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Preliminary Stormwater Management Report

Pine Valley Homes Limited

9332 County Road 93

Town of Midland, Ontario

May 2026

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

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Report Prepared By:

Kyle Ransom, B.Eng.
Engineering Designer

Report Reviewed By:

Jon Ingram, P.Eng.
Project Engineer & Associate Partner

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Preliminary Stormwater Management Report
Pine Valley Homes Limited
9332 County Road 93, Town of Midland

1.0 Introduction

1.1 Appointment

The Jones Consulting Group Ltd. (TJCG) was retained by Pine Valley Homes Limited. (Client) to prepare this Preliminary Stormwater Management Report (PSWMR) for the proposed residential subdivision located at 9332 County Road 93, in the Town of Midland (Town).

This Preliminary Stormwater Management Report (PSWMR) has been prepared in support of Official Plan Amendment, Zoning By-law Amendment and Draft Plan Approval for the proposed 9332 County Road 93 Draft Plan of Subdivision, prepared by TJCG, dated May 5th, 2026, and the 9332 County Road 93 Concept Plan, prepared by Orchard Design Studio Inc., dated October 16 2025. The following information and supporting appendices describe the stormwater management plan to address Quantity Control, Quality Control, Water Balance, and Erosion & Sediment Control. The design information presented herein, as well as within the design drawing set, has been completed in accordance with Town and MOECP standards.

1.2 Property Description

The site is rectangular in shape and is bound to the north and west by undeveloped, forested lands. Existing commercial developments border the site's eastern boundary. An existing private roadway (Fosters Road) borders the site to the south. The property is located approximately 350 metres (m) West of County 93, with existing access via Lanigan Drive, which extends from County Road 93 to the site's eastern boundary.

The property has a total area of approximately 27.63 hectares (ha) of which 10.61 ha will be dedicated as environmental protection. The development is municipally known as 9332 County Road 93, Midland, ON and legally described as Part of Lot 107, Concession 1, Geographic Township of Tiny, Town of Midland, County of Simcoe (County). The location of the subject lands is shown in Figure 1.

Figure 1 – Site Location

1.3 Supporting Documents

The following documents have been referenced in preparation of this report:

- Draft Plan of Subdivision, The Jones Consulting Group., May 5th, 2026;
- Concept Plan, Orchard Design Studio Inc., October 16 2025;
- Ministry of the Environment (MOE), Stormwater Management Planning and Design Manual, March 2003;
- Design Guidelines for Sewage Works, Ministry of the Environment and Climate Change, December 2008;
- Soil Survey of Simcoe County North Sheet, Agriculture Canada, Report No. 29, Research Branch, 1962;
- Town of Midland Engineering Development Design Standards;
- *Low Impact Development Stormwater Management Planning & Design Guide Wiki*, Sustainable Technologies Evaluation Program, 2018;

1.4 Design Criteria

The stormwater management plan described herein is intended to provide an environmentally sound approach to stormwater and drainage issues. The issues can be divided into four categories: stormwater quantity control, stormwater quality control, water balance, and erosion & sediment control.

The following stormwater runoff control criteria have been established for the subject property as per the *Town of Midland Engineering Development Design Standards* and the *Ministry of Environment Stormwater Management Planning and Design Manual*:

Quantity Control

- The attenuation of post-development peak flow rates to corresponding pre-development rates for the 1:2-year, 1:5-year, 1:10-year, 1:25-year, 1:50-year and 1:100-year design storm events. Rainfall event modelling is to include both the 4-hour Chicago and SCS Type II rainfall distributions.
- No surface ponding within the development parking lots for the 5-year return frequency or less.
- Safely convey the regulatory event to a sufficient outlet.

Quality Control

- A minimum 80% removal of Total Suspended Solids (TSS) or an enhanced (Level 1) removal as referenced in the MOE SWMPD Manual.

Water Balance

- Minimize changes in water balance between pre- and post-development conditions to promote infiltration and groundwater recharge.

Erosion and Sediment Control

- Protect the site from first disturbance through to reinstatement from erosion and sediment wash-off to mitigate impacts on natural systems.

2.0 Site Physiography

2.1 Existing Land Use, Drainage Conditions & Site Soils

2.1.2 Overview

The property is zoned Rural (Ru) in the Town's Zoning By-Law Schedule 'A' Land Use Plan. The lands are currently vacant with partially cleared - forested land coverage. In general, the existing topography is considered to be gently sloping and drains overland in a north-easterly direction to the County Road 93 roadside ditch. The site's topography ranges from an elevation of approximately 248m to approximately 243m and corresponds to an average gradient of 1%. There are no existing stormwater management facilities on the Site and all flows are released uncontrolled.. The existing drainage conditions of the Subject Lands are depicted on Drawing SWM-1 in Appendix D. Based on the Soil Survey of Simcoe County Report No. 29, and MTO Design Chart H2-6A, the predominant soils on site are represented by the Vasey Sandy Loam series and the Wyevale Gravelly Sandy Loam series, which correspond to hydrologic soil groups AB and A of the SCS Hydrologic Soil Group Classification System, respectively. A breakdown of the site soil coverage is provided below in Table 1. A copy of the *Soil Survey of Simcoe County Report 29 North Sheet* has been attached to this report in Appendix A. An excerpt of the map, including the subject land's positioning, is shown below in Figure 2.

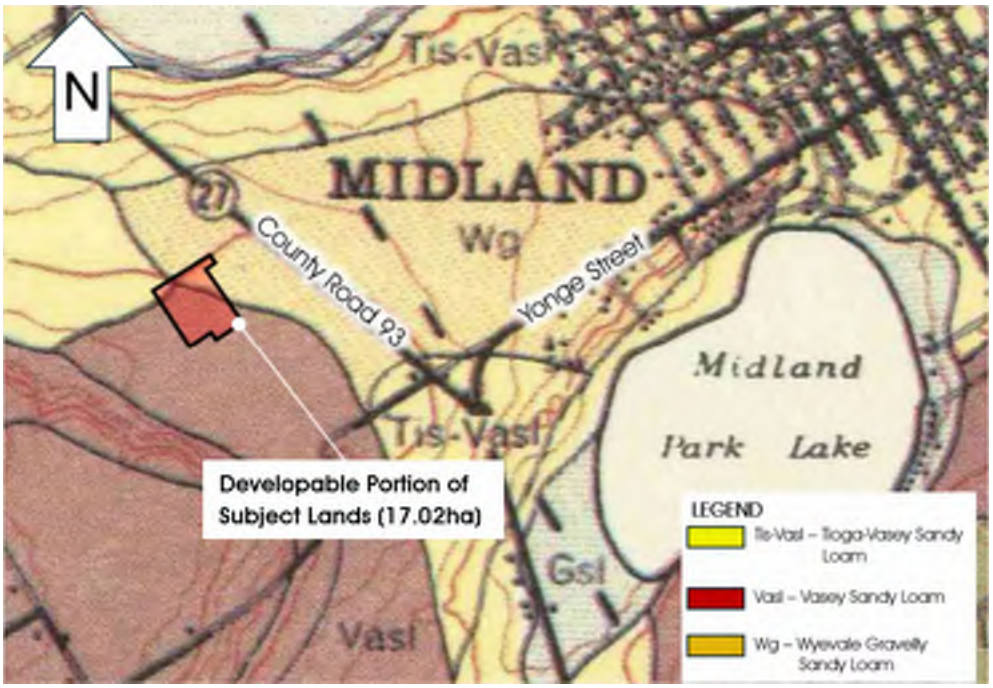


Figure 2 - Site Soils Identification

Table 1 - Soil Type Distribution

Soil Type	Soil Name	SCS Group	Total Area (ha)	Percentage Area (%)
Wg	Wyevale Gravelly Sandy Loam	Group A	3.14	18
Vasl	Tioga Loamy Sand	Group AB	13.88	82

2.1.2 Geotechnical Investigation

GEI Consultants Canada Ltd. was retained by Pine Valley Homes Limited. to complete a subsurface investigation and geotechnical report for the proposed development lands. The field work for the drilling program was carried out between March 23 and March 30, 2026. Fifteen (15) boreholes were advanced to depths ranging from 6.6m to 24.8m below existing grade. Monitoring wells were installed in five (5) of the boreholes to facilitate long-term groundwater monitoring.

In general, the subsurface investigation determined that a layer of topsoil at the ground surface was present among all boreholes, ranging from a thickness of 50mm to 150mm. Underlying the topsoil was a layer of surficial silty fine sand, followed by silt and sand / sand and silt, silt, and sand soils. Groundwater table were conducted on April 17, 2026, and none of the boreholes encountered groundwater.

The Geotechnical Investigation and Report, prepared by GEI Consultants Canada Ltd., dated April 27, 2026 has been provided under separate cover.

2.2 Proposed Land Use & Drainage Conditions

The proposed Draft Plan of Subdivision prepared by TJCG (May 5th, 2026) indicates that the development will be subdivided into various sized residential blocks (5 street townhome blocks, 2 medium density blocks, 2 high density blocks, and 1 stormwater management block). The Site's proposed land use statistics are illustrated on the proposed concept plan prepared by Orchard Design Studio Inc. (October 2025) and are summarized in **Table 2**, below. Refer to the Draft Plan of Subdivision and the Concept Plan attached in **Appendix A** for the location and orientation of the Lots, Blocks and Municipal Streets.

Table 2: Pine Valley Homes Limited Subdivision – Land Use Statistics

Residential Lot Breakdown	Units
Apartment Units	432
Rear Lane Units	138
Stacked Towns	288
3 Storey Towns	138
2 Storey Towns	55
Total	1051

Two site roadway connections are proposed to existing right-of-ways. The first access/egress is an extension of existing Lanigan Drive, which extends through the site and connects to County Road 93 to the north of the commercial development, becoming the second point of access/egress. The third is a connection to Fosters Road (Private Roadway) in the southwest corner of the development.

The development will be serviced from a stormwater management perspective by a proposed subsurface storm sewer network, an oil grit separator (OGS) unit, and an underground stormwater management facility (SWMF). The grading of the lots will direct the majority of stormwater runoff generated by the development to the Site's internal road network, which will contain a proposed subsurface storm sewer system to capture and convey major and minor rainfall event flows to the Site's stormwater management facility. The Storm Area Drainage Plan, referenced as **Drawing STM-1** in **Appendix D**, is to be reviewed in conjunction with the **Storm Sewer Design Sheet** in **Appendix B**.

The proposed SWMF features an open bottom clear stone layer to provide on site infiltration during smaller rain events, and a control structure with an overflow outlet to provide safe conveyance during larger events. The orifice-controlled outlet configuration has been designed to reduce post-development peak flows to pre-development rates. This stormwater management plan is intended to capture and treat runoff generated by the development (and portions of external drainage currently entering the lands) prior to discharging to the County Road 93 Roadside Ditch. The stormwater management plan described herein will provide the required quality and quantity control in accordance with the Town of Midland and Ministry of Environment guidelines.

The proposed stormwater management plan is intended to capture, treat, and control runoff generated by the majority of the subdivision, with some small sections along the Site's boundary flowing offsite in an uncontrolled manner due to grading constraints. These areas are further described in **Section 3.3** of this Report.

3.0 Hydrology

3.1 Design Storms

The development was hydrologically modeled using the latest version of Visual OTTHYMO modeling software (version 6.2). The site was modelled to estimate runoff peak flows for the 2- to 100-year storm events for the SCS 24-hour, and Chicago 4-hour rainfall distributions, in accordance with the *Town of Midland Engineering Development Design Standards*. The following events have been modeled:

- 4-hour Chicago rainfall distribution for the 2, 5, 10, 25, 50, and 100-year storm events;
- 24-hour SCS Type II rainfall distribution for the 2, 5, 10, 25, 50, and 100-year storm events;
- 25 mm 4-hour Chicago (Water Quality) rainfall event; and
- Timmins Regional Storm Event.

3.2 Pre-Development Modeling

The pre-development condition of the development lands has been broken down into five (5) catchments. The pre-development catchments are outlined on Drawing SWM-1 provided in Appendix D.

Catchment 101 represents the existing condition of the subject lands and encompasses the entirety of the proposed development area. This catchment generally drains in a northeasterly fashion to Lanigan Drive and County Road 93.

Catchment 301 represents the area contributing runoff to the County Rd 93 roadside ditch which is generated from the adjacent lands to the north of the development. In the post development condition, this area encompasses the extension of Lanigan Drive to County Road 93.

Catchments 302 & 303 represent areas of upstream external drainage which are located adjacent to the site's southwestern boundary. In the pre-development condition, these lands are conveyed through the subject lands in a northeasterly fashion to Lanigan Drive and County Road 93.

Catchment 404 represents an area of external drainage along the site's north-east property line which is conveyed through the subject lands to County Road 93 in the pre-development condition.

The following Figure 2 illustrates the OTTHMYO modeling schematic for pre-development scenario described herein.

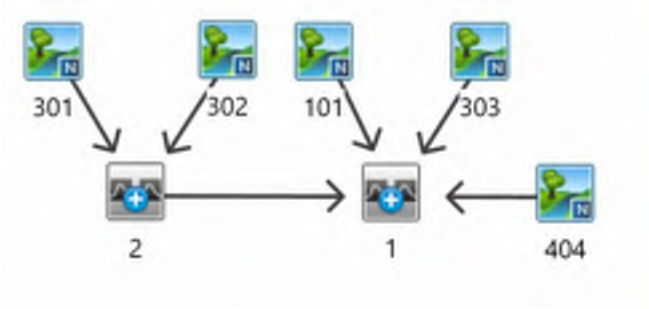


Figure 2 – Pre-Development OTTHYMO Model Schematic

The pre-development hydrologic model catchment properties are summarized below in Table 2. Supporting catchment property calculations are provided in Appendix C.

Table 2: Pre-Development Catchment Properties

NASHYD Catchments	Area (ha)	L (m)	S (%)	RC	CN	Ia (mm)	Tp (hr)	DT (min)
101	17.02	481	1.55	0.08	44	10.00	0.70	1
301	2.56	200	1.55	0.08	41	10.00	0.45	1
302	21.17	535	1.55	0.08	48	9.16	0.74	1
303	1.62	150	1.50	0.08	46	10.00	0.40	1
404	0.05	80	2.00	0.41	69	3.80	0.06	1

3.3 Post-Development Modeling

The post-development condition has been broken down into fourteen (14) catchments. The post-development catchments are outlined on Drawing SWM-2, provided in Appendix D.

Catchment 201 represents the majority of the proposed development blocks and the site's internal road network. All major and minor flows generated by this catchment are conveyed to the proposed underground SWMF before discharging to the County Road 93 roadside ditch. Runoff drains to the facility via the proposed storm sewer network during minor events, and overland within the road right-of-ways during major events.

Catchment 202 encompasses the area of the proposed stormwater management block located within the development lands. This area drains overland during both major and minor rainfall events to the proposed SWMF and is orifice controlled prior to discharging off site.

Catchment 203 represents an area of the proposed development consisting of rear-lots that are directed to the site's subsurface storm sewer network during both minor and major rainfall events. This

area is captured and controlled via the site's proposed underground SWMF before discharging to the County Rd 93 roadside ditch.

Catchments 401, 402 & 403 represent the post-development condition of pre-development Catchment 301. These catchments consist of external drainage north of the subject lands and the proposed Lanigan Drive extension. Area 402 drains to the underground SWMF during major and minor rainfall events. Catchments 401 & 403 drain uncontrolled to County Road 93 and are defined by the proposed receiving ditches along the north and south sides of Lanigan Drive, respectively.

Catchments 302 & 303 represent areas of upstream external drainage which are located adjacent to the site's southwestern boundary. These lands remain undeveloped in the post-development condition. Runoff from Catchment 302 is conveyed through a proposed by-pass swale which directs external drainage around the development and along the north side of the proposed Lanigan Drive extension. These flows ultimately drain uncontrolled to the County Road 93 roadside ditch. Runoff from Catchment 303 is directed to a proposed headwall structure and conveyed through the site's subsurface storm sewer network during both major and minor rainfall events. This drainage is captured and controlled via the proposed underground storage facility prior to discharging to the County Road 93 Roadside Ditch.

Catchments 207 and 204 represent small areas of the proposed development which cannot be directed to the underground SWMF due to grading constraints. These areas are conveyed to the proposed by-pass swale along the site's west and north boundaries and ultimately drain along the north side of the proposed Lanigan Drive Extension to the County Road 93 roadside ditch.

Catchments 205 and 208 represent small areas of the proposed development which cannot be directed to the underground SWMF due to grading constraints. Catchment 205 is located along the site's eastern boundary and drains to the existing Lanigan Drive entrance. Minor event runoff generated by this catchment is captured by the existing subsurface storm sewer network at Lanigan Drive, and major event runoff is conveyed overland through the existing right of way to County Road 93. Catchment 208 is comprised of a small portion of the site's stormwater management block along the eastern boundary of the lands. This area drains to the Lanigan Drive Extension's proposed ditch before being directed to County Road 93.

Catchment 206 is located along the site's south and east boundaries and drains to Foster Road before being directed in a northerly fashion to the proposed underground storage facility during both major and minor rainfall events.

Catchment 404 represents an area of external drainage along the site's north-east property line which is conveyed to the proposed underground storage facility during both major and minor rainfall events in the post-development condition.

Route Reservoir 4 represents the proposed underground SWMF. The corresponding stage storage discharge table used for inputting the route reservoir rating curve in OTTHYMO has been provided in Appendix B.

The following Figure 3 illustrates the OTTHYMO modeling schematic for post-development scenario described herein.

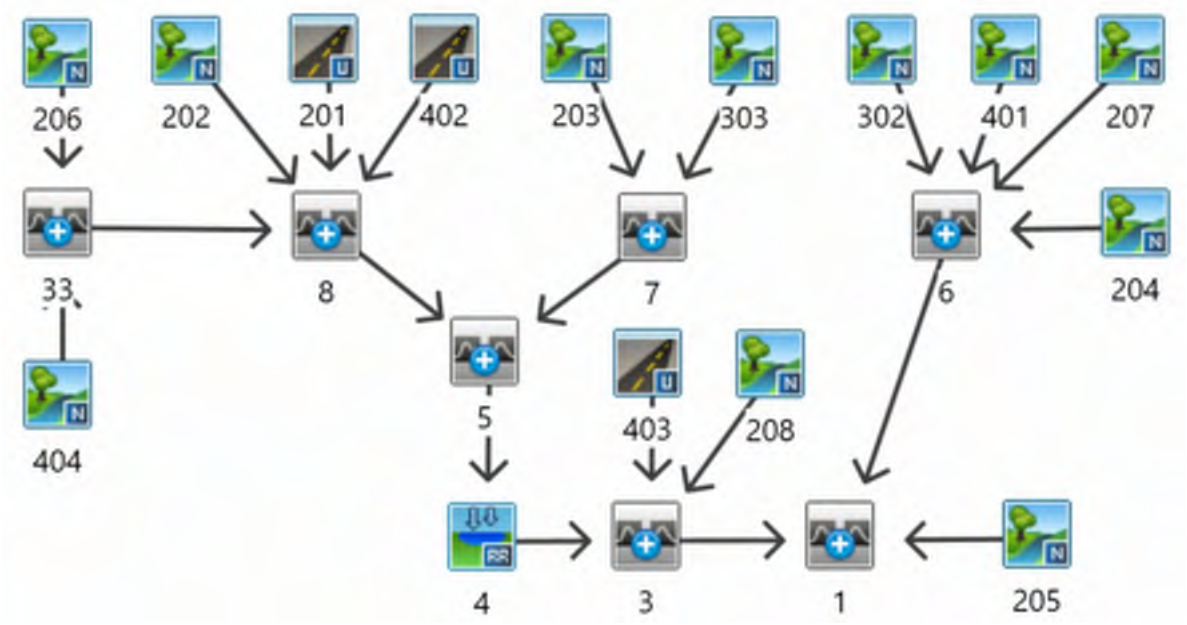


Figure 4 – Post-Development OTTHYMO Model Schematic

The post-development hydrologic model catchment properties are summarized below in Table 3. Supporting catchment property calculations are provided in Appendix C.

Table 3: Post-Development Catchment Properties

NASHYD Catchments	Area (ha)	L (m)	S (%)	RC	CN	Ia (mm)	Tp (hr)	DT (min)
*202	1.58	80	1.00	0.41	69	3.80	0.05	1
*203	0.34	20	2.00	0.44	75	3.80	0.01	1
204	0.37	85	2.00	0.53	79	3.50	0.05	1
205	0.20	40	2.00	0.53	79	3.50	0.03	1
*206	0.57	15	2.00	0.44	75	3.80	0.01	1
207	0.41	15	2.00	0.48	77	3.65	0.01	1
208	0.23	75	2.00	0.05	49	5.00	0.26	1
302	21.17	535	1.55	0.08	48	9.16	0.74	1
*303	1.62	150	1.50	0.08	46	10.00	0.40	1
401	1.88	200	1.00	0.12	47	8.41	0.50	1
*404	0.05	80	2.00	0.41	69	3.80	0.06	1
STANDHYD Catchments	Area (ha)	XIMP (%)	TIMP (%)	SLPP (%)	LGP (m)	SLPI (%)	LGI (m)	DT (min)
*201	13.32	32.5	65	1.00	40	1.00	298	1
*402	0.33	40	40	2.00	60	1.00	47	1
403	0.35	20	40	2.00	80	1.50	48	1

**Runoff from this catchment is conveyed to the Site's proposed stormwater management facility*

3.4 Pre to Post-Development Modeling Results

The determined pre- and post-development peak flow rates have been outlined below in Table 4.

Table 4: Hydrologic Analysis Peak Flow Rates, m^3/s

Storm Peak Event Flow (m^3/s)							
Storm Distribution	Area (ha)	Return Period (years)					
		2	5	10	25	50	100
Pre-Development Condition (AddHyd 1)							
CHI 4-Hr	42.43	0.096	0.198	0.282	0.408	0.523	0.639
SCS Type (II) 24-Hr	42.43	0.157	0.287	0.378	0.520	0.629	0.749
SCS Type (II) 12-Hr	42.43	0.139	0.264	0.356	0.498	0.613	0.736
SCS Type (II) 6-Hr	42.43	0.118	0.233	0.322	0.458	0.575	0.695
25mm 4-Hr CHI	42.43	0.036					
Timmins Storm	42.43	1.572					
Post Development Condition (AddHyd 1)							
CHI 4-Hr	42.43	0.084	0.154	0.209	0.303	0.435	0.549
SCS Type (II) 24-Hr	42.43	0.124	0.208	0.272	0.412	0.525	0.635
SCS Type (II) 12-Hr	42.43	0.112	0.193	0.257	0.388	0.511	0.624
SCS Type (II) 6-Hr	42.43	0.098	0.175	0.235	0.349	0.479	0.592
25mm 4-Hr CHI	42.43	0.042					
Timmins Storm	42.43	2.473					

4.0 Stormwater Management Plan

4.1 End-of-Pipe Underground SWM Facility

The proposed Underground Stormwater Management Facility is located at the northeastern corner of the proposed development. The facility is comprised of ADS MC3500 Stormtech Chambers surrounded by a layer of clear stone and wrapped in a geotextile fabric. The facility has been designed to provide both quantity and quality control for the development.

Quantity control is achieved by sizing the facility in conjunction with a proposed orifice-controlled outlet to capture, store and release post-development runoff peak flows at pre-development rates. The SWMF features a 130mm primary orifice, and a 300mm secondary orifice, cored from a baffle wall located within the proposed 1800 x 2400 concrete control structure. The top of the baffle wall has been designed to act as an overflow weir, providing safe conveyance of the regulatory event. In the event of a blockage to both the primary and secondary orifices, the proposed site grading has been designed to provide safe conveyance of the regulatory storm event to the north side of the proposed Lanigan Drive extension, and ultimately, the County Road 93 roadside ditch.

Quality control is achieved via a combination of upstream pre-treatment provided by an Oil Grit Separator Unit, the incorporation of an ETV verified Stormtech Isolator Row Plus, and the extended detention of the 25mm water quality event. The proposed facility features a 0.3m thick, open bottom stone layer to promote infiltration and groundwater recharge on site.

The following **Table 5** highlights key elevations within the proposed underground SWMF.

Table 5 – SWMF Facility Key Elevations Summary

Location	Elev. (m)
Bottom of Stone	242.00
Bottom of Chamber / Primary Orifice – 130mm dia.	242.30
Secondary Orifice – 300mm dia.	243.00
Top of Chamber	243.44
Top of Stone / Top of Baffle Wall / Overflow Weir Invert	243.75

Based on the results of the Post-Development Peak Flow OTTHYMO modeling, an abbreviated version of the SWMF stage-storage-discharge table is presented in **Table 6** below. The full table is provided in **Appendix B**. The values for maximum required storage and SWMF outflow result from the proposed geometric configuration of the facility, design height and dimensions for the orifice and overflow weir. The *SCS 24-hour* storm distribution governs the maximum outflow and storage volume requirements. Refer to **Appendix B** for details.

Table 6 – SWMF Performance Summary

Stage Storage Discharge Table – SWMF						
Return Period (Years)	Q_{PEAK} (m^3/s)	Total Storage Vol. (m^3)	Active Storage Vol. (m^3)	Total Depth (m)	Active Depth (m)	Water Level (m)
Bottom of Stone	0.000	0	0.00	0.00	0.00	242.00
Bottom of Chamber / Primary Orifice	0.000	719	0.00	0.30	0.00	242.30
25mm 4Hr CHI	0.016	2056	1337	0.57	0.27	242.57
2-yr 24Hr SCS	0.025	3319	2600	0.82	0.52	242.82
Secondary Orifice	0.029	4085	3366	1.00	0.70	243.00
5-yr 24Hr SCS	0.039	4370	3651	1.06	0.76	243.06
10-yr 24Hr SCS	0.062	4869	4150	1.18	0.88	243.18
25-yr 24Hr SCS	0.121	5410	4691	1.33	1.03	243.33
Top of Chamber	0.147	5703	4984	1.45	1.15	243.45
50-yr 24Hr SCS	0.159	5862	5143	1.50	1.20	243.50
100-yr 24Hr SCS	0.193	6367	5648	1.72	1.42	243.72
Overflow Weir	0.196	6421	5702	1.75	1.45	243.75
Regional	1.603	6429	5710	2.20	1.90	244.20
Top of Control Structure	1.819	6430	5711	2.25	1.95	244.25

4.2 Oil Grit Separator Unit

An oil grit separator (OGS) unit has been proposed immediately upstream of the underground SWMF to act as a pre-treatment device for flows entering the facility. An ADS FD-6HC unit has been sized to accept minor event runoff generated by 15.83 ha of the development block. The OGS will work in tandem with the ADS Isolator Row PLUS within the infiltration gallery. ADS detailed sizing reports have been provided in Appendix B of this Report. Equivalent OGS units may also be explored.

4.3 Low Impact Development Measures

It is recommended that all catchments should incorporate an increased depth of absorbent topsoil at least 300mm thick to promote at-source infiltration on pervious surfaces on lots. It is further recommended that any absorbent topsoil be amended with organic content (compost) as recommended in the *CVC Low Impact Development Design Guidelines* while scarifying subsoils and remaining as unconsolidated as reasonably possible to maintain void spaces.

A study conducted in BC has asserted reductions in runoff volume and peak flows up to 50% from the placement of 300mm of absorbent landscaping (*British Columbia Ministry of Land, Water and Air*

Protection, May 2002). Another study conducted in Ontario through the *Sustainable Technologies Evaluation Program (STEP)* has confirmed similar findings with a reduction in runoff of up to 27% (*STEP, Residential Lot Level SWM Practices, 2013*).

Other recommendations include downspout disconnection, where roof leaders are directed away from impervious surfaces. Additionally, it is recommended to incorporate rain barrels at the lot level where possible, to further reduce runoff volumes to downstream systems. The proposed design has accounted for no credit for the aforementioned best management practices.

5.0 Stormwater Quantity Control

5.1 Peak Flow Control

As illustrated in Table 4 of this Report, a stormwater management plan for quantity control in the form of peak flow attenuation has been established for the subject lands. The elevations and size of the primary and secondary orifices, as well as the overflow weir, were chosen to limit the post-development peak flow leaving the site to be less than the peak flow generated by the 2 to 100-year rainfall events in the pre-development condition. This peak flow attenuation was achieved while maintaining the elevation of the 100-year event within the SWMF and below the overflow weir's elevation. Additionally, the overflow weir has been sized to safely convey the regulatory event without surcharging the structure.

5.2 Minor-Major System Conveyance

All collectible minor stormwater runoff (up to the 5-year event) will be conveyed to the proposed stormwater management facility via a network of storm sewers. The storm sewer system has been designed for the 5-year event using the Rational Method. Refer to Drawing STM-1 and DS-1 or the attached 5-year storm design sheet in Appendix B for further details.

Major stormwater runoff will be safely conveyed along property lines and roadways and directed to the proposed stormwater management facility and/or designated outlets. A 100-year pipe system is designed at the stormwater management facility inlet to ensure flows are appropriately directed to the underground storage system.

All channel sizing calculations have been completed to ensure the property boundary and diversion channels are adequately sized to convey the regulatory event peak flow, as determined via OTTHYMO modeling of their respective catchment areas. Channel cross sections have been illustrated on

Drawing No. GP-2 in Appendix D. Supporting hydraulic conveyance capacity calculations have been provided in Appendix B.

To provide a sufficient outlet to the site, the stormwater management plan proposes to re-ditch a portion of the existing roadside ditch located along the south side of County Road 93. Topographic survey was conducted to verify that the existing ditch is flat in areas within 200m of the proposed development, with grades ranging from 0% to 0.5%. The proposed re-ditching will extend approximately 400m from the site and will run at a minimum gradient of 0.5%, improving the existing hydraulic conveyance capacity of County Road 93. The proposed ditch sections have been illustrated on Drawing GP-2 in Appendix D. An upstream catchment area for the ditch was developed using the Ontario Digital Terrain Model (Lidar Derived), and the regulatory event was modelled for this catchment in OTTHYMO to confirm peak flow capacities. The corresponding hydraulic conveyance calculations have been provided in Appendix B.

Figure 5 below illustrates the extent of re-ditching along the south side of County Road 93 and the ditches corresponding upstream drainage area.

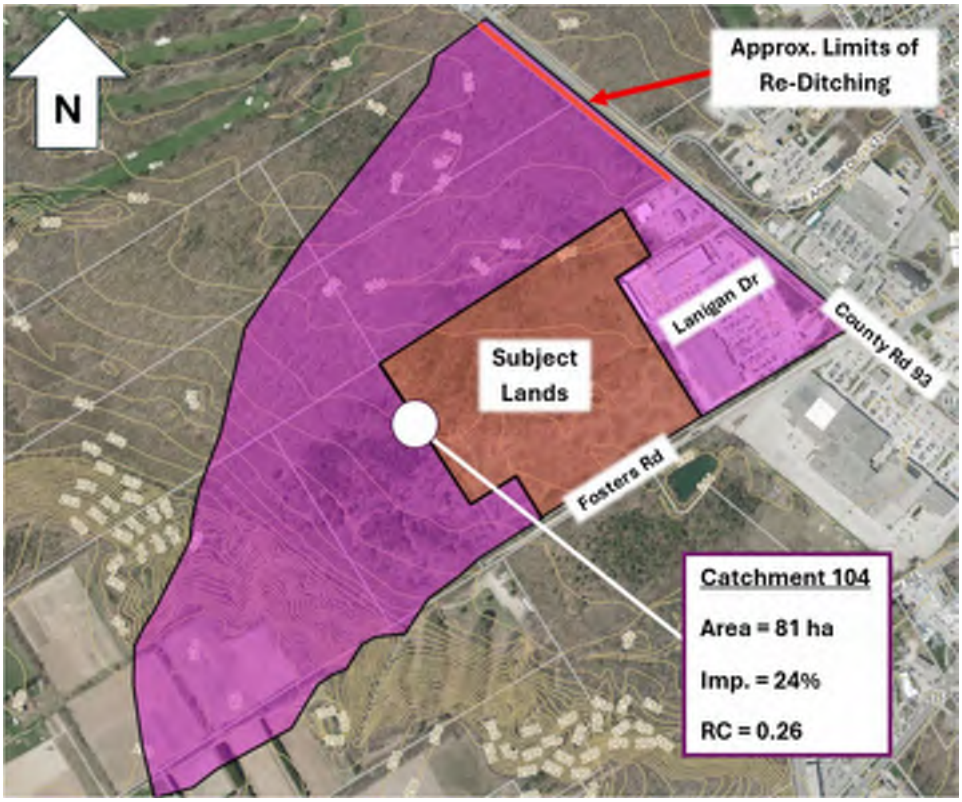


Figure 5 – County Road 93 Ditch Drainage Area

6.0 Stormwater Quality Control

6.1 Quality Control Overview

The development plan will create paved surfaces requiring quality collection and treatment for the removal of silt, hydrocarbons and heavy metals. Best management practices (BMPs) will be applied to the site in order to achieve the enhanced water quality treatment of 80% Total Suspended Solids (TSS) removal, as outlined by the MECP. The majority of post-development runoff from the development will be directed to the proposed BMPs to provide water quality treatment. This will include two (2) main features, an Oil Grit Separator OGS Unit and the proposed underground stormwater management facility complete with an isolator row.

6.2 SWMF Water Quality Performance

The total area draining to the SWMF includes approximately 17.82 hectares of land. The total imperviousness used to size the facility is 54.3% given the contributing land consists of the proposed residential development and forested external lands to the southwest. Based on the MECP requirements (interpolation of Table 3.2), 29.8 m^3/ha of storage is required for infiltration in order to achieve Enhanced quality control. For wet facilities, 40m^3/ha is required for extended detention. The proposed stormwater management facility achieves both targets.

The Enhanced water quality and extended detention volumes as per the MECP guidelines, are calculated as follows:

Enhanced (Level 1) Water Quality Protection

Total area draining to facility for quality control = 17.82 ha

54.3% Net Impervious Area, 29.8 m^3/ha total water quality

17.82 ha * 29.8 m^3/ha = 530 m^3 (water quality volume - infiltration)

17.82 ha * 40 m^3/ha = 713 m^3 (extended detention required)

However, the extended detention volume must be designed to attenuate runoff from the 4-hour 25mm Chicago rainfall event. Based on the watershed characteristics and the Visual Otthymo Model, the 25 mm storm event produces a runoff volume of 1507.2 m^3 (8.459 mm * 17.82 ha). Therefore, the runoff volume from the 4-hour 25 mm Chicago storm event will govern.

	Required:	Provided:
Water Quality - Infiltration Volume	530 m^3	719 m^3
Extended Detention	1507.2 m^3	3,366 m^3

The extended detention release rate is the maximum target flow rate to ensure that 24 to 48 hour settling occurs in the facility. The extended detention outlet orifice is 130mm in diameter. The following *Equation 4.10* of the *MOE Stormwater Management Planning and Design Manual* has been used to verify the detention time for the extended detention volume.

$$t = \frac{2A_p}{CA_o(2g)^{0.5}}\left(h_1^{0.5} - h_2^{0.5}\right)$$

Equation 4.10: Drawdown Time

Where:

t = drawdown time in seconds

A_p = surface area of the facility (m^2)

C = discharge coefficient of the orifice (0.63)

A_o = cross-sectional area of the orifice (m^2)

G = gravitational acceleration constant (9.81 m/s^2)

H_1 = starting water elevation above the orifice (m)

H_2 =ending water elevation above the orifice (m)

Given the above information, the routed and unrouted extended detention storage times of the 25mm water quality event was determined to be 45hours and 48 hours, which falls within the MOE criteria. A detailed quality control design sheet for the facility has been provided in Appendix B.

6.3 TSS Removal

A treatment train approach to TSS removal has been implemented in the proposed stormwater management plan. An infiltration gallery complete with an isolator row has been proposed to work in conjunction with an upstream oil-grit separator. Refer to Appendix B for the proposed OGS ADS FD-6HC sizing and ETV verification statement, in addition to the ETV verification for the isolator row. A summary of the proposed measures and their corresponding removal efficiencies is provided below.

LID Practice	TSS Removal Efficiency (%)
OGS 1 (FD-6HC)	36
Isolator Row Plus	77
Infiltration Gallery	60

The removal efficiency of a series of BMP devices in a treatment train can be expressed as follows:

$$R = A + B - [(A \times B)/100]$$

Where: R = Total Treatment Train Removal Efficiency (%)

A = Removal Efficiency of 1st (Upstream) BMP (%)

B = Removal Efficiency of 2nd (Downstream) BMP (%)

This approach to calculating treatment train removal efficiencies can be extended to include more than two devices. There is a total of three distinct treatment train as described below:

Treatment Train	Area (ha)	TSS Removal
OGS > Isolator Row > Infiltration Gallery	13.66	94.1 %
Infiltration Gallery	2.15	60.0 %
Untreated	1.21	0.0 %
Total	**17.02**	**83.1 %**

It has been estimated that an **area-weighted net reduction in total suspended solids of 83.1%** can be achieved when implementing BMP's in the post-development condition, exceeding the required Town and MOE criteria for quality control.

7.0 Water Balance

A pre to post development water balance has been undertaken for the Site. The analysis has been completed using the Hydrologic Cycle Component Values from Table 3.1 of the Ministry of Environment Stormwater Management Planning and Design Manual, dated March 2003. Supporting calculations are provided in **Appendix B.**

In the pre development condition, the average annual infiltration for the subject area was determined to be approximately 239.0mm. Based on the pervious area (21.20ha), this corresponds to an annual average infiltration volume of 50,662m^3. In the post development condition the average annual infiltration has been determined to be 177.0mm. The pervious area in the post development condition has been determined to be 10.74ha, corresponding to an average annual infiltration volume of

19,018m^3. This corresponds to a net loss of approximately 31,644m^3 of infiltration between the pre development and post development condition.

In order to achieve the required water balance, infiltration improvements will be implemented through the use of the underground infiltration facility located within the park block. The infiltration system will include 150mm diameter subdrains, surrounded by 19mm diameter clearstone. It is anticipated that the clearstone layer below the subdrain will act as a storage area to promote infiltration and mitigate infiltration losses associated with the impervious areas. Below the subdrain, the volume of the voids within the clearstone, assuming a porosity ratio of 0.4, is approximately 719m^3.

Catchment areas 201, 202, 203, 206, 303, 402 and 404 drain to the proposed infiltration facility and correspond to a total drainage area of 17.82 ha. These areas are comprised of 9.68ha of impervious surfaces.

Climate data indicates that an average of 99 rain events occur each year (excluding December, January and February), and that the average precipitation during an event is 4.8mm. The average rainfall event corresponds to a volume of 464.64m^3 over impervious surfaces within the facility's upstream catchment (9.68ha x 4.8mm). Assuming a loss of 15% due to evapotranspiration over impervious surfaces, the net runoff volume available for infiltration during a single event can be approximated as 394.94m^3. This is less than the volume of storage provided in the clearstone layer of the infiltration facility. Depending on the duration between storm events it is expected that 39,099m^3 (394.94m^3 x 99 events) could potentially infiltrate into the clearstone layer annually. This additional infiltration volume is greater than the net loss of infiltration between the pre and post development condition. Therefore, the proposed LID is capable of mitigating the pre- to post-development water balance deficit on an annual bases.

8.0 Erosion and Sediment Control

During construction, the majority of the development's existing 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 limits 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 which do not abut connections to existing asphalt.

- Silt socks and construction fencing to be implemented in areas abutting connections to existing asphalt.
- Temporary sediment traps 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 shall be installed at the construction accesses to reduce transmission of materials off site.
- 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.
- A bi-weekly monitoring program to ensure all ESC measures are in place and not damaged by vandalism or a significant storm event. Further,

Erosion and sediment control plans for the development will be completed at the detailed design stage. Through proper implementation of the erosion and sediment control measures, off-site impacts are expected to be minimized during the construction phase of the project.

9.0 Conclusion

This Preliminary Stormwater Management Report identifies the recommended servicing design for the proposed Pine Valley Homes Limited Subdivision. This Report outlines the proposed infrastructure required to service the site with regards to stormwater management quality control, quantity control, water balance and erosion and sediment control.

In particular, this report has recommended the following:

- The construction of an open bottom underground SWMF as described in Section 4.1 of this Report. This facility has been designed to achieve the required quantity & quality control objectives and annual water balance targets of the site in accordance with *Town of Midland Engineering Development Design Standards* and the *Ministry of Environment Stormwater Management Planning and Design Manual*.
- Construct a Minor and Major Drainage System comprised of pipes and roadways to safely convey minor and major (Regional) storm events to a suitable outlet, as detailed in Section 4.3.2.

- Prior to construction, the erosion and sediment control measures outlined in Section 4.0. should be implemented. These controls are to be maintained throughout the construction period and only removed once exposed areas have been stabilized with vegetative cover.

It is recommended that this report be accepted as fulfilling the civil engineering and stormwater management requirements in support of the Draft Plan Approval.

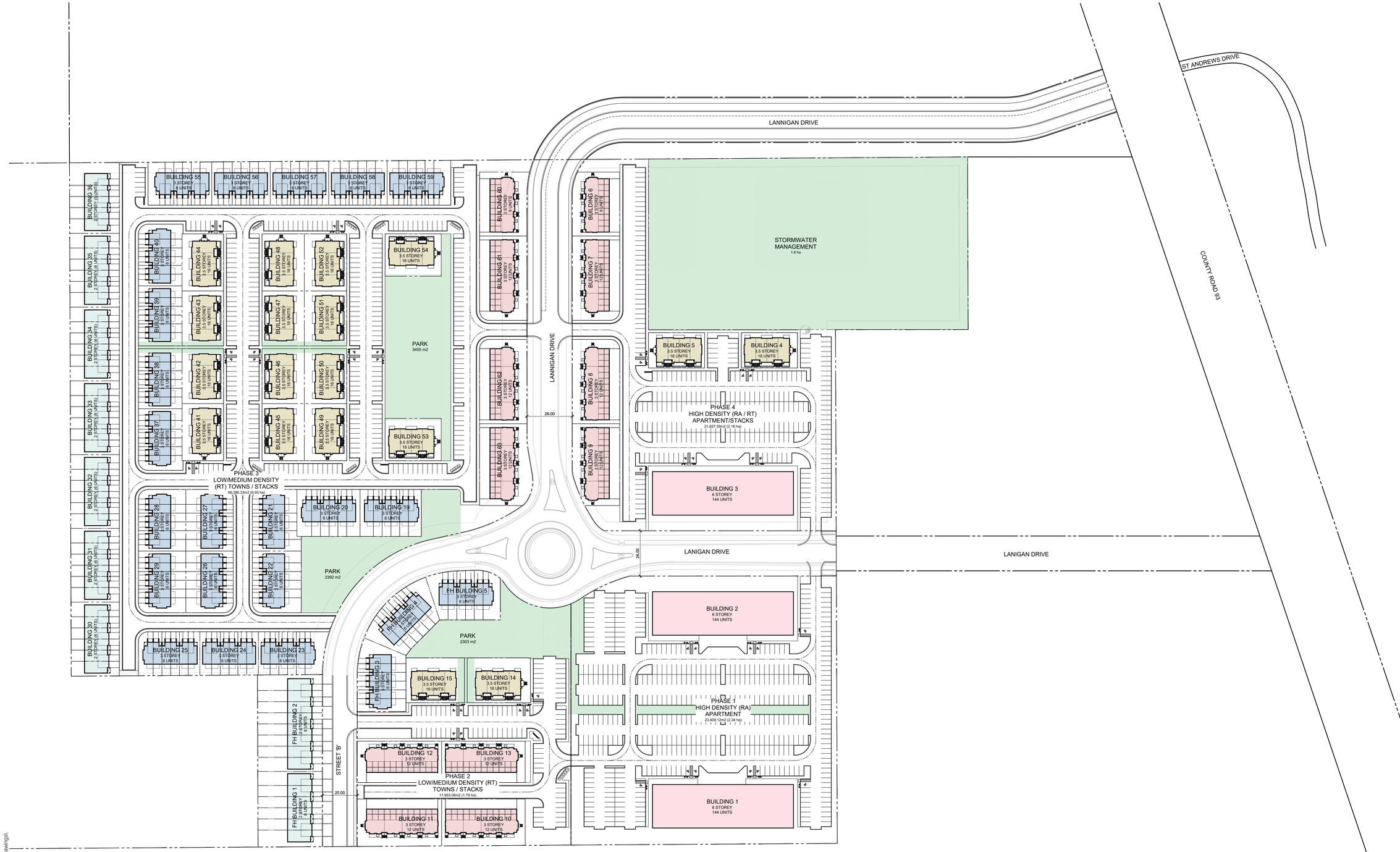
All of which is respectfully Submitted,

THE JONES CONSULTING GROUP LTD.

APPENDIX A

SUPPORTING DOCUMENTS

- Concept Plan, Orchard Design Studio Inc., October 16, 2025
- Draft Plan of Subdivision, TJCG, May 5th, 2026
- Schedule A Zoning By-law 2004-90 as amended Map 22, Town of Midland, March 22, 2024
- Soil Map of Simcoe County – Report 29 North Sheet



UNITS BREAKDOWN

PHASE	APARTMENT UNITS	REAR LANE UNITS	STACKED TOWNS	3 STOREY TOWNS	2 STOREY TOWNS	TOTAL NUMBER OF UNITS
PHASE 1	288	0	0	0	0	288
PHASE 2	0	48	32	0	0	80
PHASE 3	0	45	224	120	41	430
PHASE 4	144	45	32	0	0	221
FREEHOLD	0	0	0	18	14	32
TOTAL	432	138	288	138	55	1051

UNIT LEGEND

	# units
21' (6.4m) 2 STOREY TOWN	55 units
16' - 6" (5.0m) 3 STOREY TOWN	138 units
20'-10"(6.3m) 3.5 STOREY STACKED TOWN	288 units
33' -7" (10.2m) 3 STOREY STACKED REAR LANE TOWN	138 units
6 STOREY APARTMENT BUILDING	432 units
TOTAL UNITS =	1051 units

COMMUNITY TRAIL / LINEAR PARK

PARKING CALCULATIONS

PHASE	NUMBER OF UNITS	REQUIRED PARKING SPACES	REQUIRED VISITOR SPACES (25% OF REGULAR SPACES)(NOT ADDITIONAL)	PROVIDED PARKING SPACES
PHASE 1	288	288 x 1.5 = 432	108	441
PHASE 2	80	80 x 1.5 = 120	30	182
PHASE 3	430	430 x 1.5 = 646	162	710
PHASE 4	221	221 x 1.5 = 332	83	376
TOTAL	1019	1042 x 1.5= 1563	383	1709

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North Arrow

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Project Information

PINE VALLEY HOMES

PINE VALLEY ESTATES
9332 County Road 93, Midland ON

Set Issuance

No.	Date	Description

Sheet Information

OVERALL SITE PLAN

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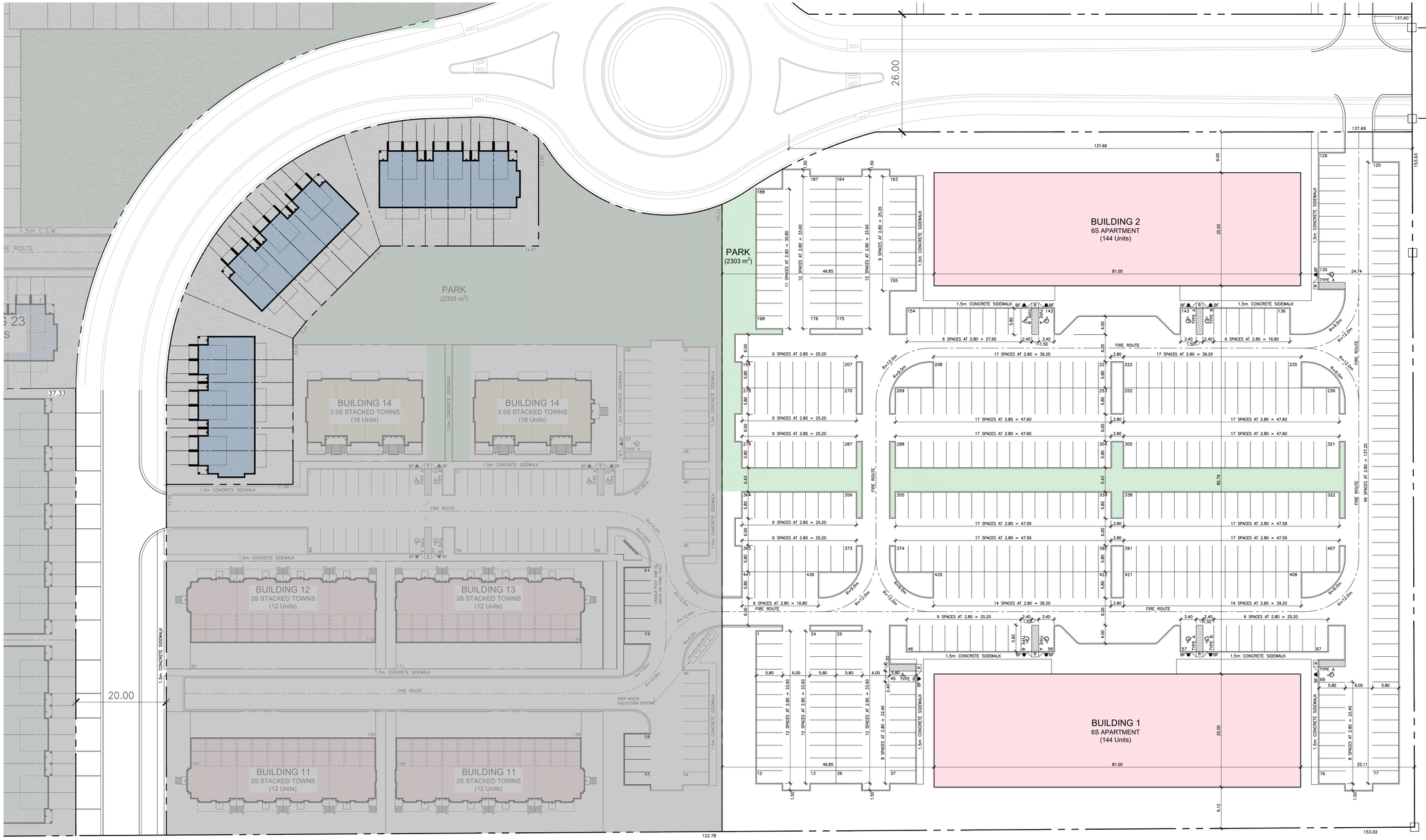

ZONING BY-LAW 2004-90				
RESIDENTIAL APARTMENT - RA				
REGULATION	REQUIRED		PROPOSED	
LOT AREA (MINIMUM)	PER UNIT	TOTAL	PER UNIT	TOTAL
	100.00 m2	28800.00 m2	81.28 m2	23409.12 m2
LOT FRONTAGE (MINIMUM)	40.00 m		137.69 m	
LOT COVERAGE (MAXIMUM)	40.00%	9363.65 m2	17.30%	4050.00 m2
FRONT YARD SETBACK (MINIMUM)	12.00 m		9.00 m	
REAR YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 7.5 m, WHICHEVER IS GREATER		9.12 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 6.0 m, WHICHEVER IS GREATER		24.74 m	
EXTERIOR SIDE YARD SETBACK (MINIMUM)	6.00 m		N/A	
BUILDING HEIGHT (MAXIMUM)	11.00 m		25.00 m	
* DENOTES VARIANCE REQUIRED				

UNIT LEGEND # units

6 STOREY APARTMENT BUILDING	288 units
TOTAL UNITS =	288 units

COMMUNITY TRAIL / LINEAR PARK

PARKING CALCULATIONS		
REGULATION	REQUIRED	PROPOSED
PARKING SPACES - APARTMENTS (MINIMUM)	1.5 SPACES PER UNIT = 432 SPACES	441 SPACES (1.53 SPACES PER UNIT)
VISITOR PARKING SPACES (MINIMUM)(INCLUDED)	25% OF TOTAL = 108 SPACES	108 SPACES
TOTAL PARKING SPACES:	432 SPACES	441 SPACES
ACCESSIBLE PARKING SPACES (AS PER AODA STANDARDS)	2+2% OF TOTAL REQUIRED SPACES = 11 SPACES	11 SPACES (6 TYPE 'A', 5 TYPE 'B')
* DENOTES VARIANCE REQUIRED		

LEGEND

- IRON BAR
- PROPERTY LINE
- MAN DOOR ENTRANCE / EXIT.
- 6.1m WIDE FIRE ROUTE
- FIRE HYDRANT (FH)
- STOP SIGN (SS)
- NO PARKING FIRE ROUTE SIGNAGE (FR)
- STREET LIGHT (REFER TO SITE LIGHTING PLAN)
- BARRIER FREE PARKING SIGN (BF)

North Arrow

True North:

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Project Information

PINE VALLEY HOMES

PINE VALLEY ESTATES
9332 County Road 93, Midland ON

Set Issuance

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Sheet Information

SITE PLAN - PHASE 1

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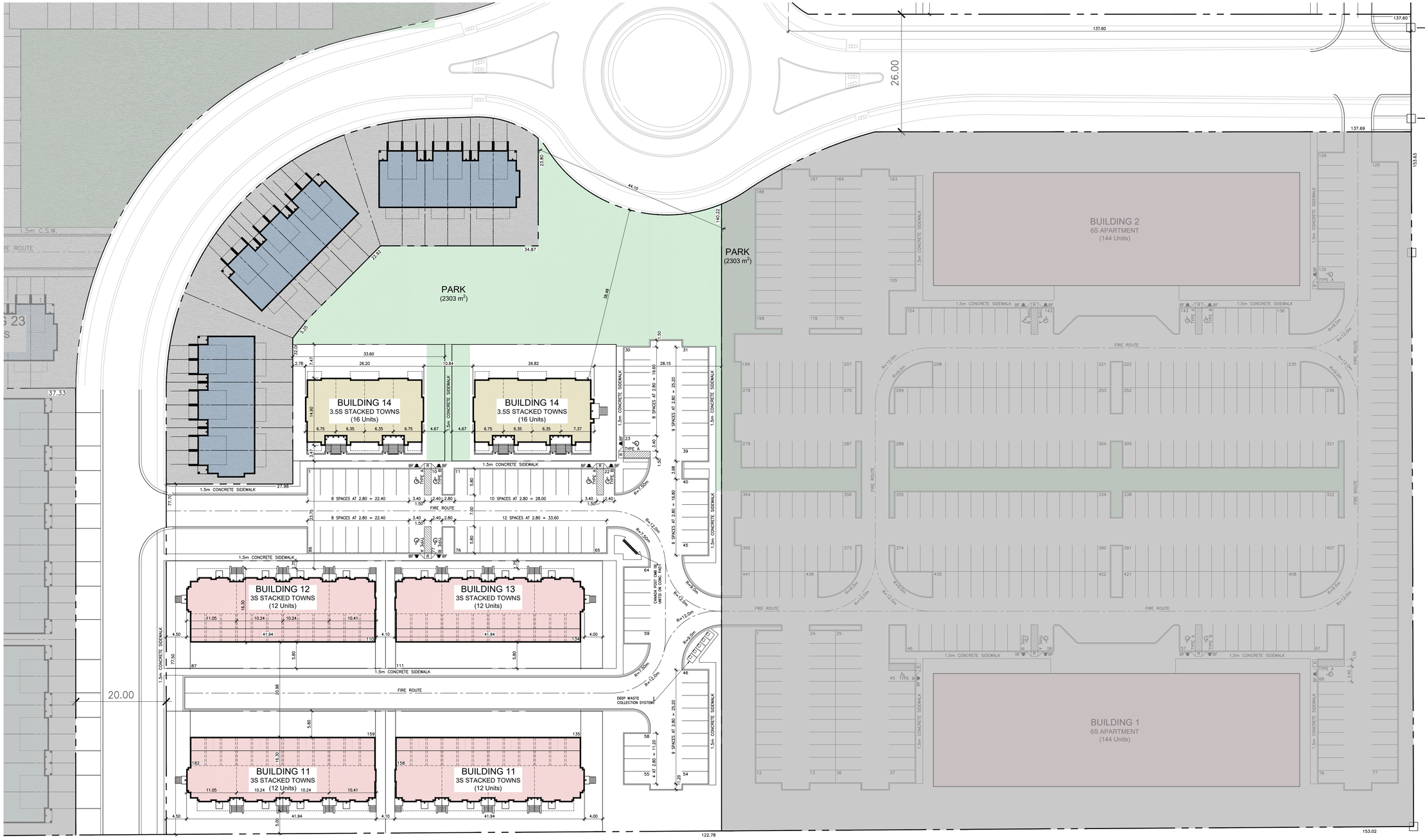

ZONING BY-LAW 2004-90				
RESIDENTIAL APARTMENT - RA				
REGULATION	REQUIRED		PROPOSED	
LOT AREA (MINIMUM)	PER UNIT	TOTAL	PER UNIT	TOTAL
	100.00 m2	8000.00 m2	183.75 m2	14700.21 m2
LOT FRONTAGE (MINIMUM)	40.00 m		44.10 m	
LOT COVERAGE (MAXIMUM)	40.00%	5880.08 m2	24.12%	3546.17 m2
FRONT YARD SETBACK (MINIMUM)	12.00 m		38.48 m	
REAR YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 7.5 m, WHICHEVER IS GREATER		5.00 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 6.0 m, WHICHEVER IS GREATER		2.78 m	
EXTERIOR SIDE YARD SETBACK (MINIMUM)	6.00 m		4.50 m	
BUILDING HEIGHT (MAXIMUM)	11.00 m		15.00 m	
* DENOTES VARIANCE REQUIRED				

UNIT LEGEND	# units
20'-10"(6.3m) 3.5 STOREY STACKED TOWN	32 units
33'-7"(10.2m) 3 STOREY STACKED REAR LANE TOWN	48 units
TOTAL UNITS =	80 units

COMMUNITY TRAIL / LINEAR PARK

PARKING CALCULATIONS		
REGULATION	REQUIRED	PROPOSED
PARKING SPACES - APARTMENTS (MINIMUM)	1.5 SPACES PER UNIT = 120 SPACES	182 SPACES (2.27 SPACES PER UNIT)
VISITOR PARKING SPACES (MINIMUM)(INCLUDED)	25% OF TOTAL = 30 SPACES	30 SPACES
TOTAL PARKING SPACES:	120 SPACES	182 SPACES
ACCESSIBLE PARKING SPACES (AS PER AODA STANDARDS)	1+3% OF TOTAL REQUIRED SPACES = 7 SPACES	7 SPACES (4 TYPE 'A', 3 TYPE 'B')
* DENOTES VARIANCE REQUIRED		

LEGEND

- IRON BAR
- PROPERTY LINE
- MAN DOOR ENTRANCE / EXIT.
- 6.1m WIDE FIRE ROUTE
- FIRE HYDRANT (FH)
- STOP SIGN (SS)
- NO PARKING FIRE ROUTE SIGNAGE (FR)
- STREET LIGHT (REFER TO SITE LIGHTING PLAN)
- BARRIER FREE PARKING SIGN (BF)

North Arrow

True North:

ORCHARD DESIGN STUDIO INC.
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Project Information

PINE VALLEY HOMES

PINE VALLEY ESTATES
9332 County Road 93, Midland ON

Set Issuance

No.	Date	Description

Sheet Information

SITE PLAN - PHASE 2

Project No. 16142
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ZONING BY-LAW 2004-90				
RESIDENTIAL TOWNHOUSES - RT - STREET TOWNHOUSE (161 UNITS)				
REGULATION	REQUIRED		PROPOSED	
LOT AREA (MINIMUM)(PER DWELLING UNIT)	220.00 m2	35420.00 m2	220.00 m2	69319.10 m2
LOT FRONTAGE (MINIMUM)	7.60 m		5.03 m	
LOT COVERAGE (MAXIMUM)	36.00%	24954.88	17.95%	12444.42 m2
FRONT YARD SETBACK (MINIMUM)	5.50 m		3.97 m	
REAR YARD SETBACK (MINIMUM)	7.60 m		5.98 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)	1.22 m		1.55 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)(COMMON WALL)	0.00 m		0.00 m	
EXTERIOR SIDE YARD SETBACK (MINIMUM)	4.50 m		2.55 m	
BUILDING HEIGHT (MAXIMUM)	11.00 m		12.00 m	
* DENOTES VARIANCE REQUIRED				

ZONING BY-LAW 2004-90				
RESIDENTIAL APARTMENT - RA (269 UNITS)				
REGULATION	REQUIRED		PROPOSED	
LOT AREA (MINIMUM)	PER UNIT	TOTAL	PER UNIT	TOTAL
	100.00 m2	26900.00 m2	100.00 m2	69319.10 m2
LOT FRONTAGE (MINIMUM)	40.00 m		26.20 m	
LOT COVERAGE (MAXIMUM)	40.00%	27727.64 m2	12.10%	8386.48 m2
FRONT YARD SETBACK (MINIMUM)	12.00 m		3.47 m	
REAR YARD SETBACK (MINIMUM)	½ THE BUILDING HEIGHT OR 7.5 m, WHICHEVER IS GREATER		6.00 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)	½ THE BUILDING HEIGHT OR 6.0 m, WHICHEVER IS GREATER		2.05 m	
EXTERIOR SIDE YARD SETBACK (MINIMUM)	6.00 m		4.51 m	
BUILDING HEIGHT (MAXIMUM)	11.00 m		15.00 m	
* DENOTES VARIANCE REQUIRED				

PARKING CALCULATIONS		
REGULATION	REQUIRED	PROPOSED
PARKING SPACES - APARTMENTS (MINIMUM)	1.5 SPACES PER UNIT = 404 SPACES	298 SPACES (1.10 SPACES PER UNIT)
PARKING SPACES - TOWNHOUSES (MINIMUM)	1.5 SPACES PER UNIT = 242 SPACES	412 SPACES (2.55 SPACES PER UNIT)
VISITOR PARKING SPACES (MINIMUM)(INCLUDED)	25% OF TOTAL = 162 SPACES	162 SPACES
TOTAL PARKING SPACES:	646 SPACES	710 SPACES
ACCESSIBLE PARKING SPACES (AS PER AODA STANDARDS)	2+2% OF TOTAL REQUIRED SPACES = 15 SPACES	16 SPACES (8 TYPE 'A', 8 TYPE 'B')
* DENOTES VARIANCE REQUIRED		

LEGEND

IRON BAR

PROPERTY LINE

MAN DOOR ENTRANCE / EXIT.

6.1m WIDE FIRE ROUTE

FIRE HYDRANT (FH)

STOP SIGN (SS)

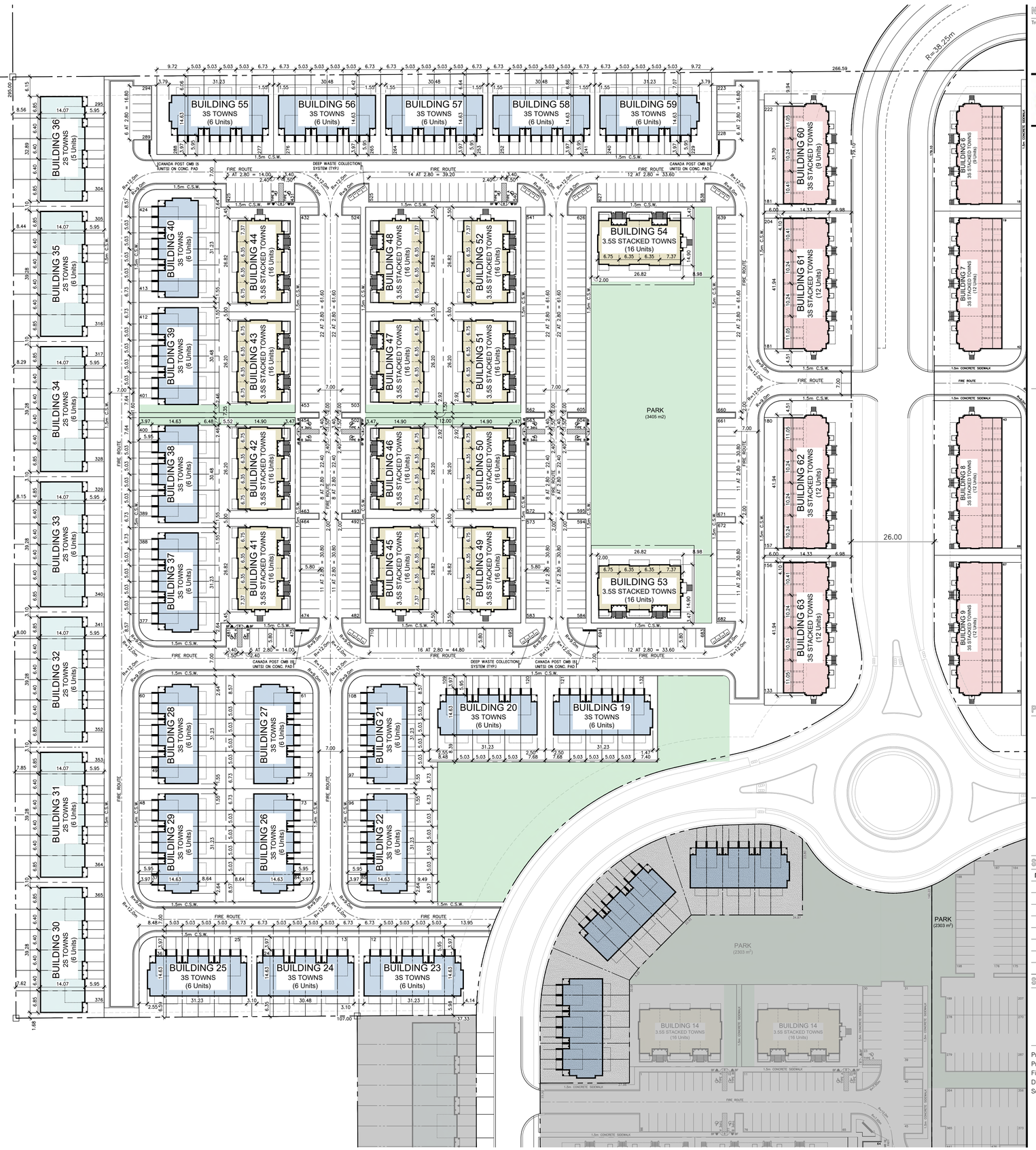
NO PARKING FIRE ROUTE SIGNAGE (FR)

STREET LIGHT (REFER TO SITE LIGHTING PLAN)

BARRIER FREE PARKING SPACE

UNIT LEGEND	# units
21' (6.4m) 2 STOREY TOWN	41 units
16' - 6" (5.0m) 3 STOREY TOWN	120 units
20'-10"(6.3m) 3.5 STOREY STACKED TOWN	224 units
33' -7" (10.2m) 3 STOREY STACKED REAR LANE TOWN	45 units
TOTAL UNITS =	430 units

COMMUNITY TRAIL / LINEAR PARK



North Arrow

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Project Information

PINE VALLEY HOMES

PINE VALLEY ESTATES
9332 County Road 93, Midland ON

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Sheet Information

SITE PLAN - PHASE 3

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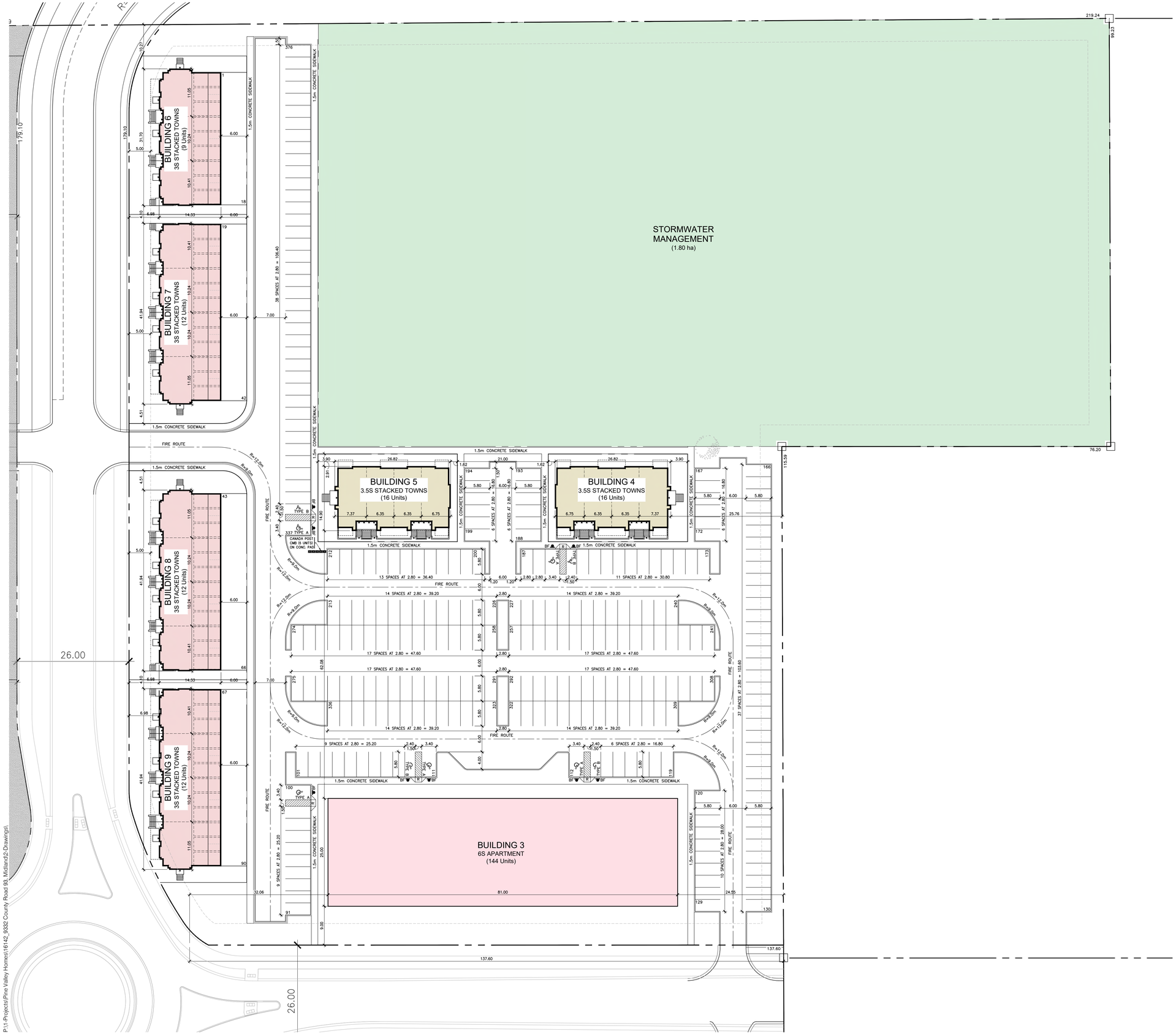

ZONING BY-LAW 2004-90				
RESIDENTIAL APARTMENT - RA				
REGULATION	REQUIRED		PROPOSED	
LOT AREA (MINIMUM)	PER UNIT	TOTAL	PER UNIT	TOTAL
	100.00 m2	22100.00 m2	179.72 m2	39718.60 m2
LOT FRONTAGE (MINIMUM)	40.00 m		137.60 m	
LOT COVERAGE (MAXIMUM)	40.00%	15887.44 m2	10.20%	4050.00 m2
FRONT YARD SETBACK (MINIMUM)	12.00 m		9.00 m	
REAR YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 7.5 m, WHICHEVER IS GREATER		10.27 m	
INTERIOR SIDE YARD SETBACK (MINIMUM)	X THE BUILDING HEIGHT OR 6.0 m, WHICHEVER IS GREATER		24.55 m	
EXTERIOR SIDE YARD SETBACK (MINIMUM)	6.00 m		5.00 m	
BUILDING HEIGHT (MAXIMUM)	11.00 m		25.00 m	
* DENOTES VARIANCE REQUIRED				

PARKING CALCULATIONS		
REGULATION	REQUIRED	PROPOSED
PARKING SPACES - APARTMENTS (MINIMUM)	1.5 SPACES PER UNIT = 332 SPACES	376 SPACES (1.70 SPACES PER UNIT)
VISITOR PARKING SPACES (MINIMUM)(INCLUDED)	25% OF TOTAL = 83 SPACES	83 SPACES
TOTAL PARKING SPACES:	332 SPACES	376 SPACES
ACCESSIBLE PARKING SPACES (AS PER AODA STANDARDS)	2+2% OF TOTAL REQUIRED SPACES = 9 SPACES	9 SPACES (5 TYPE 'A', 4 TYPE 'B')
* DENOTES VARIANCE REQUIRED		

UNIT LEGEND

	# units
20'-10"(6.3m) 3.5 STOREY STACKED TOWN	32 units
33' -7" (10.2m) 3 STOREY STACKED REAR LANE TOWN	45 units
6 STOREY APARTMENT BUILDING	144 units
TOTAL UNITS =	221 units

COMMUNITY TRAIL / LINEAR PARK

LEGEND

IRON BAR

PROPERTY LINE

MAN DOOR ENTRANCE / EXIT.

6.1m WIDE FIRE ROUTE

FIRE HYDRANT — FH

STOP SIGN — SS

NO PARKING FIRE ROUTE SIGNAGE — FR

STREET LIGHT (REFER TO SITE LIGHTING PLAN)

BARRIER FREE PARKING SIGN — BF

North Arrow

True North:

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Project Information

PINE VALLEY HOMES

PINE VALLEY ESTATES
9332 County Road 93, Midland ON

Set Issuance

No.	Date	Description

Sheet Information

SITE PLAN - PHASE 4

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Project Start Date: 2025-10-16
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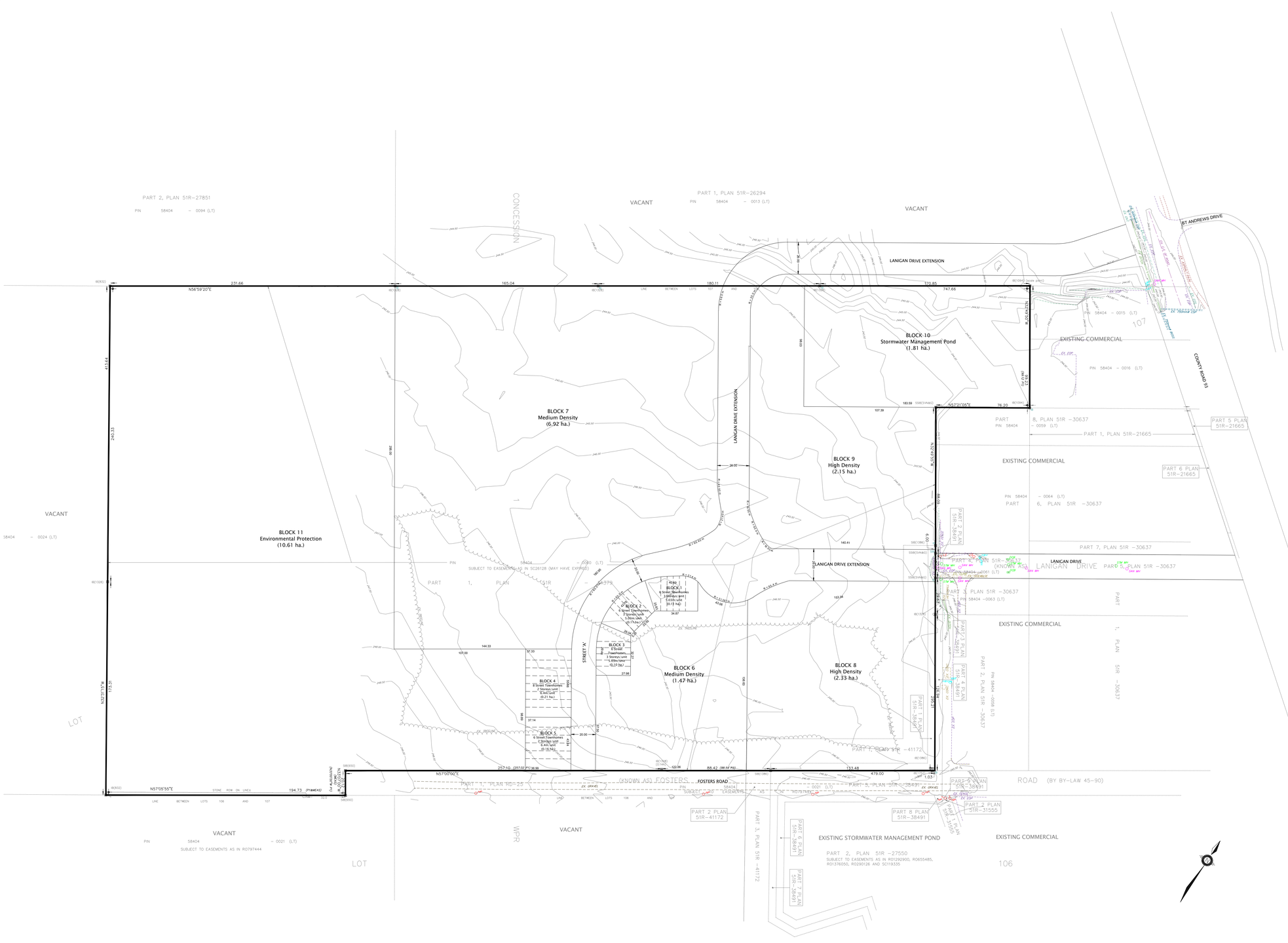
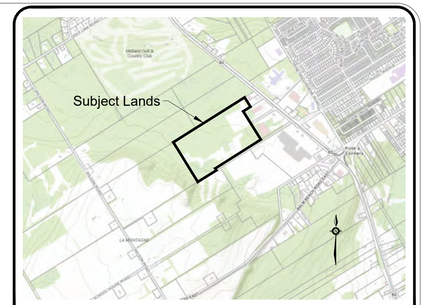




KEY PLAN 1:25,000

Draft Plan of Subdivision
9332 County Road 93
Part of Lot 107
Concession 1
West of the Penetanguishene Road
Town of Midland
County of Simcoe
2026

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

g)	SHOWN ON DRAFT PLAN	h)	MUNICIPAL WATER
b)	SHOWN ON DRAFT PLAN	i)	TIOGA LOAMY SAND & BONDHEAD SANDY LOAM
c)	SHOWN ON KEY PLAN	j)	SHOWN ON DRAFT PLAN
d)	STREET TOWNHOMES, MEDIUM DENSITY, HIGH DENSITY, STORMWATER MANAGEMENT AND ENVIRONMENTAL PROTECTION	k)	ALL MUNICIPAL SERVICES TO BE PROVIDED
		l)	THERE ARE NO RESTRICTIVE COVENANTS AFFECTING THE LAND TO BE SUBDIVIDED.
e)	SHOWN ON DRAFT PLAN		
f)	SHOWN ON DRAFT PLAN		
g)	SHOWN ON DRAFT PLAN		

OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD., TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE TOWN OF MIDLAND FOR APPROVAL.

DATE PINE VALLEY HOMES LIMITED

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE RUDY MAK, O.L.S.
RUDY MAK SURVEYING LTD.

DRAFT PLAN STATISTICS

	Number of Units	Area (ha.)
3 Storey Street Townhouses (Blocks 1 - 3)	18 units	0.32 ha.
2 Storey Street Townhouses (Blocks 4 & 5)	14 units	0.37 ha.
Medium Density (Blocks 6 & 7)	510 units	8.39 ha.
High Density (Blocks 8 & 9)	509 units	4.48 ha.
Stormwater Management (Block 10)	n/a	1.81 ha.
Environmental Protection (Block 11)	n/a	10.61ha.
Municipal Roads - Existing/Extended Lanigan Drive - New Local Street 'A'	n/a	1.65ha.
Totals	1051 units	27.63 ha.

0 10 50 100M
SCALE 1 : 1500 (A1)

Pine Valley Homes Limited

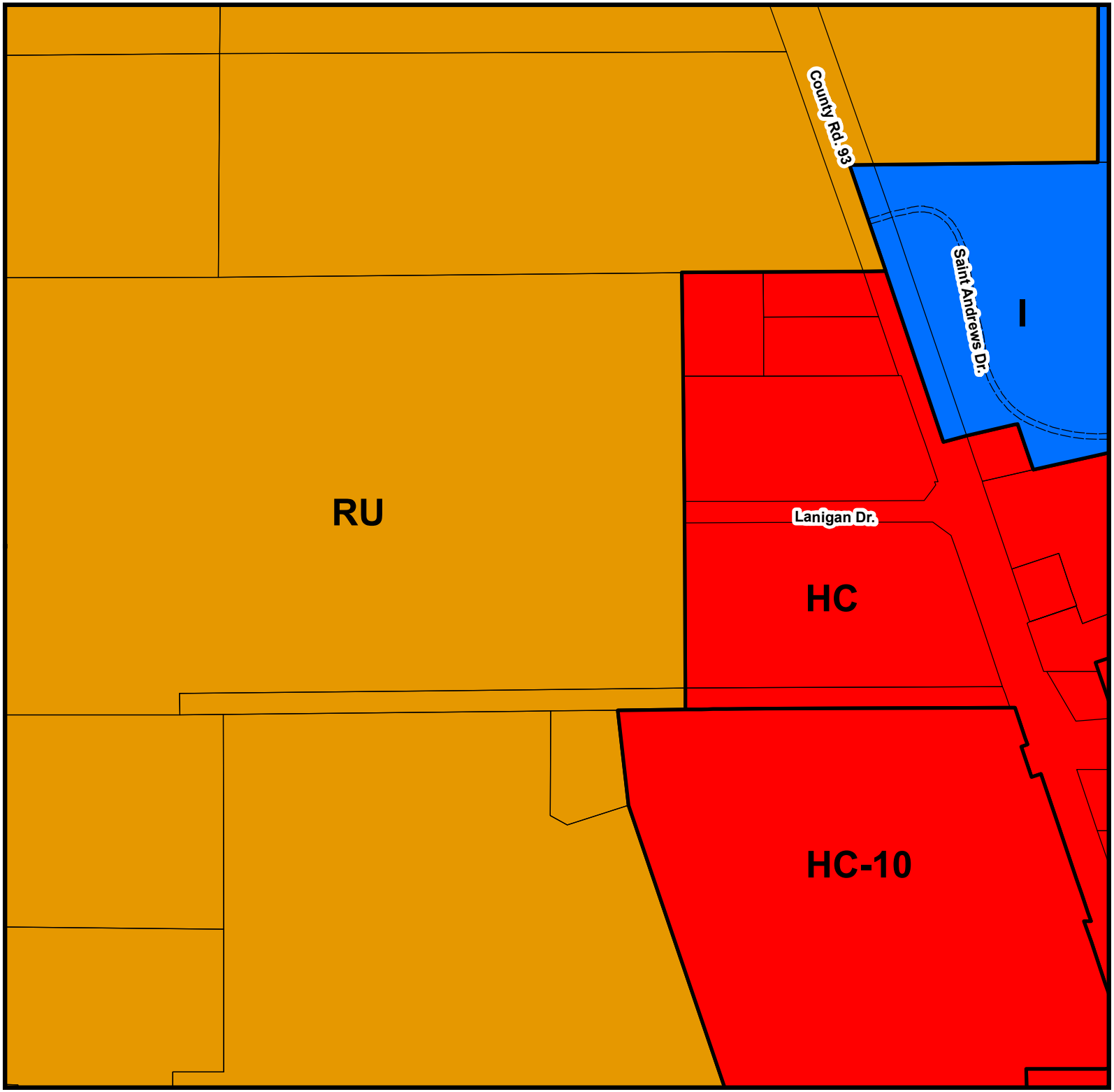
DRAFT PLAN OF SUBDIVISION

Brandi L. Clement
REGISTERED PROFESSIONAL PLANNER
R.P.P.

Date Issued:	MAY 5, 2026
Checked By:	BC
Project No.:	PIN-19037
Drawn By:	m.c.r.
Drawing Name:	PIN-19037-DP-1a.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-1056
www.jonesconsulting.com

PINE VALLEY HOMES LIMITED
TOWN OF MIDLAND



Town of Midland

Schedule A
Zoning By-law 2004-90, as amended
Map 22

100 50 0 100
m

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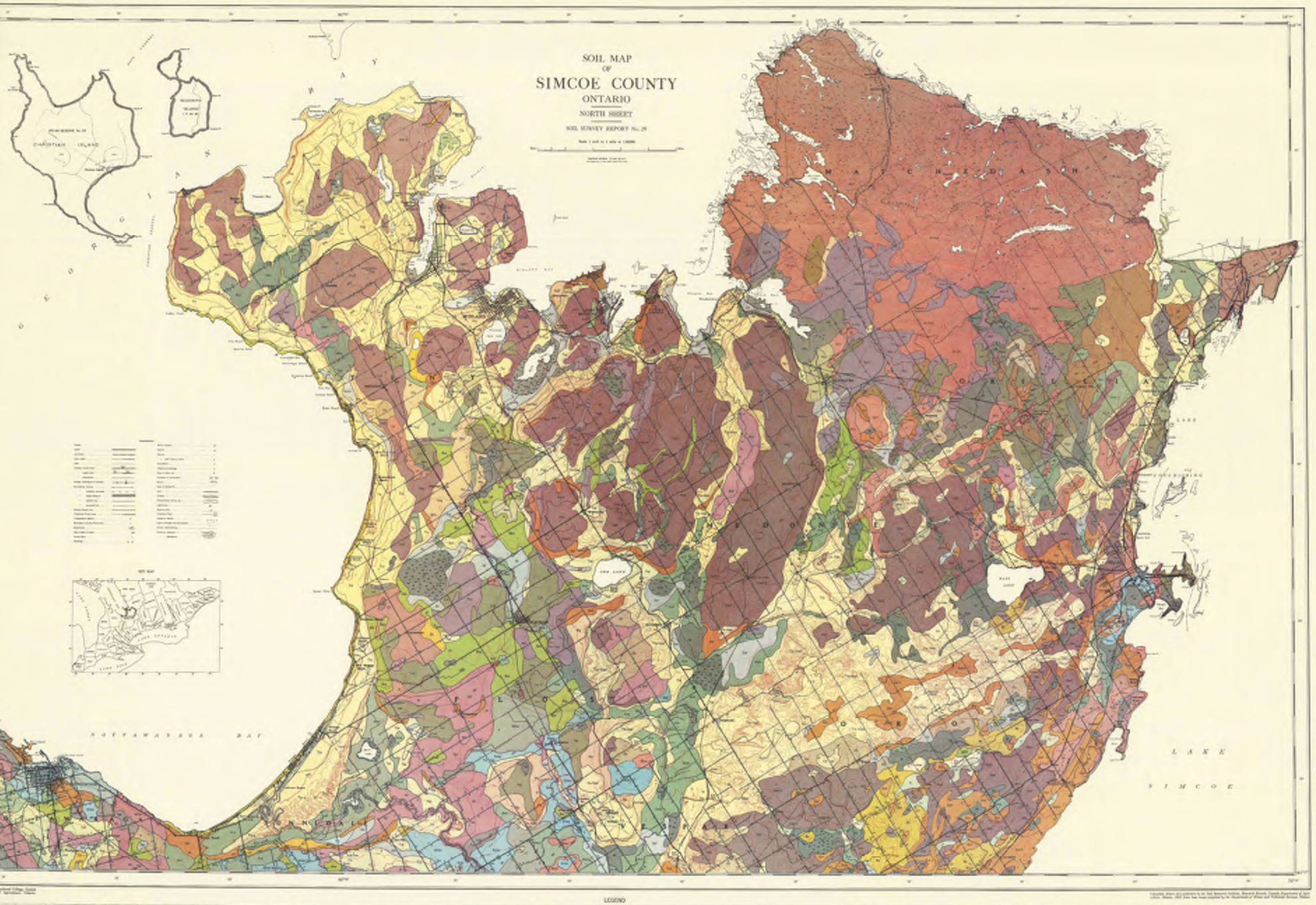
Legend

- R1 Residential Zone
- R2 Residential Zone
- R3 Residential Zone
- R4 Residential Zone
- R5 Residential Zone
- RT Residential Townhouse Zone
- RA Residential Apartment Zone
- RM Residential Mobile Home Zone
- RO Residential Office Zone
- DC Downtown Core Commercial Zone
- HC Highway Commercial Zone
- NC Neighbourhood Commercial Zone
- MC Marine Commercial Zone
- M1 Industrial Zone
- M2 Industrial Zone
- I Institutional Zone
- OS Open Space Zone
- RU Rural Zone
- EP Environmental Protection Zone
- Parking Exemption Area

Revision Date: March 22, 2024
Created By: Town of Midland Planning and Building Services

SOIL MAP
OF
SIMCOE COUNTY
ONTARIO
NORTH SHEET
SOIL SURVEY REPORT No. 29



LEGEND

APPENDIX B

SUPPORTING CALCULATIONS

- Storm Sewer Design Sheet
- Underground SWMF Stage Storage Discharge Table
- Underground SWMF Quality Control Design Sheet
- ADS MC-3500 System Drawings
- ADS FD-6HC Detailed Sizing Report & Treatment Train Calculation
- Open Channel Hydraulic Conveyance Calculations
- Water Balance Supporting Calculations

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
401	Lane F	MH70	CBMH69	**50.7**	0.65	0.46	0.30	0.30	15.00	0.53	83	0.069	**1.00**	**375**	0.18	1.6	39%
402	Lane A	CBMH69	MH67	**14.8**	0.65	0.10	0.07	0.36	15.53	0.22	81	0.082	**0.50**	**375**	0.12	1.1	66%
403	Lane G	CBMH68	MH67	**10.1**	0.65	0.47	0.31	0.31	15.00	0.15	83	0.070	**0.50**	**375**	0.12	1.1	57%
	Lane A	MH67	CBMH66	**55.1**				0.67	15.75	0.72	81	0.150	**0.50**	**450**	0.20	1.3	74%
404	Lane A	CBMH66	MH64	**15.6**	0.65	0.18	0.12	0.79	16.48	0.21	78	0.171	**0.50**	**450**	0.20	1.3	85%
405	Lane H	CBMH65	MH64	**10.1**	0.65	0.31	0.20	0.20	15.00	0.17	83	0.046	**0.50**	**300**	0.07	1.0	68%
	Lane A	MH64	CBMH63	**43.0**				0.99	16.68	0.51	78	0.214	**0.50**	**525**	0.30	1.4	70%
406	Lane A	CBMH63	CBMH62	**16.8**	0.65	0.18	0.12	1.11	17.19	0.20	77	0.235	**0.50**	**525**	0.30	1.4	77%
407	Lane I	CBMH62	CBMH61	**51.6**	0.65	0.09	0.06	1.16	17.39	0.61	76	0.246	**0.50**	**525**	0.30	1.4	81%
408	Lane I	CBMH61	MH48	**7.6**	0.65	0.33	0.21	1.38	18.00	0.09	75	0.285	**0.50**	**525**	0.30	1.4	94%
409	Lane B	MH60	CBMH59	**50.7**	0.65	0.69	0.45	0.45	15.00	0.53	83	0.103	**1.00**	**375**	0.18	1.6	59%
410	Lane B	CBMH59	MH56	**14.8**	0.65	0.09	0.06	0.51	15.53	0.22	81	0.114	**0.50**	**375**	0.12	1.1	92%
412	Lane G	CBMH58	MH56	**14.8**	0.65	0.37	0.24	0.24	15.00	0.25	83	0.055	**0.50**	**300**	0.07	1.0	81%
411	Lane G	CBMH57	MH56	**7.6**	0.65	0.40	0.26	0.50	15.00	0.11	83	0.115	**0.50**	**375**	0.12	1.1	93%
	Lane B	MH56	CBMH55	**53.6**				1.01	15.75	0.64	81	0.225	**0.50**	**525**	0.30	1.4	74%
413	Lane B	CBMH55	MH53	**17.1**	0.65	0.27	0.18	1.18	16.39	0.20	79	0.259	**0.50**	**525**	0.30	1.4	85%
414	Lane H	CBMH54	MH53	**7.8**	0.65	0.27	0.18	0.50	15.00	0.12	83	0.115	**0.50**	**375**	0.12	1.1	93%
	Lane B	MH53	CBMH52	**45.2**				1.36	16.59	0.49	78	0.295	**0.50**	**600**	0.43	1.5	68%
415	Lane B	CBMH52	MH51	**14.6**	0.65	0.23	0.15	1.51	17.08	0.16	77	0.322	**0.50**	**600**	0.43	1.5	74%
	Lane I	MH51	CBMH50	**14.1**				1.51	17.24	0.15	76	0.320	**0.50**	**600**	0.43	1.5	74%

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
416	Lane I	CBMH50	CBMH49	**57.0**	0.65	0.09	0.06	1.57	17.39	0.62	76	0.331	**0.50**	**600**	0.43	1.5	76%
417	Lane I	CBMH49	MH48	**15.0**	0.65	0.43	0.28	1.85	18.01	0.16	74	0.382	**0.50**	**600**	0.43	1.5	88%
	Lane M	MH48	CBMH47	**29.4**				3.22	18.17	0.27	74	0.664	**0.50**	**750**	0.79	1.8	84%
418	Lane M	CBMH47	MH9	**15.8**	0.65	0.07	0.05	3.27	18.45	0.15	73	0.667	**0.50**	**750**	0.79	1.8	85%
419	Lane F	CBMH46	MH45	**8.3**	0.65	0.13	0.08	0.08	15.00	0.10	83	0.019	**1.00**	**300**	0.10	1.4	20%
	Lane C	MH45	CBMH44	**7.8**				0.08	15.10	0.13	82	0.019	**0.50**	**300**	0.07	1.0	28%
	Lane C	CBMH44	CBMH43	**42.8**				0.08	15.24	0.74	82	0.019	**0.50**	**300**	0.07	1.0	28%
420	Lane C	CBMH43	CBMH42	**66.2**	0.65	0.11	0.07	0.16	15.97	1.14	80	0.035	**0.50**	**300**	0.07	1.0	51%
421	Lane C	CBMH42	MH40	**4.7**	0.65	0.21	0.14	0.29	17.11	0.08	77	0.062	**0.50**	**300**	0.07	1.0	91%
303	Street B				0.08	1.62	0.13	0.13	15.00		137	0.049					
422	Street B	HW4	MH41	**47.1**	0.44	0.32	0.14	0.27	15.00	0.49	137	0.103	**1.00**	**375**	0.18	1.6	59%
423	Street B				0.65	0.27	0.18	0.18	15.00		83	0.040					
	Street B	MH41	MH40	**33.7**				0.45	15.49	0.44	81	0.143	**0.50**	**450**	0.20	1.3	71%
	Street B	MH40	MH39	**33.6**				0.74	17.19	0.40	77	0.203	**0.50**	**525**	0.30	1.4	67%
424	Street B	MH39	CBMH38	**33.6**	0.65	0.40	0.26	1.00	17.59	0.40	76	0.256	**0.50**	**525**	0.30	1.4	84%
425	Street B	CBMH38	MH22	**67.0**	0.65	0.25	0.16	1.16	17.99	0.73	75	0.288	**0.50**	**600**	0.43	1.5	66%
428	High Density Blk	CB1	CBMH32	**53.2**	0.65	0.10	0.07	0.07	15.00	1.04	83	0.015	**0.50**	**250**	0.04	0.9	36%
429	High Density Blk	BLDG 1	CBMH32	**16.7**	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	**0.50**	**300**	0.07	1.0	64%
430	High Density Blk	CBMH32	MH72	**43.8**	0.65	0.25	0.16	0.42	16.04	0.65	80	0.092	**0.50**	**375**	0.12	1.1	75%

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
461	High Density Blk	MH72	MH73	**52.3**	0.65	0.15	0.10	0.52	16.69	0.78	78	0.111	**0.50**	**375**	0.12	1.1	90%
462	High Density Blk	CB9	CBMH33	**70.7**	0.65	0.05	0.03	0.03	15.00	1.22	83	0.007	**0.50**	**300**	0.07	1.0	11%
432	High Density Blk	BLDG 2	CBMH33	**16.7**	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	**0.50**	**300**	0.07	1.0	64%
433	High Density Blk	CBMH33	MH73	**26.2**	0.65	0.31	0.20	0.39	16.22	0.39	79	0.086	**0.50**	**375**	0.12	1.1	69%
	High Density Blk	MH73	CBMH75	**6.0**				0.94	17.46	0.07	76	0.198	**0.50**	**525**	0.30	1.4	65%
431	High Density Blk	CBMH75	CBMH76	**34.9**	0.65	0.46	0.30	1.24	17.53	0.41	76	0.260	**0.50**	**525**	0.30	1.4	86%
434	High Density Blk	CBMH76	MH74	**25.9**	0.65	0.13	0.08	1.32	17.95	0.31	75	0.274	**0.50**	**525**	0.30	1.4	90%
426	Lane E	CBMH35	CBMH34	**39.9**	0.65	0.21	0.14	0.14	15.00	0.49	83	0.031	**1.00**	**300**	0.10	1.4	32%
427	Lane L				0.65	0.15	0.10	0.23									
435	Lane L	CBMH34	MH29	**40.3**	0.65	0.05	0.03	0.27	15.49	0.69	81	0.060	**0.50**	**300**	0.07	1.0	88%
460	Lane D	CBMH37	CBMH36	**67.8**	0.65	0.13	0.08	0.08	15.00	0.83	83	0.019	**1.00**	**300**	0.10	1.4	20%
437	Lane D	CBMH36	MH29	**14.9**	0.65	0.37	0.24	0.33	15.83	0.22	80	0.073	**0.50**	**375**	0.12	1.1	58%
	Lane L	MH29	CBMH28	**10.3**				0.59	16.18	0.14	79	0.130	**0.50**	**450**	0.20	1.3	65%
436	Lane L	CBMH28	DCBMH27	**56.8**	0.65	0.09	0.06	0.65	16.32	0.75	79	0.143	**0.50**	**450**	0.20	1.3	71%
438	Lanigan Drive				0.65	0.35	0.23	0.88	17.06		77	0.187					
439	Lanigan Drive	DCBMH27	MH22	**29.2**	0.65	0.31	0.20	1.08	17.06	0.35	77	0.230	**0.50**	**525**	0.30	1.4	76%
440	Lanigan Drive	MH23	MH74	**21.7**	0.65	0.31	0.20	0.20	15.00	0.26	83	0.046	**1.00**	**300**	0.10	1.4	48%
	Lanigan Drive	MH74	MH22	**40.2**				1.52	18.25	0.44	74	0.313	**0.50**	**600**	0.43	1.5	72%
	Lanigan Drive	MH22	MH21	**32.5**				3.76	17.41	0.29	76	0.841	**0.50**	**825**	1.02	1.9	83%
441	Lanigan Drive	MH21	MH20	**32.4**	0.65	0.36	0.23	4.00	17.69	0.28	75	0.883	**0.50**	**825**	1.02	1.9	87%
442	Lanigan Drive	MH20	MH19	**48.7**	0.65	0.18	0.12	4.11	17.98	0.43	75	0.900	**0.50**	**825**	1.02	1.9	89%
443	Lanigan Drive	MH19	MH9	**15.4**	0.65	0.28	0.18	4.30	18.41	0.14	74	0.926	**0.50**	**825**	1.02	1.9	91%
444	High Density Blk	CB2	CBMH18	**25.8**	0.65	0.05	0.03	0.03	15.00	0.50	83	0.007	**0.50**	**250**	0.04	0.9	18%

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
445	High Density Blk	CBMH18	CBMH17	**70.0**	0.65	0.05	0.03	0.07	15.50	1.21	81	0.015	**0.50**	**300**	0.07	1.0	21%
447	High Density Blk	BLDG 3	CBMH17	**16.9**	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	**0.50**	**300**	0.07	1.0	64%
446	High Density Blk	CBMH17	CBMH16	**16.7**	0.65	0.25	0.16	0.42	16.71	0.25	78	0.090	**0.50**	**375**	0.12	1.1	73%
448	Lane J	CBMH16	CBMH13	**35.2**	0.65	0.17	0.11	0.53	16.96	0.52	77	0.113	**0.50**	**375**	0.12	1.1	91%
450	High Density Blk	CBMH15	CBMH14	**70.3**	0.65	0.18	0.12	0.12	15.00	1.21	83	0.027	**0.50**	**300**	0.07	1.0	39%
451	High Density Blk	CBMH14	CBMH13	**16.7**	0.65	0.35	0.23	0.34	16.21	0.25	79	0.076	**0.50**	**375**	0.12	1.1	61%
449	Lane J	CBMH13	MH11	**33.0**	0.65	0.11	0.07	0.94	17.48	0.39	76	0.199	**0.50**	**525**	0.30	1.4	65%
452	Lane J	CBMH12	MH11	**22.3**	0.65	0.16	0.10	0.10	15.00	0.38	83	0.024	**0.50**	**300**	0.07	1.0	35%
	Lane M	MH11	CBMH10	**29.0**				1.05	17.87	0.34	75	0.218	**0.50**	**525**	0.30	1.4	72%
453	Lane M	CBMH10	MH9	**10.3**	0.65	0.18	0.12	1.17	18.21	0.12	74	0.239	**0.50**	**525**	0.30	1.4	79%
	Lanigan Drive	MH9	MH8	**56.8**				8.73	18.54	0.42	73	1.824	**0.50**	**1050**	1.93	2.2	94%
454	Lanigan Drive	MH8	MH7	**33.1**	0.65	0.37	0.24	8.97	18.97	0.25	72	1.849	**0.50**	**1050**	1.93	2.2	96%
	Lanigan Drive	MH7	MH6	**33.4**				8.97	19.21	0.25	72	1.835	**0.50**	**1050**	1.93	2.2	95%
455	Lanigan Drive	MH6	MH71	**60.5**	0.65	0.27	0.18	9.15	19.46	0.45	71	1.856	**0.50**	**1050**	1.93	2.2	96%
	Lanigan Drive	MH71	DCBMH4	**11.4**				9.15	19.92	0.07	70	1.832	**0.70**	**1050**	2.28	2.6	80%
	Lanigan Drive	DCBMH4	MH5	**21.1**	0.41	0.33	0.14	9.28	19.99	0.13	117	3.008	**0.50**	**1350**	3.77	2.6	80%
	Lanigan Drive	MH71	OGS	**22.1**	*25mm Event Flow Taken from OTTHYMO Model:*							0.642	**0.50**	**750**	0.79	1.8	82%
	SWM Block	OGS	MH5	**5.3**	*25mm Event Flow Taken from OTTHYMO Model:*							0.642	**0.50**	**750**	0.79	1.8	82%
206	East Boundary	HW3	MH24	**7.1**	0.44	0.57	0.25	0.25	15.00	0.03	137	0.096	**5.00**	**375**	0.39	3.5	24%
	East Boundary	MH24	MH25	**38.8**				0.25	15.03	0.58	137	0.096	**0.50**	**375**	0.12	1.1	77%
	East Boundary	MH25	MH26	**110.0**				0.25	15.61	1.63	135	0.094	**0.50**	**375**	0.12	1.1	76%

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
507	East Boundary				0.41	0.05	0.02	0.02	15.00		137	0.008					
459	East Boundary	CB3	MH26	**4.6**	0.05	0.03	0.00	0.02	15.00	0.08	137	0.008	**0.70**	**250**	0.05	1.0	17%
	East Boundary	MH26	LID	**55.9**				0.27	17.24	0.83	127	0.096	**0.50**	**375**	0.12	1.1	78%
457	Lanigan Drive	CBMH1	DCBMH2	**56.3**	0.41	0.37	0.15	0.15	15.00	0.97	83	0.035	**0.50**	**300**	0.07	1.0	51%
458	Lanigan Drive	DCBMH2	HW2	**3.8**	0.95	0.08	0.08	0.23	15.97	0.07	80	0.051	**0.50**	**300**	0.07	1.0	74%

Note: Values in red include the 100-year flow/intensity generated by Catchments 303 & 422 and Catchments 206, 507 & 459.

Note: Values in orange are taken from the OTTHYMO model to size stm sewers for the 25mm Water Quality Event

Note: Values in blue represent the equivalent nominal pipe size for a 1725mm x 1090mm elliptical pipe

Note: Cells highlighted in green represent pipes sized for the 100-year event

Stormwater Information:

$I = A/(tc + B)^C$

A = 5 Year-1135.40, 100 Year-2193.10

B = 5 Year-7.5, 100 Year-9.04

C= 5 Year-0.841, 100 Year-0.871

t_c = Time of Concentration (mins.)

Q = (C*I*A)/360 (cms)

C: Runoff Coefficiant

I: Rainfall Intensity (mm/hr)(See IDF Curve for the 5-year storm)

A: Area (ha)

Town of Midland IDF data taken from Section 5.2.5: Orillia Atmospheric Envirnoment Weather Station

**Equivalent Diameter Used

Date: 6-May-26

Calculated By: KR

Checked By: JWI

TOWN OF MIDLAND

STORM SEWER DESIGN SHEET

Jones Consulting Project No.: PIN-19037

Pine Valley Estates

R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole		Length (m)	Increment			Total CA	Flow Time (min)		I (mm/ hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
		From	To		C	A	CA		To	In							
457	Lanigan Drive	CBMH1	DCBMH2	**56.3**	0.41	0.37	0.15	0.15	15.00	0.97	83	0.035	**0.50**	**300**	0.07	1.0	51%
458	Lanigan Drive	DCBMH2	HW2	**3.8**	0.95	0.08	0.08	0.23	15.97	0.07	80	0.051	**0.50**	**300**	0.07	1.0	74%

Note: Values in red include the 100-year flow/intensity generated by Catchments 303 & 422

Note: Values in orange are taken from the OTTHYMO model to size stm sewers for the 25mm Water Quality Event

Note: Values in blue represent the equivalent nominal pipe size for a 1725mm x 1090mm elliptical pipe

Note: Cells highlighted in green represent pipes sized for the 100-year event

Stormwater Information:

$I = A/(tc + B)^C$

A = 5 Year-1135.40, 100 Year-2193.10

B = 5 Year-7.5, 100 Year-9.04

C= 5 Year-0.841, 100 Year-0.871

t_c = Time of Concentration (mins.)

Q = (C*I*A)/360 (cms)

C: Runoff Coefficiant

I: Rainfall Intensity (mm/hr)(See IDF Curve for the 5-year storm)

A: Area (ha)

Date: 16-Apr-26

Calculated By: KR

Checked By: JWI

Town of Midland IDF data taken from Section 5.2.5: Orillia Atmospheric Envirnoment Weather Station

**Equivalent Diameter Used

Stormwater Management Facility - Underground Storage Chambers
Stage Storage Discharge Table

CLIENT: Pine Valley Estates Ltd. **DATE:** April 2026

PROJECT: Pine Valley - Midland **DESIGN:** KR

FILE: PIN-19037 **CHECKED:** JWI

Primary / Extended Detention Orifice			*Secondary Orifice*	
Radius	0.065	m	0.150	m
Outlet Diameter	130	mm	300	mm
Invert Elevation	242.30	m	243.00	m

Overflow Weir (Baffle Wall)		
C=	1.84	
L=	2.4	m
Invert Elevation=	243.75	m

Weir Equation $Q=C*L*H^{3/2}$

Surface Area: 5893.67 m^2

	Minimum		Provided		Elevation	
Water Quality Volume Required:	530	m^3	4196	m^3	243.70	m

Total Storage m^3	Active Storage m^3	Water Depth m	Primary / Ext. Detention Orifice Flow (m^3/s)	Secondary Orifice Flow (m^3/s)	Overflow Weir Flow (m^3/s)	Total Flow (m^3/s)	Elevation m
0	0	0.00	0.000	0.000	0.000	0.000	242.00
60	0	0.03	0.000	0.000	0.000	0.000	242.03
120	0	0.05	0.000	0.000	0.000	0.000	242.05
180	0	0.08	0.000	0.000	0.000	0.000	242.08
240	0	0.10	0.000	0.000	0.000	0.000	242.10
299	0	0.13	0.000	0.000	0.000	0.000	242.13
359	0	0.15	0.000	0.000	0.000	0.000	242.15
419	0	0.18	0.000	0.000	0.000	0.000	242.18
479	0	0.20	0.000	0.000	0.000	0.000	242.20
539	0	0.23	0.000	0.000	0.000	0.000	242.23
599	0	0.25	0.000	0.000	0.000	0.000	242.25
659	0	0.28	0.000	0.000	0.000	0.000	242.28
719	0	0.30	0.000	0.000	0.000	0.000	242.30
851	133	0.33	0.001	0.000	0.000	0.001	242.33
984	265	0.36	0.002	0.000	0.000	0.002	242.36
1116	397	0.38	0.005	0.000	0.000	0.005	242.38
1247	529	0.41	0.008	0.000	0.000	0.008	242.41
1378	660	0.43	0.009	0.000	0.000	0.009	242.43
1509	790	0.46	0.011	0.000	0.000	0.011	242.46
1639	920	0.48	0.013	0.000	0.000	0.013	242.48
1768	1,050	0.51	0.014	0.000	0.000	0.014	242.51
1897	1,179	0.53	0.015	0.000	0.000	0.015	242.53
2026	1,307	0.56	0.016	0.000	0.000	0.016	242.56
2154	1,435	0.58	0.017	0.000	0.000	0.017	242.58
2281	1,562	0.61	0.018	0.000	0.000	0.018	242.61
2407	1,689	0.63	0.019	0.000	0.000	0.019	242.63
2,533	1,815	0.66	0.020	0.000	0.000	0.020	242.66
2,658	1,940	0.69	0.021	0.000	0.000	0.021	242.69
2,783	2,064	0.71	0.022	0.000	0.000	0.022	242.71
2,906	2,187	0.74	0.023	0.000	0.000	0.023	242.74
3,029	2,310	0.76	0.023	0.000	0.000	0.023	242.76
3,150	2,432	0.79	0.024	0.000	0.000	0.024	242.79
3,271	2,553	0.81	0.025	0.000	0.000	0.025	242.81
3,391	2,672	0.84	0.026	0.000	0.000	0.026	242.84
3,510	2,791	0.86	0.026	0.000	0.000	0.026	242.86
3,627	2,909	0.89	0.027	0.000	0.000	0.027	242.89
3,744	3,025	0.91	0.027	0.000	0.000	0.027	242.91
3,859	3,140	0.94	0.028	0.000	0.000	0.028	242.94
3,973	3,254	0.97	0.029	0.000	0.000	0.029	242.97
4,085	3,366	0.99	0.029	0.000	0.000	0.029	242.99
4,196	3,478	1.02	0.030	0.006	0.000	0.036	243.02
4,306	3,587	1.04	0.030	0.006	0.000	0.037	243.04
4,413	3,695	1.07	0.031	0.007	0.000	0.038	243.07
4,520	3,801	1.09	0.032	0.008	0.000	0.040	243.09

Stormwater Management Facility - Underground Storage Chambers
Stage Storage Discharge Table

CLIENT: Pine Valley Estates Ltd. **DATE:** April 2026

PROJECT: Pine Valley - Midland **DESIGN:** KR

FILE: PIN-19037 **CHECKED:** JWI

Primary / Extended Detention Orifice			*Secondary Orifice*	
Radius	0.065	m	0.150	m
Outlet Diameter	130	mm	300	mm
Invert Elevation	242.30	m	243.00	m

Overflow Weir (Baffle Wall)		
C=	1.84	
L=	2.4	m
Invert Elevation=	243.75	m

Weir Equation $Q=C*L*H^{3/2}$

Surface Area: 5893.67 m^2

	Minimum		Provided		Elevation	
Water Quality Volume Required:	530	m^3	4196	m^3	243.70	m

Total Storage m^3	Active Storage m^3	Water Depth m	Primary / Ext. Detention Orifice Flow (m^3/s)	Secondary Orifice Flow (m^3/s)	Overflow Weir Flow (m^3/s)	Total Flow (m^3/s)	Elevation m
4,624	3,905	1.12	0.032	0.011	0.000	0.043	243.12
4,726	4,008	1.14	0.033	0.013	0.000	0.046	243.14
4,826	4,108	1.17	0.033	0.028	0.000	0.061	243.17
4,924	4,206	1.19	0.034	0.039	0.000	0.073	243.19
5,020	4,301	1.22	0.034	0.052	0.000	0.086	243.22
5,112	4,394	1.24	0.035	0.059	0.000	0.094	243.24
5,202	4,483	1.27	0.035	0.068	0.000	0.104	243.27
5,288	4,569	1.30	0.036	0.076	0.000	0.112	243.30
5,369	4,650	1.32	0.036	0.081	0.000	0.118	243.32
5,443	4,724	1.35	0.037	0.088	0.000	0.125	243.35
5,511	4,793	1.37	0.037	0.093	0.000	0.130	243.37
5,577	4,859	1.40	0.038	0.099	0.000	0.136	243.40
5,641	4,923	1.42	0.038	0.102	0.000	0.141	243.42
5,702	4,984	1.45	0.039	0.108	0.000	0.147	243.45
5,762	5,044	1.47	0.039	0.112	0.000	0.151	243.47
5,822	5,103	1.50	0.039	0.117	0.000	0.156	243.50
5,882	5,163	1.52	0.040	0.120	0.000	0.160	243.52
5,942	5,223	1.55	0.040	0.125	0.000	0.165	243.55
6,002	5,283	1.57	0.041	0.128	0.000	0.168	243.57
6,062	5,343	1.60	0.041	0.132	0.000	0.173	243.60
6,121	5,403	1.63	0.042	0.137	0.000	0.178	243.63
6,181	5,463	1.65	0.042	0.139	0.000	0.181	243.65
6,241	5,523	1.68	0.042	0.144	0.000	0.186	243.68
6,301	5,583	1.70	0.043	0.146	0.000	0.189	243.70
6,361	5,642	1.73	0.043	0.150	0.000	0.193	243.73
6,421	5,702	1.75	0.044	0.153	0.000	0.196	243.75
6,421	5,702	1.80	0.044	0.159	0.049	0.253	243.80
6,422	5,703	1.85	0.045	0.165	0.140	0.350	243.85
6,423	5,704	1.90	0.046	0.171	0.257	0.473	243.90
6,424	5,705	1.95	0.047	0.176	0.395	0.618	243.95
6,425	5,706	2.00	0.047	0.182	0.552	0.781	244.00
6,426	5,707	2.05	0.048	0.187	0.726	0.961	244.05
6,427	5,708	2.10	0.049	0.192	0.914	1.155	244.10
6,428	5,709	2.15	0.049	0.197	1.117	1.364	244.15
6,429	5,710	2.20	0.050	0.202	1.333	1.585	244.20
6,430	5,711	2.25	0.051	0.207	1.561	1.819	244.25

Orifice Outflow equation is for orifice flow given by:

$Q=0.63A(2gH)^{0.5}$ - Where ponding elevation is above orifice centroid

$Q=1.65\{[(\pi D^2/4)([2\cos^{-1}\{[(D/2)-H]/[D/2]\}\{180/\pi\}]/360)-([\{D/2\}-H][DH-H^2]\,\hat{}\,[1/2])/H]\}H\,\hat{}\,(1.5)$ - Where ponding elevation is at or below orifice centroid

where;

Q = flow rate (m^3/s) A = area of orifice (m^2) g = Acceleration due to gravity $9.81 m/s^2$

D= diameter of orifice (m) H = head on the orifice (m)

Storm Water Management Facility
SWMF Quality Design Notes

CLIENT: Pine Valley Estates Ltd.

PROJECT: Pine Valley - Midland

FILE: PIN-19037

DATE: April 2026

DESIGN: KR

CHECKED:

	Area (ha)	TIMP(%)
Total Area	17.82	54.3%
Post Development Drainage Area	17.82	54.3%

Permanent Pool and Extended Detention Volumes:

Drainage Area	17.82	ha
Imperviousness	54.3%	

Imperviousness	Storage Vol.	
0%		m^3/ha
35%	25	m^3/ha
55%	30	m^3/ha
70%	35	m^3/ha
85%	40	m^3/ha
100%		m^3/ha

Excerpt - MOE Table 3.2, March 2003

Volumetric Criteria:

Total Water Quality Volumetric Criteria	29.8	m^3/ha
Extended Detention Volumetric Criteria	40.0	m^3/ha

SWMF Volume Requirements:

Total Water Quality Volume (WQV) Required	530	m^3
Extended Detention Storage Volume Required	713	m^3/s
Extended Detention Volume Provided	3366	m^3
Total Water Quality Volume Provided	4196	m^3
OTTHYMO 25mm 4hr CHI Water Quality Volume	1507.2	m^3

SWMF Drawdown Requirements

Minimum Drawdown Time, MOE Table 4.7	24	Hours

$$t = \frac{2A_p}{CA_o\sqrt{2g}}\left[h_1^{0.5} - h_2^{0.5}\right]$$

Equation 4.10: Drawdown Time

Based on Eqn. 4.10 MOE SWM Planning and Design Manual

Hydraulic Detention Time		
Surface Area of Facility, A_p	5893.7	m^2
Orifice Cross Sectional Area, A_o	0.0133	m^2
Discharge Coefficient, C	0.63	
Gravitational Constant, g	9.810	m/s^2
Starting Water Depth over Orifice, h_1	0.270	m
Ending Water Depth over Orifice, h_2	0.000	m
Drawdown Time - 25mm Event Ponding Level	165,360	Sec
Routed:	**46**	Hours
25mm Event Volume (unrouted)	1507.22	m^3
Primary Orifice Elevation	242.30	m
25mm Event Elevation	242.60	m
Drawdown Time - 25mm Event Ponding Level	174,305	Sec
Unrouted:	**48**	Hours

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

PIN-19037 FEB 16

MIDLAND, ON, CANADA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
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 75 mm (3").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 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 F2418 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 MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "MC-3500 & MC-4500 STORMTECH CHAMBER INSTALLATION 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 - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. 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 MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "MC-3500 & MC-4500 STORMTECH CHAMBER INSTALLATION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "MC-3500 & MC-4500 STORMTECH CHAMBER INSTALLATION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "MC-3500 & MC-4500 STORMTECH CHAMBER INSTALLATION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

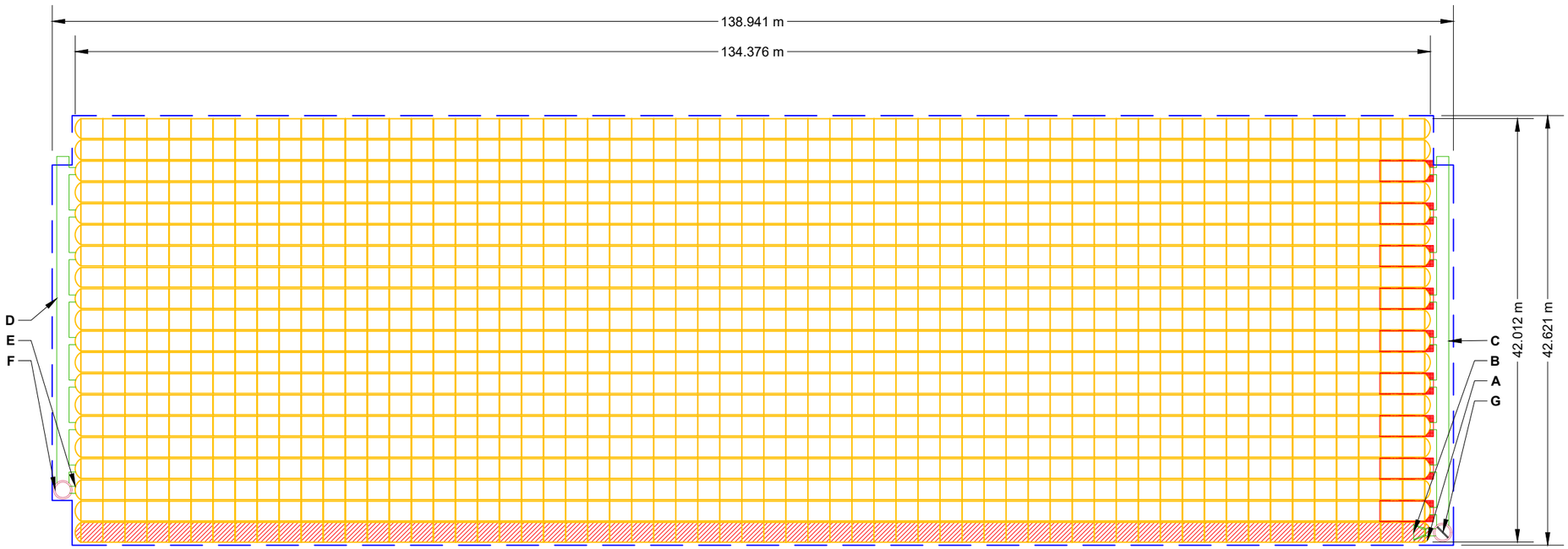
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT ADS WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
1220	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	245.881
40	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	244.052
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	243.900
300	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	243.900
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	243.900
6361.0	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	243.748
		TOP OF MC-3500 CHAMBER:	243.443
		600 mm ISOLATOR ROW PLUS INVERT:	242.352
		600 mm BOTTOM CONNECTION INVERT:	242.352
5893.7	SYSTEM AREA (m^2)	1050 mm x 600 mm BOTTOM MANIFOLD INVERT (600 mm PIPE):	242.352
363.1	SYSTEM PERIMETER (m)	BOTTOM OF MC-3500 CHAMBER:	242.300
		BOTTOM OF STONE:	242.000
		1050 mm x 600 mm BOTTOM MANIFOLD INVERT (1050 mm PIPE):	241.912

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	600 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS		
FLAMP	B	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	C	1050 mm x 600 mm ADS N-12 (1050 mm PIPE) 1050 mm x 600 mm ADS N-12 (600 mm PIPE)	-388 mm 52 mm	
MANIFOLD	D	1050 mm x 600 mm ADS N-12 (1050 mm PIPE) 1050 mm x 600 mm ADS N-12 (600 mm PIPE)	-388 mm 52 mm	
PIPE CONNECTION	E	600 mm BOTTOM CONNECTION	52 mm	
CONCRETE STRUCTURE	F	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		821 L/s OUT
CONCRETE STRUCTURE W/WEIR	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		2166 L/s IN



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

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.

PIN-19037 FEB 16

MIDLAND, ON, CANADA

DATE: 02/16/2026 | DRAWN: KR | CHECKED: N/A

PROJECT #:

DATE	DWN	CHK

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Chamber System

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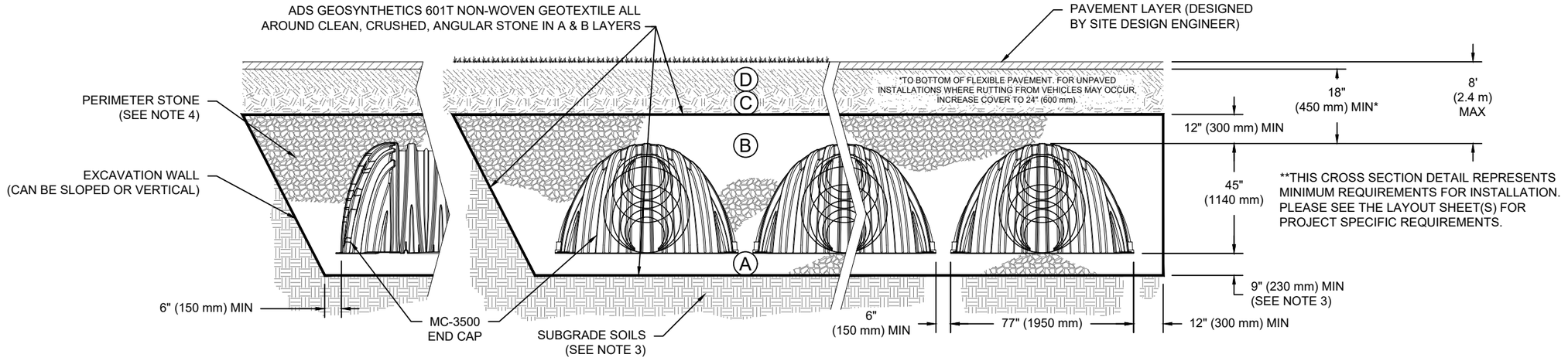
SCALE = 1 : 500

SHEET
2 OF 5

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 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 24" (600 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 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
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:
1. 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".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. 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.
4. 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.
5. 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:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. 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.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. 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 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 500 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.

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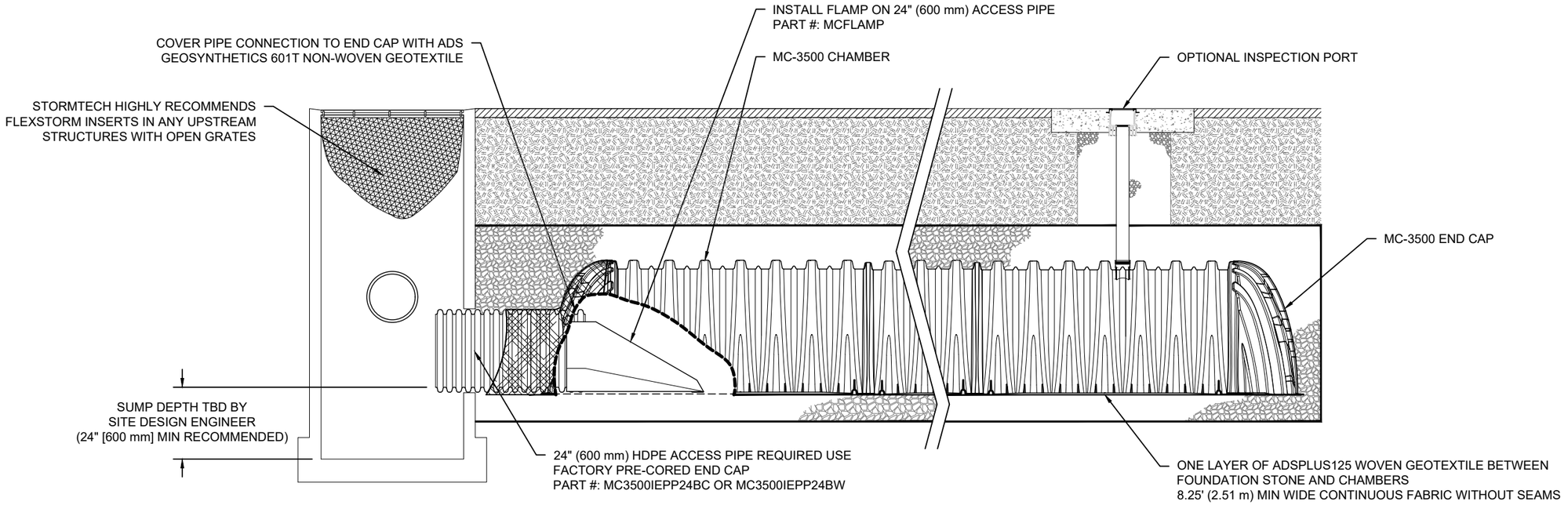

MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

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.

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MC-3500 TECHNICAL SPECIFICATION

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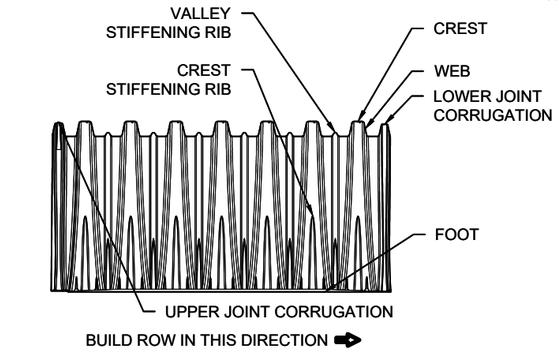
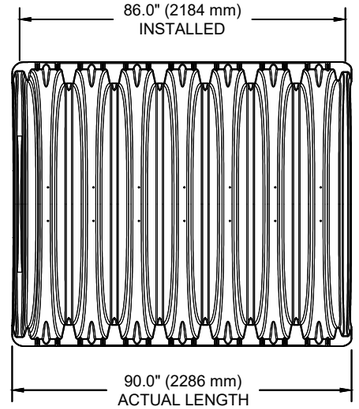
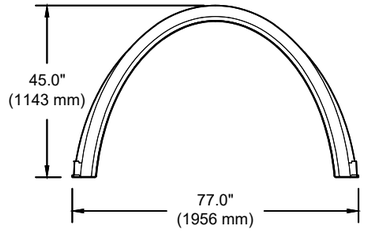
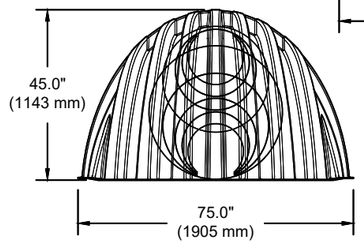
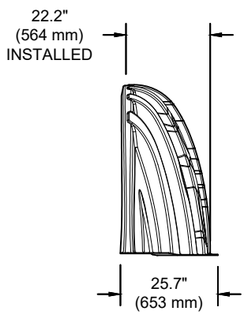










NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

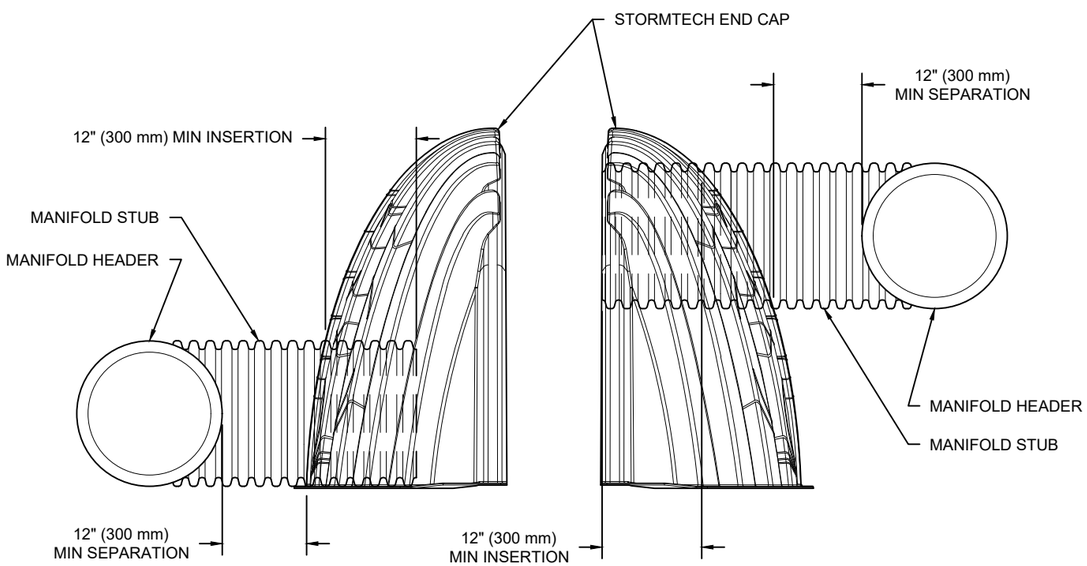
NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" SPACING BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

MC-SERIES END CAP INSERTION DETAIL

NTS

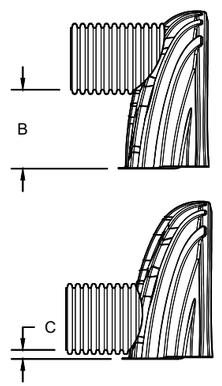


NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

PIN-19037 FEB 16
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SHEET
5 OF 5

ADS Treatment Train Sizing

Project Name: PIN-19037

Consulting Engineer: Jones Consulting

Location: Midland, ON

Sizing Completed By: Steve Buckley **Email:** steve.buckley@adspipe.com

Summary of Results	
Isolator Row PLUS TSS Removal:	76.7%
FD-6HC TSS Removal:	36.0%
Combined TSS Removal:	**84.0%**
Total Volume Treated:	**95.6%**

Site Details	
Site Area (ha):	15.83
Rational C:	0.65
Particle Size Distribution:	ETV
Rainfall Station:	Barrie, ONT

Notes: OGS results based on ETV PSD and results from ETV testing protocols.

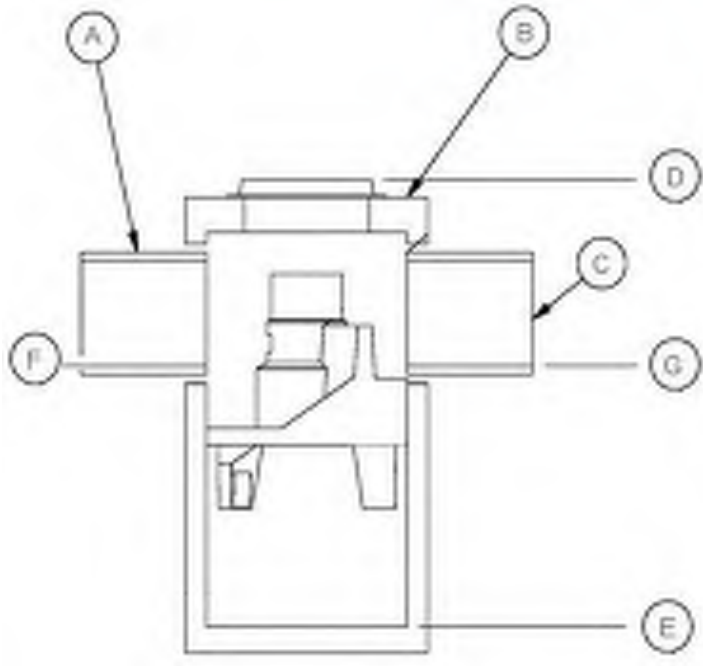
Individual OGS Results		
Model	**TSS Removal**	**Volume Treated**
FD-4HC	28.0%	>90%
FD-5HC	31.0%	>90%
FD-6HC	36.0%	>90%
FD-8HC	40.0%	>90%
FD-10HC	43.0%	>90%

Stormtech Details	
Chamber Model:	MC-3500
No. Chambers in Isolator Row PLUS:	61
Volume Treated by Isolator Row PLUS:	94.5%

Notes: Refer to Stormtech drawings for full IR+ configuration.

Isolator Row PLUS must include Flared End Ramp (FLAMP) for proper performance.

Overall System Capacities	
Total Sediment Storage Capacity (m3):	1.96
Oil Storage Capacity:	1,878 L
Max. OGS Pipe Diameter:	750 mm
Peak OGS Flow Capacity:	906 L/s
Peak Stormtech Inlet Flow Capacity:	311 L/s
Peak IR PLUS Water Quality Flow:	438 L/s



OGS Specifications	
Inlet Pipe Diameter (A):	300 mm
Unit Diameter (B):	1,800 mm
Outlet Pipe Diameter (C):	300 mm
Rim Elevation (D):	234.61 m
Bottom of Sump Elevation (E):	229.86 m
Inlet Pipe Elevation (F):	231.66 m
Outlet Pipe Elevation (G):	231.66 m

Notes:

Isolator Row PLUS removal efficiency based on verified ETV test report. For dimensions and configuration of Isolator Row PLUS, please see Stormtech drawing package.

Project Name: PIN-19037
Consulting Engineer: Jones Consulting
Location: Midland, ON

Net Annual Removal Efficiency Summary

Rainfall Intensity	Fraction of Rainfall	Removal Efficiency		Combined Removal Efficiency	Combined Weighted Removal Efficiency
		FD-6HC	IR PLUS(2)		
mm/hr	%	%	%	%	%
0.50	0.3%	49.5%	81.2%	90.5%	0.3%
1.00	25.7%	44.5%	81.2%	89.6%	23.1%
1.50	5.3%	41.6%	81.2%	89.0%	4.7%
2.00	13.4%	39.6%	81.2%	88.6%	11.8%
2.50	5.5%	38.0%	81.2%	88.3%	4.9%
3.00	3.7%	36.6%	81.2%	88.1%	3.3%
3.50	7.2%	35.5%	81.2%	87.9%	6.3%
4.00	3.4%	34.6%	81.2%	87.7%	2.9%
4.50	2.4%	33.7%	81.2%	87.5%	2.1%
5.00	4.3%	33.0%	81.2%	87.4%	3.8%
6.00	3.6%	31.6%	81.2%	87.1%	3.2%
7.00	4.3%	30.5%	81.2%	86.9%	3.8%
8.00	3.4%	29.6%	81.2%	86.8%	2.9%
9.00	1.6%	28.7%	81.2%	86.6%	1.4%
10.00	2.1%	28.0%	81.2%	86.5%	1.8%
20.00	8.9%	23.0%	62.7%	71.3%	6.3%
30.00	2.3%	20.1%	41.8%	53.5%	1.2%
		Total Net Annual Removal Efficiency			**84.0%**
		Total Runoff Volume Treated			**95.6%**

Notes:

(1) Rainfall Data: 1978:2007, HLY03, Barrie, ONT, 6110557.

(2) IR PLUS removal based on ETV PSD and ETV protocols.

(3)

(4) Combined removal efficiencies calculated based on NCDENR Stormwater BMP Manual, Section 3.9.4, where Total Removal Efficiency = 1st BMP Efficiency + 2nd BMP Efficiency - (1st BMP Efficiency x 2nd BMP Efficiency)

Pine Valley Estates Subdivision
Open Channel Hydraulic Conveyance Calculations

CLIENT: Pine Valley Estates

DATE: May-26

PROJECT: Pine Valley Estates Subdivision

DESIGN: KR

FILE: PIN-19037

CHECK: JWI

Open Channel Section I.D	Catchment I.D	Node I.D	Area, ha	OTTHYMO Peak Flow Output, m^3/s	Governing Rainfall Event	Notes
			Internal			
A - A	203 + 303	AddHyd 7	1.97	**0.095**	Timmins Regional	*All Catchments are released uncontrolled to Section A-A*
B - B	302 + 401 + 207 + 204	AddHyd 6	23.83	**0.928**	Timmins Regional	*All Catchments are released uncontrolled to Section B-B*
C - C North	302 + 401 + 207 + 204	AddHyd 6	23.83	**0.928**	Timmins Regional	*All Catchments are released uncontrolled to Section C-C North*
C - C South	201 + 202 + 402 + 203 + 303 + 206 + 404 + 403 + 208	AddHyd 3	18.40	**1.641**	Timmins Regional	*Catchments 201, 202, 402, 203, 303, 206, 404 are orifice/weir controlled to Section C-C South. Catchments 403, 208 are released uncontrolled to Section C-C South*
D - D	206	206	0.57	**0.119**	100yr 4hr CHI	*Catchment 206 is released uncontrolled to Seciton D-D*
E - E	206	206	0.57	**0.119**	100yr 4hr CHI	*Catchment 206 is released uncontrolled to Seciton E-E*
F - F	208	208	0.23	**0.013**	Timmins Regional	*Catchment 208 is released uncontrolled to Seciton F-F*
			County Road 93			
G - G	404 + 206 + 202 + 201 + 402 + 203 + 303 + 302 + 401 + 207 + 204 + 403 + 208 + 205 + 104	AddHyd 2	80.97	**3.046**	Timmins Regional	*Catchments 201, 202, 402, 203, 303, 206, 404 are orifice/weir controlled to Section G-G. All other catchments are released uncontrolled to Section G-G South*
H - H	404 + 206 + 202 + 201 + 402 + 203 + 303 + 302 + 401 + 207 + 204 + 403 + 208 + 205 + 104	AddHyd 2	80.97	**3.046**	Timmins Regional	*Catchments 201, 202, 402, 203, 303, 206, 404 are orifice/weir controlled to Section G-G. All other catchments are released uncontrolled to Section G-G South*

Section A - A
V Notch Channel Capacity Calculator

Input:

Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.25	m	
Channel Manning n	0.03		
Channel Slope	0.005	m/m	

Calculated:

Wetted Area	0.189	m^2
Wetted Perimeter	1.589	m
Rh	0.119	m
Channel Flow	**0.108**	m^3/s
Channel Ave Velocity	**0.57**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section B -B
Trapezoidal Channel Capacity Calculator

Input:

Channel Top Width	3.89	m	
Channel Bottom Width	1.49	m	
Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.40	m	
Channel Manning n	0.03		
Channel Slope	0.004	m/m	

Calculated:

Wetted Area	1.075	m^2
Wetted Perimeter	4.016	m
Rh	0.268	m
Channel Flow	**0.941**	m^3/s
Channel Ave Velocity	**0.88**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section C - C North
V Notch Channel Capacity Calculator

Input:

Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.59	m	
Channel Manning n	0.03		
Channel Slope	0.004	m/m	

Calculated:

Wetted Area	1.043	m^2
Wetted Perimeter	3.730	m
Rh	0.280	m
Channel Flow	**0.941**	m^3/s
Channel Ave Velocity	**0.90**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section C - C South
Trapezoidal Channel Capacity Calculator

Input:

Channel Top Width	4.8	m	
Channel Bottom Width	1.2	m	
Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.6	m	
Channel Manning n	0.03		
Channel Slope	0.003	m/m	

Calculated:

Wetted Area	1.800	m^2
Wetted Perimeter	4.995	m
Rh	0.360	m
Channel Flow	**1.664**	m^3/s
Channel Ave Velocity	**0.92**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section D - D
Trapezoidal Channel Capacity Calculator

Input:

Channel Top Width	1.9649574	m	
Channel Bottom Width	1	m	
Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.16	m	
Channel Manning n	0.03		
Channel Slope	0.005	m/m	

Calculated:

Wetted Area	0.238	m^2
Wetted Perimeter	2.017	m
Rh	0.118	m
Channel Flow	**0.135**	m^3/s
Channel Ave Velocity	**0.57**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section E - E
V Notch Channel Capacity Calculator

Input:

Channel Side Slopes	3 :1	(H:V)	
Channel Depth	0.275	m	
Channel Manning n	0.03		
Channel Slope	0.005	m/m	

Calculated:

Wetted Area	0.226	m^2
Wetted Perimeter	1.737	m
Rh	0.130	m
Channel Flow	**0.137**	m^3/s
Channel Ave Velocity	**0.61**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section F - F

V Notch Channel Capacity Calculator

Input:

Channel Side Slopes	3 :1	(H:V)
Channel Depth	0.15	m
Channel Manning n	0.03	
Channel Slope	0.005	m/m

Calculated:

Wetted Area	0.068	m^2
Wetted Perimeter	0.949	m
Rh	0.071	m
Channel Flow	**0.027**	m^3/s
Channel Ave Velocity	**0.40**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section E - E

V Notch Channel Capacity Calculator

Input:

Channel Side Slopes	2 :1	(H:V)
Channel Depth	1	m
Channel Manning n	0.03	
Channel Slope	0.006	m/m

Calculated:

Wetted Area	2.000	m^2
Wetted Perimeter	4.472	m
Rh	0.447	m
Channel Flow	**3.124**	m^3/s
Channel Ave Velocity	**1.56**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Section G - G

Trapezoidal Channel Capacity Calculator

Input:

Channel Top Width	5.7	m
Channel Bottom Width	1.5	m
Channel Side Slopes	3 :1	(H:V)
Channel Depth	0.7	m
Channel Manning n	0.03	
Channel Slope	0.005	m/m

Calculated:

Wetted Area	2.520	m^2
Wetted Perimeter	5.927	m
Rh	0.425	m
Channel Flow	**3.358**	m^3/s
Channel Ave Velocity	**1.33**	m/s

Chezy Eq. $Q=1/n*A*R^{2/3}*S^{1/2}$

Pine Valley Estates Subdivision
Annual Water Balance Calculations - Thornwaite & Mather Approach

CLIENT: Pine Valley Estates Ltd.
PROJECT: Pine Valley Estates Subdivision
FILE: PIN-19037

DATE: March 2026
DESIGN: KR
CHECK: JWI

Pre Development

Total Area (ha)	21.20
Impervious Area (ha)	0.00
Pervious Area (ha)	21.20

	Precipitation	Evapo-Tanspiration	Surplus	Infiltration Factor	Actual Infiltration	Pervious Surface Run-off
Annual Depth (mm)	912	547	365	0.80	239.0	154
Annual Volume (m^3)	193380	115964			50662	32676

Post Development

Total Area (ha)	21.20
Impervious Area (ha)	10.46
Pervious Area (ha)	10.74

	Precipitation	Evapo-Tanspiration	Surplus	Infiltration Factor	Actual Infiltration	Pervious Surface Run-off
Annual Depth (mm)	912	526	386	0.66	177.0	237
Annual Volume (m^3)	193380	111580			19018	25431

Pre - Post Development Infiltration Volume (m^3):	**31644**

Infiltration Factors		
Sub Factors	Description	Factor
Topography	Flat Land	0.3
	Rolling Land	0.2
	Hilly Land	0.1
Soils	Tight Impervious Clay	0.1
	Medium Combinations of Clay/Loam	0.2
	Open Sandy Loam	0.4
Cover	Cultivated Land	0.1
	Woodland	0.2

* Infiltration factors are taken from '*Table 3.1:Hydrologic Cycle Component Values*' from the MOE Stormwater Management Planning and Design Manual, 2003

Pine Valley Estates Subdivision
Water Balance Calculations

CLIENT: Pine Valley Estates

DATE: March 2026

PROJECT: Pine Valley Estates Subdivision

DESIGN: KR

FILE: PIN-19037

CHECK: JWI

Annual Precipitation = 940mm

Pre Development				
Total Area:	21.20	ha	Soil Type:	A
Imperviousness:	0.00%		Mature Forests	4.30 ha
Pervious Area:	21.20	ha	Soil Type:	AB
			Mature Forests	16.90 ha
Weighted ET	546.90	mm		
Weighted Infiltration	299	mm		
Infiltration Factor	0.8			
Actual Infiltration	238.97	mm		
Depth of Runoff, Pervious Areas	154	mm	Infiltration Factor:	
			Topography	0.2
Total Infiltration Volume:	**50662**	**m^3**	Soils	0.4
Runoff Volume, Pervious Areas:	32676	m^3	Cover	0.2
Evaporation From Imp Areas (assume 15%):	141	mm		
Surplus Available for Runoff From Imp areas:	799.00	mm		
Runoff Volume, Impervious Areas:	0	m^3		
Total Runoff Volume:	**32676**	**m^3**		

Post Development				
Total Area:	21.20	ha	Soil Type:	A
			Urban Lawns:	2.53 ha
			Mature Forests	0.45 ha
Imperviousness:	49%			
Pervious Area:	10.74	ha	Soil Type:	AB
			Urban Lawns:	5.25 ha
			Mature Forests:	2.52 ha
Weighted ET	526.23	mm		
Weighted Infiltration	270.22	mm	Infiltration Factor:	
Infiltration Factor	0.66		Topography	0.2
Actual Infiltration	177.04	mm	Soils	0.4
Runoff	236.74	mm	Cover	0
			Cover	0.06
Total Infiltration Volume:	**19018**	**m^3**		
Runoff Volume, Pervious Areas:	25431	m^3		
Evaporation From Imp Areas (assume 15%):	141.00	mm		
Surplus Available for Runoff From Imp areas:	799.00	mm		
Runoff Volume, Impervious Areas:	83589	m^3		
Total Runoff Volume:	**109020**	**m^3**		

NOTE: Water balance components have been compiled using the information provided in Section 3.2 of the MOECP Stormwater Management Planning and Design Manual 2003.

APPENDIX C

OTTHYMO MODELING

- OTTHYMO Input Parameters
- OTTHYMO Detailed Outputs
    - Post-Dev-PF-CHI, 25mm WQE
    - Post-Dev-PF-CHI, 5yr 4hr CHI
    - Post-Dev-PF-SCS, 5yr 24hr SCS
    - Post-Dev-PF-CHI, 100yr 4hr CHI
    - Post-Dev-PF-SCS, 100yr 24hr SCS
    - Post-Dev-PF, Timmins
- OTTHYMO Post-Development Detailed Summary (Reservoir 4)
- OTTHYMO Post-Development Peak Flow Detail Output (AddHYD 1)
- OTTHYMO County Rd 93 Ditch Sizing Detail Output (AddHYD 2)
- Digital Modeling Files

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	101 - Internal		
Hydrologic Soil Group	A & AB		
Soil Texture	Wyevale Gravelly Sandy Loam, Vasey Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	17.019	44.2	0.08
Pasture/Lawn Area(ha)/CN	0.000	N/A	N/A
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	17.02	ha
Average CN	44	
Average Pervious CN	44	
Average Runoff 'C'	0.08	

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	10.00	mm
Average Pervious IA	10.00	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	481	m

Calculated:

Catchment Ave. Slope	1.55	%
Imperviousness	0.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.08	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.09	
50YR Rational 'C'	0.10	
100YR Rational 'C'	0.10	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	63.11	min
Time of Concentration	1.05	hr
Time to Peak	0.70	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	18.92	min
Time of Concentration	0.32	hr
Time to Peak	0.21	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**1.05**	**hr**
Time to Peak	**0.70**	**hr**

Catchment Area Summary (101)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	3.0178	36	108.64	0.08	0.2414
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "A"	3.0178				
Weighted CN "A"			36.00		0.0800
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	14.0011	46	644.05	0.08	1.1201
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	14.0011				
Weighted CN "AB"			46.00		0.0800

Totals:	17.0190	Weighted CN	44.23	Weighted "C"	0.08

Weighted Curve Number Calculator

Input:

Catchment ID	Pre - 301		
Hydrologic Soil Group	A & AB	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam, Vasey Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	2.558	41.0	0.08
Pasture/Lawn Area(ha)/CN	0.000	N/A	N/A
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	2.56	ha
Average CN	41	
Average Pervious CN	41	
Average Runoff 'C'	0.08	

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	10.00	mm
Average Pervious IA	10.00	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	200	m

Calculated:

Catchment Ave. Slope	1.55	%
Imperviousness	0.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.08	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.09	
50YR Rational 'C'	0.10	
100YR Rational 'C'	0.10	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	40.69	min
Time of Concentration	0.68	hr
Time to Peak	0.45	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	9.51	min
Time of Concentration	0.16	hr
Time to Peak	0.11	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.68**	**hr**
Time to Peak	**0.45**	**hr**

Catchment Area Summary (301)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	1.2790	36	46.04	0.08	0.1023
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "A"	1.2790				
Weighted CN "A"			36.00		0.0800
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	1.2790	46	58.83	0.08	0.1023
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	1.2790				
Weighted CN "AB"			46.00		0.0800

Totals:	2.5580	Weighted CN	41.00	Weighted "C"	0.08

Weighted Curve Number Calculator

Input:

Catchment ID	Pre/Post 302		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey Sandy Loam	Curve Number	Runoff 'C'
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	17.619	46.0	0.08
Pasture/Lawn Area(ha)/CN	3.555	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	21.17	ha
Average CN	48	
Average Pervious CN	48	
Average Runoff 'C'	0.08	

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	9.16	mm
Average Pervious IA	9.16	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	535	m

Calculated:

Catchment Ave. Slope	1.55	%
Imperviousness	0.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.08	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.09	
50YR Rational 'C'	0.10	
100YR Rational 'C'	0.10	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	66.34	min
Time of Concentration	1.11	hr
Time to Peak	0.74	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	20.59	min
Time of Concentration	0.34	hr
Time to Peak	0.23	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**1.11**	**hr**
Time to Peak	**0.74**	**hr**

Catchment Area Summary (302)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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"	17.6188	46	810.46	0.08	1.4095
Pasture/Lawn "AB"	3.5549	59	209.74	0.10	0.3555
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	21.1737				
Weighted CN "AB"			48.18		0.0834

Totals:	21.1737	Weighted CN	48.18	Weighted "C"	0.08

Weighted Curve Number Calculator

Input:

Catchment ID	Pre/Post 303		
Hydrologic Soil Group	A & AB	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam, Vasey Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	1.624	46.0	0.08
Pasture/Lawn Area(ha)/CN	0.000	N/A	N/A
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	1.62	ha
Average CN	46	
Average Pervious CN	46	
Average Runoff 'C'	0.08	

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	10.00	mm
Average Pervious IA	10.00	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	150	m

Calculated:

Catchment Ave. Slope	1.50	%
Imperviousness	0.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.08	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.09	
50YR Rational 'C'	0.10	
100YR Rational 'C'	0.10	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	35.62	min
Time of Concentration	0.59	hr
Time to Peak	0.40	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	7.51	min
Time of Concentration	0.13	hr
Time to Peak	0.08	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.59**	**hr**
Time to Peak	**0.40**	**hr**

Catchment Area Summary (303)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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"	1.6239	46	74.70	0.08	0.1299
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	1.6239				
Weighted CN "AB"			46.00		0.0800

Totals:	1.6239	Weighted CN	46.00	Weighted "C"	0.08

Weighted Curve Number Calculator

Input:

Catchment ID	Post-401		
Hydrologic Soil Group	A & AB	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam & Vasey Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	1.338	42.7	0.08
Pasture/Lawn Area(ha)/CN	0.446	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.094	98.0	0.95

Calculated:

Area	1.88	ha
Average CN	47	
Average Pervious CN	44	
Average Runoff 'C'	0.12	

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	8.41	mm
Average Pervious IA	8.75	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	200	m

Calculated:

Catchment Ave. Slope	1.00	%
Imperviousness	5.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.12	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.13	
50YR Rational 'C'	0.14	
100YR Rational 'C'	0.15	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	45.35	min
Time of Concentration	0.76	hr
Time to Peak	0.50	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	10.70	min
Time of Concentration	0.18	hr
Time to Peak	0.12	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.76**	**hr**
Time to Peak	**0.50**	**hr**

Catchment Area Summary (401)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.4461	36	16.06	0.08	0.0357
Pasture/Lawn "A"	0.4461	49	21.86	0.05	0.0223
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0939	98	9.20	0.95	0.0892
Total Area "A"	0.9861				
Weighted CN "A"			47.79		0.1493
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.8922	46	41.04	0.08	0.0714
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.8922				
Weighted CN "AB"			46.00		0.0800

Totals:	1.8783	Weighted CN	46.94	Weighted "C"	0.12

Weighted Curve Number Calculator

Input:

Catchment ID	Post-402		
Hydrologic Soil Group	A	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.200	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.134	98.0	0.95

Calculated:

Area	0.33	ha
Average CN	69	
Average Pervious CN	49	
Average Runoff 'C'	0.41	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	60	m

Calculated:

Catchment Ave. Slope	1.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	40.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.41	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.45	
50YR Rational 'C'	0.49	
100YR Rational 'C'	0.51	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	17.42	min
Time of Concentration	0.29	hr
Time to Peak	0.19	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	3.82	min
Time of Concentration	0.06	hr
Time to Peak	0.04	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.06**	**hr**
Time to Peak	**0.04**	**hr**

Catchment Area Summary (402)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.2005	49	9.82	0.05	0.0100
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.1337	98	13.10	0.95	0.1270
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "A"	0.3341				
Weighted CN "A"			68.60		0.4100
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0000				
Weighted CN "AB"			0.00		0.0000

Totals:	0.3341	Weighted CN	68.60	Weighted "C"	0.41

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	Post-403		
Hydrologic Soil Group	A & AB		
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.207	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.138	98.0	0.95

Calculated:

Area	0.35	ha
Average CN	69	
Average Pervious CN	49	
Average Runoff 'C'	0.41	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	80	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	20.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.41	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.45	
50YR Rational 'C'	0.49	
100YR Rational 'C'	0.51	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	16.01	min
Time of Concentration	0.27	hr
Time to Peak	0.18	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	4.41	min
Time of Concentration	0.07	hr
Time to Peak	0.05	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.07**	**hr**
Time to Peak	**0.05**	**hr**

Catchment Area Summary (403)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.2074	49	10.16	0.05	0.0104
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0691	98	6.77	0.95	0.0657
Impervious "A" (Dis-Connected)	0.0691	98	6.77	0.95	0.0657
Total Area "A"	0.3456				
Weighted CN "A"			68.60		0.4100
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0000				
Weighted CN "AB"			0.00		0.0000

Totals:	0.3456	Weighted CN	68.60	Weighted "C"	0.41

Weighted Curve Number Calculator

Input:

Catchment ID	Post-404		
Hydrologic Soil Group	A	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.032	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.021	98.0	0.95

Calculated:

Area	0.05	ha
Average CN	69	
Average Pervious CN	49	
Average Runoff 'C'	0.41	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	80	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.41	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.45	
50YR Rational 'C'	0.49	
100YR Rational 'C'	0.51	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	16.01	min
Time of Concentration	0.27	hr
Time to Peak	0.18	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	5.33	min
Time of Concentration	0.09	hr
Time to Peak	0.06	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.09**	**hr**
Time to Peak	**0.06**	**hr**

Catchment Area Summary (404)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0316	49	1.55	0.05	0.0016
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0211	98	2.07	0.95	0.0200
Total Area "A"	0.0527				
Weighted CN "A"			68.60		0.4100
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0000				
Weighted CN "AB"			0.00		0.0000

Totals:	0.0527	Weighted CN	68.60	Weighted "C"	0.41

Weighted Curve Number Calculator

Input:

Catchment ID	Post-201		
Hydrologic Soil Group	A & AB	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam, Vasey Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	4.663	58.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	8.660	98.0	0.95

Calculated:

Area	13.32	ha
Average CN	84	
Average Pervious CN	58	
Average Runoff 'C'	0.65	

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	3.05	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	40	m

Calculated:

Catchment Ave. Slope	1.00	%
Imperviousness	65.00%	
Directly Connected Imperviousness	32.50%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.65	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.72	
50YR Rational 'C'	0.78	
100YR Rational 'C'	0.81	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	9.26	min
Time of Concentration	0.15	hr
Time to Peak	0.10	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	1.76	min
Time of Concentration	0.03	hr
Time to Peak	0.02	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.03**	**hr**
Time to Peak	**0.02**	**hr**

Catchment Area Summary (201)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.4663	49	22.85	0.05	0.0233
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.4330	98	42.44	0.95	0.4114
Impervious "A" (Dis-Connected)	0.4330	98	42.44	0.95	0.4114
Total Area "A"	1.3323				
Weighted CN "A"	0.0000		80.85		0.6350
	0.0000				
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	4.1969	59	247.62	0.10	0.4197
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	3.8971	98	381.92	0.95	3.7023
Impervious "AB" (Dis-Connected	3.8971	98	381.92	0.95	3.7023
Total Area "AB"	11.9911				
Weighted CN "AB"			84.35		0.6525

Totals:	13.3235	Weighted CN	84.00	Weighted "C"	0.65

Weighted Curve Number Calculator

Input:

Catchment ID	Post-202		
Hydrologic Soil Group	A	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.946	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.631	98.0	0.95

Calculated:

Area	1.58	ha
Average CN	69	
Average Pervious CN	49	
Average Runoff 'C'	0.41	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	80	m

Calculated:

Catchment Ave. Slope	1.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.41	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.45	
50YR Rational 'C'	0.49	
100YR Rational 'C'	0.51	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	20.12	min
Time of Concentration	0.34	hr
Time to Peak	0.22	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	4.36	min
Time of Concentration	0.07	hr
Time to Peak	0.05	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.07**	**hr**
Time to Peak	**0.05**	**hr**

Catchment Area Summary (202)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.9461958	49	46.36	0.05	0.0473
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.6307972	98	61.82	0.95	0.5993
Total Area "A"	1.5770				
Weighted CN "A"			68.60		0.4100
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0000				
Weighted CN "AB"			0.00		0.0000

Totals:	1.5770	Weighted CN	68.60	Weighted "C"	0.41

Weighted Curve Number Calculator

Input:

Catchment ID	Post-203		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey 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	0.204	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.136	98.0	0.95

Calculated:

Area	0.34	ha
Average CN	75	
Average Pervious CN	59	
Average Runoff 'C'	0.44	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	20	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.44	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.48	
50YR Rational 'C'	0.53	
100YR Rational 'C'	0.55	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	7.65	min
Time of Concentration	0.13	hr
Time to Peak	0.09	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	1.11	min
Time of Concentration	0.02	hr
Time to Peak	0.01	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.02**	**hr**
Time to Peak	**0.01**	**hr**

Catchment Area Summary (203)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.2044	59	12.06	0.10	0.0204
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.1362	98	13.35	0.95	0.1294
Total Area "AB"	0.3406				
Weighted CN "AB"			74.60		0.4400

Totals:	0.3406	Weighted CN	74.60	Weighted "C"	0.44

Weighted Curve Number Calculator

Input:

Catchment ID	Post-204		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey 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	0.186	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.186	98.0	0.95

Calculated:

Area	0.37	ha
Average CN	79	
Average Pervious CN	59	
Average Runoff 'C'	0.53	

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	3.50	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	85	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	50.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.53	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.58	
50YR Rational 'C'	0.63	
100YR Rational 'C'	0.66	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	13.75	min
Time of Concentration	0.23	hr
Time to Peak	0.15	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	4.66	min
Time of Concentration	0.08	hr
Time to Peak	0.05	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.08**	**hr**
Time to Peak	**0.05**	**hr**

Catchment Area Summary (204)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.1856	59	10.95	0.10	0.0186
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.1856	98	18.18	0.95	0.1763
Total Area "AB"	0.3711				
Weighted CN "AB"			78.50		0.5250

Totals:	0.3711	Weighted CN	78.50	Weighted "C"	0.53

Weighted Curve Number Calculator

Input:

Catchment ID	Post-205		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey 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	0.101	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.101	98.0	0.95

Calculated:

Area	0.20	ha
Average CN	79	
Average Pervious CN	59	
Average Runoff 'C'	0.53	

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	3.50	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	40	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	50.00%	
Directly Connected Imperviousness	40.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.53	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.58	
50YR Rational 'C'	0.63	
100YR Rational 'C'	0.66	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	9.43	min
Time of Concentration	0.16	hr
Time to Peak	0.10	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	2.33	min
Time of Concentration	0.04	hr
Time to Peak	0.03	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.04**	**hr**
Time to Peak	**0.03**	**hr**

Catchment Area Summary (205)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.1010	59	5.96	0.10	0.0101
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0808	98	7.92	0.95	0.0768
Impervious "AB" (Dis-Connected	0.0202	98	1.98	0.95	0.0192
Total Area "AB"	0.2020				
Weighted CN "AB"			78.50		0.5250

Totals:	0.2020	Weighted CN	78.50	Weighted "C"	0.53

Weighted Curve Number Calculator

Input:

Catchment ID	Post-206		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey 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	0.340	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.227	98.0	0.95

Calculated:

Area	0.57	ha
Average CN	75	
Average Pervious CN	59	
Average Runoff 'C'	0.44	

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	3.80	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	15	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	40.00%	
Directly Connected Imperviousness	20.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.44	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.48	
50YR Rational 'C'	0.53	
100YR Rational 'C'	0.55	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	6.63	min
Time of Concentration	0.11	hr
Time to Peak	0.07	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	0.79	min
Time of Concentration	0.01	hr
Time to Peak	0.01	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.01**	**hr**
Time to Peak	**0.01**	**hr**

Catchment Area Summary (206)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.3399	59	20.05	0.10	0.0340
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.1133	98	11.10	0.95	0.1076
Impervious "AB" (Dis-Connected	0.1133	98	11.10	0.95	0.1076
Total Area "AB"	0.5664				
Weighted CN "AB"			74.60		0.4400

Totals:	0.5664	Weighted CN	74.60	Weighted "C"	0.44

Weighted Curve Number Calculator

Input:

Catchment ID	Post-207		
Hydrologic Soil Group	AB	Weighted	Weighted
Soil Texture	Vasey 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	0.223	59.0	0.10
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.183	98.0	0.95

Calculated:

Area	0.41	ha
Average CN	77	
Average Pervious CN	59	
Average Runoff 'C'	0.48	

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	3.65	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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	15	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	45.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.48	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.53	
50YR Rational 'C'	0.58	
100YR Rational 'C'	0.60	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	6.20	min
Time of Concentration	0.10	hr
Time to Peak	0.07	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	0.81	min
Time of Concentration	0.01	hr
Time to Peak	0.01	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.01**	**hr**
Time to Peak	**0.01**	**hr**

Catchment Area Summary (207)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.0000	49	0.00	0.05	0.0000
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	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	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.2231	59	13.16	0.10	0.0223
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.1825	98	17.89	0.95	0.1734
Total Area "AB"	0.4056				
Weighted CN "AB"			76.55		0.4825

Totals:	0.4056	Weighted CN	76.55	Weighted "C"	0.48

Weighted Curve Number Calculator

Input:

		Weighted Curve Number	Weighted Runoff 'C'
Catchment ID	Post-208		
Hydrologic Soil Group	A		
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	0.000	N/A	N/A
Pasture/Lawn Area(ha)/CN	0.232	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	0.000	N/A	N/A

Calculated:

Area	0.23	ha
Average CN	49	
Average Pervious CN	49	
Average Runoff 'C'	0.05	

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:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	75	m

Calculated:

Catchment Ave. Slope	2.00	%
Imperviousness	0.00%	
Directly Connected Imperviousness	0.00%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.05	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.06	
50YR Rational 'C'	0.06	
100YR Rational 'C'	0.06	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	23.58	min
Time of Concentration	0.39	hr
Time to Peak	0.26	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	4.31	min
Time of Concentration	0.07	hr
Time to Peak	0.05	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

Time of Concentration	**0.39**	**hr**
Time to Peak	**0.26**	**hr**

Catchment Area Summary (208)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	0.0000	36	0.00	0.08	0.0000
Pasture/Lawn "A"	0.2320	49	11.37	0.05	0.0116
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "A"	0.2320				
Weighted CN "A"			49.00		0.0500
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	0.0000	46	0.00	0.08	0.0000
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	0.0000				
Weighted CN "AB"			0.00		0.0000

Totals:	0.2320	Weighted CN	49.00	Weighted "C"	0.05

Weighted Curve Number Calculator

Input:

Catchment ID	Ditch Sizing - 104		
Hydrologic Soil Group	A	Weighted Curve Number	Weighted Runoff 'C'
Soil Texture	Wyevale Gravelly Sandy Loam		
Wetland(ha)/CN	0.000	N/A	N/A
Woods(ha)/CN	29.943	38.7	0.08
Pasture/Lawn Area(ha)/CN	2.100	49.0	0.05
Cultivated(ha)/CN	0.000	N/A	N/A
Impervious Area(ha)/CN	6.500	98.0	0.95

Calculated:

Area	38.54	ha
Average CN	49	
Average Pervious CN	39	
Average Runoff 'C'	0.23	

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	8.38	mm
Average Pervious IA	9.67	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.

21.31333043
0.263127536

Time of Concentration Calculator

Input:

Flow Length Max El.		m
Flow Length Min. El.		m
Catchment Flow Length	1450	m

Calculated:

Catchment Ave. Slope	0.50	%
Imperviousness	16.86%	
Directly Connected Imperviousness	16.86%	

Calculated: RATIONAL COEFFICIENT

5YR Rational 'C'	0.23	

Calculated: MTO DRAINAGE MANUAL

25YR Rational 'C'	0.25	
50YR Rational 'C'	0.27	
100YR Rational 'C'	0.28	

Calculated: AIRPORT METHOD (Runoff Coef <0.4)

Time of Concentration	136.52	min
Time of Concentration	2.28	hr
Time to Peak	1.52	hr

$Tc=3.26*(1.1-C)*L^{0.5}*S^{-0.33}$

Calculated: BRANSBY-WILLIAMS METHOD (Runoff Coef >=0.4)

Time of Concentration	65.90	min
Time of Concentration	1.10	hr
Time to Peak	0.73	hr

$Tc=0.057*L*S^{-0.2}*A^{-0.1}$

Use:

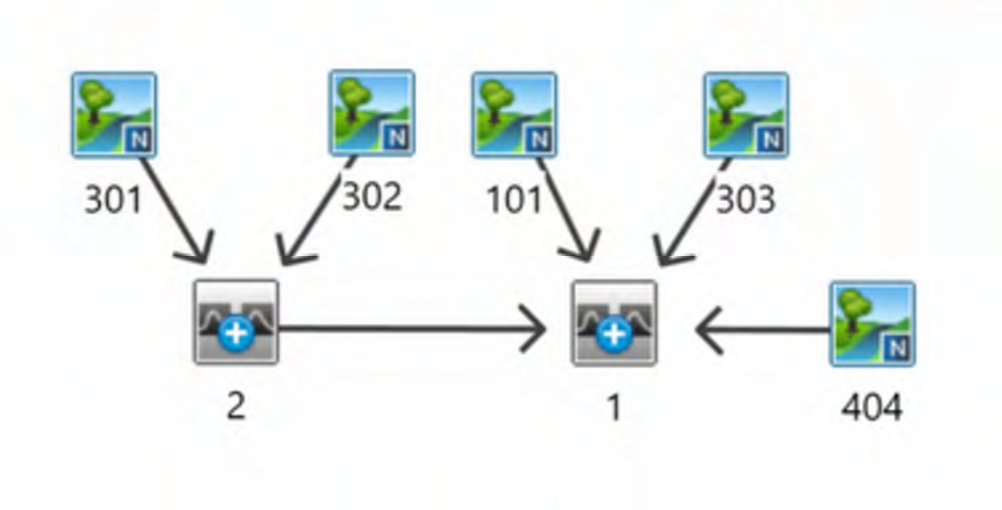
Time of Concentration	**2.28**	**hr**
Time to Peak	**1.52**	**hr**

Catchment Area Summary (104)

	Area (ha)	CN	CN*A	Rational "C"	C*A
Wetlands "A"	0.0000	50	0.00	0.05	0.0000
Woods "A"	21.9109	36	788.79	0.08	1.7529
Pasture/Lawn "A"	2.1000	49	102.90	0.05	0.1050
Cultivated "A"	0.0000	66	0.00	0.30	0.0000
Impervious "A" (Connected)	6.5000	98	637.00	0.95	6.1750
Impervious "A" (Dis-Connected)	0.0000	98	0.00	0.95	0.0000
Total Area "A"	30.5109				
Weighted CN "A"			50.10		0.2633
Wetlands "AB"	0.0000	50	0.00	0.05	0.0000
Woods "AB"	8.0321	46	369.48	0.08	0.6426
Pasture/Lawn "AB"	0.0000	59	0.00	0.10	0.0000
Cultivated "AB"	0.0000	66	0.00	0.35	0.0000
Impervious "AB" (Connected)	0.0000	98	0.00	0.95	0.0000
Impervious "AB" (Dis-Connected	0.0000	98	0.00	0.95	0.0000
Total Area "AB"	8.0321				
Weighted CN "AB"			46.00		0.0800

Totals:	38.5430	Weighted CN	49.25	Weighted "C"	0.23

Pre-Development OTTHYMO Modeling Schematic



Pre-Development Modeling Detail Output: AddHyd 1

```
************************************************
** SIMULATION:100yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.276     6.80    13.95
     + ID2= 2 (  0002):    23.73   0.428     6.80    15.80
       ================================================
       ID = 3 (  0001):    40.75   0.704     6.80    15.03

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.704     6.80    15.03
     + ID2= 2 (  0303):     1.62   0.042     6.42    14.89
       ================================================
       ID = 1 (  0001):    42.37   0.735     6.77    15.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.735     6.77    15.02
     + ID2= 2 (  0404):     0.05   0.008     6.08    33.41
       ================================================
       ID = 3 (  0001):    42.43   0.736     6.77    15.05

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.282    12.78    12.57
     + ID2= 2 (  0002):    23.73   0.435    12.78    19.08
       ================================================
       ID = 3 (  0001):    40.75   0.716    12.78    18.18

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.716    12.78    18.18
     + ID2= 2 (  0303):     1.62   0.043    12.42    13.84
       ================================================
       ID = 1 (  0001):    42.37   0.749    12.75    18.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.749    12.75    18.17
     + ID2= 2 (  0404):     0.05   0.008    12.08    32.14
       ================================================
       ID = 3 (  0001):    42.43   0.749    12.75    18.20

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
****************************************
** SIMULATION:100yr 4hr 5min Chicago **
****************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.239     2.30     9.91
     + ID2= 2 (  0002):    23.73   0.372     2.30    11.32
       ================================================
       ID = 3 (  0001):    40.75   0.611     2.30    10.73

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.611     2.30    10.73
     + ID2= 2 (  0303):     1.62   0.036     1.90    10.60
       ================================================
       ID = 1 (  0001):    42.37   0.638     2.28    10.72

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.638     2.28    10.72
     + ID2= 2 (  0404):     0.05   0.008     1.38    25.36
       ================================================
       ID = 3 (  0001):    42.43   0.639     2.28    10.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 6hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.260     3.85    11.32
     + ID2= 2 (  0002):    23.73   0.405     3.83    12.89
       ================================================
       ID = 3 (  0001):    40.75   0.665     3.83    12.24

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.665     3.83    12.24
     + ID2= 2 (  0303):     1.62   0.039     3.43    12.10
       ================================================
       ID = 1 (  0001):    42.37   0.695     3.82    12.23

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.695     3.82    12.23
     + ID2= 2 (  0404):     0.05   0.008     3.08    28.23
       ================================================
       ID = 3 (  0001):    42.43   0.695     3.82    12.25

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
************************************************
** SIMULATION:10yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.132     6.83     6.86
     + ID2= 2 (  0002):    23.73   0.208     6.82     7.90
       ================================================
       ID = 3 (  0001):    40.75   0.340     6.82     7.47
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.340	6.82	7.47
+ ID2= 2 (0303):		1.62	0.020	6.43	7.35
ID = 1 (0001):		42.37	0.355	6.80	7.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.355	6.80	7.46
+ ID2= 2 (0404):		0.05	0.005	6.08	18.89
ID = 3 (0001):		42.43	0.356	6.80	7.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:10yr 24hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.141	12.80	6.30
+ ID2= 2 (0002):		23.73	0.221	12.80	9.95
ID = 3 (0001):		40.75	0.361	12.80	9.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.361	12.80	9.42
+ ID2= 2 (0303):		1.62	0.022	12.42	6.98
ID = 1 (0001):		42.37	0.377	12.77	9.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.377	12.77	9.41
+ ID2= 2 (0404):		0.05	0.005	12.08	18.53
ID = 3 (0001):		42.43	0.378	12.77	9.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:10yr 4hr 5min Chicago **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.104	2.35	4.53
+ ID2= 2 (0002):		23.73	0.166	2.35	5.27
ID = 3 (0001):		40.75	0.270	2.35	4.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.270	2.35	4.96
+ ID2= 2 (0303):		1.62	0.015	1.93	4.86
ID = 1 (0001):		42.37	0.281	2.33	4.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.281	2.33	4.96
+ ID2= 2 (0404):		0.05	0.004	1.38	13.60
ID = 3 (0001):		42.43	0.282	2.32	4.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:10yr 6hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.119	3.87	5.32
+ ID2= 2 (0002):		23.73	0.189	3.87	6.17
ID = 3 (0001):		40.75	0.308	3.87	5.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.308	3.87	5.82
+ ID2= 2 (0303):		1.62	0.018	3.47	5.71
ID = 1 (0001):		42.37	0.322	3.85	5.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.322	3.85	5.81
+ ID2= 2 (0404):		0.05	0.004	3.08	15.44
ID = 3 (0001):		42.43	0.322	3.85	5.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:25yr 12hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.186	6.82	9.51
+ ID2= 2 (0002):		23.73	0.290	6.80	10.87
ID = 3 (0001):		40.75	0.476	6.82	10.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.476	6.82	10.30
+ ID2= 2 (0303):		1.62	0.028	6.42	10.18
ID = 1 (0001):		42.37	0.497	6.78	10.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.497	6.78	10.30
+ ID2= 2 (0404):		0.05	0.006	6.08	24.54
ID = 3 (0001):		42.43	0.498	6.78	10.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:25yr 24hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.194	12.78	8.69
+ ID2= 2 (0002):		23.73	0.303	12.78	13.47
ID = 3 (0001):		40.75	0.497	12.78	12.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.497	12.78	12.79
+ ID2= 2 (0303):		1.62	0.030	12.42	9.60
ID = 1 (0001):		42.37	0.520	12.77	12.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.520	12.77	12.79
+ ID2= 2 (0404):		0.05	0.006	12.08	23.92
ID = 3 (0001):		42.43	0.520	12.77	12.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:25yr 4hr 5min Chicago **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.152	2.33	6.47
+ ID2= 2 (0002):		23.73	0.239	2.33	7.47
ID = 3 (0001):		40.75	0.391	2.33	7.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.391	2.33	7.05
+ ID2= 2 (0303):		1.62	0.022	1.92	6.94
ID = 1 (0001):		42.37	0.408	2.30	7.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0001)|

1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.408	2.30	7.05
+ ID2= 2 (0404):		0.05	0.005	1.38	18.03
ID = 3 (0001):		42.43	0.408	2.30	7.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:25yr 6hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.170	3.85	7.52
+ ID2= 2 (0002):		23.73	0.268	3.85	8.64
ID = 3 (0001):		40.75	0.438	3.85	8.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.438	3.85	8.17
+ ID2= 2 (0303):		1.62	0.026	3.45	8.05
ID = 1 (0001):		42.37	0.458	3.83	8.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.458	3.83	8.17
+ ID2= 2 (0404):		0.05	0.006	3.08	20.32
ID = 3 (0001):		42.43	0.458	3.83	8.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:2yr 12hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):		17.02	0.050	6.87	2.78
+ ID2= 2 (0002):		23.73	0.082	6.87	3.29
ID = 3 (0001):		40.75	0.133	6.87	3.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):		40.75	0.133	6.87	3.08
+ ID2= 2 (0303):		1.62	0.008	6.47	2.99
ID = 1 (0001):		42.37	0.138	6.85	3.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):		42.37	0.138	6.85	3.07
+ ID2= 2 (0404):		0.05	0.002	6.08	9.32
ID = 3 (0001):		42.43	0.139	6.85	3.08

```
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:2yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.058    12.83     2.63
     + ID2= 2 (  0002):    23.73   0.093    12.83     4.41
       ================================================
       ID = 3 (  0001):    40.75   0.151    12.83     4.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.151    12.83     4.14
     + ID2= 2 (  0303):     1.62   0.009    12.43     2.94
       ================================================
       ID = 1 (  0001):    42.37   0.157    12.80     4.14

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.157    12.80     4.14
     + ID2= 2 (  0404):     0.05   0.003    12.08     9.41
       ================================================
       ID = 3 (  0001):    42.43   0.157    12.80     4.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************
** SIMULATION:2yr 4hr 5min Chicago **
************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.034     2.45     1.63
     + ID2= 2 (  0002):    23.73   0.057     2.43     1.96
       ================================================
       ID = 3 (  0001):    40.75   0.092     2.45     1.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.092     2.45     1.82
     + ID2= 2 (  0303):     1.62   0.005     2.00     1.75
       ================================================
       ID = 1 (  0001):    42.37   0.095     2.42     1.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.095     2.42     1.82
     + ID2= 2 (  0404):     0.05   0.002     1.38     6.22
       ================================================
       ID = 3 (  0001):    42.43   0.096     2.42     1.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:2yr 6hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.043     3.93     2.00
     + ID2= 2 (  0002):    23.73   0.070     3.92     2.39
       ================================================
       ID = 3 (  0001):    40.75   0.113     3.93     2.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.113     3.93     2.23
     + ID2= 2 (  0303):     1.62   0.006     3.52     2.16
       ================================================
       ID = 1 (  0001):    42.37   0.118     3.90     2.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.118     3.90     2.23
     + ID2= 2 (  0404):     0.05   0.002     3.08     7.26
       ================================================
       ID = 3 (  0001):    42.43   0.118     3.90     2.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:50yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.230     6.80    11.67
     + ID2= 2 (  0002):    23.73   0.357     6.80    13.28
       ================================================
       ID = 3 (  0001):    40.75   0.587     6.80    12.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.587     6.80    12.60
     + ID2= 2 (  0303):     1.62   0.035     6.42    12.47
       ================================================
       ID = 1 (  0001):    42.37   0.613     6.78    12.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.613     6.78    12.60
     + ID2= 2 (  0404):     0.05   0.007     6.08    28.92
       ================================================
       ID = 3 (  0001):    42.43   0.613     6.78    12.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:50yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.236    12.78    10.54
```

```
      + ID2= 2 (  0002):    23.73   0.366    12.78    16.16
        ==========================================================
        ID = 3 (  0001):    40.75   0.602    12.78    15.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.602    12.78    15.37
      + ID2= 2 (  0303):     1.62   0.036    12.42    11.62
        ==========================================================
        ID = 1 (  0001):    42.37   0.629    12.77    15.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.629    12.77    15.36
      + ID2= 2 (  0404):     0.05   0.007    12.08    27.91
        ==========================================================
        ID = 3 (  0001):    42.43   0.629    12.75    15.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**************************************
** SIMULATION:5Oyr 4hr 5min Chicago **
**************************************


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.195     2.32     8.17
      + ID2= 2 (  0002):    23.73   0.306     2.32     9.38
        ==========================================================
        ID = 3 (  0001):    40.75   0.500     2.32     8.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.500     2.32     8.88
      + ID2= 2 (  0303):     1.62   0.029     1.92     8.75
        ==========================================================
        ID = 1 (  0001):    42.37   0.522     2.28     8.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.522     2.28     8.87
      + ID2= 2 (  0404):     0.05   0.007     1.38    21.73
        ==========================================================
        ID = 3 (  0001):    42.43   0.523     2.28     8.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5Oyr 6hr 5min SCS Type II (MTO) **
**********************************************


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.215     3.85     9.39
      + ID2= 2 (  0002):    23.73   0.335     3.85    10.74
        ==========================================================
        ID = 3 (  0001):    40.75   0.550     3.85    10.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.550     3.85    10.18
      + ID2= 2 (  0303):     1.62   0.032     3.45    10.05
        ==========================================================
        ID = 1 (  0001):    42.37   0.574     3.82    10.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.574     3.82    10.17
      + ID2= 2 (  0404):     0.05   0.007     3.08    24.29
        ==========================================================
        ID = 3 (  0001):    42.43   0.575     3.82    10.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 12hr 5min SCS Type II (MTO) **
**********************************************


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.097     6.83     5.14
      + ID2= 2 (  0002):    23.73   0.155     6.83     5.96
        ==========================================================
        ID = 3 (  0001):    40.75   0.252     6.83     5.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.252     6.83     5.62
      + ID2= 2 (  0303):     1.62   0.015     6.43     5.51
        ==========================================================
        ID = 1 (  0001):    42.37   0.264     6.82     5.61

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.264     6.82     5.61
      + ID2= 2 (  0404):     0.05   0.004     6.08    15.02
        ==========================================================
        ID = 3 (  0001):    42.43   0.264     6.82     5.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 24hr 5min SCS Type II (MTO) **
**********************************************


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.106    12.82     4.79
      + ID2= 2 (  0002):    23.73   0.168    12.80     7.69
        ==========================================================
        ID = 3 (  0001):    40.75   0.275    12.80     7.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.275    12.80     7.26
```

```
      + ID2= 2 (  0303):     1.62   0.016    12.42     5.31
        ==================================================
        ID = 1 (  0001):    42.37   0.287    12.78     7.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.287    12.78     7.26
      + ID2= 2 (  0404):     0.05   0.004    12.08    14.92
        ==================================================
        ID = 3 (  0001):    42.43   0.287    12.78     7.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************
** SIMULATION:5yr 4hr 5min Chicago **
************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.072     2.38     3.25
      + ID2= 2 (  0002):    23.73   0.117     2.37     3.82
        ==================================================
        ID = 3 (  0001):    40.75   0.189     2.38     3.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.189     2.38     3.58
      + ID2= 2 (  0303):     1.62   0.011     1.95     3.49
        ==================================================
        ID = 1 (  0001):    42.37   0.197     2.35     3.58

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.197     2.35     3.58
      + ID2= 2 (  0404):     0.05   0.003     1.38    10.50
        ==================================================
        ID = 3 (  0001):    42.43   0.198     2.35     3.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:5yr 6hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.086     3.88     3.88
      + ID2= 2 (  0002):    23.73   0.137     3.88     4.54
        ==================================================
        ID = 3 (  0001):    40.75   0.223     3.88     4.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.223     3.88     4.27
      + ID2= 2 (  0303):     1.62   0.013     3.48     4.17
        ==================================================
        ID = 1 (  0001):    42.37   0.233     3.87     4.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.233     3.87     4.26
      + ID2= 2 (  0404):     0.05   0.003     3.08    12.05
        ==================================================
        ID = 3 (  0001):    42.43   0.233     3.87     4.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************
** SIMULATION:TIMMINS.STM     **
********************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.600     7.47    66.15
      + ID2= 2 (  0002):    23.73   0.906     7.47    72.28
        ==================================================
        ID = 3 (  0001):    40.75   1.506     7.47    69.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   1.506     7.47    69.72
      + ID2= 2 (  0303):     1.62   0.073     7.15    69.60
        ==================================================
        ID = 1 (  0001):    42.37   1.570     7.45    69.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   1.570     7.45    69.71
      + ID2= 2 (  0404):     0.05   0.005     7.00   117.97
        ==================================================
        ID = 3 (  0001):    42.43   1.572     7.45    69.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************
** SIMULATION:WQE 25mm 4hr CHI **
************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):    17.02   0.012     2.65     0.66
      + ID2= 2 (  0002):    23.73   0.022     2.62     0.83
        ==================================================
        ID = 3 (  0001):    40.75   0.034     2.63     0.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    40.75   0.034     2.63     0.76
      + ID2= 2 (  0303):     1.62   0.002     2.12     0.72
        ==================================================
        ID = 1 (  0001):    42.37   0.036     2.62     0.76

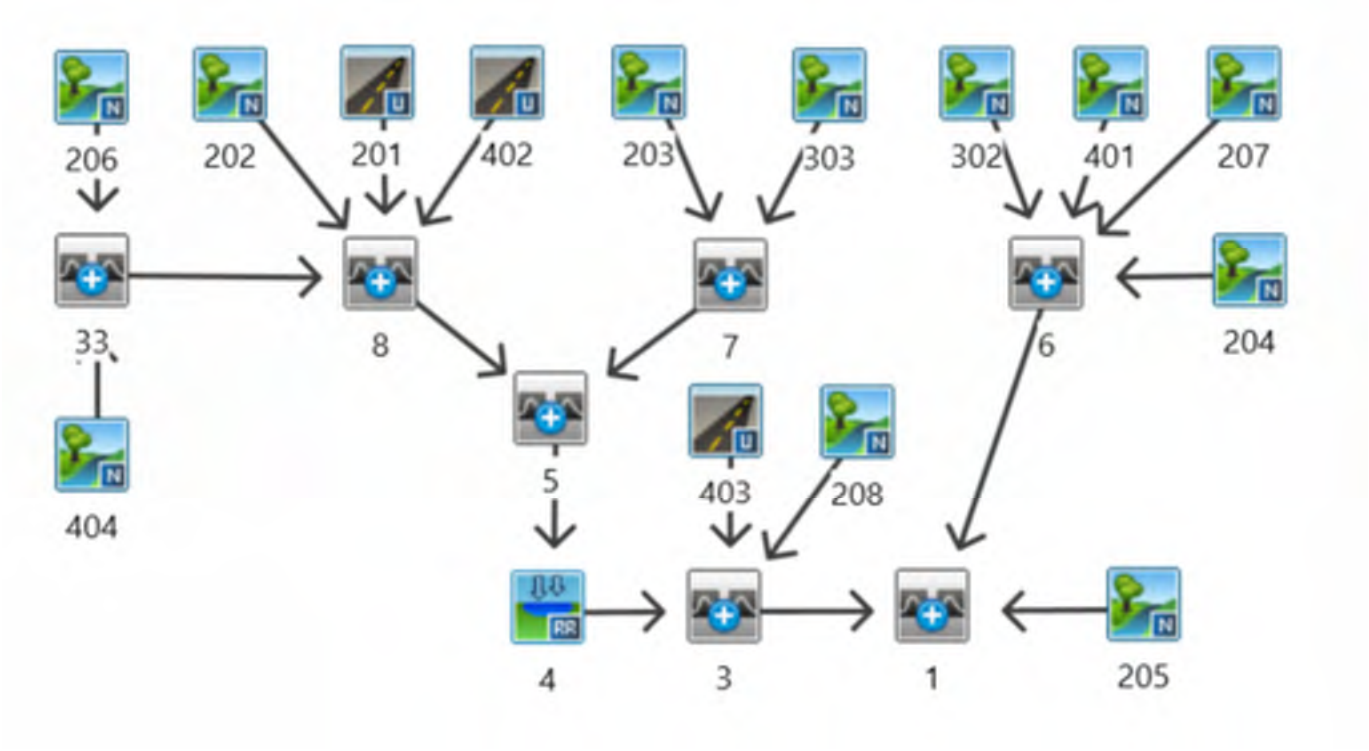
     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    42.37   0.036     2.62     0.76
```

```
      + ID2= 2 (  0404):     0.05   0.001     1.38     3.32
        ================================================
        ID = 3 (  0001):    42.43   0.036     2.62     0.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

Post-Development OTTHYMO Modeling Schematic



Post-Development Modeling Detail Output: AddHyd 1

```
************************************************
** SIMULATION:100yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.042     6.08    43.91
     + ID2= 2 (  0003):    18.40   0.194     7.35    34.18
       ================================================
       ID = 3 (  0001):    18.60   0.196     7.35    34.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.196     7.35    34.28
     + ID2= 2 (  0006):    23.83   0.434     6.80    16.87
       ================================================
       ID = 1 (  0001):    42.43   0.624     6.83    24.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.044    12.08    42.44
     + ID2= 2 (  0003):    18.40   0.198    13.32    35.65
       ================================================
       ID = 3 (  0001):    18.60   0.200    13.32    35.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.200    13.32    35.81
     + ID2= 2 (  0006):    23.83   0.442    12.78    20.29
       ================================================
       ID = 1 (  0001):    42.43   0.635    12.82    27.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
****************************************
** SIMULATION:100yr 4hr 5min Chicago **
****************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.055     1.33    34.13
     + ID2= 2 (  0003):    18.40   0.174     2.97    27.84
       ================================================
       ID = 3 (  0001):    18.60   0.176     2.92    27.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.176     2.92    27.91
     + ID2= 2 (  0006):    23.83   0.382     2.30    12.17
       ================================================
       ID = 1 (  0001):    42.43   0.549     2.33    19.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 6hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.044     3.08    37.65
     + ID2= 2 (  0003):    18.40   0.188     4.65    30.27
       ================================================
       ID = 3 (  0001):    18.60   0.191     4.58    30.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.191     4.58    30.35
     + ID2= 2 (  0006):    23.83   0.413     3.85    13.82
       ================================================
       ID = 1 (  0001):    42.43   0.592     3.88    21.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
************************************************
** SIMULATION:10yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.026     6.08    26.04
     + ID2= 2 (  0003):    18.40   0.061    10.13    18.44
       ================================================
       ID = 3 (  0001):    18.60   0.068     6.08    18.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.068     6.08    18.52
     + ID2= 2 (  0006):    23.83   0.214     6.83     8.57
       ================================================
       ID = 1 (  0001):    42.43   0.257     6.85    12.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
************************************************
** SIMULATION:10yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.027    12.08    25.62
     + ID2= 2 (  0003):    18.40   0.063    16.10    18.34
       ================================================
       ID = 3 (  0001):    18.60   0.071    12.08    18.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.071    12.08    18.48
     + ID2= 2 (  0006):    23.83   0.226    12.80    10.73
       ================================================
       ID = 1 (  0001):    42.43   0.272    12.82    14.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
****************************************
** SIMULATION:10yr 4hr 5min Chicago **
****************************************

--------------------
| ADD HYD  (  0001)|
```

```
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.030     1.33     19.24
     + ID2= 2 (  0003):     18.40    0.041     4.02     15.63
       ================================================
       ID = 3 (  0001):     18.60    0.066     1.35     15.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.066     1.35     15.67
     + ID2= 2 (  0006):     23.83    0.172     2.33      5.78
       ================================================
       ID = 1 (  0001):     42.43    0.209     2.33     10.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:10yr 6hr 5min SCS Type II (MTO) **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.026     3.08     21.63
     + ID2= 2 (  0003):     18.40    0.047     6.10     16.64
       ================================================
       ID = 3 (  0001):     18.60    0.066     3.08     16.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.066     3.08     16.70
     + ID2= 2 (  0006):     23.83    0.195     3.88      6.73
       ================================================
       ID = 1 (  0001):     42.43    0.235     3.90     11.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:25yr 12hr 5min SCS Type II (MTO) **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.032     6.08     33.11
     + ID2= 2 (  0003):     18.40    0.120     8.15     24.64
       ================================================
       ID = 3 (  0001):     18.60    0.121     8.08     24.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.121     8.08     24.73
     + ID2= 2 (  0006):     23.83    0.296     6.82     11.70
       ================================================
       ID = 1 (  0001):     42.43    0.388     6.92     17.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:25yr 24hr 5min SCS Type II (MTO) **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.034    12.08     32.39
     + ID2= 2 (  0003):     18.40    0.124    13.80     25.24
       ================================================
       ID = 3 (  0001):     18.60    0.125    13.80     25.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.125    13.80     25.39
     + ID2= 2 (  0006):     23.83    0.309    12.80     14.43
       ================================================
       ID = 1 (  0001):     42.43    0.412    12.88     19.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:25yr 4hr 5min Chicago **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.039     1.33     24.95
     + ID2= 2 (  0003):     18.40    0.089     3.92     19.89
       ================================================
       ID = 3 (  0001):     18.60    0.090     3.92     19.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.090     3.92     19.95
     + ID2= 2 (  0006):     23.83    0.247     2.33      8.11
       ================================================
       ID = 1 (  0001):     42.43    0.303     2.48     13.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:25yr 6hr 5min SCS Type II (MTO) **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.033     3.08     27.85
     + ID2= 2 (  0003):     18.40    0.109     5.22     21.73
       ================================================
       ID = 3 (  0001):     18.60    0.110     5.10     21.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 3 (  0001):     18.60    0.110     5.10     21.80
     + ID2= 2 (  0006):     23.83    0.275     3.87      9.35
       ================================================
       ID = 1 (  0001):     42.43    0.349     4.00     14.81

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:2yr 12hr 5min SCS Type II (MTO) **
**********************************************

-------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0205):      0.20    0.014     6.08     13.55
     + ID2= 2 (  0003):     18.40    0.027     6.10     11.14
       ================================================
       ID = 3 (  0001):     18.60    0.040     6.08     11.17
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.040	6.08	11.17
+ ID2= 2 (0006):		23.83	0.086	6.87	3.65
ID = 1 (0001):		42.43	0.112	6.87	6.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:2yr 24hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.015	12.08	13.69
+ ID2= 2 (0003):		18.40	0.028	12.10	10.45
ID = 3 (0001):		18.60	0.043	12.08	10.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.043	12.08	10.52
+ ID2= 2 (0006):		23.83	0.097	12.83	4.86
ID = 1 (0001):		42.43	0.124	12.83	7.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:2yr 4hr 5min Chicago **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.013	1.33	9.31
+ ID2= 2 (0003):		18.40	0.023	1.37	9.58
ID = 3 (0001):		18.60	0.036	1.35	9.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.036	1.35	9.58
+ ID2= 2 (0006):		23.83	0.061	2.42	2.21
ID = 1 (0001):		42.43	0.084	2.42	5.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:2yr 6hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.013	3.08	10.75
+ ID2= 2 (0003):		18.40	0.025	3.10	10.28
ID = 3 (0001):		18.60	0.037	3.08	10.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.037	3.08	10.29
+ ID2= 2 (0006):		23.83	0.074	3.93	2.69
ID = 1 (0001):		42.43	0.098	3.93	6.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:50yr 12hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.037	6.08	38.49
+ ID2= 2 (0003):		18.40	0.158	8.08	29.40
ID = 3 (0001):		18.60	0.160	8.08	29.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.160	8.08	29.50
+ ID2= 2 (0006):		23.83	0.364	6.82	14.23
ID = 1 (0001):		42.43	0.511	6.87	20.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:50yr 24hr 5min SCS Type II (MTO) **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.039	12.08	37.30
+ ID2= 2 (0003):		18.40	0.162	13.60	30.30
ID = 3 (0001):		18.60	0.164	13.58	30.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0001):		18.60	0.164	13.58	30.45
+ ID2= 2 (0006):		23.83	0.372	12.78	17.24
ID = 1 (0001):		42.43	0.525	12.83	23.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:50yr 4hr 5min Chicago **
****

ADD HYD (0001)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		0.20	0.047	1.33	29.62
+ ID2= 2 (0003):		18.40	0.136	3.22	23.92
ID = 3 (0001):		18.60	0.138	3.18	23.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)

```
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.138     3.18    23.99
     + ID2= 2 (  0006):    23.83   0.315     2.32    10.13
       ================================================
       ID = 1 (  0001):    42.43   0.435     2.42    16.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5Oyr 6hr 5min SCS Type II (MTO) **
**********************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.038     3.08    32.81
     + ID2= 2 (  0003):    18.40   0.152     4.92    26.05
       ================================================
       ID = 3 (  0001):    18.60   0.154     4.92    26.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.154     4.92    26.12
     + ID2= 2 (  0006):    23.83   0.343     3.85    11.56
       ================================================
       ID = 1 (  0001):    42.43   0.479     3.92    17.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 12hr 5min SCS Type II (MTO) **
**********************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.021     6.08    21.08
     + ID2= 2 (  0003):    18.40   0.038    10.12    15.02
       ================================================
       ID = 3 (  0001):    18.60   0.057     6.08    15.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.057     6.08    15.09
     + ID2= 2 (  0006):    23.83   0.160     6.83     6.51
       ================================================
       ID = 1 (  0001):    42.43   0.193     6.83    10.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 24hr 5min SCS Type II (MTO) **
**********************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.023    12.08    20.99
     + ID2= 2 (  0003):    18.40   0.040    16.12    14.50
       ================================================
       ID = 3 (  0001):    18.60   0.060    12.08    14.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.060    12.08    14.62
     + ID2= 2 (  0006):    23.83   0.173    12.82     8.34
       ================================================
       ID = 1 (  0001):    42.43   0.208    12.80    11.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 4hr 5min Chicago **
**********************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.023     1.33    15.14
     + ID2= 2 (  0003):    18.40   0.032     1.37    13.20
       ================================================
       ID = 3 (  0001):    18.60   0.053     1.35    13.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.053     1.35    13.22
     + ID2= 2 (  0006):    23.83   0.122     2.33     4.22
       ================================================
       ID = 1 (  0001):    42.43   0.154     2.33     8.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
**********************************************
** SIMULATION:5yr 6hr 5min SCS Type II (MTO) **
**********************************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.021     3.08    17.21
     + ID2= 2 (  0003):    18.40   0.034     3.10    13.90
       ================================================
       ID = 3 (  0001):    18.60   0.055     3.08    13.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   0.055     3.08    13.93
     + ID2= 2 (  0006):    23.83   0.142     3.90     5.00
       ================================================
       ID = 1 (  0001):    42.43   0.175     3.88     8.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
*********************************
** SIMULATION:TIMMINS.STM     **
*********************************

--------------------
| ADD HYD  (  0001)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0205):     0.20   0.021     7.00   138.91
     + ID2= 2 (  0003):    18.40   1.641     7.00   121.68
       ================================================
       ID = 3 (  0001):    18.60   1.662     7.00   121.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0001)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0001):    18.60   1.662     7.00   121.87
     + ID2= 2 (  0006):    23.83   0.928     7.48    75.06
       ================================================
       ID = 1 (  0001):    42.43   2.473     7.00    95.58
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

ADD HYD (0001)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0205):	0.20	0.007	1.33	5.16
+ ID2= 2 (0003):	18.40	0.017	4.00	6.41
ID = 3 (0001):	18.60	0.022	1.35	6.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0001)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0001):	18.60	0.022	1.35	6.39
+ ID2= 2 (0006):	23.83	0.024	2.58	0.98
ID = 1 (0001):	42.43	0.042	1.33	3.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Post-Development Modeling Detail Output: Route Reservoir 4

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************************************************
** SIMULATION:100yr 12hr 5min SCS Type II (MTO) **
************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.459      6.08      45.91
   OUTFLOW: ID= 1 (  0004)     17.818      0.189      7.57      34.36

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.71
                  TIME SHIFT OF PEAK FLOW         (min)= 89.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5590

------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 24hr 5min SCS Type II (MTO) **
************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.488     12.08      52.17
   OUTFLOW: ID= 1 (  0004)     17.818      0.193     13.50      35.73

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.75
                  TIME SHIFT OF PEAK FLOW         (min)= 85.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5648

------------------------------------------------------------------------------
**************************************
** SIMULATION:100yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.929      1.38      36.77
   OUTFLOW: ID= 1 (  0004)     17.818      0.170      3.10      28.03

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.80
                  TIME SHIFT OF PEAK FLOW         (min)=103.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5295

------------------------------------------------------------------------------
```

```
************************************************
** SIMULATION:100yr 6hr 5min SCS Type II (MTO) **
************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.582      3.08      40.07
   OUTFLOW: ID= 1 (  0004)     17.818      0.184      4.78      30.47

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.13
                  TIME SHIFT OF PEAK FLOW         (min)=102.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5509

------------------------------------------------------------------------------
************************************************
** SIMULATION:10yr 12hr 5min SCS Type II (MTO) **
************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.507      6.08      29.17
   OUTFLOW: ID= 1 (  0004)     17.818      0.060     10.18      18.49

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.97
                  TIME SHIFT OF PEAK FLOW         (min)=246.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4133

------------------------------------------------------------------------------
**************************************
** SIMULATION:10yr 24hr 5min SCS Type II (MTO) **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.552     12.08      33.80
   OUTFLOW: ID= 1 (  0004)     17.818      0.062     16.13      18.29

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.98
                  TIME SHIFT OF PEAK FLOW         (min)=243.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4150

------------------------------------------------------------------------------
```

```
**************************************
** SIMULATION:10yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.802      1.38      22.69
   OUTFLOW: ID= 1 (  0004)     17.818      0.040      4.12      15.72

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.20
                  TIME SHIFT OF PEAK FLOW         (min)=164.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3698

------------------------------------------------------------------------------
**************************************************
** SIMULATION:10yr 6hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.535      3.08      24.98
   OUTFLOW: ID= 1 (  0004)     17.818      0.045      6.20      16.72

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.94
                  TIME SHIFT OF PEAK FLOW         (min)=187.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3966

------------------------------------------------------------------------------
**************************************************
** SIMULATION:25yr 12hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.885      6.08      35.82
   OUTFLOW: ID= 1 (  0004)     17.818      0.117      8.22      24.74

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.21
                  TIME SHIFT OF PEAK FLOW         (min)=128.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4652

------------------------------------------------------------------------------
```

```
**************************************************
** SIMULATION:25yr 24hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.960     12.08      41.25
   OUTFLOW: ID= 1 (  0004)     17.818      0.121     13.87      25.24

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.19
                  TIME SHIFT OF PEAK FLOW         (min)=107.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4691

------------------------------------------------------------------------------
**************************************
** SIMULATION:25yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.250      1.38      28.14
   OUTFLOW: ID= 1 (  0004)     17.818      0.087      3.98      20.01

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.89
                  TIME SHIFT OF PEAK FLOW         (min)=156.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4383

------------------------------------------------------------------------------
**************************************************
** SIMULATION:25yr 6hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.928      3.08      30.87
   OUTFLOW: ID= 1 (  0004)     17.818      0.107      5.25      21.85

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.54
                  TIME SHIFT OF PEAK FLOW         (min)=130.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4559

------------------------------------------------------------------------------
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**********************************************
** SIMULATION:2yr 12hr 5min SCS Type II (MTO) **
**********************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      0.852      6.08      17.16
   OUTFLOW: ID= 1 (  0004)     17.818      0.024     11.00      11.20

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.86
                  TIME SHIFT OF PEAK FLOW         (min)=295.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2501

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**********************************************
** SIMULATION:2yr 24hr 5min SCS Type II (MTO) **
**********************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      0.900     12.08      20.38
   OUTFLOW: ID= 1 (  0004)     17.818      0.025     17.02      10.42

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.77
                  TIME SHIFT OF PEAK FLOW         (min)=296.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2600

------------------------------------------------------------------------------
**************************************
** SIMULATION:2yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.034      1.38      12.89
   OUTFLOW: ID= 1 (  0004)     17.818      0.022      4.17       9.67

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.12
                  TIME SHIFT OF PEAK FLOW         (min)=167.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2084

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**********************************************
** SIMULATION:2yr 6hr 5min SCS Type II (MTO) **
**********************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      0.851      3.08      14.37
   OUTFLOW: ID= 1 (  0004)     17.818      0.023      6.25      10.37

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.71
                  TIME SHIFT OF PEAK FLOW         (min)=190.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.2279

------------------------------------------------------------------------------
**********************************************
** SIMULATION:50yr 12hr 5min SCS Type II (MTO) **
**********************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.182      6.08      40.85
   OUTFLOW: ID= 1 (  0004)     17.818      0.155      8.12      29.55

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.09
                  TIME SHIFT OF PEAK FLOW         (min)=122.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5095

------------------------------------------------------------------------------
**********************************************
** SIMULATION:50yr 24hr 5min SCS Type II (MTO) **
**********************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.215     12.08      46.59
   OUTFLOW: ID= 1 (  0004)     17.818      0.159     13.65      30.34

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.16
                  TIME SHIFT OF PEAK FLOW         (min)= 94.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5143

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**************************************
** SIMULATION:50yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.578      1.38      32.54
   OUTFLOW: ID= 1 (  0004)     17.818      0.133      3.32      24.08

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.15
                  TIME SHIFT OF PEAK FLOW         (min)=116.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4821

------------------------------------------------------------------------------
**************************************************
** SIMULATION:50yr 6hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      2.254      3.08      35.53
   OUTFLOW: ID= 1 (  0004)     17.818      0.149      5.08      26.21

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.59
                  TIME SHIFT OF PEAK FLOW         (min)=120.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5018

------------------------------------------------------------------------------
**************************************************
** SIMULATION:5yr 12hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.240      6.08      24.46
   OUTFLOW: ID= 1 (  0004)     17.818      0.037     10.58      15.06

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.99
                  TIME SHIFT OF PEAK FLOW         (min)=270.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3576

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**************************************************
** SIMULATION:5yr 24hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.289      12.08      28.66
   OUTFLOW: ID= 1 (  0004)     17.818      0.039      16.48      14.44

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.00
                  TIME SHIFT OF PEAK FLOW         (min)=264.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3651

------------------------------------------------------------------------------
**************************************
** SIMULATION:5yr 4hr 5min Chicago **
**************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.473      1.38      18.72
   OUTFLOW: ID= 1 (  0004)     17.818      0.028      4.17      13.29

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.87
                  TIME SHIFT OF PEAK FLOW         (min)=167.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3064

------------------------------------------------------------------------------
**************************************************
** SIMULATION:5yr 6hr 5min SCS Type II (MTO) **
**************************************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.254      3.08      20.74
   OUTFLOW: ID= 1 (  0004)     17.818      0.032      6.25      13.97

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.55
                  TIME SHIFT OF PEAK FLOW         (min)=190.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.3330

------------------------------------------------------------------------------
```

```
*********************************
** SIMULATION:TIMMINS.STM      **
*********************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      1.603      7.00     134.96
   OUTFLOW: ID= 1 (  0004)     17.818      1.603      7.00     122.43

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 99.98
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.5710

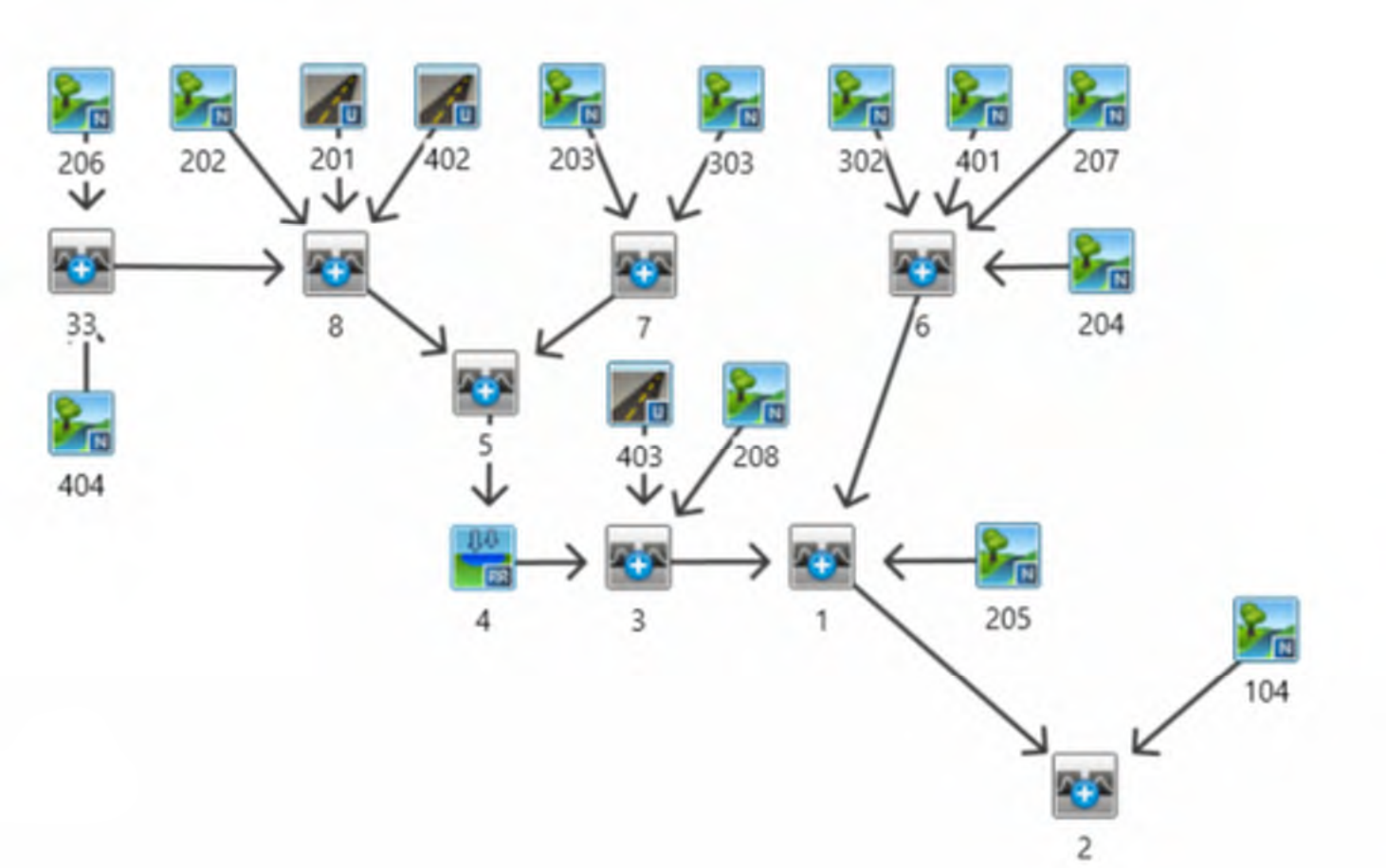
--------------------------------------------------------------------------------
*********************************
** SIMULATION:WQE 25mm 4hr CHI **
*********************************
--------------------
| RESERVOIR(  0004)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.1250      0.4724
                          0.0050      0.0397   |    0.1650      0.5223
                          0.0140      0.1050   |    0.1890      0.5583
                          0.0180      0.1562   |    0.1960      0.5702
                          0.0210      0.1940   |    0.3500      0.5703
                          0.0240      0.2432   |    1.1550      0.5708
                          0.0260      0.2791   |    2.0640      0.5712
                          0.0280      0.3140   |    2.8650      0.5720
                          0.0460      0.4008   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0005)     17.818      0.642      1.40       8.46
   OUTFLOW: ID= 1 (  0004)     17.818      0.016      4.25       6.48

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.53
                  TIME SHIFT OF PEAK FLOW         (min)=171.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1337

--------------------------------------------------------------------------------
```

Post-Development – County Rd 93 Ditch Sizing OTTHYMO Modeling Schematic



Post-Development Modeling
County Road 93 Ditch Sizing Detail Output:
AddHyd 2

```
************************************************
** SIMULATION:100yr 12hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    42.43   0.624     6.83    24.51
      + ID2= 2 (  0009):    38.54   0.429     7.80    16.97
        ================================================
        ID = 3 (  0002):    80.97   0.955     7.08    20.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 24hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    42.43   0.635    12.82    27.09
      + ID2= 2 (  0009):    38.54   0.438    13.77    13.42
        ================================================
        ID = 3 (  0002):    80.97   0.976    13.08    23.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
**************************************
** SIMULATION:100yr 4hr 5min Chicago **
**************************************

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    42.43   0.549     2.33    19.07
      + ID2= 2 (  0009):    38.54   0.383     3.33    12.26
        ================================================
        ID = 3 (  0002):    80.97   0.846     2.67    15.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
************************************************
** SIMULATION:100yr 6hr 5min SCS Type II (MTO) **
************************************************

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    42.43   0.592     3.88    21.07
      + ID2= 2 (  0009):    38.54   0.412     4.90    13.93
        ================================================
        ID = 3 (  0002):    80.97   0.909     4.23    17.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
********************************
** SIMULATION:TIMMINS.STM     **
********************************

--------------------
| ADD HYD  (  0002)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    42.43   2.473     7.00    95.58
      + ID2= 2 (  0009):    38.54   1.261     9.52    75.55
        ================================================
        ID = 3 (  0002):    80.97   3.046     7.00    86.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

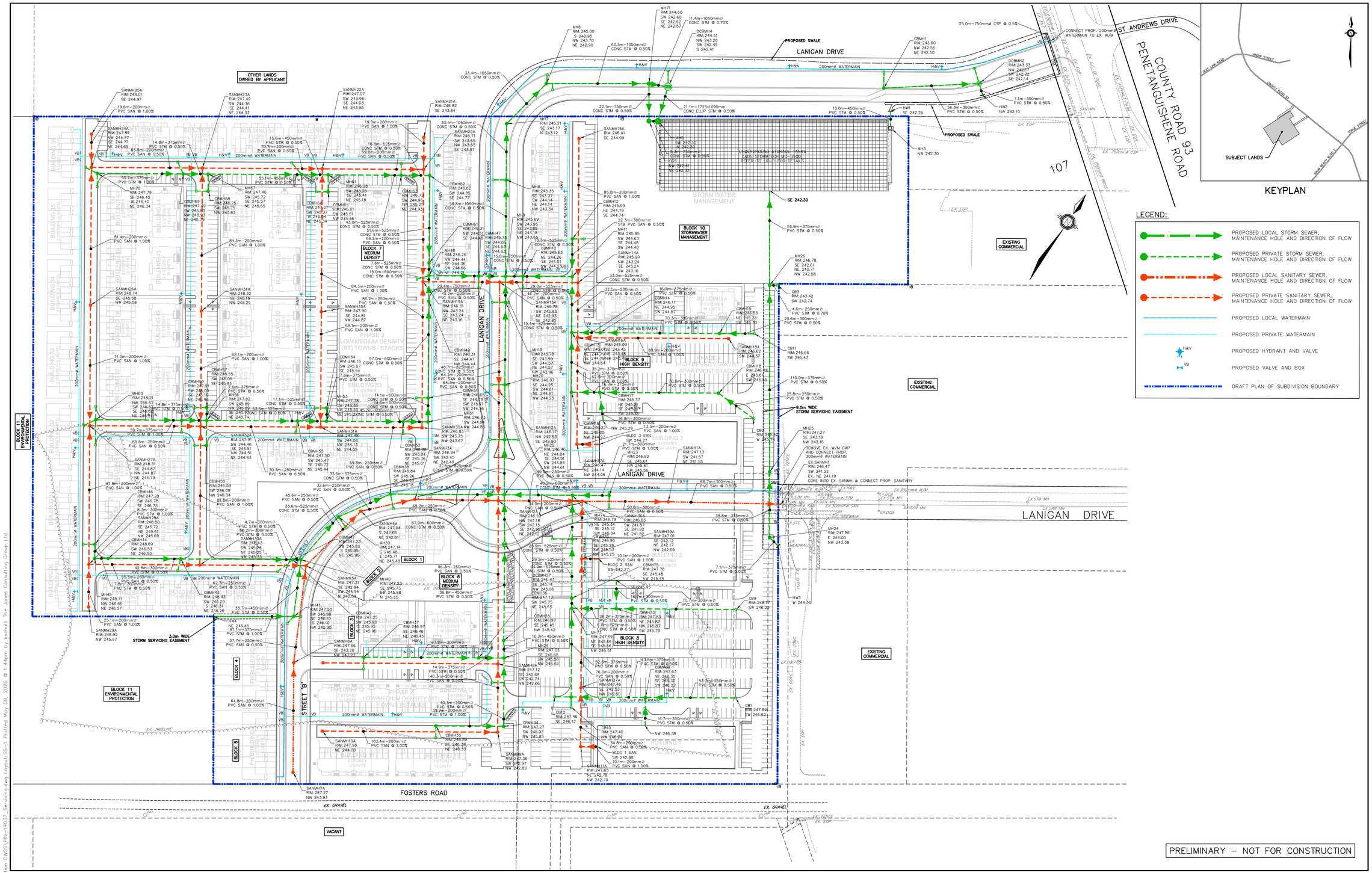
APPENDIX D

ENGINEERING DRAWINGS

The Jones Consulting Group Ltd. – *Pine Valley Homes Limited Subdivision Drawings*

Stamped May 2026:

- SS-1 Site Servicing Plan
- GP-1 Grading Plan
- GP-2 Grading Plan & Sections
- PP-1 Lanigan Drive, Plan and Profile, STA. 0+000 to STA 0+300
- PP-2 Lanigan Drive, Plan and Profile, STA 0+300 to STA+602
- PP-3 Street 'B' & Lanigan Drive, Plan and Profile, STA 0+000 to STA 0+200
- PP-4 Street 'B' & Lanigan Drive, Plan and Profile, STA 0+200 to STA 0+456
- SAN-1 Sanitary Sewer Subcatchment Plan
- STM-1 Storm Sewer Subcatchment Plan
- DS-1 Design Sheets
- SWM-1 Stormwater Management Plan, Pre-Development Conditions
- SWM-2 Stormwater Management Plan, Post-Development Conditions
- LID-1 LID Sections & Details, Below Grade SWM Facility



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ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
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LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

SITE SERVICING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: 1:1000	DATE FEBRUARY 2026
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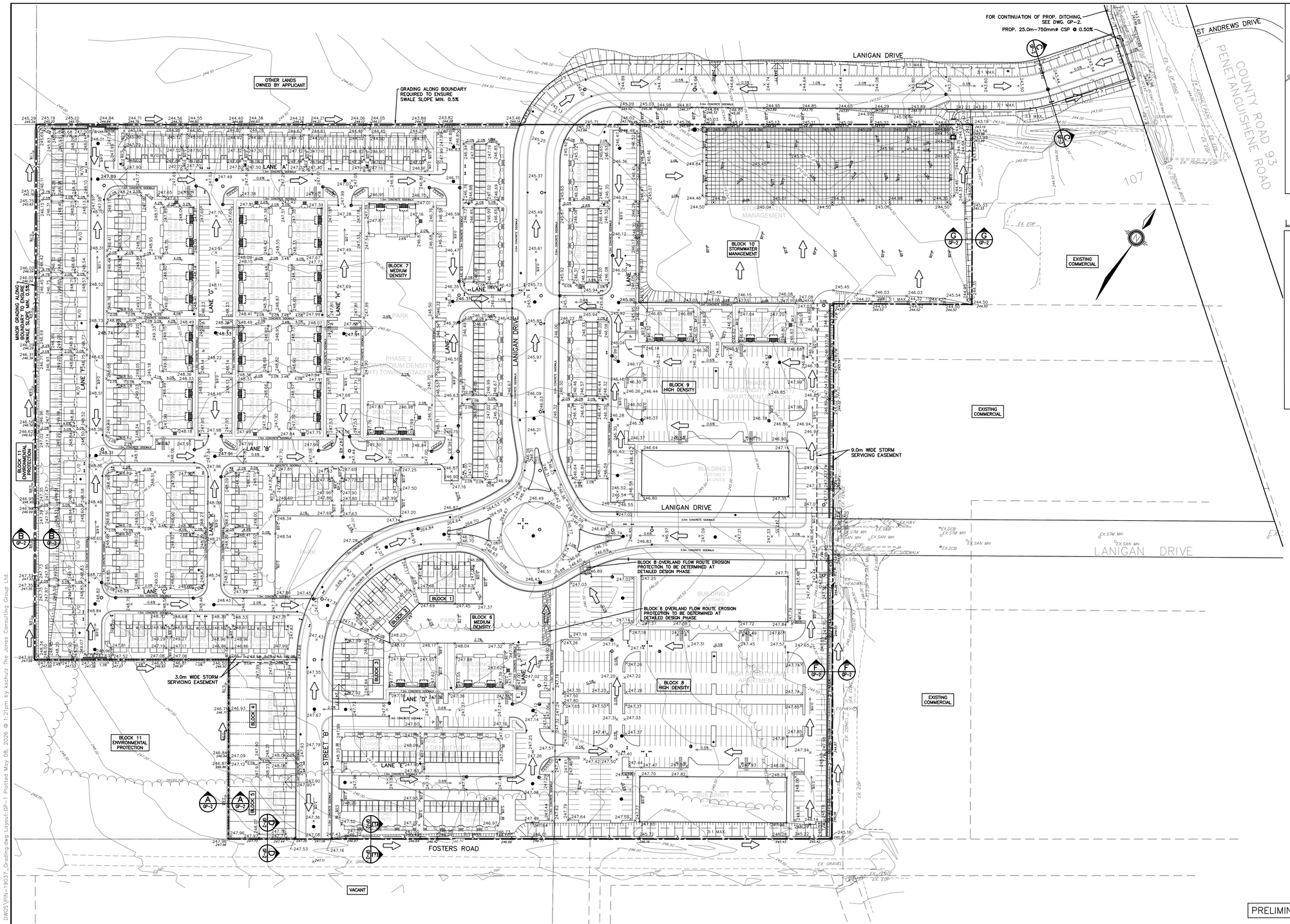
CHECKED	JW		



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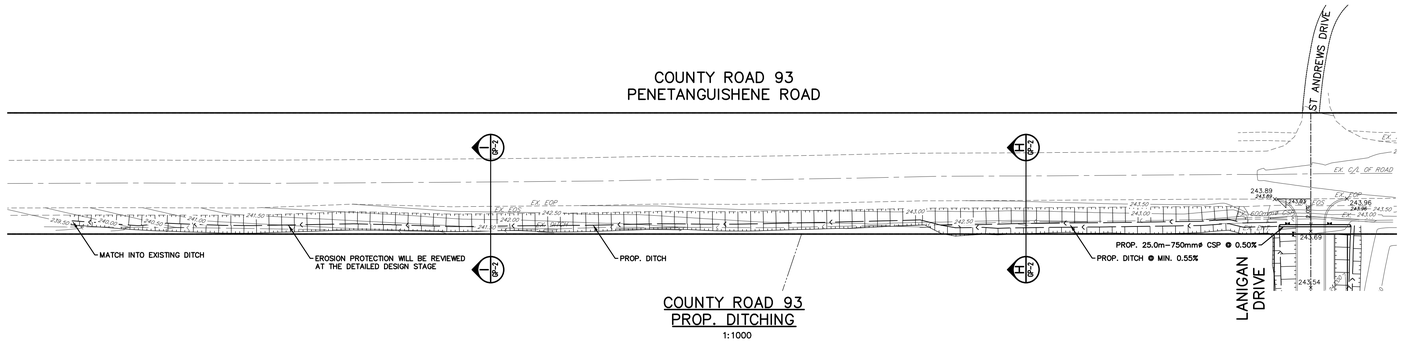
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

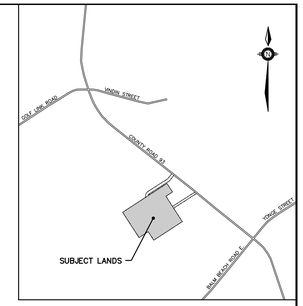
GRADING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: 1:1000	DATE FEBRUARY 2026
DRAWN	KS	PROJECT PIN-19037	DWG. Nº GP-1
CHECKED	JW		



COUNTY ROAD 93
PROP. DITCHING
1:1000



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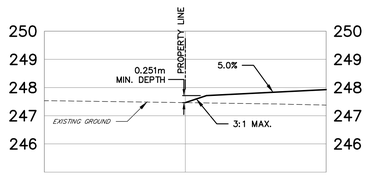

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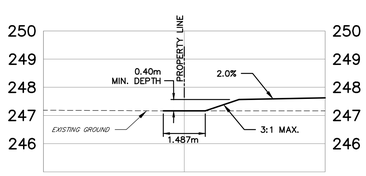

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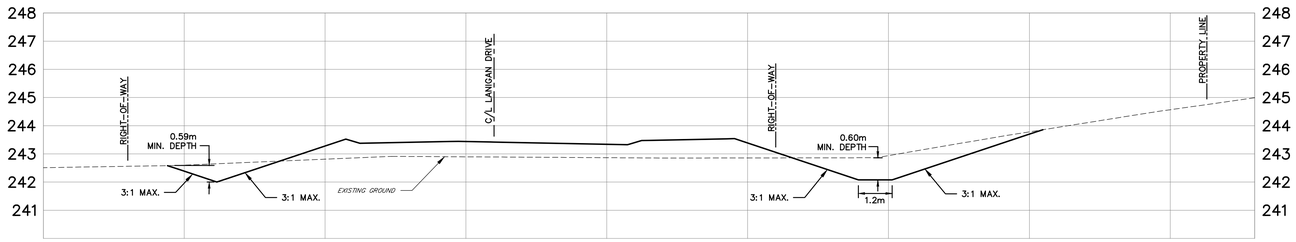

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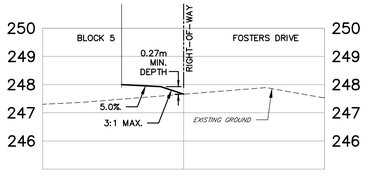

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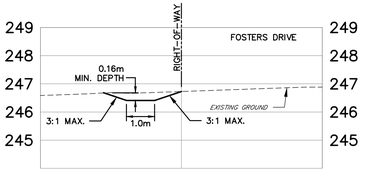

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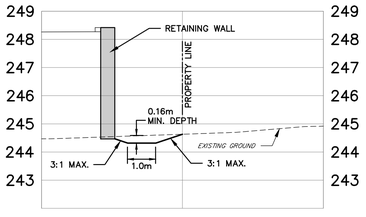

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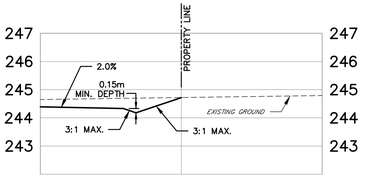

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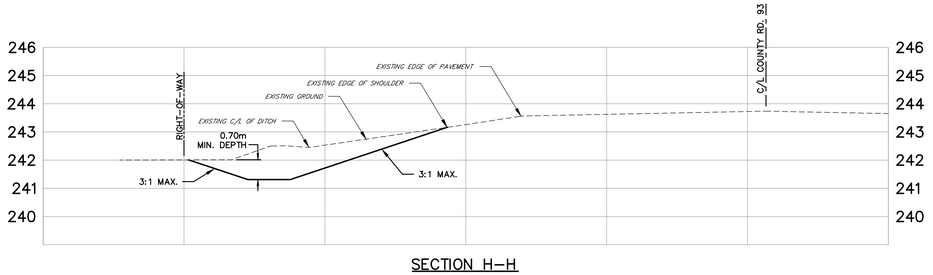

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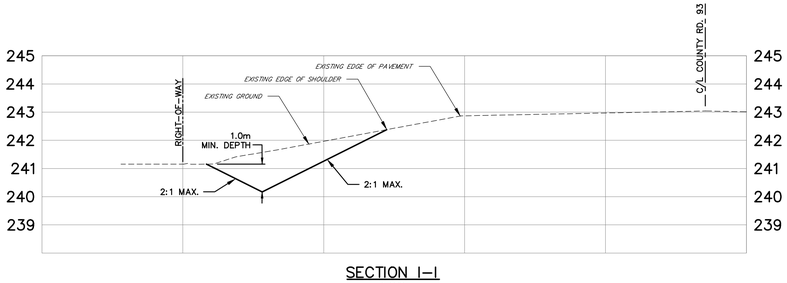

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NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

GRADING PLAN
& SECTIONS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JWI	SCALE: AS NOTED	DATE APRIL 2026
DRAWN	KS	PROJECT PIN-19037	DWG. Nº GP-2
CHECKED	JWI		

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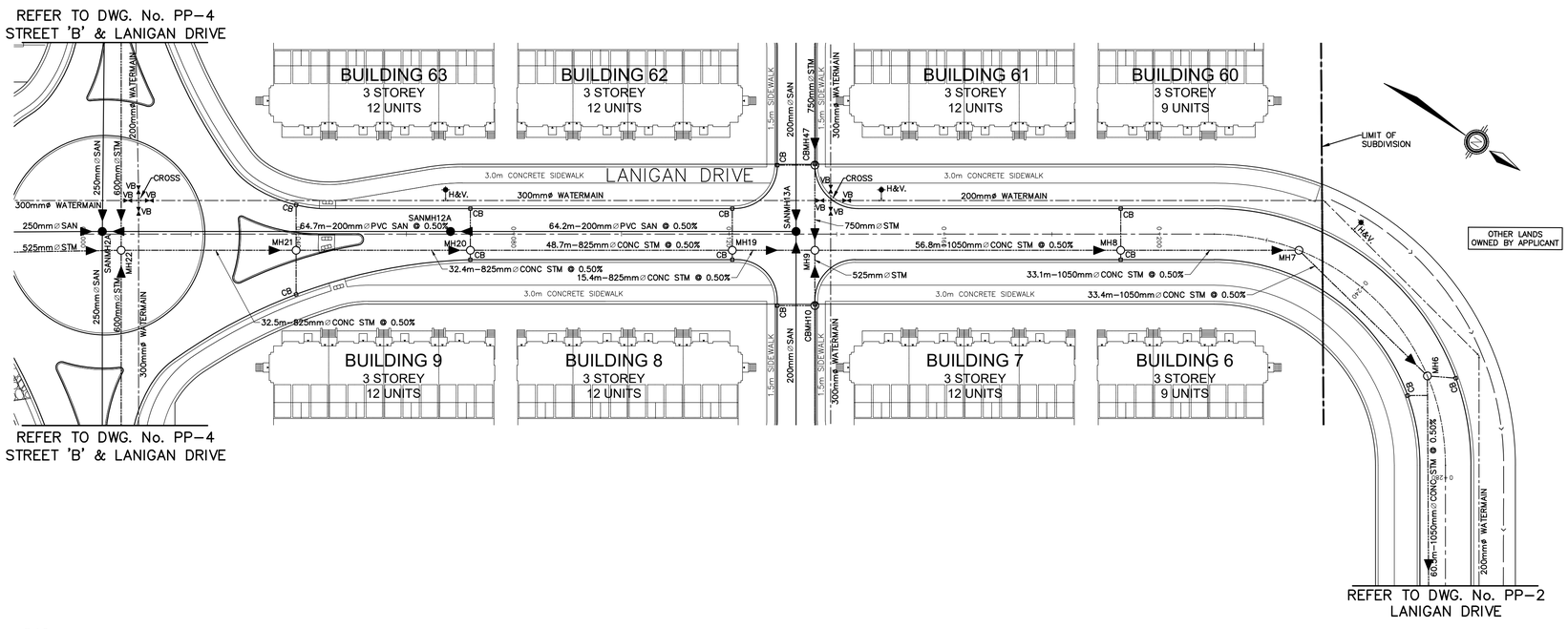

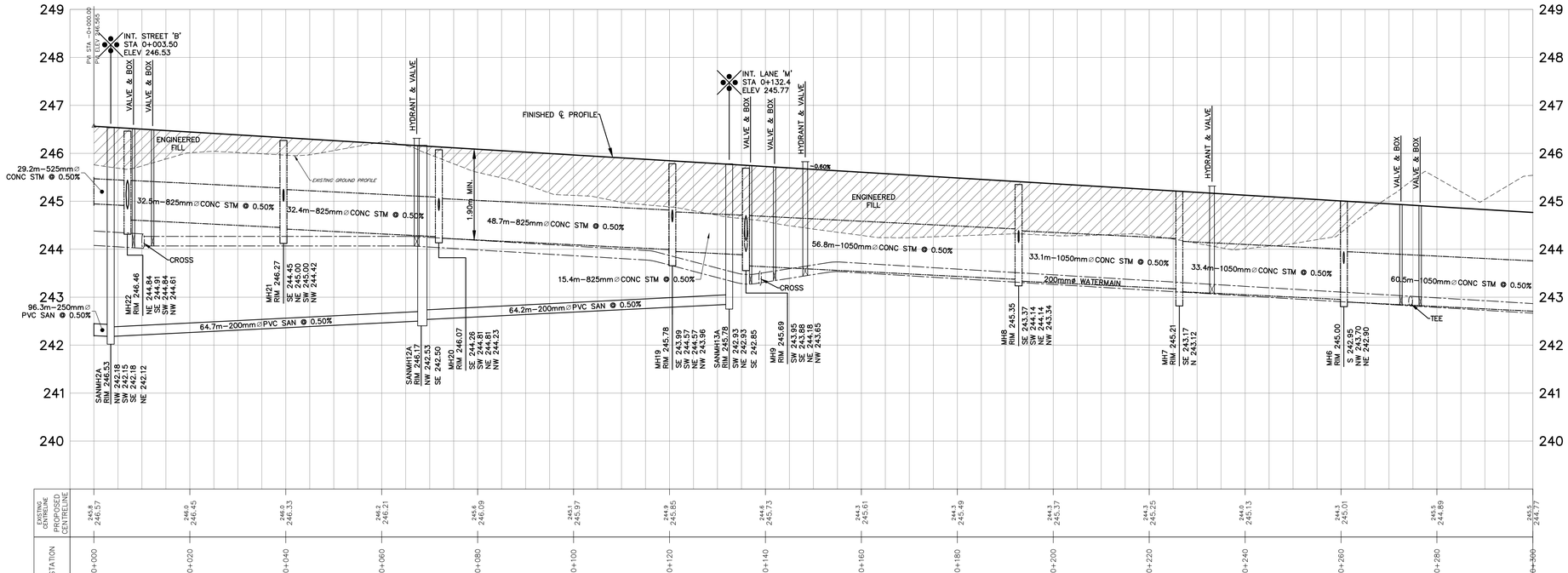

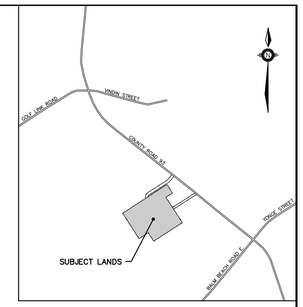

LEGEND

- EX. SANMH — EX. SANITARY MAINTENANCE HOLE
- H&V. — HYDRANT AND VALVE
- VB — VALVE AND BOX
- MH1A — SANITARY MAINTENANCE HOLE
- MH2 — STORM MAINTENANCE HOLE
- CBMH1 — STORM CATCHBASIN MAINTENANCE HOLE
- CB1 — CATCH BASIN
- DCB3 — DOUBLE CATCH BASIN
- DEPRESSED CURB
- SANITARY SEWER AND FLOW DIRECTION
- STORM SEWER AND FLOW DIRECTION
- WATERMAIN
- DRAFT PLAN OF SUBDIVISION BOUNDARY

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 26-05-08 — PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

LANIGAN DRIVE
PLAN AND PROFILE
STA. 0+000 TO STA. 0+300

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	K.S./K.R.	SCALE: H.1:500 V.1:50	DATE FEBRUARY 2026
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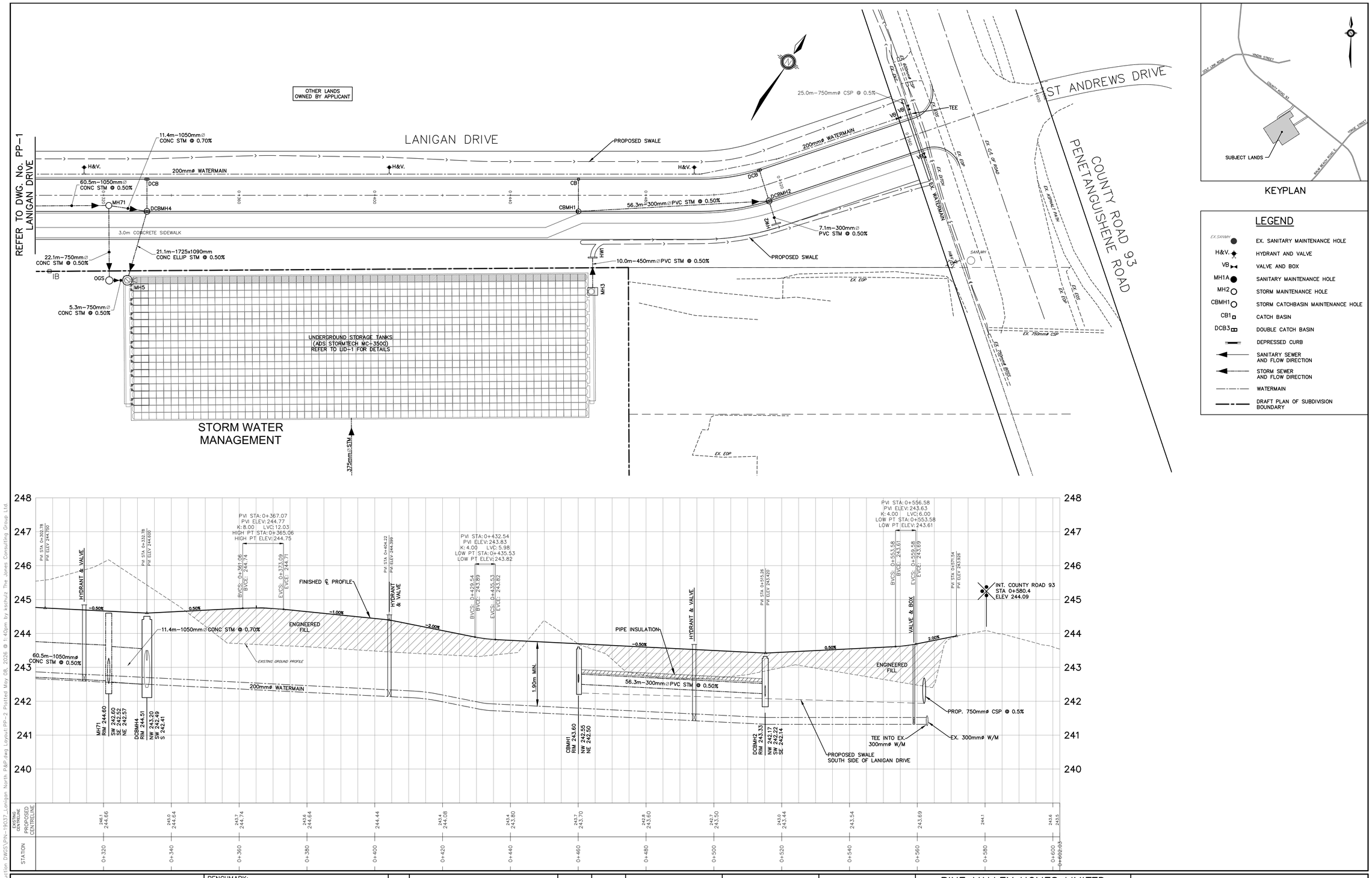
CHECKED	J.W.I.		



LEGEND

- EX. SANMH — EX. SANITARY MAINTENANCE HOLE
- H&V. — HYDRANT AND VALVE
- VB — VALVE AND BOX
- MH1A — SANITARY MAINTENANCE HOLE
- MH2 — STORM MAINTENANCE HOLE
- CBMH1 — STORM CATCHBASIN MAINTENANCE HOLE
- CB1 — CATCH BASIN
- DCB3 — DOUBLE CATCH BASIN
- DEPRESSED CURB
- SANITARY SEWER AND FLOW DIRECTION
- STORM SEWER AND FLOW DIRECTION
- WATERMAIN
- DRAFT PLAN OF SUBDIVISION BOUNDARY

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PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

LANIGAN DRIVE
PLAN AND PROFILE
STA. 0+300 TO STA. 0+602

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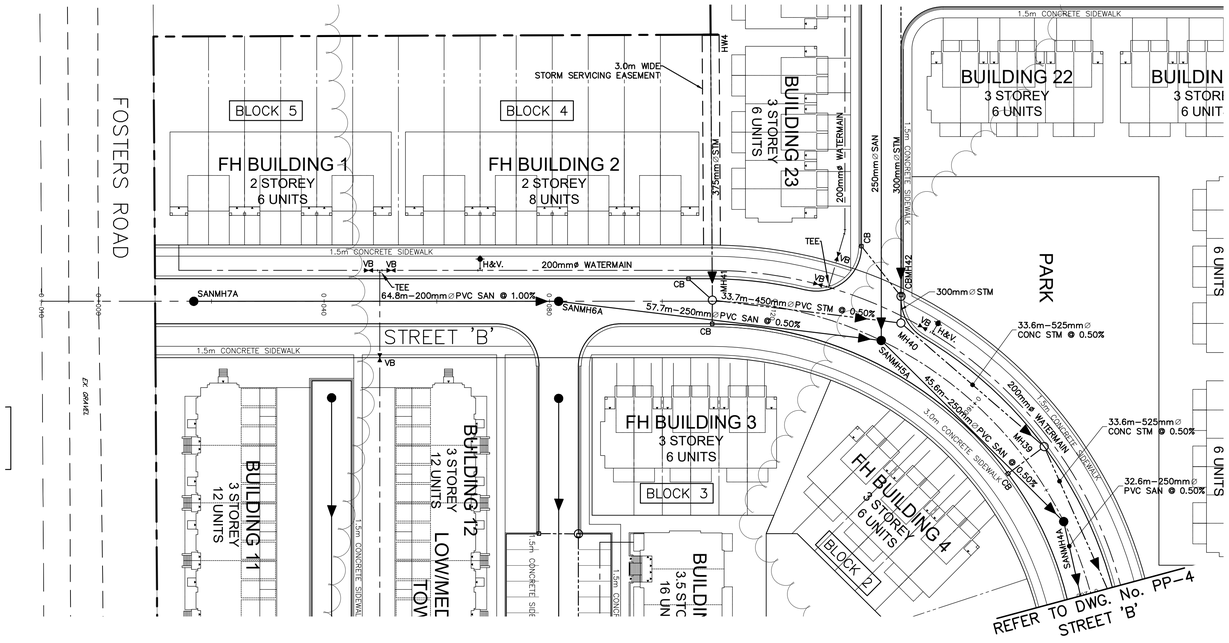
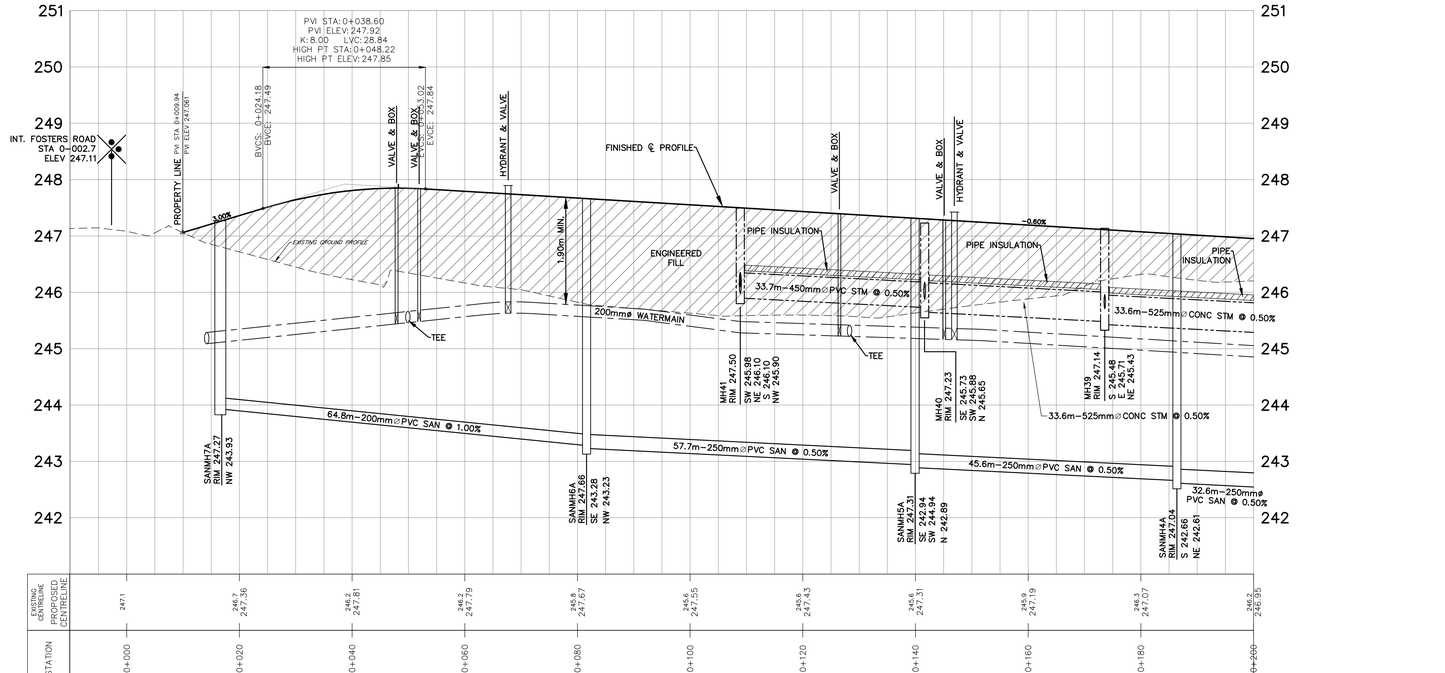
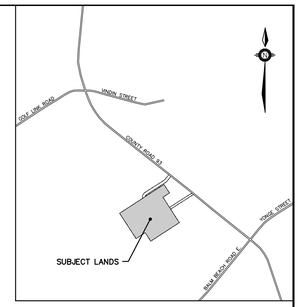
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN K.S./K.R.	SCALE: H.1:500 V.1:50	DATE FEBRUARY 2026	
DRAWN K.S.	PROJECT PIN-19037	DWG. Nº PP-2	
CHECKED J.W.I.			

G:\Eng_3D\PIN-19037\Production DWGS\PIN-19037_Lanigan North P&P.dwg Layout:PP-2 Plotted May 08, 2026 @ 1:40pm by kschulz The Jones Consulting Group Ltd







KEYPLAN

LEGEND

- EX. SANMH — EX. SANITARY MAINTENANCE HOLE
- H&V. — HYDRANT AND VALVE
- VB — VALVE AND BOX
- MH1A — SANITARY MAINTENANCE HOLE
- MH2 — STORM MAINTENANCE HOLE
- CBMH1 — STORM CATCHBASIN MAINTENANCE HOLE
- CB1 — CATCH BASIN
- DCB3 — DOUBLE CATCH BASIN
- DEPRESSED CURB
- SANITARY SEWER AND FLOW DIRECTION
- STORM SEWER AND FLOW DIRECTION
- WATERMAIN
- DRAFT PLAN OF SUBDIVISION BOUNDARY

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN–NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

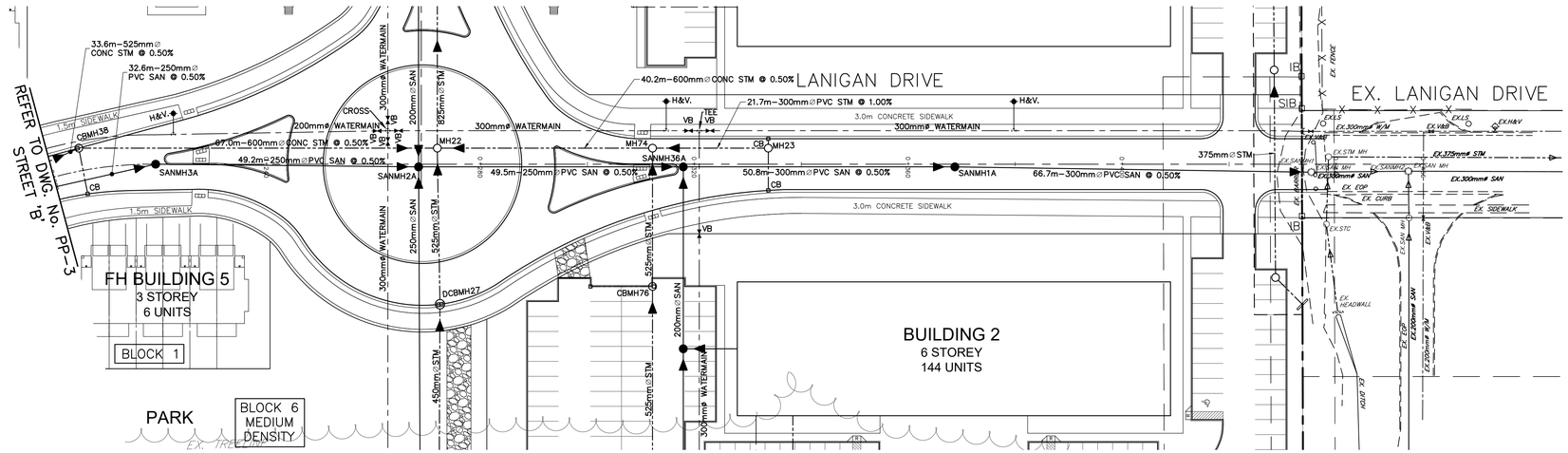
LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 26-05-08 — PROVINCE OF ONTARIO

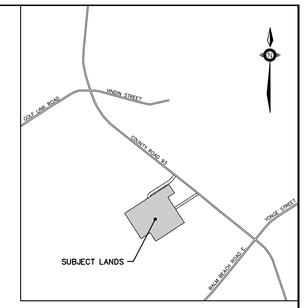
PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

STREET 'B' & LANIGAN DRIVE
PLAN AND PROFILE
STA. 0+000 TO STA. 0+200

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	K.S./K.R.	SCALE: H.1:500 V.1:50	DATE FEBRUARY 2026
DRAWN	K.S.	PROJECT PIN–19037	DWG. Nº PP–3
CHECKED	J.W.I.		





KEYPLAN

LEGEND

- EX.SANMH — EX. SANITARY MAINTENANCE HOLE
- H&V. — HYDRANT AND VALVE
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- MH1A — SANITARY MAINTENANCE HOLE
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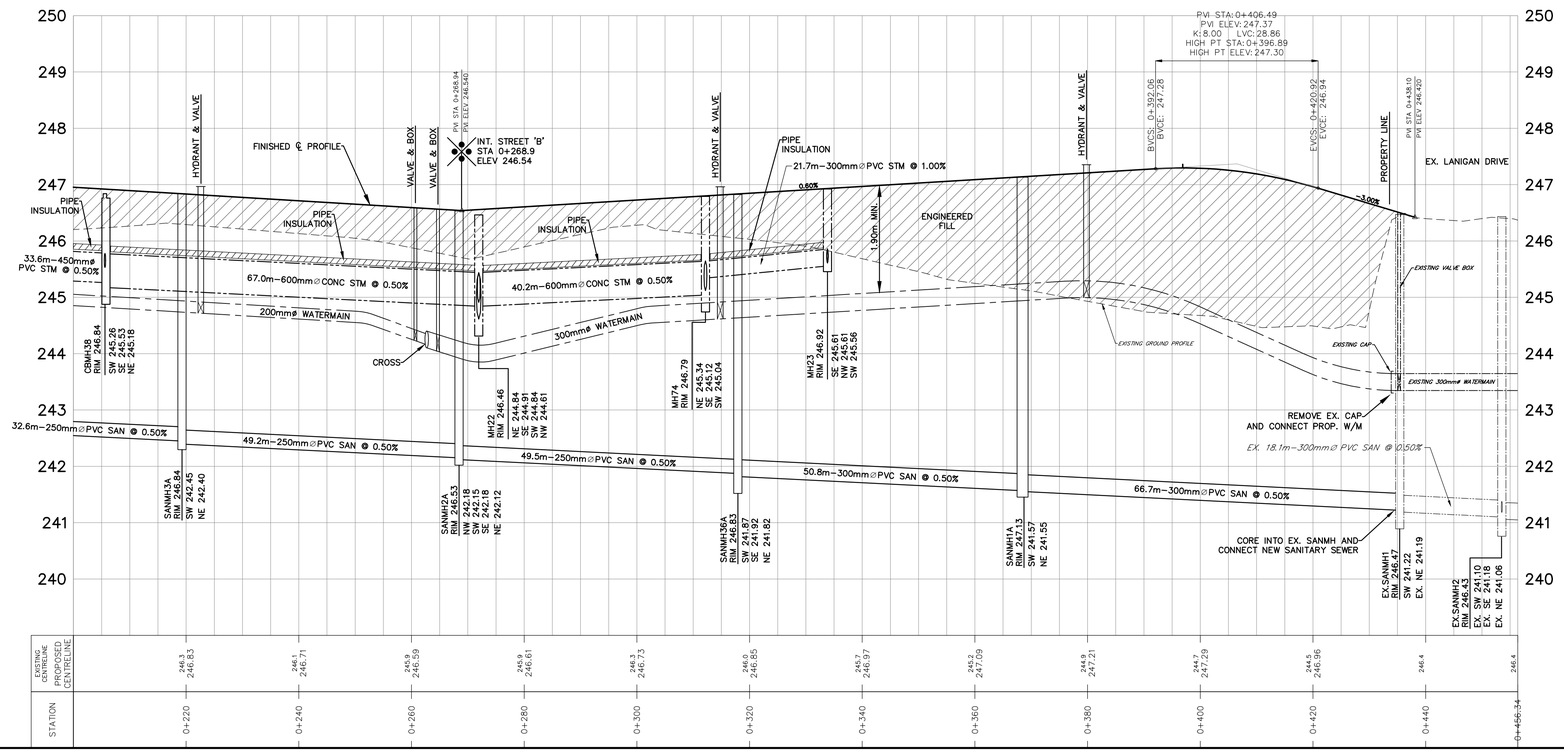


EXISTING CENTRELINE PROPOSED CENTRELINE	246.3 246.83	246.1 246.71	245.9 246.59	245.8 246.61	245.8 246.73	246.0 246.85	245.9 246.87	245.7 247.09	244.9 247.21	244.7 247.29	244.5 246.96	246.4	246.4
STATION	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+456.34

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN–NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

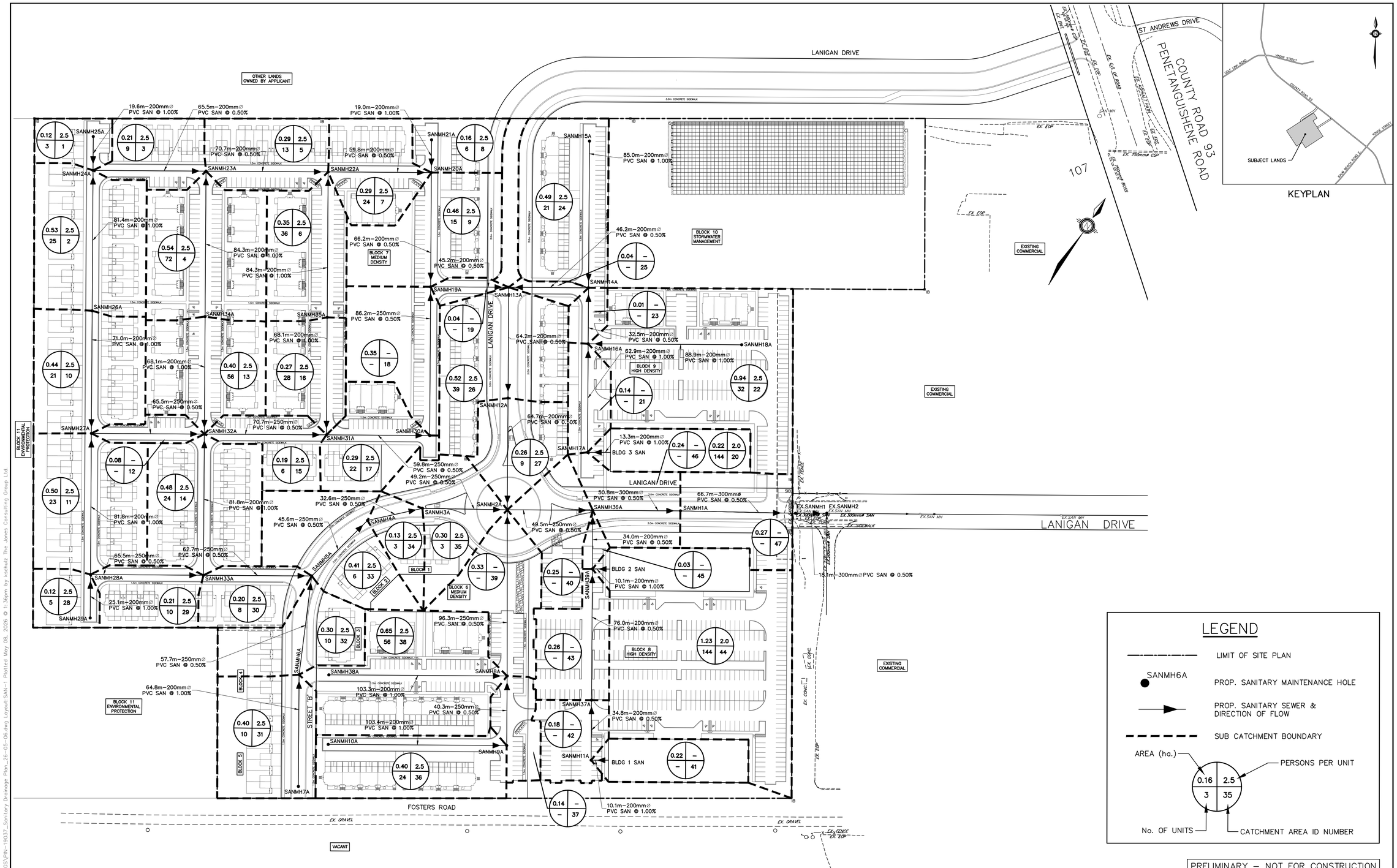
LICENSED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 26-05-08 — PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

STREET 'B' & LANIGAN DRIVE
PLAN AND PROFILE
STA. 0+200 TO STA. 0+456

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2688
F. 705.734.1056

DESIGN K.S./K.R.	SCALE: H.1:500 V.1:50	DATE FEBRUARY 2026
DRAWN K.S.	PROJECT PIN–19037	DWG. Nº PP–4
CHECKED J.W.I.		



BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

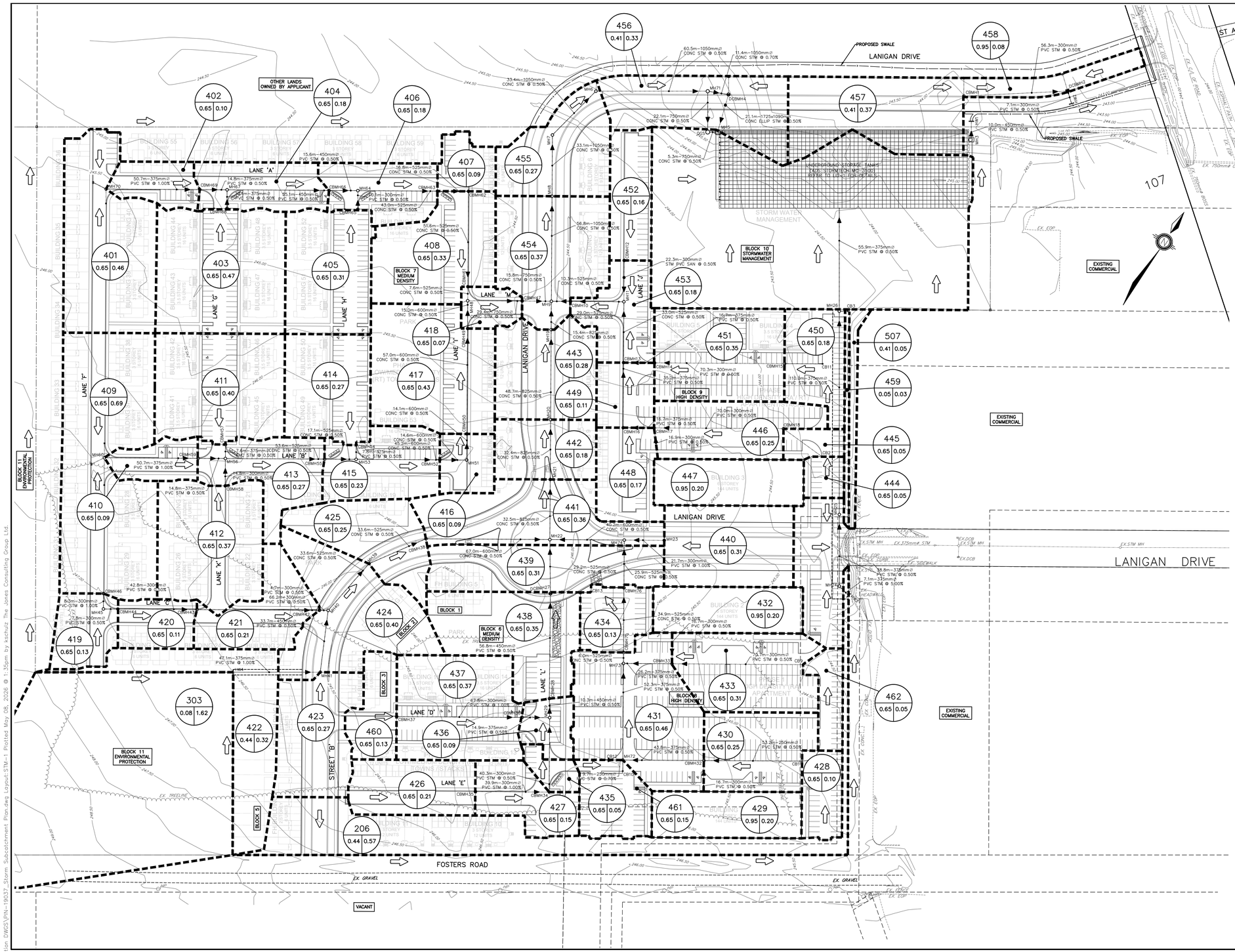
LICENSED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 26-05-08 PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

SANITARY SEWER SUBCATCHMENT PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	WS	SCALE: 1:1000	DATE MARCH 2026
DRAWN	WS	PROJECT PIN–19037	DWG. Nº SAN–1
CHECKED	JWI		



BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

LICENSED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

STORM SEWER
SUBCATCHMENT PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN KS/JWI	SCALE: 1:1000	DATE MARCH 2026
DRAWN KS	PROJECT PIN-19037	DWG. Nº STM-1
CHECKED JWI		

TOWN OF MIDLAND
STORM SEWER DESIGN SHEET
Pine Valley Estates

Jones Consulting Project No.: PIN-19037
R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole From	Maintenance Hole To	Length (m)	Increment C	Increment A	Increment CA	Total CA	Flow Time (min) To	Flow Time (min) In	I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
401	Lane F	MH70	CBMH69	50.7	0.65	0.46	0.30	0.30	15.00	0.53	83	0.069	1.00	375	0.18	1.6	39%
402	Lane A	CBMH69	MH67	14.8	0.65	0.10	0.07	0.36	15.53	0.22	81	0.082	0.50	375	0.12	1.1	66%
403	Lane G	CBMH68	MH67	10.1	0.65	0.47	0.31	0.31	15.00	0.15	83	0.070	0.50	375	0.12	1.1	57%
	Lane A	MH67	CBMH66	55.1				0.67	15.75	0.72	81	0.150	0.50	450	0.20	1.3	74%
404	Lane A	CBMH66	MH64	15.6	0.65	0.18	0.12	0.79	16.48	0.21	78	0.171	0.50	450	0.20	1.3	85%
405	Lane H	CBMH65	MH64	10.1	0.65	0.31	0.20	0.20	15.00	0.17	83	0.046	0.50	300	0.07	1.0	68%
	Lane A	MH64	CBMH63	43.0				0.99	16.68	0.51	78	0.214	0.50	525	0.30	1.4	70%
406	Lane A	CBMH63	CBMH62	16.8	0.65	0.18	0.12	1.11	17.19	0.20	77	0.235	0.50	525	0.30	1.4	77%
407	Lane I	CBMH62	CBMH61	51.6	0.65	0.09	0.06	1.16	17.39	0.61	76	0.246	0.50	525	0.30	1.4	81%
408	Lane I	CBMH61	MH48	7.6	0.65	0.33	0.21	1.38	18.00	0.09	75	0.285	0.50	525	0.30	1.4	94%
409	Lane B	MH60	CBMH59	50.7	0.65	0.69	0.45	0.45	15.00	0.53	83	0.103	1.00	375	0.18	1.6	59%
410	Lane B	CBMH59	MH56	14.8	0.65	0.09	0.06	0.51	15.53	0.22	81	0.114	0.50	375	0.12	1.1	92%
412	Lane G	CBMH58	MH56	14.8	0.65	0.37	0.24	0.24	15.00	0.25	83	0.055	0.50	300	0.07	1.0	81%
411	Lane G	CBMH57	MH56	7.6	0.65	0.40	0.26	0.50	15.00	0.11	83	0.115	0.50	375	0.12	1.1	93%
	Lane B	MH56	CBMH55	53.6				1.01	15.75	0.64	81	0.225	0.50	525	0.30	1.4	74%
413	Lane B	CBMH55	MH53	17.1	0.65	0.27	0.18	1.18	16.39	0.20	79	0.259	0.50	525	0.30	1.4	85%
414	Lane H	CBMH54	MH53	7.8	0.65	0.27	0.18	0.50	15.00	0.12	83	0.115	0.50	375	0.12	1.1	93%
	Lane B	MH53	CBMH52	45.2				1.36	16.59	0.49	78	0.295	0.50	600	0.43	1.5	68%
415	Lane B	CBMH52	MH51	14.6	0.65	0.23	0.15	1.51	17.08	0.16	77	0.322	0.50	600	0.43	1.5	74%
	Lane I	MH51	CBMH50	14.1				1.51	17.24	0.15	76	0.320	0.50	600	0.43	1.5	74%

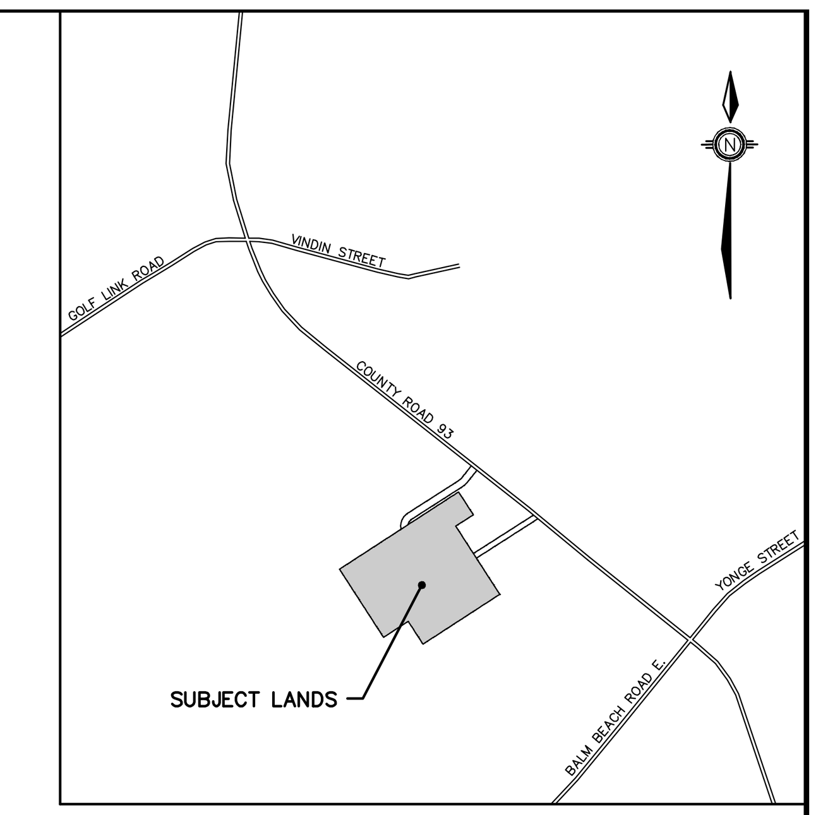
TOWN OF MIDLAND
STORM SEWER DESIGN SHEET
Pine Valley Estates

Jones Consulting Project No.: PIN-19037
R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole From	Maintenance Hole To	Length (m)	Increment C	Increment A	Increment CA	Total CA	Flow Time (min) To	Flow Time (min) In	I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
416	Lane I	CBMH50	CBMH49	57.0	0.65	0.09	0.06	1.57	17.39	0.62	76	0.331	0.50	600	0.43	1.5	76%
417	Lane I	CBMH49	MH48	15.0	0.65	0.43	0.28	1.85	18.01	0.16	74	0.382	0.50	600	0.43	1.5	88%
	Lane M	MH48	CBMH47	29.4				3.22	18.17	0.27	74	0.664	0.50	750	0.79	1.8	84%
418	Lane M	CBMH47	MH9	15.8	0.65	0.07	0.05	3.27	18.45	0.15	73	0.667	0.50	750	0.79	1.8	85%
419	Lane F	CBMH46	MH45	8.3	0.65	0.13	0.08	0.08	15.00	0.10	83	0.019	1.00	300	0.10	1.4	20%
	Lane C	MH45	CBMH44	7.8				0.08	15.10	0.13	82	0.019	0.50	300	0.07	1.0	28%
	Lane C	CBMH44	CBMH43	42.8				0.08	15.24	0.74	82	0.019	0.50	300	0.07	1.0	28%
420	Lane C	CBMH43	CBMH42	66.2	0.65	0.11	0.07	0.16	15.97	1.14	80	0.035	0.50	300	0.07	1.0	51%
421	Lane C	CBMH42	MH40	4.7	0.65	0.21	0.14	0.29	17.11	0.08	77	0.062	0.50	300	0.07	1.0	91%
303	Street B				0.08	1.62	0.13	0.13	15.00		137	0.049					
422	Street B	HW4	MH41	47.1	0.44	0.32	0.14	0.27	15.00	0.49	137	0.103	1.00	375	0.18	1.6	59%
423	Street B				0.65	0.27	0.18	0.18	15.00		83	0.040					
	Street B	MH41	MH40	33.7				0.45	15.49	0.44	81	0.143	0.50	450	0.20	1.3	71%
	Street B	MH40	MH39	33.6				0.74	17.19	0.40	77	0.203	0.50	525	0.30	1.4	67%
424	Street B	MH39	CBMH38	33.6	0.65	0.40	0.26	1.00	17.59	0.40	76	0.256	0.50	525	0.30	1.4	84%
425	Street B	CBMH38	MH22	67.0	0.65	0.25	0.16	1.16	17.99	0.73	75	0.288	0.50	600	0.43	1.5	66%

428	High Density Blk	CB1	CBMH32	53.2	0.65	0.10	0.07	0.07	15.00	1.04	83	0.015	0.50	250	0.04	0.9	36%
429	High Density Blk	BLDG 1	CBMH32	16.7	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	0.50	300	0.07	1.0	64%
430	High Density Blk	CBMH32	MH72	43.8	0.65	0.25	0.16	0.42	16.04	0.65	80	0.092	0.50	375	0.12	1.1	75%



KEYPLAN

TOWN OF MIDLAND
STORM SEWER DESIGN SHEET
Pine Valley Estates

Jones Consulting Project No.: PIN-19037
R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole From	Maintenance Hole To	Length (m)	Increment C	Increment A	Increment CA	Total CA	Flow Time (min) To	Flow Time (min) In	I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
461	High Density Blk	MH72	MH73	52.3	0.65	0.15	0.10	0.52	16.69	0.78	78	0.111	0.50	375	0.12	1.1	90%
462	High Density Blk	CB9	CBMH33	70.7	0.65	0.05	0.03	0.03	15.00	1.22	83	0.007	0.50	300	0.07	1.0	11%
432	High Density Blk	BLDG 2	CBMH33	16.7	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	0.50	300	0.07	1.0	64%
433	High Density Blk	CBMH33	MH73	26.2	0.65	0.31	0.20	0.39	16.22	0.39	79	0.086	0.50	375	0.12	1.1	69%
	High Density Blk	MH73	CBMH75	6.0				0.94	17.46	0.07	76	0.198	0.50	525	0.30	1.4	65%
431	High Density Blk	CBMH75	CBMH76	34.9	0.65	0.46	0.30	1.24	17.53	0.41	76	0.260	0.50	525	0.30	1.4	86%
434	High Density Blk	CBMH76	MH74	25.9	0.65	0.13	0.08	1.32	17.95	0.31	75	0.274	0.50	525	0.30	1.4	90%
426	Lane E	CBMH35	CBMH34	39.9	0.65	0.21	0.14	0.14	15.00	0.49	83	0.031	1.00	300	0.10	1.4	32%
427	Lane L				0.65	0.15	0.10	0.23									
435	Lane L	CBMH34	MH29	40.3	0.65	0.05	0.03	0.27	15.49	0.69	81	0.060	0.50	300	0.07	1.0	88%
460	Lane D	CBMH37	CBMH36	67.8	0.65	0.13	0.08	0.08	15.00	0.83	83	0.019	1.00	300	0.10	1.4	20%
437	Lane D	CBMH36	MH29	14.9	0.65	0.37	0.24	0.33	15.83	0.22	80	0.073	0.50	375	0.12	1.1	58%
	Lane L	MH29	CBMH28	10.3				0.59	16.18	0.14	79	0.130	0.50	450	0.20	1.3	65%
436	Lane L	CBMH28	DCBMH27	56.8	0.65	0.09	0.06	0.65	16.32	0.75	79	0.143	0.50	450	0.20	1.3	71%
438	Lanigan Drive				0.65	0.35	0.23	0.88	17.06		77	0.187					
439	Lanigan Drive	DCBMH27	MH22	29.2	0.65	0.31	0.20	1.08	17.06	0.35	77	0.230	0.50	525	0.30	1.4	76%
440	Lanigan Drive	MH23	MH74	21.7	0.65	0.31	0.20	0.20	15.00	0.26	83	0.046	1.00	300	0.10	1.4	48%
	Lanigan Drive	MH74	MH22	40.2				1.52	18.25	0.44	74	0.313	0.50	600	0.43	1.5	72%
	Lanigan Drive	MH22	MH21	32.5				3.76	17.41	0.29	76	0.841	0.50	825	1.02	1.9	83%
441	Lanigan Drive	MH21	MH20	32.4	0.65	0.36	0.23	4.00	17.69	0.28	75	0.883	0.50	825	1.02	1.9	87%
442	Lanigan Drive	MH20	MH19	48.7	0.65	0.18	0.12	4.11	17.98	0.43	75	0.900	0.50	825	1.02	1.9	89%
443	Lanigan Drive	MH19	MH9	15.4	0.65	0.28	0.18	4.30	18.41	0.14	74	0.926	0.50	825	1.02	1.9	91%
444	High Density Blk	CB2	CBMH18	25.8	0.65	0.05	0.03	0.03	15.00	0.50	83	0.007	0.50	250	0.04	0.9	18%

TOWN OF MIDLAND
STORM SEWER DESIGN SHEET
Pine Valley Estates

Jones Consulting Project No.: PIN-19037
R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole From	Maintenance Hole To	Length (m)	Increment C	Increment A	Increment CA	Total CA	Flow Time (min) To	Flow Time (min) In	I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
445	High Density Blk	CBMH18	CBMH17	70.0	0.65	0.05	0.03	0.07	15.50	1.21	81	0.015	0.50	300	0.07	1.0	21%
447	High Density Blk	BLDG 3	CBMH17	16.9	0.95	0.20	0.19	0.19	15.00	0.29	83	0.044	0.50	300	0.07	1.0	64%
446	High Density Blk	CBMH17	CBMH16	16.7	0.65	0.25	0.16	0.42	16.71	0.25	78	0.090	0.50	375	0.12	1.1	73%
448	Lane J	CBMH16	CBMH13	35.2	0.65	0.17	0.11	0.53	16.96	0.52	77	0.113	0.50	375	0.12	1.1	91%
450	High Density Blk	CBMH15	CBMH14	70.3	0.65	0.18	0.12	0.12	15.00	1.21	83	0.027	0.50	300	0.07	1.0	39%
451	High Density Blk	CBMH14	CBMH13	16.7	0.65	0.35	0.23	0.34	16.21	0.25	79	0.076	0.50	375	0.12	1.1	61%
449	Lane J	CBMH13	MH11	33.0	0.65	0.11	0.07	0.94	17.48	0.39	76	0.199	0.50	525	0.30	1.4	65%
452	Lane J	CBMH12	MH11	22.3	0.65	0.16	0.10	0.10	15.00	0.38	83	0.024	0.50	300	0.07	1.0	35%
	Lane M	MH11	CBMH10	29.0				1.05	17.87	0.34	75	0.218	0.50	525	0.30	1.4	72%
453	Lane M	CBMH10	MH9	10.3	0.65	0.18	0.12	1.17	18.21	0.12	74	0.239	0.50	525	0.30	1.4	79%
	Lanigan Drive	MH9	MH8	56.8				8.73	18.54	0.42	73	1.824	0.50	1050	1.93	2.2	94%
454	Lanigan Drive	MH8	MH7	33.1	0.65	0.37	0.24	8.97	18.97	0.25	72	1.849	0.50	1050	1.93	2.2	96%
	Lanigan Drive	MH7	MH6	33.4				8.97	19.21	0.25	72	1.835	0.50	1050	1.93	2.2	95%
455	Lanigan Drive	MH6	MH71	60.5	0.65	0.27	0.18	9.15	19.46	0.45	71	1.856	0.50	1050	1.93	2.2	96%
	Lanigan Drive	MH71	DCBMH4	11.4				9.15	19.92	0.07	70	1.832	0.70	1050	2.28	2.6	80%
	Lanigan Drive	DCBMH4	MH5	21.1	0.41	0.33	0.14	9.28	19.99	0.13	117	3.008	0.50	1350	3.77	2.6	80%
	Lanigan Drive	MH71	OGS	22.1	*25mm Event Flow Taken from OTTHYMO Model:*							0.642	0.50	750	0.79	1.8	82%
	SWM Block	OGS	MH5	5.3	*25mm Event Flow Taken from OTTHYMO Model:*							0.642	0.50	750	0.79	1.8	82%
206	East Boundary	HW3	MH24	7.1	0.44	0.57	0.25	0.25	15.00	0.03	137	0.096	5.00	375	0.39	3.5	24%
	East Boundary	MH24	MH25	38.8				0.25	15.03	0.58	137	0.096	0.50	375	0.12	1.1	77%
	East Boundary	MH25	MH26	110.0				0.25	15.61	1.63	135	0.094	0.50	375	0.12	1.1	76%

TOWN OF MIDLAND
STORM SEWER DESIGN SHEET
Pine Valley Estates

Jones Consulting Project No.: PIN-19037
R.P. No.:

5 Year Storm Sewer Sizing

Area ID#	Street / Location	Maintenance Hole From	Maintenance Hole To	Length (m)	Increment C	Increment A	Increment CA	Total CA	Flow Time (min) To	Flow Time (min) In	I (mm/hr)	Total Q (cms)	S (%)	DIA (mm)	Q Full (cms)	V Full (m/s)	Percent Capacity (%)
507	East Boundary				0.41	0.05	0.02	0.02	15.00		137	0.008					
459	East Boundary	CB3	MH26	4.6	0.05	0.03	0.00	0.02	15.00	0.08	137	0.008	0.70	250	0.05	1.0	17%
	East Boundary	MH26	LID	55.9				0.27	17.24	0.83	127	0.096	0.50	375	0.12	1.1	78%
457	Lanigan Drive	CBMH1	DCBMH2	56.3	0.41	0.37	0.15	0.15	15.00	0.97	83	0.035	0.50	300	0.07	1.0	51%
458	Lanigan Drive	DCBMH2	HW2	3.8	0.95	0.08	0.08	0.23	15.97	0.07	80	0.051	0.50	300	0.07	1.0	74%

Note: Values in red include the 100-year flow/intensity generated by Catchments 303 & 422 and Catchments 206, 507 & 459.
Note: Values in orange are taken from the OTTHYMO model to size stm sewers for the 25mm Water Quality Event
Note: Values in blue represent the equivalent nominal pipe size for a 1725mm x 1090mm elliptical pipe
Note: Cells highlighted in green represent pipes sized for the 100-year event

Stormwater Information:

$I = A/(tc + B)^{c}$ — Q = (C*I*A)/360 (cms)
A = 5 Year-1135.40, 100 Year-2193.10 — C: Runoff Coefficiant
B = 5 Year-7.5, 100 Year-9.04 — I: Rainfall Intensity (mm/hr)(See IDF Curve for the 5-year storm)
C= 5 Year-0.841, 100 Year-0.871 — A: Area (ha)
t_c = Time of Concentration (mins.)
Town of Midland IDF data taken from Section 5.2.5: Orillia Atmospheric Envirnoment Weather Station
**Equivalent Diameter Used

Date: 6-May-26
Calculated By: KR
Checked By: JWI

Pine Valley Homes - 9332 County Road 93
SANITARY SEWER DESIGN
Development Details Basis

CLIENT: Pine Valley Homes
PROJECT: Pine Valley Estates Midland
FILE: PIN-19037 (50)

DATE: May 2026
DESIGN: WS
CHECKED: JI

$n \geq 0.013$
M = 1+[14/(4+P^0.5)] (Harmon peaking factor where; 2 ≤ M ≤ 4)
Q_p = P*q*M/86.4 (Peak population flow where; q = 450 L/day/person; P = population in thousands)
Q_i = I*A (Peak extraneous flow: I= 0.23L/s/ha over development area)
$Q_{tot} = Q_p + Q_i$ (Total peak flow as the sum of peak population flow and peak extraneous flow)

FILE NO: PIN-19037
CONTRACT / PROJECT: Pine Valley Homes

CATCHMENT ID	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	DWELL UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR	Q_p (Peak Residential Flow) (L/S)	AREA (ha)	AREA (ACC) (ha)	Q_i (Infiltration Flow) (L/S)	Q_{tot} (Total Peak Flow) (L/S)	L (m)	D (mm)	S (%)	Q Full (L/S)	V Full (m/s)	V Partial (m/s)	Velocity > 0.6 (m/s)	Velocity < 4.0 (m/s)
1	SANMH25	SANMH24	3	2.5	8	8	4.00	0.156	0.12	0.12	0.028	0.184	19.6	200	1.00	32.80	1.04	0.265	Ok	Ok
2	SANMH26	SANMH24	25	2.5	63	63	4.00	1.302	0.53	0.53	0.123	1.425	81.4	200	1.00	32.80	1.04	0.508	Ok	Ok
3	SANMH24	SANMH23	9	2.5	23	93	4.00	1.927	0.21	0.86	0.199	2.126	65.5	250	0.50	42.05	0.86	0.434	Ok	Ok
4	SANMH34A	SANMH23A	72	2.5	180	180	4.00	3.750	0.54	0.54	0.123	3.873	84.3	200	1.00	32.80	1.04	0.694	Ok	Ok
5	SANMH23A	SANMH22A	13	2.5	33	305	4.00	6.354	0.29	1.69	0.388	6.742	70.7	250	0.50	42.05	0.86	0.616	Ok	Ok
6	SANMH35A	SANMH22A	36	2.5	90	90	4.00	1.875	0.35	0.35	0.081	1.956	84.3	200	1.00	32.80	1.04	0.566	Ok	Ok
7	SANMH22A	SANMH20A	24	2.5	60	455	3.99	9.467	0.29	2.32	0.534	10.001	59.8	250	0.50	42.05	0.86	0.691	Ok	Ok
8	SANMH21A	SANMH20A	6	2.5	15	15	4.00	0.313	0.16	0.16	0.038	0.350	19.0	200	1.00	32.80	1.04	0.327	Ok	Ok
9	SANMH20A	SANMH19A	15	2.5	38	508	3.97	10.496	0.46	2.94	0.677	11.173	66.2	250	0.50	42.05	0.86	0.711	Ok	Ok
10	SANMH26A	SANMH27A	21	2.5	53	53	4.00	1.094	0.44	0.44	0.101	1.195	71.0	200	1.00	32.80	1.04	0.482	Ok	Ok
11	SANMH28A	SANMH27A	23	2.5	58	58	4.00	1.198	0.50	0.50	0.115	1.313	81.8	200	1.00	32.80	1.04	0.494	Ok	Ok
12	SANMH27A	SANMH32A	0	0.0	0	110	4.00	2.292	0.08	1.02	0.234	2.526	65.5	250	0.50	42.05	0.86	0.457	Ok	Ok
13	SANMH34A	SANMH32A	56	2.5	140	140	4.00	2.917	0.40	0.40	0.091	3.008	68.1	200	1.00	32.80	1.04	0.644	Ok	Ok
14	SANMH33A	SANMH32A	24	2.5	60	60	4.00	1.250	0.48	0.48	0.111	1.361	81.8	200	1.00	32.80	1.04	0.501	Ok	Ok
15	SANMH32A	SANMH31A	6	2.5	15	325	4.00	6.771	0.19	2.09	0.480	7.251	70.7	250	0.50	42.05	0.86	0.628	Ok	Ok
16	SANMH35A	SANMH31A	28	2.5	70	70	4.00	1.458	0.27	0.27	0.062	1.520	68.1	200	1.00	32.80	1.04	0.524	Ok	Ok
17	SANMH31A	SANMH30A	22	2.5	55	450	4.00	9.369	0.29	2.65	0.610	9.979	59.8	250	0.50	42.05	0.86	0.689	Ok	Ok
18	SANMH30A	SANMH19A	0	0.0	0	450	4.00	9.369	0.35	3.00	0.691	10.059	86.2	250	0.50	42.05	0.86	0.689	Ok	Ok
19	SANMH19A	SANMH13A	0	0.0	0	958	3.81	19.011	0.04	5.99	1.377	20.388	45.2	250	0.50	42.05	0.86	0.835	Ok	Ok
20	BLDG3	SANMH17A	144	2.0	288	288	4.00	6.000	0.22	0.22	0.050	6.050	13.3	200	1.00	32.8	1.044	0.794	Ok	Ok
21	SANMH17A	SANMH16A	0	0.0	0	288	4.00	6.000	0.14	0.35	0.082	6.082	62.9	200	1.00	32.80	1.04	0.794	Ok	Ok
22	SANMH18A	SANMH16A	32	2.5	80	80	4.00	1.667	0.94	0.94	0.216	1.883	88.9	200	1.00	32.80	1.04	0.546	Ok	Ok
23	SANMH16A	SANMH14A	0	0.0	0	368	4.00	7.667	0.01	1.30	0.300	7.967	32.5	200	0.50	23.19	0.74	0.662	Ok	Ok
24	SANMH15A	SANMH14A	21	2.5	53	53	4.00	1.094	0.49	0.49	0.113	1.207	85.0	200	1.00	32.80	1.04	0.482	Ok	Ok
25	SANMH14A	SANMH13A	0	0.0	0	421	4.00	8.760	0.04	1.84	0.422	9.183	46.2	200	0.50	23.19	0.74	0.686	Ok	Ok
26	SANMH13A	SANMH12A	39	2.5	98	1476	3.68	28.317	0.52	8.35	1.920	30.236	64.2	250	0.50	42.05	0.86	0.919	Ok	Ok
27	SANMH12A	SANMH2A	9	2.5	23	1498	3.68	28.711	0.26	8.60	1.979	30.690	64.7	250	0.50	42.05	0.86	0.922	Ok	Ok
28	SANMH29A	SANMH28A	5	2.5	13	13	4.00	0.260	0.12	0.12	0.029	0.289	25.1	200	1.00	32.80	1.04	0.312	Ok	Ok
29	SANMH28A	SANMH33A	10	2.5	25	38	4.00	0.781	0.21	0.33	0.077	0.858	65.5	250	0.50	42.05	0.86	0.330	Ok	Ok
30	SANMH33A	SANMH5A	8	2.5	20	58	4.00	1.198	0.20	0.53	0.123	1.321	62.7	250	0.50	42.05	0.86	0.375	Ok	Ok
31	SANMH7A	SANMH6A	10	2.5	25	25	4.00	0.521	0.40	0.40	0.093	0.613	64.8	200	1.00	32.80	1.04	0.383	Ok	Ok
32	SANMH6A	SANMH5A	10	2.5	25	50	4.00	1.042	0.30	0.70	0.162	1.204	57.7	250	0.50	42.05	0.86	0.361	Ok	Ok
33	SANMH5A	SANMH4A	6	2.5	15	123	4.00	2.552	0.41	1.65	0.380	2.932	45.6	250	0.50	42.05	0.86	0.473	Ok	Ok
34	SANMH4A	SANMH3A	3	2.5	8	130	4.00	2.708	0.13	1.78	0.409	3.117	32.6	250	0.50	42.05	0.86	0.480	Ok	Ok
35	SANMH3A	SANMH2A	3	2.5	8	138	4.00	2.865	0.30	2.08	0.478	3.343	49.2	250	0.50	42.05	0.86	0.488	Ok	Ok
36	SANMH10A	SANMH9A	24	2.5	60	60	4.00	1.250	0.40	0.40	0.092	1.342	103.4	200	1.00	32.80	1.04	0.501	Ok	Ok
37	SANMH9A	SANMH8A	0	0.0	0	60	4.00	1.250	0.14	0.54	0.124	1.374	40.3	250	0.50	42.05	0.86	0.381	Ok	Ok
38	SANMH38A	SANMH8A	56	2.5	140	200	4.00	4.167	0.65	0.65	0.151	4.317	103.0	200	1.00	32.80	1.04	0.715	Ok	Ok
39	SANMH8A	SANMH2A	0	0.0	0	200	4.00	4.167	0.33	1.52	0.350	4.516	96.3	250	0.50	42.05	0.86	0.545	Ok	Ok
40	SANMH2A	SANMH36A	0	0.0	0	1836	3.61	34.554	0.25	12.45	2.863	37.417	49.5	250	0.50	42.05	0.86	0.956	Ok	Ok
41	BLDG1	SANMH11A	144	2.0	288	288	4.00	6.000	0.22	0.22	0.049	6.049	10.1	200	1.00	32.80	1.04	0.794	Ok	Ok
42	SANMH11A	SANMH37A	0	0.0	0	288	4.00	6.000	0.18	0.39	0.090	6.090	34.8	200	0.50	23.19	0.74	0.620	Ok	Ok
43	SANMH37A	SANMH39A	0	0.0	0	288	4.00	6.000	0.26	0.65	0.149	6.149	76.0	200	0.50	23.19	0.74	0.620	Ok	Ok
44	BLDG2	SANMH39A	144	2.0	288	576	3.94	11.825	1.23	1.23	0.283	12.108	10.1	200	1.00	32.80	1.04	0.959	Ok	Ok
45	SANMH39	SANMH36A	0	0.0	0	576	3.94	11.825	0.03	1.91	0.439	12.264	34.0	200	0.50	23.19	0.74	0.741	Ok	Ok
46	SANMH36A	SANMH1A	0	0.0	0	2412	3.52	44.226	0.24	14.60	3.358	47.584	50.8	300	0.50	68.38	0.97	1.028	Ok	Ok
47	SANMH1A	EX. SANMH1	0	0.0	0	2412	3.52	44.226	0.27	14.87	3.420	47.646	66.7	300	0.50	68.38	0.97	1.028	Ok	Ok
EXT	EX. SANMH1	EX. SANMH2	0	0.0	0	2412	3.52	44.226	0.00	14.87	3.420	47.646	18.1	300	0.50	68.38	0.97	1.028	Ok	Ok

DATE: 26-05-07 CALCULATED BY: WS CHECKED BY: JI

PRELIMINARY – NOT FOR CONSTRUCTION

BENCHMARK:
ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

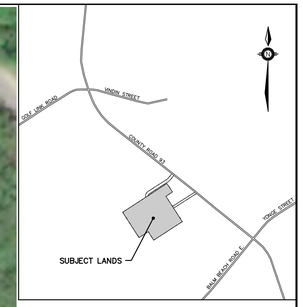
LICENSED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 26-05-08 — PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

DESIGN SHEETS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JWI	SCALE:	DATE MARCH 2026
DRAWN	KS	PROJECT PIN-19037	DWG. № DS-1
CHECKED	JWI		



KEYPLAN

LEGEND:

- PRE-DEVELOPMENT SUBCATCHMENT AREAS
- OVERLAND FLOW DIRECTION
- DRAFT PLAN OF SUBDIVISION BOUNDARY
- 214.00 EX. CONTOUR AND ELEVATION
- CATCHMENT ID NUMBER / RUNOFF COEFFICIENT: 101 | 0.08
- AREA IN HECTARES (ha): 17.02

PRELIMINARY – NOT FOR CONSTRUCTION

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

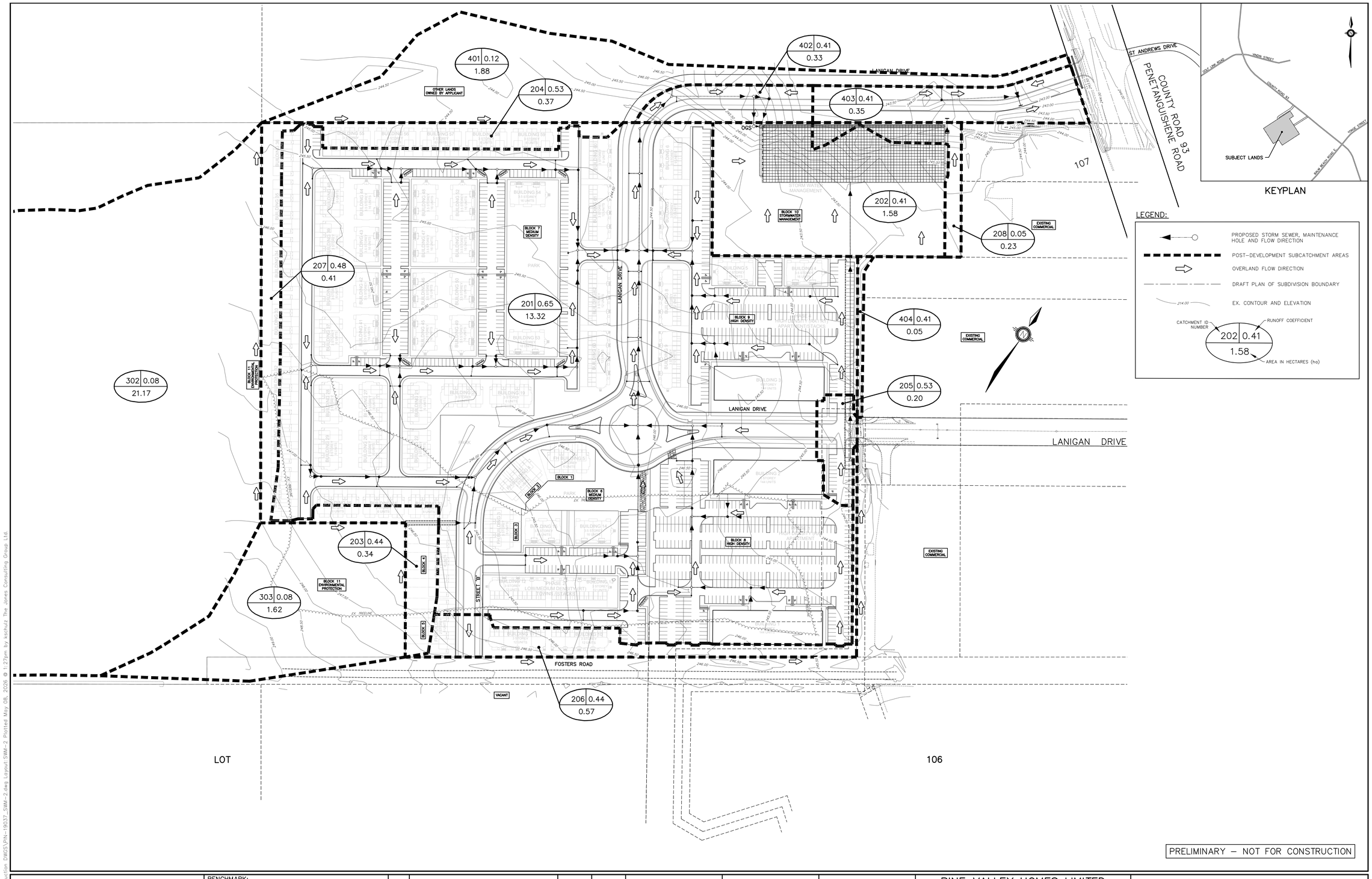
LICENSED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

STORMWATER MANAGEMENT PLAN
PRE-DEVELOPMENT CONDITIONS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/KR	SCALE: 1:1250	DATE APRIL 2026
DRAWN	KS	PROJECT PIN-19037	DWG. Nº SWM-1
CHECKED	JWI		



PRELIMINARY – NOT FOR CONSTRUCTION

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN-NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

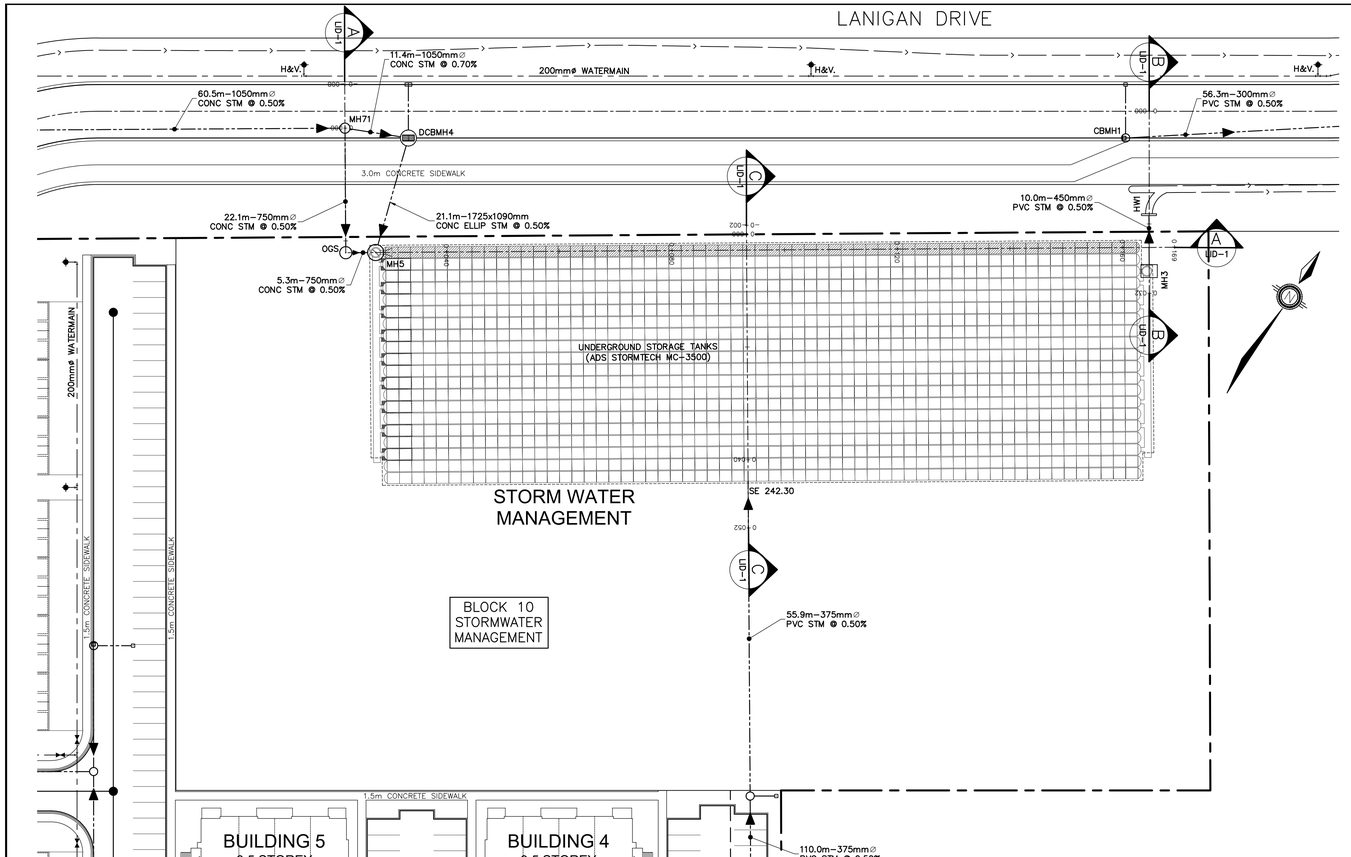
LICENSED PROFESSIONAL ENGINEER
J. W. INGRAM
100149779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

STORMWATER MANAGEMENT PLAN
POST-DEVELOPMENT CONDITIONS

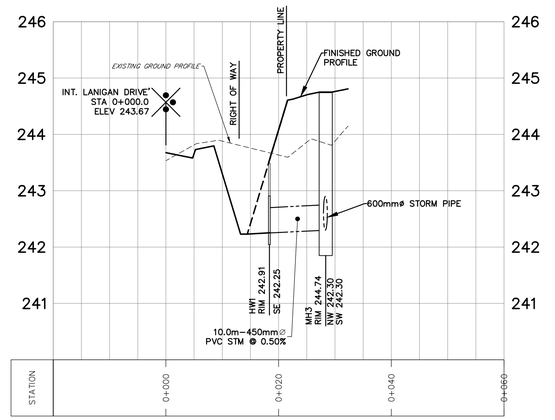
JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/KR	SCALE: 1:1250	DATE APRIL 2026
DRAWN	KS	PROJECT PIN-19037	DWG. Nº SWM-2
CHECKED	JWI		



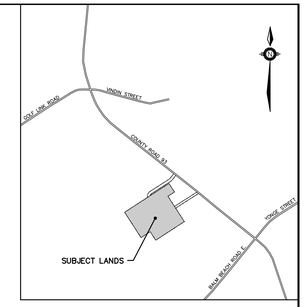
PLAN VIEW

1:500

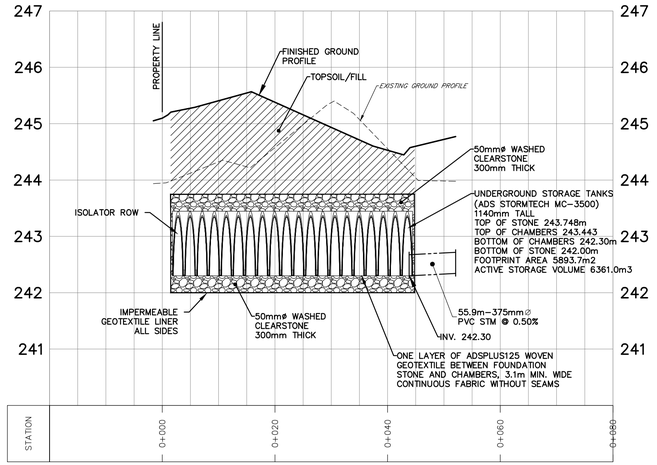


SECTION B–B

HOR. 1:500
VERT. 1:50

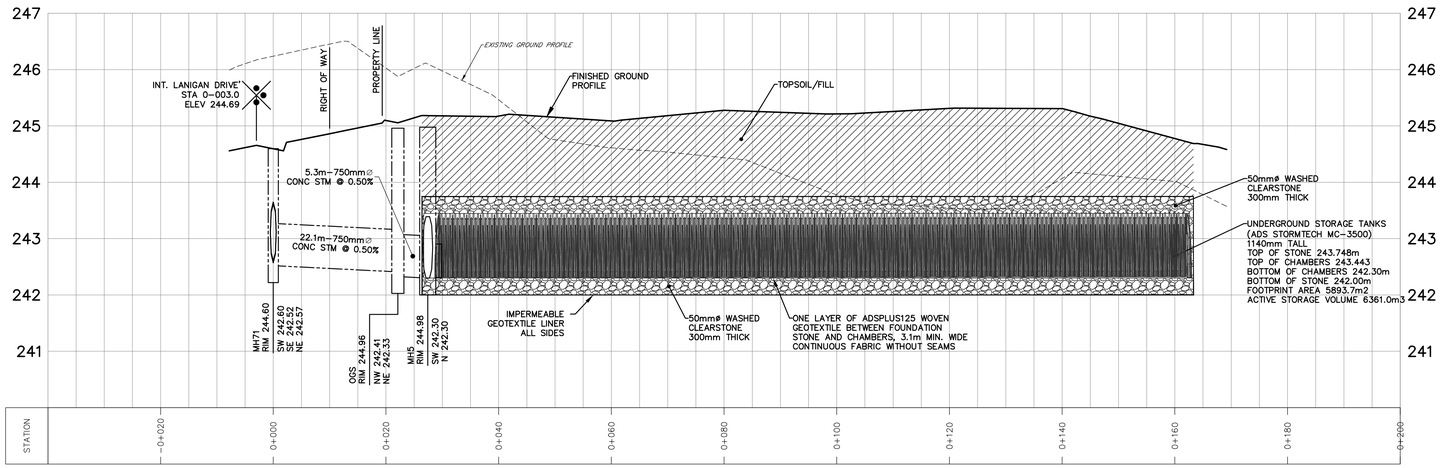


KEYPLAN



SECTION C–C

HOR. 1:500
VERT. 1:50



SECTION A–A

HOR. 1:500
VERT. 1:50

PRELIMINARY – NOT FOR CONSTRUCTION

BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED BY REAL TIME NETWORK OBSERVATIONS, USING THE CAN–NET NETWORK, UTM ZONE 17, NAD83(CSRS),(2020).

NO.	REVISIONS	DATE	INITIAL
1.	ZBA & DPA SUBMISSION	MAY 2026	JWI

LICENSED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
26-05-08
PROVINCE OF ONTARIO

PINE VALLEY HOMES LIMITED
9332 COUNTY ROAD 93
TOWN OF MIDLAND

LID SECTIONS & DETAILS
BELOW GRADE SWM FACILITY

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JWI	SCALE: AS NOTED	DATE FEBRUARY 2026
DRAWN	KS	PROJECT PIN–19037	DWG. Nº LID–1
CHECKED	JWI		