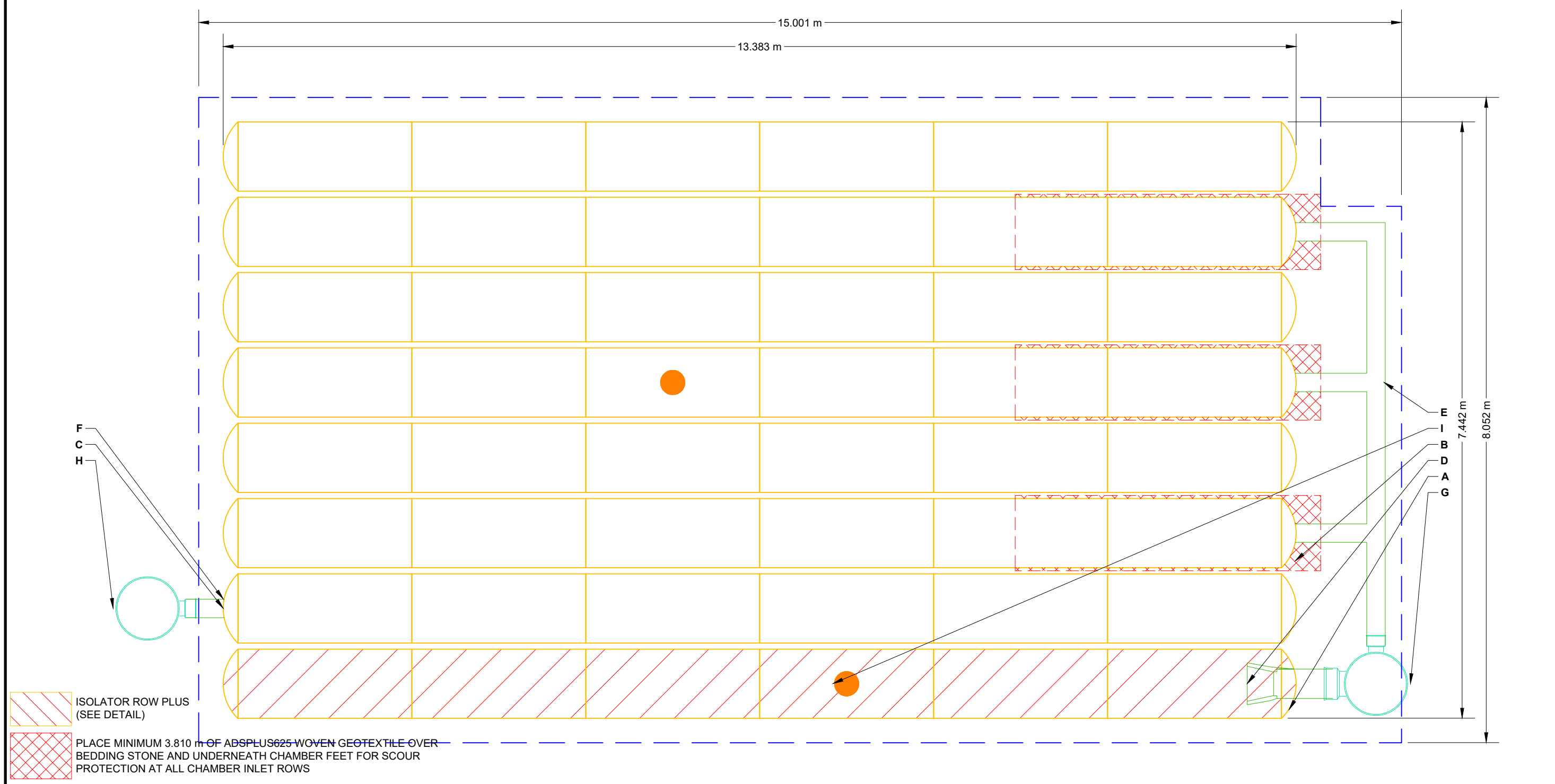
NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRE LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS:		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
48	STORMTECH SC-310 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	2.997					
16	STORMTECH SC-310 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.118					
152	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	0.965	PREFABRICATED EZ END CAP	A	300 mm BOTTOM PREFABRICATED EZ END CAP, PART#: SC310ECEZ / TYP OF ALL 300 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	23 mm	
152	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	0.965					
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	0.965	PRE-CORED END CAP	B	200 mm TOP PRE-CORED END CAP, PART#: SC310EPE08TPC / TYP OF ALL 200 mm TOP CONNECTIONS	89 mm	
46.0	INSTALLED SYSTEM VOLUME (m³) BELOW ELEVATION 0.711 (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	0.711	PRE-CORED END CAP	C	200 mm BOTTOM PRE-CORED END CAP, PART#: SC310EPE08BPC / TYP OF ALL 200 mm BOTTOM CONNECTIONS	15 mm	
		TOP OF SC-310 CHAMBER:	0.559					
		200 mm x 200 mm TOP MANIFOLD INVERT:	0.241	FLAMP	D	INSTALL FLAMP ON 300 mm ACCESS PIPE / PART#: SC31012RAMP		
		300 mm ISOLATOR ROW PLUS INVERT:	0.175	MANIFOLD	E	200 mm x 200 mm TOP MANIFOLD, MOLDED FITTINGS	89 mm	
119.4	SYSTEM AREA (m²)	200 mm BOTTOM CONNECTION INVERT:	0.168	PIPE CONNECTION	F	200 mm BOTTOM CONNECTION	15 mm	
46.1	SYSTEM PERIMETER (m)	BOTTOM OF SC-310 CHAMBER:	0.152	NYLOPLAST (INLET W/ ISO PLUS ROW)	G	750 mm DIAMETER (610 mm SUMP MIN)		65 L/s IN
		BOTTOM OF STONE:	0.000	NYLOPLAST (OUTLET)	H	750 mm DIAMETER (DESIGN BY ENGINEER)		20 L/s OUT
				INSPECTION PORT	I	100 mm SEE DETAIL (TYP 2 PLACES)		



NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

PRA-24067

BARRIE, ON, CANADA

DATE: 03/04/2025

PROJECT #:

DATE: 03/04/2025

DRW: WS

CHK:

DESCRIPTION:

DRAWN: WS

CHECKED: N/A

StormTech®
Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 50

SHEET

2 OF 6

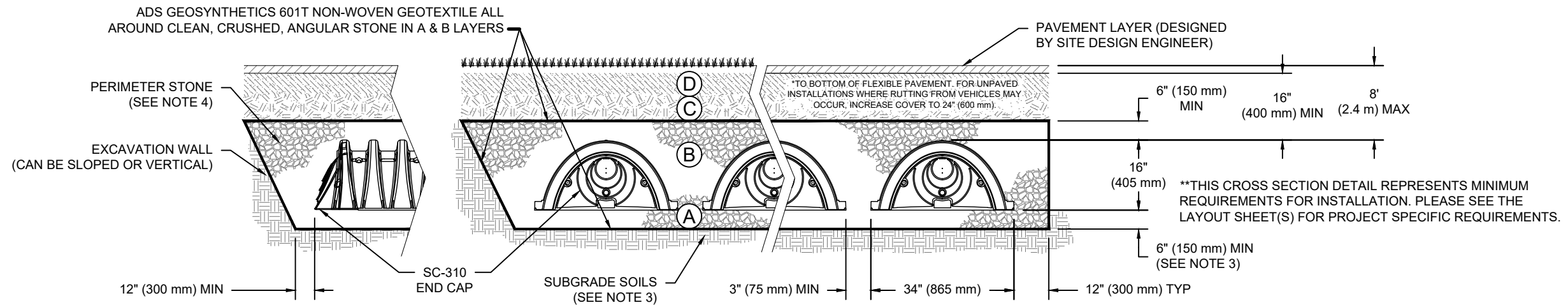
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD (EOR) OR OTHER PROJECT REPRESENTATIVE. THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO BIDDING AND/OR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ⁵	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ⁵	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

PLEASE NOTE:

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
- WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

PRA-24067

BARRIE, ON, CANADA

DATE: 03/04/2025

PROJECT #:

CHK

DATE

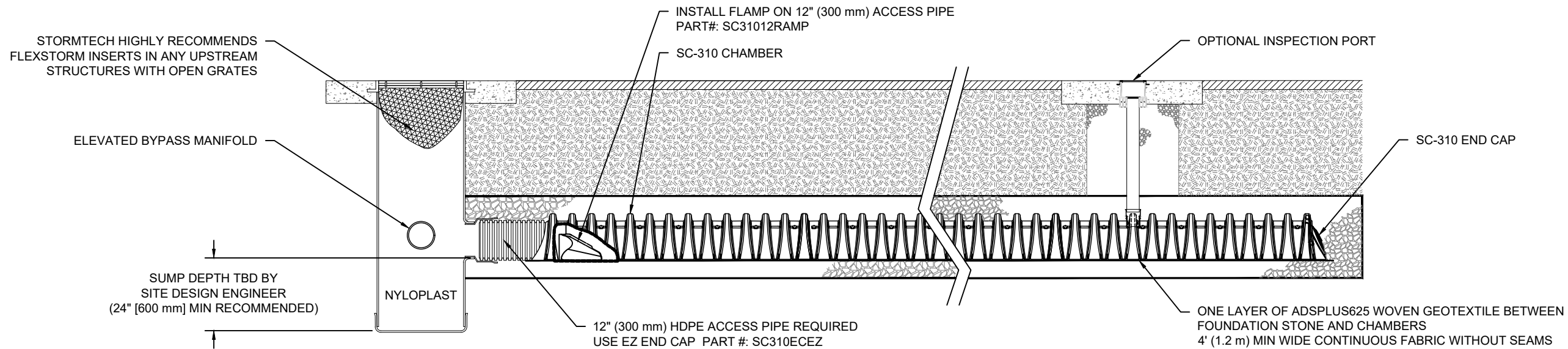
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StormTech®
Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
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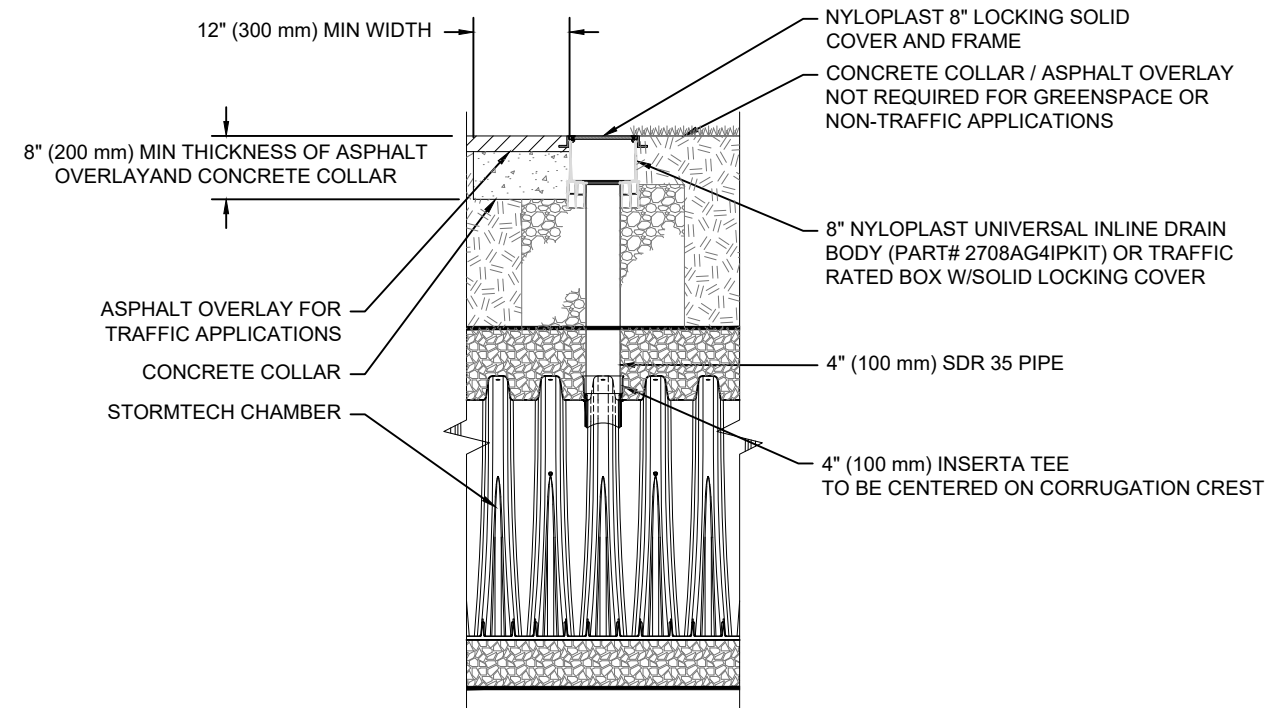
SC-310 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR PLUS ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



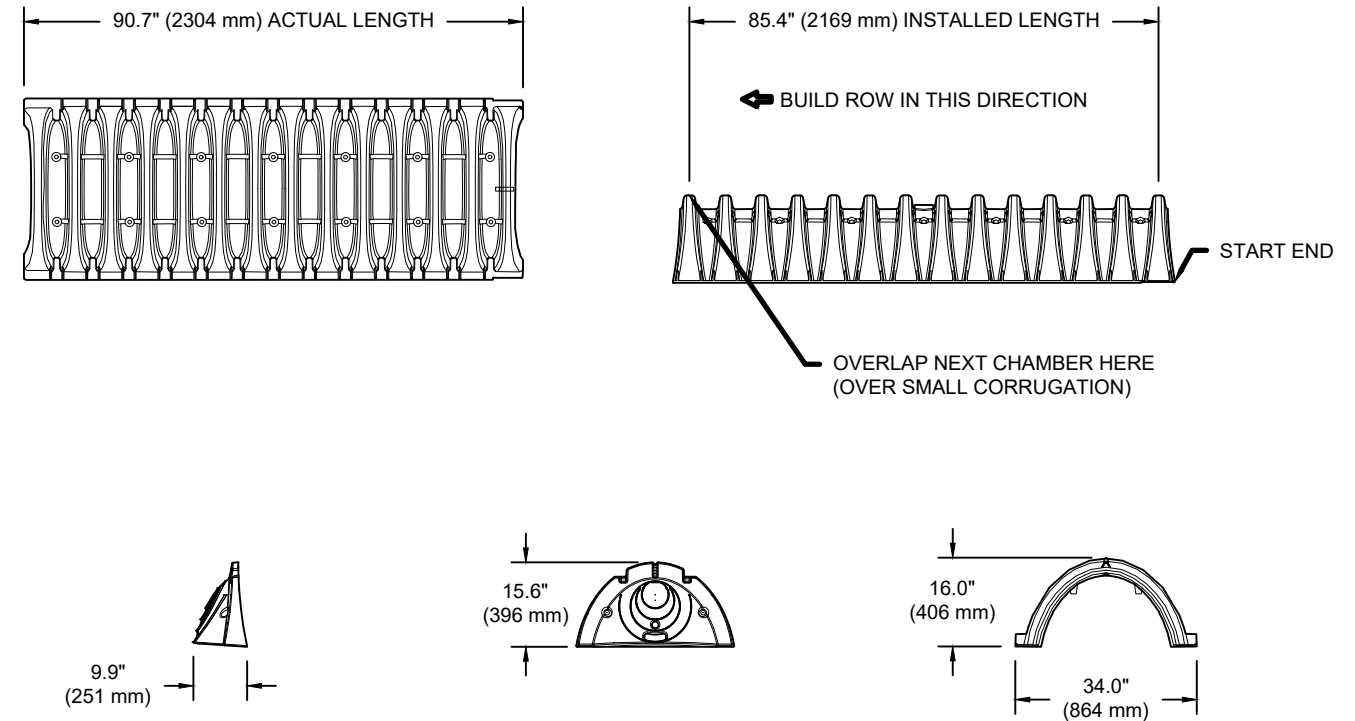
NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)
NTS

<p>PRA-24067</p> <p>BARRIE, ON, CANADA</p>	<p>DATE: 03/04/2025</p> <p>PROJECT #:</p>	<p>DRAWN: WS</p> <p>CHECKED: N/A</p>	<p>DESCRIPTION</p> <p>CHK</p> <p>DRW</p> <p>DATE</p>
<p>StormTech® Chamber System</p> <p>1-800-821-6710 WWW.STORMTECH.COM</p>			
<p>4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473</p>			
<p>THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD (EOR) OR OTHER PROJECT REPRESENTATIVE. THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.</p>			
<p>SHEET 4 OF 6</p>			

SC-310 TECHNICAL SPECIFICATION

NTS

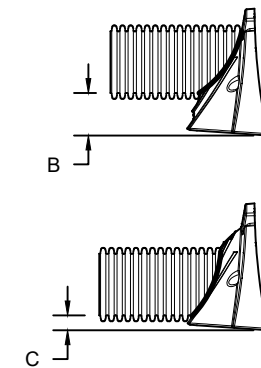


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m ³)
MINIMUM INSTALLED STORAGE*	29.3 CUBIC FEET	(0.83 m ³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND 3" (75 mm) BETWEEN CHAMBERS

PART #	STUB	B	C
SC310EPE06TPC	6" (150 mm)	5.8" (147 mm)	---
SC310EPE06BPC		---	0.5" (13 mm)
SC310EPE08TPC	8" (200 mm)	3.5" (89 mm)	---
SC310EPE08BPC		---	0.6" (15 mm)
SC310EPE10TPC	10" (250 mm)	1.4" (36 mm)	---
SC310EPE10BPC		---	0.7" (18 mm)
SC310ECEZ*	12" (300 mm)	---	0.9" (23 mm)



ALL STUBS, EXCEPT FOR THE SC310ECEZ ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310ECEZ THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL; PRE-CORED END CAPS END WITH "PC"

PRA-24067

BARRIE, ON, CANADA

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StormTech®
Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

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HILLIARD, OH 43026
1-800-733-7473



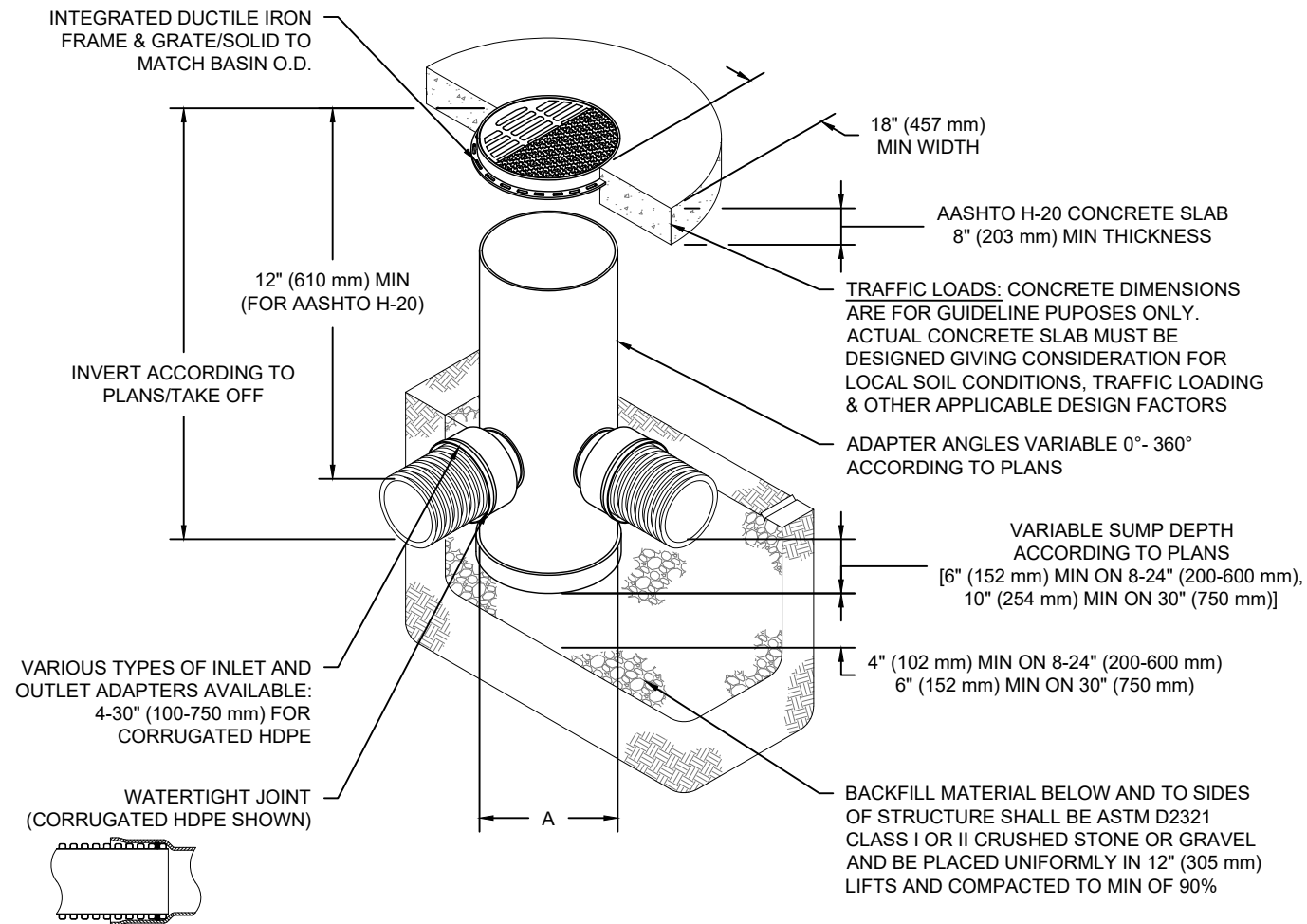
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SHEET

5 OF 6

NYLOPLAST DRAIN BASIN

NTS



NOTES

- 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: WWW.NYLOPLAST-US.COM
- TO ORDER CALL: 800-821-6710

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

PRA-24067

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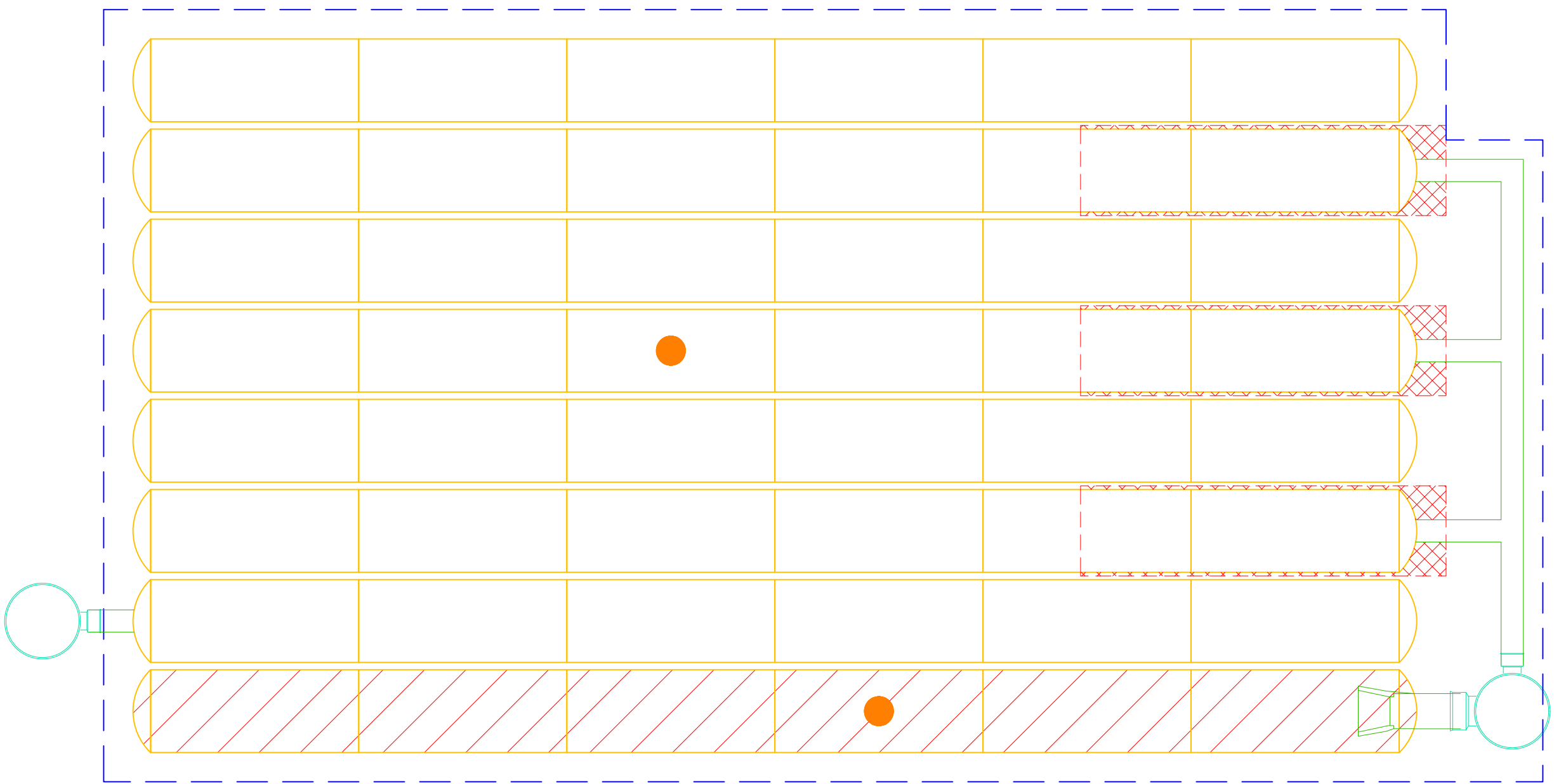
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Project DEVELOPMENT Summary

DEVELOPMENT: PRA-24067 - 60 Dean Ave

Subwatershed: Lovers Creek

Total Pre-Development Area (ha):	0.667	Total Pre-Development Phosphorus Load (kg/yr):	0.11
----------------------------------	--------------	--	-------------

Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)		P Load (kg/yr)
Sod Farm / Golf Course	0.667	0.17		0.11

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)
High Intensity - Comm/Industrial	0.487	1.82	Wet Detention Ponds	63% 0.33

The remainder of the site flows to the nearby existing Wet Detention Pond

High Intensity - Residential	0.18	1.32	Treatment Train Approach	72% 0.07
------------------------------	------	------	--------------------------	-------------

Part of the site flows into an Infiltration Gallery, which then flows into the nearby existing Wet Detention Pond.

Post-Development Area Altered:	0.67		P Load (kg/yr)
Total Pre-Development Area:	0.67		

Unaffected Area: **0**

Pre-Development:	0.11
Post-Development:	1.12
Change (Pre - Post):	-1.01

891% Net Increase in Load

Post-Development (with BMPs):	0.39
Change (Pre - Post):	-0.28

247.89% Net Increase in Load

DEVELOPMENT: PRA-24067 - 60 Dean Ave

Subwatershed: Lovers Creek

CONSTRUCTION PHASE LOAD

	P Load (kg/yr)
SUMMARY WITH IMPLEMENTATION OF BMPs	
Pre-Development:	0.11
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	0.39
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	-0.28
Conclusion:	248% Increase 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:	
Not approve development as site specific appropriate	

Pre-to-Post Development Water Balance

March 2025

MONTHLY AND YEARLY WATER BALANCE COMPONENTS (POST-DEVELOPMENT CONDITION)														
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Potential Evapotranspiration Calculation	Average Temperature: T (°C)	-7.7	-6.6	-2.1	5.6	12.3	17.9	20.8	19.7	15.3	8.7	2.7	-3.5	6.9
	Heat Index: $i=(T/5)^{1.514}$	0.00	0.00	0.00	1.19	3.91	6.90	8.66	7.97	5.44	2.31	0.39	0.00	36.8
	Unadjusted Daily Potential Evapotranspiration: U (mm)	0.0	0.0	0.0	25.2	59.0	88.5	104.1	98.1	74.7	40.6	11.5	0.0	501.7
	Adjusted Potential Evapotranspiration - PET (mm)	0.0	0.0	0.0	28.5	74.9	113.3	135.3	117.8	77.7	38.1	9.2	0.0	594.8
Pervious Components	Precipitation: P (mm)													914
	Adjusted Potential Evapotranspiration: PET (mm)													571
	P - PET													343
	Change in Soil Moisture Storage (mm)													-
	Water Holding Capacity (max. 75 mm)													-
	Water Surplus Available for Infiltration or Runoff													343
Impervious Components	Precipitation: P (mm)													914.0
	Potential Evaporation: PE (mm), Assume 15%													137.1
	Potential Surface Water Runoff: P - PE (mm)													776.9

Notes

1. Both potential infiltration and surface water runoff are independent of temperature
2. Assumption is in January maximum soil moisture storage value is present (75 mm)
3. Water Holding Capacity & Infiltration Factors taken from Table 3.1 of MOE SWMPDM, 2003
4. Average Temp. and Precip. taken from Environment Canada station Barrie WPCC (6110557) and Lake Simcoe Climate Data (LSRCA, 2017)
5. Adjusting Factor for U based on Lorente, 1961

Pre-to-Post Development Water Balance

PRE- AND POST-DEVELOPMENT WATER BALANCE (WITHOUT MITIGATION)									
		Total Land Area (m ²)	Impervious Factor	Pervious Area (m ²)	Impervious Area (m ²)	Infiltration Factor	Runoff Factor	Infiltration (m ³ /year)	Runoff (m ³ /year)
Existing Land Use (Pre-Development)	Vacant Land	6670	0%	6670	0	0.45	0.55	1030	1258
	TOTAL	6,670	0%	6,670	0	0.45	0.55	1,030	1,258
Proposed Land Use (Post-Development No Mitigation)	Proposed 6 storey	1710	100%	0	1710	0.45	0.55	0	1328
	landscaped	2794	0%	2794	0	0.45	0.55	431	527
	Parking + ROW	2166	100%	0	2166	0.45	0.55	0	1683
	TOTAL	6,670	58%	2,794	3,876	0.45	0.55	431	3,538

SUMMARY				
	Infiltration		Runoff	
	m ³ /year	%	m ³ /year	%
Pre-to-Post Change Without Mitigation	-598	-58	+ 2280	+ 181
Required to Meet Pre-Development Conditions	+ 598	-	-2,280	-

Notes

1. Both potential infiltration and surface water runoff are independent of temperature
2. Assumption is in January maximum soil moisture storage value is present (75 mm)
3. Water Holding Capacity & Infiltration Factors taken from Table 3.1 of MOE SWMPDM, 2003
4. Average Temp. and Precip. taken from Environment Canada station Barrie WPCC (6110557) and Lake Simcoe Climate Data (LSRCA, 2017)
5. Adjusting Factor for U based on Lorente, 1961



Appendix D

Engineering Drawings

(Reduced, NTS)

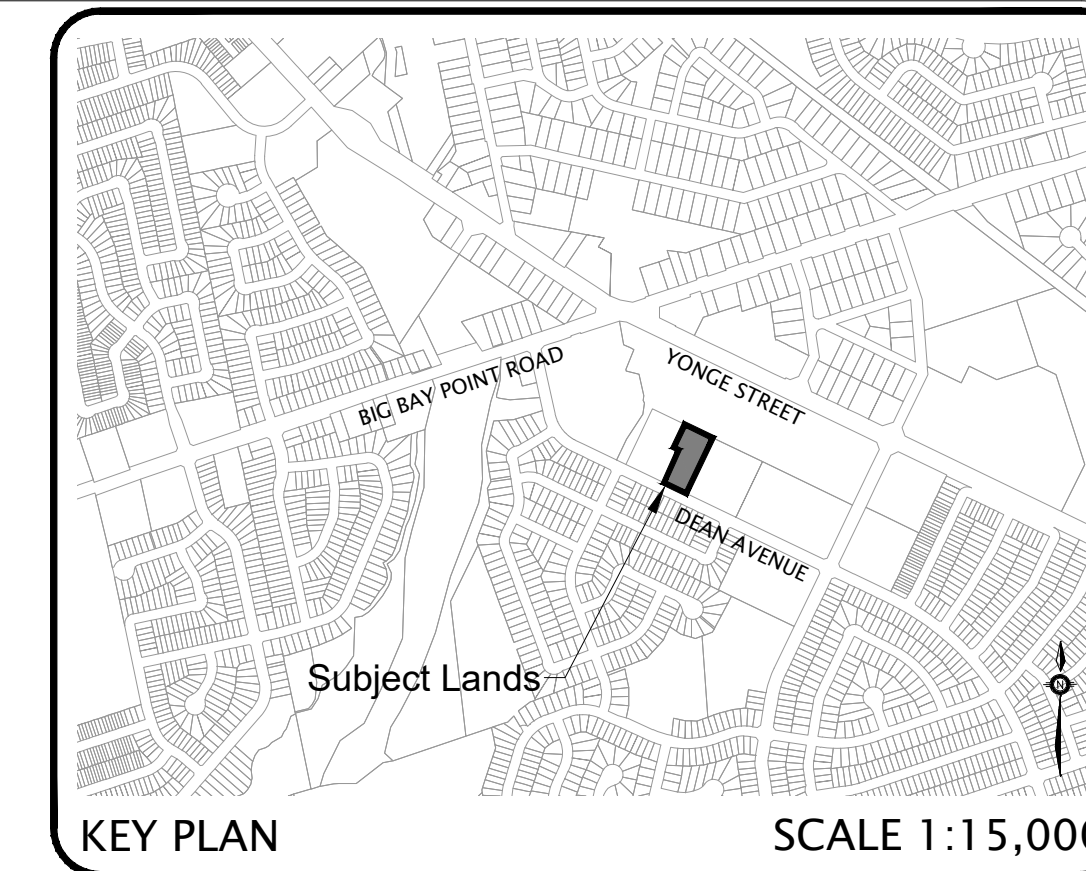
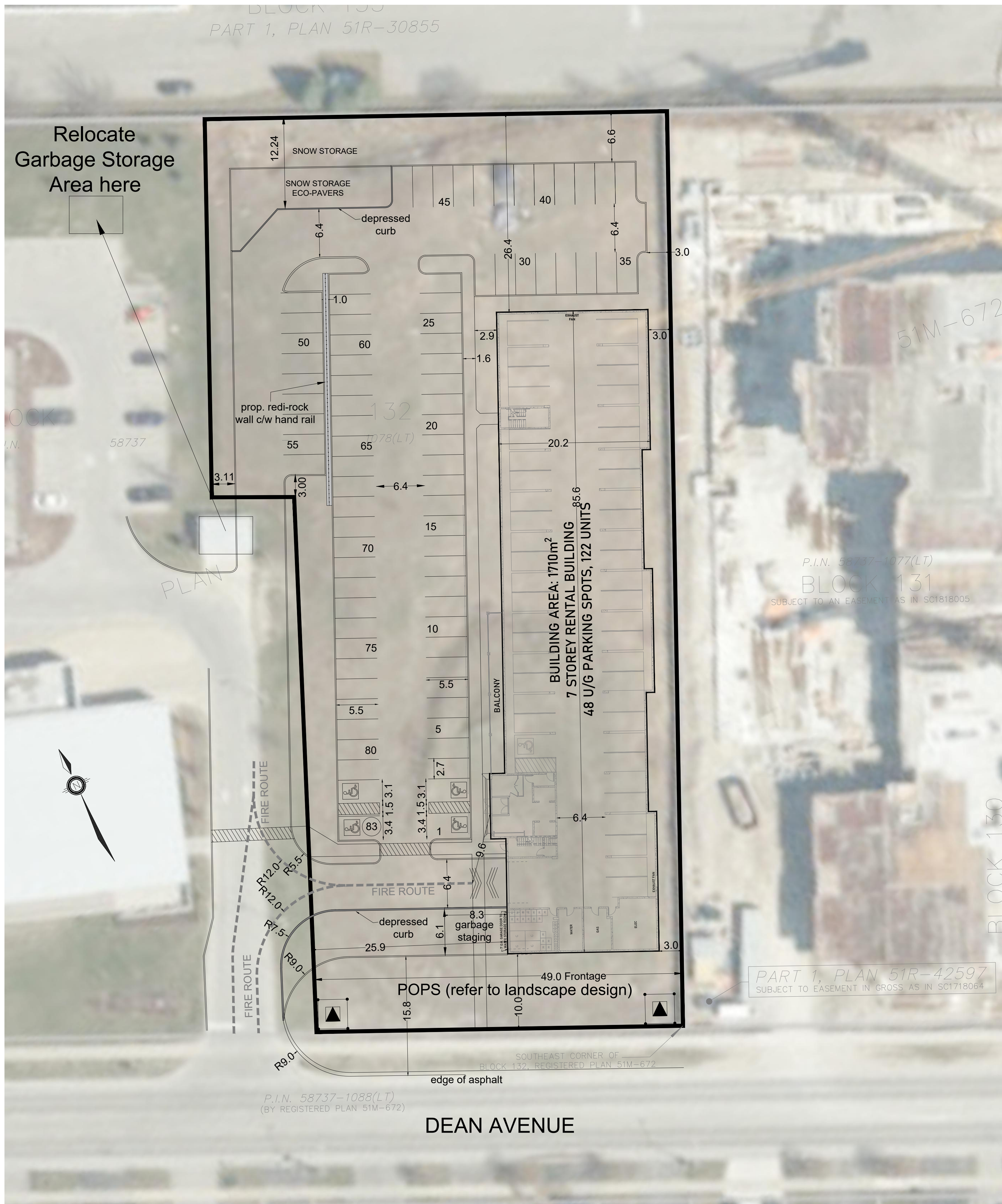
Drawings by TJCG:

- 60 Dean Avenue Site Plan by The Jones Consulting Group Ltd. (Planning), dated February 27, 2025
- TITLE: Title Page
- GN-1: General Notes
- ESC-1: Erosion and Sediment Control Plan
- ESC-2: Erosion and Sediment Control Plan Details
- SG-1: Site Grading Plan
- GS-1: General Servicing Plan
- SWM-1: Stormwater Management Plan Pre-Development Conditions
- SWM-2: Stormwater Management Plan Post-Development Conditions
- LID-1: LID Infiltration Gallery Plan View
- LID-2: LID Infiltration Gallery Sections
- STM-1: Storm Sewer Subcatchment Plan
- SAN-1: Sanitary Drainage Area Plan
- DS-1: Sanitary and Storm Sewer Design Sheets
- PM-1: Pavement Marking and Signage Plan
- CUP-1: Composite Utility Plan
- DET-1: Standard Details
- DET-2: Standard Details
- DET-3: Standard Details

Drawings by RG Robinson and Associates (Barrie) Ltd.:

- G-2 – Barrie Heritage Subdivision General Servicing Plan 2 of 2
- G-4 – Barrie Heritage Subdivision Sanitary Drainage Plan 2 of 2
- G-6 - Barrie Heritage Subdivision Storm Drainage Plan 2 of 2
- P-19 - Barrie Heritage Subdivision Plan and Profile Dean Street

G:\Planning Drawings\PRA-24067-CP-9K.dwg Layout:CP Plotted Feb 27, 2025 @ 8:31am by marichards The Jones Consulting Group Ltd.



Site Plan
60 Dean Avenue
Part of Lot 13
Concession 12

City of Barrie
 2025

SITE PLAN STATISTICS
 Zone Provision for Residential (Apartment) Zone (Bill No. 051)
 (RA2-1)(SP-658)(H-164)

Subject Lands - 6670 m² (PART 2)
 7 Storey Apartment Building - 122 units
 1712 m² - footprint
 8,809 m² - GFA

	REQUIRED	PROVIDED
Lot Area	1300 m ²	6670 m ²
Lot Frontage (min.)	30.0 m	49.0 m
Front Yard (min.)	9.0 m	10.0 m
Interior Side Yard (min.)	3.0 m	3.0 m
Rear Yard	3.0 m	26.4 m
Lot Coverage (max.)	57% / 3802 m ²	26% / 1712 m ²
Gross Floor Area (min.)	209% / 13940 m ²	132% / 8,809 m ² *
Height (max.)	36.0 m	21.8 m
Parking Coverage (max.)	35% / 2335 m ²	35% / 2317 m ²
Landscape Buffer	3.0 m	3.0 m
Landscape Open Space (min.)	35% / 2335 m ²	32% / 2166 m ² *
Angular Plane	45 degree	Please refer to inset #1

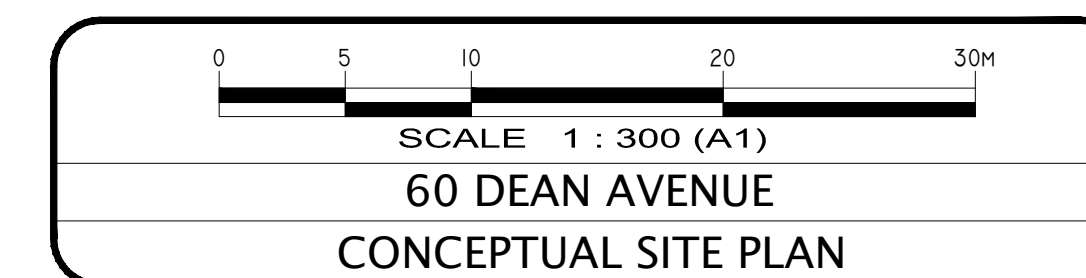
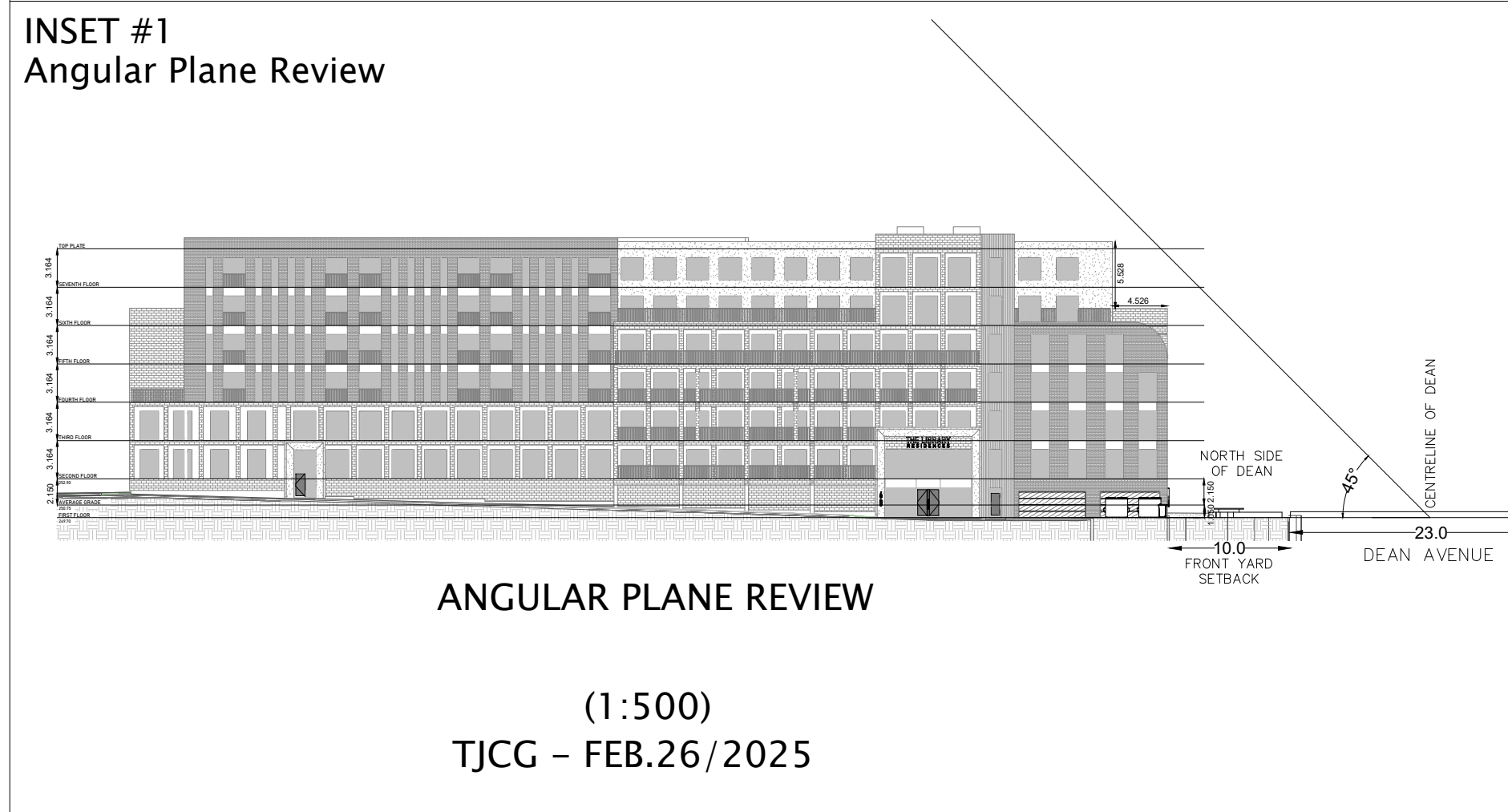
Parking Details	98 spaces (0.8/unit)	131 spaces (1.07/unit)
Apartment		

- Parking Provision Breakdown**
- Typical Street Level Spaces - 79
 - Barrier Free Spaces - 5 (1 underground)
 - Underground Typical Spaces - 47
 - Total - 131 Spaces

Barrier Free 4 spaces 5 spaces

Fire Route - - - - -

Notes
 - * This symbol indicates a minor variance is required.



	Date Issued:	FEB. 27, 2025
	Checked By:	RD
	Project No.:	PRA-24067
	Drawn By:	m.c.r.
	Drawing Name:	PRA-24067-CP-9K.dwg

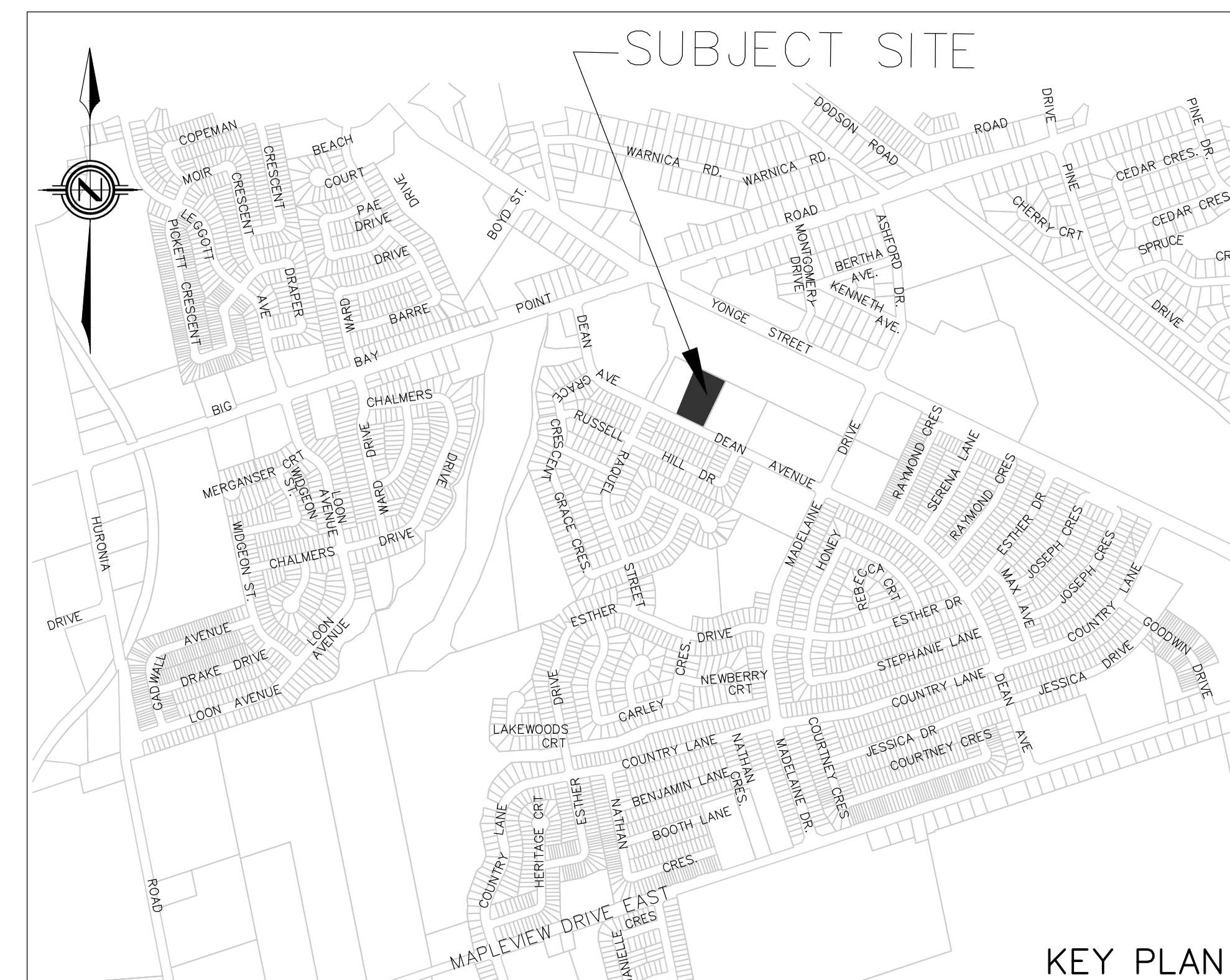
JONES CONSULTING GROUP LTD.
 PLANNERS & ENGINEERS
 229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0W5
 Phone: 705-734-2533 Fax: 705-734-1096
 www.jonesconsulting.com

60 DEAN AVENUE
CITY OF BARRIE

60 DEAN AVENUE NESTWISE INC. CITY OF BARRIE COUNTY OF SIMCOE

DRAWING LEGEND

TITLE	TITLE PAGE
GN-1	GENERAL NOTES
ESC-1	EROSION AND SEDIMENT CONTROL PLAN
ESC-2	EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS
SG-1	SITE GRADING PLAN
GS-1	GENERAL SERVICING PLAN
SWM-1	STORMWATER MANAGEMENT PLAN PRE-DEVELOPMENT CONDITIONS
SWM-2	STORMWATER MANAGEMENT PLAN POST-DEVELOPMENT CONDITIONS
LID-1	LID INFILTRATION GALLERY PLAN VIEW
LID-2	LID INFILTRATION GALLERY SECTIONS
STM-1	STORM SEWER SUBCATCHMENT PLAN
SAN-1	SANITARY DRAINAGE AREA PLAN
DS-1	SANITARY AND STORM SEWER DESIGN SHEETS
PM-1	PAVEMENT MARKING AND SIGNAGE PLAN
CUP-1	COMPOSITE UTILITY PLAN
DET-1	STANDARD DETAILS
DET-2	STANDARD DETAILS
DET-3	STANDARD DETAILS



MUNICIPALITY:

CITY OF BARRIE
70 COLLIER STREET (BOX 400)
BARRIE, ON L4M 4T5
PH 705.726.4242
FAX 705.739.4243

CLIENT:

NESTWISE INC.
35 WORSLEY STREET
BARRIE, ON L4M 1L7

DEVELOPER'S ENGINEER:



229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

GENERAL NOTES

1. DRAWINGS

A. ALL DRAWINGS SHALL BE PRODUCED IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARDS & SYMBOLS FOR PLAN & PROFILE DRAWINGS, GENERAL SERVICE PLANS AND LOT GRADING PLANS.

2. MEASUREMENTS

A. ALL DIMENSIONS ARE IN METRES, EXCEPT PIPE DIAMETERS, WHICH ARE IN MILLIMETRES, UNLESS SPECIFIED OTHERWISE.

3. GENERAL

A. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF BARRIE STANDARD DRAWINGS (BSD) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).

B. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY CITY OF BARRIE STANDARD DRAWINGS (BSD) AND SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).

C. LOCATION OF EXISTING SERVICES ARE NOT GUARANTEED. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.

D. A ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE ROADS AND PARKS OPERATIONS BRANCH PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT-OF-WAY.

E. A SITE ALTERATION PERMIT IS REQUIRED FROM THE ENGINEERING DEPARTMENT PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT-OF-WAY.

F. NATIVE MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO 90% STANDARD PROCTOR MAXIMUM DRY DENSITY.

G. GRANULAR MATERIAL, USED FOR BACKFILL, SHALL BE PLACED IN LAYERS 150mm IN DEPTH MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY.

H. ALL DISTURBED AREAS ARE TO BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER, AS DETERMINED BY THE CITY ENGINEERING DEPARTMENT.

I. ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION OF CONCRETE AND THE GRASS HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE CITY ENGINEERING DEPARTMENT.

	Development General Notes	REV No.	DATE: APR 2023
		5	SCALE: N.T.S.
		G200B	

GENERAL NOTES

SANITARY SEWERS

A. SANITARY SEWER TO BE LOCATED AT THE CENTRELINE OF THE ROAD.

B. SEWERS SHALL BE CONSTRUCTED WITH BEDDINGS AS PER OPSD-105.02, (GRAN. A' EMBEDMENT MATERIAL FOR FLEXIBLE PIPES AND OPSD-105.03 CLASS B (GRAN. A') FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF MUNICIPAL WORKS.

C. MAXIMUM DEFLECTION FROM COMBINED LIVE AND DEAD LOADING SHALL NOT EXCEED ANY C.S.A., O.P.S. OR MANUFACTURERS RECOMMENDED SPECIFICATIONS.

D. PVC, CONCRETE AND PROFILE WALL PVC SEWERS SHALL HAVE RUBBER GASKET TYPE JOINTS AND SHALL BE CERTIFIED TO CONFORM TO ALL APPLICABLE CURRENT C.S.A. SPECIFICATIONS.

E. CONCRETE SANITARY SEWERS SHALL HAVE A MINIMUM STRENGTH OF 50 N/mm² CONFORMING TO CSA STANDARD A237.2-1982, CLASS 50.0 (PREVIOUSLY C.S.A. STANDARD A237.2-1974, CLASS II).

F. MAINTENANCE HOLE TOPS (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WHEN THE TOP LIFT OF ASPHALT IS PLACED. ALL ADJUSTMENT WILL BE ACCORDANCE WITH BSD-42.

G. ALL CONNECTIONS TO NEW SANITARY MAINS SHALL BE PREMANUFACTURED, FABRICATED TEES, CONNECTIONS TO EXISTING SANITARY SEWER SHALL BE MADE WITH APPROVED FACTORY MADE TEES OR INSERTA-TEES IN STRICT ACCORDANCE TO MANUFACTURERS GUIDELINES.

	Sanitary Sewers General Notes	REV No.	DATE: APR 2023
		3	SCALE: N.T.S.
		S607	

GENERAL NOTES - WATERMAIN

1. CONTRACTORS SHALL INFORM THE CITY OF BARRIE WATER OPERATIONS DEPARTMENT A MINIMUM OF 48 HOURS IN ADVANCE OF THEIR INTENTIONS TO PERFORM WORK ON WATER INFRASTRUCTURE.

2. OPERATION OF HYDRANTS AND VALVES ON THE POTABLE WATER SYSTEM BY OTHER THAN QUALIFIED WATER OPERATIONS STAFF IS PROHIBITED BY CURRENT BY-LAW. CITY SERVICE FEES ARE PER THE CURRENT FEES BY THE CITY'S WATER OPERATIONS STAFF. SWAL PRESSURE TEST, CHLORINATE AND FLUSH ALL NEW WATERMANS.

3. MINIMUM COVER OVER WATERMAIN SHALL BE 1.7m. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATERMAIN AND SEWERS SHALL BE 2.5m WHERE WATERMAIN CONFLICTS WITH SEWER PIPES. DEFLECT WATERMAIN HORIZONTALLY OR VERTICALLY WHILE PROVIDING A MINIMUM OF 0.5m CLEARANCE BETWEEN WATERMAIN AND SEWERS. MAINTAIN MINIMUM DEPTH OF COVER AT ALL TIMES.

4. WATERMAIN SHALL BE INSTALLED IN BEDDING AS PER OPSD 802.010 (GRANULAR A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD 802.030 OR 802.031 CLASS B' (GRANULAR A' BEDDING MATERIAL, GRANULAR A' OR SELECT NATIVE COVER MATERIAL FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF WATER OPERATIONS. ALTERNATIVE EMBEDMENT MATERIAL, SAND MEETING GRADATION REQUIREMENTS OF OPSD MAIN 1004.05.07 COMPACTED TO 90% STANDARD PROCTOR MAXIMUM DRY DENSITY IS PERMISSIBLE WHERE NOTED IN STANDARD DETAILS. GEOTECHNICAL CERTIFICATION OF MATERIAL AND COMPACTION TESTING MUST BE PROVIDED EVERY 150 METRES. THE COMPACTION TESTING MUST INCLUDE THE ENTIRE EMBEDMENT ENVELOPE (GRAUNCHES, BEDDING, TOP OF PIPE AND COVER).

5. COPPER WATER MAINS AND SERVICES 25mm TO 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW TO CONFORM TO OPSD MAIN 1004.02.07.

6. RESTRAINING WILL BE REQUIRED ON ALL HYDRANTS. THRUST BLOCKS, AS PER OPSD 1103.010 AND 1103.020. RESTRAINING DEVICES MAY BE REQUIRED IN ADDITION TO STANDARD CONCRETE THRUST BLOCKING WHERE SOIL CONDITIONS WARRANT AT THE CITY'S DISCRETION.

7. NEW WATERMANS TO BE PVC DR18 CL150 MINIMUM, DUCTILE IRON CL35 AS PER THE APPROVED MANUFACTURERS PRODUCTS FOR LINEAR WATER SYSTEMS LIST.

8. TRACING WIRE SHALL BE #12 AWG HIGH STRENGTH COPPER CLAD (HS-CSS) AND SHALL BE INSTALLED ON THE TOTAL LENGTH OF ALL WATERMAIN AND BROUGHT UP AT EACH HYDRANT AND TERMINATED INSIDE A HYDRANT TEST STATION. ALL SPLICES TO UTILIZE CONNECTORS AS PER THE APPROVED MANUFACTURERS PRODUCTS FOR LINEAR WATER SYSTEMS LIST.

9. ALL WATER SERVICES SHALL BE MINIMUM 25mm TYPE 'K' COPPER OR 25mm CROSS-LINKED POLYETHYLENE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF WATER OPERATIONS. WATER SERVICE SADDLES SHALL BE USED WHEN TAPPING INTO PVC WATERMAIN.

10. SERVICE TAPPINGS SHALL BE PLACED AT A MINIMUM SEPARATION OF 1.0m AND A MINIMUM OF 0.6m FROM JOINTS. (ENDS OF PIPE)

11. RISER PIPES ARE TO BE INSTALLED AS PER BSD-410 AND REMOVED AS DIRECTED. SWAGING SCHEDULE TO BE SUPPLIED BY A WATER OPERATIONS FIELD REPRESENTATIVE. ALL RISERS ARE TO BE RESTRAINED ON THRUST BLOCKS.

12. ALL NEW CURB STOPS AND BOXES TO BE LOCATED AT PROPERTY LINE AND OUT OF DRIVEWAYS AND SIDEWALKS.

	Watermain General Notes	REV No.	DATE: APR 2023
		4	SCALE: N.T.S.
		W539	

STORM SEWER

A. STORM SEWER TO BE PROVIDED ON ALL ROADS WITH CURB AND GUTTER.

B. PLACE ALL CATCH BASIN LATERALS AT 2% GRADE UNLESS OTHERWISE NOTED. PIPE SIZE MINIMUM 250mm DIA. SINGLE, 300mm DIA. DOUBLE.

C. STORM SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD-802.010 (GRAN. A' EMBEDMENT MATERIAL) FOR FLEXIBLE PIPES AND OPSD-802.030 OR 802.031 CLASS B (GRAN. A' BEDDING MATERIAL) FOR RIGID PIPE UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF ENGINEERING.

D. MAINTENANCE HOLE TOPS (FRAMES) AND CATCH BASIN (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WHEN THE TOP LIFT OF ASPHALT IS PLACED.

E. STORM SEWER TO BE LOCATED OFFSET 3.0m SOUTH OR EAST OF CENTRELINE UNLESS OTHERWISE SPECIFIED.

F. ALL CONNECTIONS TO THE STORM MAIN SHALL BE MADE WITH A STORM MANHOLE OR APPROVED FACTORY TEE CONNECTION AS PER OPSD-708.01 OR 708.03.

G. PIPE MATERIAL TO BE REINFORCED CONCRETE WITH A MINIMUM STRENGTH OF 50 N/mm² (PREVIOUSLY C.S.A. STANDARD A237.2-1974, CLASS IV) OR PVC CERTIFIED TO C.S.A. STANDARDS 182.2 AND 182.4.

H. STORM SEWER TO BE MINIMUM 300mm DIAMETER WITH JOINTS CONFORMING TO C.S.A. STANDARD A237.3.

I. ALL PIPE BEDDING MUST CONFORM TO OPSD MAXIMUM COVER TABLE. NO FLEXIBLE PIPE SEWERS WILL BE INSTALLED WITH A DEPTH OF COVER GREATER THAN 6 METRES UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF ENGINEERING.

J. ALL PIPE HANDLING INSTALLATIONS MUST BE IN STRICT COMPLIANCE WITH MANUFACTURERS INSTALLATION GUIDES AND THE O.C.P.A. OR UNBELL GUIDELINES.

K. SUMP PUMP DISCHARGE PIPING IN BOULEVARD: IN THE EVENT OF OVERACTIVE SUMP PUMP ACTIVITY, A 150mm DIAMETER PVC DR-28 SEWER MAY BE INSTALLED, WHEN SO DIRECTED BY THE DIRECTOR OF ENGINEERING, ALONG THE FRONTAGES OF DESIGNATED LOTS, WITH AN OFFSET OF 0.6m FROM CURB. THIS SEWER IS TO BE CAPPED AT THE UPSTREAM END AND IS TO OUTLET INTO THE NEAREST CATCH-BASIN DOWNSTREAM. DEPTH OF SEWER IS TO BE EQUAL TO SUBGRAIN DEPTH. NOT TO BE DIRECTLY CONNECTED TO FOUNDATION GRADE.

	Storm Sewers General Notes	REV No.	DATE: AUG 2024
		6	SCALE: N.T.S.
		D788	

EROSION CONTROL NOTES

- ALL TEMPORARY SILT CONTROL AND EROSION PROTECTION DEVICES (I.E. SILT FENCING, DRAINAGE SWALES, ROCK CHECK DAMS, SEDIMENT TRAPS, GRAVEL ACCESS PAD, ETC.) SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF SITE WORKS AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND THE GRASS HAS ESTABLISHED GROWTH, SUBJECT TO APPROVAL BY THE CITY ENGINEERING DEPARTMENT.
- ALL SEDIMENTATION CONTROL MEASURES ARE TO BE INSPECTED REGULARLY (MINIMUM WEEKLY), AS WELL AS AFTER EVERY RAINFALL EVENT AND ANY DAMAGED SILT CONTROL AND EROSION PROTECTION DEVICES SHALL BE PROMPTLY REPAIRED OR REPLACED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES.
- AREAS WITHOUT STABLE GROUND COVER SHALL BE PROTECTED WITH SILTATION CONTROL, FENCING, STRAW MULCH, ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BECOME ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
- ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED BY SEEDING. (IF SEEDING IS APPROPRIATE DURING CURRENT SEASON)
- ALL SITE DRAINAGE IS TO BE DIRECTED TO THE TEMPORARY SEDIMENT TRAPS AND OTHER CHECK DAMS VIA SHEET DRAINAGE, BERMS OR SWALES (AS NECESSARY) TO FACILITATE THE COMPLETION OF GRADING WORKS. THE CONTRACTOR SHALL CONSTRUCT ANY ADDITIONAL SWALES OR BERMS THAT MAY BE NECESSARY TO DIRECT RUN-OFF TO THE SEDIMENT TRAPS.
- ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE FROM PROPOSED CONSTRUCTION ACCESS VIA THE GRAVEL ACCESS PAD. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE INSPECTOR.
- THE CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPS 805. CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, AS WELL AS APPLICABLE MUNICIPAL STANDARDS AND/OR APPROVAL AGENCY STANDARDS.
- THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES, SUCH MEASURES MUST BE PRESENTED IN WRITING FOR APPROVAL BY THE CONTRACT ADMINISTRATOR AND MUST BE APPROVED IN WRITING BY THE APPLICABLE APPROVAL AGENCIES.

GRADING NOTES

- ALL DISTURBED AREAS TO BE RESTORED TO EXISTING CONDITIONS OR BETTER WITH A MIN. 200mm DEPTH OF TOPSOIL AND SOD IMMEDIATELY FOLLOWING COMPLETION OF GRADING.
- ALL SLOPES SHALL BE RESTORED WITH A MIN. 200mm DEPTH OF TOPSOIL AND SOD IMMEDIATELY FOLLOWING COMPLETION OF GRADING.
- ALL SLOPES ALONG DITCHES TO BE MAXIMUM SLOPES OF 3:1.

WATER SERVICING NOTES, AS REQUIRED BY THE CITY OF BARRIE

GENERAL

- ALL REQUIRED PERMITS SHALL BE IN PLACE PRIOR TO INSTALLATION OF WATERMAIN AND SERVICES.
- A ROAD OCCUPANCY PERMIT IS REQUIRED, AND CAN BE OBTAINED AT THE OPERATION CENTRE.
- MINIMUM COVER OVER WATER MAIN TO BE 1.7m. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SEWER TO BE 2.5m. WHERE WATER MAIN CONFLICTS WITH SEWER PIPES, DEFLECT WATER MAIN HORIZONTALLY OR VERTICALLY WHILE PROVIDING A MINIMUM OF 0.5m CLEARANCE BETWEEN WATER MAIN AND SEWERS. MAINTAIN MINIMUM DEPTH OF COVER AT ALL TIMES.
- ALL BENDS AND TEES SHALL BE RESTRAINED IN ADDITION TO THRUST BLOCKS. (O.P.S.D. 1103.010, O.P.S.D. 1103.020, O.P.S.D. 1103.021)
- ALL DOMESTIC AND FIRE WATER SERVICES WILL REQUIRE BACKFLOW PREVENTION AS PER CITY OF BARRIE BYLAW 2017-12.
- SERVICES INSTALLED UNDER FLOORS SHALL BE FULLY RESTRAINED.
- HYDRANTS SHALL BE INSTALLED AS PER DETAIL W507. ON SITE HYDRANTS SHALL BE CONSIDERED PRIVATE (PAINTED RED), AND ARE TO BE MAINTAINED BY THE OWNER.
- ALL FIRE SERVICES SHALL CONFORM TO THE MOST CURRENT BUILDING CODE AND NATIONAL FIRE PROTECTION ACT. THE REQUIREMENT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER. INFORMATION MAY BE OBTAINED FROM THE INSURANCE UNDERWRITER, CITY OF BARRIE PLANNING AND DEVELOPMENT AND THE CITY OF BARRIE FIRE DEPARTMENT.
- ALL NEW CURB STOPS AND BOXES TO BE LOCATED OUT OF DRIVEWAYS AND SIDEWALKS.
- COPPER WATER SERVICES 19mm TO 50mm IN DIAMETER SHALL BE EMBEDDED IN SAND 100mm ABOVE AND BELOW.
- ALL COPPER WATER SERVICE FITTINGS SHALL BE COMPRESSION STYLE. IF A CONDITION ARISES WHERE A COPPER SERVICE MUST BE JOINED UNDER THE FLOOR, THE COPPER SHALL BE JOINED BY SILVER SOLDER CONNECTION ONLY.
- CONTRACTOR SHALL INFORM THE CITY OF BARRIE OPERATIONS DEPARTMENT A MINIMUM OF 48 HOURS IN ADVANCE OF THEIR INTENTIONS TO WORK.
- THE CITY WILL FLUSH THE NEW SERVICE AND CONTRACTOR WILL PERFORM PRESSURE TEST WITNESSED BY THE WATER FIELD COORDINATOR.
- WATER WILL NOT BE AVAILABLE UNTIL SERVICES HAVE BEEN SAMPLED AND PASSES FOR BACTERIOLOGICAL COMPLIANCE. A CHECK VALVE SHALL BE INSTALLED FOR TEMPORARY WATER.
- A FLAT RATE CONNECTION FEE WILL BE REQUIRED FOR EACH OF THE WATER SERVICE CONNECTIONS, IN ACCORDANCE WITH CITY OF BARRIE BY-LAW 2024-024 SCHEDULE N.
- AN ANNUAL CHARGE FOR EACH PRIVATE CONNECTION MADE TO THE MUNICIPAL WATER DISTRIBUTION SYSTEM WILL APPLY, IN ACCORDANCE WITH CITY OF BARRIE BY-LAW 2024-024 SCHEDULE N.
- WATER SERVICES TO BE MECHANICALLY RESTRAINED. WATERMAIN TO BE MECHANICALLY RESTRAINED IN AREAS OF FILL.

100mm DOMESTIC AND 150mm FIRE SERVICES

- DOMESTIC AND FIRE SERVICE VALVES SHALL BE LOCATED IN THE BOULEVARD, UNLESS OTHERWISE NOTED.
- DOMESTIC AND FIRE SERVICES SHALL BE MECHANICALLY RESTRAINED FROM THE TEE TO THE BUILDINGS.
- DOMESTIC AND FIRE SERVICE RISERS ENTERING EACH BUILDING SHALL BE INSTALLED AS PER DETAIL W505.
- ALL DOMESTIC AND FIRE SERVICES TO BE HAND SWABBED OR A SWAB IS TO BE PLACED IN SERVICE AND REMOVED FROM RISERS.
- THE 100mm DOMESTIC WATER SERVICE WILL REQUIRE A 100mm WATER METER (SUPPLIED AND INSTALLED BY THE OWNER) COMPLETE WITH A BYPASS ASSEMBLY AS PER DETAIL W533 AND SHALL BE LOCATED IN AN APPROPRIATELY SIZED MECHANICAL ROOM.
- BACKFLOW PREVENTION SHALL BE PROVIDED ON ALL DOMESTIC AND FIRE SERVICES AS PER CITY OF BARRIE BYLAW 2017-12.

ENGINEERING NOTES

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

- ALL MEASUREMENTS FOR THIS PROJECT ARE IN METERS, EXCEPT PIPE DIAMETERS WHICH IS IN MILLIMETRES, UNLESS OTHERWISE NOTED. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF ANY CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
- ALL MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS, RULES AND REGULATIONS, TO MEET THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION AND TO MEET THE DESIGN INTENT.
- ALL WORK AND MATERIALS WITHIN THE PROPERTY BOUNDARIES SHALL CONFORM TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE, WHERE THERE IS A CONFLICT BETWEEN THE FOLLOWING NOTES AND SPECIFICATIONS AND THE ONTARIO BUILDING CODE, THE DECISION OF THE CHIEF BUILDING OFFICIAL WILL GOVERN.
- INFORMATION ON EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY UTILITY LOCATES PRIOR TO COMMENCING CONSTRUCTION.
- ALL CORRUGATED STEEL PIPE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND AS PER O.P.S.D. 801.010. ALL CSP TO BE 2.0mm THICKNESS GAUGE.
- CONTRACTOR SHALL INFORM THE SITE (PROJECT) MANAGER A MINIMUM 24 HOURS IN ADVANCE OF HIS INTENTION TO COMMENCE WORK. CONTRACTOR SHALL AT ALL TIMES, PROVIDE SUITABLE BARRICADES AND FLAGGING PROTECTION IN ACCORDANCE WITH THE MINISTRY OF LABOUR PRACTICES, AND OCCUPATIONAL HEALTH AND SAFETY ACT.
- THESE NOTES ARE GENERAL IN NATURE; FOR SPECIFIC DETAILS REFER TO CITY OF BARRIE AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
- SEWER PIPE MATERIAL (IF APPLICABLE): -POLYVINYL CHLORIDE PIPE SHALL CONFORM TO CSA-B-182.1 AND CSA-B-182.2 WITH BELL AND SPIGOT RUBBER GASKETED JOINTS COMPLYING WITH CSA-B182.2 AND CSA-B182.3. SANITARY PIPE SHALL BE SDR-35 AND ALL SANITARY SERVICE LATERALS TO BE SDR-26.
- SEWER BEDDING WILL CONFORM TO O.P.S.D. 802.030 FOR RIGID PIPE INSTALLATION AND O.P.S.D. 802.010 FOR FLEXIBLE PIPE INSTALLATION. NATIVE MATERIAL USED FOR BACKFILL SHALL BE APPROVED BY A GEOTECHNICAL ENGINEER.
- ALL TRENCHES ARE TO BE BACKFILLED WITH NATIVE MATERIAL AND COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY OR AS PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. IN ADDITION, ALL STRUCTURES WITHIN TRAVELLED PORTION OF THE ROAD & PARKING AREAS SHALL HAVE NATIVE 4:1 FROST TAPERS FROM FROST LINE TO SUBGRADE.
- MAINTENANCE HOLES:
 - STEPS SHALL BE ALUMINUM ALLOY O.P.S.D. 405.010 SOLID CIRCULAR ALUMINUM OR APPROVED EQUAL.
 - FRAMES AND COVERS SHALL BE DOMINON WHEEL FOUNDRIES DESIGN STD. 579 OR APPROVED EQUAL AND SELF LEVELLING FRAME AND GRATE/COVER SHALL BE USED FOR ALL NEW MAINTENANCE HOLES WITHIN ASPHALT ROADWAYS AS PER BSD-41 (OCTOBER 2017) O.P.S.D. 401.010 TYPE 'A'.
 - SANITARY MAINTENANCE HOLES ARE TO HAVE CORE AND SEAL GASKETS ON ALL PIPE CONNECTIONS. 1200 DIAMETER MAINTENANCE HOLES - O.P.S.D. 701.010
 - STORM MAINTENANCE HOLES TO BE 1200mm DIAMETER PER OPSD 701.010 UNLESS OTHERWISE NOTED.
 - MAINTENANCE HOLE BENCHING SHALL EXTEND TO PIPE OVERT AND SHALL BE IN ACCORDANCE WITH DETAILS SHOWN AS PER OPSD 701.021.

- PAVEMENT DESIGN MAKE-UP: (REFER TO GEOTECHNICAL INVESTIGATION REPORT, PROPOSED RESIDENTIAL BUILDING 60 DEAN AVENUE, BARRIE, ONTARIO PREPARED BY GEI CONSULTANTS, DATED 2025-02-27)

SURFACE COURSE ASPHALTIC CONCRETE	HEAVY DUTY
HL3 (OPSS 1150) WITH PG 58-28 ASPHALT CEMENT (OPSS:MUNI 1101)	40mm
BINDER COURSE ASPHALTIC CONCRETE	
HL8 (OPSS 1150) WITH PG 58-28 ASPHALT CEMENT (OPSS:MUNI 1101)	80mm
BASE COURSE	
GRANULAR A (OPSS:MUNI 1010)	150mm
SUBBASE COURSE	
GRANULAR B TYPE 1 (OPSS:MUNI 1010)	450mm

- BARRIER CURB TO COMPLY WITH OPSD 600.110.

NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

GENERAL NOTES



229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W6
P. 706.734.2638
F. 706.734.1056

DESIGN	DR/CG	SCALE: NTS	DATE: JAN 2025
DRAWN	CG	PROJECT: PRA-24067	DWG. NO: DWG. N0
CHECKED	MF		GN-1

BENCHMARK:

BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE CURB ON THE WEST SIDE OF THE BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.761m

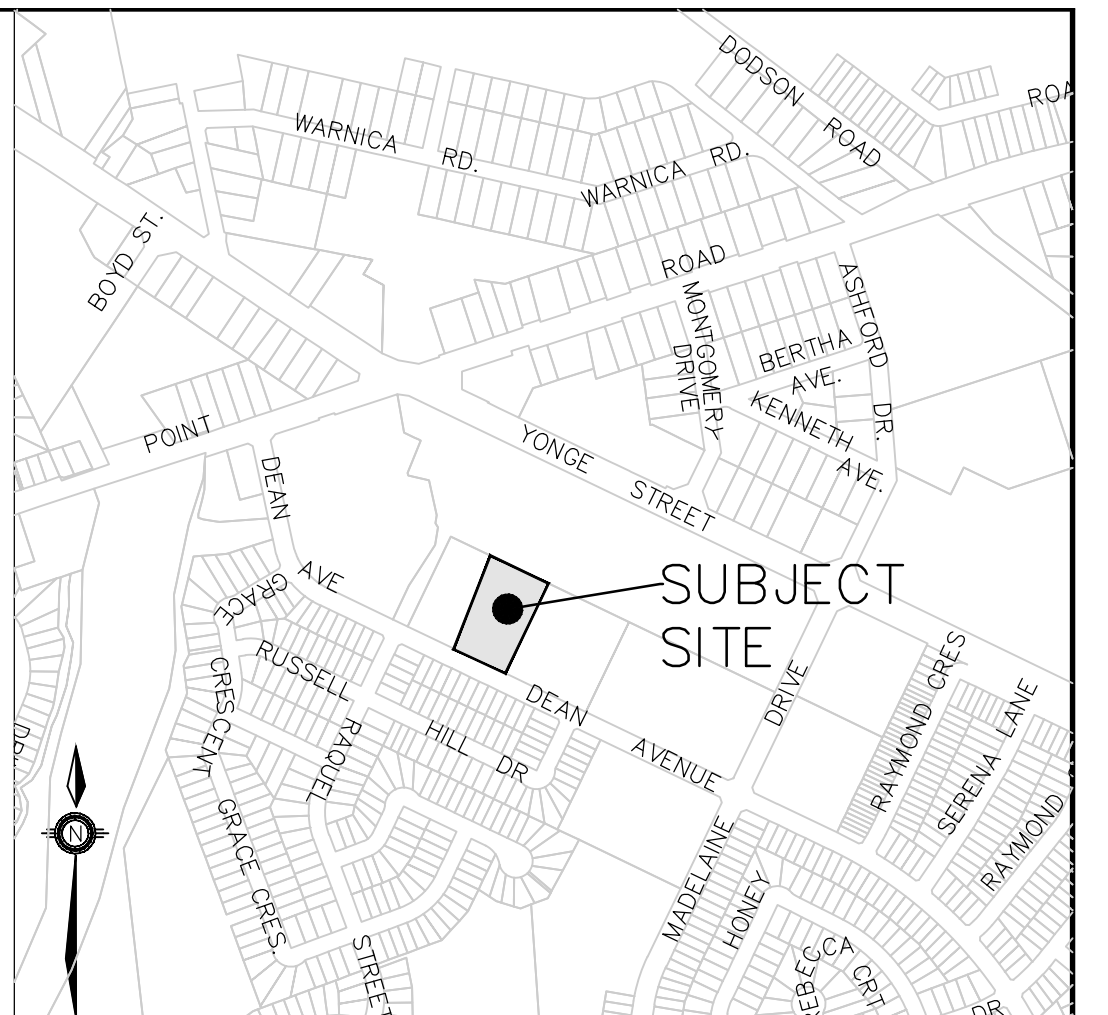
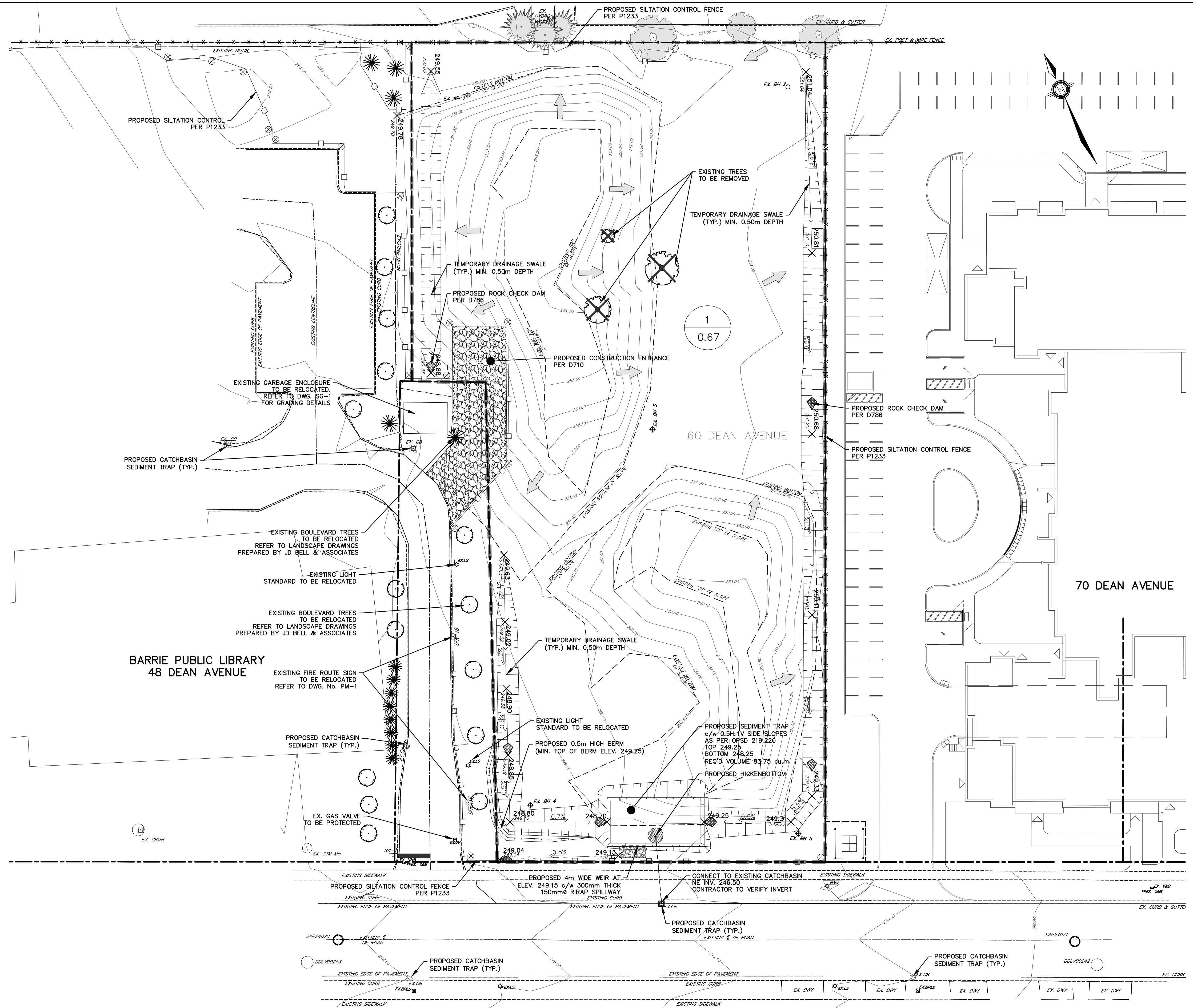
BENCHMARK NO. 0313003029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m

BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312002007. NOTE MONUMENT SET IN CONCRETE. N:4912309.361 E:627444.743

BENCHMARK NO. 0310180040 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:628748.999

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL





KEY PLAN
NTS

LEGEND

- EXISTING CONTOUR AND ELEVATION
- PROPERTY LINE
- EX. BOREHOLE LOCATION AND ID NUMBER
- EX. DITCH
- EX. TREE
- EX. BUSH
- EX. GAS VALVE
- EX. LIGHT STANDARD
- EX. VALVE
- EX. HYDRANT
- DRAINAGE AREA
- CATCHMENT ID NUMBER
AREA (ha)
- EXISTING DIRECTION OVERLAND FLOW
- EXISTING FENCE
- EXISTING CATCH BASIN
- EXISTING SANITARY MAINTENANCE HOLE
- EXISTING STORM MAINTENANCE HOLE
- PROPOSED ELEVATION
- EXISTING ELEVATION
- PROPOSED GRADIENT AND FLOW DIRECTION
- TEMPORARY SWALE
- PROPOSED CATCHBASIN
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED DOUBLECATCH BASIN MAINTENANCE HOLE
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED SILTATION CONTROL
- PROPOSED CEDAR POST
- PROPOSED CATCHBASIN SEDIMENT TRAP

NOTE:
I HAVE REVIEWED THE PLANS FOR THE CONSTRUCTION OF 60 DEAN AVENUE AND HAVE PREPARED THIS PLAN TO INDICATE THE COMPATIBILITY OF THE PROPOSAL TO EXISTING ADJACENT PROPERTIES AND MUNICIPAL SERVICES. IT IS MY BELIEF THAT ADHERENCE TO THE PROPOSED GRADES AS SHOWN WILL PRODUCE ADEQUATE SURFACE DRAINAGE AND PROPER FACILITY OF MUNICIPAL SERVICES WITHOUT ANY DETRIMENTAL EFFECT TO THE EXISTING DRAINAGE PATTERNS OR ADJACENT PROPERTIES.

BENCHMARK:
BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.5 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.763m
BENCHMARK NO. 0312002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
BENCHMARK NO. 0312004006 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312002007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. ELEV. 250.746m

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	DR

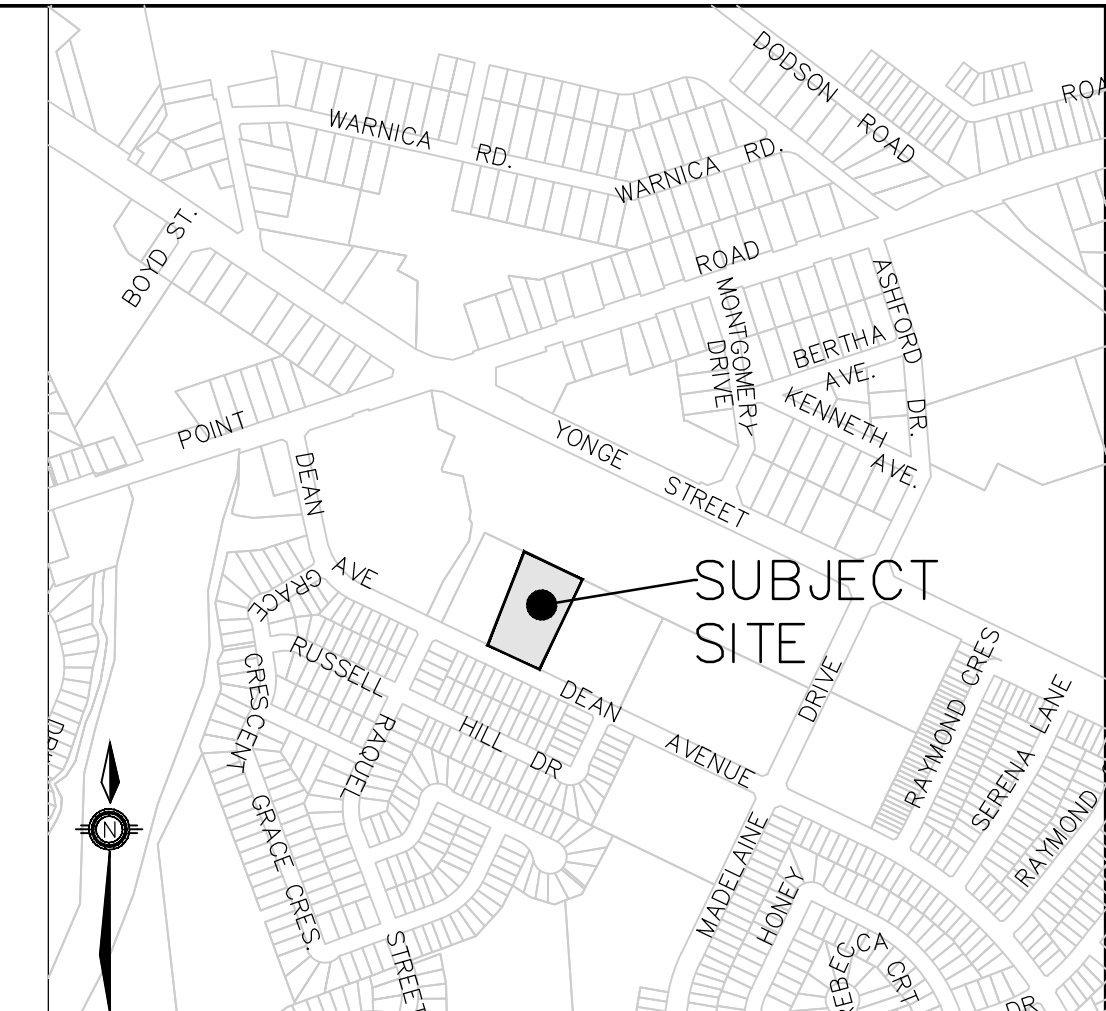
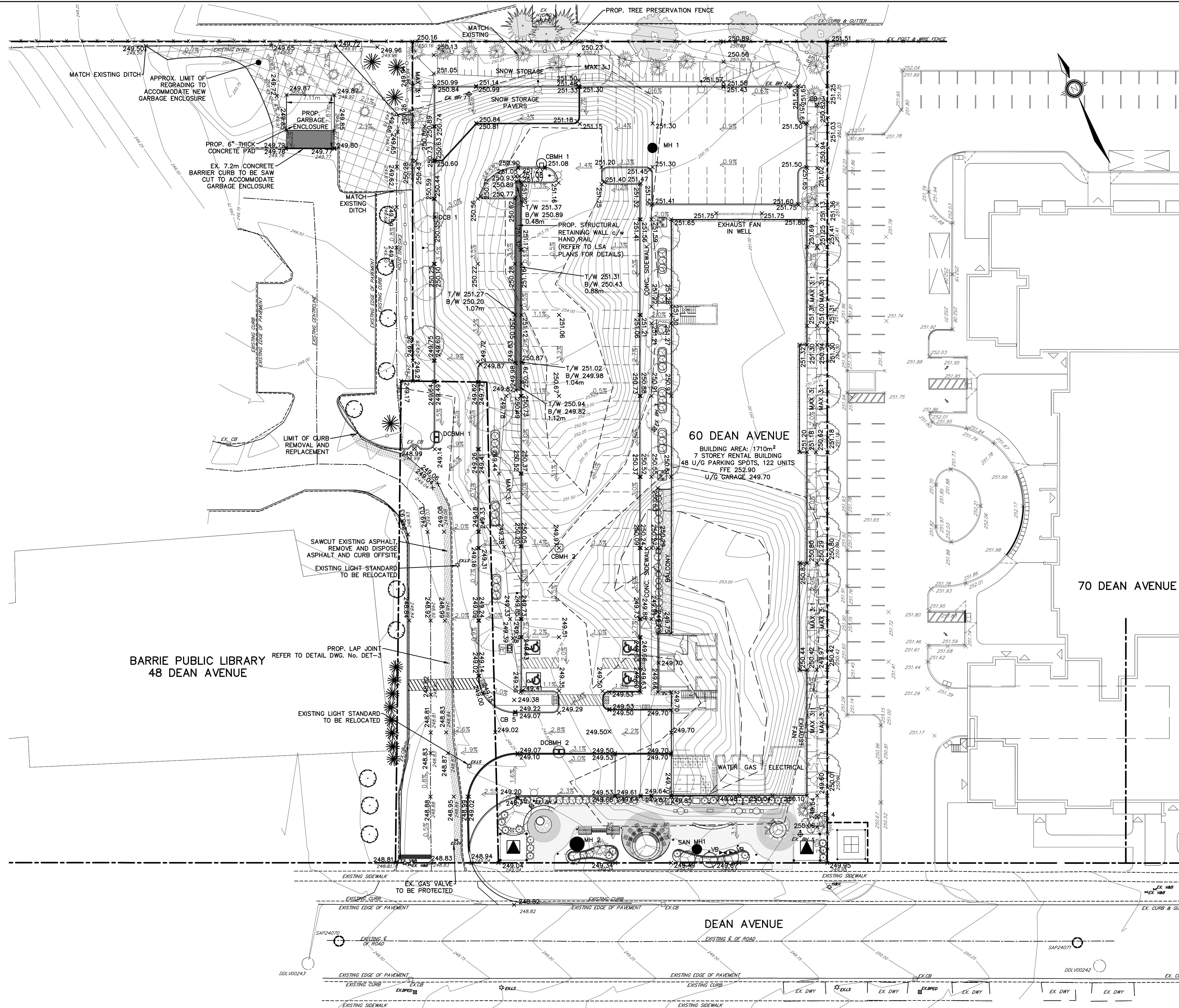
M. G. F. L. S.
 03-07-2015
 PROVINCE OF ONTARIO

NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE
**EROSION AND SEDIMENT
 CONTROL PLAN**

JONES
 CONSULTING GROUP LTD.
 PLANNERS & ENGINEERS
 229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W5
 P. 706.734.2638
 F. 706.734.1058

DESIGN DR/CG	SCALE: 1:300	DATE FEB 2025
DRAWN CG	PROJECT PRA-24067	DWG. NO ESC-1
CHECKED DR		

G:\Eng_3D\PRAs-24067\Production\DWG\PRAs-24067-ESC.dwg, Layout:ESC-1, Plotted Mar 06, 2025 @ 2:28pm, by cpgagnon, The Jones Consulting Group Ltd.



KEY PLAN
NTS

LEGEND

	PROPERTY LINE
	EX. CONTOUR AND ELEVATION
	EX. BOREHOLE LOCATION AND ID NUMBER
	EX. FENCE
	EX. DITCH
	EX. TREE
	EX. BUSH
	EX. GAS VALVE
	EX. LIGHT STANDARD
	EX. VALVE
	EX. HYDRANT
	EX. SANITARY MAINTENANCE HOLE
	EX. STORM MAINTENANCE HOLE
	EX. CATCHBASIN
	PROP. ELEVATION
	EX. ELEVATION
	PROP. HIGH POINT
	PROP. DRAINAGE FLOW DIRECTION AND GRADIENT
	PROP. SLOPE 3:1 (MAX)
	PROP. SWALE
	PROP. VALVE
	PROP. SANITARY MAINTENANCE HOLE
	PROP. STORM MAINTENANCE HOLE
	PROP. DOUBLE CATCHBASIN MAINTENANCE HOLE
	PROP. CATCHBASIN MAINTENANCE HOLE
	PROP. CATCHBASIN
	PROP. DOUBLE CATCHBASIN
	PROP. STRUCTURAL RETAINING WALL c/w RAILING REFER TO LSA PLANS
	PROP. TREE PRESERVATION FENCE REFER TO LANDSCAPE DRAWINGS
	PROP. TRANSFORMER
	PROP. STREETLIGHT
	PROP. TREES

BARRIE PUBLIC LIBRARY
48 DEAN AVENUE

60 DEAN AVENUE
BUILDING AREA: 1710m²
7 STOREY RENTAL BUILDING
48 U/G PARKING SPOTS, 122 UNITS
FFE 252.90
U/G GARAGE 249.70

70 DEAN AVENUE

DEAN AVENUE
EXISTING E. OF ROAD

BENCHMARK:

BENCHMARK NO. 0312000207 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE.
ELEV. 248.59m

BENCHMARK NO. 0312000209 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL. THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE.
ELEV. 250.59m

BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312000207. NOTE MONUMENT SET IN CONCRETE.
ELEV. 248.74m

BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD.
N:491148.724 E:608748.999

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL



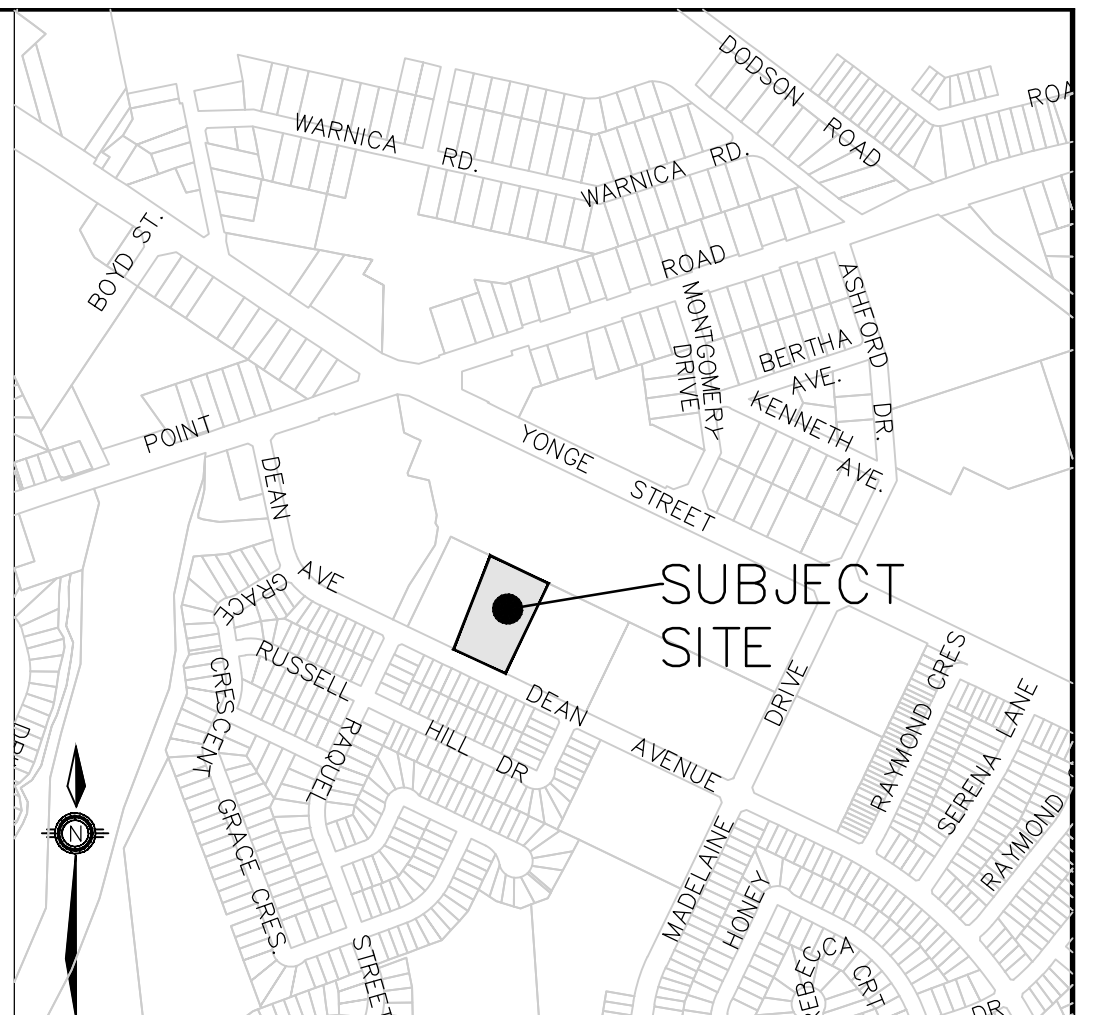
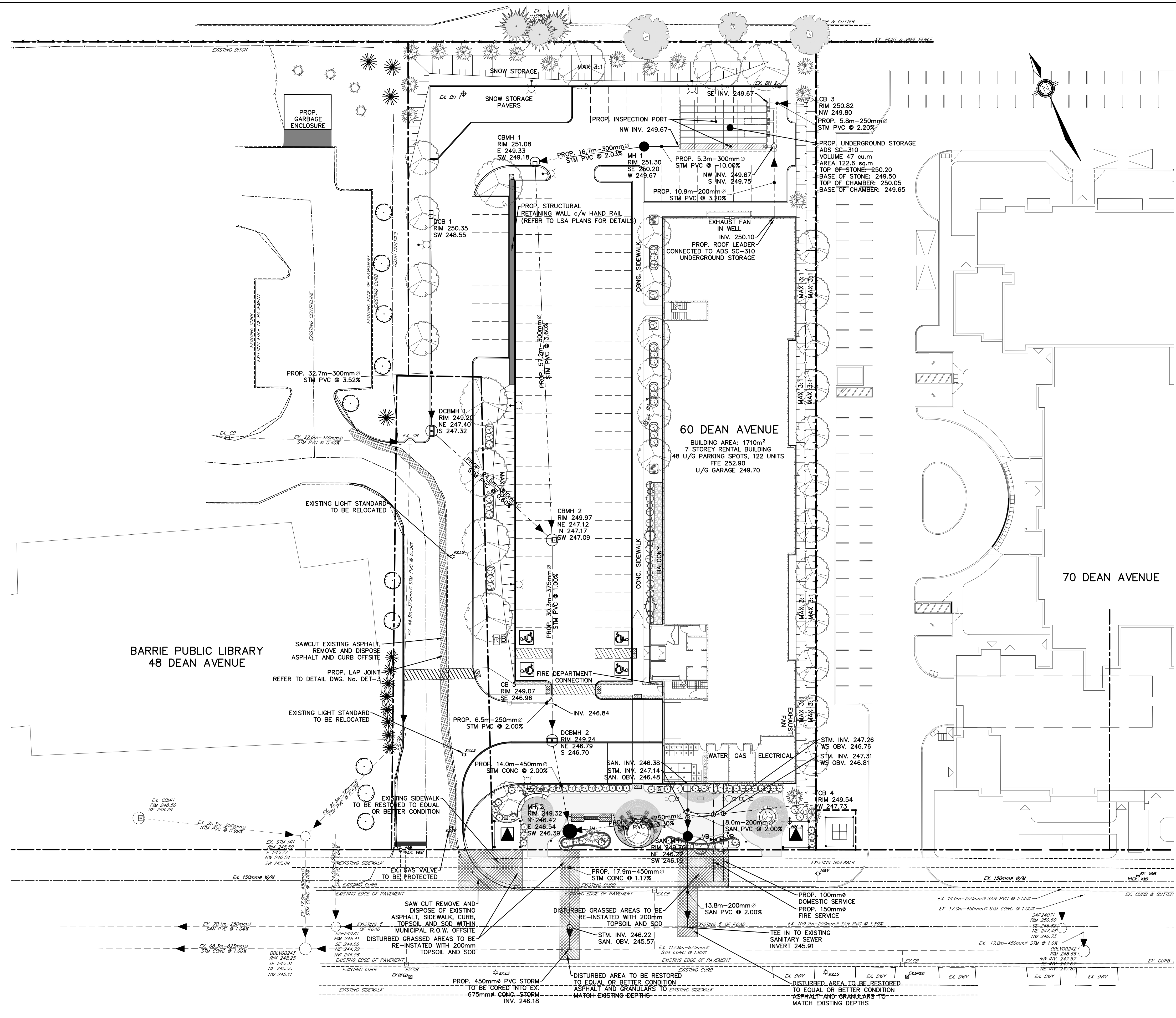
NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE



SITE GRADING PLAN

DESIGN DR/CG	SCALE: 1:300	DATE JAN 2025
DRAWN CG	PROJECT PRA-24067	DWG. NO DWG. N ^o
CHECKED MF		SG-1

G:\Eng_3D\Y-PRA-24067\Production\DWG\PRA-24067-GRADING.dwg Layout:SG-1 Plotted: Mar 07, 2025 @ 11:05am by cpgannon The Jones Consulting Group Ltd.



KEY PLAN
NTS

LEGEND

	PROPERTY LINE
	EX. CONTOUR AND ELEVATION
	EX. BOREHOLE LOCATION AND ID NUMBER
	EX. FENCE
	EX. DITCH
	EX. TREE
	EX. BUSH
	EX. GAS VALVE
	EX. LIGHT STANDARD
	EX. WATERMAIN
	EX. VALVE
	EX. HYDRANT
	EX. SANITARY MAINTENANCE HOLE AND FLOW DIRECTION
	EX. STORM MAINTENANCE HOLE
	EX. CATCHBASIN
	EX. STORM SEWER AND FLOW DIRECTION
	PROP. SLOPE 3:1 (MAX)
	PROP. SWALE
	PROP. SANITARY MAINTENANCE HOLE
	PROP. SANITARY SEWER AND FLOW DIRECTION
	PROP. STORM MAINTENANCE HOLE
	PROP. DOUBLE CATCHBASIN MAINTENANCE HOLE
	PROP. CATCHBASIN MAINTENANCE HOLE
	PROP. CATCHBASIN
	PROP. DOUBLE CATCHBASIN
	PROP. STORM SEWER AND FLOW DIRECTION
	PROP. VALVE
	PROP. WATER & FIRE SERVICE
	PROP. STRUCTURAL RETAINING WALL c/w RAILING REFER TO LSA PLANS
	PROP. TRANSFORMER
	PROP. STREETLIGHT
	PROP. TREES

BARRIE PUBLIC LIBRARY
48 DEAN AVENUE

60 DEAN AVENUE
BUILDING AREA: 1710m²
7 STOREY RENTAL BUILDING
48 U/G PARKING SPOTS, 122 UNITS
FFE 252.90
U/G GARAGE 249.70

70 DEAN AVENUE

BENCHMARK:

BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.5 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE 100 mm FACE OF THE CONCRETE MONUMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m SOUTH OF THE TOP OF THE BRIDGE. ELEV. 244.76m

BENCHMARK NO. 0312002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m

BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312002007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m

BENCHMARK NO. 10118000101 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:491148.724 E:658748.999

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL

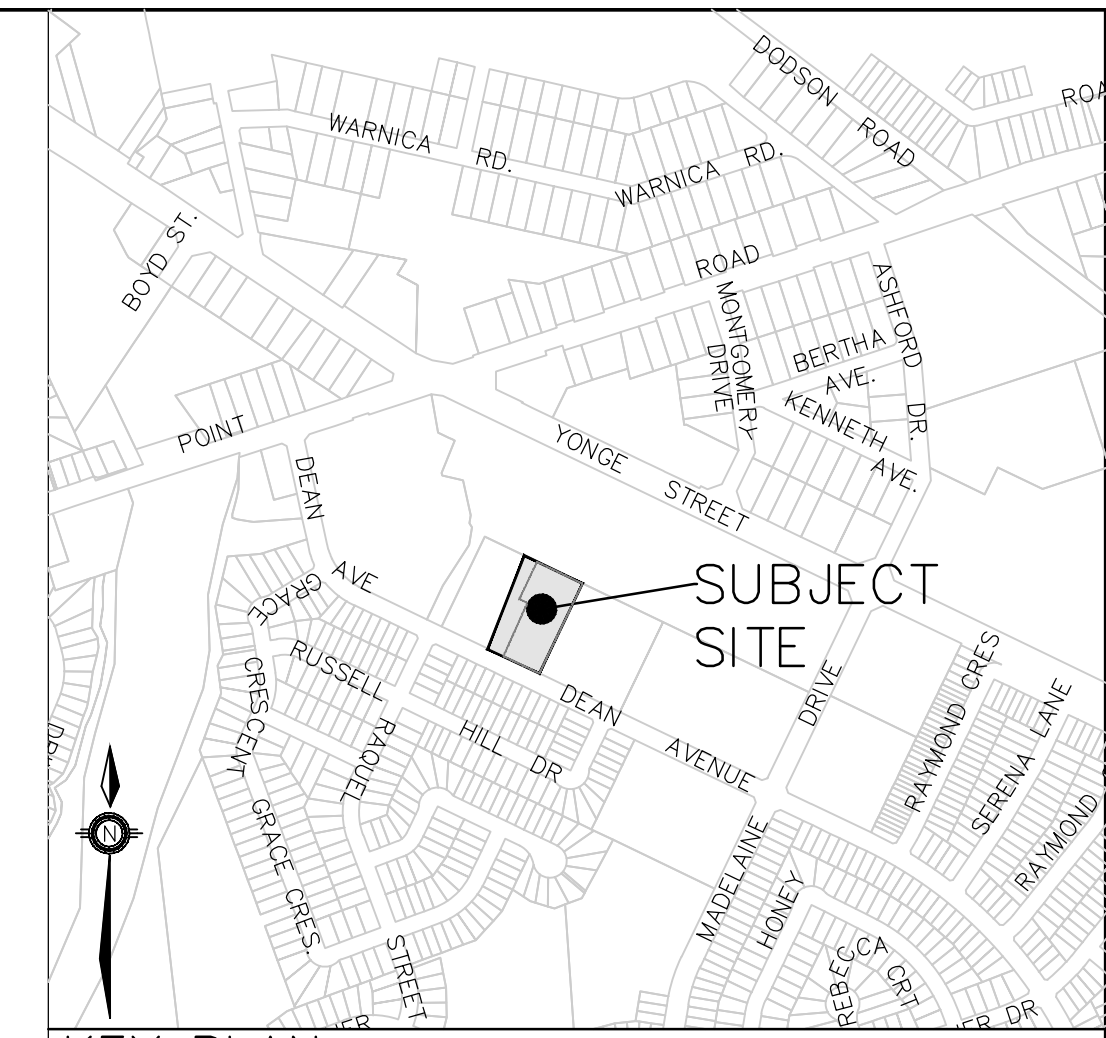
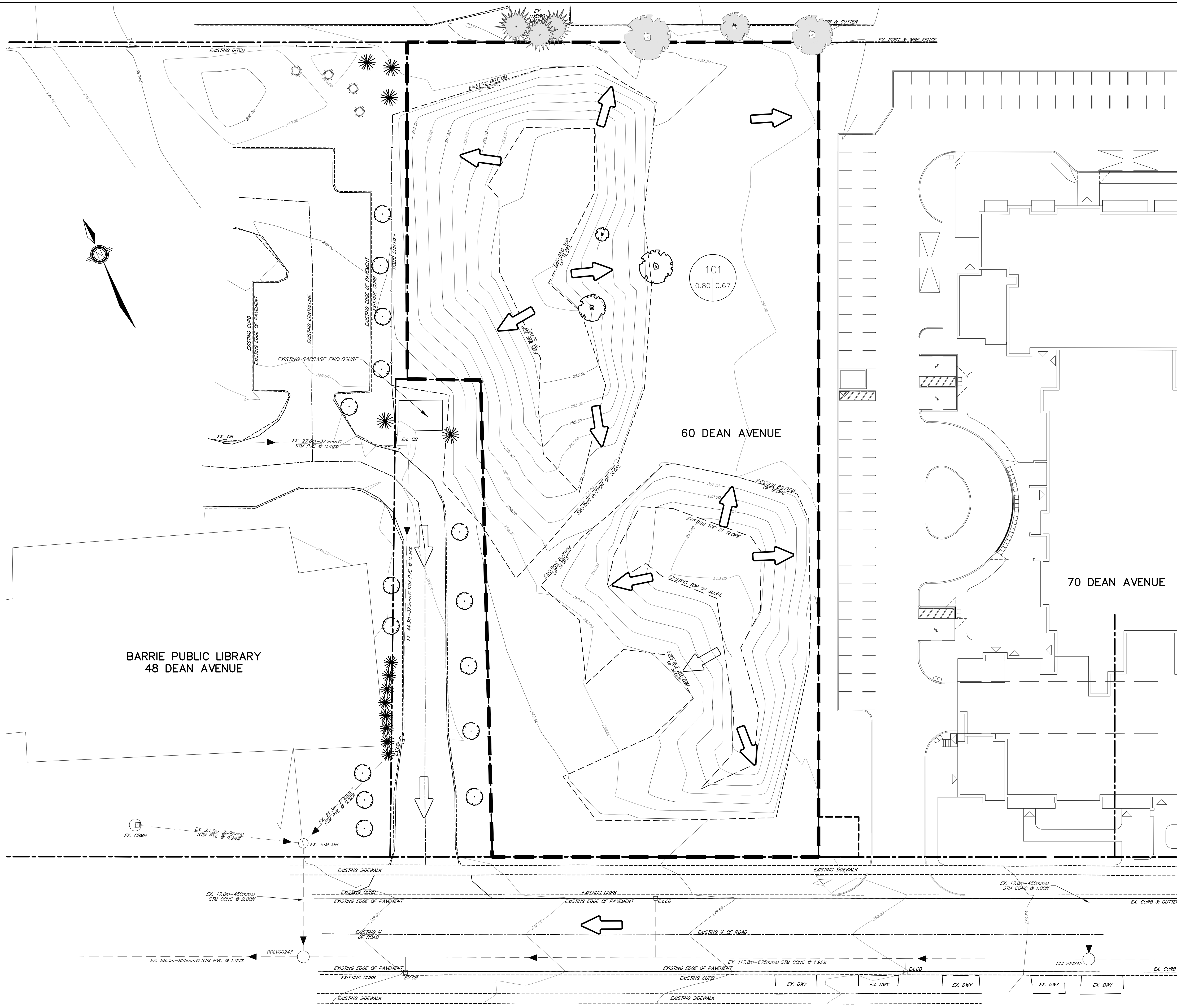


NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

GENERAL SERVICING PLAN

		229 Mapleview Dr. E. Unit 1 Barrie, ON L4N 0W5 P. 705.734.2638 F. 705.734.1058
DESIGN DR/CG	SCALE: 1:300	DATE FEB 2025
DRAWN CG	PROJECT PRA-24067	DWG. NO. GS-1
CHECKED MF		

G:\Eng_3D\PRAs-24067-Production\DWGS\PRAs-24067-GENERAL_SERVICING.dwg Layout:GS-1 Plotted: Mar 07, 2025 @ 8:50am by: cspagnon The Jones Consulting Group Ltd.



KEY PLAN
NTS

LEGEND

- PROPERTY LINE
- CATCHMENT BOUNDARY
- EX. TREE
- EX. BUSH
- EX. CONTOUR AND ELEVATION
- EX. STORM MAINTENANCE HOLE
- EX. CATCHBASIN
- EX. STORM SEWER AND FLOW DIRECTION
- DIRECTION OF OVERLAND FLOW
- CATCHMENT AREA NUMBER
- AREA (ha.)
- RUN-OFF COEFFICIENT

BARRIE PUBLIC LIBRARY
48 DEAN AVENUE

60 DEAN AVENUE

70 DEAN AVENUE

G:\Eng_3D\PRAs-24067-DRAINAGE-PLAN.dwg layout:SWM-1 Plotted Mar 07, 2025 @ 1:03pm by cspagnon The Jones Consulting Group Ltd.

BENCHMARK:
BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.761m
BENCHMARK NO. 0312002009 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312002007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911448.724 E:608748.999

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

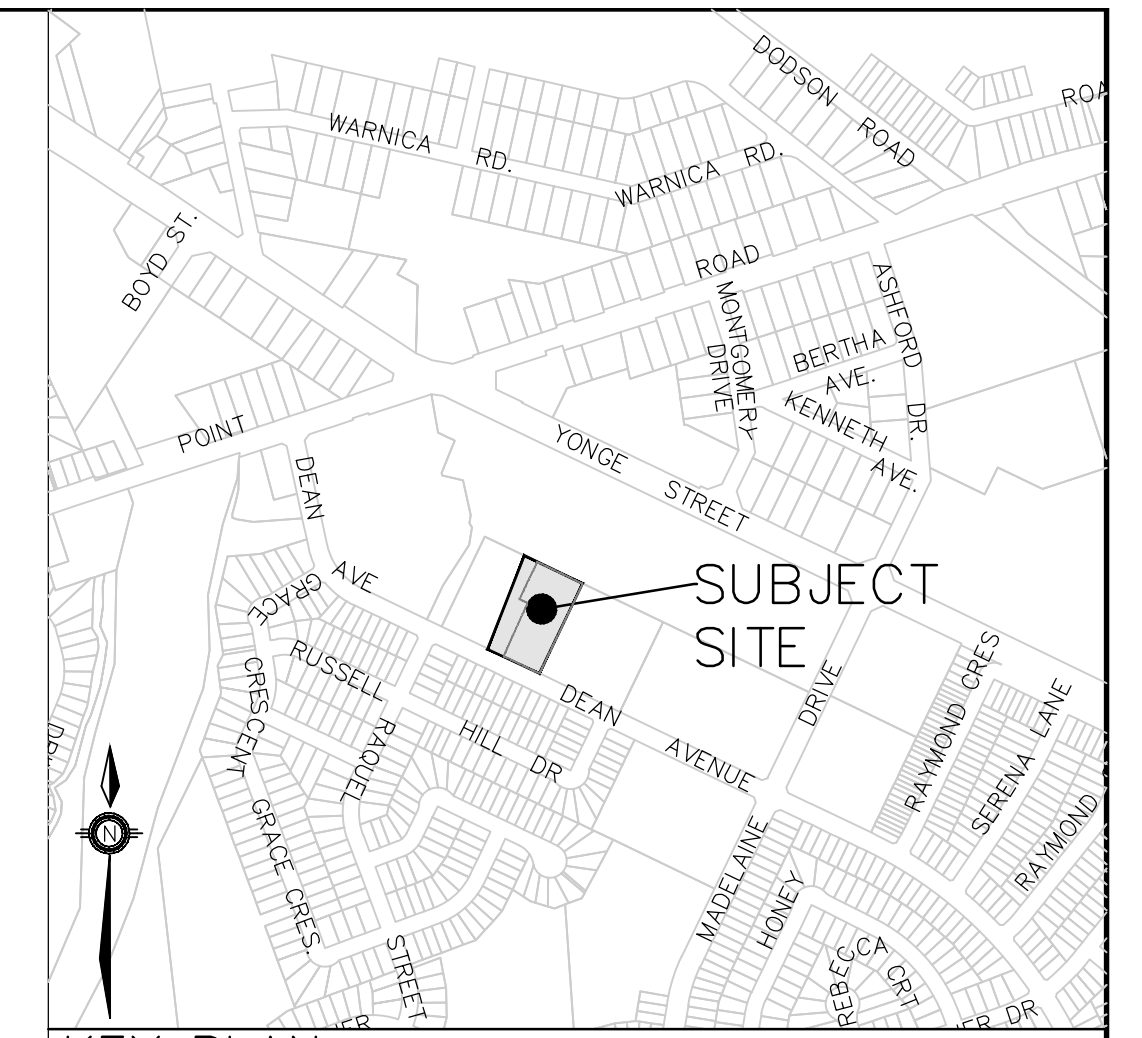
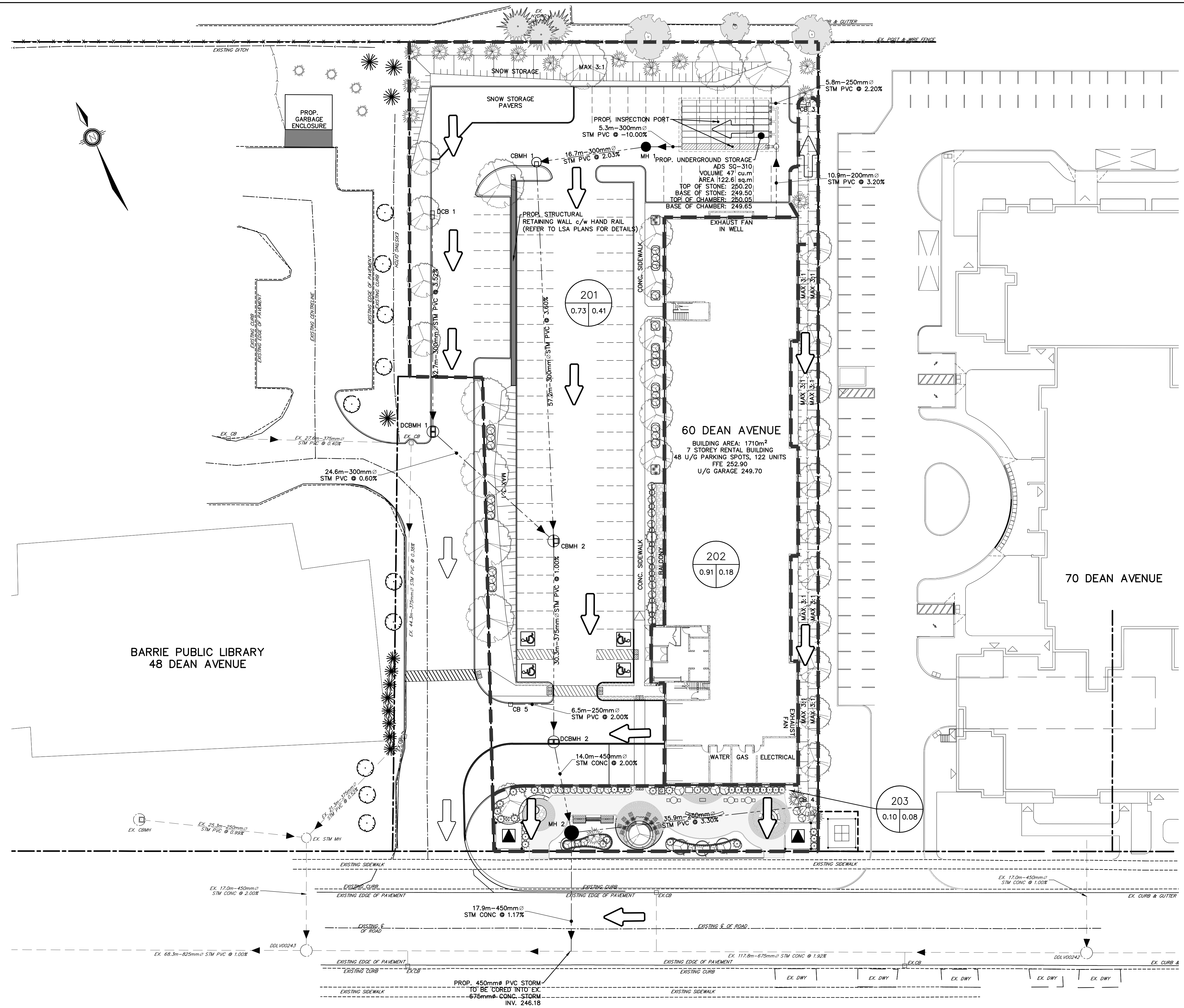
M.G. PLUS
 40148153
 03-07-2025
 PROVINCE OF ONTARIO

NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE
STORMWATER MANAGEMENT PLAN
PRE-DEVELOPMENT CONDITIONS

JONES
 CONSULTING GROUP LTD.
 PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W5
 P. 705.734.2638
 F. 705.734.1058

DESIGN	CG/DR	SCALE: 1:300	DATE	FEB 2025
DRAWN	WS	PROJECT	DWG. NO	
CHECKED	MF	PRA-24067	SWM-1	



KEY PLAN
NTS

LEGEND

- PROPERTY LINE
- EX. CONTOUR AND ELEVATION
- EX. STORM MAINTENANCE HOLE
- EX. CB
- EX. STORM SEWER AND FLOW DIRECTION
- CATCHMENT BOUNDARY
- MH1
- ⊕ DCBMH 1
- ⊕ CBMH 1
- CB
- DCB
- PROP. STORM SEWER AND FLOW DIRECTION
- PROP. TREE
- ➔ DIRECTION OF OVERLAND FLOW
- 301
0.95 0.17 ← CATCHMENT AREA NUMBER
← AREA (ha.)

BARRIE PUBLIC LIBRARY
48 DEAN AVENUE

60 DEAN AVENUE
BUILDING AREA: 1710m²
7 STOREY RENTAL BUILDING
48 U/G PARKING SPOTS, 122 UNITS
FFE 252.90
U/G GARAGE 249.70

70 DEAN AVENUE

BENCHMARK:
BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.1m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.761m
BENCHMARK NO. 0312002009 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312002007. NOTE MONUMENT SET IN CONCRETE. N:4912309.381 E:82744.743
BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:828748.999

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

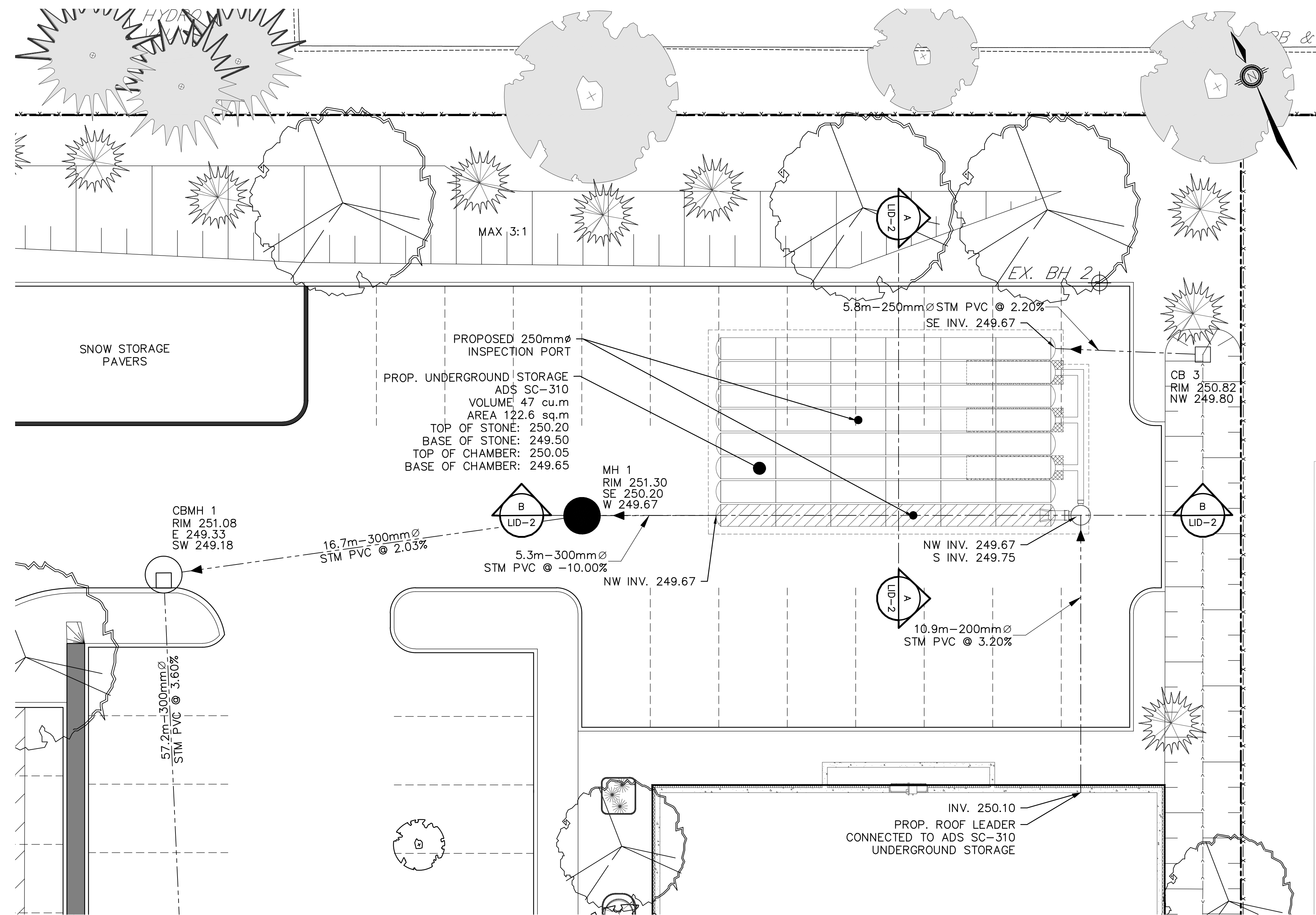
STORMWATER MANAGEMENT PLAN
POST-DEVELOPMENT CONDITIONS

DESIGN	DR/CG	SCALE: 1:300	DATE	FEB 2025
DRAWN	WS	PROJECT	DWG. NO	
CHECKED	MF	PRA-24067	SWM-2	

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2638
F. 705.734.1056

G:\Eng_3D\YARRA-24067\Production\DWG\PRA-24067-DRAINAGE_Plan.dwg layout:SWM-2, Plotted: Mar 07, 2025 @ 9:10am by cspagnon, The Jones Consulting Group, Ltd.



G:\Eng_3D\PRAs\24067\Production\DWG\PRAs\24067-LID-DESIGN.dwg Layout: LID-1 Plotted Mar 06, 2025 @ 2:55pm by cspagnon The Jones Consulting Group Ltd.

BENCHMARK:
 BENCHMARK NO. 0312000007 LOCATED ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.75m
 BENCHMARK NO. 0312000029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
 BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT. BENCHMARK NO. 0312000007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
 BENCHMARK NO. 10118000401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:608748.999

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

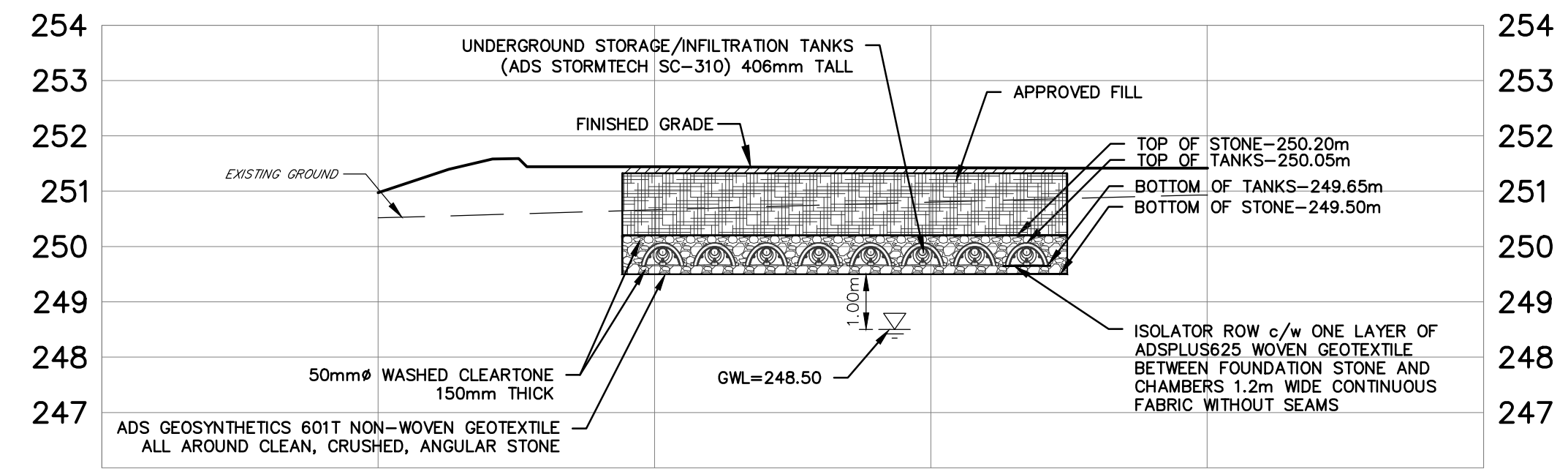


NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE
**LID INFILTRATION GALLERY
 PLAN VIEW**

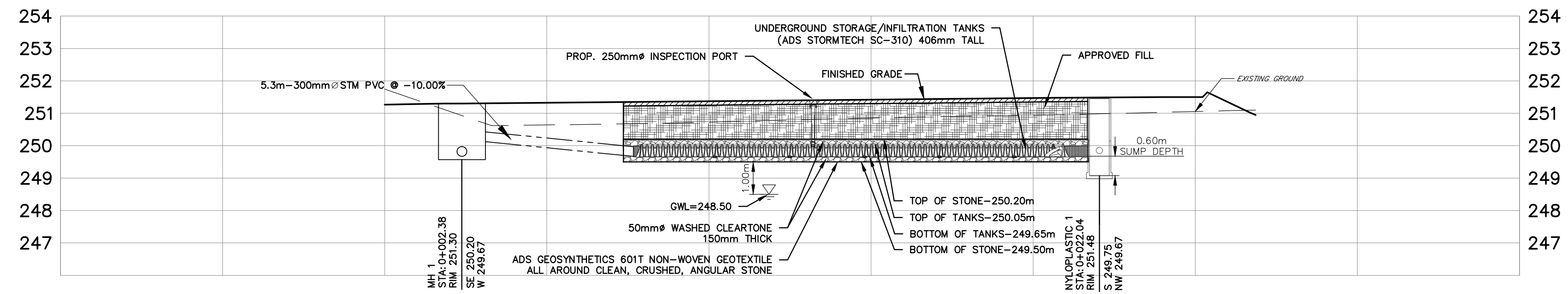
		DESIGN	DR/CG	SCALE: 1:100	DATE	FEB 2025
		DRAWN	WS	PROJECT	DWG. NO	
		CHECKED	MF	PRA-24067	LID-1	

229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W5
 P. 705.734.2638
 F. 705.734.1058

SECTION A-A
1:100



SECTION B-B
1:100



G:\Eng_3D\VPRA-24067\Production\DWG\VPRA-24067-LID DESIGN.dwg Layout:ID-2 Plotted Mar 06, 2025 @ 3:06pm by cspagnon The Jones Consulting Group Ltd.

BENCHMARK:
 BENCHMARK NO. 0312002007 LOCATED ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.75m
 BENCHMARK NO. 0312003029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
 BENCHMARK NO. 0312004004 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312003007. NOTE MONUMENT SET IN CONCRETE. N:4912309.381 E:82744.743
 BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:828748.999

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL

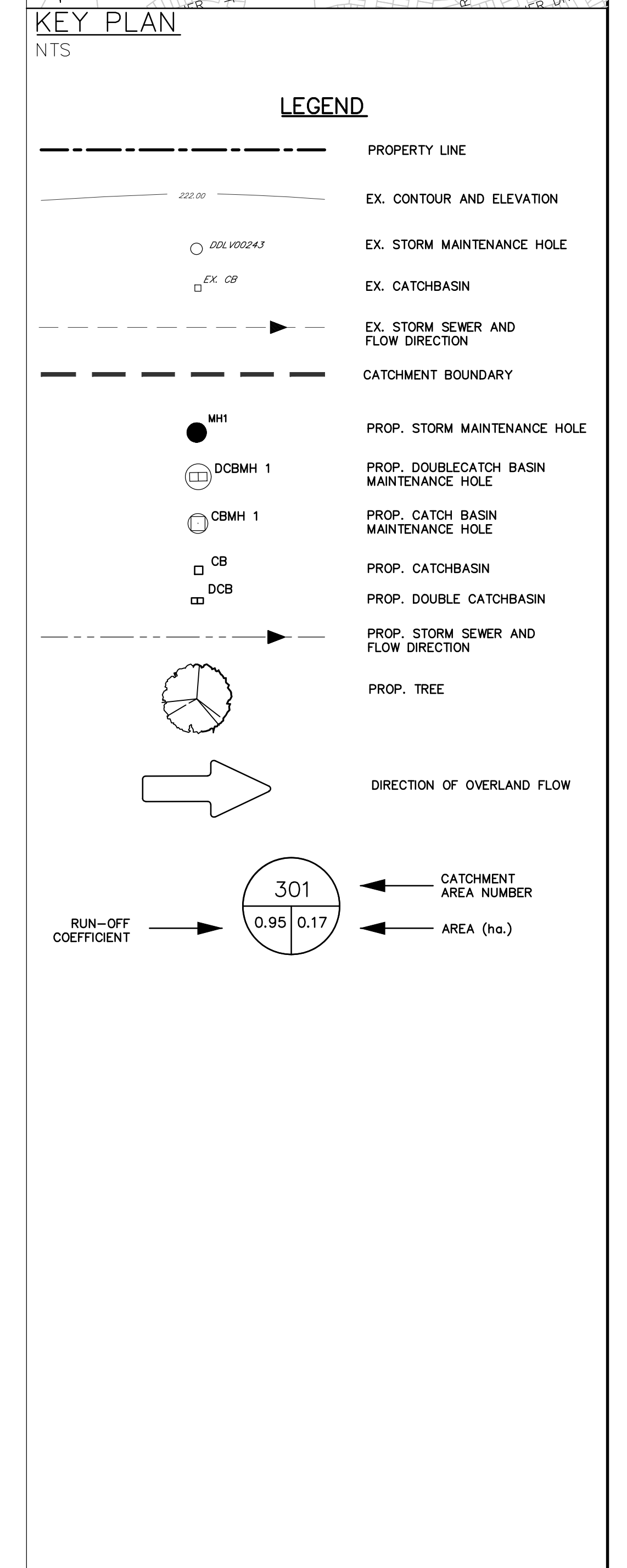
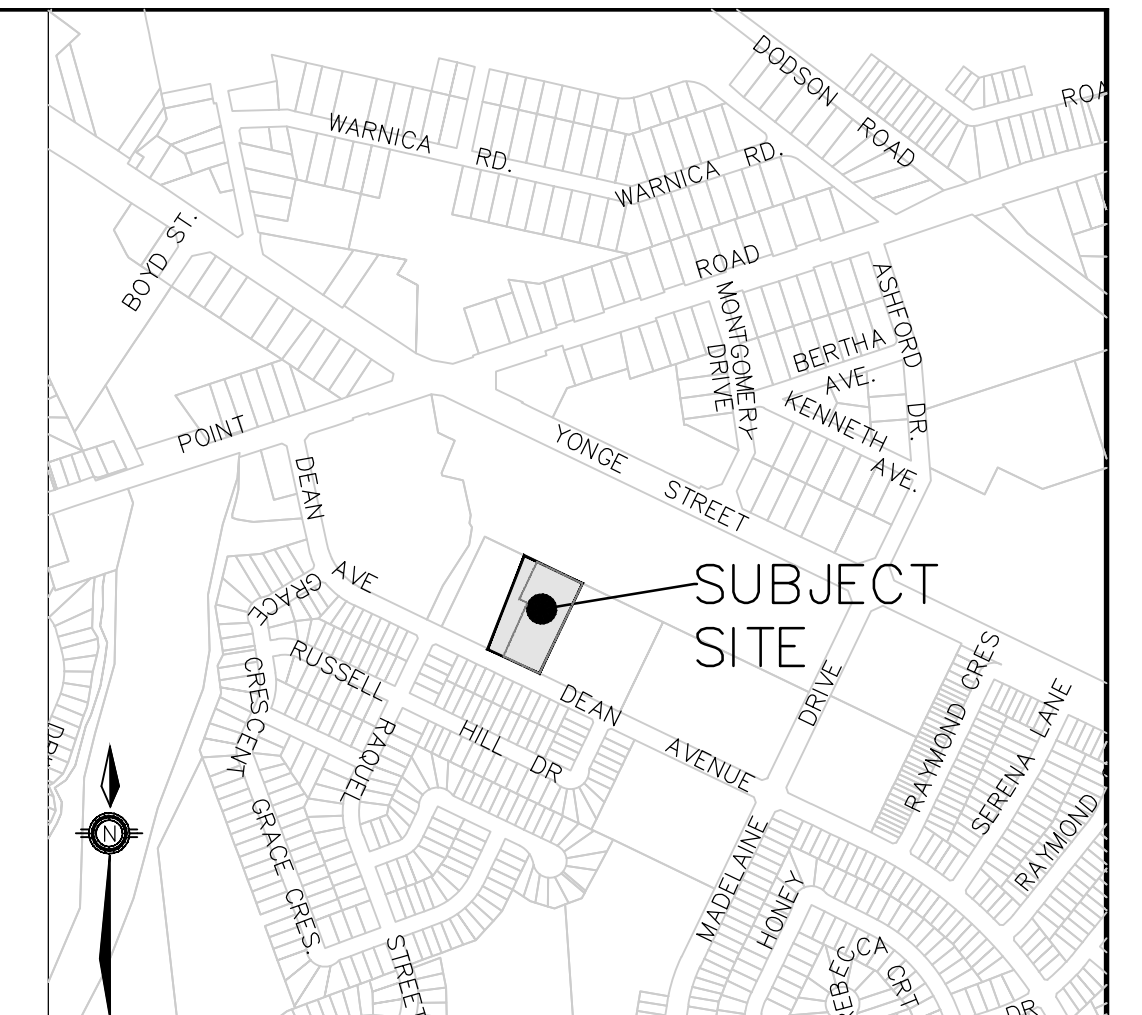
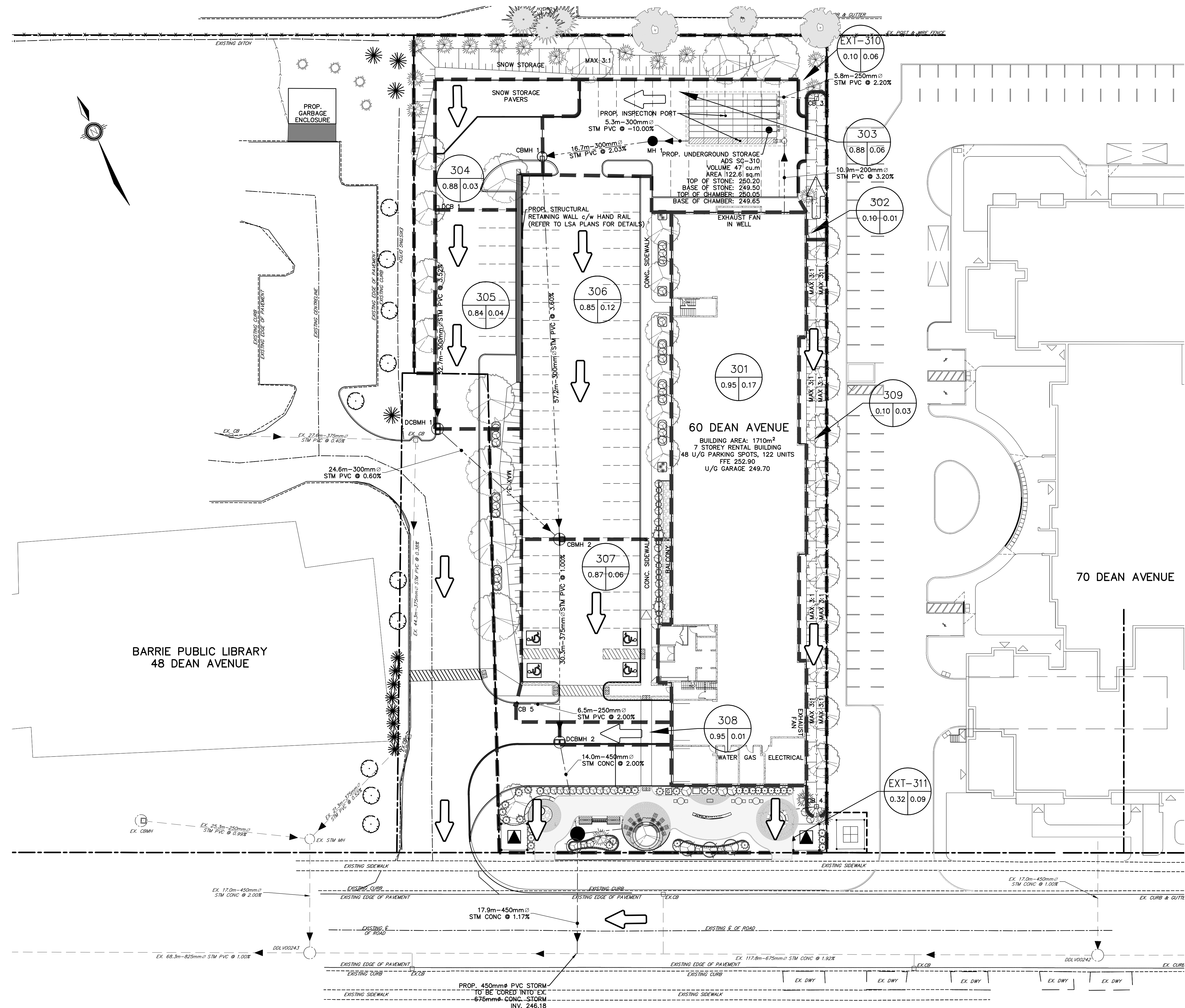


NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

LID INFILTRATION GALLERY
SECTIONS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2638
F. 705.734.1058

DESIGN	DR/CG	SCALE: AS NOTED	DATE	FEB 2025
DRAWN	WS	PROJECT	DWG. NO	
CHECKED	MF	PRA-24067	LID-2	



G:\Eng_3D\PRAs-24067-Production\DWG\PRAs-24067-DRAINAGE_Plan.dwg layout:STM-1, Plotted Mar 07, 2025 @ 9:11am by cspagnon The Jones Consulting Group Ltd.

BENCHMARK:

BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.763m

BENCHMARK NO. 0312002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m

BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312002007. NOTE MONUMENT SET IN CONCRETE. N:4912309.381 E:82744.743

BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:828748.999

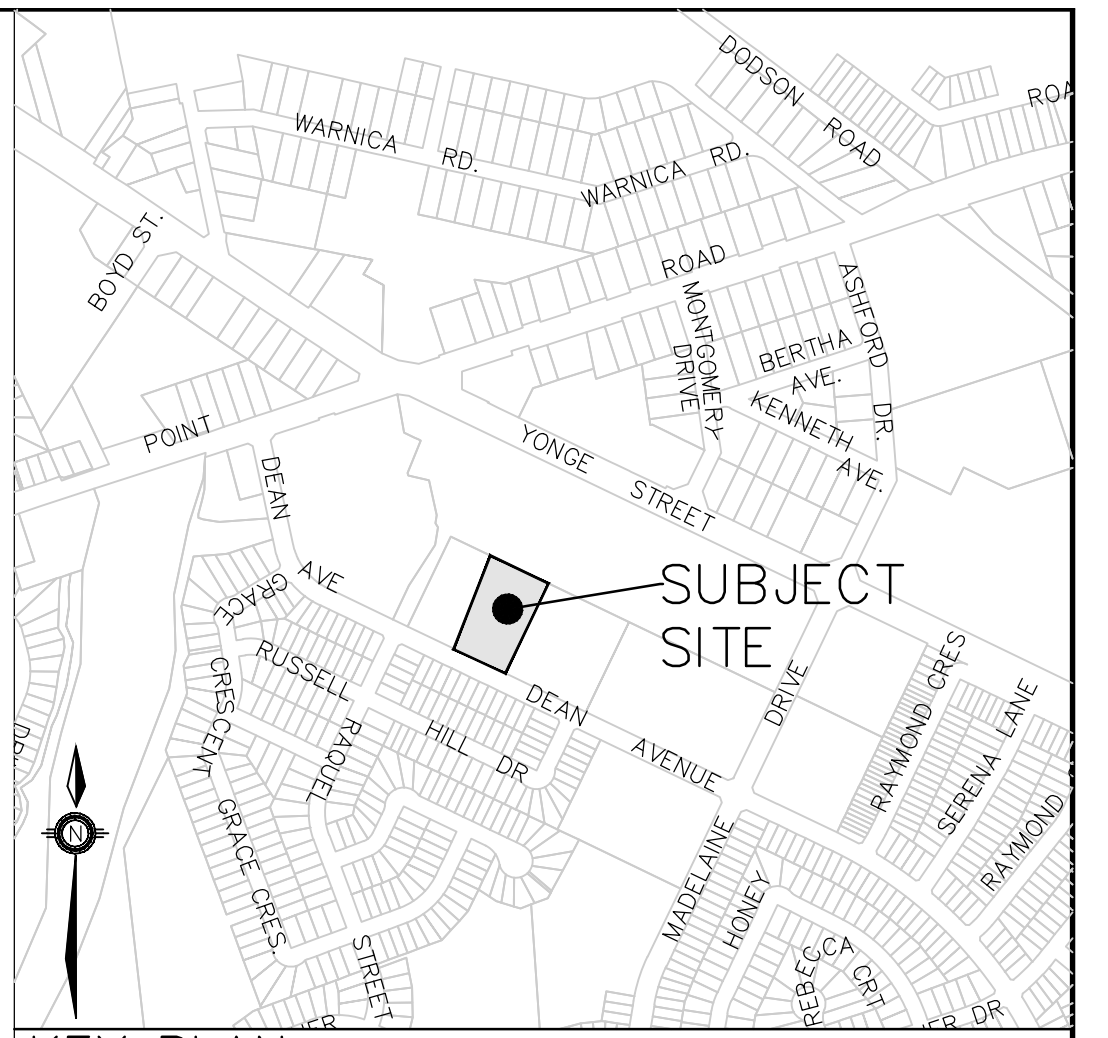
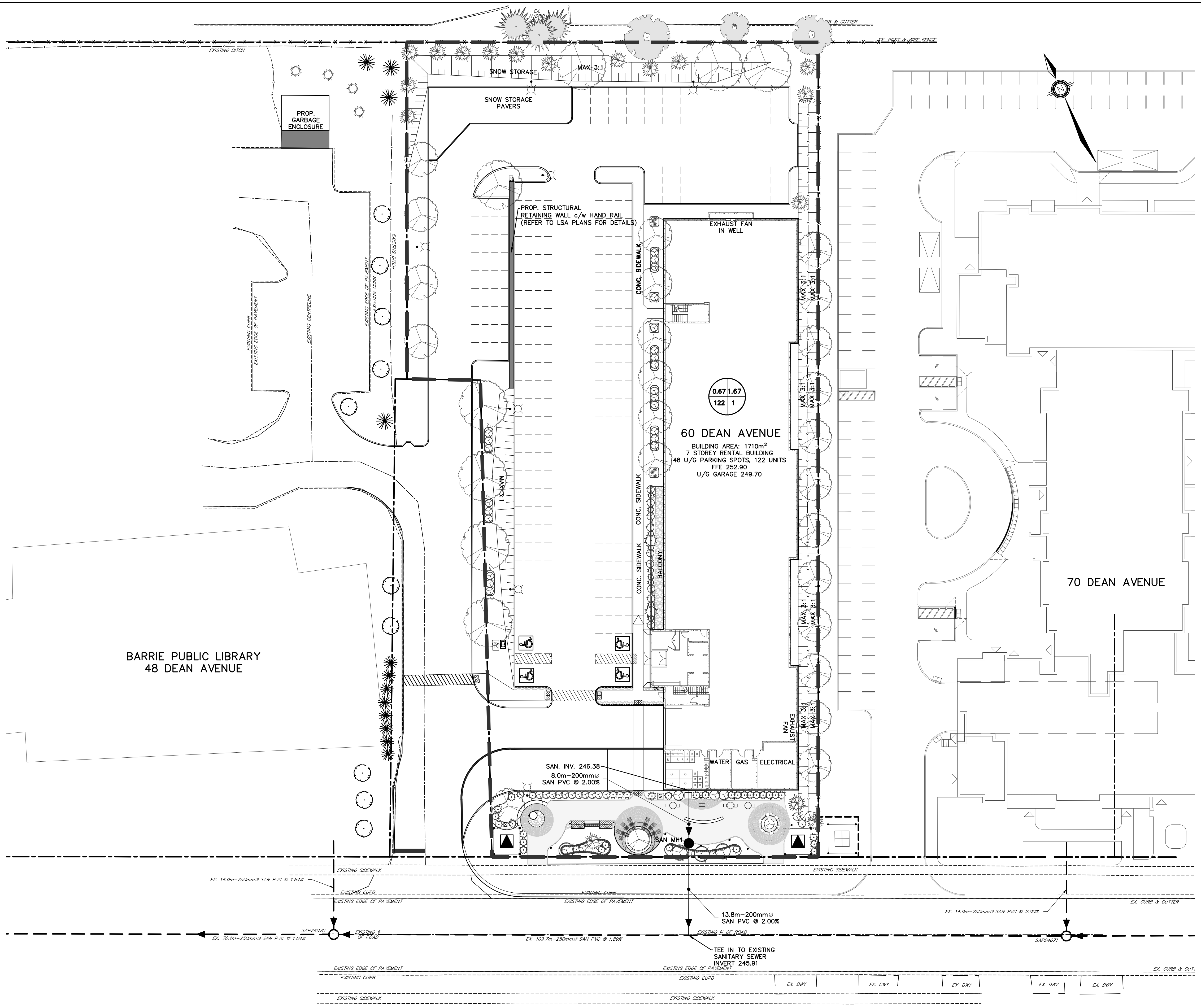
NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE

STORM SEWER
 SUBCATCHMENT PLAN

229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W5
 P. 705.734.2638
 F. 705.734.1056

DESIGN DR/CG	SCALE: 1:300	DATE FEB 2025
DRAWN WS	PROJECT PRA-24067	DWG. NO DWG-1
CHECKED MF		STM-1



KEY PLAN
NTS

LEGEND

- PROPERTY LINE
- EXISTING MAINTENANCE HOLE
- EXISTING SANITARY SEWER AND FLOW DIRECTION
- SAN MH 1
- PROPOSED MAINTENANCE HOLE
- PROPOSED SANITARY SEWER AND FLOW DIRECTION
- - - - - SANITARY CATCHMENT AREA

AREA (ha) → 0.67 1.67 ← PERSONS PER UNIT (PPU)

No. OF UNITS → 122 1 ← CATCHMENT ID NUMBER

BARRIE PUBLIC LIBRARY
48 DEAN AVENUE

0.67 1.67
122 1
60 DEAN AVENUE
BUILDING AREA: 1710m²
7 STOREY RENTAL BUILDING
48 U/G PARKING SPOTS, 122 UNITS
FFE 252.90
U/G GARAGE 249.70

70 DEAN AVENUE

BENCHMARK:
BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.75m
BENCHMARK NO. 0312003029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312003007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:658748.999

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL



NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

SANITARY DRAINAGE AREA PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2638
F. 705.734.1058

DESIGN DR/CG	SCALE: 1:300	DATE JAN 2025
DRAWN CG	PROJECT PRA-24067	DWG. NO DWG-1
CHECKED MF		

G:\Eng_3D\PRAs-24067\Production\DWGS\PRAs-24067-SANITARY DRAINAGE PLAN.dwg Layout: SAN-1 Printed: Mar 07, 2025 @ 9:16am by caggon The Jones Consulting Group Ltd.



SANITARY SEWER DESIGN - LOCAL SEWER
Development Details Basis

DESIGN SHEET 1 of 1
FILE NO PRA-24067 (50)
CONTRACT / PROJECT 60 Dean Avenue
DATE Mar-25

$n \geq 0.013$
 $M = 5/P^{0.2}$ Babbitt
 $M=1+[14/(4+P^{0.5})]$ Harmon
 $Q_p = P \cdot q \cdot M / 86.4$
 $Q_i = I \cdot A$
 $Q_{tot} = Q_p + Q_i$
 $Q_{Commercial}$

Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; $M \geq 2$), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.
(Peak population flow where; $q = 225$ L/day/person; $P =$ population in thousands) 225 litres/person/day
(Peak extraneous flow; $I = 0.1$ L/s/ha over development area)
(Total peak flow as the sum of peak population flow and peak extraneous flow)
See Note 1.

AREA - STREET	MAINTENANCE HOLE		DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBITT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q _p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q _i (l/s)	Q _{tot} (l/s)	L (m)	D (mm)	S (%)	Q _f FULL (l/s)	d/D ⁽²⁾	d/D ⁽³⁾ >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial ⁽¹⁾ (m/s)	Velocity ⁽⁴⁾ > 0.6 (m/s)
	FROM	TO																						
1A - 60 Dean Avenue	Building	SAN MH1	122		1.67	204	204	6.873	4.145	6.873	3.647	0.67	0.67	0.067	3.713	8.0	200	2.00	46.384	0.191	Ok	1.476	0.878	Ok
1B -	SAN MH1	Dean Avenue Main				0	204	6.873	4.145	6.873	3.647	0.67	0.67	0.067	3.714	13.8	200	2.00	46.384	0.191	Ok	1.476	0.878	Ok

Date: March 2025
CALCULATED BY: WS
CHECKED BY: MF

- (1) without extraneous flow
 - (2) with extraneous flow
 - (3) d/D>0.5 for pipes 375 and less, d/D>0.7 for pipes greater than 375
 - (4) Velocity check based on the lesser of full flow or partial velocity
- Numbers in Blue are cell formulas

Residential Development
Storm Sewer Catchment Areas & Sizing

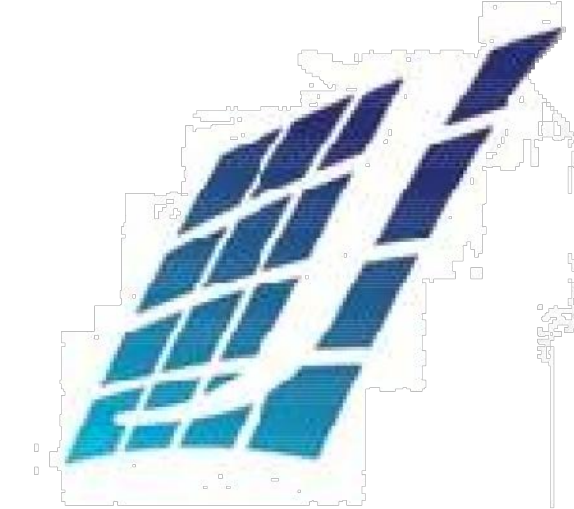
CLIENT: Nestwise Inc.

DATE: March 2025

PROJECT: 60 Dean Avenue, Barrie

DESIGN: WS
CHECKED BY: MF

FILE: PRA-24067 (50)



5 Year Storm Sewer Sizing

AREAS	MANHOLE		LENGTH (m)	INCREMENT			TOTAL CA	FLOW TIME (min)		I (mm/h)	TOTAL Q (cms)	S (%)	D (mm)	Q FULL (cms)	V FULL (m/s)	PERCENT FULL (%)
	FROM	To		C	A	CA		TO	IN							
301	BLDG	LID	10.9	0.95	0.17	0.16	0.16	10.00	0.10	109	0.049	3.2	200	0.059	1.9	84.0
302	CB3	LID	5.8	0.10	0.01	0.0007	0.0007	10.00	0.05	109	0.00022	2.2	250	0.088	1.8	0.3
	LID/MH1	CBMH1	16.7				0.16	10.10	0.14	109	0.049	2.0	300	0.138	1.9	35.6
303	CBMH1	CBMH2	57.2	0.88	0.06	0.06	0.22	10.24	0.37	108	0.066	3.6	300	0.183	2.6	35.8
304	DCB1	DCBMH1	32.7	0.88	0.03	0.0287	0.03	10.00	0.21	109	0.009	3.5	300	0.181	2.6	4.8
305	DCBMH1	CBMH2	24.6	0.84	0.04	0.04	0.06	10.21	0.39	108	0.019	0.6	300	0.075	1.1	25.6
306	CBMH2	TEE1	24.6	0.85	0.12	0.10	0.39	10.60	0.26	106	0.114	1.0	375	0.175	1.6	64.8
307	CB5	TEE1	6.5	0.87	0.06	0.05	0.05	10.00	0.06	109	0.016	2.0	250	0.084	1.7	18.7
	TEE1	DCBMH2	5.6				0.44	10.86	0.06	104	0.127	1.0	375	0.175	1.6	72.6
308	DCBMH2	MH2	14.0	0.95	0.01	0.01	0.44	10.92	0.09	104	0.128	2.0	450	0.403	2.5	31.9
309	CB4	MH2	35.9	0.10	0.03	0.003	0.003	10.00	0.27	109	0.001	3.3	250	0.108	2.2	0.8
	MH2	DEAN AVE	17.9				0.45	11.01	0.15	104	0.129	1.2	450	0.308	1.9	41.7

Q = 0.0028 * C * I * A (cms); C=RUNOFF COEFFICIENT; I-RAINFALL INTENSITY (5 Year) = 843.019 / (T.C. + 4.582)^0.763; A=AREA (ha)

BENCHMARK:

BENCHMARK NO. 0312000207 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.75m
BENCHMARK NO. 0312000209 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312000207. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. ELEV. 191.45m



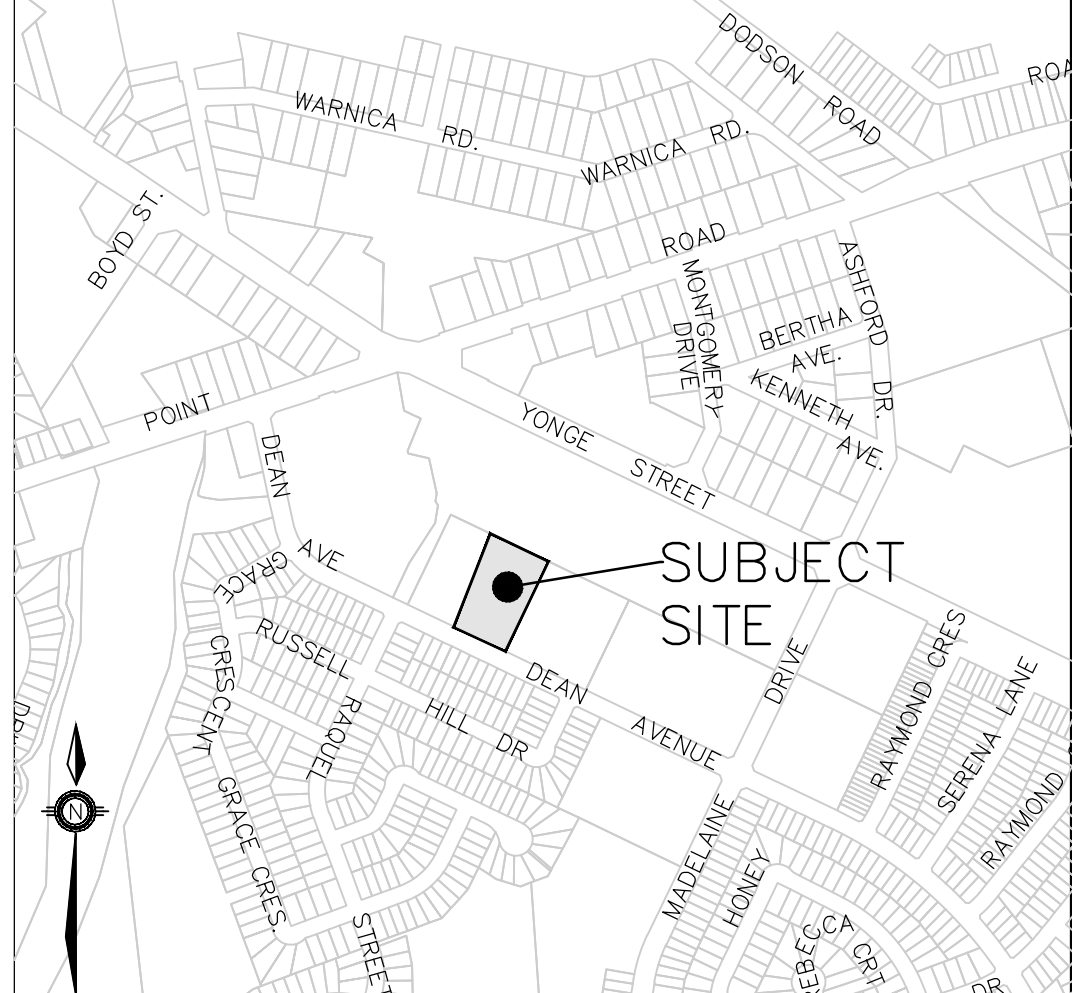
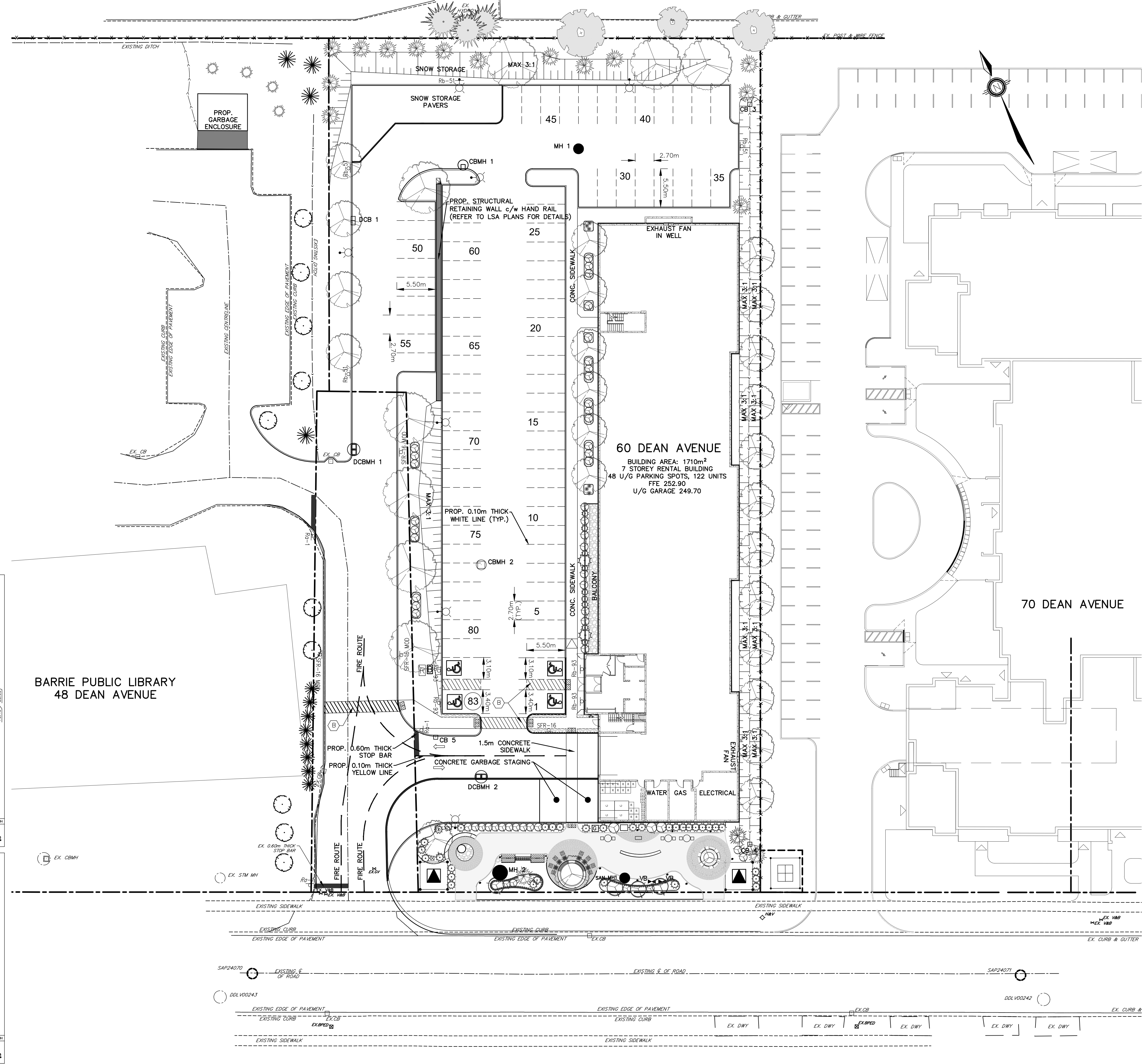
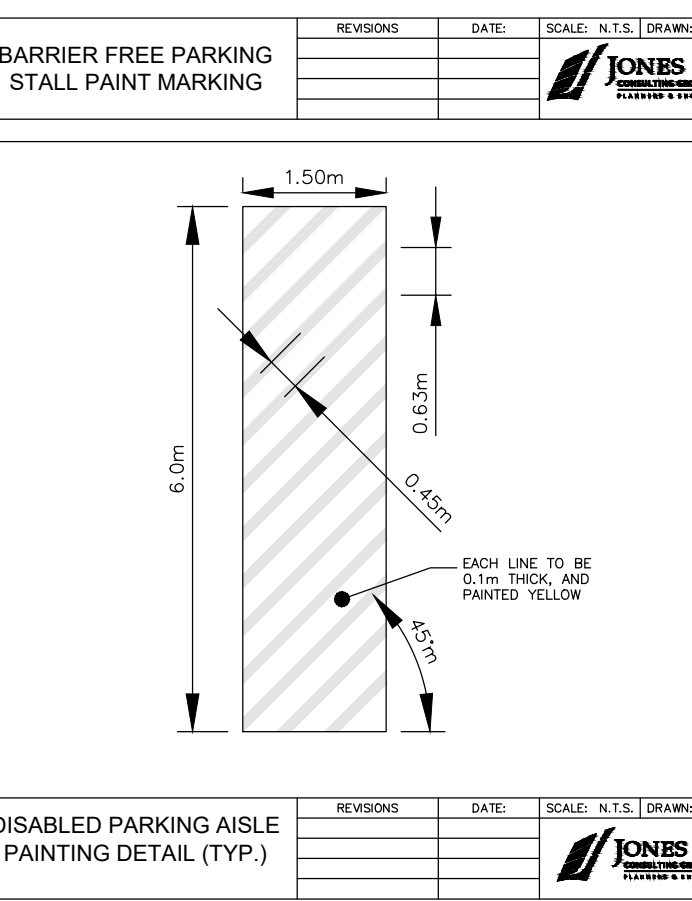
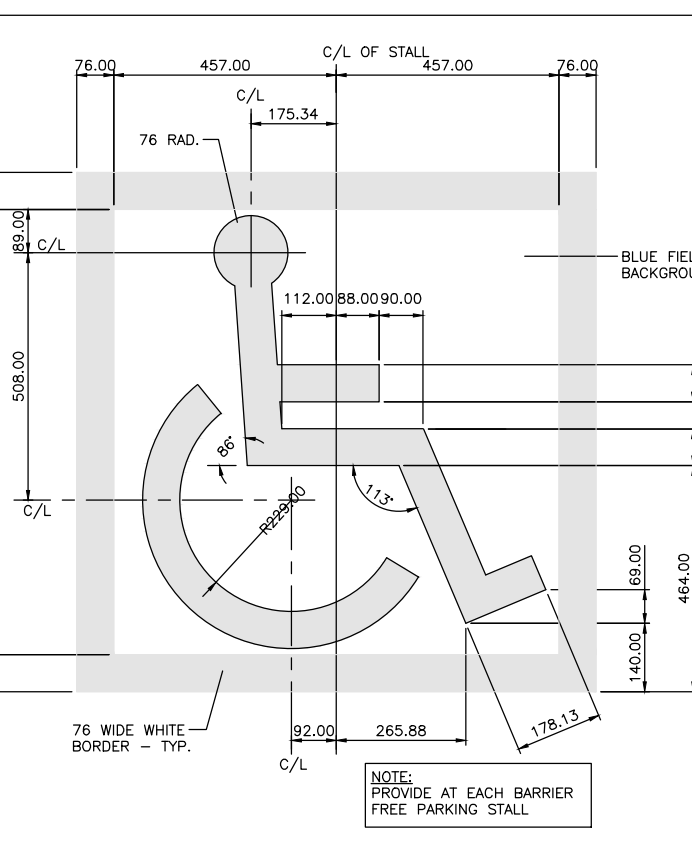
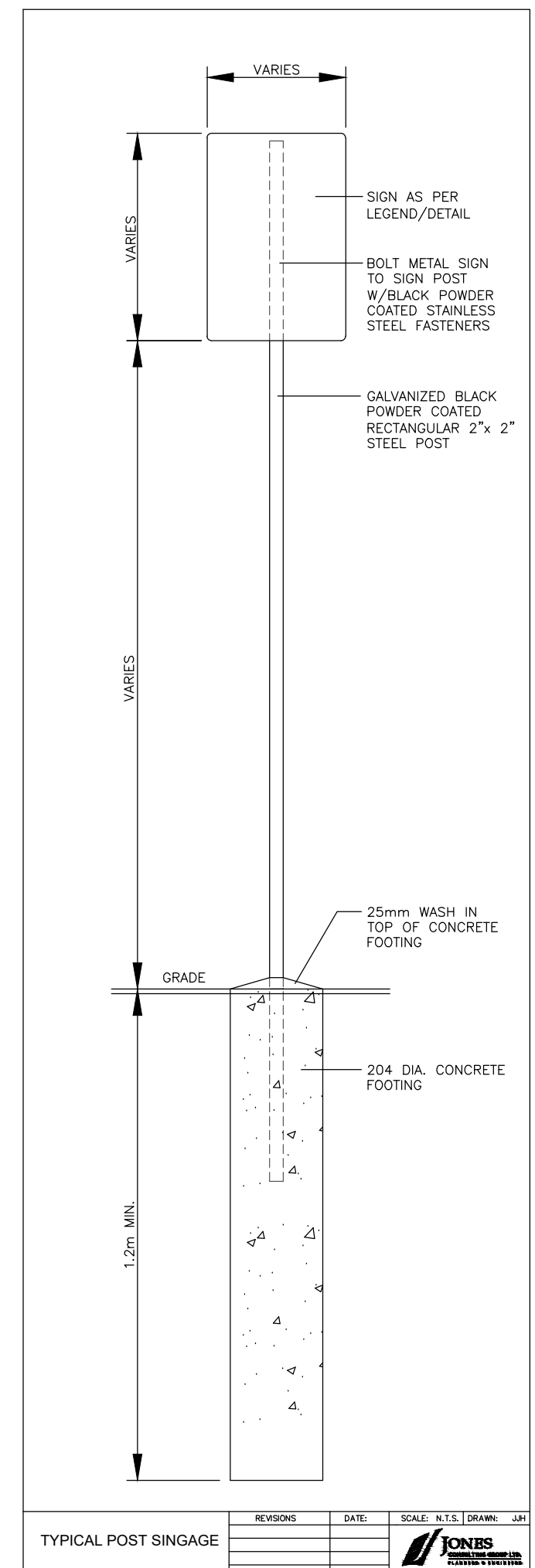
NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE
STORM AND SANITARY
DESIGN SHEETS



229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2638
F. 705.734.1058

DESIGN	DR/CG	SCALE: N/A	DATE	FEB 2025
DRAWN	WS	PROJECT	DWG. NO	
CHECKED	MF	PRA-24067	DS-1	

1.	FIRST SUBMISSION	MAR 2025	MF
NO.	REVISIONS	DATE	INITIAL



KEY PLAN
NTS

LEGEND

- Ro-1 STOP SIGN
- Rb-51 NO PARKING SIGN
- Rb-93 ACCESSIBLE PARKING PERMIT SIGN
- SFR-16 NO PARKING FIRE ROUTE MOD
- WHEELCHAIR ACCESSIBLE PARKING
- PROPOSED LIGHT STANDARD c/w Rb-51 SIGN ATTACHED
- PROPOSED TACTILE WARNING PLATES PER OPSD 310.039
- SOLID YELLOW, 10cm THICK
- STOP BAR, 60cm THICK
- PROP. SLOPE 3:1 (MAX)
- PROP. SWALE
- EX. SANITARY MAINTENANCE HOLE
- EX. STORM MAINTENANCE HOLE
- EX. CATCHBASIN
- PROP. VALVE
- PROP. SANITARY MAINTENANCE HOLE
- PROP. STORM MAINTENANCE HOLE
- PROP. DOUBLECATCH BASIN MAINTENANCE HOLE
- PROP. CATCHBASIN
- PROP. STRUCTURAL RETAINING WALL c/w RAILING REFER TO LSA PLANS

NOTE: ① TO DENOTE PAVEMENT MARKING, DURABLE

- NOTE:**
- ALL PAVEMENT MARKINGS AND TRAFFIC SIGNS SHALL CONFORM TO THE ONTARIO TRAFFIC MANUAL.
 - PAVEMENT MARKINGS FOR PARKING STALLS SHALL BE PAINTED WHITE AND CONFORM TO OPSD 1712.
 - PAINT COLOR SPECIFIED ON DRAWING, PAINT TO BE QUICK DRYING WATER BASED LATEX PAINT (WITHOUT GLASS BEADS).

BENCHMARK:

BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 250.55m

BENCHMARK NO. 0312002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 250.55m

BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT. ELEV. 250.55m

BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. ELEV. 250.55m

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

NESTWISE INC.
60 DEAN AVE
CITY OF BARRIE

PAVEMENT MARKING AND SIGNAGE PLAN

DESIGN DR/CG
DRAWN CG
CHECKED MF

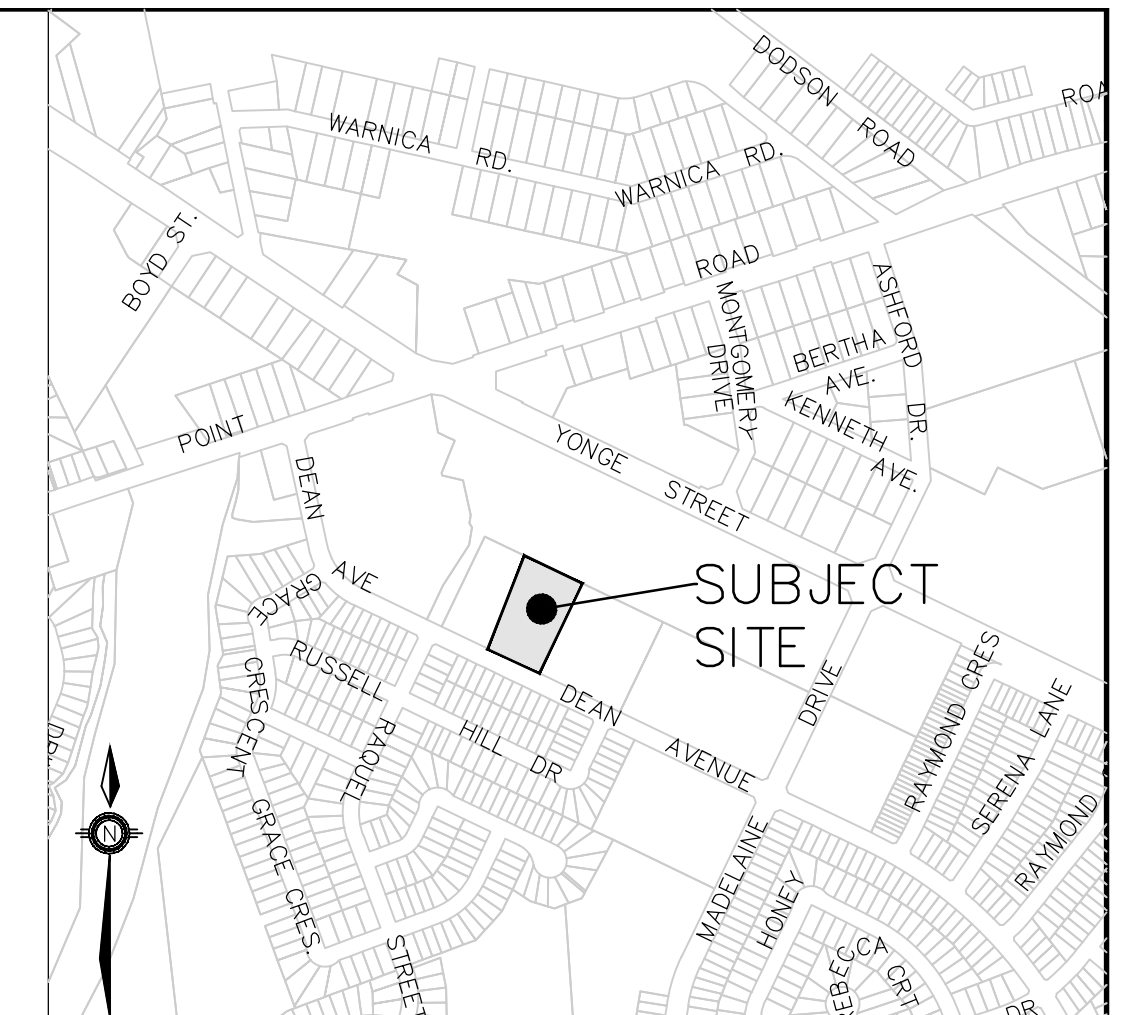
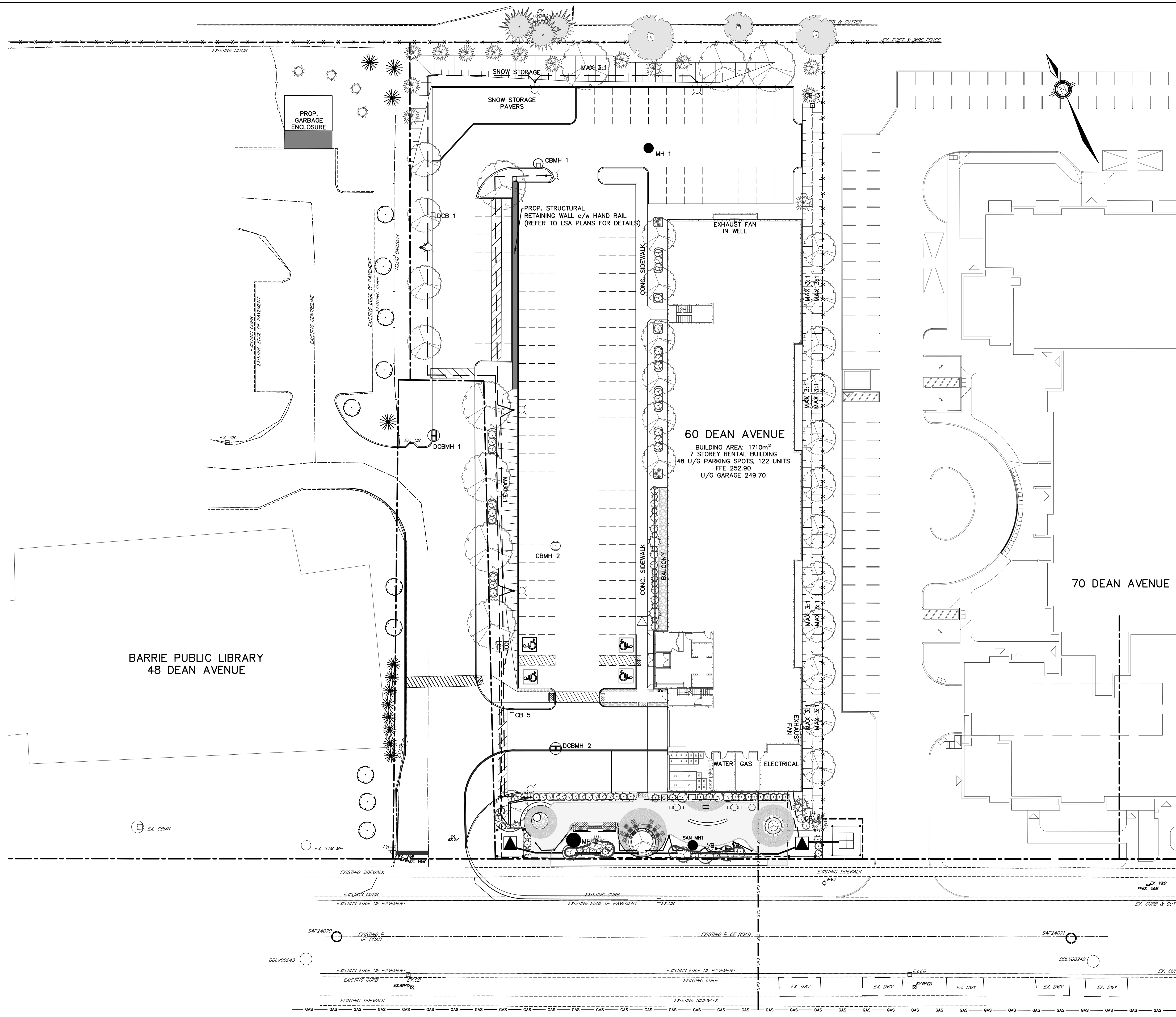
SCALE: 1:300
PROJECT PRA-24067

DATE JAN 2025
DWG. NO PM-1

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
Barrie, ON L4N 0W5
P. 705.734.2638
F. 705.734.1056

G:\Eng_3D\PRAs\Production\DWG\PRAs\24067-PAVEMENT MARKING.dwg Layout:PM-1 Plotted Mar 07, 2025 @ 9:13am by: cspagnon The Jones Consulting Group Ltd.



KEY PLAN
NTS

LEGEND

	EX. TRANSFORMER
	EX. GASMAIN
	PROP. POWER PEDESTAL
	PROP. PRIMARY DUCTBANK
	UNDERGROUND CONCRETE ENCASED
	PROP. SECONDARY DUCTBANK
	UNDERGROUND CONCRETE ENCASED
	PROP. LIGHTING DUCT, UNDERGROUND DIRECT BURIED
	PROP. UNDERGROUND COMMUNICATION DUCT
	PROP. LIGHT STANDARD
	PROP. 3-PHASE PAD MOUNTED TRANSFORMER c/w VAULT AND GROUND GRID
	PROP. CONCRETE ENCASED DUCTBANK
	PROP. BELL BOX
	PROP. ROGERS BOX
	PROP. SLOPE 3:1 (MAX)
	PROP. SWALE
	EX. SANITARY MAINTENANCE HOLE
	EX. STORM MAINTENANCE HOLE
	EX. CATCHBASIN
	PROP. VALVE
	PROP. SANITARY MAINTENANCE HOLE
	PROP. STORM MAINTENANCE HOLE
	PROP. DOUBLECATCH BASIN MAINTENANCE HOLE
	PROP. CATCH BASIN MAINTENANCE HOLE
	PROP. CATCHBASIN
	PROP. GAS LINE
	PROP. STRUCTURAL RETAINING WALL c/w RAILING REFER TO LSA PLANS

G:\Eng_3D\PARA-24067\Production\DWG\PARA-24067-COMPOSITE UTILITY PLAN.dwg Layout\CUP-1 Plotted Mar 07, 2025 @ 9:14pm by cpagnon The Jones Consulting Group Ltd.

BENCHMARK:
 BENCHMARK NO. 0312002007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.75m
 BENCHMARK NO. 0312002029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
 BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT #0312002007. NOTE MONUMENT SET IN CONCRETE. N:4912309.381 E:82744.743
 BENCHMARK NO. 1011800401 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N:4911948.724 E:828748.999

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF



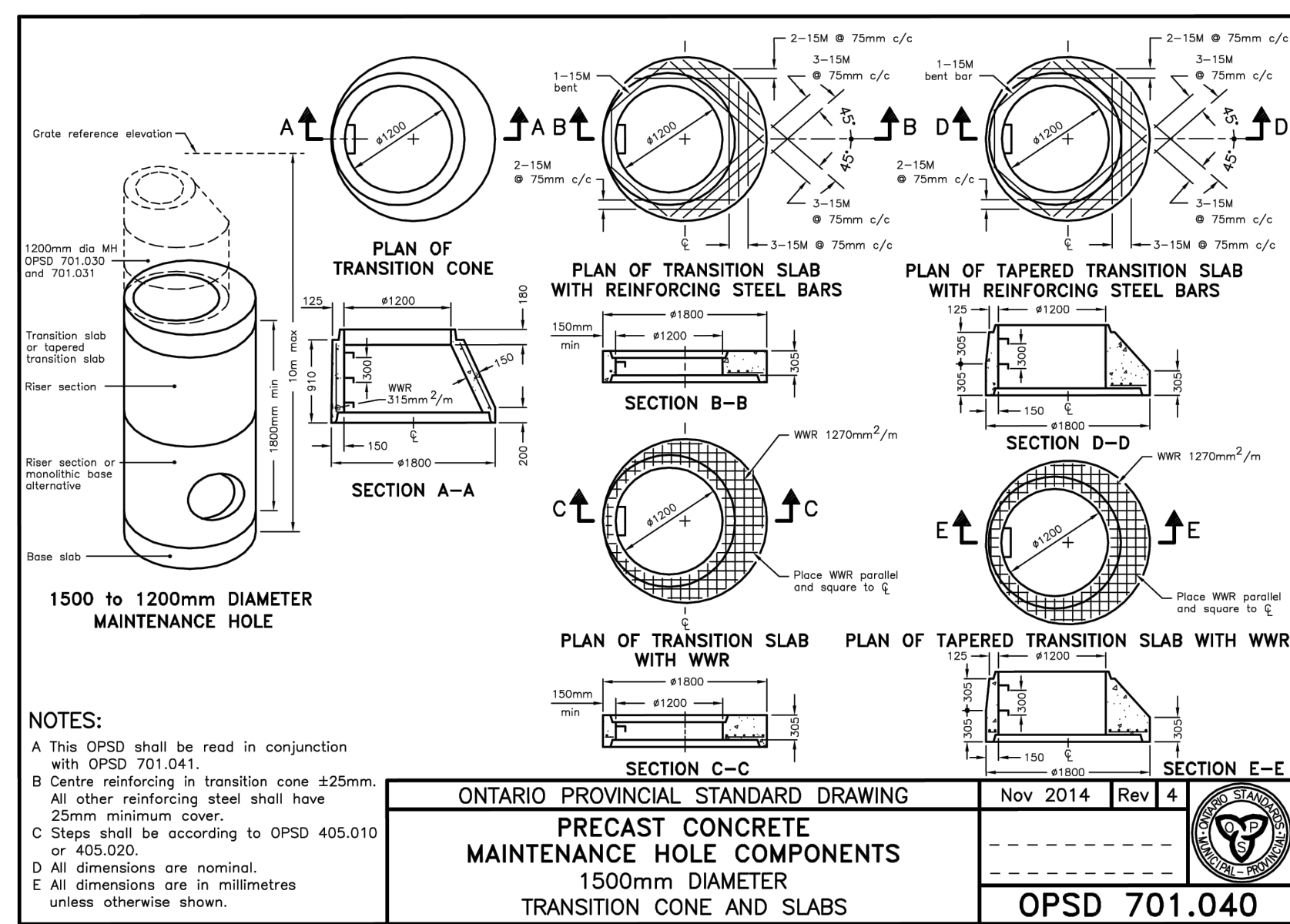
NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE

COMPOSITE UTILITY PLAN

JONES CONSULTING GROUP LTD.
 PLANNERS & ENGINEERS

229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W5
 P. 705.734.2638
 F. 705.734.1056

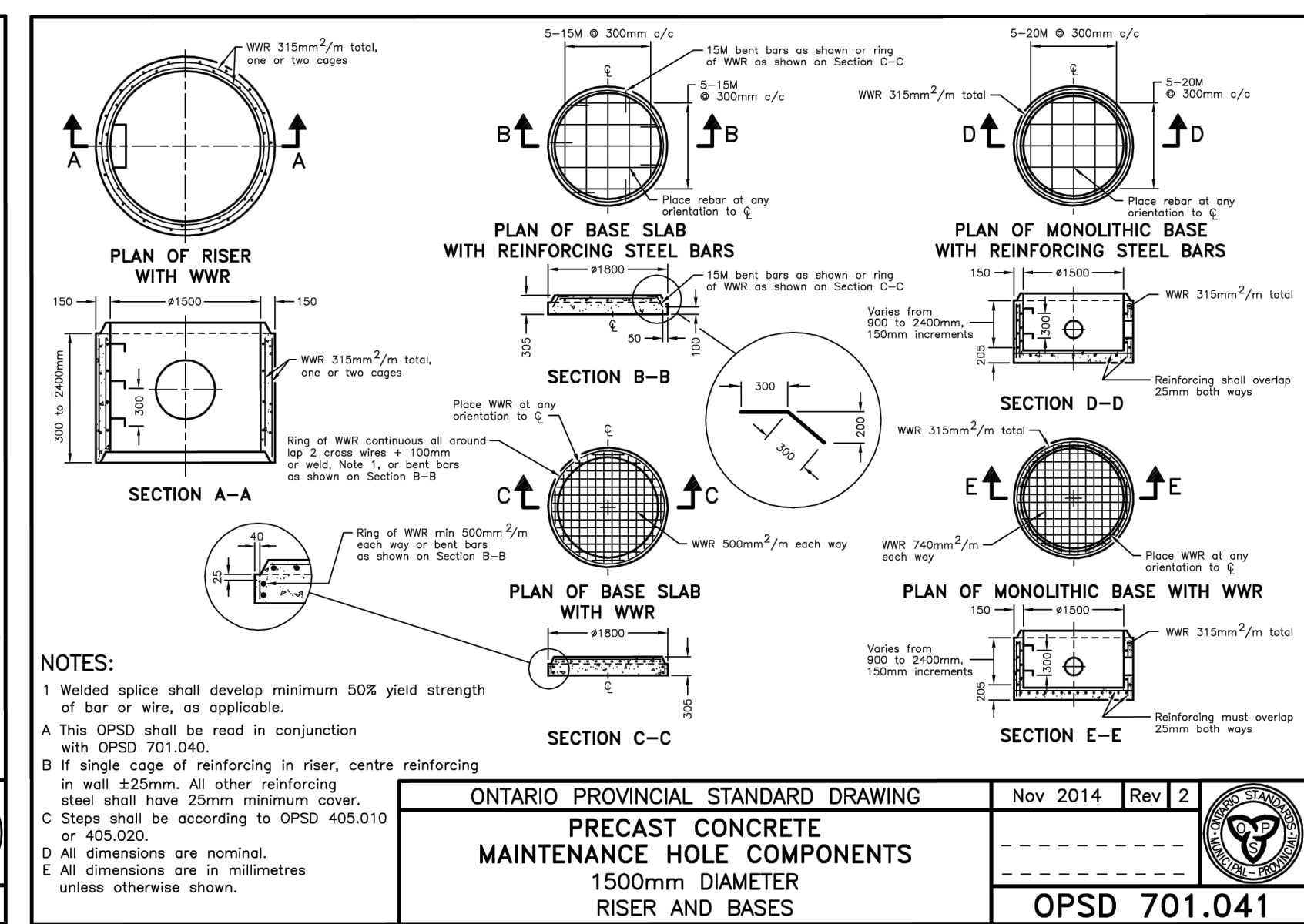
DESIGN DR/CG	SCALE: 1:300	DATE JAN 2025
DRAWN CG	PROJECT PRA-24067	DWG. NO DWG-1
CHECKED MF		CUP-1



1500 to 1200mm DIAMETER MAINTENANCE HOLE

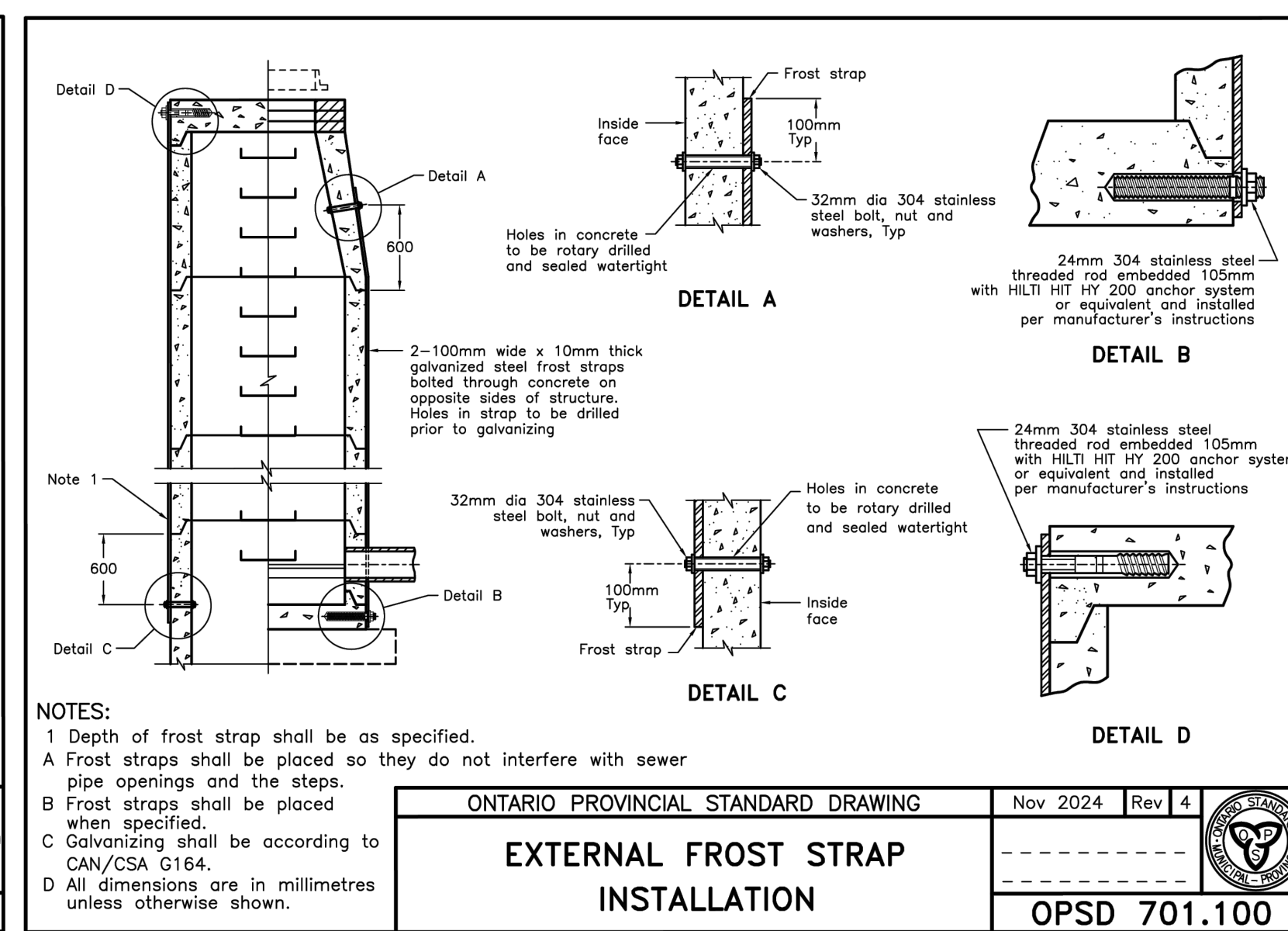
NOTES:
 A This OPSD shall be read in conjunction with OPSD 701.041.
 B Centre reinforcing in transition cone ±25mm. All other reinforcing steel shall have 25mm minimum cover.
 C Steps shall be according to OPSD 405.010 or 405.020.
 D All dimensions are nominal.
 E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 4
PRECAST CONCRETE MAINTENANCE HOLE COMPONENTS		
1500mm DIAMETER TRANSITION CONE AND SLABS		
OPSD 701.040		



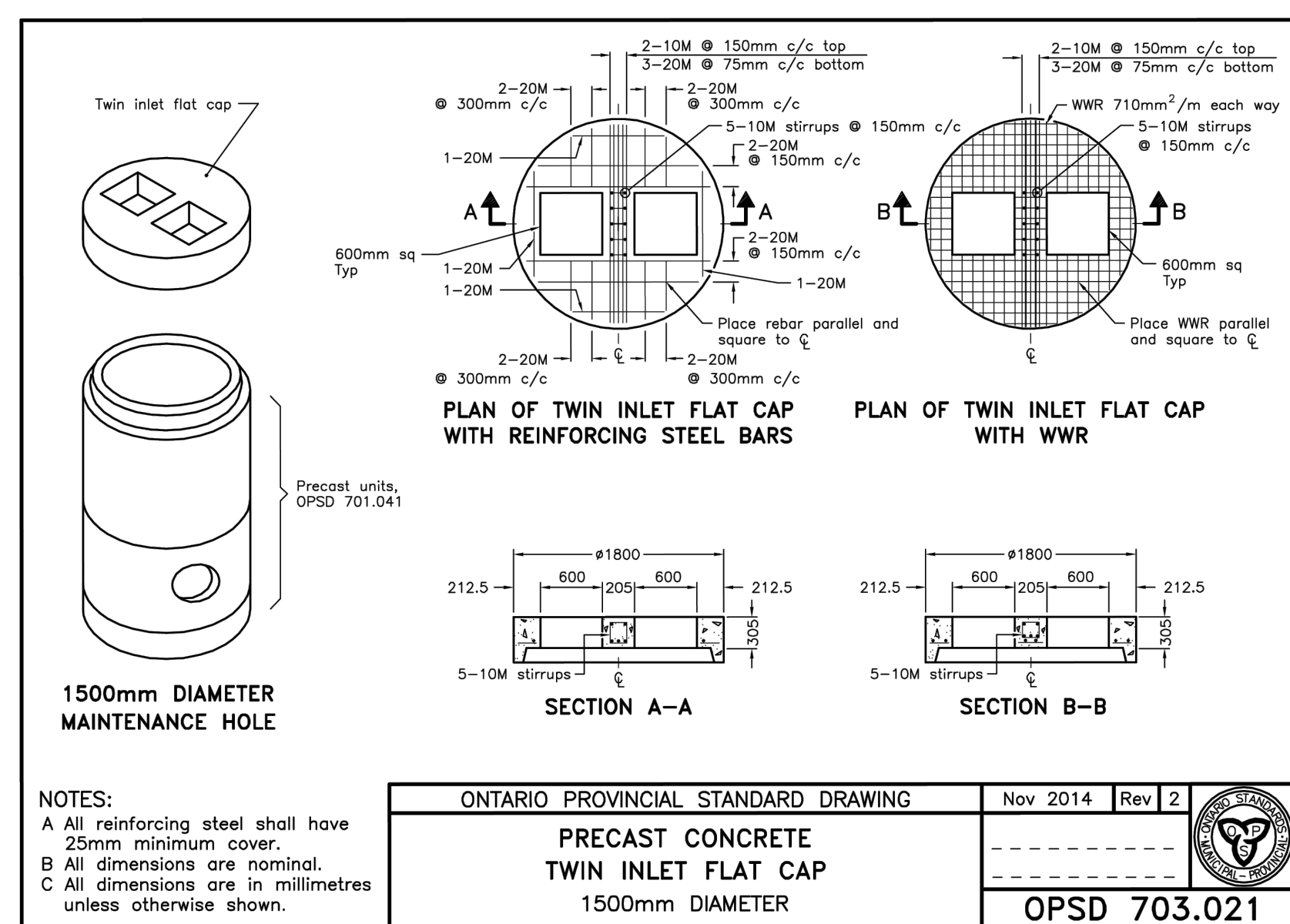
NOTES:
 1 Welded splice shall develop minimum 50% yield strength of bar or wire, as applicable.
 A This OPSD shall be read in conjunction with OPSD 701.040.
 B If single cage of reinforcing in riser, centre reinforcing in wall ±25mm. All other reinforcing steel shall have 25mm minimum cover.
 C Steps shall be according to OPSD 405.010 or 405.020.
 D All dimensions are nominal.
 E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 2
PRECAST CONCRETE MAINTENANCE HOLE COMPONENTS		
1500mm DIAMETER RISER AND BASES		
OPSD 701.041		



NOTES:
 1 Depth of frost strap shall be as specified.
 A Frost straps shall be placed so they do not interfere with sewer pipe openings and the steps.
 B Frost straps shall be placed when specified.
 C Galvanizing shall be according to CAN/CSA G164.
 D All dimensions are in millimetres unless otherwise shown.

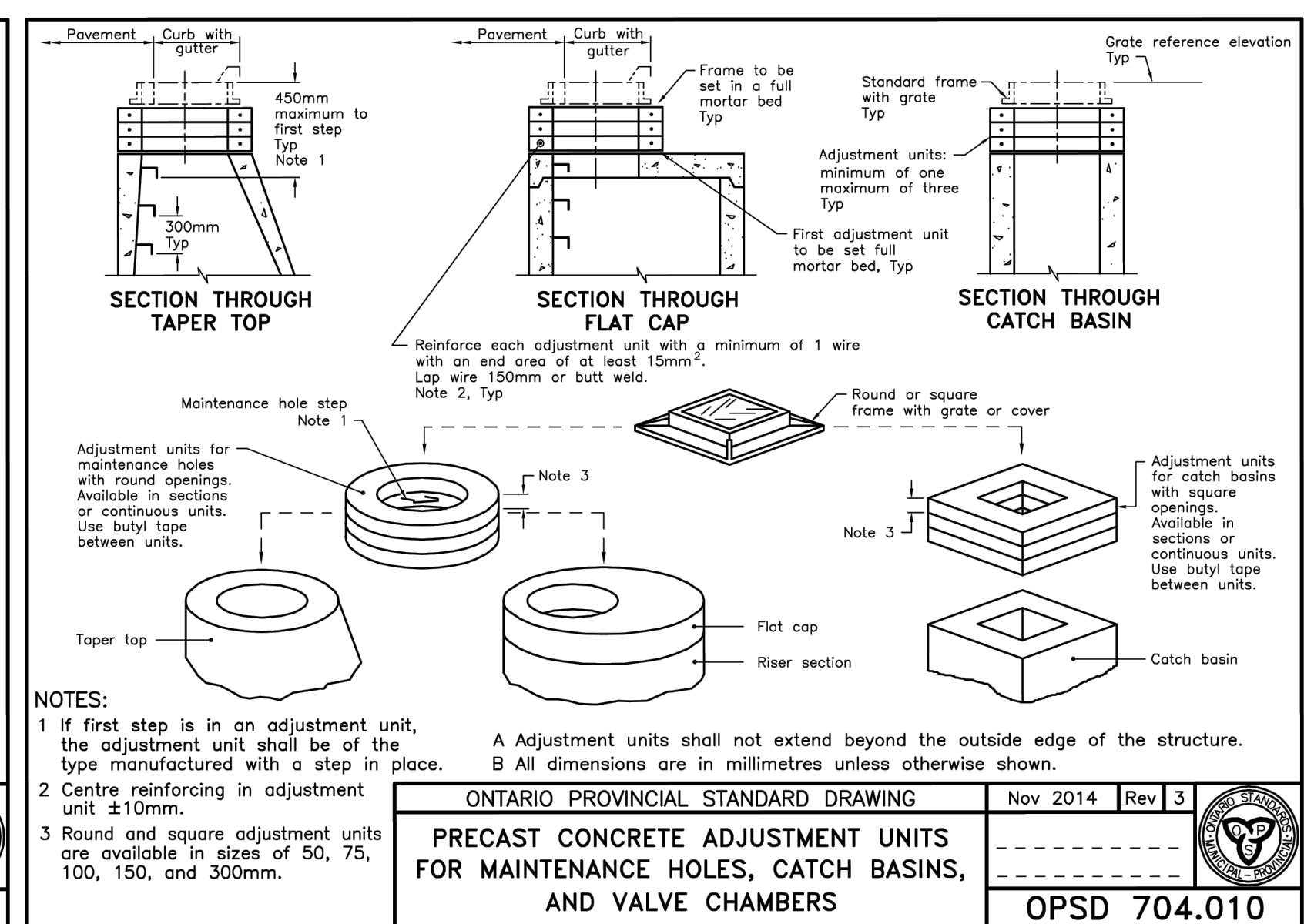
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2024	Rev 4
EXTERNAL FROST STRAP INSTALLATION		
OPSD 701.100		



1500mm DIAMETER MAINTENANCE HOLE

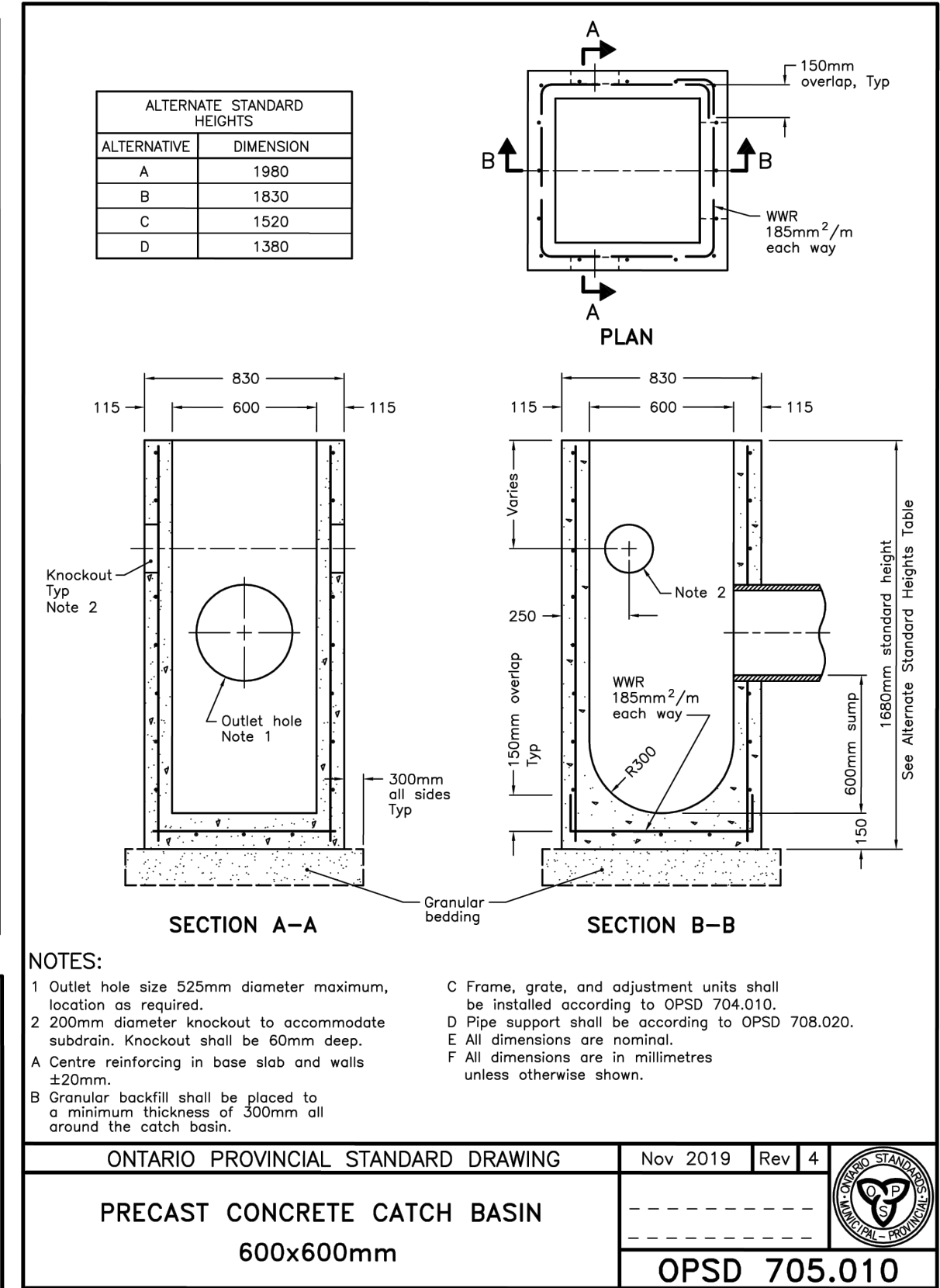
NOTES:
 A All reinforcing steel shall have 25mm minimum cover.
 B All dimensions are nominal.
 C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 2
PRECAST CONCRETE TWIN INLET FLAT CAP		
1500mm DIAMETER		
OPSD 703.021		



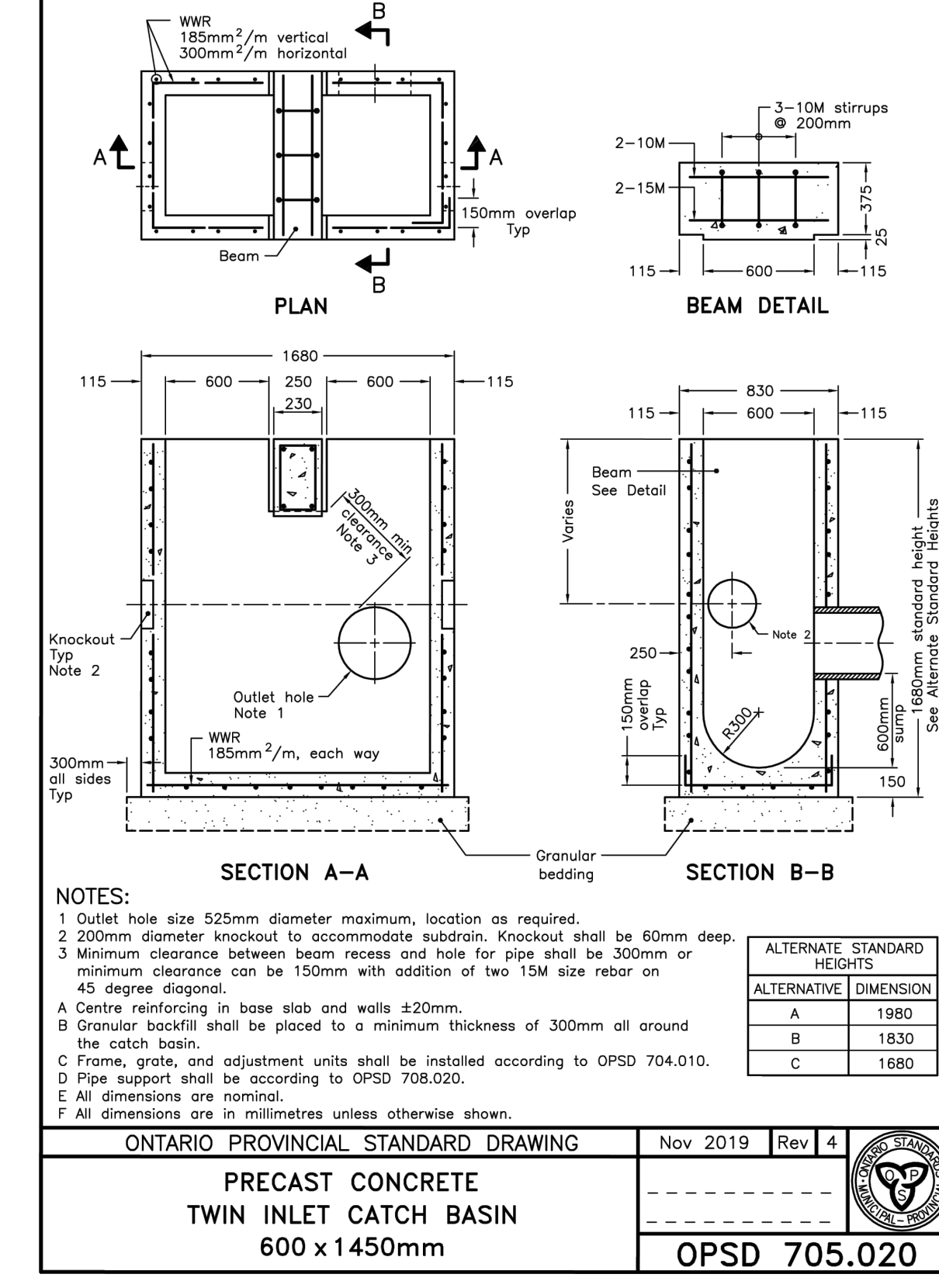
NOTES:
 1 If first step is in an adjustment unit, the adjustment unit shall be of the type manufactured with a step in place.
 2 Centre reinforcing in adjustment unit ±10mm.
 3 Round and square adjustment units are available in sizes of 50, 75, 100, 150, and 300mm.
 A Adjustment units shall not extend beyond the outside edge of the structure.
 B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
PRECAST CONCRETE ADJUSTMENT UNITS FOR MAINTENANCE HOLES, CATCH BASINS, AND VALVE CHAMBERS		
OPSD 704.010		



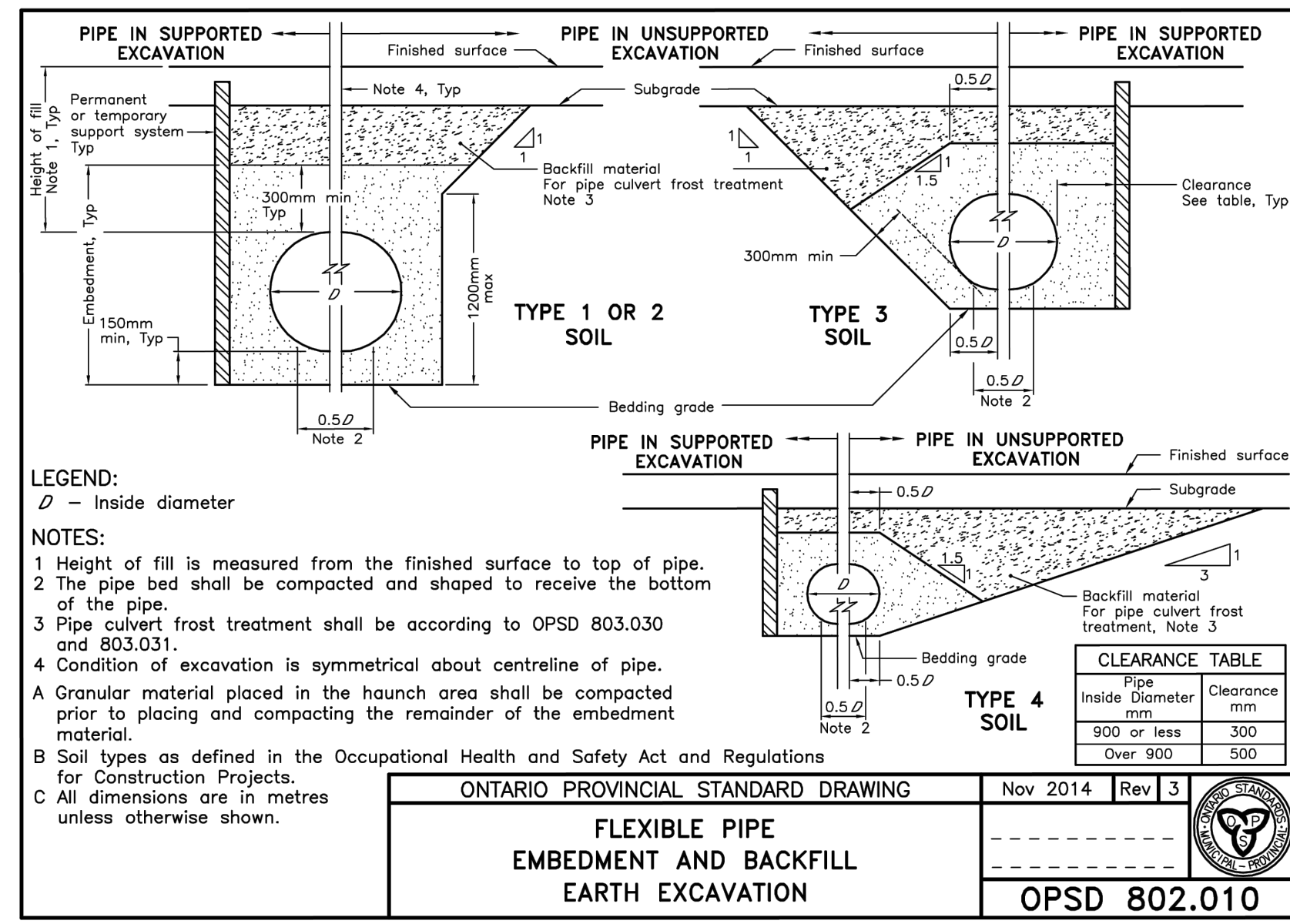
NOTES:
 1 Outlet hole size 525mm diameter maximum, location as required.
 2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
 3 Minimum clearance between beam recess and hole for pipe shall be 300mm or minimum clearance can be 150mm with addition of two 15M size rebar on 45 degree diagonal.
 A Centre reinforcing in base slab and walls ±20mm.
 B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
 C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
 D Pipe support shall be according to OPSD 708.020.
 E All dimensions are nominal.
 F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN		
600x600mm		
OPSD 705.010		



NOTES:
 1 Outlet hole size 525mm diameter maximum, location as required.
 2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
 3 Minimum clearance between beam recess and hole for pipe shall be 300mm or minimum clearance can be 150mm with addition of two 15M size rebar on 45 degree diagonal.
 A Centre reinforcing in base slab and walls ±20mm.
 B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
 C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
 D Pipe support shall be according to OPSD 708.020.
 E All dimensions are nominal.
 F All dimensions are in millimetres unless otherwise shown.

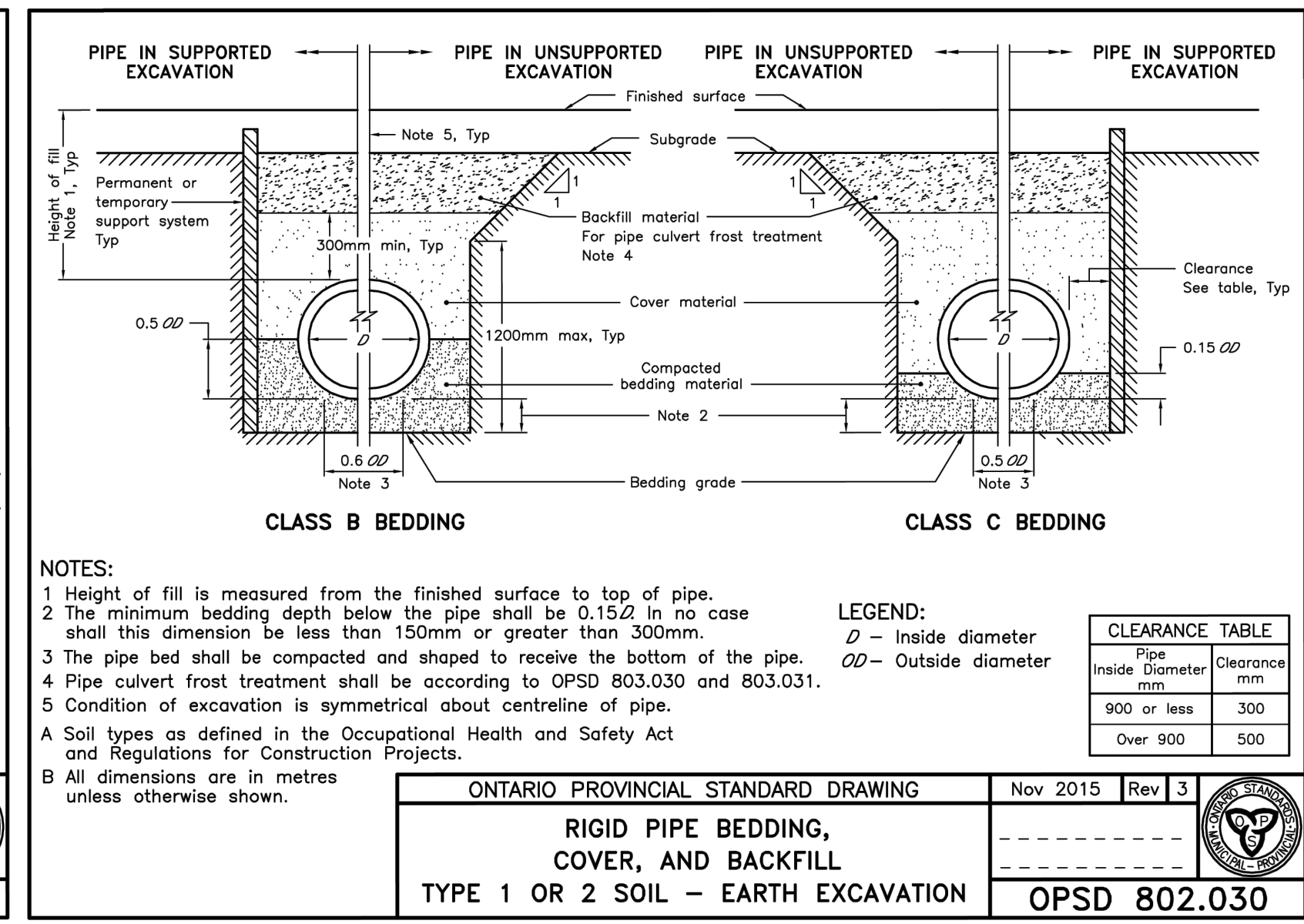
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE TWIN INLET CATCH BASIN		
600 x 1450mm		
OPSD 705.020		



LEGEND:
 D = Inside diameter

NOTES:
 1 Height of fill is measured from the finished surface to top of pipe.
 2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 4 Condition of excavation is symmetrical about centreline of pipe.
 A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
 B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
 C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		
OPSD 802.010		



LEGEND:
 D = Inside diameter
 OD = Outside diameter

CLEARANCE TABLE		
Pipe Inside Diameter mm	Clearance mm	
900 or less	300	
Over 900	500	

NOTES:
 1 Height of fill is measured from the finished surface to top of pipe.
 2 The minimum bedding depth below the pipe shall be 0.15D in no case shall this dimension be less than 150mm or greater than 300mm.
 3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 5 Condition of excavation is symmetrical about centreline of pipe.
 A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
 B All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 3
RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 1 OR 2 SOIL - EARTH EXCAVATION		
OPSD 802.030		

DESIGN	DR/CG	SCALE: NTS	DATE	JAN 2025
DRAWN	CG	PROJECT	DWG. NO	
CHECKED	MF	PRA-24067	DET-2	

NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION	MAR 2025	MF

BENCHMARK:
 BENCHMARK NO. 0312000007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWER CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE CURB AT THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL. LOCATED 1.8m WEST OF THE EAST END OF THE BRIDGE AND 500m BELOW THE TOP OF THE BRIDGE. ELEV. 244.787m
 BENCHMARK NO. 0312000029 HARPLEYVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL. THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.59m
 BENCHMARK NO. 0312004064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWER CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT 0312000007. NOTE MONUMENT SET IN CONCRETE. ELEV. 250.59m
 BENCHMARK NO. 0312000008 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. ELEV. 248.748.99m

PROFESSIONAL ENGINEER
 M. G. F. J.S.
 800149153
 03-07-2025
 PROVINCE OF ONTARIO

NESTWISE INC.
 60 DEAN AVE
 CITY OF BARRIE

JONES CONSULTING GROUP LTD.
 PLANNERS & ENGINEERS
 229 Mapleview Dr. E. Unit 1
 Barrie, ON L4N 0W6
 P. 706.734.2638
 F. 706.734.1058

STANDARD DETAILS

G:\Eng_3D\VPRA-24067\Production\DWG\VPRA-24067-COVER.dwg Layouth:DEC-23, 2:17pm by:cgjeng The Jones Consulting Group Ltd.

SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa

PIPE DIA	a	b	c	d
100	150	250	200	200
150	250	400	250	300
200	400	550	300	450
250	500	650	400	500
300	650	800	450	650
350	700	900	550	700
400	900	1050	600	850

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 289 kPa

PIPE DIA	a	b	c	d
100	150	200	150	150
150	250	250	200	200
200	400	350	250	300
250	500	450	300	350
300	650	500	350	400
350	700	600	400	500
400	900	750	400	600

SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

PIPE DIA	a	b	c	d
100	150	150	150	150
150	250	200	200	200
200	400	300	200	250
250	500	400	250	300
300	650	450	300	300
350	700	550	350	350
400	900	650	350	450

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 3
CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS
 OPSD 1103.010

UP-THRUST BLOCK ELEVATION

DOWN-THRUST BLOCK ELEVATION

DOWN-THRUST BLOCK SECTION Y-Y

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 4
CONCRETE THRUST BLOCKS FOR VERTICAL BENDS
 OPSD 1103.020

UP-THRUST BLOCK SECTION X-X

DOWN-THRUST BLOCK SECTION Y-Y

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 3
Water Service 100mm to 300mm
 W505

Watermain Storm, Culvert & Ditch Separation

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 3
Watermain Storm, Culvert & Ditch Separation
 W519

Water Meter Installation with By-Pass Assembly

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 5
Water Meter Installation with By-Pass Assembly
 W533

LAP JOINT DETAIL

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 1
LAP JOINT DETAIL
 W533

SC-319 ISOLATOR (NOW PLUG) DETAIL

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 1
SC-319 ISOLATOR (NOW PLUG) DETAIL
 W533

SC-315 TECHNICAL SPECIFICATION

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 1
SC-315 TECHNICAL SPECIFICATION
 W533

ACCEPTABLE FIL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 1
ACCEPTABLE FIL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS
 W533

NYLOPLAST DRAIN BASIN

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 1
NYLOPLAST DRAIN BASIN
 W533

BENCHMARK:

BENCHMARK NO. 0312000007 BRIDGE ON BIG BAY POINT RD 0.3 km WEST OF YONGE ST OVER LOWERS CREEK. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE NORTH FACE OF THE CONCRETE ABUTMENT AT THE SOUTH-EAST CORNER OF BRIDGE. THE TABLE IS LOCATED 1.0m WEST OF THE EAST END OF THE BRIDGE AND 50m BELOW THE TOP OF THE BRIDGE. ELEV. 244.787.

BENCHMARK NO. 0312000029 HARPLEYVIEW HEIGHTS ELEMENTARY SCHOOL - 180 ESTHER DR. THE VERTICAL CONTROL MONUMENT IS SET FLUSH IN THE CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTH-EAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND THE TABLE IS ON THE SOUTH SIDE OF THE FLAGPOLE BASE. ELEV. 250.509m.

BENCHMARK NO. 03120040064 LOCATED ON THE SOUTH SIDE OF BIG BAY POINT ROAD ON BRIDGE OVER LOWERS CREEK AT SOUTH-EAST CORNER OF BRIDGE IN WALKWAY OPPOSITE THE VERTICAL CONTROL MONUMENT. ELEV. 0312000007. NOTE: MONUMENT SET IN CONCRETE. N.4912309.361 E.62744.743

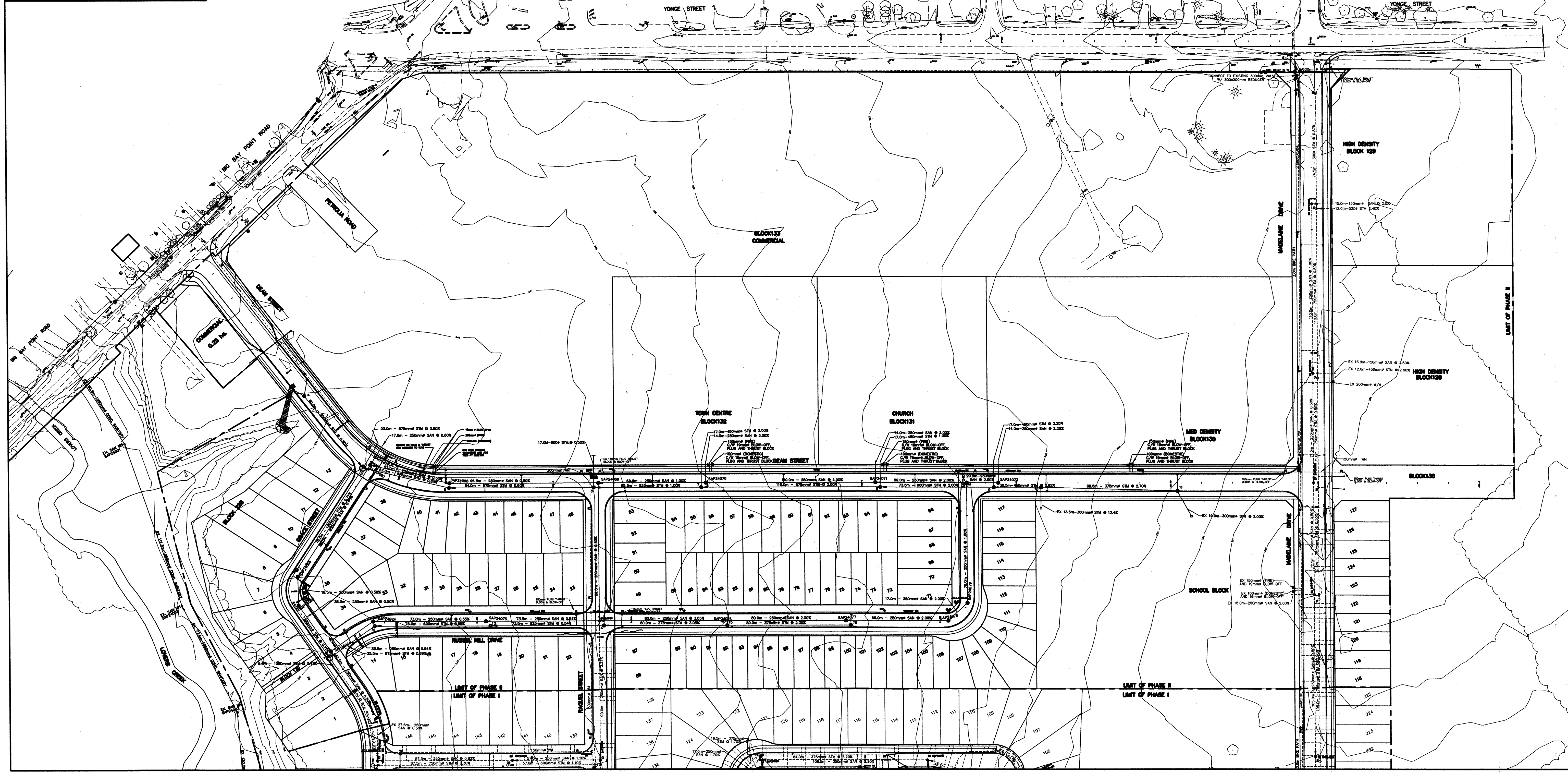
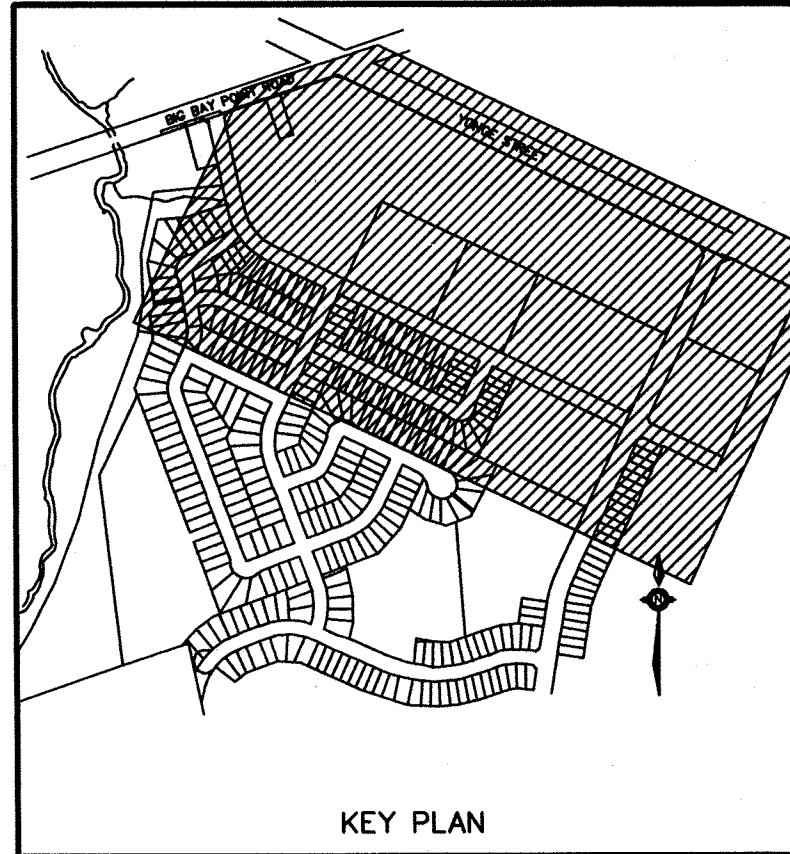
BENCHMARK NO. 0312000001 LOCATED ON THE EAST SIDE OF YONGE STREET APPROXIMATELY 1.4 km SOUTH-EAST OF BIG BAY POINT ROAD. N.4911948.724 E.628748.999

1. FIRST SUBMISSION MAR 2025 MF

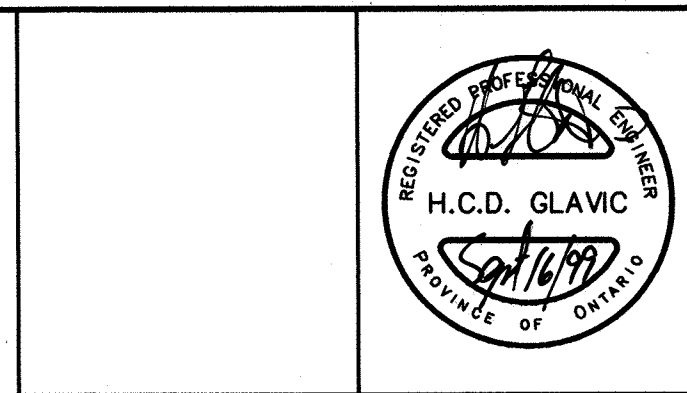
NESTWISE INC. 60 DEAN AVE CITY OF BARRIE

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS 229 Mapleview Dr. E. Unit 1 Barrie, ON L4N 0W6 P. 706.734.2638 F. 706.734.1058

DESIGN DR/CG SCALE: NTS DATE JAN 2025
 DRAWN CG PROJECT DWG. NO
 CHECKED MF PRA-24067 DET-3



Notes



BENCHMARK:
 HORIZONTAL CONTROL MONUMENT #010860415
 SET ON ROUND IRON BAR ON SOUTH SIDE OF
 BIG BAY POINT RD AND WEST OF YONGE ST.
 ELEV 249.516m

NO.	REVISIONS	DATE	INITIAL
3	PHASE II	JUNE/99	S.N.
2	DEAN STREET REALIGNMENT	MAY20/98	S.N.
1	FINAL SUBMISSION - PHASE I	MAR.23/98	S.N.

Approved
CITY OF BARRIE
APPROVED
 DATE: Oct. 11/99...
R. S. Neulove
 DIRECTOR OF MUNICIPAL WORKS

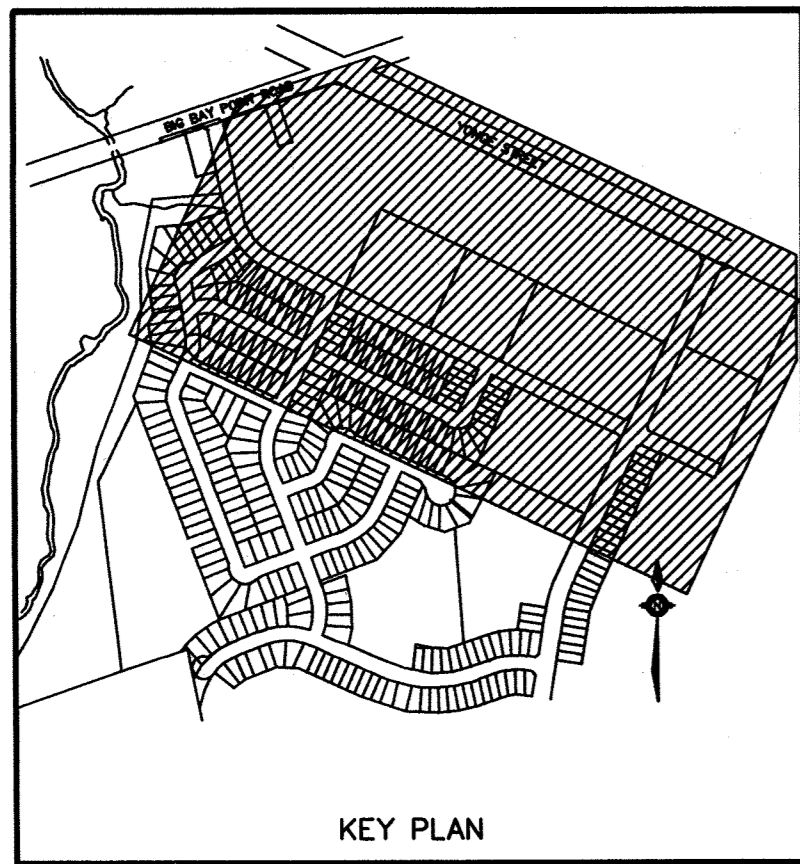
Approved

BARRIE HERITAGE SUBDIVISION
 PHASE II
 BARRIE HERITAGE DEVELOPMENTS INC.
 GENERAL
 SERVICING PLAN
 2 OF 2

RG ROBINSON CONSULTING ENGINEERS AND PLANNERS
 10 High Street, Suite 200, Barrie, Ontario (705) 721-9222

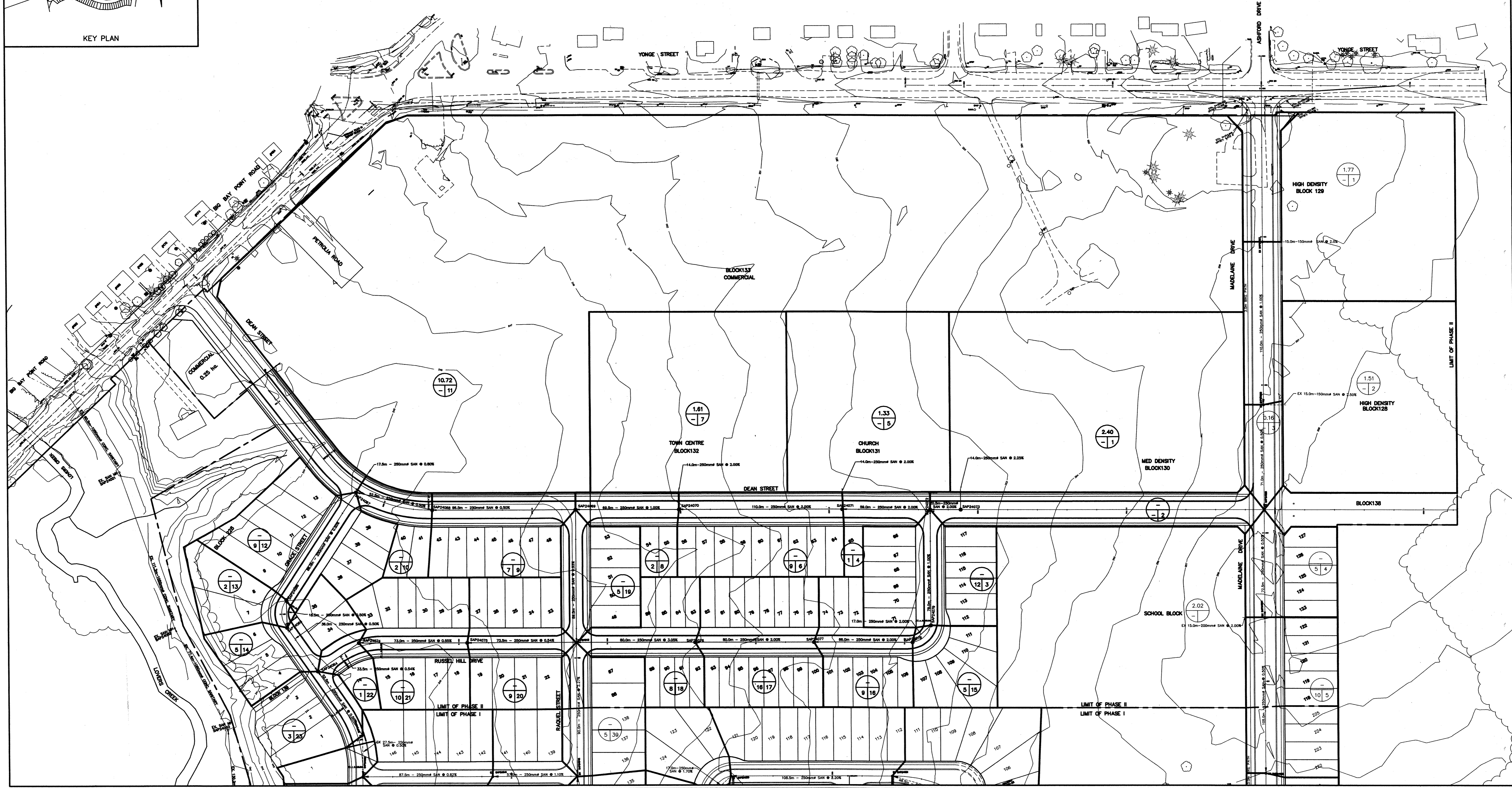
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 560-96052-24
 DESIGN: S.NORWOOD CHECKED: H.C.G.
 DRAWN: P.H. DATE: NOV/97 DWG. N°: G-2

F:\landprojects\960524\img\g-2.dwg Tue Aug 31 11:04:39 1999 John C. RGRA



LEGEND

- AREA IN HECTARES
- AREA REFERENCE No.
- No. OF UNITS



F:\landproj\proj\560524\img\g-4.dwg Tue Aug 31 12:11:05 1999 John C. RDBA

Notes



BENCHMARK:
HORIZONTAL CONTROL MONUMENT #010860415
SET ON ROUND IRON BAR ON SOUTH SIDE OF
BIG BAY POINT RD AND WEST OF YONGE ST.
ELEV 249.516m

NO.	REVISIONS	DATE	INITIAL
3	PHASE II	JUNE/99	S.N.
2	DEAN STREET REALIGNMENT	MAY20/98	S.N.
1	FINAL SUBMISSION - PHASE I	MAR.23/98	S.N.

Approved
CITY OF BARRIE APPROVED
DATE: Oct. 1, 1999
R. S. Newburn
DIRECTOR OF MUNICIPAL WORKS

Approved

BARRIE HERITAGE SUBDIVISION
PHASE II
BARRIE HERITAGE DEVELOPMENTS INC.

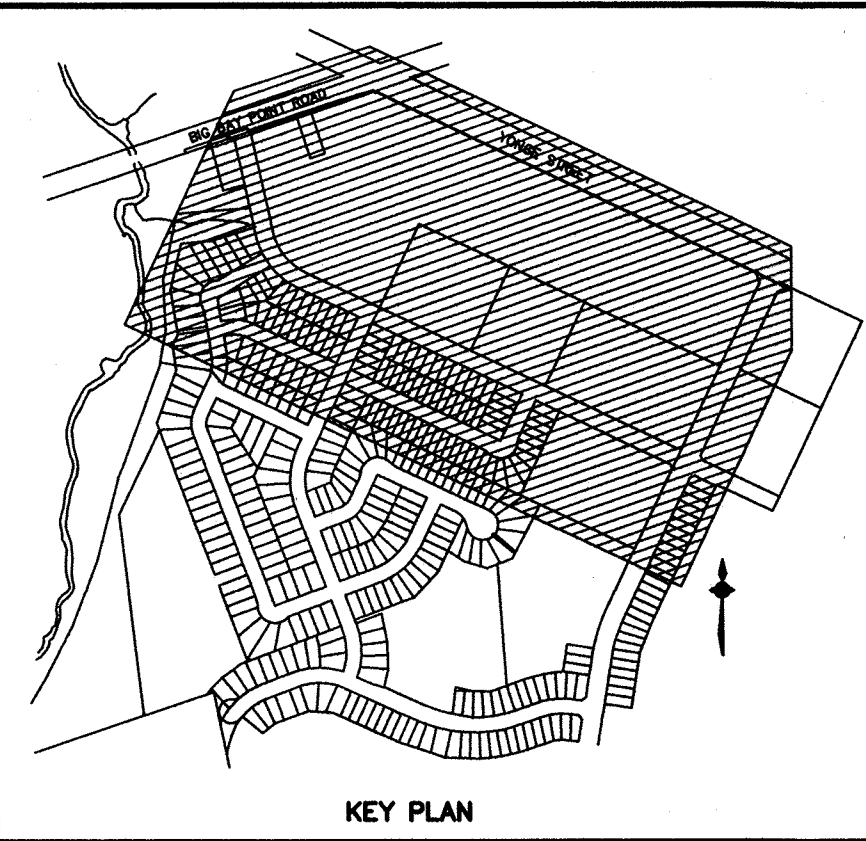
SANITARY
DRAINAGE PLAN
2 OF 2

RG ROBINSON CONSULTING ENGINEERS AND PLANNERS
AND ASSOCIATES (BARRIE) LTD
10 High Street, Suite 200, Barrie, Ontario (705) 721-9222

SCALE: 1:1250
560-96052-24

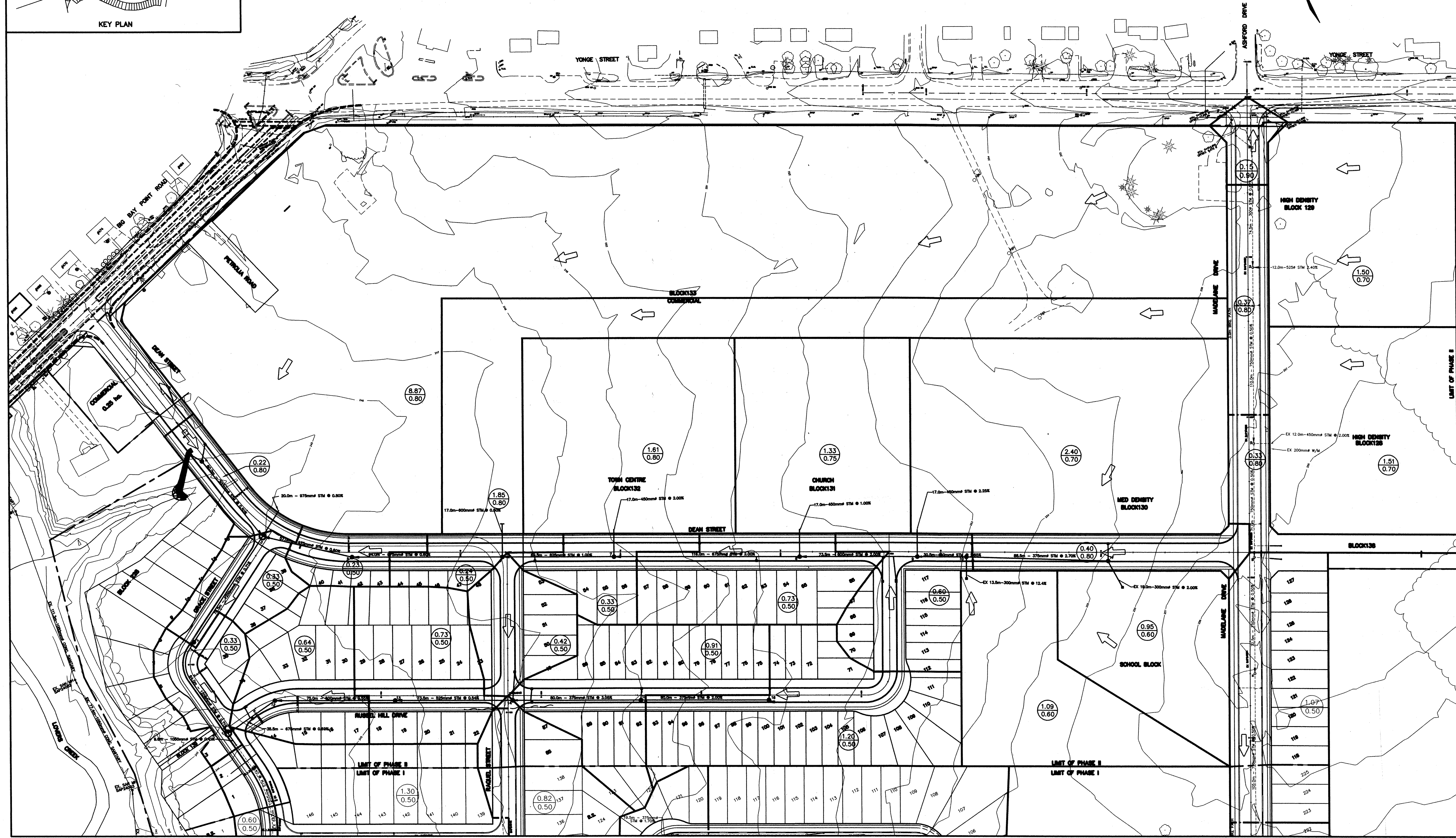
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DRAWN	P.H.	DATE	NOV/97

DWG. N^o G-4



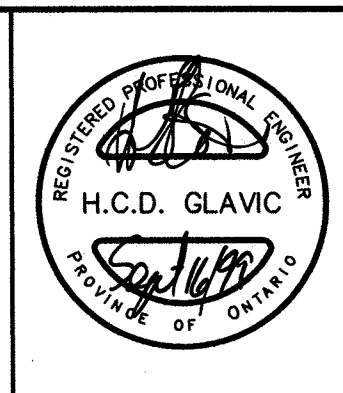
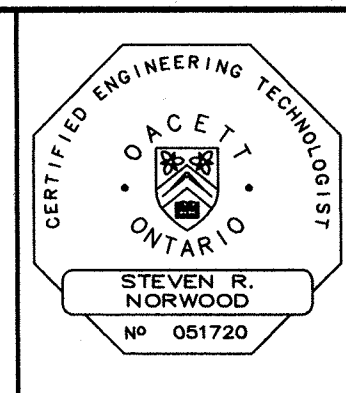
LEGEND

$\frac{1.25}{0.60}$	EXISTING AREA IN HECTARES	\rightarrow	EXISTING OVERLAND FLOW
$\frac{3.09}{0.80}$	EXISTING RUN-OFF COEFFICIENT	\rightarrow	PROPOSED OVERLAND FLOW
$\frac{3.09}{0.80}$	PROPOSED AREA IN HECTARES		
$\frac{0.80}{0.80}$	PROPOSED RUN-OFF COEFFICIENT		



C:\LandProjects\960524\mg\g-6.dwg Tue Sep 14 14:53:44 1999 R.G. Robinson and Associates (P.L.L.C.)

Notes



BENCHMARK:
HORIZONTAL CONTROL MONUMENT #010860415
SET ON ROUND IRON BAR ON SOUTH SIDE OF
BIG BAY POINT RD AND WEST OF YONGE ST.
ELEV 249.516m

NO.	REVISIONS	DATE	INITIAL
3	PHASE II	JUNE/99	S.N.
2	DEAN STREET REALIGNMENT	MAY20/98	S.N.
1	FINAL SUBMISSION - PHASE I	MAR.23/98	S.N.

Approved
CITY OF BARRIE APPROVED
DATE: Oct 1/99
R. S. Newlove
DIRECTOR OF MUNICIPAL WORKS

Approved

BARRIE HERITAGE SUBDIVISION
PHASE II
BARRIE HERITAGE DEVELOPMENTS INC.

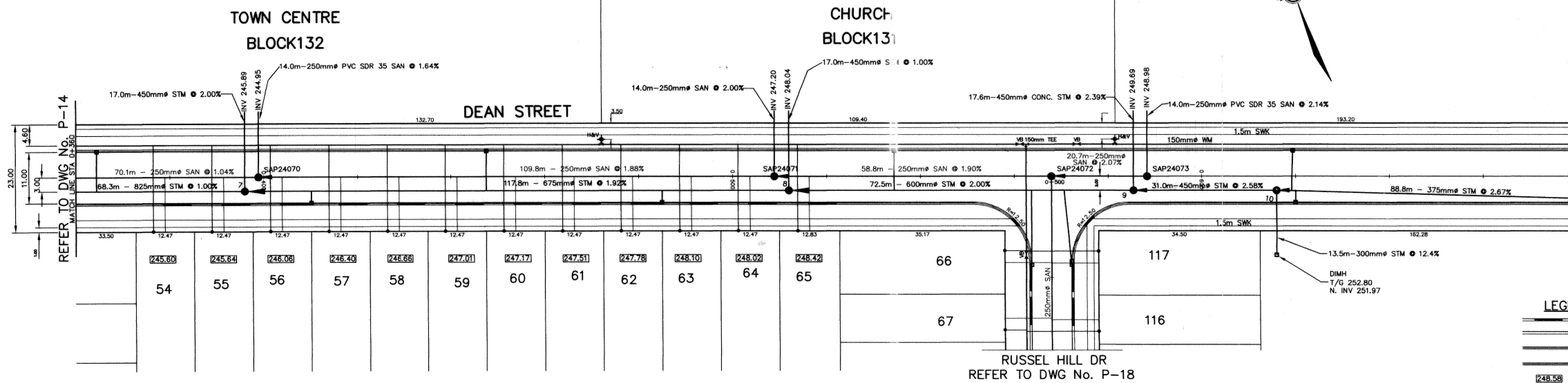
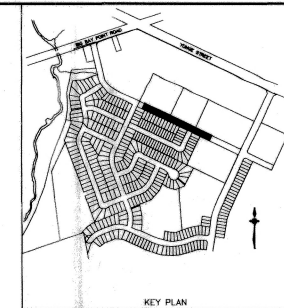
STORM
DRAINAGE PLAN
2 OF 2

RG ROBINSON CONSULTING ENGINEERS AND PLANNERS
AND ASSOCIATES (BARRIE) LTD
10 High Street, Suite 200, Barrie, Ontario (705) 721-9222

SCALE: 1:1250
560-96052-24

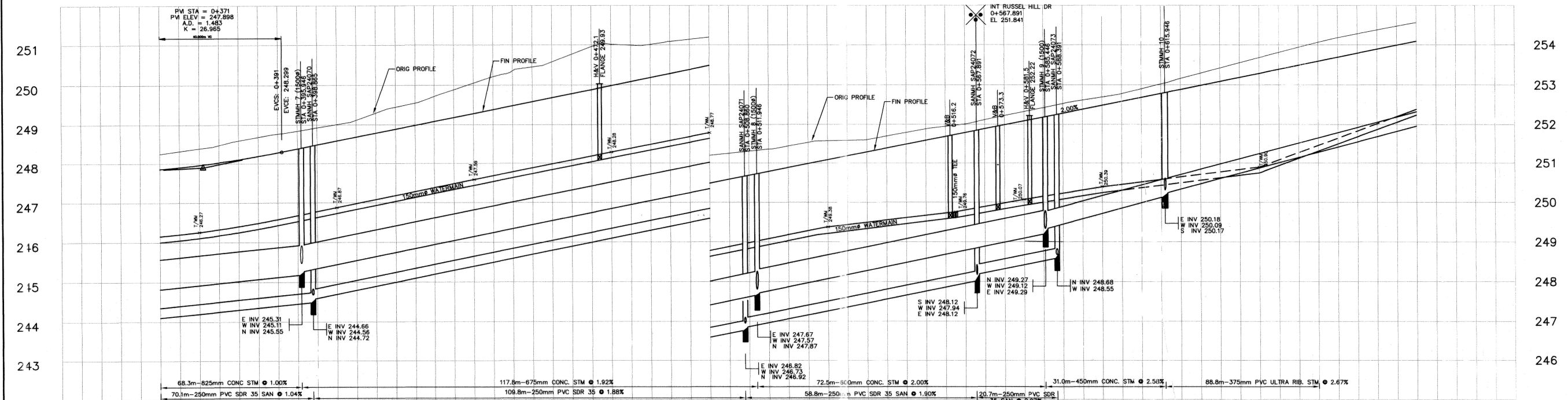
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DRAWN	P.H/MAS	DATE	NOV/97

DWG. NO G-6



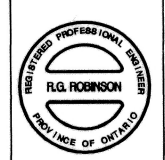
LEGEND

- DEPRESSED CURB
- MOUNTABLE CURB
- SINGLE STAGE BARRIER CURB
- TWO STAGE BARRIER CURB
- SAN. SERVICE INV. ELEVATION
- PROPERTY LINE



CHANGE	ORIG. C/L PROFILE	FIN. C/L PROFILE
0+360	248.25	247.86
0+380	248.58	248.10
0+400	248.92	248.48
0+420	249.45	248.88
0+440	250.05	249.28
0+460	250.57	249.68
0+480	250.99	250.08
0+500	251.19	250.48
0+520	251.44	250.88
0+540	251.60	251.28
0+560	251.95	251.67
0+580	252.33	252.09
0+600	252.70	252.49
0+620	253.16	252.85
0+640	253.68	253.29
0+660	254.18	253.69
0+680	254.56	254.09

Note
 "This Record Drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the City does not warrant the accuracy of this information, and shall not be held responsible for damages arising from the use of the Record Drawing. The user hereby releases and discharges the City, its employees or agents from any claims, losses or damages and agrees to indemnify and save harmless, the City, from any claims, losses, or damages arising from the use of the Record Drawing."



NO.	REVISIONS	DATE	INITIAL
1	AS-CONSTRUCTED	FEB/03	MD

BARRIE HERITAGE SUBDIVISION
 PHASE II
 BARRIE HERITAGE DEVELOPMENTS INC
 PLAN AND PROFILE
 DEAN STREET
 STA 0+360 TO STA 1+680

RG ROBINSON CONSULTING ENGINEERS AND PLANNERS
 AND ASSOCIATES (BARRIE) LTD
 10 High Street, Suite 200, Barrie, Ontario (705) 721-9222

SCALE: HORIZ. 1:500
 VERT. 1:50
 DESIGN S.N. CHECKED H.G.
 DRAWN P.H. DATE MAY/03
 560-96052-24
 DWG. No P-19

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