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The Village of Innis Landing

STORMWATER MANAGEMENT REPORT

Schlegel Villages Inc.

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Issue	Date	Description
01	July 17, 2024	Site Plan Approval – First Submission
02	September 6, 2024	Site Plan Approval – Second Submission

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by Schlegel Villages Inc. to prepare a Stormwater Management (SWM) Report in support of a Site Plan Approval (SPA) application for a proposed retirement development located 800 Yonge Street (Site) in the City of Barrie (City).

1.1 OBJECTIVES

This report has been prepared to demonstrate the proposed development achieves the relevant SWM design criteria and to ensure the property is developed to avoid adversely impacting surface water, groundwater, and downstream drainage systems, and where necessary, provide solutions to mitigate any adverse impacts.

The objective of this report is to assess the effects of the proposed development on drainage in the area to ensure it meets the capacity requirements of the existing municipal storm sewers, the road allowances, and the downstream SWM pond.

1.2 GUIDELINES AND REPORTS

This report is prepared in consideration of the following municipal, provincial, and agency guideline documents:

- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Stormwater Management Practices Planning and Design Manual* (2003);
- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Lake Simcoe Protection Plan* (LSPP) (2009);
- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Lake Simcoe Phosphorus Offsetting Policy* (LSPOP) (2023);
- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Source Protection Information Atlas* (accessed September 6, 2024);
- Lake Simcoe Regional Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Management Submission* (2022);
- City of Barrie, *Stormwater Infrastructure Design Standard* (2023); and
- City of Barrie, *Infiltration LID Screening Process* (2017).

This report is prepared in consideration of the following site-specific studies and reports:

- R.G Robinson and Associates Ltd., *Country Lane Phase III, Part 6 Subdivision/Swallow Glen Subdivision Drawing Set* (2005);

- EXP Services Inc., *Preliminary Geotechnical Investigation – Final Report* (2024);
- EXP Services Inc., *Hydrogeological Investigation and Water Balance Assessment* (2024);
- Tatham Engineering Limited, *Barrie West – Armel Lands SWM Report* (2023);
- Tatham Engineering Limited, *Functional Servicing Report* (2024); and
- Tatham Engineering Limited, *Traffic Impact Study* (2024).

2 Site Description

The subject property is located at 800 Yonge Street, approximately 300 m northwest of the Mapleview Drive East and Yonge Street intersection. The site is bound by Yonge Street to the northeast, Country Lane to the northwest, existing residential lands to the southwest and future development lands to the southeast.

The legal description of the site is:

Part of Block 19
Plan 51M-832
City of Barrie
County of Simcoe

Refer to Figure 1: Site Location Plan.

2.1 LAND USE AND ZONING BY-LAW

The City of Barrie Official Plan designates the subject property as 'Commercial District'.

The subject property is zoned General Commercial C4 (SP-348).

2.2 TOPOGRAPHY

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, and topographic surveys, and was confirmed during site visits.

A detailed topographic survey of the site was completed by KRCMAR Surveyors Ltd. in February 2022.

The subject site is approximately 4.05 ha and consists of mainly undeveloped, plowed agricultural fields. It gently slopes (at approximately 1%) from southeast to the northwest (towards Country Lane).

2.3 LSRCA REGULATION AND SOURCE WATER PROTECTION

The site is located within the Lake Simcoe Conservation Authority (LSRCA) watershed but is not within their regulated area. However, the proposed development is classified as 'major development' under the Lake Simcoe Protection Plan (LSPP) and, therefore, must demonstrate how changes in water balance will be minimized. In addition, the site is located within a Highly Vulnerable Aquifer (HVA) and as such, infiltration should be limited to treat rooftop drainage only.

2.4 GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

The *Preliminary Geotechnical Investigation – Final Report* and *Hydrogeological Investigation and Water Balance Assessment* was completed to identify subsurface conditions and determine the engineering properties of the in-situ soils for the design and construction of the proposed development. Existing soil strata is described as topsoil, reworked native soils, sandy silt, and sand. Based on the Ontario Soil Survey, the soils are classified as Dundonald Sandy Loam, which is part of Hydrologic Soil Group (HSG) 'B' and is consistent with the geotechnical investigation.

Groundwater levels from eight monitoring wells were measured as part of the hydrogeological investigation. The groundwater elevation was recorded in wells ranging from 8.36 mbgs to 6.82 mbgs (257.20 masl to 258.73 masl). A groundwater contour mapping figure included in the *Preliminary Geotechnical Investigation – Final Report* was appended in Appendix G for reference. The low groundwater levels and sandy soils across the site are suitable for Low Impact Development (LID) measures to promote infiltration. Significant dewatering in support of construction is not expected.

As specified in the hydrogeological assessment, a design infiltration rate of 16 mm/hr was calculated and has been utilized in the design of Low Impact Development (LID) facilities in the site.

2.5 SOURCE WATER PROTECTION

The *Hydrogeological Investigation and Water Balance Assessment* describes the site as within a Highly Vulnerable Aquifer but not within Significant Groundwater Recharge Areas (SGRA) nor Well Head Protection Areas (WHPA), which is consistent with the *Source Protection Information Atlas*.

3 Proposed Development

The proposed development consists of a long-term care home, retirement homes and residential apartment buildings. Each building contains accessory uses including, but not limited to, a medical facility, restaurants/dining areas and various commercial spaces.

Refer to Appendix A for the Master Site Plan (Drawing SP1.0) prepared by Anderson Wellsman Architects Incorporated, dated July 2024.

We understand the site plan will be constructed in four stages and sequenced as follows:

Stage 1: Phase 1

- One 6-Storey Long Term Care (LTC) Facility (192 LTC beds) & Secure Courtyard;
- Access and parking provided from Country Lane; and
- Access and parking provided from Yonge Street.

Stage 2: Phase 4

- One 26-Storey General Market Residential building (Phase 4A, 185 apartments);
- One 18-Storey General Market Residential building (Phase 4B, 175 apartments);
- Parkette;
- One Level of Underground Parking; and
- Access and parking provided from Corby Adams Lane (private-owned by others) of the neighbouring Metro Grocery Store (located at 640 Mapleview Drive East).

Stage 3: Phase 2

- One 12-storey Retirement Home building (276 apartments) and Health Centre;
- Town Square (including commercial and amenity uses);
- One Level of Underground Parking; and
- Additional parking and an access provided from Phase 1.

Stage 4: Phase 3

- One 12-storey Retirement Home building (278 apartments); and
- One Level of Underground Parking.

Refer to the Construction Staging Plan (Drawing CSP-1; dated September 6, 2024) in the engineering drawing package for additional information.

The site is located within Commercial Block 19 of the original Swallow Glen Subdivision. In addition, at present, only Driveways 'A' and 'B' will be constructed in support of the Barrie West Development directly to the south of the site. Both of these have been considered in the overall SWM plan and establishing the site's target release rates.

On-site storm servicing is proposed to connect to the existing storm sewer system in Country Lane. The storm sewer conveys runoff to an existing SWM pond (SWM Pond LV19) servicing the existing Swallow Glen Subdivision, located west of Grace Crescent which was designed to accommodate site flows.

4 Stormwater Management Plan

According to the Internal Storm Drainage Plan (Drawing G-3) and the External Storm Drainage Plan (Drawing G-4) of the *Country Lane Phase III, Part 6 Subdivision/Swallow Glen Subdivision Drawing Set* (original engineering drawing set), the original Commercial Block 19 (containing the site) is provided with quantity and quality controls by the downstream SWM Pond LV19. Minor storms (up to the 1:5-year storm) are conveyed in the storm sewer collection system and major storms (up to the 1:100-year storm) are conveyed within the road allowances before discharging in SWM Pond LV19.

In accordance with LSRCA, a 'sufficient outlet' is defined as one safely and directly discharging to a municipal storm system or to a permanent water course or lake. As the site directly discharges to the Yonge Street and Country Lane road allowances (which provide adequate minor and major flow conveyance), the site is provided with a sufficient outlet.

4.1 METHODOLOGY

Pre-development and post-development drainage conditions were modelled using Visual OTTHYMO (VO6.2) hydrologic modelling software.

Refer to Appendix B for Hydrologic Modelling Output.

Peak flow rates have been generated for the 1:2-year through 1:100-year return periods using the rainfall data from the Barrie WPCC (adjusted for climate change) to model the 4-hour Chicago (CHI), 6-hour SCS Type II (SCS), 12-hour SCS Type II (SCS) and 24-hour SCS Type II (SCS) design storm distributions.

4.2 TARGET RELEASE RATES (ORIGINAL SUBDIVISION DESIGN)

In the External Storm Drainage Plan (Drawing G-4) of the original engineering drawing set, the subject site (4.05 ha) was located within a 16.51 ha catchment with an assigned runoff coefficient (RC) of 0.67 which drains to SWM Pond LV19. This 16.51 ha catchment was further broken down in the Internal Storm Drainage Plan (Drawing G-3) included in Appendix G for reference. On this drawing, the subject site is located within Commercial Block 19 which is a 6.95 ha catchment with an assigned RC of 0.80 (equivalent to 86% impervious). Minor flows from this 6.95 ha area drain to the Country Lane storm sewers which were sized to convey peak flows from the area assuming an RC of 0.80. Major flows from this area drain to the Country Lane road allowance and are conveyed overland to SWM Pond LV19.

A weighted average calculation was performed on the smaller catchments on Drawing G-3 making up the overall 16.51 ha catchment on Drawing G-4 to confirm the smaller catchments shown on Drawing G-3 sum to 16.51 ha in area and the overall RC assigned to this area is 0.67 and is thusly consistent with Drawing G-4. This consistency in catchment parameters in both drawings confirms the intended behaviour of the minor and major drainage as described above. This SWM plan is proposed to maintain this intended drainage behaviour to the extent possible. Refer to Appendix B of this report for supporting calculations.

According to the *Barrie West – Armel Lands* report, 2.90 ha of this original 6.95 ha Commercial Block 19 is being re-directed to the Goodwin Drive storm sewers and road allowance which results in the reduced 4.05 ha site area per the current Site Plan. As such, the site (Catchment 101) was modelled with a 4.05 ha area and an RC of 0.80, equivalent to 86% total imperviousness (TIMP) to establish peak flow targets for the site under the proposed condition.

A figure has been prepared to compare the Catchment 101 delineation versus the subject site area and is provided in Appendix B of this report. A summary of the peak flow targets is provided in Table 1 and the existing hydrologic modelling output is provided in Appendix B of this report.

Table 1: Target Peak Flow Rates Summary

STORM	PEAK FLOW (m^3/s)			
	4-hr CHI	6-hr SCS	12-hr SCS	24-hr SCS
1:2-year	0.76	0.64	0.60	0.59
1:5-year	1.02	0.91	0.84	0.83
1:10-year	1.20	1.10	1.00	0.99
1:25-year	1.42	1.34	1.20	1.20
1:50-year	1.58	1.51	1.36	1.36
1:100-year	1.75	1.69	1.51	1.51
Regional (Hazel)	0.59			

Note: Target peak flow rates are based on a drainage area of 4.05 ha with a TIMP of 86%.

4.3 STORMWATER MANAGEMENT DESIGN CRITERIA

The following SWM plan has been prepared in accordance with Municipal, LSRCA, and MECP standards and is subject to their review and approval.

Quantity Control

Post-development peak flow rates must be controlled to pre-development rates or lower for storm events up to and including the 1:100-year return frequency storm event.

Conveyance

The 1:100-year return frequency peak flow from the subject property must be safely conveyed to the site outlets under proposed conditions. Further, the Regulatory storm (the greater of the uncontrolled 1:100-year return frequency design storm and the Regional storm) for the upstream development must be safely conveyed through the site to the outlet.

Quality Control

Water quality controls must be provided to satisfy the MECP *Stormwater Management Planning and Design Manual*, with 'Enhanced' level water quality protection corresponding to 80% total suspended solids (TSS) removal is required.

Runoff Volume Control

The SWM plan must demonstrate best efforts have been made to infiltrate, filter, or re-use the 25 mm storm event runoff from impervious areas within the proposed development in accordance with the volume control requirements described in Section 3.2.4 of the LSRCA's *Technical Guidelines for Stormwater Management Submission.*

Water Balance

The SWM plan must demonstrate best efforts have been made to minimize changes in water balance due to the proposed development through the completion of a water balance assessment.

Phosphorus Treatment & Mitigation

This development application is exempt from the LSPOP. In accordance with the Transition Policy, the LSPOP is not applicable to Site Plan Approval for a Block on a Registered Plan provided there is no substantive change to the approved SWM scheme.

This report was prepared to demonstrate a SWM plan for the development which is consistent with the approved SWM plan for the previously approved subdivision. Further information is provided in Section 4.10 of this report.

Erosion & Sediment Control

An erosion and sediment control plan is required to demonstrate erosion mitigation and manage the risk of sediment transport downstream.

4.4 PROPOSED DRAINAGE CONDITION

Under the proposed condition, the total site area draining to Country Lane is reduced from 6.95 ha from the original design to 4.05 ha. The proposed development generally drains north towards Country Lane, which is identified as the site outlet. The site under the proposed condition is comprised of Catchments 201, 202, 203 and 204.

Catchment 201 is approximately 2.25 ha with an assigned TIMP and directly connected imperviousness (XIMP) of 79%. Runoff from minor and major storms from Catchment 201 will drain towards the Country Lane storm sewers and road allowance, respectively.

Catchment 202 is approximately 1.64 ha with an assigned TIMP and XIMP of 92%. Minor flows from Catchment 202 will drain towards Country Lane via storm sewers while major flows will drain overland towards Yonge Street before draining to Country Lane.

Catchment 203 is approximately 0.05 ha with an assigned TIMP of 20% and XIMP of 0%. Minor and major flows from Catchment 203 will drain overland towards Country Lane.

Catchment 204 is approximately 0.11 ha with an assigned TIMP of 25% and XIMP of 3%. Minor and major flows from Catchment 204 will drain overland towards Yonge Street before draining to Country Lane.

Therefore, the total 4.05 ha site has a TIMP of 82%. In comparison to the original subdivision design, the site under the proposed condition has decreased in drainage area (originally 6.95 ha, now 4.05 ha) and has decreased in imperviousness (originally 86%, now 82%). As the site is less impervious than the original design parameters used for the downstream infrastructure (conveyance and end-of-pipe quantity and quality control), on-site water quantity controls are not required.

A summary of the proposed condition peak flow rates is provided in Table 2. Supporting calculations and the proposed hydrologic modelling output are provided in Appendix C of this report, while the Post-Development Drainage Plan (Drawing DP-1) is provided in Appendix G.

Table 2: Proposed Condition Peak Flow Rates Summary

STORM	PEAK FLOW (m^3/s)			
	4-hr CHI	6-hr SCS	12-hr SCS	24-hr SCS
1:2-year	0.74 *(0.76)*	0.61 *(0.64)*	0.57 *(0.60)*	0.56 *(0.59)*
1:5-year	0.99 *(1.02)*	0.88 *(0.91)*	0.81 *(0.84)*	0.80 *(0.83)*
1:10-year	1.16 *(1.20)*	1.06 *(1.10)*	0.96 *(1.00)*	0.96 *(0.99)*
1:25-year	1.37 *(1.42)*	1.29 *(1.34)*	1.17 *(1.20)*	1.17 *(1.20)*
1:50-year	1.53 *(1.58)*	1.47 *(1.51)*	1.32 *(1.36)*	1.32 *(1.36)*
1:100-year	1.69 *(1.75)*	1.64 *(1.69)*	1.47 *(1.51)*	1.48 *(1.51)*
Regional (Hazel)	0.58 (0.59)			

Note: Proposed condition peak rates are based on a drainage area of 4.05 ha with a TIMP of 82%. Additionally, values in *(italics)* denote target peak flow rates.

4.5 QUANTITY CONTROL

As outlined in Table 2, peak flow rates under the proposed condition are lower than the target peak flow rates established in the original design. Since the peak flow rates are reduced under the proposed condition, the downstream SWM Pond LV19 is expected to have sufficient capacity to treat the runoff from the subject site.

4.6 CONVEYANCE

Since peak flow rates under the proposed condition are lower than the target release rates, the Country Lane storm sewers will have sufficient capacity to convey runoff from minor storms to SWM Pond LV19 and the Country Lane and Yonge Street road allowances will have sufficient capacity to convey major (1:100-year event) storms to SWM Pond LV19.

Sufficient overland flow routes are therefore provided for the site.

Minor Storm Events

Minor storm runoff from Catchments 201 and 202 will be collected internally via a network of storm sewers, catch basins, and roof leaders. Runoff from these catchments drain to the Country Lane storm sewers before draining to SWM Pond LV19. A storm sewer design sheet and accompanying Storm Sewer Catchment Plan (Drawing STM-1) demonstrate the storm sewers were sufficiently sized for the minor storm event in accordance with the *Stormwater Infrastructure Design Standard*. Refer to Appendix C for detailed calculations and Appendix G for Drawing STM-1.

Minor runoff from Catchment 203 will drain directly to the Country Lane road allowance before draining overland to SWM Pond LV19. Minor runoff from Catchment 204 will drain to the Yonge Street road allowance before discharging to the Country Lane road allowance and ultimately to SWM Pond LV19. The grading in Catchment 204 was optimized to minimize the minor peak flows draining to Yonge Street and to drain the majority of site flows to the internal storm sewers to the extent possible.

Major Storm Events

Major storm runoff from Catchment 201 will drain overland directly to the Country Lane road allowance before draining to SWM Pond LV19. Under the emergency scenario in which the storm sewers are 100% blocked, a conveyance channel is provided in this catchment to convey the major storm runoff (approximately 0.75 m^3/s) to the road allowance without impacting the adjacent property to the south. This conveyance channel therefore sufficiently conveys upstream site runoff from Catchment 201 to the Country Lane road allowance without adversely impacting adjacent properties under the emergency condition. Supporting hydraulic calculations are provided in Appendix C.

Major storm runoff from Catchment 202 will drain overland to the Yonge Street road allowance before discharging to the Country Lane road allowance and ultimately to SWM Pond LV19. Directing the major runoff from Catchment 202 to the Yonge Street road allowance will not cause adverse impacts on the existing Yonge Street storm sewers, as it is expected they will be at full flow capacity during the major storm event. Major runoff from Catchment 202 is expected to bypass the storm sewers and drain westerly to Country Lane before draining to SWM Pond LV19. This drainage behaviour was verified based on available topographic survey as shown on the Master Grading Plan (Drawing MGP-1).

Major storm runoff from Catchment 203 will drain overland directly to the Country Lane road allowance before draining to SWM Pond LV19. Major runoff from Catchment 204 will drain overland first to the Yonge Street road allowance before discharging to the Country Lane road allowance and ultimately to SWM Pond LV19, similar to the major runoff from Catchment 202.

Since the peak flow rates under the proposed condition are lower than the original design, the existing infrastructure (storm sewer system and road allowance) are sufficient in accommodating the proposed development.

4.7 QUALITY CONTROL

In accordance with the *Stormwater Management Practices Planning and Design Manual*, ‘Enhanced’ level water quality protection, corresponding to 80% total suspended solids (TSS) removal, is required for the proposed development.

As mentioned previously, the original subdivision design assumed the subject site was 6.95 ha with a TIMP of 86%. The downstream SWM Pond LV19 was originally designed to provide water quality for the site based on these parameters.

The proposed development is now 4.05 ha with a TIMP of 82%. This reduction in area and TIMP indicates the site generates less TSS under the proposed condition versus the original design, which is due to the increase in pervious areas (i.e., clean landscaped areas) in the proposed development. Therefore, SWM Pond LV19 will continue to provide sufficient water quality control for the site.

City of Barrie Sewer Use By-law 2001-002

To satisfy the City's Sewer Use By-law 2001-002, an Oil-Grit Separator (OGS) unit has been provided as a form of pre-treatment of site flows prior to its release into the municipal storm sewers. The OGS unit (First Defense FD-8HC) provides an additional 87% TSS removal using the 'Fine' particle size distribution. Refer to the manufacturer sizing report and the standard drawing provided in Appendix D.

4.8 RUNOFF VOLUME CONTROL

In accordance with LSRCA requirements, projects defined as 'major development' are required to meet the volume control requirements outlined in Section 3.2.4 of *Technical Guidelines for Stormwater Management Submission*. Best efforts must be demonstrated to infiltrate, filter, or re-use runoff generated during the 25 mm rainfall event from impervious areas on site.

Per the *Infiltration LID Screening Process*, since the site land use is classified as high intensity/mixed use residential and is within an HVA, infiltration of the 25 mm rainfall event has been provided for building rooftops of Phase 1, 2, and 3 only. Notably, infiltration for building rooftops of Phase 4 is not feasible due to the underground parking garage. The total rooftop area contributing to the LID facilities is 1.09 ha. The 25 mm storm event volume from this rooftop area is 273 m^3.

Five LID facilities are provided to infiltrate rooftop runoff from the buildings of Phases 1 through 3. Each facility will consist of StormTank ST-30 modules and will be connected to respective building rooftop drains with the overflow to the site's internal storm sewer network. Each facility is located a minimum of 5 m away from building foundations and is specified with at least 1 m of vertical separation between the LID invert and seasonal high groundwater level (HGWL). A drawdown time of 46 hours is provided for each LID facility, in accordance with City standards.

As described in Section 4.9 of this report, the LID facilities will also be used to balance post-development infiltration rates to pre-development infiltration rates. The five LID facilities provide a total infiltration volume of 283 m^3 which is accomplished through the capture of the 26 mm storm event from the building rooftops of Phases 1 through 3 (which is equivalent to the 860 mm of annual precipitation). This is equivalent to the 8.5 mm rainfall event across the entire impervious site area. As the total infiltration storage exceeds the minimum required volume, the runoff volume control requirement is achieved.

The sequence of construction of each LID will be as follows which is in conjunction with the overall site phasing:

1. Phase 1 – LID #1 and LID #2
2. Phase 4 – No LIDs provided
3. Phase 2 – LID #3
4. Phase 3 – LID #4

For additional details, refer to supporting calculations and manufacturer shop drawings in Appendix E of this report as well as the Master Servicing Plan (Drawing MSP-1) and the Low Impact Development Plans (Drawings LID-1, LID-2, and LID-3).

4.9 WATER BALANCE

In accordance with LSPP, it must be demonstrated best efforts have been made to mitigate changes in water balance due to the proposed development. As such, a water balance assessment in support of the proposed development has been completed as part of the *Hydrogeological Investigation and Water Balance Assessment*. As part of the assessment, annual runoff and annual infiltration volumes were calculated under the existing and proposed condition. A summary of the findings of the report is provided below while additional details are provided in the original report under separate cover.

Pre-Development Condition

Under the pre-development condition, the subject site was modelled as landscape/open space. Based on the report, the total pre-development infiltration volume is calculated to be 8,199 m^3/year.

Post-Development Condition

Under the un-mitigated post-development condition, the total annual infiltration volume was calculated to be 1,476 m^3/year resulting in an infiltration deficit of 6,724 m^3/year due to the proposed development.

As described in Section 4.8 of this report, the LID facilities capture and infiltrate 860 mm of precipitation from the rooftop areas annually. Assuming that 20% of the runoff from the rooftops is lost to evapotranspiration, the annual infiltration volume provided by the LID facilities is 7,502 m^3 which exceeds the deficit.

LID sizing calculations and manufacturer shop drawings are provided in Appendix E of this report as well as Drawing MSP-1 and Drawings LID-1, LID-2, and LID-3.

4.10 PHOSPHORUS TREATMENT & MITIGATION

As described in Section 4.3 of this report, the development is exempt from the LSPOP per the Transition Policy. The LSPOP is not applicable to Site Plan Approval for a Block on a Registered Plan given there be no substantive changes to the previously approved SWM design.

As previously mentioned, the total imperviousness of the site under the proposed condition (82%) is below that of the original subdivision design (86%). In addition, peak flows from the site continue to drain towards SWM Pond LV19. Since the overall SWM design of the original subdivision is maintained under the proposed condition, phosphorus mitigation measures will not be required for the site.

Refer to the original subdivision's drainage plans in Appendix G for further details.

4.11 OPERATION & MAINTENANCE

To ensure the SWM plan is operating effectively, a regular inspection and maintenance program of each element of the plan is recommended. Monitoring and maintenance provide a variety of important functions. Specifically, monitoring and maintenance ensures the systems implemented are operating continuously and effectively. Monitoring can yield early warnings to provide time to address problems before they become larger, more costly issues.

The manufacturer O&M manuals for the OGS unit and the LID facilities are included in Appendix F for reference. The manufacturer should be consulted on proper inspection and maintenance techniques.

4.12 EROSION & SEDIMENT CONTROL

Erosion & Sediment Control (ESC) will be implemented for all activities at each construction stage (Phase 1, Phase 4, Phase 2, and Phase 3) within the subject site including vegetation clearing, topsoil stripping, grading, and stockpiling of materials. The basic principles considered to minimize erosion and sedimentation and resultant environmental impacts include:

- All erosion control devices to be specified with the Ministry of Natural Resources and Forestry (MNRF) and Ontario Provincial Standard Design (OPSD) guidelines;
- Silt control fences to be erected before the commencement of any grading operations to control sediment movement;

- A designated construction vehicle entrance(s) to the site only, with a stone mud mat to reduce off-site tracking of material;
- Cut-off swales and temporary sediment basins to minimize and capture erosion and sedimentation between each construction stage;
- Expose the smallest possible land area to erosion for the shortest possible time; and
- Long-term siltation and erosion control will be enhanced with a re-vegetation strategy for disturbed areas.

Regular inspection of control measures is to be instituted through a monitoring and mitigation plan and repairs will be made as necessary. Weekly inspections of the site ESC measures should be completed per the Site Alteration By-law 2014-100.

Refer to the Erosion & Sediment Control Plan (Drawing ESC-1) provided in the engineering drawing package for additional information.

5 Summary

The SWM plan demonstrates the proposed development will not result in negative impacts with respect to stormwater and has been prepared in accordance with City, LSRCA, and MECP design guidelines.

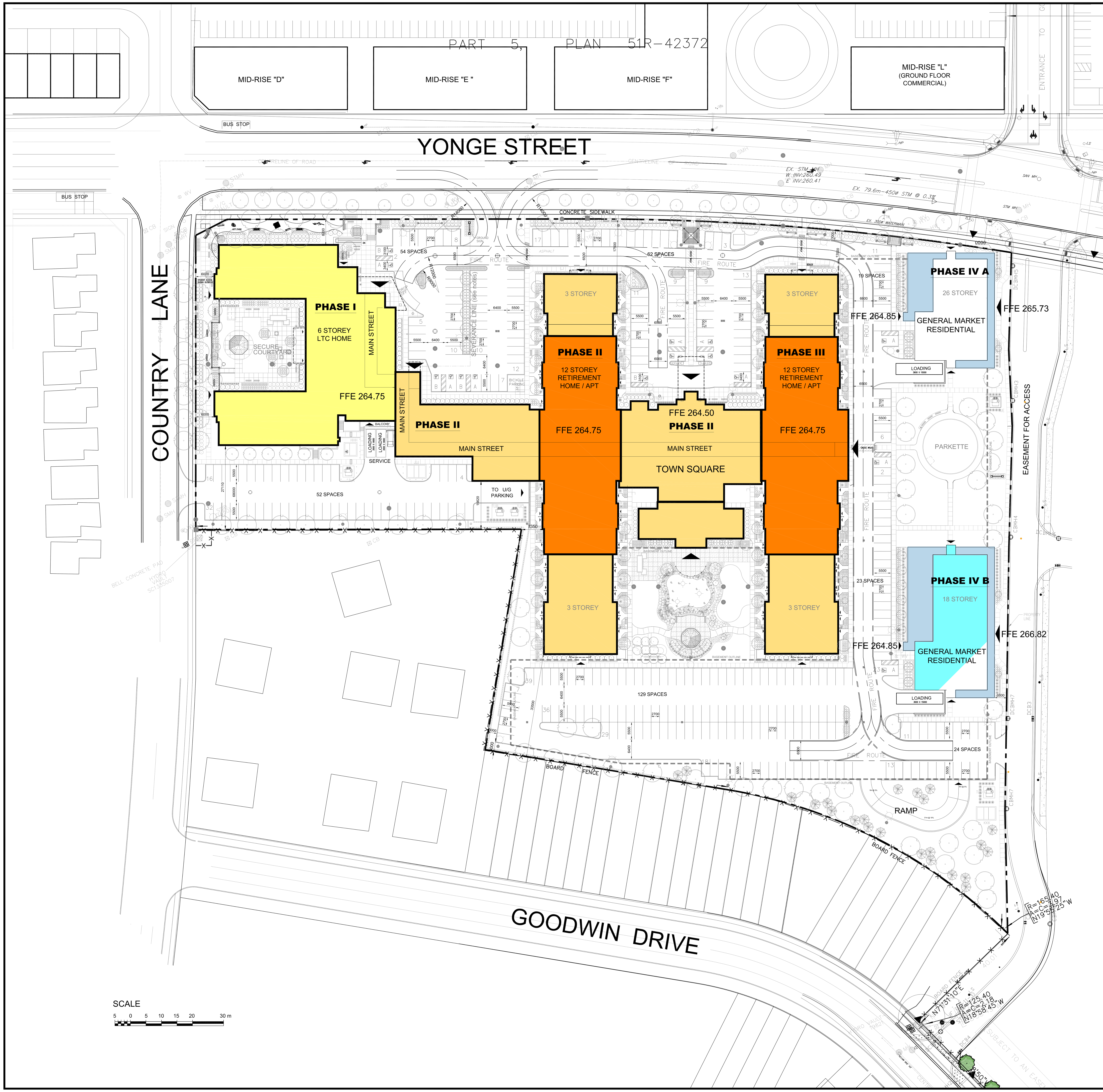
The existing SWM Pond LV19 will continue to provide sufficient quantity and quality controls for the site since the total site impervious area is reduced in comparison to the original design. Sufficient conveyance of site flows will be provided via the Yonge Street and Country Lane road allowances, the Country Lane and internal site storm sewers, and the proposed drainage channel on site. An OGS unit has been provided as a form of pre-treatment to satisfy the City's Sewer Use By-law. Infiltration LID facilities are provided on site to satisfy the LSRCA volume control requirements and will fully mitigate the infiltration deficit. Phosphorus removal measures are not required in accordance with the Transition Policy of the LSPOP.

Throughout construction, siltation and erosion control will be maintained and inspected to reduce erosion and the transportation of sediment from the site and between each stage. These measures will mitigate environmental impacts downstream during construction.

THE VILLAGE OF INNIS LANDING, 800 YONGE STREET, CITY OF BARRIE - STORMWATER MANAGEMENT REPORT

Figure 1: Site Location Plan

Appendix A:
Site Plan



SITE BOUNDARY INFORMATION IS TAKEN FROM :
PLAN OF SURVEY OF
BLOCK 19
PLAN 51M-832
AND
PART OF SOUTH HALF OF LOT 15
CONCESSION 12
CITY OF BARRIE
COUNTY OF SIMCOE

PREPARED BY :
KRCMAR Surveyors Ltd May 25 2023

CONSTRUCTION NORTH

SITE STATISTICS

LOT AREA	- 40,461 m^2	10 ACRES
BUILDING AREA	- 13,150 m^2	
COVERAGE	- 32.5 %	
GFA	- 108,350 m^2	
FSI	- 2.68	
LANDSCAPED AREA	- 14,501 m^2	36%

SETBACKS	REQUIRED	PROVIDED
FRONT YARD (COUNTRY LANE)	- 2.0 m MINIMUM	- 6.0 m
EXTERIOR SIDE YARD	- 0.0 m MINIMUM	- 0.0 m
INTERIOR SIDE YARD	- 7.0 m MINIMUM	- 7.3 m
REAR YARD	- 0.0 m MINIMUM	- 0.0 m

PARKING CALCULATION	REQUIRED	PROVIDED	
PHASE I			
192 LTC BEDS 0.5 SPACES PER BED	- 96 SPACES	- 96 SPACES	
PHASES II & III			
485 RETIREMENT SUITES 0.5 SPACES PER SUITE	- 243 SPACES	- 243 SPACES	
120 SENIORS APT. DWELLING UNITS 1.0 SPACES PER DWELLING	- 120 SPACES	- 120 SPACES	
SVI HEALTH CENTRE 1 SPACE PER 15 m^2	- 13 SPACES	- 13 SPACES	
SUB-TOTAL PHASE I - III PARKING	- 472 SPACES	- 472 SPACES	
SUB-TOTAL PHASE I - III SURFACE PARKING		- 316 SPACES	
SUB-TOTAL PHASE I - III U/G PARKING		- 156 SPACES	
PHASE IV			
360 RESIDENTIAL APT. DWELLING UNITS 1.0 SPACES PER UNIT	- 360 SPACES	- 405 SPACES	(INCLUDES 71 TANDEM PARKING SPACES)
APT SURFACE PARKING PROVIDED		- 47 SPACES	
APT U/G 1 LEVEL PARKING PROVIDED		- 358 SPACES	(INCLUDES 71 TANDEM PARKING SPACES)
PROJECT TOTAL PARKING	- 832 SPACES	- 877 SPACES	

BARRIER FREE PARKING AODA - 2 + 2% OF REQUIRED PARKING	REQUIRED	PROVIDED
PHASE I - PHASE III	- 12 SPACES	- 12 SPACES
PHASE IV	- 10 SPACES	- 10 SPACES
BARRIER FREE PARKING PROVIDED		(12 TYPE A + 10 TYPE B)

LOADING SPACES PROVIDED
- 4 LARGE LOADING SPACES TOTAL PROVIDED
- 2 LARGE LOADING SPACES PHASES I - III
- 1 LARGE LOADING SPACES PHASE IVA
- 1 LARGE LOADING SPACES PHASE IVB

LEGEND

U/G	DENOTES UNDERGROUND
HW	DENOTES HANDWELL
HV	DENOTES HYDRO VAULT
CB	DENOTES CATCH BASIN
WV	DENOTES WATER VALVE
HYD	DENOTES HYDRANT
LS	DENOTES LIGHT STANDARD
HP	DENOTES HYDRO POLE
GW	DENOTES GUY WIRE
BPED	DENOTES BELL PEDISTAL
CB	DENOTES CATCH BASIN
SMH	DENOTES SANITARY MANHOLE
STMH	DENOTES STORM MANHOLE
BF	DENOTES BOARD FENCE
PWF	DENOTES POST & WIRE FENCE
——X——	DENOTES FENCE

CONSTRUCTION NORTH

REVISIONS

No.	DATE	DESCRIPTION
1		

No.	Date	Description
1	2024.7.18	For SPA Submission

Issued

ANDERSON WELLSMAN ARCHITECTS INCORPORATED
1090 DON MILLS ROAD
SUITE 612
TORONTO, ONTARIO
M3C 3R6
TEL: 416.391.3699
FAX: 416.510.2629

Project:
THE VILLAGE OF INNIS LANDING

800 YONGE STREET
BARRIE, ON

Drawing Title
MASTER SITE PLAN

Scale:	1:600
Date:	JUL 12 2022
Input by:	G.V.
Checked by:	R.A.
Job No.	2116

Sheet No.
SP 1.0

FILE NAME: VERSION 8.2

STAGE ONE OBC MATRIX

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
	Name of Practice: Anderson Wellsman Architects Incorporated 1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6 tel (416) 391-3699	
	Certificate of Practice No. 5948	
	Name of Project: Schlegel Villages Barrie Stage One - Long-Term Care	
	Project Location: 800 Yonge Street, Barrie, Ontario	
1	Project Description: ■ New □ Addition □ Alteration	
2	Major Occupancy: Group B2 Major Occupancy w/ A2 and F3 Subsidiary Occupancy	3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 2,456m² Total: 2,456m²	1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 13,674m² Total: 13,674m²	1.4.1.2.[A]
5	Number of Storeys: Above Grade: 6 Below Grade: 1 Height of Building (m): 21.63 m	3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 2 (Building is fully sprinklered)	3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy / Height / Area Support Areas (Basement): F3 - Subsidiary Occupancy Common Areas (1st Floor): A2 - Subsidiary Occupancy Care Units (1st Floor - 6th floor): B2 / Any / Any	3.2.2.38
8	Sprinkler System Proposed: ■ Entire building □ Basement only □ Roof / Attic only	3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES □ NO	3.2.9
10	Fire Alarm Required: ■ YES □ NO	3.2.4
11	Water Service / Supply is Adequate: ■ YES □ NO	3.2.5.7
12	High Building: ■ YES □ NO	3.2.6.1 (c)
13	Permitted Construction: □ COMBUSTIBLE ■ NON-COMBUSTIBLE □ BOTH	3.2.2.38
14	Mezzanine (s) Area m²: N/A	
15	Occupant Load based on: □ m² / Person ■ Design of building Location / Occupancy / Number of Persons 64 Staffs (During Peak Shift) First Floor Common Areas / A2 / 30 Visitors First Floor - Sixth Floor / B2 / 32 Residents per Floor **286 TOTAL**	3.1.17
16	Barrier-free Design: ■ YES □ NO (EXPLAIN)	3.8
17	Hazardous Substances: □ YES ■ NO	SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor / 2 Hours / Precast Concrete Roof / 0 Hours / Building is Fully Sprinklered Support Member Ratings Floor / 2 Hours / Walls - Cast-in-place Concrete Columns / 2 Hours / Protected Concrete / Steel Columns Beams / 2 Hours / Protected Concrete / Steel Beams	3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 38 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls	3.2.3

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	Reference
North	782.2 m²	17.5m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
East	873.7 m²	26.9m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	191.6 m²	198.7m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	871.3 m²	27.1m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Group B2 Occupancy Requirements	3.3.3.1 / 2 / 3
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 2 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements	
	1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4	3.2.6.2.(1)
	2. Protection of Stairs Below the Lowest Exit Level (Stair A & D)	3.2.6.2.(2)
	3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D)	3.2.6.2.(3)
	4. Limiting Smoke Movement into Upper Storeys	3.2.6.2.(4)
	5. Operation of Air Circulation Systems	3.2.6.2.(5)
	6. Connected Buildings (Existing)	3.2.6.3.
	7. Emergency Operation of Elevators	3.2.6.4.
	8. Firefighters Elevators	3.2.6.5.
	9. Smoke Venting	3.2.6.6.
	10. Central Alarm and Control Facility	3.2.6.7.
	11. Voice Communication System	3.2.6.8.
	12. System Testing	3.2.6.9.

STAGE TWO OBC MATRIX

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
	Name of Practice: Anderson Wellsman Architects Incorporated 1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6 tel (416) 391-3699	
	Certificate of Practice No. 5948	
	Name of Project: Schlegel Villages Barrie Stage Two - Residential Apartment	
	Project Location: 800 Yonge Street, Barrie, Ontario	
1	Project Description: ■ New □ Addition □ Alteration	
2	Major Occupancy (s): Group C Major Occupancy w/ A2 & F3 Subsidiary Occupancy	3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 2,131 m² (Tower A: 906 m²; Tower B: 1,225 m²) Total: 2,131 m² (Tower A: 906 m²; Tower B: 1,225 m²)	1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 33,628 m² (Tower A 17,240 m²; Tower B: 16,389 m²) Total: 33,628 m² (Tower A 17,240 m²; Tower B: 16,389 m²)	1.4.1.2.[A]
5	Number of Storeys: Above Grade: 26 (Tower A: 26; Tower B: 18) Below Grade: 1 Height of Building (m): 84 m (Tower A: 84 m; Tower B: 58.4 m)	3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 1 (Building is fully sprinklered)	3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy / Height / Area Underground Parking Areas (Basement): F3 - Subsidiary Occupancy Stores and Shops Areas (1st Floor): A2 - Subsidiary Occupancy Residential Units (1st Floor - 26th floor): C / Any / Any	3.2.2.42
8	Sprinkler System Proposed: ■ Entire building □ Basement only □ Roof / Attic only	3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES □ NO	3.2.9
10	Fire Alarm Required: ■ YES □ NO	3.2.4
11	Water Service / Supply is Adequate: ■ YES □ NO	3.2.5.7
12	High Building: ■ YES □ NO	3.2.6.1 (c)
13	Permitted Construction: □ COMBUSTIBLE ■ NON-COMBUSTIBLE □ BOTH	3.2.2.42
14	Mezzanine (s) Area m²: N/A	
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons Underground Parking Areas / F3 / 388 Persons First Floor Common Areas / A2 / 448 Persons (Tower A: 160 Persons; Tower B: 288 Persons) First Floor - twenty-sixth Floor / C / 1,062 Persons (Tower A: 556 Persons; Tower B: 506 Persons) **1,898 TOTAL**	3.1.17
16	Barrier-free Design: ■ YES □ NO (EXPLAIN)	3.8
17	Hazardous Substances: □ YES ■ NO	SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor / 2 Hours / Precast Concrete Roof / 0 Hours / Building is Fully Sprinklered Support Member Ratings Floor / 2 Hours / Walls - Cast-in-place Concrete Columns / 2 Hours / Protected Concrete / Steel Columns Beams / 2 Hours / Protected Concrete / Steel Beams	3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls	3.2.3

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	Reference
North: Tower A	2908.9 m²	9.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
Tower B	2693.4 m²	9.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
East: Tower A	2282.2 m²	20.1m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
Tower B	1617.7 m²	94.6m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
South: Tower A	2908.9 m²	12.1m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
Tower B	2693.4 m²	8.4m	n/a	82%	0HR	Faces a street	3.2.3.10.(2)
West: Tower A	2282.2 m²	48.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
Tower B	1617.7 m²	148.6m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd for each High-Rise Residential Building	3.8.2.3.(2)
	High Building Requirements	
	1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4	3.2.6.2.(1)
	2. Protection of Stairs Below the Lowest Exit Level (Stair A & D)	3.2.6.2.(2)
	3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D)	3.2.6.2.(3)
	4. Limiting Smoke Movement into Upper Storeys	3.2.6.2.(4)
	5. Operation of Air Circulation Systems	3.2.6.2.(5)
	6. Connected Buildings (Existing)	3.2.6.3.
	7. Emergency Operation of Elevators	3.2.6.4.
	8. Firefighters Elevators	3.2.6.5.
	9. Smoke Venting	3.2.6.6.
	10. Central Alarm and Control Facility	3.2.6.7.
	11. Voice Communication System	3.2.6.8.
	12. System Testing	3.2.6.9.

STAGE THREE OBC MATRIX

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
	Name of Practice: Anderson Wellsman Architects Incorporated 1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6 tel (416) 391-3699	
	Certificate of Practice No. 5948	
	Name of Project: Schlegel Villages Barrie Stage Three - Retirement Home	
	Project Location: 800 Yonge Street, Barrie, Ontario	
1	Project Description: ■ New □ Addition □ Alteration	
2	Major Occupancy (s): A2, B3, C, F3	3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 5,197 m² Total: 5,197 m²	1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 27,973 m² Total: 27,973 m²	1.4.1.2.[A]
5	Number of Storeys: Above Grade: 12 Below Grade: 1 Height of Building (m): 43.47 m	3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 1 (Building is fully sprinklered)	3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy / Height / Area Garage and Support Areas (Basement): F3 / Any / Any Common Areas (1st Floor): A2 / Any / Any Care Units (1st Floor - 3rd Floor): B3 / Any / Any Retirement Units (4th Floor - 12th Floor): C / Any / Any	3.2.2.42
8	Sprinkler System Proposed: ■ Entire building □ Basement only □ Roof / Attic only	3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES □ NO	3.2.9
10	Fire Alarm Required: ■ YES □ NO	3.2.4
11	Water Service / Supply is Adequate: ■ YES □ NO	3.2.5.7
12	High Building: ■ YES □ NO	3.2.6.1 (c)
13	Permitted Construction: □ COMBUSTIBLE ■ NON-COMBUSTIBLE □ BOTH	3.2.2.42
14	Mezzanine (s) Area m²: N/A	
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons 64 Staffs (During Peak Shift) Garage & Support Areas / F3 / 140 Persons First Floor Common Areas / A2 / 30 Visitors First Floor - Second Floor / B3 / 72 Residents Third Floor - Twelfth Floor / C / 408 Persons **714 TOTAL**	3.1.17
16	Barrier-free Design: ■ YES □ NO (EXPLAIN)	3.8
17	Hazardous Substances: □ YES ■ NO	SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor / 2 Hours / Precast Concrete Roof / 0 Hours / Building is Fully Sprinklered Support Member Ratings Floor / 2 Hours / Walls - Cast-in-place Concrete Columns / 2 Hours / Protected Concrete / Steel Columns Beams / 2 Hours / Protected Concrete / Steel Beams	3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls	3.2.3

Wall	Area of EBF (m²)	L.D. (m²)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	Reference
North	1384.7m²	7.3m	n/a	66%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
East	290.6 m²	36.4m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	269.3 m²	47.2m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	290.6 m²	33.5m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements	
	1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4	3.2.6.2.(1)
	2. Protection of Stairs Below the Lowest Exit Level (Stair A & D)	3.2.6.2.(2)
	3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D)	3.2.6.2.(3)
	4. Limiting Smoke Movement into Upper Storeys	3.2.6.2.(4)
	5. Operation of Air Circulation Systems	3.2.6.2.(5)
	6. Connected Buildings (Existing)	3.2.6.3.
	7. Emergency Operation of Elevators	3.2.6.4.
	8. Firefighters Elevators	3.2.6.5.
	9. Smoke Venting	3.2.6.6.
	10. Central Alarm and Control Facility (Existing)	3.2.6.7.
	11. Voice Communication System	3.2.6.8.
	12. System Testing	3.2.6.9.

STAGE FOUR OBC MATRIX

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
	Name of Practice: Anderson Wellsman Architects Incorporated 1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6 tel (416) 391-3699	
	Certificate of Practice No. 5948	
	Name of Project: Schlegel Villages Barrie Stage Four - Retirement Home	
	Project Location: 800 Yonge Street, Barrie, Ontario	
1	Project Description: ■ New □ Addition □ Alteration	
2	Major Occupancy (s): A2, B3, C, F3	3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 3,335 m² Total: 3,335 m²	1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 24,989 m² Total: 24,989 m²	1.4.1.2.[A]
5	Number of Storeys: Above Grade: 12 Below Grade: 1 Height of Building (m): 43.47 m	3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 2 (Building is fully sprinklered)	3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy / Height / Area Undergraound Parking Areas (Basement): F3 / Any / Any Common Areas (1st Floor): A2 / Any / Any Care Units (1st Floor - 3rd Floor): B3 / Any / Any Retirement Units (4th Floor - 12th Floor): C / Any / Any	3.2.2.42
8	Sprinkler System Proposed: ■ Entire building □ Basement only □ Roof / Attic only	3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES □ NO	3.2.9
10	Fire Alarm Required: ■ YES □ NO	3.2.4
11	Water Service / Supply is Adequate: ■ YES □ NO	3.2.5.7
12	High Building: ■ YES □ NO	3.2.6.1 (c)
13	Permitted Construction: □ COMBUSTIBLE ■ NON-COMBUSTIBLE □ BOTH	3.2.2.42
14	Mezzanine (s) Area m²: N/A	
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons 47 Staffs (During Peak Shift) Garage / F3 / 111 Persons First Floor Common Areas / A2 / 30 Visitors First Floor - Third Floor / B3 / 72 Residents Fourth Floor - Twelfth Floor / C / 412 Persons **672 TOTAL**	3.1.17
16	Barrier-free Design: ■ YES □ NO (EXPLAIN)	3.8
17	Hazardous Substances: □ YES ■ NO	SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor / 2 Hours / Precast Concrete Roof / 0 Hours / Building is Fully Sprinklered Support Member Ratings Floor / 2 Hours / Walls - Cast-in-place Concrete Columns / 2 Hours / Protected Concrete / Steel Columns Beams / 2 Hours / Protected Concrete / Steel Beams	3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls	3.2.3

Wall	Area of EBF (m²)	L.D. (m²)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	Reference
North	3632.2m²	78.6m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
East	290.6 m²	32.9m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	97.9 m²	9.5m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	290.6 m²	36m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C. REFERENCE
20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements	
	1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4	3.2.6.2.(1)
	2. Protection of Stairs Below the Lowest Exit Level (Stair A & D)	3.2.6.2.(2)
	3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D)	3.2.6.2.(3)
	4. Limiting Smoke Movement into Upper Storeys	3.2.6.2.(4)
	5. Operation of Air Circulation Systems	3.2.6.2.(5)
	6. Connected Buildings (Existing)	3.2.6.3.
	7. Emergency Operation of Elevators	3.2.6.4.
	8. Firefighters Elevators	3.2.6.5.
	9. Smoke Venting	3.2.6.6.
	10. Central Alarm and Control Facility (Existing)	3.2.6.7.
	11. Voice Communication System	3.2.6.8.
	12. System Testing	3.2.6.9.

SCHLEGEL VILLAGES

REVISIONS

ISSUED
2024-07-18 ISSUED FOR SPA SUBMISSION

ANDERSON WELLSMAN ARCHITECTS INCORPORATED
1090 DON MILLS ROAD SUITE 612
TORONTO ONTARIO M3C 3R6
T 416 391 3699

THE VILLAGE OF INNIS LANDING
800 YONGE ST, BARRIE, ON

Drawing Title:
BUILDING CODE MATRIX

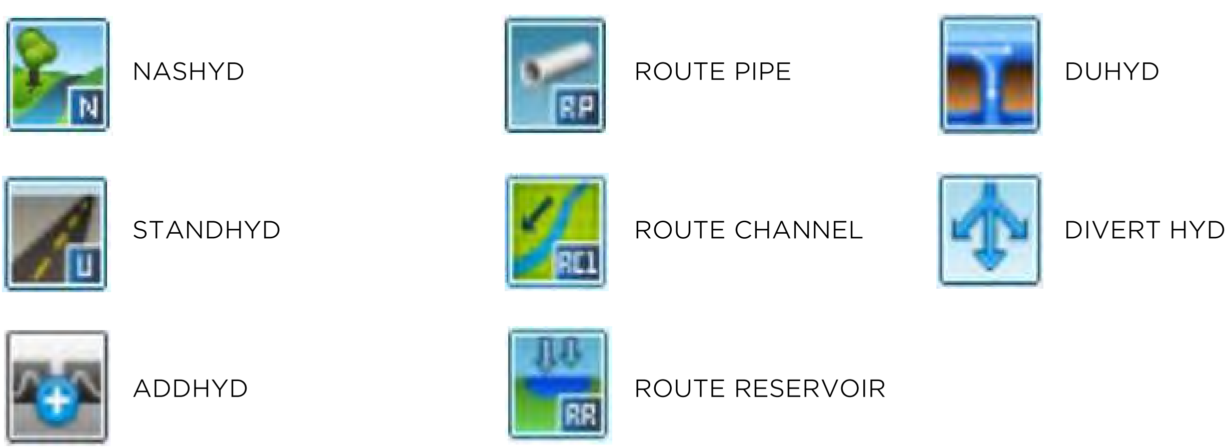
Checked By: RA
Drawn By: PC
Project No.: 2116
Plot Date: 7/16/2024 MM/DD/YYYY

SP1.1

Appendix B: Original Subdivision Design Condition

TATHAM ENGINEERING

PROJECT	The Village of Innis Landing	FILE	422426
		DATE	9/6/2024
SUBJECT	Original Subdivision Design VO Schematic	NAME	LJC
		PAGE	1 OF 1



PROJECT		FILE	422426
	The Village of Innis Landing	DATE	9/6/2024
SUBJECT	Catchment 101 Parameters	NAME	LJC
		PAGE	1 OF 2

The catchment parameters below were extracted from the site area from the Internal Storm Drainage Plan (Drawing G-3) of the Swallow Glen Subdivision As-Constructed Drawing Set (R.G. Robinson, 2005).

Catchment Parameters

Area (ha): 6.95 (Drainage catchment containing the 4.05 ha subject site)

Runoff Coefficient: 0.80

Based on the City of Barrie's Stormwater Infrastructure Design Standard (2023), the following equation can be used to approximate the runoff coefficient based on a site's total imperviousness.

C = 0.7 x TIMP + 0.2

where: C = Runoff Coefficient

TIMP = Total Imperiousness (%)

Solving for to determine Total Imperviousness of Catchment 101:

TIMP = (C - 0.2)/0.7 = 86%

Therefore, the input parameters for the VO hydrologic modelling are as follows:

Hydrologic Catchment Parameter Input Parameters:

ID: 101

Area (ha): 4.05

TIMP: 86%

Refer to calculation checks on page 2.

Checks

Catchment Parameters

Area (ha): 16.51
Runoff Coefficient: 0.67

External Storm Drainage Plan (Drawing G-4) of the Swallow Glen Subdivision As-Constructed Drawing Set (R.G. Robinson, 2005).

Confirm that the subcatchments in Drawing G-3 that make up the 16.51 ha drainage area in Drawing G-4 equates to a Runoff Coefficient of 0.67.

Drawing G-3 Drainage Area (ha)	Runoff Coefficient
2.75	0.80
0.28	0.45
6.95	0.80
1.09	0.45
0.21	0.45
0.30	0.45
0.48	0.45
0.24	0.45
1.00	0.60
0.35	0.35
0.44	0.44
0.45	0.45
1.18	0.45
0.79	0.45
Total: 16.51	**RC: 0.67**

The areas and RCs in Drawings G-3 and G-4 correspond correctly to each other. Therefore, proceed with a total imperviousness of 86% for the site under existing conditions.

```
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
```

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```
                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c785e0cb-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c785e0cb-


DATE: 07/09/2024                          TIME: 06:02:38

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 01 - CHI2YR.stm           **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\36bee6a3-9a96-4506-83eb
    remark: CHI2YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.76  1.33  31.35 0.85   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
```

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```
                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\200de154-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\200de154-


DATE: 07/09/2024                          TIME: 06:02:38

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 02 - CHI5YR.stm           **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\3ed01281-ad7a-4e70-a437
    remark: CHI5YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.02  1.33  43.59 0.86   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
```

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```
                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b230aabf-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b230aabf-


DATE: 07/09/2024                          TIME: 06:02:38

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 03 - CHI10YR.stm          **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\f5e70070-9bd9-4253-a6c5
    remark: CHI10YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.20  1.33  51.96 0.87   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
```

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```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\82425da9-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\82425da9-

DATE: 07/09/2024                            TIME: 06:02:38

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 04 - CHI25YR.stm          **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 71.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\9ea8e150-1213-4a04-977c
    remark: CHI25YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.42  1.33  62.57 0.88   0.000
    [I%=85.0:S%= 2.00]
*
=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6b6a5199-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6b6a5199-

DATE: 07/09/2024                            TIME: 06:02:38

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 05 - CHI50YR.stm          **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\b537a0c9-171b-435c-bebd
    remark: CHI50YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.58  1.33  70.19 0.88   0.000
    [I%=85.0:S%= 2.00]
*
=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\29534e18-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\29534e18-

DATE: 07/09/2024                            TIME: 06:02:39

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 06 - CHI100YR.stm         **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\e328c1fb-c975-45ae-af1b
    remark: CHI100YR.stm
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.75  1.33  77.75 0.89   0.000
    [I%=85.0:S%= 2.00]
*
 FINISH

=============================================================================================================

=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6d86c086-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6d86c086-
```

```
DATE: 07/09/2024                         TIME: 06:02:37

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 07 - 2Y6H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 42.30 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\a57f669c-56f0-4b46-a822
    remark: 2Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.64  3.25  36.16 0.85   0.000
    [I%=85.0:S%= 2.00]
*
=============================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e64b6523-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e64b6523-


DATE: 07/09/2024                         TIME: 06:02:37

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 08 - 5Y6H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 59.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\f14659f3-9c83-42d1-ba69
    remark: 5Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.91  3.25  51.78 0.87   0.000
    [I%=85.0:S%= 2.00]
*
=============================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\22e72919-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\22e72919-


DATE: 07/09/2024                         TIME: 06:02:37

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 09 - 10Y6H.STM           **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 70.80 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\d1c2a790-43ba-4a79-91eb
    remark: 10Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.10  3.25  62.17 0.88   0.000
    [I%=85.0:S%= 2.00]
*
=============================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6164329b-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6164329b-


DATE: 07/09/2024                         TIME: 06:02:37

USER:


COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 10 - 25Y6H.STM           **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms
```

```
      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 85.20 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\333e42b4-1c1c-4a53-84bb
    remark: 25Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.34  3.25  75.53 0.89   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```


```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\46167046-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\46167046-

DATE: 07/09/2024                          TIME: 06:02:37

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 11 - 50Y6H.STM            **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 95.90 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\0c236c11-5928-41bb-8b35
    remark: 50Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.51  3.25  85.54 0.89   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```


```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\cf55f0d4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\cf55f0d4-

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 12 - 100Y6H.STM           **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot=106.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\a901d005-564f-45e6-bb6e
    remark: 100Y6H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.69  3.25  95.51 0.90   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```


```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\5ab94a0a-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\5ab94a0a-

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 13 - 2Y12H.STM            **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 46.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\c895c294-0717-4720-be3a
    remark: 2Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.60  6.25  40.12 0.86   0.000
    [I%=85.0:S%= 2.00]
*
=====================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
```

```
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\a02986da-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\a02986da-

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COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 14 - 5Y12H.STM              **
  **************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 64.31 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\5c387f65-ec7b-4540-b7a0
    remark: 5Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.84  6.25  56.19 0.87   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c6180248-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c6180248-

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  **************************************************
  ** SIMULATION : Run 15 - 10Y12H.STM             **
  **************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\d4419be2-ea45-4388-bc83
    remark: 10Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.00  6.25  66.98 0.88   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1c8b3062-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1c8b3062-

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  **************************************************
  ** SIMULATION : Run 16 - 25Y12H.STM             **
  **************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                15.0
    [ Ptot= 90.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\067f4bd3-eee4-4716-8775
    remark: 25Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.20  6.25  80.66 0.89   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****
```

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\34020ac5-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\34020ac5-

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  ************************************************
  ** SIMULATION : Run 17 - 50Y12H.STM          **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=101.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\278120d1-deee-44f9-baf3
    remark: 50Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.36  6.25  90.98 0.89   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\ed03ff27-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\ed03ff27-

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 18 - 100Y12H.STM         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=112.51 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\a3ebeba9-ef50-472e-a122
    remark: 100Y12H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.51  6.25 101.18 0.90   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\0af550f3-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\0af550f3-

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 19 - 2Y24H.STM           **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 55.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\4e7c09b0-b15a-4fe3-9b0e
    remark: 2Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.59 12.25  47.67 0.87   0.000
    [I%=85.0:S%= 2.00]
*
============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\2e35b181-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\2e35b181-

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COMMENTS: ____________________________________________________________

  ************************************************
```

```
  ** SIMULATION : Run 20 - 5Y24H.STM            **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM               15.0
    [ Ptot= 76.01 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\a413c5aa-9732-4ea5-a7b8
    remark: 5Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.83 12.25  66.99 0.88   0.000
    [I%=85.0:S%= 2.00]
*
==============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\44748e2b-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\44748e2b-

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  ************************************************
  ** SIMULATION : Run 21 - 10Y24H.STM           **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM               15.0
    [ Ptot= 89.94 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\88f4b56d-ec00-487a-a26d
    remark: 10Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.99 12.25  79.96 0.89   0.000
    [I%=85.0:S%= 2.00]
*
==============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c0e0034e-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\c0e0034e-

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  ************************************************
  ** SIMULATION : Run 22 - 25Y24H.STM           **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM               15.0
    [ Ptot=107.47 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\468f02aa-a25e-4fb5-b418
    remark: 25Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.20 12.25  96.43 0.90   0.000
    [I%=85.0:S%= 2.00]
*
==============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                    *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e610d1e1-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e610d1e1-

DATE: 07/09/2024                           TIME: 06:02:38

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COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 23 - 50Y24H.STM           **
  ************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM               15.0
    [ Ptot=120.63 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\bb99b713-4871-4330-8b2c
    remark: 50Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.36 12.25 108.87 0.90   0.000
    [I%=85.0:S%= 2.00]
```

```
*
==========================================================================================================


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b29d5188-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b29d5188-


DATE: 07/09/2024                           TIME: 06:02:38

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 24 - 100Y24H.STM          **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6cd46fd8-9fde-44f0-a557-d744a49ecfc9\ccb65c87-fee8-4ab2-8cca
    remark: 100Y24H.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    1.51 12.25 121.20 0.91   0.000
    [I%=85.0:S%= 2.00]
*
```

```
=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
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DATE: 07/09/2024                           TIME: 06:02:42

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Regional (Hazel)              **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

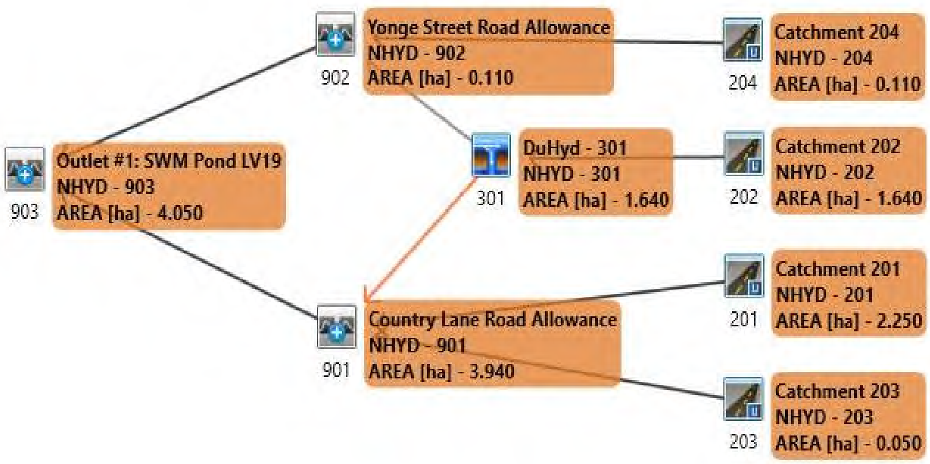
      START @  0.00 hrs
      --------------------
    READ STORM                 12.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\6f1858cb-c675-466b-b050-5f2c8a0038c7\6900206a-ba94-4182-8717
    remark: HAZEL.STM
*
 *  CALIB STANDHYD       0101  1  5.0    4.05    0.59 10.00 202.53 0.96   0.000
    [I%=85.0:S%= 2.00]
*
 FINISH

=============================================================================================================
```

Appendix C:
Proposed Drainage Condition

TATHAM ENGINEERING

PROJECT		FILE	422426
	The Village of Innis Landing	DATE	9/6/2024
SUBJECT	Post-Development VO Schematic	NAME	LJC
		PAGE	1 OF 1



 NASHYD

 ROUTE PIPE

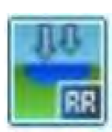
 DUHYD

 STANDHYD

 ROUTE CHANNEL

 DIVERT HYD

 ADDHYD

 ROUTE RESERVOIR

PROJECT	The Village of Innis Landing	FILE	422426
		DATE	9/6/2024
SUBJECT	Post-Development Land Use Allocation	NAME	LJC
		PAGE	1 OF 1

Catchment 201 - StandHyd								
Land Use	Total Area	Total Imperviousness (TIMP)	Total Impervious Area	Directly Connected Impervious (XIMP)	Directly Connected Impervious (XIMP)	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha	-	mm
Buildings	0.56	100%	0.56	100%	0.56	0.00	-	-
Hardscape	0.47	100%	0.47	100%	0.47	0.00	-	-
Parking Lot	0.76	100%	0.76	100%	0.76	0.00	-	-
Lawn	0.47	0%	0.00	0%	0.00	0.47	59.00	5.00
Total	**2.25**	**79%**	**1.79**	**79%**	**1.79**	**0.47**	**59.00**	**5.00**

Catchment 202 - StandHyd								
Land Use	Total Area	Total Imperviousness (TIMP)	Total Impervious Area	Directly Connected Impervious (XIMP)	Directly Connected Impervious (XIMP)	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha	-	mm
Buildings	0.77	100%	0.77	100%	0.77	0.00	-	-
Hardscape	0.24	100%	0.24	100%	0.24	0.00	-	-
Parking Lot	0.51	100%	0.51	100%	0.51	0.00	-	-
Lawn	0.13	0%	0.00	0%	0.00	0.13	59.00	5.00
Total	**1.64**	**92%**	**1.52**	**92%**	**1.52**	**0.13**	**59.00**	**5.00**

Catchment 203 - StandHyd								
Land Use	Total Area	Total Imperviousness (TIMP)	Total Impervious Area	Directly Connected Impervious (XIMP)	Directly Connected Impervious (XIMP)	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha	-	mm
Hardscape	0.01	100%	0.01	0%	0.00	0.00	-	-
Lawn	0.04	0%	0.00	0%	0.00	0.04	59.00	5.00
Total	**0.05**	**20%**	**0.01**	**0%**	**0.00**	**0.04**	**59.00**	**5.00**

Catchment 204 - StandHyd								
Land Use	Total Area	Total Imperviousness (TIMP)	Total Impervious Area	Directly Connected Impervious (XIMP)	Directly Connected Impervious (XIMP)	Pervious Area	Pervious CN	Pervious IA
	ha	%	ha	%	ha	ha	-	mm
Hardscape	0.02	100%	0.02	0%	0.00	0.00	-	-
Driveway	0.003	100%	0.00	100%	0.00	0.00	-	-
Lawn	0.08	0%	0.00	0%	0.00	0.08	59.00	5.00
Total	**0.11**	**25%**	**0.03**	**3%**	**0.00**	**0.08**	**59.00**	**5.00**

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Post Development Condition

Watershed:	LSRCA
Catchment ID:	201
Catchment Area (ha):	2.25
Impervious %:	79%
Pervious Area (ha):	0.47

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol		**Ds**							
Soil Series		Dundonald							
Hydrologic Soils Group		AB							
Soil Texture		Sand Loam							
Runoff Coefficient Type		1							
Area (ha)		0.47							
Percentage of Catchment		100%							
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98						
Gravel	3		81						
Woodland	10		46						
Pasture/Lawns	5	0.47	59						
Meadows	8		51						
Cultivated	7		68						
Waterbody	12		50						
Average CN		59.00							
Average IA		5.00							

Notes

CN and IA values have been calculated for the pervious area of the catchment only.

Summary

Catchment CN:	59.0
Catchment IA (mm):	5.00

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Post Development Condition

Watershed:	LSRCA
Catchment ID:	202
Catchment Area (ha):	1.64
Impervious %:	92%
Pervious Area (ha):	0.13

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol		**Ds**							
Soil Series		Dundonald							
Hydrologic Soils Group		AB							
Soil Texture		Sand Loam							
Runoff Coefficient Type		1							
Area (ha)		0.13							
Percentage of Catchment		100%							
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98						
Gravel	3		81						
Woodland	10		46						
Pasture/Lawns	5	0.13	59						
Meadows	8		51						
Cultivated	7		68						
Waterbody	12		50						
Average CN		59.00							
Average IA		5.00							

Notes

CN and IA values have been calculated for the pervious area of the catchment only.

Summary

Catchment CN:	59.0
Catchment IA (mm):	5.00

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Post Development Condition

Watershed:	LSRCA
Catchment ID:	203
Catchment Area (ha):	0.05
Impervious %:	20%
Pervious Area (ha):	0.04

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol		**Ds**							
Soil Series		Dundonald							
Hydrologic Soils Group		AB							
Soil Texture		Sand Loam							
Runoff Coefficient Type		1							
Area (ha)		0.04							
Percentage of Catchment		100%							
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98						
Gravel	3		81						
Woodland	10		46						
Pasture/Lawns	5	0.04	59						
Meadows	8		51						
Cultivated	7		68						
Waterbody	12		50						
Average CN		59.00							
Average IA		5.00							

Notes

CN and IA values have been calculated for the pervious area of the catchment only.

Summary

Catchment CN:	59.0
Catchment IA (mm):	5.00

TATHAM ENGINEERING

Visual OTTHYMO Model Parameter Calculations (StandHYD)

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

Data Sources

Detailed Soil Survey Reports for Ontario, LSRCA Technical Guidelines for Stormwater Management Submissions (2016), MTO Drainage Management Manual (1997)

Post Development Condition

Watershed:	LSRCA
Catchment ID:	204
Catchment Area (ha):	0.11
Impervious %:	25%
Pervious Area (ha):	0.08

Average Curve Number (CN) and Initial Abstraction (IA) for Pervious Area

Soil Symbol		**Ds**							
Soil Series		Dundonald							
Hydrologic Soils Group		AB							
Soil Texture		Sand Loam							
Runoff Coefficient Type		1							
Area (ha)		0.08							
Percentage of Catchment		100%							
Land Cover Category	**IA**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**	**A (ha)**	**CN**
Impervious	2		98						
Gravel	3		81						
Woodland	10		46						
Pasture/Lawns	5	0.08	59						
Meadows	8		51						
Cultivated	7		68						
Waterbody	12		50						
Average CN		59.00							
Average IA		5.00							

Notes

CN and IA values have been calculated for the pervious area of the catchment only.

Summary

Catchment CN:	59.0
Catchment IA (mm):	5.00

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Sep 5 2024

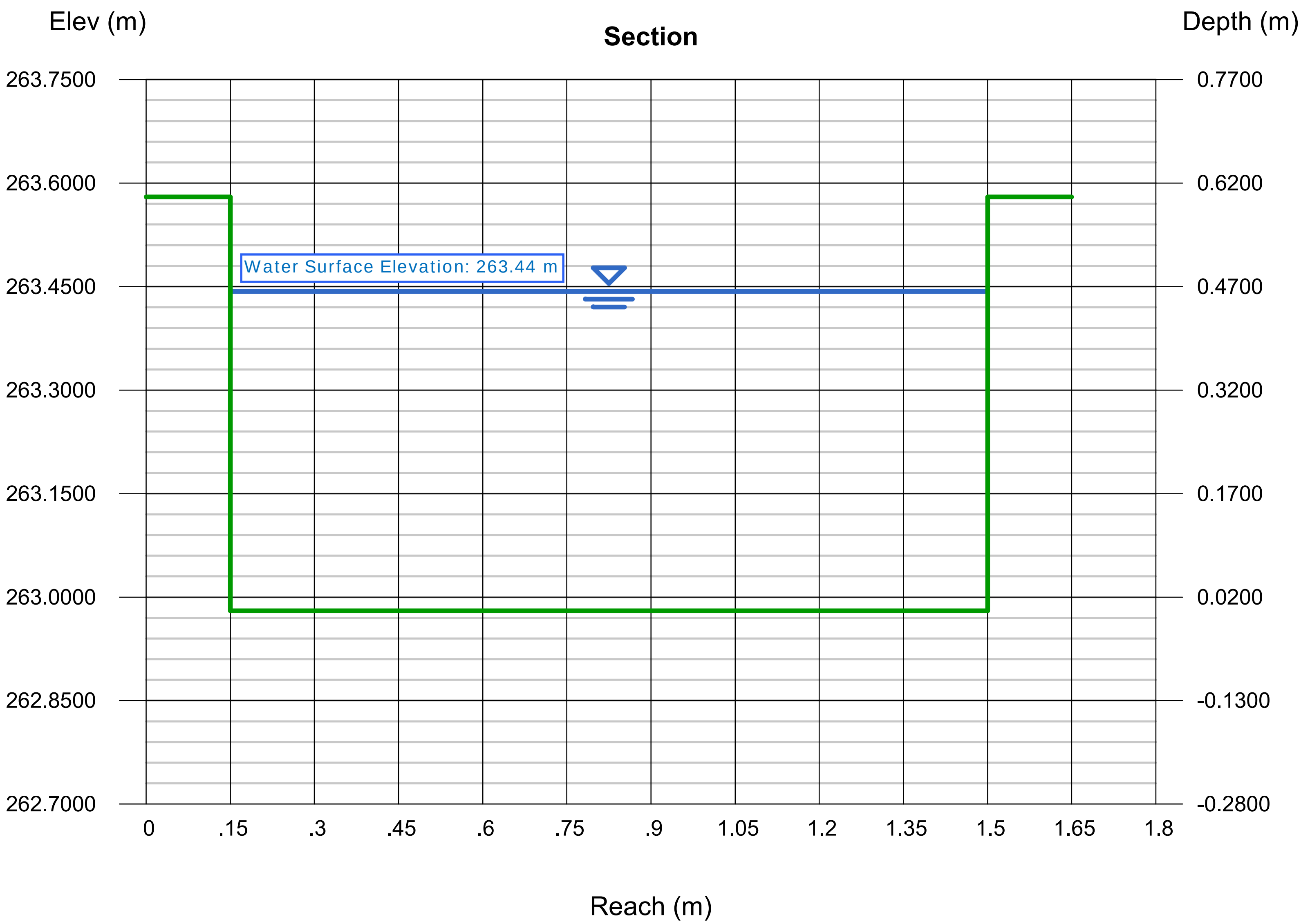
Conveyance Channel (Emergency Scenario)

Rectangular
Bottom Width (m) = 1.3500
Total Depth (m) = 0.6000

Invert Elev (m) = 262.9800
Slope (%) = 1.3000
N-Value = 0.040

Calculations
Compute by: Known Q
Known Q (cms) = 0.7500

Highlighted
Depth (m) = 0.4633
Q (cms) = 0.7500
Area (sqm) = 0.6254
Velocity (m/s) = 1.1991
Wetted Perim (m) = 2.2766
Crit Depth, Yc (m) = 0.3170
Top Width (m) = 1.3500
EGL (m) = 0.5366



```
==================================================================================================

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      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****

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DATE: 09/05/2024                           TIME: 07:05:31

USER:


COMMENTS: ____________________________________________________________


  **************************************************
  ** SIMULATION : Run 01 - CHI2YR.stm            **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\36bee6a3-9a96-4506-83eb
    remark: CHI2YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.40  1.33  29.18 0.79   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\36bee6a3-9a96-4506-83eb
    remark: CHI2YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  1.58   6.21 0.17   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\36bee6a3-9a96-4506-83eb
    remark: CHI2YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.34  1.33  33.22 0.90   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.34  1.33  33.22  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.34  1.33  33.22  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.40  1.33  28.68  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.74  1.33  30.57  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\36bee6a3-9a96-4506-83eb
    remark: CHI2YR.stm
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.00  1.58   7.25 0.20   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.00  1.58   7.25  n/a   0.000
```

```
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.74  1.33  29.94  n/a   0.000
*
==================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                  *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e7c64a8c-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\e7c64a8c-


DATE: 09/05/2024                           TIME: 07:05:34

USER:


COMMENTS: ____________________________________________________________


  **************************************************
  ** SIMULATION : Run 02 - CHI5YR.stm            **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\3ed01281-ad7a-4e70-a437
    remark: CHI5YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.53  1.33  40.77 0.81   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\3ed01281-ad7a-4e70-a437
    remark: CHI5YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  1.50  11.66 0.23   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\3ed01281-ad7a-4e70-a437
    remark: CHI5YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.45  1.33  46.00 0.91   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.45  1.33  46.00  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.45  1.33  46.00  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.53  1.33  40.14  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.98  1.33  42.58  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\3ed01281-ad7a-4e70-a437
    remark: CHI5YR.stm
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.00  1.50  12.94 0.26   0.000
```

```
   [I%= 3.0:S%= 2.00]
*
   ADD [  0204+  0301]  0902  3  5.0    0.11    0.00  1.50  12.94  n/a   0.000
*
   ADD [  0901+  0902]  0903  3  5.0    4.05    0.99  1.33  41.77  n/a   0.000
*
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\afaa9358-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\afaa9358-

DATE: 09/05/2024                            TIME: 07:05:33

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 03 - CHI10YR.stm            **
  **************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.    Qbase
                                   min     ha   '  cms   hrs     mm           cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f5e70070-9bd9-4253-a6c5
    remark: CHI10YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.63  1.33  48.75 0.82   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f5e70070-9bd9-4253-a6c5
    remark: CHI10YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  1.50  15.89 0.27   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f5e70070-9bd9-4253-a6c5
    remark: CHI10YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.53  1.33  54.70 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.53  1.33  54.70  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.53  1.33  54.70  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.63  1.33  48.03  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    1.16  1.33  50.81  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f5e70070-9bd9-4253-a6c5
```

```
    remark: CHI10YR.stm
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  1.50  17.41 0.29   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01  1.50  17.41  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.16  1.33  49.90  n/a   0.000
*
=====================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\d59cddce-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\d59cddce-

DATE: 09/05/2024                            TIME: 07:05:34

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 04 - CHI25YR.stm            **
  **************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.    Qbase
                                   min     ha   '  cms   hrs     mm           cms

      START @  0.00 hrs
      --------------------
    READ STORM                 10.0
    [ Ptot= 71.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\9ea8e150-1213-4a04-977c
    remark: CHI25YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.74  1.33  58.92 0.83   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 71.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\9ea8e150-1213-4a04-977c
    remark: CHI25YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  1.50  21.86 0.31   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 71.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\9ea8e150-1213-4a04-977c
    remark: CHI25YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.62  1.33  65.71 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.62  1.33  65.71  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.01    0.02  1.33  65.71  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.63    0.60  1.33  65.71  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.74  1.33  58.11  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.93    1.34  1.33  61.26  n/a   0.000
*
```

```
    READ STORM                  10.0
    [ Ptot= 71.24 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\9ea8e150-1213-4a04-977c
    remark: CHI25YR.stm
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  1.50  23.65 0.33   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.12    0.03  1.33  27.33  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.37  1.33  60.25  n/a   0.000
*
======================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b1a2ebd5-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\b1a2ebd5-

DATE: 09/05/2024                        TIME: 07:05:34

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 05 - CHI50YR.stm          **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      -------------------
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\b537a0c9-171b-435c-bebd
    remark: CHI50YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.83  1.33  66.24 0.83   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\b537a0c9-171b-435c-bebd
    remark: CHI50YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  1.42  26.50 0.33   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\b537a0c9-171b-435c-bebd
    remark: CHI50YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.69  1.33  73.57 0.93   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.69  1.33  73.57  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.05    0.09  1.33  73.57  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.59    0.60  1.25  73.57  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.83  1.33  65.37  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.89    1.43  1.33  68.72  n/a   0.000
*
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\b537a0c9-171b-435c-bebd
    remark: CHI50YR.stm
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  1.42  28.43 0.36   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.16    0.10  1.33  43.40  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.53  1.33  67.69  n/a   0.000
*
======================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\8087e0d4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\8087e0d4-

DATE: 09/05/2024                        TIME: 07:05:32

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 06 - CHI100YR.stm         **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      -------------------
    READ STORM                  10.0
    [ Ptot= 87.58 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\e328c1fb-c975-45ae-af1b
    remark: CHI100YR.stm
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.91  1.33  73.53 0.84   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  10.0
    [ Ptot= 87.58 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\e328c1fb-c975-45ae-af1b
    remark: CHI100YR.stm
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01  1.42  31.31 0.36   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  10.0
    [ Ptot= 87.58 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\e328c1fb-c975-45ae-af1b
    remark: CHI100YR.stm
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.76  1.33  81.38 0.93   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.76  1.33  81.38  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.10    0.16  1.33  81.38  n/a   0.000
```

```
     MINOR SYSTEM:     0301  3  5.0    1.54    0.60  1.25  81.38  n/a   0.000
*
   ADD [  0201+  0203]  0901  3  5.0    2.30    0.92  1.33  72.61  n/a   0.000
*
   ADD [  0901+  0301]  0901  1  5.0    3.84    1.52  1.33  76.13  n/a   0.000
*
   READ STORM                 10.0
   [ Ptot= 87.58 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\e328c1fb-c975-45ae-af1b
   remark: CHI100YR.stm
*
 * CALIB STANDHYD       0204  1  5.0    0.11    0.01  1.42  33.41 0.38   0.000
   [I%= 3.0:S%= 2.00]
*
   ADD [  0204+  0301]  0902  3  5.0    0.21    0.17  1.33  56.31  n/a   0.000
*
   ADD [  0901+  0902]  0903  3  5.0    4.05    1.69  1.33  75.10  n/a   0.000
*
==========================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\f2563e68-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\f2563e68-

DATE: 09/05/2024                           TIME: 07:05:34

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 07 - 2Y6H.STM               **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
   READ STORM                 15.0
   [ Ptot= 42.30 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a57f669c-56f0-4b46-a822
   remark: 2Y6H.STM
*
 * CALIB STANDHYD       0201  1  5.0    2.25    0.33  3.25  33.72 0.80   0.000
   [I%=78.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 42.30 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a57f669c-56f0-4b46-a822
   remark: 2Y6H.STM
*
 * CALIB STANDHYD       0203  1  5.0    0.05    0.00  3.42   7.86 0.19   0.000
   [I%= 1.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 42.30 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a57f669c-56f0-4b46-a822
   remark: 2Y6H.STM
*
 * CALIB STANDHYD       0202  1  5.0    1.64    0.28  3.25  38.25 0.90   0.000
   [I%=91.0:S%= 2.00]
```

```
*
   DUHYD                0301  1  5.0    1.64    0.28  3.25  38.25  n/a   0.000
     MAJOR SYSTEM:      0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
     MINOR SYSTEM:      0301  3  5.0    1.64    0.28  3.25  38.25  n/a   0.000
*
   ADD [  0201+  0203]  0901  3  5.0    2.30    0.33  3.25  33.16  n/a   0.000
*
   ADD [  0901+  0301]  0901  1  5.0    3.94    0.61  3.25  35.27  n/a   0.000
*
   READ STORM                 15.0
   [ Ptot= 42.30 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a57f669c-56f0-4b46-a822
   remark: 2Y6H.STM
*
 * CALIB STANDHYD       0204  1  5.0    0.11    0.00  3.42   9.34 0.22   0.000
   [I%= 3.0:S%= 2.00]
*
   ADD [  0204+  0301]  0902  3  5.0    0.11    0.00  3.42   9.34  n/a   0.000
*
   ADD [  0901+  0902]  0903  3  5.0    4.05    0.61  3.25  34.57  n/a   0.000
*
==========================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\cfbdc181-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\cfbdc181-

DATE: 09/05/2024                           TIME: 07:05:34

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 08 - 5Y6H.STM               **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
   READ STORM                 15.0
   [ Ptot= 59.50 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f14659f3-9c83-42d1-ba69
   remark: 5Y6H.STM
*
 * CALIB STANDHYD       0201  1  5.0    2.25    0.48  3.25  48.58 0.82   0.000
   [I%=78.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 59.50 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f14659f3-9c83-42d1-ba69
   remark: 5Y6H.STM
*
 * CALIB STANDHYD       0203  1  5.0    0.05    0.00  3.33  15.82 0.27   0.000
   [I%= 1.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 59.50 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f14659f3-9c83-42d1-ba69
   remark: 5Y6H.STM
```

```
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.39  3.25  54.52 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.39  3.25  54.52  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.39  3.25  54.52  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.48  3.25  47.87  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.87  3.25  50.64  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 59.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\f14659f3-9c83-42d1-ba69
    remark: 5Y6H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  3.33  17.33 0.29   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01  3.33  17.33  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.88  3.25  49.73  n/a   0.000
*
==========================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\3762f12c-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\3762f12c-

DATE: 09/05/2024                           TIME: 07:05:30

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 09 - 10Y6H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 70.80 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d1c2a790-43ba-4a79-91eb
    remark: 10Y6H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.58  3.25  58.53 0.83   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 70.80 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d1c2a790-43ba-4a79-91eb
    remark: 10Y6H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  3.33  21.63 0.31   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 70.80 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d1c2a790-43ba-4a79-91eb
    remark: 10Y6H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.47  3.25  65.29 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.47  3.25  65.29  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.47  3.25  65.29  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.58  3.25  57.73  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    1.05  3.25  60.88  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 70.80 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d1c2a790-43ba-4a79-91eb
    remark: 10Y6H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  3.33  23.41 0.33   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01  3.33  23.41  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.06  3.25  59.86  n/a   0.000
*
==========================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\fa88d476-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\fa88d476-

DATE: 09/05/2024                           TIME: 07:05:35

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 10 - 25Y6H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 85.20 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\333e42b4-1c1c-4a53-84bb
    remark: 25Y6H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.70  3.25  71.39 0.84   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 85.20 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\333e42b4-1c1c-4a53-84bb
    remark: 25Y6H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01  3.25  29.88 0.35   0.000
```

```
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 85.20 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\333e42b4-1c1c-4a53-84bb
    remark: 25Y6H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.57  3.25  79.09 0.93   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.57  3.25  79.09  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.57  3.25  79.09  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.71  3.25  70.49  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    1.28  3.25  74.07  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 85.20 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\333e42b4-1c1c-4a53-84bb
    remark: 25Y6H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01  3.25  31.93 0.37   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01  3.25  31.93  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.29  3.25  72.92  n/a   0.000
*
 FINISH
=========================================================================================================
=========================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\97345203-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\97345203-

DATE: 09/05/2024                           TIME: 07:05:33

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 11 - 50Y6H.STM             **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 95.90 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\0c236c11-5928-41bb-8b35
    remark: 50Y6H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.80  3.25  81.06 0.85   0.000
    [I%=78.0:S%= 2.00]
```

```
*
    READ STORM                  15.0
    [ Ptot= 95.90 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\0c236c11-5928-41bb-8b35
    remark: 50Y6H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01  3.25  36.47 0.38   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 95.90 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\0c236c11-5928-41bb-8b35
    remark: 50Y6H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.65  3.25  89.39 0.93   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.65  3.25  89.39  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.03    0.05  3.25  89.39  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.61    0.60  3.17  89.39  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.81  3.25  80.09  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.91    1.41  3.25  83.92  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 95.90 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\0c236c11-5928-41bb-8b35
    remark: 50Y6H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.02  3.25  38.74 0.40   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.14    0.06  3.25  49.07  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.47  3.25  82.73  n/a   0.000
*
=========================================================================================================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\80d5c34f-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\80d5c34f-

DATE: 09/05/2024                           TIME: 07:05:32

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 12 - 100Y6H.STM            **
  **************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot=106.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a901d005-564f-45e6-bb6e
    remark: 100Y6H.STM
```

```
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.89  3.25  90.71 0.85   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=106.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a901d005-564f-45e6-bb6e
    remark: 100Y6H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01  3.25  43.35 0.41   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=106.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a901d005-564f-45e6-bb6e
    remark: 100Y6H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.72  3.25  99.62 0.94   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.72  3.25  99.62  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.09    0.12  3.25  99.62  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.55    0.60  3.08  99.62  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.90  3.25  89.68  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.85    1.50  3.25  93.69  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=106.50 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a901d005-564f-45e6-bb6e
    remark: 100Y6H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.02  3.25  45.84 0.43   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.20    0.14  3.25  70.00  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.64  3.25  92.52  n/a   0.000
*
=========================================================================================================

       V    V   I    SSSSS  U    U    A    L              (v 6.2.2015)
       V    V   I    SS     U    U   A A   L
        V  V    I     SS    U    U  AAAAA  L
        V  V    I      SS   U    U  A   A  L
         VV     I    SSSSS  UUUUU  A    A  LLLLL

        OOO   TTTTT  TTTTT  H    H  Y   Y  M    M   OOO     TM
       O   O    T      T    H    H   Y Y   MM MM  O   O
       O   O    T      T    H    H    Y    M    M  O   O
        OOO     T      T    H    H    Y    M    M   OOO
```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6146620c-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6146620c-

DATE: 09/05/2024                        TIME: 07:05:31

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 13 - 2Y12H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.    Qbase
                                  min      ha   '  cms   hrs     mm           cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 46.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\c895c294-0717-4720-be3a
    remark: 2Y12H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.30  6.25  37.47 0.80   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 46.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\c895c294-0717-4720-be3a
    remark: 2Y12H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00  6.42   8.22 0.18   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 46.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\c895c294-0717-4720-be3a
    remark: 2Y12H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.26  6.25  42.38 0.91   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.26  6.25  42.38  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.26  6.25  42.38  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.30  6.25  36.83  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.56  6.25  39.14  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 46.69 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\c895c294-0717-4720-be3a
    remark: 2Y12H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.00  6.25  11.21 0.24   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.00  6.25  11.21  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.56  6.25  38.38  n/a   0.000
*
=========================================================================================================

       V    V   I    SSSSS  U    U    A    L              (v 6.2.2015)
       V    V   I    SS     U    U   A A   L
        V  V    I     SS    U    U  AAAAA  L
        V  V    I      SS   U    U  A   A  L
         VV     I    SSSSS  UUUUU  A    A  LLLLL

        OOO   TTTTT  TTTTT  H    H  Y   Y  M    M   OOO     TM
       O   O    T      T    H    H   Y Y   MM MM  O   O
       O   O    T      T    H    H    Y    M    M  O   O
        OOO     T      T    H    H    Y    M    M   OOO
```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\80af5499-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\80af5499-

DATE: 09/05/2024                        TIME: 07:05:32

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 14 - 5Y12H.STM            **
  ************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.    Qbase
                                  min      ha   '  cms   hrs     mm           cms
```

```
      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 64.31 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\5c387f65-ec7b-4540-b7a0
    remark: 5Y12H.STM
*
 *  CALIB STANDHYD        0201  1  5.0    2.25    0.44  6.25  52.80 0.82   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 64.31 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\5c387f65-ec7b-4540-b7a0
    remark: 5Y12H.STM
*
 *  CALIB STANDHYD        0203  1  5.0    0.05    0.00  6.33  17.15 0.27   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 64.31 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\5c387f65-ec7b-4540-b7a0
    remark: 5Y12H.STM
*
 *  CALIB STANDHYD        0202  1  5.0    1.64    0.36  6.25  59.10 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                 0301  1  5.0    1.64    0.36  6.25  59.10  n/a   0.000
       MAJOR SYSTEM:      0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:      0301  3  5.0    1.64    0.36  6.25  59.10  n/a   0.000
*
    ADD [  0201+  0203]   0901  3  5.0    2.30    0.44  6.25  52.02  n/a   0.000
*
    ADD [  0901+  0301]   0901  1  5.0    3.94    0.80  6.25  54.97  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 64.31 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\5c387f65-ec7b-4540-b7a0
    remark: 5Y12H.STM
*
 *  CALIB STANDHYD        0204  1  5.0    0.11    0.01  6.33  19.82 0.31   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]   0902  3  5.0    0.11    0.01  6.33  19.82  n/a   0.000
*
    ADD [  0901+  0902]   0903  3  5.0    4.05    0.81  6.25  54.01  n/a   0.000
*
==============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1847e3c6-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1847e3c6-

DATE: 09/05/2024                              TIME: 07:05:29

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 15 - 10Y12H.STM           **
  ************************************************
```

```
  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.    Qbase
                                  min      ha   '  cms   hrs     mm           cms
      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d4419be2-ea45-4388-bc83
    remark: 10Y12H.STM
*
 *  CALIB STANDHYD        0201  1  5.0    2.25    0.52  6.25  63.15 0.83   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d4419be2-ea45-4388-bc83
    remark: 10Y12H.STM
*
 *  CALIB STANDHYD        0203  1  5.0    0.05    0.00  6.33  24.51 0.32   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d4419be2-ea45-4388-bc83
    remark: 10Y12H.STM
*
 *  CALIB STANDHYD        0202  1  5.0    1.64    0.43  6.25  70.27 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                 0301  1  5.0    1.64    0.43  6.25  70.27  n/a   0.000
       MAJOR SYSTEM:      0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:      0301  3  5.0    1.64    0.43  6.25  70.27  n/a   0.000
*
    ADD [  0201+  0203]   0901  3  5.0    2.30    0.53  6.25  62.31  n/a   0.000
*
    ADD [  0901+  0301]   0901  1  5.0    3.94    0.96  6.25  65.62  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 76.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\d4419be2-ea45-4388-bc83
    remark: 10Y12H.STM
*
 *  CALIB STANDHYD        0204  1  5.0    0.11    0.01  6.33  26.39 0.35   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]   0902  3  5.0    0.11    0.01  6.33  26.39  n/a   0.000
*
    ADD [  0901+  0902]   0903  3  5.0    4.05    0.96  6.25  64.56  n/a   0.000
*
==============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\647febb1-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\647febb1-

DATE: 09/05/2024                              TIME: 07:05:31

USER:

COMMENTS: ____________________________________________________________

  ************************************************
```

```
 ** SIMULATION : Run 16 - 25Y12H.STM           **
 ************************************************

 W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                 15.0
   [ Ptot= 90.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\067f4bd3-eee4-4716-8775
   remark: 25Y12H.STM
*
 * CALIB STANDHYD       0201  1  5.0    2.25    0.63  6.25  76.34 0.84   0.000
   [I%=78.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 90.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\067f4bd3-eee4-4716-8775
   remark: 25Y12H.STM
*
 * CALIB STANDHYD       0203  1  5.0    0.05    0.01  6.25  33.21 0.37   0.000
   [I%= 1.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot= 90.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\067f4bd3-eee4-4716-8775
   remark: 25Y12H.STM
*
 * CALIB STANDHYD       0202  1  5.0    1.64    0.52  6.25  84.37 0.93   0.000
   [I%=91.0:S%= 2.00]
*
   DUHYD                0301  1  5.0    1.64    0.52  6.25  84.37  n/a   0.000
      MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
      MINOR SYSTEM:     0301  3  5.0    1.64    0.52  6.25  84.37  n/a   0.000
*
   ADD [  0201+  0203]  0901  3  5.0    2.30    0.64  6.25  75.40  n/a   0.000
*
   ADD [  0901+  0301]  0901  1  5.0    3.94    1.16  6.25  79.14  n/a   0.000
*
   READ STORM                 15.0
   [ Ptot= 90.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\067f4bd3-eee4-4716-8775
   remark: 25Y12H.STM
*
 * CALIB STANDHYD       0204  1  5.0    0.11    0.01  6.25  35.38 0.39   0.000
   [I%= 3.0:S%= 2.00]
*
   ADD [  0204+  0301]  0902  3  5.0    0.11    0.01  6.25  35.38  n/a   0.000
*
   ADD [  0901+  0902]  0903  3  5.0    4.05    1.17  6.25  77.95  n/a   0.000
*
==================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                  *****  S U M M A R Y   O U T P U T  *****

 Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
 Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\81295605-
 Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\81295605-

DATE: 09/05/2024                          TIME: 07:05:32

USER:

COMMENTS: ____________________________________________________________
```

```
 ************************************************
 ** SIMULATION : Run 17 - 50Y12H.STM           **
 ************************************************

 W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                 min     ha   '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
   READ STORM                 15.0
   [ Ptot=101.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\278120d1-deee-44f9-baf3
   remark: 50Y12H.STM
*
 * CALIB STANDHYD       0201  1  5.0    2.25    0.72  6.25  86.32 0.85   0.000
   [I%=78.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot=101.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\278120d1-deee-44f9-baf3
   remark: 50Y12H.STM
*
 * CALIB STANDHYD       0203  1  5.0    0.05    0.01  6.25  40.18 0.40   0.000
   [I%= 1.0:S%= 2.00]
*
   READ STORM                 15.0
   [ Ptot=101.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\278120d1-deee-44f9-baf3
   remark: 50Y12H.STM
*
 * CALIB STANDHYD       0202  1  5.0    1.64    0.58  6.25  94.98 0.93   0.000
   [I%=91.0:S%= 2.00]
*
   DUHYD                0301  1  5.0    1.64    0.58  6.25  94.98  n/a   0.000
      MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
      MINOR SYSTEM:     0301  3  5.0    1.64    0.58  6.25  94.98  n/a   0.000
*
   ADD [  0201+  0203]  0901  3  5.0    2.30    0.73  6.25  85.32  n/a   0.000
*
   ADD [  0901+  0301]  0901  1  5.0    3.94    1.31  6.25  89.34  n/a   0.000
*
   READ STORM                 15.0
   [ Ptot=101.69 mm ]
   fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\278120d1-deee-44f9-baf3
   remark: 50Y12H.STM
*
 * CALIB STANDHYD       0204  1  5.0    0.11    0.02  6.25  42.60 0.42   0.000
   [I%= 3.0:S%= 2.00]
*
   ADD [  0204+  0301]  0902  3  5.0    0.11    0.02  6.25  42.60  n/a   0.000
*
   ADD [  0901+  0902]  0903  3  5.0    4.05    1.32  6.25  88.07  n/a   0.000
*
==================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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```
                  *****  S U M M A R Y   O U T P U T  *****

 Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
 Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\77860c31-
 Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\77860c31-

DATE: 09/05/2024                          TIME: 07:05:32

USER:
```

```
COMMENTS: _____________________________________________________________


  **************************************************
  ** SIMULATION : Run 18 - 100Y12H.STM           **
  **************************************************

  W/E COMMAND              HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot=112.51 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a3ebeba9-ef50-472e-a122
    remark: 100Y12H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.80  6.25  96.22 0.86   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot=112.51 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a3ebeba9-ef50-472e-a122
    remark: 100Y12H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01  6.25  47.38 0.42   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot=112.51 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a3ebeba9-ef50-472e-a122
    remark: 100Y12H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.64  6.25 105.44 0.94   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.64  6.25 105.44  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.02    0.04  6.25 105.44  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.62    0.60  6.17 105.44  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.81  6.25  95.15  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.92    1.41  6.25  99.40  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=112.51 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a3ebeba9-ef50-472e-a122
    remark: 100Y12H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.02  6.25  50.02 0.44   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.13    0.06  6.25  59.49  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.47  6.25  98.09  n/a   0.000
*
===================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6fe0aec5-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\6fe0aec5-
```

```
DATE: 09/05/2024                        TIME: 07:05:31

USER:


COMMENTS: _____________________________________________________________


  **************************************************
  ** SIMULATION : Run 19 - 2Y24H.STM             **
  **************************************************

  W/E COMMAND              HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\4e7c09b0-b15a-4fe3-9b0e
    remark: 2Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.30 12.25  44.66 0.81   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\4e7c09b0-b15a-4fe3-9b0e
    remark: 2Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00 12.33   9.83 0.18   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\4e7c09b0-b15a-4fe3-9b0e
    remark: 2Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.26 12.25  50.25 0.91   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.26 12.25  50.25  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.26 12.25  50.25  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.30 12.25  43.90  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.56 12.25  46.54  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\4e7c09b0-b15a-4fe3-9b0e
    remark: 2Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.00 12.25  13.97 0.25   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.00 12.25  13.97  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.56 12.25  45.66  n/a   0.000
*
===================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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```
                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\813ac1c5-
```

```
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\813ac1c5-

DATE: 09/05/2024                        TIME: 07:05:33

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 20 - 5Y24H.STM              **
  **************************************************

  W/E COMMAND              HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 76.01 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a413c5aa-9732-4ea5-a7b8
    remark: 5Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.44 12.25  63.16 0.83   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 76.01 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a413c5aa-9732-4ea5-a7b8
    remark: 5Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00 12.33  22.50 0.30   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 76.01 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a413c5aa-9732-4ea5-a7b8
    remark: 5Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.36 12.25  70.27 0.92   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.36 12.25  70.27  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.36 12.25  70.27  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.44 12.25  62.28  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.80 12.25  65.61  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 76.01 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\a413c5aa-9732-4ea5-a7b8
    remark: 5Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01 12.33  26.39 0.35   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01 12.33  26.39  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.80 12.25  64.54  n/a   0.000
*
=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```


***** S U M M A R Y   O U T P U T *****

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\3efb8eb4-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\3efb8eb4-

DATE: 09/05/2024                        TIME: 07:05:30

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Run 21 - 10Y24H.STM             **
  **************************************************

  W/E COMMAND              HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                  15.0
    [ Ptot= 89.94 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\88f4b56d-ec00-487a-a26d
    remark: 10Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.52 12.25  75.66 0.84   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 89.94 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\88f4b56d-ec00-487a-a26d
    remark: 10Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.00 12.25  30.27 0.34   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 89.94 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\88f4b56d-ec00-487a-a26d
    remark: 10Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.42 12.25  83.65 0.93   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.42 12.25  83.65  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.42 12.25  83.65  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.53 12.25  74.67  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.95 12.25  78.41  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 89.94 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\88f4b56d-ec00-487a-a26d
    remark: 10Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01 12.25  34.92 0.39   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01 12.25  34.92  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.96 12.25  77.23  n/a   0.000
*
=============================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO     TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

```
              *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\a82c8565-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\a82c8565-

DATE: 09/05/2024                          TIME: 07:05:33

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 22 - 25Y24H.STM           **
  ************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min      ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=107.47 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\468f02aa-a25e-4fb5-b418
    remark: 25Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.64 12.25  91.60 0.85   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=107.47 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\468f02aa-a25e-4fb5-b418
    remark: 25Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01 12.25  43.97 0.41   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=107.47 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\468f02aa-a25e-4fb5-b418
    remark: 25Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.51 12.25 100.56 0.94   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.51 12.25 100.56  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.51 12.25 100.56  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.64 12.25  90.57  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    1.16 12.25  94.73  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=107.47 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\468f02aa-a25e-4fb5-b418
    remark: 25Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01 12.25  46.52 0.43   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01 12.25  46.52  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.17 12.25  93.42  n/a   0.000
*
==========================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```



```
              *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\00ca6188-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\00ca6188-

DATE: 09/05/2024                          TIME: 07:05:29

USER:

COMMENTS: ____________________________________________________________

  ************************************************
  ** SIMULATION : Run 23 - 50Y24H.STM           **
  ************************************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min      ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=120.63 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\bb99b713-4871-4330-8b2c
    remark: 50Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.72 12.25 103.69 0.86   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=120.63 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\bb99b713-4871-4330-8b2c
    remark: 50Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01 12.25  53.03 0.44   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=120.63 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\bb99b713-4871-4330-8b2c
    remark: 50Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.58 12.25 113.31 0.94   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.58 12.25 113.31  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.58 12.25 113.31  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.73 12.25 102.59  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    1.31 12.25 107.05  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=120.63 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\bb99b713-4871-4330-8b2c
    remark: 50Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.02 12.25  55.76 0.46   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.02 12.25  55.76  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.32 12.25 105.66  n/a   0.000
*
==========================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
```

```
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\2203061a-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\2203061a-


DATE: 09/05/2024                           TIME: 07:05:30

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 24 - 100Y24H.STM          **
  ************************************************

  W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min    ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\ccb65c87-fee8-4ab2-8cca
    remark: 100Y24H.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.80 12.25 115.70 0.87   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\ccb65c87-fee8-4ab2-8cca
    remark: 100Y24H.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01 12.25  62.29 0.47   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\ccb65c87-fee8-4ab2-8cca
    remark: 100Y24H.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.64 12.25 125.91 0.94   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.64 12.25 125.91  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.02    0.04 12.25 125.91  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.62    0.60 12.17 125.91  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.81 12.25 114.54  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.92    1.41 12.25 119.24  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\d7f25106-a756-47e0-acc8-df68738fb948\ccb65c87-fee8-4ab2-8cca
    remark: 100Y24H.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.02 12.25  65.26 0.49   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.13    0.06 12.25  73.88  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    1.48 12.25 117.81  n/a   0.000
*
```

```
==================================================================================================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                   *****  S U M M A R Y   O U T P U T  *****

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1c4fa7a3-
  Summary filename: C:\Users\lcarretas\AppData\Local\Civica\VH5\0b709f27-27fd-40eb-a716-31abc2b8d4c0\1c4fa7a3-

DATE: 09/05/2024                           TIME: 07:09:13

USER:

COMMENTS: ____________________________________________________________

  **************************************************
  ** SIMULATION : Regional (Hazel)                **
  **************************************************

  W/E COMMAND            HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
    READ STORM                12.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\2888a766-397e-4afc-a148-e54f7614b026\6900206a-ba94-4182-8717
    remark: HAZEL.STM
*
 *  CALIB STANDHYD       0201  1  5.0    2.25    0.32 10.00 198.36 0.94   0.000
    [I%=78.0:S%= 2.00]
*
    READ STORM                12.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\2888a766-397e-4afc-a148-e54f7614b026\6900206a-ba94-4182-8717
    remark: HAZEL.STM
*
 *  CALIB STANDHYD       0203  1  5.0    0.05    0.01 10.00 161.01 0.76   0.000
    [I%= 1.0:S%= 2.00]
*
    READ STORM                12.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\2888a766-397e-4afc-a148-e54f7614b026\6900206a-ba94-4182-8717
    remark: HAZEL.STM
*
 *  CALIB STANDHYD       0202  1  5.0    1.64    0.24 10.00 206.11 0.97   0.000
    [I%=91.0:S%= 2.00]
*
    DUHYD                0301  1  5.0    1.64    0.24 10.00 206.11  n/a   0.000
       MAJOR SYSTEM:     0301  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
       MINOR SYSTEM:     0301  3  5.0    1.64    0.24 10.00 206.11  n/a   0.000
*
    ADD [  0201+  0203]  0901  3  5.0    2.30    0.33 10.00 197.55  n/a   0.000
*
    ADD [  0901+  0301]  0901  1  5.0    3.94    0.57 10.00 201.11  n/a   0.000
*
    READ STORM                12.0
    [ Ptot=212.00 mm ]
    fname : C:\Users\lcarretas\AppData\Local\Temp\2888a766-397e-4afc-a148-e54f7614b026\6900206a-ba94-4182-8717
    remark: HAZEL.STM
*
 *  CALIB STANDHYD       0204  1  5.0    0.11    0.01 10.00 163.77 0.77   0.000
    [I%= 3.0:S%= 2.00]
*
    ADD [  0204+  0301]  0902  3  5.0    0.11    0.01 10.00 163.77  n/a   0.000
*
    ADD [  0901+  0902]  0903  3  5.0    4.05    0.58 10.00 200.10  n/a   0.000
*
 FINISH

==================================================================================================
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TATHAM ENGINEERING

Storm Sewer Design Sheet

Version Date:	September 6, 2024
Version Number:	2

Project Information

The Village of Innis Landing, 800 Yonge Street	422426

Drawing Reference

Storm Sewer Catchment Plan (Drawing STM-1)	September 6/24

Prepared By

LJC/JLM	September 6/24

Reviewed By

LC/JG	September 6/24

Municipality

City of Barrie

Runoff Coefficient Adjustment

Equation	1	
Year	**A**	**B**
10	1.00	0.00
25	1.10	0.00
50	1.20	0.00
100	1.25	0.00

Time of Concentration

10 mins

IDF Curve Coefficients

Year	A	B	C
2	675.59	4.68	0.78
5	843.02	4.58	0.76
10	976.90	4.75	0.76
25	1133.12	4.73	0.76
50	1251.47	4.85	0.75
100	1383.63	4.91	0.75

Manning's Coefficient

Material	Value
CSP	0.024
Concrete	0.013
PVC	0.013

Notes

Engineer Stamp

Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area × Runoff Coefficient	Cumulative Area (ha)	Cumulative Area × Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m^3/s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m^3/s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)	Total Time of Travel (min)
North Sewers TBD by Mech	301	DRAIN1	STM PLUG1	0.16	0.95	5	0.95	0.15	0.16	0.15	10.00	109.11	0.046	0.013	37.5	0.5%	300	0.97	0.068	0.97	0.65	259	67.4%	10.65
Ph. 4A Roof Leader TBD by Mech	302	Ph. 4A Roof	STM PLUG1	0.10	0.95	5	0.95	0.10	0.10	0.10	10.00	109.11	0.029	0.013	11.0	0.5%	300	0.97	0.068	0.86	0.21	217	42.1%	10.21
North Sewers	-	STM PLUG1	CBMH1	-	-	5	-	0.00	0.26	0.25	10.65	105.55	0.072	0.013	3.6	0.5%	375	1.12	0.124	1.09	0.05	306	58.4%	10.70
North Sewers	303	CBMH1	DCBMH1	0.11	0.95	5	0.95	0.10	0.37	0.35	10.70	105.27	0.103	0.013	45.6	0.5%	375	1.12	0.124	1.12	0.68	349	82.9%	11.38
North Sewers	304	DCB1	DCBMH1	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	21.1	0.5%	300	0.97	0.068	0.78	0.45	190	29.5%	10.45
North Sewers	305	DCBMH1	DCBMH3	0.08	0.95	5	0.95	0.08	0.52	0.49	11.38	101.84	0.140	0.013	20.4	0.5%	450	1.27	0.202	1.27	0.27	392	69.3%	11.65
North Sewers	306	STM PLUG2	STM MH2	0.05	0.95	5	0.95	0.05	0.05	0.05	10.00	109.11	0.014	0.013	16.4	0.5%	300	0.99	0.070	0.72	0.38	166	20.6%	10.38
North Sewers	307	STM PLUG3	STM MH2	0.18	0.95	5	0.95	0.17	0.18	0.17	10.00	109.11	0.052	0.013	21.3	0.5%	300	0.97	0.068	0.97	0.37	270	75.8%	10.37
North Sewers	308	STM PLUG4	STM MH2	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	15.4	0.5%	300	0.97	0.068	0.62	0.41	138	12.6%	10.41
North Sewers	-	STM MH2	STM MH3	-	-	5	-	0.00	0.26	0.25	10.37	107.06	0.073	0.013	20.4	0.5%	375	1.12	0.124	1.10	0.31	308	59.2%	10.68
North Sewers	309	STM PLUG5	STM MH3	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	15.4	0.5%	300	0.97	0.068	0.62	0.41	138	12.6%	10.41
North Sewers	-	STM MH3	STM MH4	-	-	5	-	0.00	0.29	0.28	10.68	105.39	0.081	0.013	5.4	0.5%	375	1.12	0.124	1.12	0.08	319	65.1%	10.76
North Sewers	-	STM MH4	DCBMH2	-	-	5	-	0.00	0.29	0.28	10.76	104.97	0.080	0.013	4.6	0.5%	375	1.12	0.124	1.12	0.07	319	64.8%	10.83
North Sewers	310	DCBMH2	DCBMH3	0.06	0.95	5	0.95	0.06	0.35	0.33	10.83	104.62	0.097	0.013	21.1	0.5%	375	1.12	0.124	1.12	0.31	341	77.9%	11.14
North Sewers	311	DCBMH3	DCBMH4	0.07	0.95	5	0.95	0.07	0.94	0.89	11.65	100.55	0.249	0.013	52.2	0.5%	525	1.40	0.304	1.40	0.62	487	82.0%	12.27

TATHAM ENGINEERING

Storm Sewer Design Sheet

Version Date:	September 6, 2024
Version Number:	2

Project Information

The Village of Innis Landing, 800 Yonge Street	422426

Drawing Reference

Storm Sewer Catchment Plan (Drawing STM-1)	September 6/24

Prepared By

LJC/JLM	September 6/24

Reviewed By

LC/JG	September 6/24

Municipality

City of Barrie

Runoff Coefficient Adjustment

Equation	1	
Year	**A**	**B**
10	1.00	0.00
25	1.10	0.00
50	1.20	0.00
100	1.25	0.00

Time of Concentration

10 mins

IDF Curve Coefficients

Year	A	B	C
2	675.59	4.68	0.78
5	843.02	4.58	0.76
10	976.90	4.75	0.76
25	1133.12	4.73	0.76
50	1251.47	4.85	0.75
100	1383.63	4.91	0.75

Manning's Coefficient

Material	Value
CSP	0.024
Concrete	0.013
PVC	0.013

Notes

Engineer Stamp

Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area × Runoff Coefficient	Cumulative Area (ha)	Cumulative Area × Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m^3/s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m^3/s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)	Total Time of Travel (min)
North Sewers	312	DCB2	DCBMH4	0.06	0.95	5	0.95	0.06	0.06	0.06	10.00	109.11	0.017	0.013	24.3	0.5%	300	0.97	0.068	0.75	0.54	179	25.3%	10.54
North Sewers	313	DCBMH4	DCBMH5	0.12	0.95	5	0.95	0.11	1.12	1.06	12.27	97.72	0.289	0.013	20.1	0.6%	525	1.54	0.333	1.54	0.22	497	86.7%	12.48
North Sewers	314	STM PLUG6	STM MH5	0.05	0.95	5	0.95	0.05	0.05	0.05	10.00	109.11	0.014	0.013	21.0	0.5%	300	0.97	0.068	0.71	0.49	167	21.1%	10.49
North Sewers	315	STM PLUG7	STM MH5	0.17	0.95	5	0.95	0.16	0.17	0.16	10.00	109.11	0.049	0.013	19.2	0.5%	300	0.97	0.068	0.97	0.33	265	71.6%	10.33
North Sewers	-	STM MH5	STM MH6	-	-	5	-	0.00	0.22	0.21	10.33	107.25	0.062	0.013	20.1	0.5%	375	1.12	0.124	1.05	0.32	290	50.2%	10.65
North Sewers	316	STM PLUG8	STM MH6	0.10	0.95	5	0.95	0.10	0.10	0.10	10.00	109.11	0.029	0.013	11.0	0.5%	300	0.97	0.068	0.86	0.21	217	42.1%	10.21
North Sewers	-	STM MH6	STM MH7	-	-	5	-	0.00	0.32	0.30	10.65	105.53	0.089	0.013	5.6	0.5%	375	1.12	0.124	1.12	0.08	331	71.9%	10.73
North Sewers	317	STM PLUG9	STM MH7	0.06	0.95	5	0.95	0.06	0.06	0.06	10.00	109.11	0.017	0.013	11.9	0.5%	300	0.97	0.068	0.75	0.26	179	25.3%	10.26
North Sewers	-	STM MH7	DCBMH6	-	-	5	-	0.00	0.38	0.36	10.73	105.10	0.105	0.013	5.6	0.5%	375	1.12	0.124	1.12	0.08	353	85.0%	10.82
North Sewers	318	DCBMH6	DCBMH5	0.05	0.95	5	0.95	0.05	0.43	0.41	10.82	104.66	0.119	0.013	24.3	0.5%	450	1.27	0.202	1.24	0.33	369	58.9%	11.14
North Sewers	319	DCBMH5	STM MH8	0.11	0.95	5	0.95	0.10	1.66	1.58	12.48	96.77	0.424	0.013	23.2	0.6%	600	1.68	0.476	1.68	0.23	574	89.1%	12.71
North Sewers	-	STM MH8	STM MH9	-	-	5	-	0.00	1.66	1.58	12.71	95.79	0.420	0.013	8.1	0.6%	600	1.68	0.476	1.68	0.08	572	88.2%	12.79
North Sewers	-	STM MH9	STM MH10	-	-	5	-	0.00	1.66	1.58	12.79	95.45	0.418	0.013	50.0	0.6%	600	1.68	0.476	1.68	0.50	571	87.9%	13.29
West Sewers	-	STM MH10	STM MH11	-	-	5	-	0.00	1.66	1.58	13.29	93.42	0.409	0.013	42.9	0.6%	600	1.68	0.476	1.68	0.43	567	86.0%	13.71
West Sewers	320	STM PLUG10	STM MH12	0.08	0.95	5	0.95	0.08	0.08	0.08	10.00	109.11	0.023	0.013	19.6	0.5%	300	0.97	0.068	0.81	0.40	199	33.7%	10.40
West Sewers	321	STM PLUG11	STM MH12	0.04	0.95	5	0.95	0.04	0.04	0.04	10.00	109.11	0.012	0.013	3.7	0.5%	300	0.97	0.068	0.67	0.09	154	16.8%	10.09

TATHAM ENGINEERING

Storm Sewer Design Sheet

Version Date:	September 6, 2024
Version Number:	2

Project Information

The Village of Innis Landing, 800 Yonge Street	422426

Drawing Reference

Storm Sewer Catchment Plan (Drawing STM-1)	September 6/24

Prepared By

LJC/JLM	September 6/24

Reviewed By

LC/JG	September 6/24

Municipality

City of Barrie

Runoff Coefficient Adjustment

Equation	1	
Year	**A**	**B**
10	1.00	0.00
25	1.10	0.00
50	1.20	0.00
100	1.25	0.00

Time of Concentration

10 mins

IDF Curve Coefficients

Year	A	B	C
2	675.59	4.68	0.78
5	843.02	4.58	0.76
10	976.90	4.75	0.76
25	1133.12	4.73	0.76
50	1251.47	4.85	0.75
100	1383.63	4.91	0.75

Manning's Coefficient

Material	Value
CSP	0.024
Concrete	0.013
PVC	0.013

Notes

Engineer Stamp

Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area × Runoff Coefficient	Cumulative Area (ha)	Cumulative Area × Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m³/s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m³/s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)	Total Time of Travel (min)
West Sewers	322	STM PLUG12	STM MH12	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	7.2	0.5%	300	0.97	0.068	0.78	0.15	190	29.5%	10.15
West Sewers	-	STM MH12	STM MH13	-	-	5	-	0.00	0.19	0.18	10.40	106.86	0.054	0.013	10.7	0.5%	300	0.97	0.068	0.97	0.18	274	78.4%	10.59
West Sewers	-	STM MH13	STM MH11	-	-	5	-	0.00	0.19	0.18	10.59	105.87	0.053	0.013	15.6	0.5%	375	1.12	0.124	1.00	0.26	273	42.8%	10.85
West Sewers	-	STM MH11	OGS1	-	-	5	-	0.00	1.85	1.76	13.71	91.76	0.448	0.013	44.9	0.5%	675	1.66	0.594	1.66	0.45	607	75.4%	14.16
South Sewers TBD by Mech	323	DRAIN2	DRAIN3	0.17	0.95	5	0.95	0.16	0.17	0.16	10.00	109.11	0.049	0.013	40.9	0.5%	300	0.97	0.068	0.97	0.70	265	71.6%	10.70
Ph. 4B Roof Leader TBD by Mech	324	Ph. 4B Roof	DRAIN3	0.13	0.95	5	0.95	0.12	0.13	0.12	10.00	109.11	0.037	0.013	5.0	0.5%	300	0.97	0.068	0.92	0.09	239	54.7%	10.09
South Sewers TBD by Mech	325	DRAIN3	DRAIN4	0.10	0.95	5	0.95	0.10	0.40	0.38	10.33	107.25	0.113	0.013	17.4	0.6%	375	1.23	0.136	1.23	0.24	350	83.4%	10.57
South Sewers TBD by Mech	326	DRAIN4	DRAIN5	0.18	0.95	5	0.95	0.17	0.58	0.55	10.57	105.98	0.162	0.013	58.5	0.5%	450	1.27	0.202	1.27	0.77	415	80.5%	11.34
South Sewers	327	STM PLUG13	STM MH15	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	24.2	0.5%	300	0.97	0.068	0.62	0.65	138	12.6%	10.65
South Sewers	328	STM PLUG14	STM MH15	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	5.6	0.5%	300	0.93	0.066	0.76	0.12	193	30.7%	10.12
South Sewers	-	STM MH15	STM MH16	-	-	5	-	0.00	0.10	0.10	10.45	106.61	0.028	0.013	9.8	0.5%	300	0.97	0.068	0.86	0.19	215	41.1%	10.64
South Sewers	329	STM PLUG15	STM MH16	0.02	0.95	5	0.95	0.02	0.02	0.02	10.00	109.11	0.006	0.013	6.7	0.5%	300	0.97	0.068	0.56	0.20	119	8.4%	10.20
South Sewers	-	STM MH16	STM MH19	-	-	5	-	0.00	0.12	0.11	10.64	105.58	0.033	0.013	18.4	0.5%	375	1.12	0.124	0.89	0.35	229	27.0%	10.99
South Sewers	-	STM MH19	STM PLUG20	-	-	5	-	0.00	0.12	0.11	10.99	103.79	0.033	0.013	10.3	0.5%	375	1.12	0.124	0.88	0.19	228	26.5%	11.18
South Sewers TBD by Mech	-	STM PLUG20	DRAIN5	-	-	5	-	0.00	0.12	0.11	11.18	102.81	0.033	0.013	33.9	0.5%	375	1.12	0.124	0.88	0.64	227	26.3%	11.82
South Sewers	330	STM PLUG16	STM MH17	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	5.3	0.5%	300	0.97	0.068	0.78	0.11	190	29.5%	10.11

TATHAM ENGINEERING

Storm Sewer Design Sheet

Version Date:	September 6, 2024
Version Number:	2

Project Information

The Village of Innis Landing, 800 Yonge Street	422426

Drawing Reference

Storm Sewer Catchment Plan (Drawing STM-1)	September 6/24

Prepared By

LJC/JLM	September 6/24

Reviewed By

LC/JG	September 6/24

Municipality

City of Barrie

Runoff Coefficient Adjustment

Equation	1	
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10 mins

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Manning's Coefficient

Material	Value
CSP	0.024
Concrete	0.013
PVC	0.013

Notes

Engineer Stamp

Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area × Runoff Coefficient	Cumulative Area (ha)	Cumulative Area × Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m^3/s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m^3/s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)	Total Time of Travel (min)
South Sewers	331	STM PLUG17	STM MH17	0.04	0.95	5	0.95	0.04	0.04	0.04	10.00	109.11	0.012	0.013	30.4	0.5%	300	0.97	0.068	0.67	0.75	154	16.8%	10.75
South Sewers	-	STM MH17	STM MH18	-	-	5	-	0.00	0.11	0.10	10.45	106.61	0.031	0.013	6.2	0.5%	300	0.97	0.068	0.88	0.12	223	45.3%	10.57
South Sewers	332	STM PLUG18	STM MH18	0.02	0.95	5	0.95	0.02	0.02	0.02	10.00	109.11	0.006	0.013	13.8	0.5%	300	0.97	0.068	0.56	0.41	119	8.4%	10.41
South Sewers	-	STM MH18	STM MH20	-	-	5	-	0.00	0.13	0.12	10.57	105.97	0.036	0.013	10.5	0.5%	**375**	1.12	0.124	0.91	0.19	237	29.3%	10.76
South Sewers	-	STM MH20	STM PLUG19	-	-	5	-	0.00	0.13	0.12	10.76	104.95	0.036	0.013	12.2	0.5%	**375**	1.12	0.124	0.90	0.22	236	29.0%	10.99
South Sewers TBD by Mech	-	STM PLUG19	DRAIN5	-	-	5	-	0.00	0.13	0.12	10.99	103.79	0.036	0.013	26.2	0.5%	**375**	1.12	0.124	0.90	0.48	235	28.7%	11.47
South Sewers TBD by Mech	333	DRAIN5	DRAIN6	0.67	0.73	5	0.73	0.49	1.50	1.28	11.34	102.05	0.362	0.013	49.9	0.5%	600	1.54	0.434	1.54	0.54	560	83.4%	11.88
South Sewers TBD by Mech	334	DRAIN6	STM PLUG21	0.15	0.95	5	0.95	0.14	1.65	1.42	11.88	99.47	0.392	0.013	22.2	0.6%	600	1.68	0.476	1.68	0.22	558	82.5%	12.10
Storm Sewers	-	STM PLUG21	STM MH21	-	-	5	-	0.00	1.65	1.42	12.10	98.47	0.388	0.013	41.8	0.6%	600	1.68	0.476	1.68	0.41	556	81.7%	12.51
Storm Sewers	-	STM MH21	STM MH22	-	-	5	-	0.00	1.65	1.42	12.51	96.65	0.381	0.013	23.6	0.6%	600	1.68	0.476	1.68	0.23	552	80.2%	12.75
Storm Sewers	-	STM MH22	CBMH4	-	-	5	-	0.00	1.65	1.42	12.75	95.65	0.377	0.013	31.2	0.6%	600	1.68	0.476	1.68	0.31	550	79.3%	13.05
Storm Sewers	335	CBMH4	CBMH5	0.21	0.73	5	0.73	0.15	1.86	1.57	13.05	94.37	0.412	0.013	38.8	0.6%	600	1.68	0.476	1.68	0.38	569	86.7%	13.44
Storm Sewers	336	CBMH5	OGS1	0.12	0.95	5	0.95	0.11	1.98	1.69	13.44	92.83	0.435	0.013	14.0	0.5%	**675**	1.66	0.594	1.66	0.14	600	73.2%	13.58
OUTLET	-	OGS1	EX. STUB	-	-	5	-	0.00	3.83	3.44	14.16	90.07	0.862	0.013	4.4	0.5%	825	1.90	1.015	1.90	0.04	776	84.9%	14.20

Appendix D: OGS Unit Details

ADS OGS Sizing Summary

Project Name:	The Village of Innis Landing - 800 Yonge Street		
Consulting Engineer:	Tatham Engineering		
Location:	Barrie, Ontario		
Sizing Completed By:	Haider Nasrullah	**Email:**	haider.nasrullah@adspipe.com

Treatment Requirements		
Treatment Goal:	Enhanced (MOE)	
Selected Parameters:	80% TSS	90% Volume
Selected Unit:	**FD-8HC**	

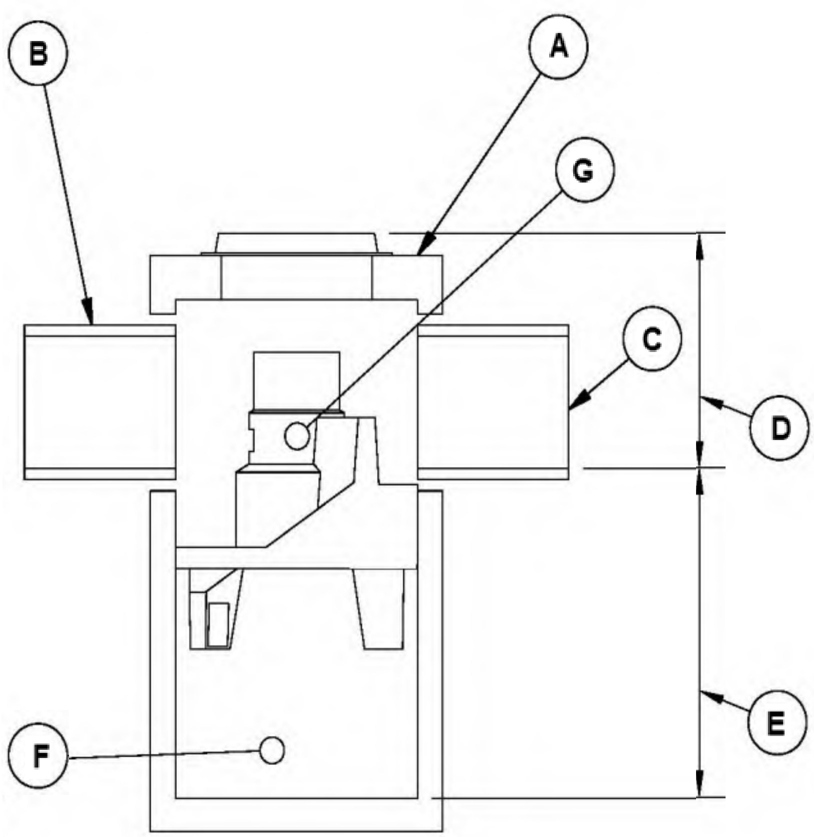
Site Details	
Site Area:	3.81 ha
% Impervious:	90%
Rational C:	0.84
Rainfall Station:	Barrie, ONT
Particle Size Distribution:	Fine
Peak Flowrate:	---

Summary of Results

Model	TSS Removal	Volume Treated
FD-4HC	76.0%	>90%
FD-5HC	80.0%	>90%
FD-6HC	82.0%	>90%
FD-8HC	87.0%	>90%
FD-10HC	90.0%	>90%

FD-8HC Specification	
Unit Diameter (A):	2,400 mm
Inlet Pipe Diameter (B):	675, 675 mm
Outlet Pipe Diameter (C):	825 mm
Height, T/G to Outlet Invert (D):	2650 mm
Height, Outlet Invert to Sump (E):	2260 mm
Sediment Storage Capacity (F):	3.47 m^3
Oil Storage Capacity (G):	4,239 L
Recommended Sediment Depth for Maintenance:	465 mm
Max. Pipe Diameter:	1,200 mm
Peak Flow Capacity:	1,415 L/s

Site Elevations:	
Rim Elevation:	262.64
Inlet Pipe Elevation:	260.14, 260.14
Outlet Pipe Elevation:	259.99



Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.

Project Name:	The Village of Innis Landing - 800 Yonge Street
Consulting Engineer:	Tatham Engineering
Location:	Barrie, Ontario

Net Annual Removal Efficiency Summary: FD-8HC

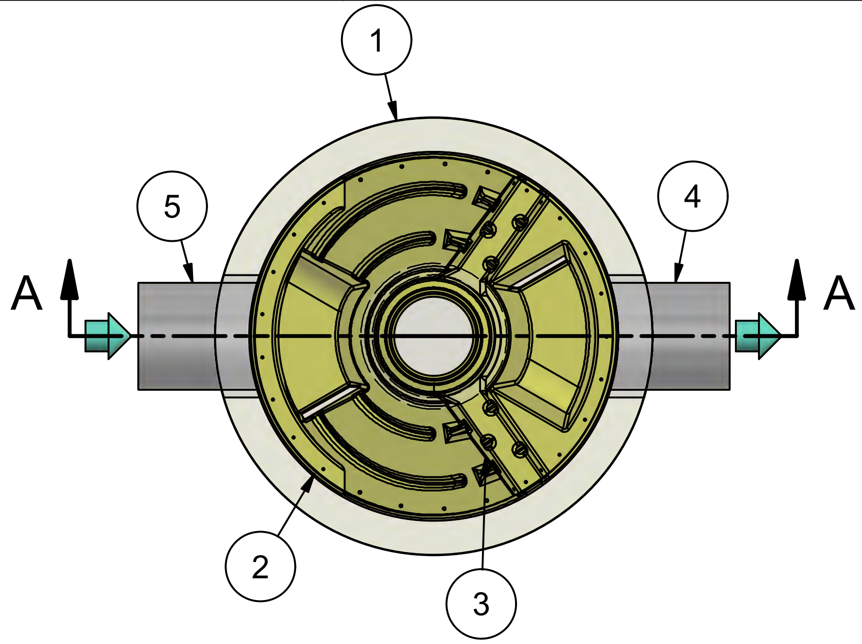
Rainfall Intensity(1)	Fraction of Rainfall(1)	FD-8HC Removal Efficiency(2)	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.3%	100.0%	0.3%
1.00	25.7%	96.6%	24.9%
1.50	5.3%	93.0%	5.0%
2.00	13.4%	90.5%	12.1%
2.50	5.5%	88.7%	4.9%
3.00	3.7%	87.2%	3.2%
3.50	7.2%	85.9%	6.2%
4.00	3.4%	84.9%	2.9%
4.50	2.4%	84.0%	2.0%
5.00	4.3%	83.1%	3.6%
6.00	3.6%	81.7%	3.0%
7.00	4.3%	80.6%	3.5%
8.00	3.4%	79.6%	2.7%
9.00	1.6%	78.7%	1.3%
10.00	2.1%	77.9%	1.6%
20.00	8.9%	73.1%	6.5%
30.00	2.3%	70.4%	1.6%
40.00	1.0%	68.5%	0.7%
50.00	0.5%	67.1%	0.4%
100.00	0.7%	62.9%	0.5%
150.00	0.1%	60.6%	0.0%
200.00	0.0%	59.0%	0.0%
		Total Net Annual Removal Efficiency:	70%
		Total Runoff Volume Treated:	>90%

Notes:

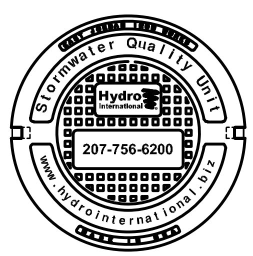
(1) Rainfall Data: 1978:2007, HLY03, Barrie, ONT, 6110557.

(2) Based on third party verified data and appoximating the removal of a PSD similar to the STC Fine distribution

(3) Rainfall adjusted to 5 min peak intensity based on hourly average.

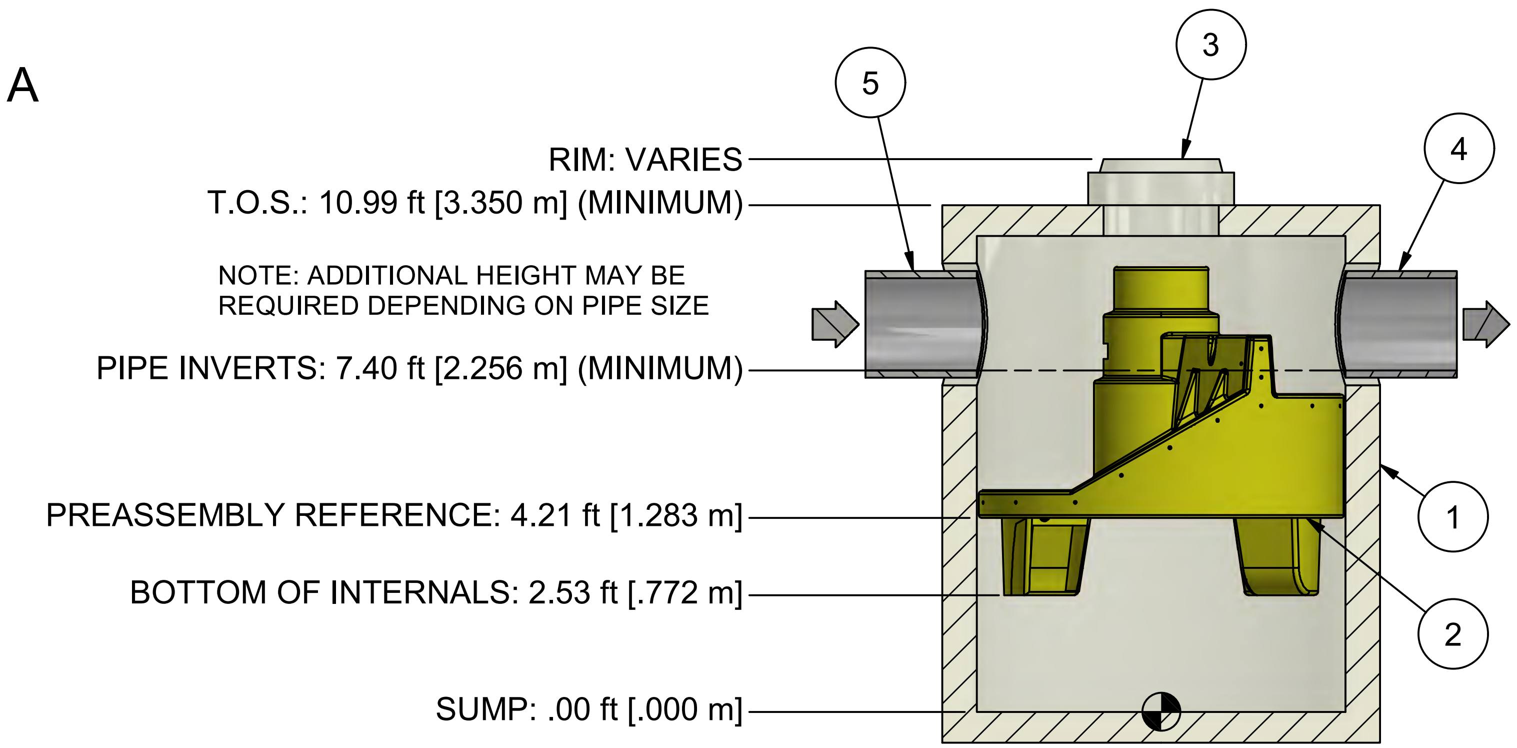


PLAN VIEW



HYDRO FRAME AND COVER (INCLUDED)

GRADE RINGS BY OTHERS
AS REQUIRED



SECTION A-A

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

PRODUCT SPECIFICATION:

1. Peak Hydraulic Flow: 50.0 cfs (1415 l/s)
2. Min Sediment Storage Capacity: 2.8 cu. yd. (2.1 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 48 in. (1200 mm)
4. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
5. For more product information including regulatory acceptances, please visit https://hydro-int.com/en/products/first-defense

GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 48".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	96	2400	I.D. PRECAST MANHOLE
2	1			INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	750	FRAME AND COVER (ROUND)
4	1	48 (MAX)	1200 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	48 (MAX)	1200 (MAX)	INLET PIPE (BY OTHERS)

PROJECTION

IF IN DOUBT ASK

DATE: 11/2/2021	SCALE: 1:50	
DRAWN BY: ER	CHECKED BY: MRJ	APPROVED BY

Title
8-ft DIAMETER
FIRST DEFENSE

GENERAL ARRANGEMENT

Hydro International
hydro-int.com
HYDRO INTERNATIONAL

WEIGHT:	MATERIAL:	
STOCK NUMBER:		
DRAWING NO.: FD GA-8		
SHEET SIZE: B	SHEET: 1 OF 1	Rev: -

Appendix E: LSRCA Volume Control, Water Balance & LID Design

Calculations completed in accordance with:

Infiltration: Sizing and modeling: LID SWM Planning and Design Guide. (2021, December 10). Sustainable Technologies Evaluation Program. Retrieved September 6, 2024 from: *https://wiki.sustainabletechnologies.ca/index.php?title=Infiltration:_Sizing_and_modeling&oldid=12158*

Infiltration Sizing when practice is fixed or constrained (1D Drainage)

Ratio of Catchment Impervious Area to Practice Permeable Area

$$R = \frac{A_i}{A_p}$$

Where:

A_i = Catchment Impervious Area = 1.09 ha

A_p = Area of Practice (m^2) = 385 m^2

R = 28.3

Drawdown Time Within Practice Permeable Area

$$d_r = \frac{f' \times t}{n}$$

Where:

d_r: reservoir depth (m)

f′: Design Infiltration Rate (Factor of Safety of 2.5 applied)

n: Porosity of Storage Material

Composite Porosity

Infiltration Chamber d_r: 0.76 m (StormTank ST-30)

n: 96.5%

Drawdown Time

d_r: 0.76 m

f′: 16 mm/hr (factored) ; 39 mm/hr (unfactored)

n: 96.5%

t = 46 hours

Refer to *Hydrogeological Investigation and Water Balance Assessment* prepared by EXP Services Inc., dated September 2024.

Total Drawdown Time: 46 hours < 48 hours

Water Budget

Mitigation Measures

Required LID Storage Volume

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID Volume Sizing Details

Site Area (ha)	4.05
Impervious Area (ha)	3.34
LID Impervious Drainage Area (ha)	1.09
Infiltration Deficit(1) (m^3)	6,724
Evapotranspiration from Impervious Area	20%
Required Infiltration Depth from LID Drainage Area (mm/year)	771
Required Annual Average Captured (m^3)	8,405
Design Precipitation Depth (mm)	13.6
Total LID Volume Required to Balance the Deficit (m^3)	148

Additional Notes

(1) Refer to EXP's hydrogeological/water balance report (2024) for detailed calculations.

Climate Data & Source: Barrie WPCC

Climate Normal Data for 1984 to 2003 (Environment Canada)

TATHAM ENGINEERING

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID System Design Details

LID Measure	StormTank ST-30
Site Area (ha)	4.05
Site Impervious Area (ha)	3.34
LID Impervious Drainage Area (ha)	1.09
Void Ratio	0.97
Total LID Footprint Provided (m^2)	385
Depth of LID (m)	0.76
Volume Provided (m^3)	283
Design Precipitation Depth on Rooftop (mm)	26.0
Design Precipitation Depth on Site Impervious Area (mm)	8.5
Annual Volume Captured (mm)	860.4
Annual Volume Captured excluding Evapotransiration (m^3)	9,378
Annual Volume Captured after Evapotranspiration (m^3)	7,502

Additional Notes

The 26 mm storm from the rooftop areas is captured within the LID system which is equivalent to the 8.5 mm storm across the site impervious area. Since this design precipitation depth exceeds the minimum 5 mm depth per LSRCA guidelines, the runoff volume requirements have been met.

Since the total LID volume of 283 m^3 exceeds the minimum requirement of 148 m^3 to balance the water deficit, water infiltration rates are improved due to the proposed development. Therefore, the LSRCA water balance requirements have been met due to the implementation of the LIDs.

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID #1 Design Details

LID Measure	StormTank ST-30
LID Impervious Drainage Area (ha)	0.18
Void Ratio	0.97
Footprint of LID (m^2)	65
Depth of LID (m)	0.76
Volume Provided (m^3)	48
Design Precipitation Depth on Rooftop (mm)	26.6

Additional Notes

At minimum, the 25 mm storm is captured within this LID.

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID #2 Design Details

LID Measure	StormTank ST-30
LID Impervious Drainage Area (ha)	0.38
Void Ratio	0.97
Footprint of LID (m^2)	130
Depth of LID (m)	0.76
Volume Provided (m^3)	96
Design Precipitation Depth on Rooftop (mm)	25.2

Additional Notes

At minimum, the 25 mm storm is captured within this LID.

TATHAM ENGINEERING

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID #3 Design Details

LID Measure	StormTank ST-30
LID Impervious Drainage Area (ha)	0.28
Void Ratio	0.97
Footprint of LID (m^2)	100
Depth of LID (m)	0.76
Volume Provided (m^3)	74
Design Precipitation Depth on Rooftop (mm)	26.3

Additional Notes

At minimum, the 25 mm storm is captured within this LID.

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID #4 Design Details

LID Measure	StormTank ST-30
LID Impervious Drainage Area (ha)	0.13
Void Ratio	0.97
Footprint of LID (m^2)	45
Depth of LID (m)	0.76
Volume Provided (m^3)	33
Design Precipitation Depth on Rooftop (mm)	25.5

Additional Notes

At minimum, the 25 mm storm is captured within this LID.

TATHAM ENGINEERING

Water Budget
Mitigation Measures
LID Design

Project Details

The Village of Innis Landing	422426

Prepared By

LJC	9/6/2024

LID #5 Design Details

LID Measure	StormTank ST-30
LID Impervious Drainage Area (ha)	0.13
Void Ratio	0.97
Footprint of LID (m^2)	45
Depth of LID (m)	0.76
Volume Provided (m^3)	33
Design Precipitation Depth on Rooftop (mm)	25.5

Additional Notes

At minimum, the 25 mm storm is captured within this LID.

TATHAM ENGINEERING

Water Budget
Summary

Project Details

The Village of Innis Landing	422426

Prepared By

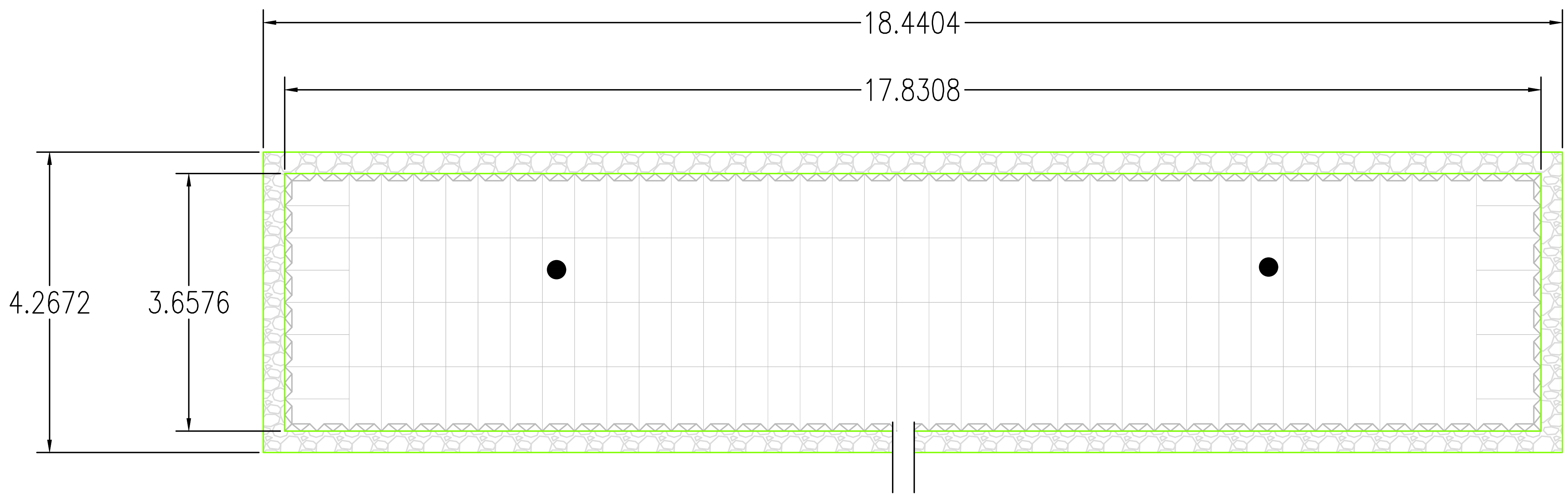
LJC	9/6/2024

Summary

(1)Existing Infiltration (m^3)	8,199
(1)Proposed Infiltration (m^3) - No Mitigtation	1,476
(1)Infiltration Deficit Prior to Mitigation (m^3)	-6,724
Proposed Infiltration Measures	
[ ] Increase Topsoil Depth	
[x] Infiltration LID	
[ ] Impervious Area Routed Over Pervious Area	
Mitigation - Increase Topsoil Reduction in Pervious Runoff (m^3)	0
Mitigation Measure - Implementing LID (m^3)	7,502
Mitigation Measure - Impervious Area Routed over Pervious Area (m^3)	0
Proposed Infiltration (m^3)	8,978
Infiltration Deficit after Mitigation (m^3)	778

Additional Notes

(1) Refer to EXP's hydrogeological/water balance report (2024) for detailed calculations.



TITAN
BUILD YOUR LEGEND

BRENTWOOD STORMTANK COMPONENTS

	STORMTANK SIDE PANEL (SEE DETAIL 3/S-02)
	STORMTANK MODULE ST30 (SEE DETAIL 2/S-02)
	STORMTANK OBSERVATION PORT (SEE DETAIL 2/S-03)
	STORMTANK DEBRIS ROW (SEE DETAIL 1/S-03)
	INLET/OUTLET CONNECTION (SEE DETAIL S-04)
	19 MM CLEAR STONE

TitanEnviro.com
866-327-1957

No.	Description	By	dd.mm.yyyy
5			
4			
3			
2			
1			
0	PRELIMINARY LAYOUT	AW	07/14/2024

NOTES:
1) ALL DIMENSIONS ARE MEASURED IN METERS UNLESS NOTED OTHERWISE.
2) REFERENCE BRENTWOOD STORMTANK DESIGN GUIDE AND INSTALLATION GUIDE FOR DETAILED AND CURRENT INFORMATION (www.stormtank.com)
3) ENGINEER OF RECORD TO CONFIRM REGULATORY CONFORMANCE FOR ALLOWABLE PROXIMITY TO STRUCTURES, PIPES AND FOUNDATIONS.
4) ALL INLET AND PIPE LOCATIONS AND DESIGNS BY OTHERS.
5) DURING AND AFTER INSTALLATION, THE STORMTANK MODULE AREA SHOULD BE CLEARLY MARKED TO PREVENT UNAUTHORIZED CONSTRUCTION AND EQUIPMENT TRAFFICKING OVER THE MODULES.
6) TOP OF GROUND WATER IS TO BE MAINTAINED 610mm (2ft) BELOW THE MODULE TO PREVENT BUOYANCY, UNLESS OTHERWISE NOTED BY ENGINEER.
7) MATERIALS MUST BE STORED IN A MANNER TO PREVENT PROLONGED EXPOSURE TO UV LIGHT.

INSTALLATION GUIDE

MODULE ASSEMBLY

ELEVATIONS	
MAXIMUM FINISHED GRADE	265.2100
MINIMUM FINISHED GRADE	263.2316
TOP OF STONE BACKFILL	262.9268
TOP OF MODULE	262.6220
MODULE INVERT	261.8600
LEVELING STONE BOTTOM	261.7584
TOP MODULE	ST30
BOTTOM MODULE	N/A

QUANTITIES		
TOTAL STORAGE VOLUME	48.11	m^3
MODULE STORAGE VOLUME	48.11	m^3
STONE STORAGE VOLUME	0.00	m^3
ACTIVE STORAGE VOLUME	N/A	m^3
ACTIVE STORAGE ELEVATION	N/A	m

GROUNDWATER LEVEL REVIEW	
GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
HAS THE TANK DESIGN INCLUDED A REVIEW FOR UPLIFT PRESSURE DUE TO THE GROUNDWATER LEVEL?	N/A
ALLOWABLE LOADING	HS25

NOT FOR CONSTRUCTION. THIS LAYOUT DRAWING WAS PREPARED TO SUPPORT THE ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO REVIEW THE INFORMATION AND ENSURE THAT THE LAYOUT AND DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS AND THAT THE STORMTANK SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

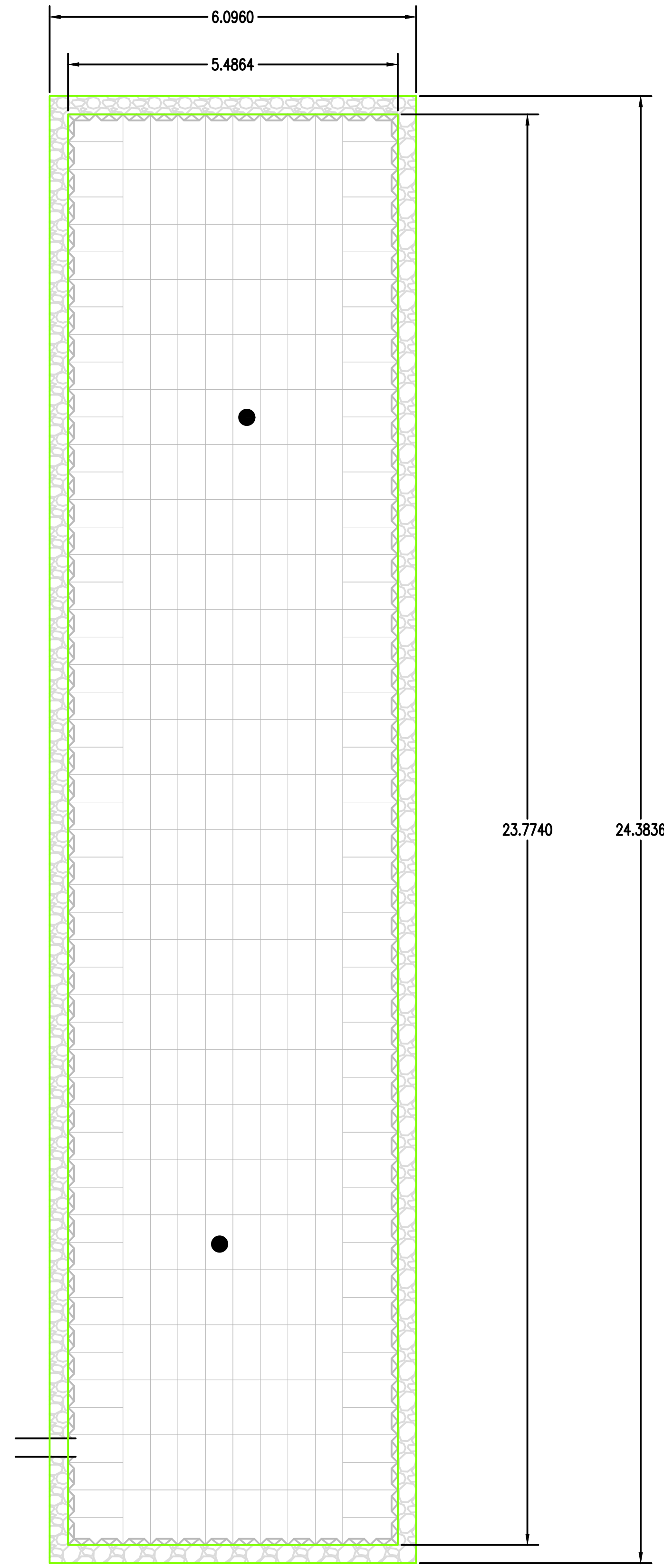
Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING-LID 1
Barrie, ON

Sheet Title: LAYOUT

Scale: NTS

SHEET 1a of 4



TITAN

BUILD YOUR LEGEND

BRENTWOOD STORMTANK COMPONENTS

Symbol	Component
	STORMTANK SIDE PANEL (SEE DETAIL 3/S-02)
	STORMTANK MODULE ST30 (SEE DETAIL 2/S-02)
	STORMTANK OBSERVATION PORT (SEE DETAIL 2/S-03)
	STORMTANK DEBRIS ROW (SEE DETAIL 1/S-03)
	INLET/OUTLET CONNECTION (SEE DETAIL S-04)
	19 MM CLEAR STONE

TitanEnviro.com
866-327-1957

No.	Description	By	dd.mm.yyyy
5			
4			
3			
2			
1	REDUCED FOOTPRINT/VOLUME	AW	09/06/2024
0	PRELIMINARY LAYOUT	AW	07/14/2024

NOTES:

1) ALL DIMENSIONS ARE MEASURED IN METERS UNLESS NOTED OTHERWISE.
2) REFERENCE BRENTWOOD STORMTANK DESIGN GUIDE AND INSTALLATION GUIDE FOR DETAILED AND CURRENT INFORMATION (www.stormtank.com)
3) ENGINEER OF RECORD TO CONFIRM REGULATORY CONFORMANCE FOR ALLOWABLE PROXIMITY TO STRUCTURES, PIPES AND FOUNDATIONS.
4) ALL INLET AND PIPE LOCATIONS AND DESIGNS BY OTHERS.
5) DURING AND AFTER INSTALLATION, THE STORMTANK MODULE AREA SHOULD BE CLEARLY MARKED TO PREVENT UNAUTHORIZED CONSTRUCTION AND EQUIPMENT TRAFFICKING OVER THE MODULES.
6) TOP OF GROUND WATER IS TO BE MAINTAINED 610mm (2ft) BELOW THE MODULE TO PREVENT BUOYANCY, UNLESS OTHERWISE NOTED BY ENGINEER.
7) MATERIALS MUST BE STORED IN A MANNER TO PREVENT PROLONGED EXPOSURE TO UV LIGHT.

INSTALLATION GUIDE

MODULE ASSEMBLY

ELEVATIONS	
MAXIMUM FINISHED GRADE	265.0400
MINIMUM FINISHED GRADE	263.0616
TOP OF STONE BACKFILL	262.7568
TOP OF MODULE	262.4520
MODULE INVERT	261.6900
LEVELING STONE BOTTOM	261.5884
TOP MODULE	ST30
BOTTOM MODULE	N/A

QUANTITIES		
TOTAL STORAGE VOLUME	96.22	m^3
MODULE STORAGE VOLUME	96.22	m^3
STONE STORAGE VOLUME	0.00	m^3
ACTIVE STORAGE VOLUME	N/A	m^3
ACTIVE STORAGE ELEVATION	N/A	m

GROUNDWATER LEVEL REVIEW	
GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
HAS THE TANK DESIGN INCLUDED A REVIEW FOR UPLIFT PRESSURE DUE TO THE GROUNDWATER LEVEL?	N/A
ALLOWABLE LOADING	HS25

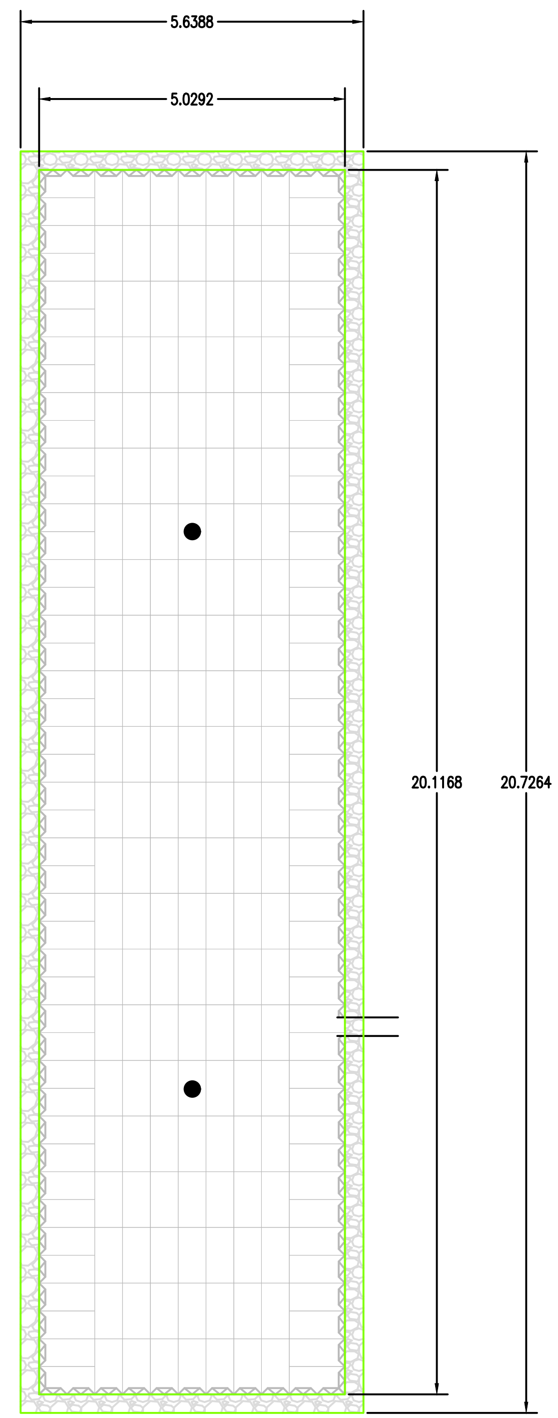
NOT FOR CONSTRUCTION. THIS LAYOUT DRAWING WAS PREPARED TO SUPPORT THE ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO REVIEW THE INFORMATION AND ENSURE THAT THE LAYOUT AND DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS AND THAT THE STORMTANK SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

Project Number: OPP21234

Project Name/Location THE VILLAGE OF INNIS LANDING-LID 2, Barrie, ON

Sheet Title: LAYOUT

Scale: NTS



BRENTWOOD STORMTANK COMPONENTS

	STORMTANK SIDE PANEL (SEE DETAIL 3/S-02)
	STORMTANK MODULE ST30 (SEE DETAIL 2/S-02)
	STORMTANK OBSERVATION PORT (SEE DETAIL 2/S-03)
	STORMTANK DEBRIS ROW (SEE DETAIL 1/S-03)
	INLET/OUTLET CONNECTION (SEE DETAIL S-04)
	19 MM CLEAR STONE

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No.	Description	By	dd.mm.yyyy
5			
4			
3			
2			
1	REDUCED FOOTPRINT/VOLUME	AW	09/06/2024
0	PRELIMINARY LAYOUT	AW	07/14/2024

NOTES:
1) ALL DIMENSIONS ARE MEASURED IN METERS UNLESS NOTED OTHERWISE.
2) REFERENCE BRENTWOOD STORMTANK DESIGN GUIDE AND INSTALLATION GUIDE FOR DETAILED AND CURRENT INFORMATION (www.stormtank.com)
3) ENGINEER OF RECORD TO CONFIRM REGULATORY CONFORMANCE FOR ALLOWABLE PROXIMITY TO STRUCTURES, PIPES AND FOUNDATIONS.
4) ALL INLET AND PIPE LOCATIONS AND DESIGNS BY OTHERS.
5) DURING AND AFTER INSTALLATION, THE STORMTANK MODULE AREA SHOULD BE CLEARLY MARKED TO PREVENT UNAUTHORIZED CONSTRUCTION AND EQUIPMENT TRAFFICKING OVER THE MODULES.
6) TOP OF GROUND WATER IS TO BE MAINTAINED 610mm (2ft) BELOW THE MODULE TO PREVENT BUOYANCY, UNLESS OTHERWISE NOTED BY ENGINEER.
7) MATERIALS MUST BE STORED IN A MANNER TO PREVENT PROLONGED EXPOSURE TO UV LIGHT.

INSTALLATION GUIDE

MODULE ASSEMBLY

ELEVATIONS	
MAXIMUM FINISHED GRADE	265.0400
MINIMUM FINISHED GRADE	263.0616
TOP OF STONE BACKFILL	262.7568
TOP OF MODULE	262.4520
MODULE INVERT	261.6900
LEVELING STONE BOTTOM	261.5884
TOP MODULE	ST30
BOTTOM MODULE	N/A

QUANTITIES		
TOTAL STORAGE VOLUME	74.63	m^3
MODULE STORAGE VOLUME	74.63	m^3
STONE STORAGE VOLUME	0.00	m^3
ACTIVE STORAGE VOLUME	N/A	m^3
ACTIVE STORAGE ELEVATION	N/A	m

GROUNDWATER LEVEL REVIEW	
GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
HAS THE TANK DESIGN INCLUDED A REVIEW FOR UPLIFT PRESSURE DUE TO THE GROUNDWATER LEVEL?	N/A
ALLOWABLE LOADING	HS25

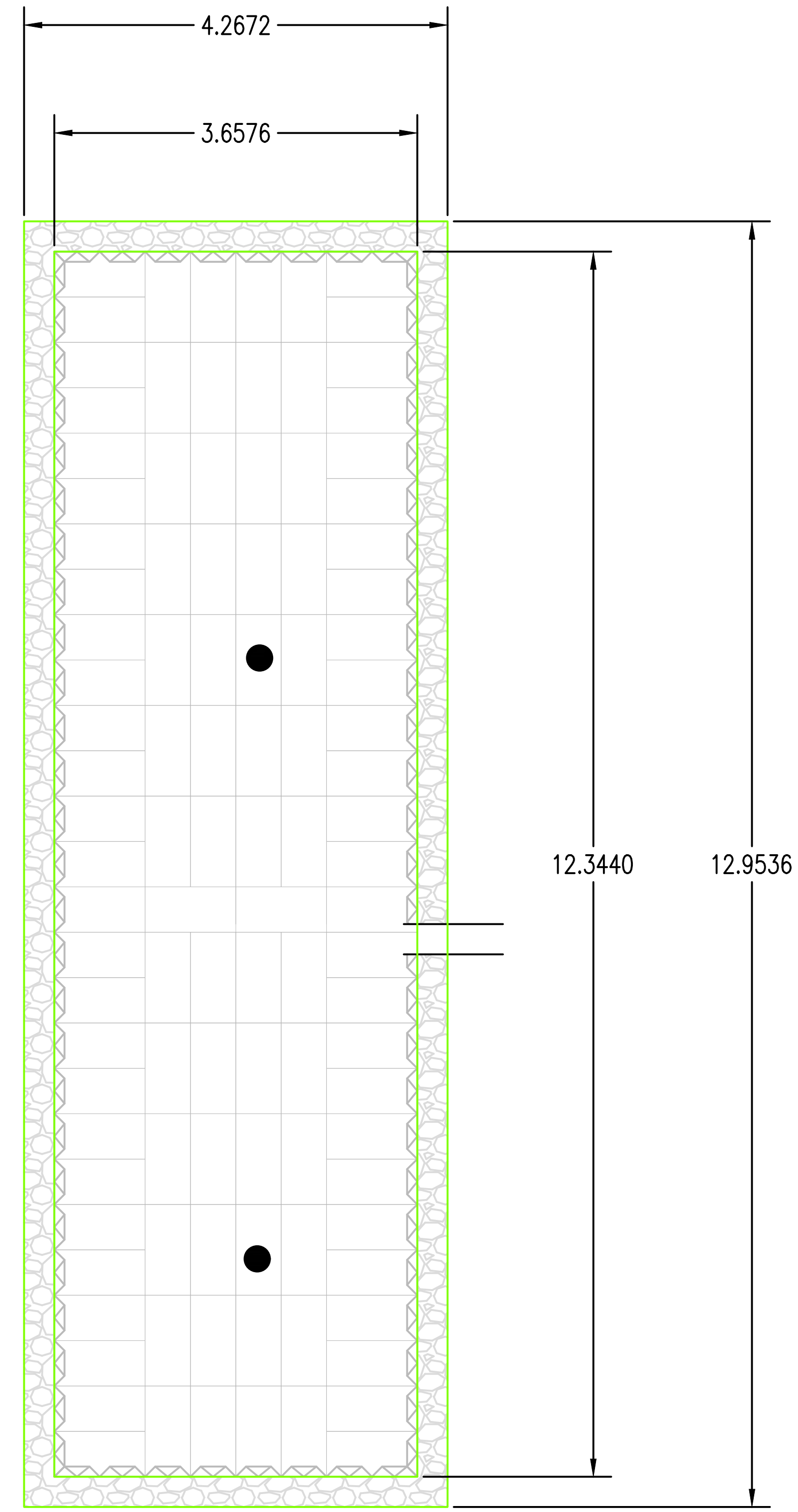
NOT FOR CONSTRUCTION. THIS LAYOUT DRAWING WAS PREPARED TO SUPPORT THE ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO REVIEW THE INFORMATION AND ENSURE THAT THE LAYOUT AND DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS AND THAT THE STORMTANK SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING-LID 3
Barrie, ON

Sheet Title: LAYOUT

Scale: NTS



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BRENTWOOD STORMTANK COMPONENTS

	STORMTANK SIDE PANEL (SEE DETAIL 3/S-02)
	STORMTANK MODULE ST30 (SEE DETAIL 2/S-02)
	STORMTANK OBSERVATION PORT (SEE DETAIL 2/S-03)
	STORMTANK DEBRIS ROW (SEE DETAIL 1/S-03)
	INLET/OUTLET CONNECTION (SEE DETAIL S-04)
	19 MM CLEAR STONE

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No.	Description	By	dd.mm.yyyy
5			
4			
3			
2			
1	REDUCED FOOTPRINT/VOLUME	AW	09/06/2024
0	PRELIMINARY LAYOUT	AW	07/14/2024

NOTES:

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3) ENGINEER OF RECORD TO CONFIRM REGULATORY CONFORMANCE FOR ALLOWABLE PROXIMITY TO STRUCTURES, PIPES AND FOUNDATIONS.
4) ALL INLET AND PIPE LOCATIONS AND DESIGNS BY OTHERS.
5) DURING AND AFTER INSTALLATION, THE STORMTANK MODULE AREA SHOULD BE CLEARLY MARKED TO PREVENT UNAUTHORIZED CONSTRUCTION AND EQUIPMENT TRAFFICKING OVER THE MODULES.
6) TOP OF GROUND WATER IS TO BE MAINTAINED 610mm (2ft) BELOW THE MODULE TO PREVENT BUOYANCY, UNLESS OTHERWISE NOTED BY ENGINEER.
7) MATERIALS MUST BE STORED IN A MANNER TO PREVENT PROLONGED EXPOSURE TO UV LIGHT.

INSTALLATION GUIDE

MODULE ASSEMBLY

ELEVATIONS	
MAXIMUM FINISHED GRADE	264.9300
MINIMUM FINISHED GRADE	262.9516
TOP OF STONE BACKFILL	262.6468
TOP OF MODULE	262.3420
MODULE INVERT	261.5800
LEVELING STONE BOTTOM	261.4784
TOP MODULE	ST30
BOTTOM MODULE	N/A

QUANTITIES		
TOTAL STORAGE VOLUME	33.31	m^3
MODULE STORAGE VOLUME	33.31	m^3
STONE STORAGE VOLUME	0.00	m^3
ACTIVE STORAGE VOLUME	N/A	m^3
ACTIVE STORAGE ELEVATION	N/A	m

GROUNDWATER LEVEL REVIEW	
GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
HAS THE TANK DESIGN INCLUDED A REVIEW FOR UPLIFT PRESSURE DUE TO THE GROUNDWATER LEVEL?	N/A
ALLOWABLE LOADING	HS25

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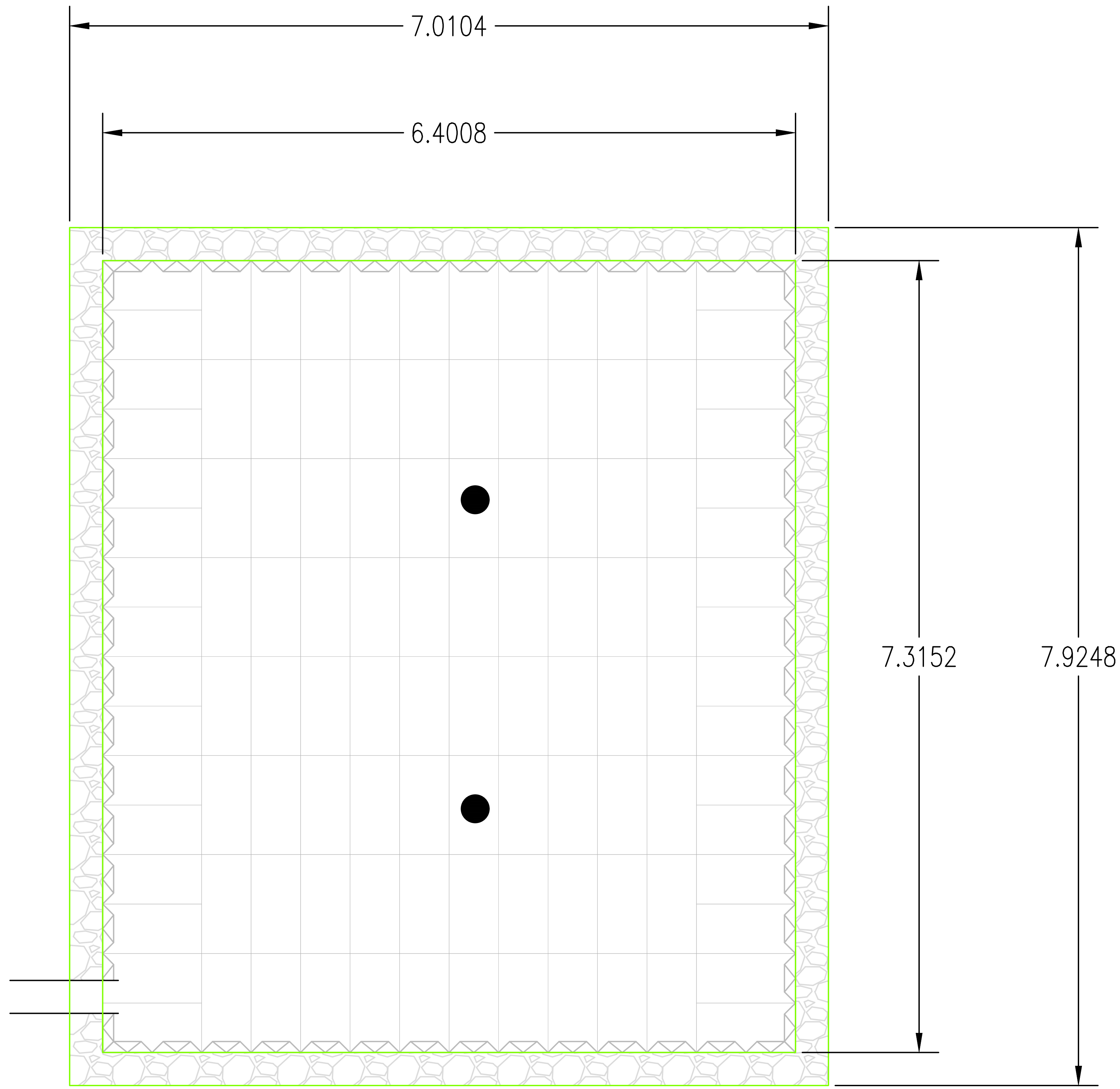
Project Number: OPP21234

Project Name/Location: THE VILLAGE OF INNIS LANDING-LID 4, Barrie, ON

Sheet Title:	Scale:	SHEET
LAYOUT	NTS	1d of 4



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BRENTWOOD STORMTANK COMPONENTS

	STORMTANK SIDE PANEL (SEE DETAIL 3/S-02)
	STORMTANK MODULE ST30 (SEE DETAIL 2/S-02)
	STORMTANK OBSERVATION PORT (SEE DETAIL 2/S-03)
	STORMTANK DEBRIS ROW (SEE DETAIL 1/S-03)
	INLET/OUTLET CONNECTION (SEE DETAIL S-04)
	19 MM CLEAR STONE

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No.	Description	By	dd.mm.yyyy
5			
4			
3			
2			
1	REDUCED FOOTPRINT/VOLUME	AW	09/06/2024
0	PRELIMINARY LAYOUT	AW	07/14/2024

NOTES:
1) ALL DIMENSIONS ARE MEASURED IN METERS UNLESS NOTED OTHERWISE.
2) REFERENCE BRENTWOOD STORMTANK DESIGN GUIDE AND INSTALLATION GUIDE FOR DETAILED AND CURRENT INFORMATION (www.stormtank.com)
3) ENGINEER OF RECORD TO CONFIRM REGULATORY CONFORMANCE FOR ALLOWABLE PROXIMITY TO STRUCTURES, PIPES AND FOUNDATIONS.
4) ALL INLET AND PIPE LOCATIONS AND DESIGNS BY OTHERS.
5) DURING AND AFTER INSTALLATION, THE STORMTANK MODULE AREA SHOULD BE CLEARLY MARKED TO PREVENT UNAUTHORIZED CONSTRUCTION AND EQUIPMENT TRAFFICKING OVER THE MODULES.
6) TOP OF GROUND WATER IS TO BE MAINTAINED 610mm (2ft) BELOW THE MODULE TO PREVENT BUOYANCY, UNLESS OTHERWISE NOTED BY ENGINEER.
7) MATERIALS MUST BE STORED IN A MANNER TO PREVENT PROLONGED EXPOSURE TO UV LIGHT.

INSTALLATION GUIDE

MODULE ASSEMBLY

ELEVATIONS	
MAXIMUM FINISHED GRADE	264.9500
MINIMUM FINISHED GRADE	262.9716
TOP OF STONE BACKFILL	262.6668
TOP OF MODULE	262.3620
MODULE INVERT	261.6000
LEVELING STONE BOTTOM	261.4984
TOP MODULE	ST30
BOTTOM MODULE	N/A

QUANTITIES		
TOTAL STORAGE VOLUME	34.54	m^3
MODULE STORAGE VOLUME	34.54	m^3
STONE STORAGE VOLUME	0.00	m^3
ACTIVE STORAGE VOLUME	N/A	m^3
ACTIVE STORAGE ELEVATION	N/A	m

GROUNDWATER LEVEL REVIEW	
GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
HAS THE TANK DESIGN INCLUDED A REVIEW FOR UPLIFT PRESSURE DUE TO THE GROUNDWATER LEVEL?	N/A
ALLOWABLE LOADING	HS25

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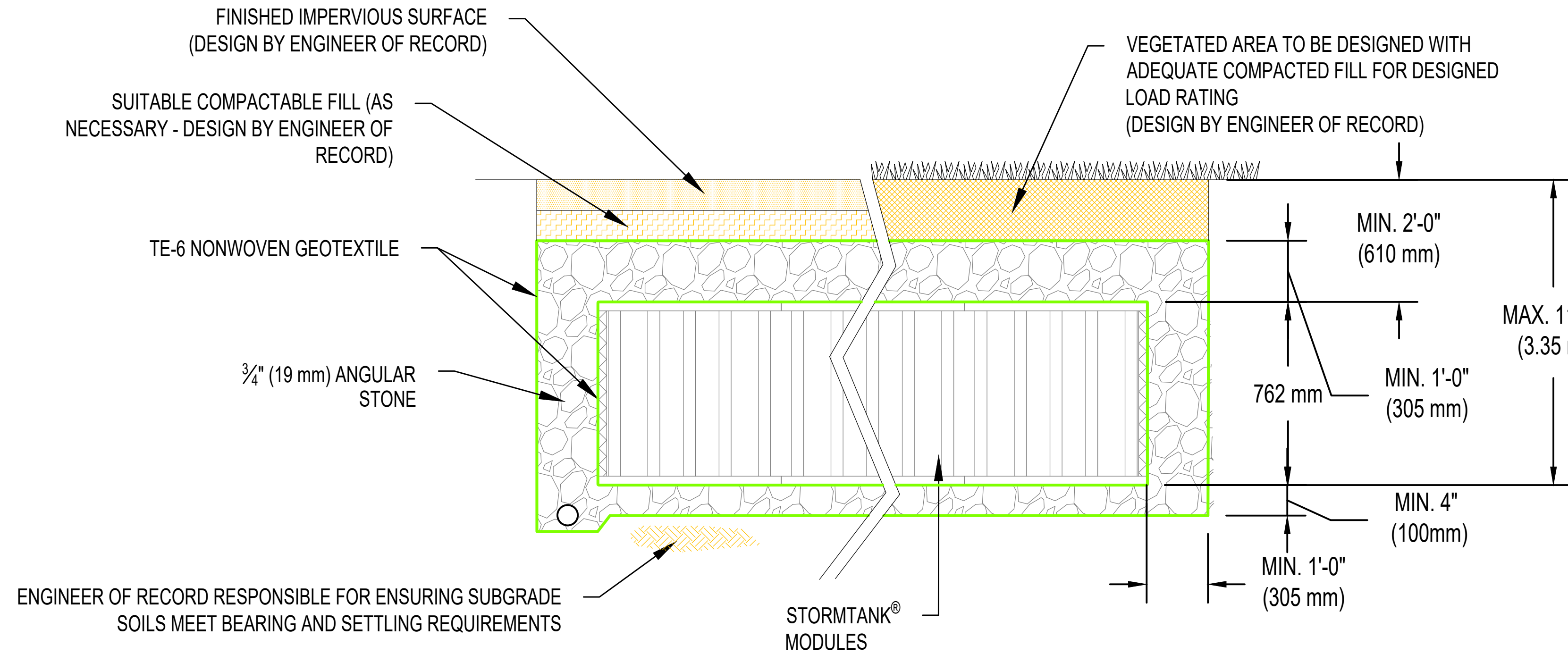
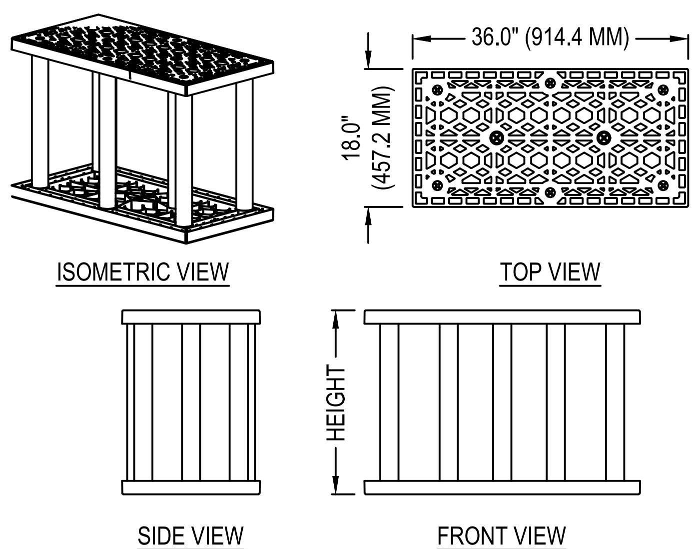
Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING-LID 5
Barrie, ON

Sheet Title: LAYOUT
Scale: NTS
SHEET 1e of 4

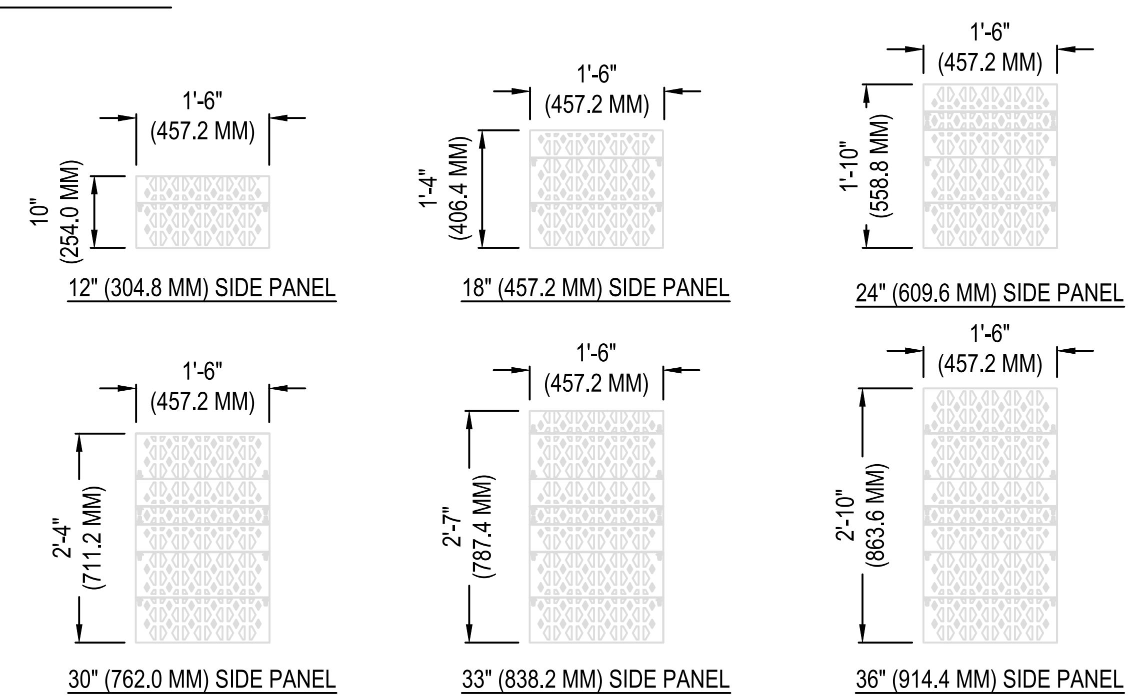


1 S-02 CROSS SECTION



25 SERIES MODULE				
MODEL	HEIGHT (MM)	CAPACITY (M³)	NOMINAL VOID	NOMINAL WEIGHT (KG)
2512	12" (304.8)	4.216 CF (0.1194)	93.70%	17.56 LBS. (7.965)
2518	18" (457.2)	6.436 CF (0.1824)	95.50%	22.70 LBS. (10.29)
2524	24" (609.6)	8.656 CF (0.2454)	96.00%	26.30 LBS. (11.92)
2530	30" (762.0)	10.876 CF (0.3084)	96.50%	29.50 LBS. (13.38)
2533	33" (838.2)	11.986 CF (0.3399)	96.90%	29.82 LBS. (13.53)
2536	36" (914.4)	13.096 CF (0.3714)	97.00%	33.10 LBS. (15.01)

2 S-02 MODULE DETAIL



- SIDE PANELS TO BE INSTALLED ALONG SYSTEM PERIMETER, UNLESS OTHERWISE SPECIFIED.
- ALL HEIGHTS TO BE CUT FROM A 36" (914.4 MM) SIDE PANEL AT PRE-SCRIBED LOCATIONS, EXCEPT 33" (838.2 MM) & 12" (304.8 MM) SIDE PANEL.

3 S-02 SIDE PANEL DETAIL

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5			
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0	PRELIMINARY LAYOUT	AW	07/14/2024

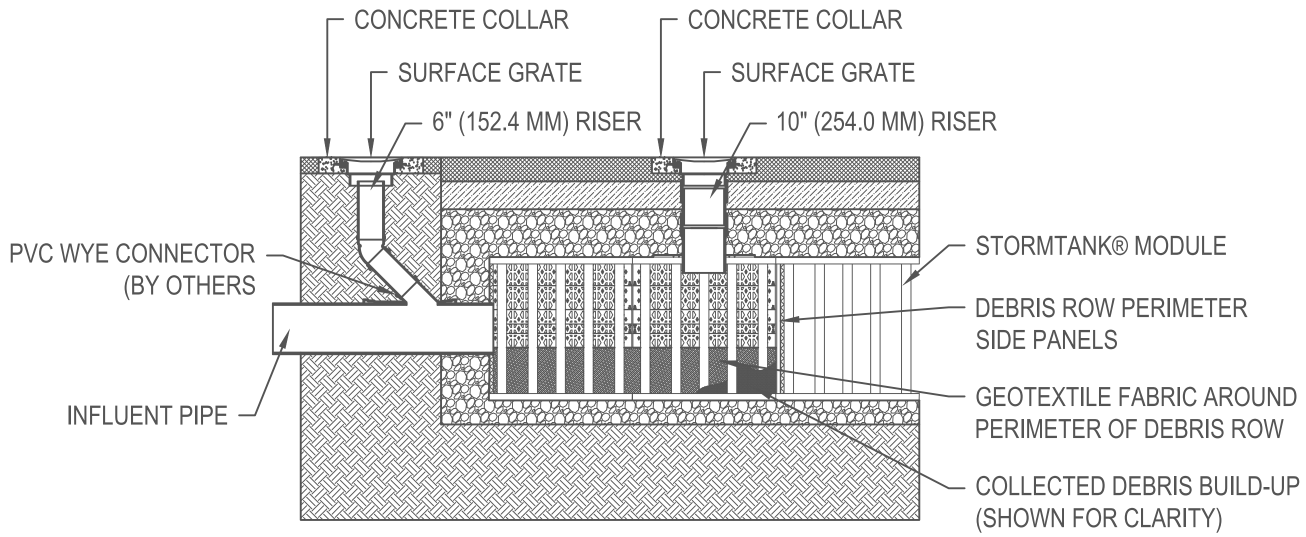
Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING
Barrie, ON

Sheet Title: CROSS SECTION

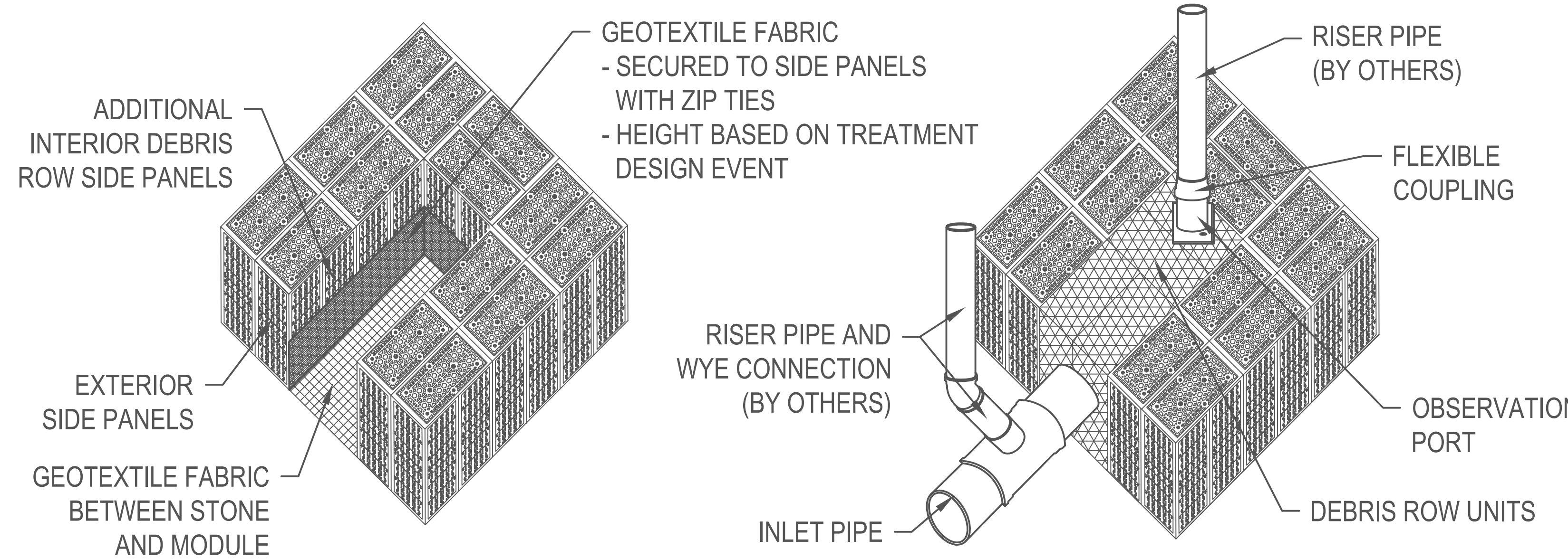
Scale: NTS

SHEET 2 of 4



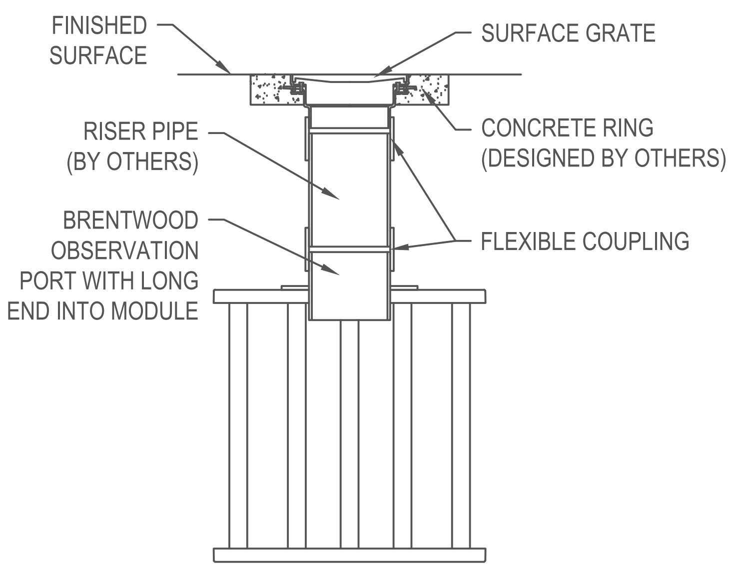
CROSS SECTION

NOTE: GEOTEXTILE HEIGHT BASED ON HYDROGRAPH ELEVATION OF SELECTED STORM OR MINIMUM 12" (304.8 MM), WHICHEVER IS GREATER, AND CONNECTED TO PANEL WITH ZIP-TIES.



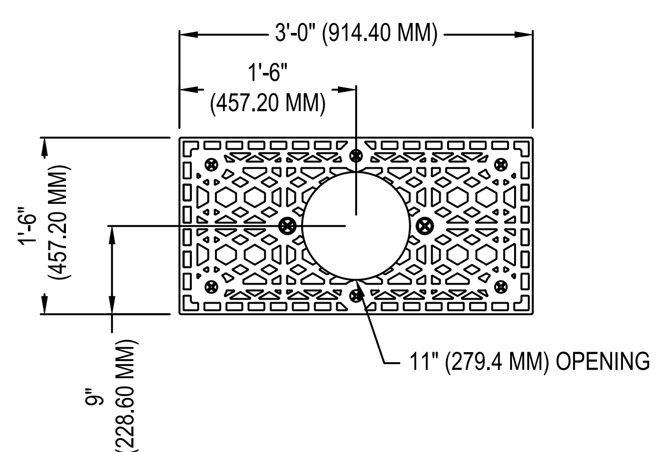
ISOMETRIC

1 / S-03 DEBRIS ROW DETAIL



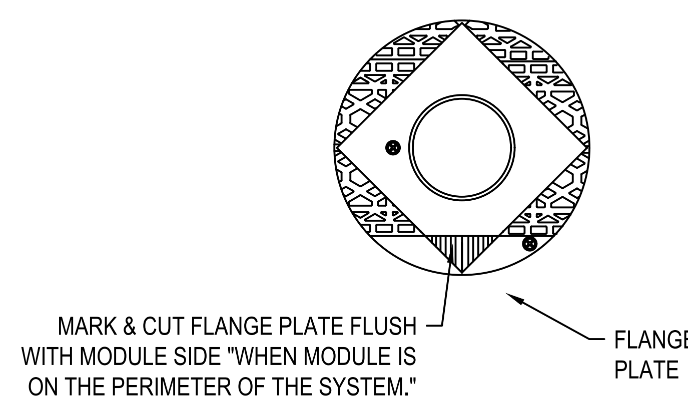
STEP 1

PORT IS TO BE MARKED ONTO THE PLATEN AND THEN THE OPENING CUT INTO THE PLATEN USING A JIGSAW OR SAWZALL, BEING SURE TO STAY AS CLOSE TO THE PORT DIAMETER AS POSSIBLE.



STEP 2

PLACE PORT INTO OPENING, ALIGNING PORT WITH STACKING PINS PLACED IN CUPS WITHIN THE PLATEN.



2 / S-03 OBSERVATION PORT DETAIL

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No.	Description	By	dd.mm.yyyy
5			
4			
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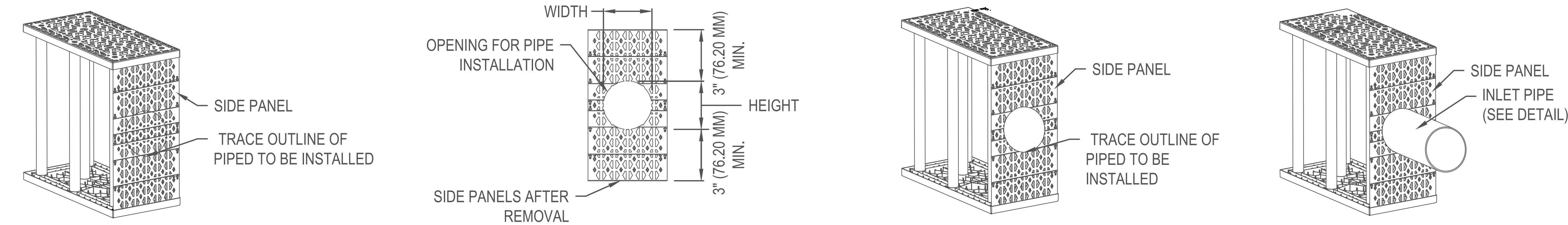
1			
0	PRELIMINARY LAYOUT	AW	07/14/2024

Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING
Barrie, ON

Sheet Title: DEBRIS ROW/OBSERVATION PORT

Scale: NTS

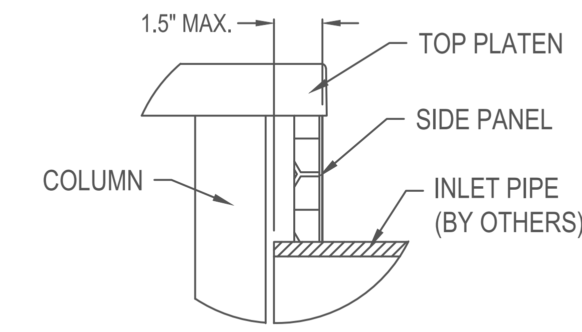


STEP 1
LOCATE AND MARK OPENING

STEP 2
REMOVE SIDE PANELS FROM MODULES AND CUT OPENING

STEP 3
REINSTALL SIDE PANEL

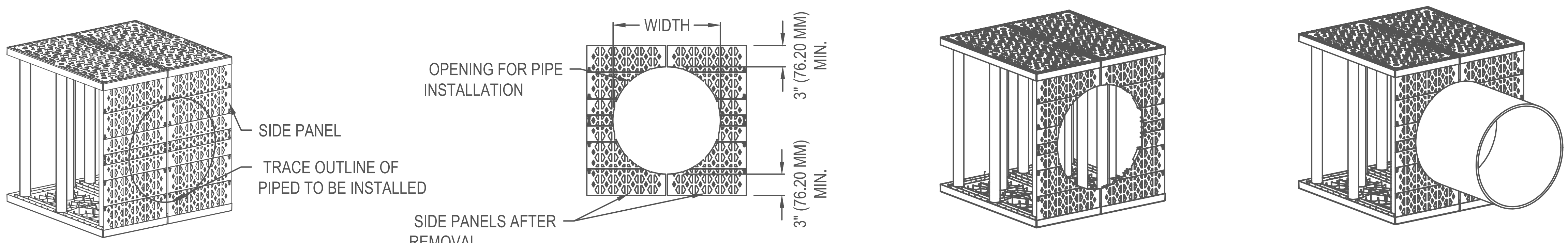
STEP 4
INSERT PIPE (SLIP FIT) AND SECURE GEOTEXTILE FABRIC



PIPE DETAIL

1 S-04 SMALL DIAMETER PIPE DETAIL

DIMENSION TABLE			
MODULE 25 SERIES	MAX. OPENING HEIGHT (MM)	SINGLE PANEL MAX. OPENING WIDTH (MM)	DOUBLE PANEL MAX. OPENING WIDTH (MM)
2512	6" (152.4)	15" (381.0)	30" (762.0)
2518	12" (304.8)	15" (381.0)	30" (762.0)
2524	18" (457.2)	15" (381.0)	30" (762.0)
2530	24" (609.6)	15" (381.0)	30" (762.0)
2533	27" (685.8)	15" (381.0)	30" (762.0)
2536	30" (762.0)	15" (381.0)	30" (762.0)



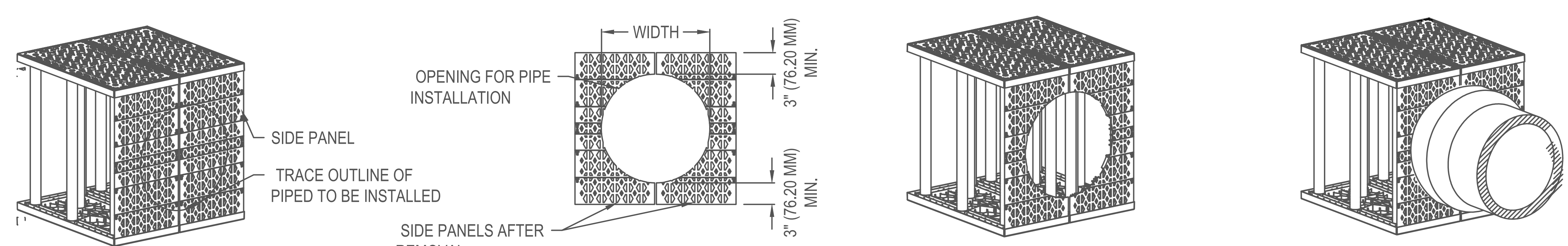
STEP 1
LOCATE AND MARK OPENING

STEP 2
REMOVE SIDE PANELS FROM MODULES AND CUT OPENING

STEP 3
REINSTALL SIDE PANEL

STEP 4
INSERT PIPE (SLIP FIT) AND SECURE GEOTEXTILE FABRIC

2 S-04 LARGE DIAMETER PIPE DETAIL



STEP 1
LOCATE AND MARK I.D. OPENING

STEP 2
REMOVE SIDE PANELS FROM MODULES AND CUT OPENING

STEP 3
REINSTALL SIDE PANEL

STEP 2
ABUT THE PIPE AND SECURE GEOTEXTILE FABRIC

3 S-04 LARGE DIAMETER PIPE DETAIL

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3			
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1			
0	PRELIMINARY LAYOUT	AW	07/14/2024

Project Number: OPP21234

Project Name/Location
THE VILLAGE OF INNIS LANDING
Barrie, ON

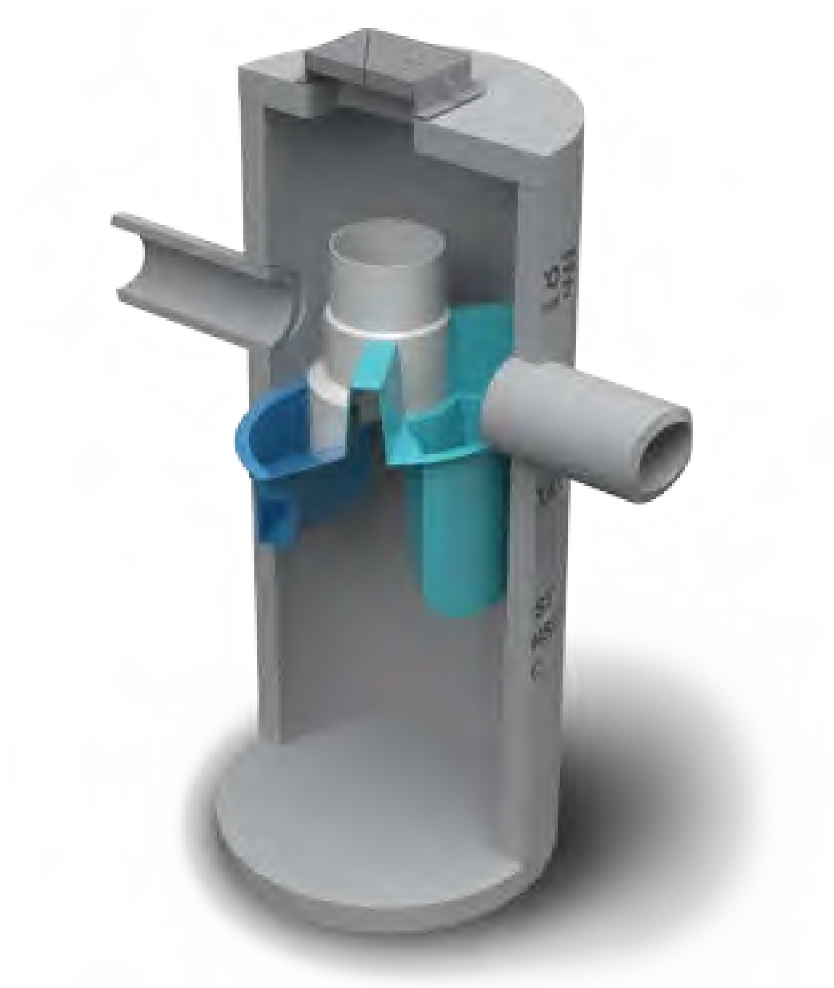
Sheet Title: PIPE CONNECTIONS

Scale: NTS

SHEET 4 of 4

Appendix F:
Operation & Maintenance

Hydro International



Operation and Maintenance Manual

First Defense® and First Defense® High Capacity

Vortex Separator for Stormwater Treatment

Table of Contents

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Hydro Maintenance Services

Hydro International has been engineering stormwater treatment systems for over 30 years. We understand the mechanics of removing pollutants from stormwater and how to keep systems running at an optimal level.

Nobody Knows our Systems Better than we do

Avoid Service Negligence

Sanitation services providers not intimately familiar with stormwater treatment systems are at risk of the following:

- Inadvertently breaking parts or failing to clean/replace system components appropriately.
- Charging you for more frequent maintenance because they lacked the tools to service your system properly in the first place.
- Billing you for replacement parts that might have been covered under your Hydro warranty plan
- Charging for maintenance that may not yet have been required.

Leave the Dirty Work to us

Trash, sediment and polluted water is stored inside treatment systems until they are removed by our team with a vactor truck. Sometimes teams must physically enter the system chambers in order to prepare the system for maintenance and install any replacement parts. Services include but are not limited to:

- Solids removal
- Removal of liquid pollutants
- Replacement media installation (when applicable)

Better Tools, Better Results

Not all vactor trucks are created equal. Appropriate tools and suction power are needed to service stormwater systems appropriately. Companies who don't specialize in stormwater treatment won't have the tools to properly clean systems or install new parts.

Service Warranty

Make sure you're not paying for service that is covered under your warranty plan. Only Hydro International's service teams can identify tune-ups that should be on us, not you.

Treatment Systems Serviced by Hydro:

- Stormwwater filters
- Stormwater separators
- Baffle boxes
- Biofilters/biorention systems
- Storage structures
- Catch basins
- Stormwater ponds
- Permeable pavement

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I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for “offline” arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

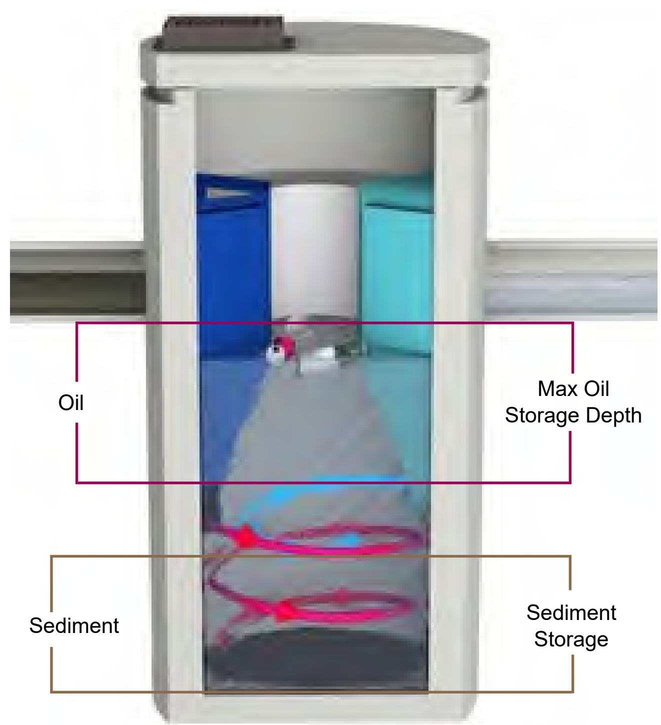


Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

1. **Built-In Bypass**
2. **Inlet Pipe**
3. **Inlet Chute**
4. **Floatables Draw-off Port**
5. **Outlet Pipe**
6. **Floatables Storage**
7. **Sediment Storage**
8. **Inlet Grate or Cover**

a.
b.

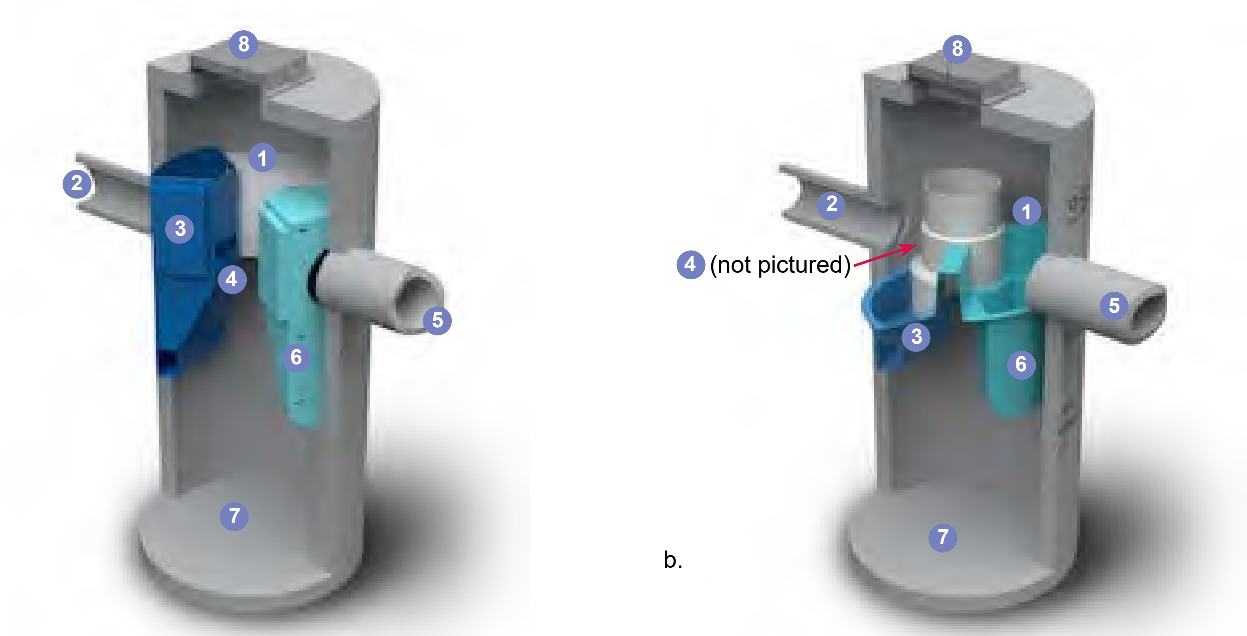


Fig.2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates		Peak Online Flow Rate	Maximum Pipe Diameter[1]	Oil Storage Capacity	Typical Sediment Storage Capacity[2]	Minimum Distance from Outlet Invert to Top of Rim[3]	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified	106µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd^3 / m^3)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	1.60 / 45.3	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	1.88 / 50.9	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC	5 / 1.5	2.34 / 66.2	2.94 / 82.1	20 / 566	24 / 609	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	4.73 / 133.9	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6.00 / 169.9	7.52 / 212.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 -1.8	7.40 / 2.2

[1]Contact Hydro International when larger pipe sizes are required.
[2]Contact Hydro International when custom sediment storage capacity is required.
[3]Minimum distance for models depends on pipe diameter.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

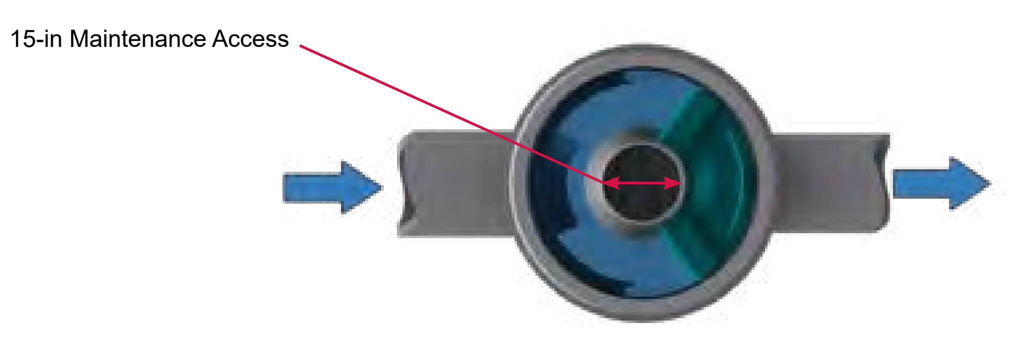


Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge-Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / flotables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.

4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.

6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

7. Securely replace the grate or lid.

8. Take down safety equipment.

9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump clean out are typically conducted once a year during any season.

- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.

4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.5) or with the skimmer or net (not pictured).

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).

6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.5).

7. Retract the vactor hose from the vessel.

8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.

9. Securely replace the grate or lid.

Fig.5 Sediment is removed with a vactor hose (First Defense model FD-4, shown).

Maintenance at a Glance

Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area
NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.	

First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL SIZE (CIRCLE ONE): **FD-4** **FD-4HC** **FD-6** **FD-6HC**

INLET (CIRCLE ALL THAT APPLY): **GRATED INLET (CATCH BASIN)** **INLET PIPE (FLOW THROUGH)**

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Do it Right the First Time

Learn more at hydro-int.com/service

CALL **1 (888) 382-7808** TO SCHEDULE AN INSPECTION

Stormwater Solutions

94 Hutchins Drive
Portland, ME 04102

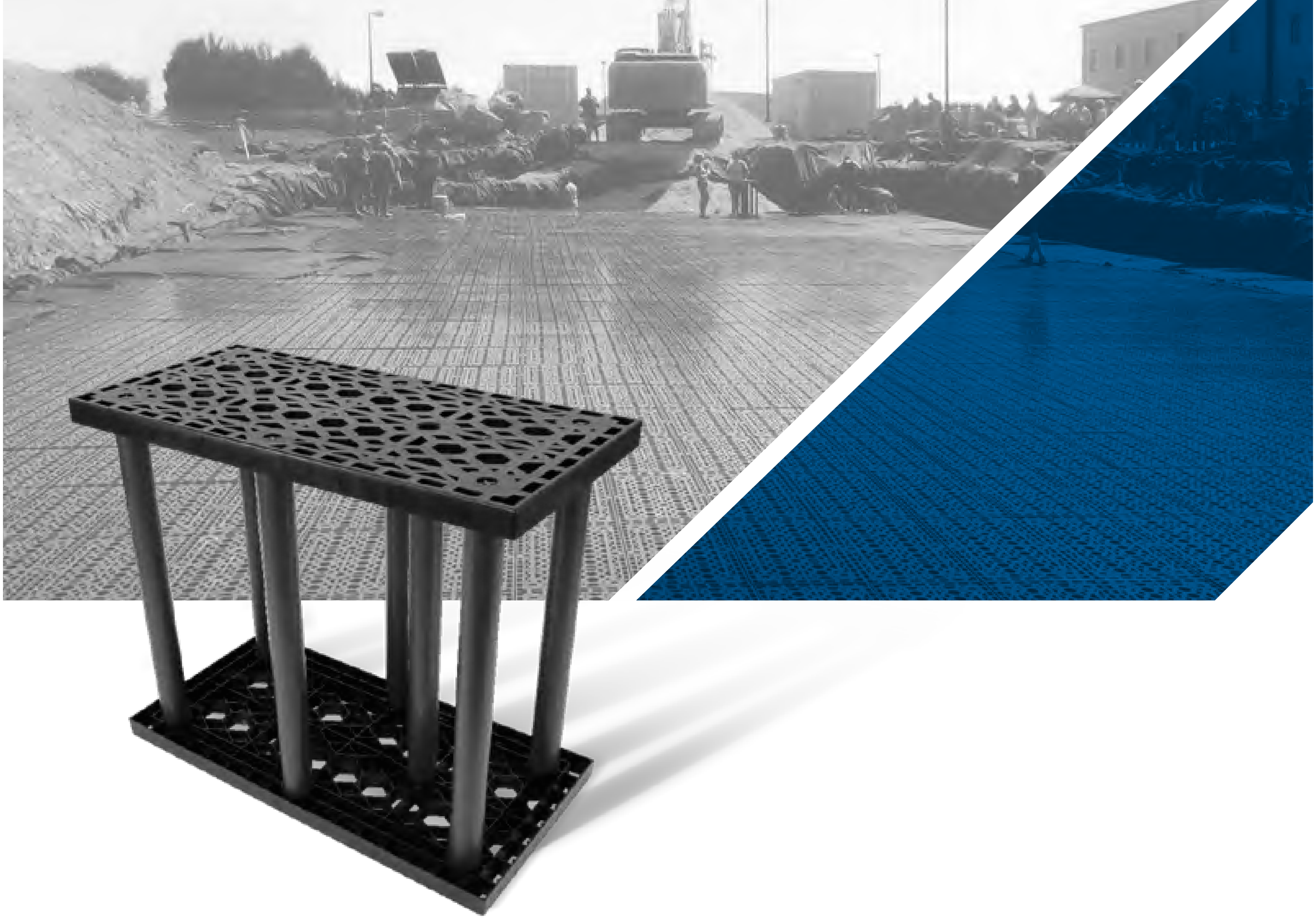
Tel: (207) 756-6200
Fax: (207) 756-6212
stormwaterinquiry@hydro-int.com

www.hydro-int.com

Turning Water Around...®

MODULE 25 SERIES

DESIGN GUIDE



STORMTANK®

Expect Results™

A BRAND OF BRENTWOOD

CONTENT

GENERAL NOTES

1. Brentwood recommends that the installing contractor contact either Brentwood or the local distributor prior to installation of the system to schedule a pre-construction meeting. This meeting will ensure that the installing contractor has a firm understanding of the installation instructions.
2. All systems must be designed and installed to meet or exceed Brentwood's minimum requirements. Although Brentwood offers support during the design, review, and construction phases of the Module system, it is the ultimate responsibility of the Engineer of Record to design the system in full compliance with all applicable engineering practices, laws, and regulations.
3. Brentwood requires a minimum cover of 24" (610 mm) and/or a maximum Module invert of 11' (3.35 m). Additionally, a minimum 6" (152 mm) leveling bed, 12" (305 mm) side backfill, and 12" (305 mm) top backfill are required on every system.
4. Brentwood recommends a minimum bearing capacity and subgrade compaction for all installations. If site conditions are found not to meet any design requirements during installation, the Engineer of Record must be contacted immediately.
5. All installations require a minimum two layers of geotextile fabric. One layer is to be installed around the Modules, and another layer is to be installed between the stone/soil interfaces.
6. Stone backfilling is to follow all requirements of the most current installation instructions.
7. The installing contractor must apply all protective measures to prevent sediment from entering the system during and after installation per local, state, and federal regulations.
8. The StormTank® Module carries a Limited Warranty, which can be accessed at www.stormtank.com.

About Brentwood

Brentwood is a global manufacturer of custom and proprietary products and systems for the construction, consumer, medical, power, transportation, and water industries. A focus on plastics innovation, coupled with diverse production capabilities and engineering expertise, has allowed Brentwood to build a strong reputation for thermoplastic molding and solutions development.

Brentwood's product and service offerings continue to grow with an ever-increasing manufacturing presence. By emphasizing customer service and working closely with clients throughout the design, engineering, and manufacturing phases of each project, Brentwood develops forward-thinking strategies to create targeted, tailored solutions.

StormTank® Module

The StormTank Module is a strong, yet lightweight, alternative to other subsurface systems and offers the largest void space (up to 97%) of any subsurface stormwater storage unit on the market. The Modules are simple to assemble on site, limiting shipping costs, installation time, and labor. Their structural PVC columns pressure fit into the polypropylene top/bottom platens, with side panels inserted around the perimeter of the system. This open design and lack of internal walls make the Module system easy to clean compared to other subsurface box structures. When properly designed, applied, installed, and maintained, the Module system has been engineered to achieve a 50-year lifespan.

Technical Support

Brentwood's knowledgeable distributor network and in-house associates emphasize customer service and support by partnering with customers to extend the process beyond physical material supply. These trained specialists are available to assist in the review of proposed systems, conversions of alternatively designed systems, or to resolve any potential concerns before, during, and after the design process. To provide the best assistance, it is recommended that associates be provided with a site plan and cross-sections that include grading, drainage structures, dimensions, etc.

Applications

The Module system can be utilized for detention, infiltration, capture and reuse, and specialty applications across a wide range of industries, including the commercial, residential, and recreational segments. The product's modular design allows the system to be configured in almost any shape (even around utilities) and to be located under almost any pervious or impervious surface.

Module Selection

Brentwood manufactures the Module in six different heights (Table 1) that can be stacked uniformly up to two Modules high. This allows for numerous height configurations up to 6' (1.83 m) tall. The Modules can be buried up to a maximum invert of 11' (3.35 m) and require a minimum cover of 24" (610 mm) for load rating. When selecting the proper Module, it is important to consider the minimum required cover, any groundwater or limiting zone restrictions, footprint requirements, and all local, state, and federal regulations.

Table 1: Nominal StormTank® Module Specifications

MODEL SPEC	ST-12	ST-18	ST-24	ST-30	ST-33	ST-36
Height	12" (305 mm)	18" (457 mm)	24" (610 mm)	30" (762 mm)	33" (838 mm)	36" (914 mm)
Void Space	93.70%	95.5%	96.0%	96.5%	96.9%	97.0%
Storage Capacity	4.21 ft³ (0.12 m³)	6.54 ft³ (0.18 m³)	8.64 ft³ (0.24 m³)	10.86 ft³ (0.31 m³)	11.99 ft³ (0.34 m³)	13.10 ft³ (0.37 m³)
Min. Installed Capacity*	6.91 ft³ (0.20 m³)	9.15 ft³ (0.26 m³)	11.34 ft³ (0.32 m³)	13.56 ft³ (0.38 m³)	14.69 ft³ (0.42 m³)	15.80 ft³ (0.45 m³)
Weight	17.56 lb (7.97 kg)	22.70 lb (10.30 kg)	26.30 lb (11.93 kg)	29.50 lb (13.38 kg)	31.30 lb (14.20 kg)	33.10 lb (15.01 kg)

(*) Minimum Installed Capacity includes the leveling bed, Module, and top backfill storage capacity for one Module. Stone storage capacity is based on 40% void space. Side backfill storage is not included.

3.0 MANUFACTURING STANDARDS

Brentwood selects material based on long-term performance needs. To ensure long-term performance and limit component deflection over time (creep), Brentwood selected polyvinyl chloride (PVC) for the Module's structural columns and a virgin polypropylene (PP) blend for the top/bottom and side panels. PVC provides the largest creep resistance of commonly available plastics, and therefore, provides the best performance under loading conditions. Materials like polyethylene (HDPE) and recycled PP have lower creep resistance and are not recommended for load-bearing products and applications.

Materials:

Brentwood's proprietary PVC and PP copolymer resins have been chosen specifically for utilization in the StormTank® Module. The PVC is blended in house by experts and is a 100% blend of post-manufacturing/pre-consumer recycled material. Both materials exhibit structural resilience and naturally resist the chemicals typically found in stormwater runoff.

Methods:

<u>Injection Molding</u>

The Module's top/bottom platens and side panels are injection molded, using proprietary molds and materials. This allows Brentwood to manufacture a product that meets structural requirements while maintaining dimensional control, molded-in traceability, and quality control.

<u>Extrusion</u>

Brentwood's expertise in PVC extrusion allows the structural columns to be manufactured in house. The column extrusion includes the internal structural ribs required for lateral support.

Quality Control

Brentwood maintains strict quality control in order to ensure that materials and the final product meet design requirements. This quality assurance program includes full material property testing in accordance with American Society for Testing and Materials (ASTM) standards, full-part testing, and process testing in order to quantify product performance during manufacturing. Additionally, Brentwood conducts secondary finished-part testing to verify that design requirements continue to be met post-manufacturing.

All Module parts are marked with traceability information that allows for tracking of manufacturing. Brentwood maintains equipment at all manufacturing locations, as well as at its corporate testing lab, to ensure all materials and products meet all requirements.

4.0 STRUCTURAL RESPONSE

Structural Design

The Module has been designed to resist loads calculated in accordance with the American Association of State Highway and Transportation Official's (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design manual. This fully factored load includes a multiple presence factor, dynamic load allowance, and live load factor to account for real-world situations. This loading was considered when Brentwood developed both the product and installation requirements. The developed minimum cover ensures the system maintains an adequate resistance factor for the design truck (HS-20) and HS-25 loads.

Full-Scale Product Testing

Engineers at Brentwood's in-house testing facility have completed full-scale vertical and lateral tests on the Module to evaluate product response. To date, Brentwood continues in-house testing in order to evaluate long-term creep effects.

Fully Installed System Testing

Brentwood's dedication to providing a premier product extends to fully installed testing. Through a partnership with Queen's University's GeoEngineering Centre in Kingston, Ontario, Brentwood has conducted full-scale installation tests of single- and double-stacked Module systems to analyze short- and long-term performance. Testing includes short-term ultimate limit state testing under fully factored AASHTO loads and minimum installation cover, lateral load testing, long-term performance and lifecycle testing utilizing time-temperature superposition, and load resistance development. Side backfill material tests were also performed to compare the usage of sand, compacted stone, and uncompacted stone.

5.0 FOUNDATION

The foundation (subgrade) of the subsurface storage structure may be the most important part of the Module system installation as this is the location where the system applies the load generated at the surface. If the subgrade lacks adequate support or encounters potential settlement, the entire system could be adversely affected. Therefore, when implementing an underground storage solution, it is imperative that a geotechnical investigation be performed to ensure a strong foundation.

Considerations & Requirements:

Bearing Capacity

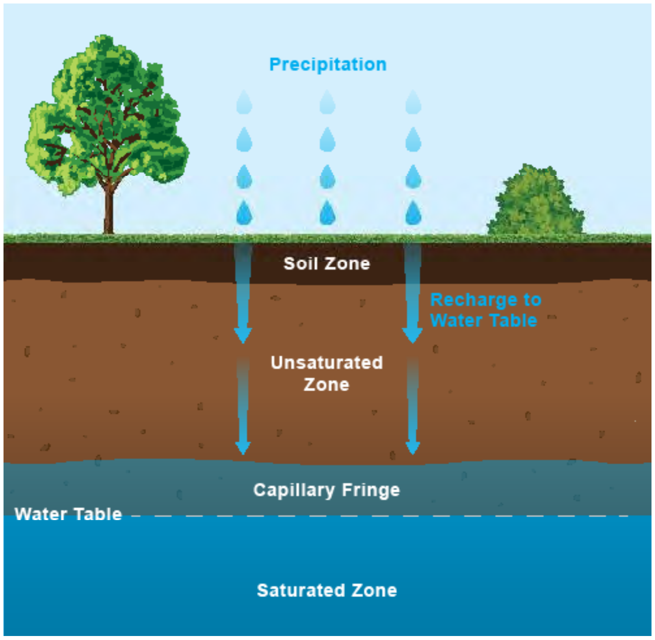
The bearing capacity is the ability of the soil to resist settlement. In other words, it is the amount of weight the soil can support. This is important versus the native condition because the system is replacing earth, and even though the system weighs less than the earth, the additional load displacement of the earth is not offset by the difference in weight.

Using the Loading and Resistance Factor Design (LRFD) calculation for bearing capacity, Brentwood has developed a conservative minimum bearing capacity table (see Appendix). The Engineer of Record shall reference this table to assess actual cover versus the soil bearing required for each unit system.

Soil Profile

Limiting Zones

Limiting zones are conditions in the underlying soils that can affect the maximum available depth for installation and can reduce the strength and stability of the underlying subgrade. The three main forms of limiting zones are water tables, bedrock, and karst topography. It is recommended that a system be offset a minimum of 12" (305 mm) from any limiting zones.



Water Table Zones

Compaction

Soil compaction occurs as the soil particles are pressed together and pore space is eliminated. By compacting the soils to 95% (as recommended by Brentwood), the subgrade strength will increase, in turn limiting both the potential for the soil to move once installed and for differential settlement to occur throughout the system. If designing the specific compaction requirement, settlement should be limited to less than 1" (25 mm) through the entire subgrade and should not exceed a 1/2" (13 mm) of differential settlement between any two adjacent units within the system over time.

Mitigation

If a minimum subgrade bearing capacity cannot be achieved because of weak soil, a suitable design will need to be completed by a Geotechnical Engineer. This design may include the over-excavation of the subgrade and an engineered fill or slurry being placed. Additional material such as geogrid or other products may also be required. Please contact a Geotechnical Engineer prior to selecting products or designing the subgrade.

Geotextile Fabric

The 6-ounce geotextile fabric is recommended to be installed between the soil and stone interfaces around the Modules to prevent soil migration.

Leveling Bed

The leveling bed is constructed of 6”-thick (152 mm) angular stone (Table 2). The bed has not been designed as a structural element but is utilized to provide a level surface for the installation of the system and provide an even distribution of load to the subgrade.

Stone Backfill

The stone backfill is designed to limit the strain on the product through displacement of load and ensure the product’s longevity. Therefore, a minimum of 12”-wide (305 mm) angular stone must be placed around all sides of the system. In addition, a minimum layer of 12” (305 mm) angular stone is required on top of the system. All material is to be placed evenly in 12” (305 mm) lifts around and on top of the system and aligned with a vibratory plate compactor.

Table 2: Approved Backfill Material

Material Location	Description	AASHTO M43 Designation	ASTM D2321 Class	Compaction/Density
Finished Surface	Topsoil, hardscape, stone, concrete, or asphalt per Engineer of Record	N/A	N/A	Prepare per engineered plans
Suitable Compactable Fill	Well-graded granular soil/aggregate, typically road base or earthen fill (maximum 4" particle size)	56, 57, 6, 67, 68	I & II III (Earth Only)	Place in maximum 12" lifts to a minimum 90% standard proctor density
Top Backfill	Crushed angular stone placed between Modules and road base or earthen fill	56, 57, 6, 67, 68	I & II	Plate vibrate to provide evenly distributed layers
Side Backfill	Crushed angular stone placed between earthen wall and Modules	56, 57, 6, 67, 68	I & II	Place and plate vibrate in uniform 12" lifts around the system
Leveling Bed	Crushed angular stone placed to provide level surface for installation of Modules	56, 57, 6, 67, 68	I & II	Plate vibrate to achieve level surface

Impermeable Liner

In designs that prevent runoff from infiltrating into the surrounding soil (detention or reuse applications) or groundwater from entering the system, an impermeable liner is required. When incorporating a liner as part of the system, Brentwood recommends using a manufactured product such as a PVC liner. This can be installed around the Modules themselves or installed around the excavation (to gain the benefit of the void space in the stone) and should include an underdrain system to ensure the basin fully drains. This liner is installed with a layer of geotextile fabric on both sides to prevent puncture, in accordance with manufacturer recommendations.

7.0 CONNECTIONS

Stormwater runoff must be able to move readily in and out of the StormTank® Module system. Brentwood has developed numerous means of connecting to the system, including inlet/outlet ports and direct abutment to a catch basin or endwall. All methods of connection should be evaluated as each one may offer a different solution. Brentwood has developed drawings to assist with specific installation methods, and these are available at *www.stormtank.com*.

Inlet/Outlet and Pipe Connections

To facilitate easy connection to the system, Brentwood manufactures two inlet/outlet ports. They are 12" (305 mm) and 14" (356 mm), respectfully, and utilize a flexible coupling connection to the adjoining pipe.

Another common installation method is to directly connect the pipe to the system. In order to do this, an opening is cut into the side panels, the pipe is inserted, and then the system is wrapped in geotextile fabric. When utilizing this connection method, the pipe must be located a minimum of 3" (76 mm) from the bottom of the system. This provides adequate clearance for the bottom platen and the required strength in the remaining side panel. To maintain the required clearances or reduce pipe size, it may be necessary to connect utilizing a manifold system.

Direct Abutment

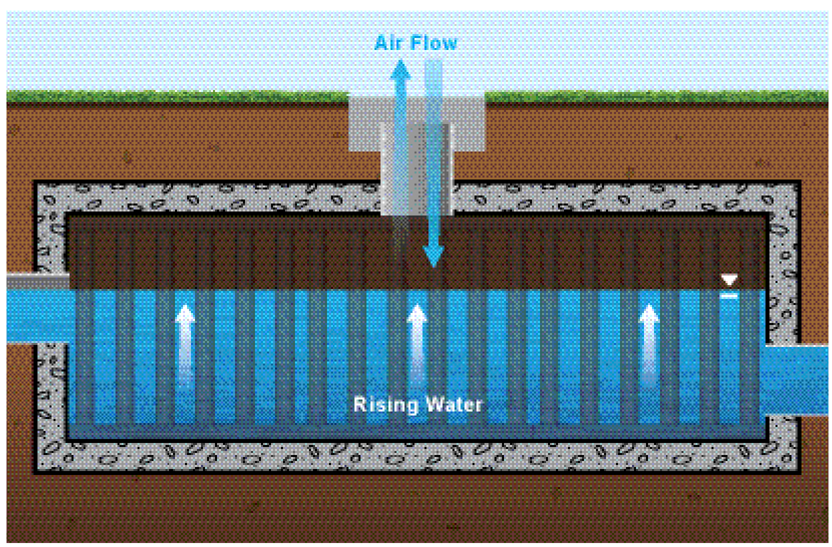
The system can also be connected by directly abutting Modules to a concrete catch basin or endwall. This allows for a seamless connection of structures in close proximity to the system and eliminates the need for numerous pipe connections. When directly abutting one of these structures, remove any side panels that fully abut the structure, and make sure it is flush with the system to prevent material migration into the structure.

Underdrain

Underdrains are typically utilized in detention applications to ensure the system fully drains since infiltration is limited or prohibited. The incorporation of an underdrain in a detention application will require an impermeable liner between the stone-soil interface.

Cleanout Ports

Brentwood understands the necessity to inspect and clean a subsurface system and has designed the Module without any walls to allow full access. Brentwood offers three different cleanout/observation ports for utilization with the system. The ports are made from PVC, provide an easy means of connection, and are available in 6" (152 mm), 8" (203 mm) and 10" (254 mm) diameters. The 10" (254 mm) port is sized to allow access to the system by a vacuum truck suction hose for easy debris removal. It is recommended that ports be located a maximum of 30' (9.14 m) on center to provide adequate access, ensure proper airflow, and allow the system to completely fill.



Ventilation and Air Flow

8.0 PRETREATMENT

Removing pollutants from stormwater runoff is an important component of any stormwater management plan. Pretreatment works to prevent water quality deterioration and also plays an integral part in allowing the system to maintain performance over time and increase longevity. Treatment products vary in complexity, design, and effectiveness, and therefore, should be selected based on specific project requirements.

Typical Stormwater System

Catch Basin → **Inlet Piping** → **Pretreatment** → **Storage Basin** → **Outlet Structure**

Pretreatment: STORMTANK SHIELD

Storage Basin: STORMTANK SHIELD & MODULE

StormTank® Shield

Brentwood's StormTank Shield provides a low-cost solution for stormwater pretreatment. Designed to improve sumped inlet treatment, the Shield reduces pollutant discharge through gross sediment removal and oil/water separation. For more information, please visit *www.stormtank.com*.

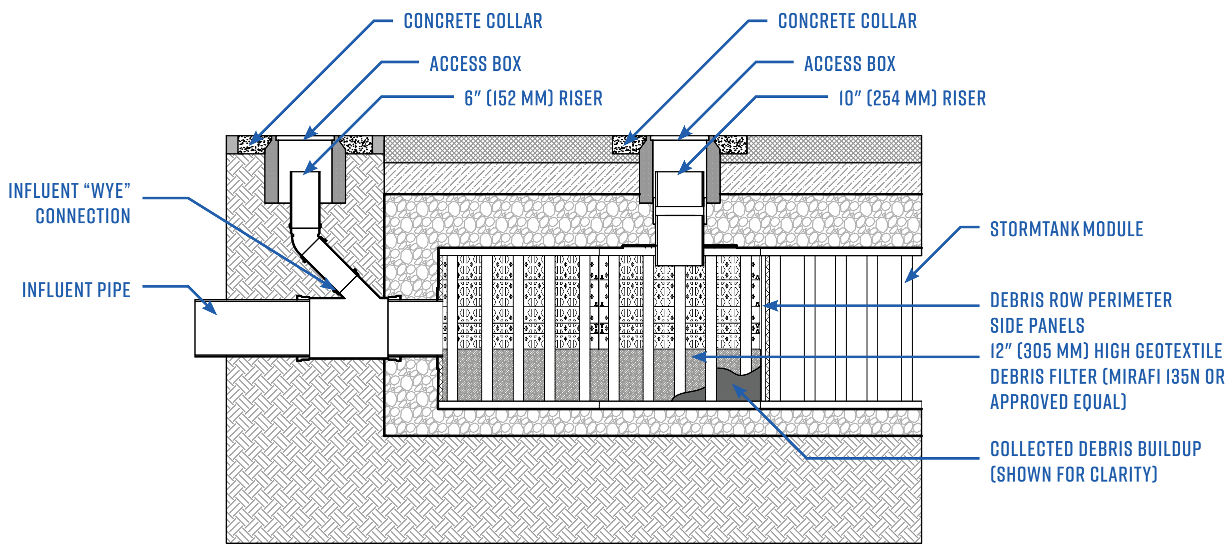
Debris Row (Easy Cleanout)

An essential step of designing, installing, and maintaining a subsurface system is preventing debris from entering the storage. This can be done by incorporating debris rows (or bays) at the inlets of the system to prevent debris from entering the rest of the system.

The debris row is built into the system utilizing side panels with a 12" (305 mm) segment of geotextile fabric. This allows for the full basin capacity to be utilized while storing any debris in an easy-to-remove location. To calculate the number of side panels required to prevent backing up, the opening area of the side panels on the area above the geotextile fabric has been calculated and compared to the inflow pipe diameter.

Debris row cleanout is made easy by including 10" (254 mm) suction ports, based on the length of the row, and a 6" (152 mm) saddle connection to the inflow pipe. If the system is directly abutting a catch basin, the saddle connection is not required, and the flush hose can be inserted through the catch basin. Debris is then flushed from the inlet toward the suction ports and removed.

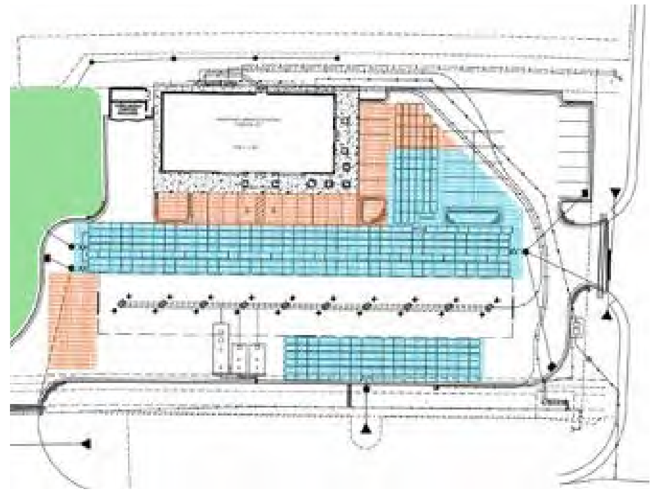
Brentwood has developed drawings and specifications that are available at *www.stormtank.com* to illustrate the debris row configuration and layouts.



Debris Row Section Detail

9.0 ADDITIONAL CONSIDERATIONS

Many variable factors, such as the examples below, must be taken into consideration when designing a StormTank® Module system. As these considerations require complex calculations and proper planning, please contact Brentwood or your local distributor to discuss project-specific requirements.



Site Plan Module Layout Adaptability
(StormTank Modules shown in blue)

Adaptability

The Modules can be arranged in custom configurations to meet tight site constraints and to provide different horizontal and edge configurations. Modules can also be stacked, to a maximum 2 units tall, to meet capacity needs and can be buried to a maximum invert of 11' (3.35 m) to allow for a stacked system or deeper burial.

Adjacent Structures

The location of adjacent structures, especially the location of footings and foundations, must be taken into consideration as part of system design. The foundation of a building or retaining wall produces a load that is transmitted to a footing and then applied to the surface below. The footing is intended to distribute the line load of the wall over a larger area without increasing the larger wall's thickness. The reason this is important is because the load the footing is applying to the earth is distributed through the earth and could potentially affect a subsurface system as either a vertical load to the top of the Module or a lateral load to the side of the Module.

Based on this increased loading, it is recommended that the subsurface system either maintain a distance away from the foundation, footing equal to the height between the Module invert and structure invert of the system, or the foundation or footing extend at a minimum to the invert of the subsurface system. By locating the foundation away from the system or equal to the invert, the loading generated by the structure does not get transferred onto the system. It is recommended that all adjacent structures be completed prior to the installation of the Modules to prevent construction loads from being imparted on the system.

Adjacent Excavation

The subsurface system must be protected before, during, and after the installation. Once a system is installed, it is important to remember that excavation adjacent to the system could potentially cause the system to become unstable. The uniform backfilling will evenly distribute the lateral loads to the system and prohibit the system from becoming unstable and racking from unequal loads. However, it is recommended that any excavation adjacent to a system remain a minimum distance away from the system equal to the invert. This will provide a soil load that is equal to the load applied by the opposite side of the installation. If the excavation is to exceed the invert of the system, additional analysis may be necessary.

Sloped Finished Grade

Much like adjacent excavation, a finished grade with a differential cover could potentially cause a subsurface system to become disproportionately loaded. For example, if one side of the system has 10' (3.05 m) of cover and the adjacent side has 24" (610 mm) of cover, the taller side will generate a higher lateral load, and the opposite side may not have an equal amount of resistance to prevent a racking of the system. Additional evaluation may be required when working on sites where the final grade around a system exceeds 5%.

10.0 INSPECTION & MAINTENANCE

Description

Proper inspection and maintenance of a subsurface stormwater storage system are vital to ensuring proper product functioning and system longevity. It is recommended that during construction the contractor takes the necessary steps to prevent sediment from entering the subsurface system. This may include the installation of a bypass pipe around the system until the site is stabilized. The contractor should install and maintain all site erosion and sediment per Best Management Practices (BMP) and local, state, and federal regulations.

Once the site is stabilized, the contractor should remove and properly dispose of erosion and sediment per BMP and all local, state, and federal regulations. Care should be taken during removal to prevent collected sediment or debris from entering the stormwater system. Once the controls are removed, the system should be flushed to remove any sediment or construction debris by following the maintenance procedure outlined below.

During the first service year, a visual inspection should be completed during and after each major rainfall event, in addition to semi-annual inspections, to establish a pattern of sediment and debris buildup. Each stormwater system is unique, and multiple criteria can affect maintenance frequency. For example, whether or not a system design includes inlet protection or a pretreatment device has a substantial effect on the system's need for maintenance. Other factors include where the runoff is coming from (hardscape, gravel, soil, etc.) and seasonal changes like autumn leaves and winter salt.

During and after the second year of service, an established annual inspection frequency, based on the information collected during the first year, should be followed. At a minimum, an inspection should be performed semi-annually. Additional inspections may be required at the change of seasons for regions that experience adverse conditions (leaves, cinders, salt, sand, etc).

Maintenance Procedures

Inspection:

1. Inspect all observation ports, inflow and outflow connections, and the discharge area.
2. Identify and log any sediment and debris accumulation, system backup, or discharge rate changes.
3. If there is a sufficient need for cleanout, contact a local cleaning company for assistance.

Cleaning:

1. If a pretreatment device is installed, follow manufacturer recommendations.
2. Using a vacuum pump truck, evacuate debris from the inflow and outflow points.
3. Flush the system with clean water, forcing debris from the system.
4. Repeat steps 2 and 3 until no debris is evident.

System Sizing Calculation

This section provides a brief description of the process required to size the StormTank® Module system. If you need additional assistance in determining the required number of Modules or assistance with the proposed configuration, it is recommended that you contact Brentwood or your local distributor. Additionally, Brentwood's volume calculator can help you to estimate the available storage volumes with and without stone storage. This tool is available at *www.stormtank.com*.

1. Determine the required storage volume (Vs):

It is the sole responsibility of the Engineer of Record to calculate the storage volume in accordance with all local, state, and federal regulations.

2. Determine the required number of Modules (N):

If the storage volume does not include stone storage, take the total volume divided by the selected Module storage volume. If the stone storage is to be included, additional calculations will be required to determine the available stone storage for each configuration.

3. Determine the required volume of stone (Vstone):

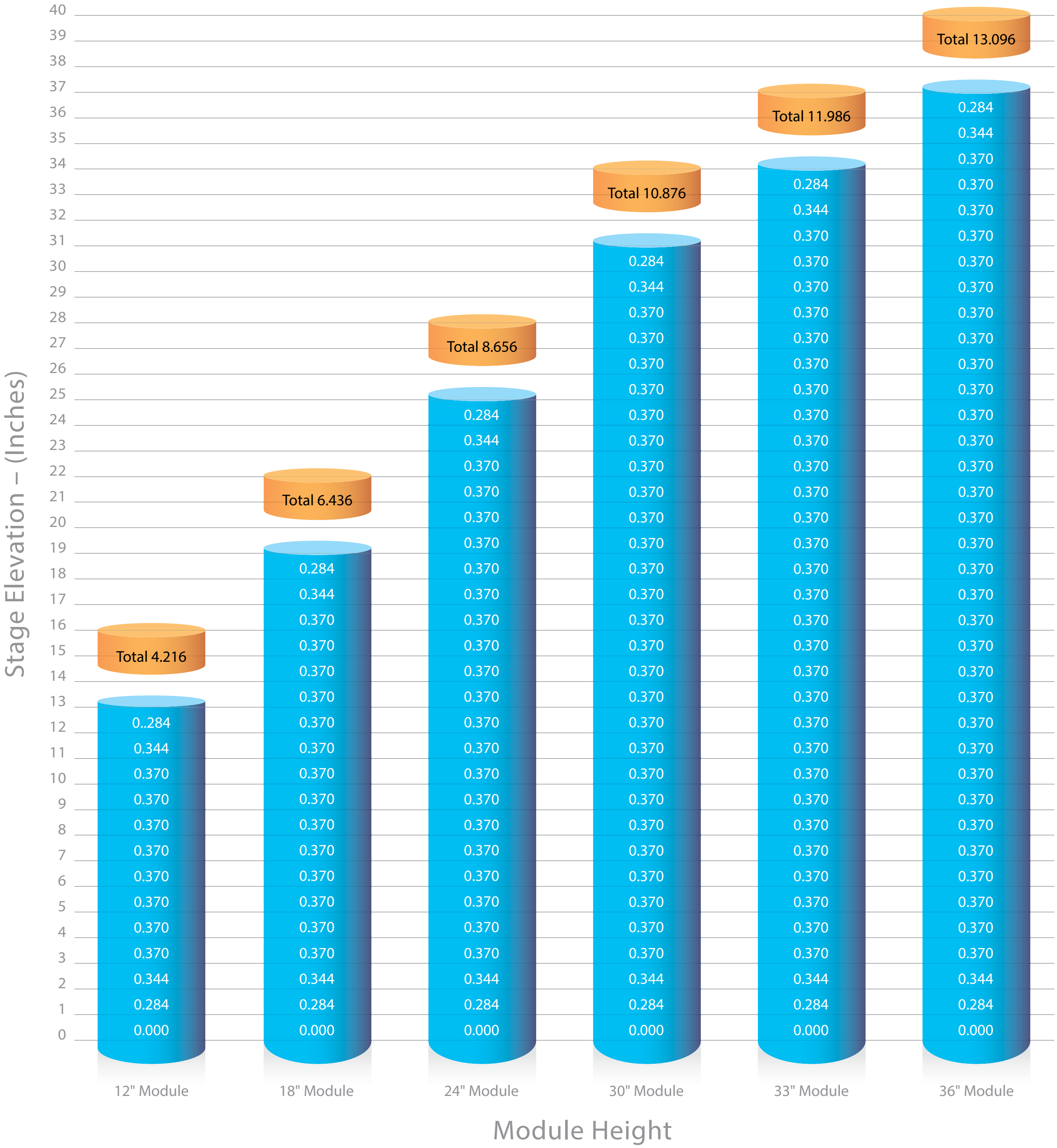
The system requires a minimum 6" (152 mm) leveling bed, 12" (305 mm) backfill around the system, and 12" (305 mm) top backfill utilizing 3/4" (19 mm) angular clean stone. Therefore, take the area of the system times the leveling bed and the top backfill. Once that value is determined, add the volume based on the side backfill width times the height from the invert of the Modules to the top of the Modules.

4. Determine the required excavation volume (Vexcv):

Utilizing the area of the system, including the side backfill, multiply by the depth of the system including the leveling bed. It is noted that this calculation should also include any necessary side pitch or benching that is required for local, state, or federal safety standards.

5. Determine the required amount of geotextile (G):

The system utilizes a multiple layer system of geotextile fabric. Therefore, two calculations are required to determine the necessary amount of geotextile. The first layer surrounds the entire system (including all backfill), and the second layer surrounds the Module system only. It is recommended that an additional 20% be included for waste and overlap.


Stage Elevation – (Inches)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
Total 4.216
0..284 0.344 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.344 0.284 0.000
12" Module
Total 6.436
0.284 0.344 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.370 0.344 0.284 0.000
18" Module
Total 8.656
0.284 0.344 0.370 0.344 0.284 0.000
24" Module
Total 10.876
0.284 0.344 0.370 0.344 0.284 0.000
30" Module
Total 11.986
0.284 0.344 0.370 0.344 0.284 0.000
33" Module
Total 13.096
0.284 0.344 0.370 0.344 0.284 0.000
36" Module
Module Height

11.2 MATERIAL QUANTITY WORKSHEET

Project Name: By:

Location: Date:

System Requirements

Required Storage	ft^3 (m^3)	
Number of Modules	Each	
Module Storage	ft^3 (m^3)	
Stone Storage	ft^3 (m^3)	
Module Footprint	ft^2 (m^2)	Number of Modules x 4.5 ft^2 (0.42 m^2)
System Footprint w/ Stone	ft^2 (m^2)	Module Footprint + 1 ft (0.3048 m) to each edge
Stone	Tons (kg)	Leveling Bed + Side Backfill + Top Backfill
Volume of Excavation	yd^3 (m^3)	System Footprint w/ Stone x Total Height
Area of Geotextile	yd^2 (m^2)	Wrap around Modules + Wrap around Stone/Soil Interface

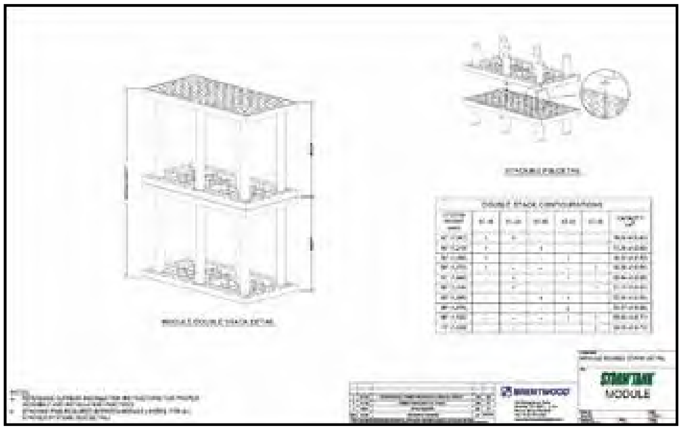
System Cost

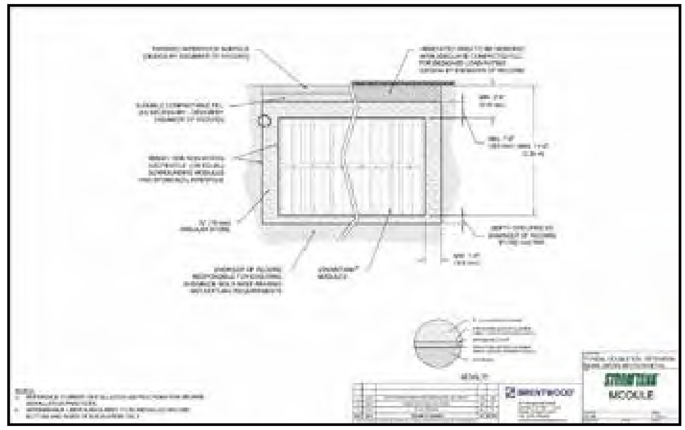
	Quantity		Unit Price			Total
Modules	ft^3 (m^3)	**X**	$	ft^3 (m^3)	**=**	$
Stone	Tons (kg)	**X**	$	Tons (kg)	**=**	$
Excavation	yd^3 (m^3)	**X**	$	yd^3 (m^3)	**=**	$
Geotextile	yd^2 (m^2)	**X**	$	yd^2 (m^2)	**=**	$
					Subtotal =	$
					Tons =	$

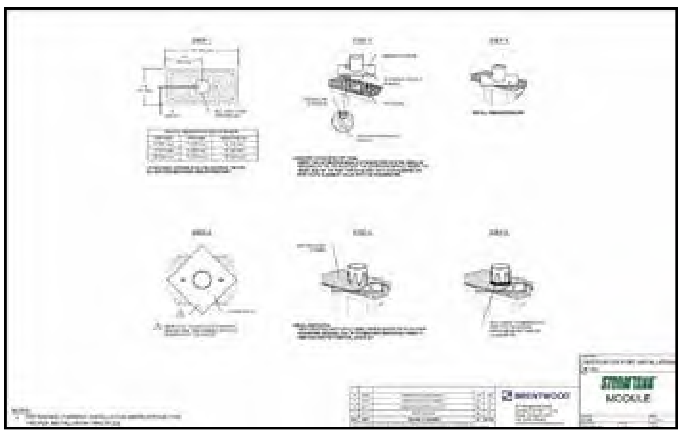
Material costs may not include freight.
Please contact Brentwood or your local distributor for this information.

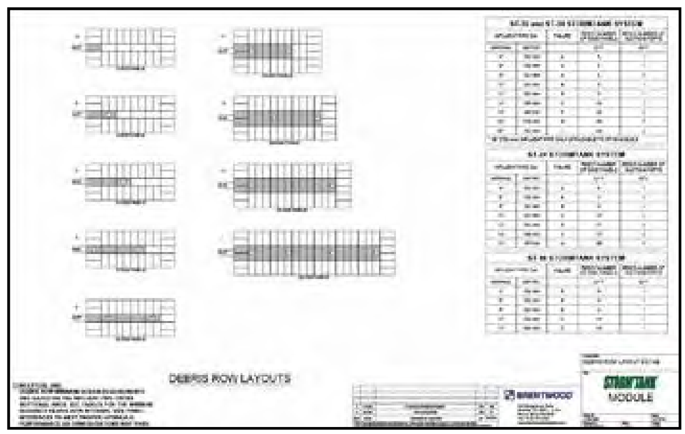
12.0 DETAIL DRAWINGS

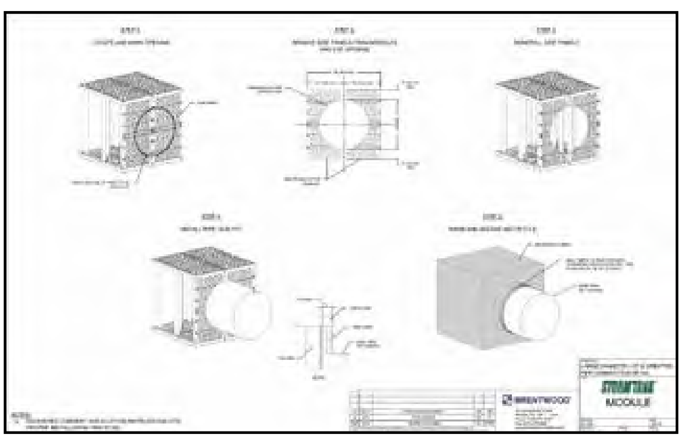
Brentwood has developed numerous drawings for utilization when specifying a StormTank® Module system. Below are some examples of drawings available at www.stormtank.com.

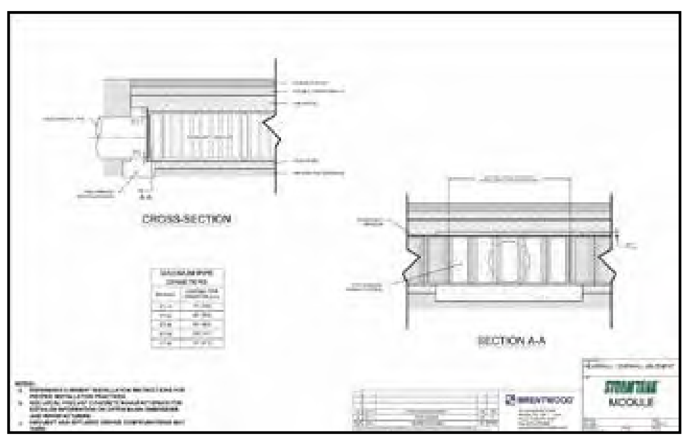












13.0 SPECIFICATIONS

1) General

a) This specification shall govern the implementation, performance, material, and fabrication pertaining to the subsurface stormwater storage system. The subsurface stormwater storage system shall be manufactured by Brentwood Industries, Inc., 500 Spring Ridge Drive, Reading, PA 19610 (610.374.5109), and shall adhere to the following specification at the required storage capacities.

b) All work is to be completed per the design requirements of the Engineer of Record and to meet or exceed the manufacturer's design and installation requirements.

2) Subsurface Stormwater Storage System Modules

a) The subsurface stormwater storage system shall be constructed from virgin polypropylene and 100% recycled PVC to meet the following requirements:

i) High-Impact Polypropylene Copolymer Material

(1) Injection molded, polypropylene, top/bottom platens and side panels formed to a dimension of 36" (914 mm) long by 18" (457 mm) wide [nominal].

ii) 100% Recycled PVC Material

(1) PVC conforming to ASTM D-1784 Cell Classification 12344 b-12454 B.

(2) Extruded, rigid, and 100% recycled PVC columns sized for applicable loads as defined by Section 3 of the AASHTO LRFD Bridge Design Specifications and manufactured to the required length per engineer-approved drawings.

iii) Platens and columns are assembled on site to create Modules, which can be uniformly stacked up to two Modules high, in vertical structures of variable height (custom for each project).

iv) Modular stormwater storage units must have a minimum 95% void space and be continuously open in both length and width, with no internal walls or partitions.

3) Submittals

a) Only systems that are approved by the engineer will be allowed.

b) At least 10 days prior to bid, submit the following to the engineer to be considered for pre-qualification to bid:

i) A list of materials to be provided for work under this article, including the name and address of the materials producer and the location from which the materials are to be obtained.

ii) Three hard copies of the following:

(1) Shop drawings.

(2) Specification sheets.

(3) Installation instructions.

(4) Maintenance guidelines.

c) Subsurface Stormwater Storage System Component Samples for review:

i) Subsurface stormwater storage system Modules provide a single 36" (914 mm) long by 18" (457 mm) wide, height as specified, unit of the product for review.

ii) Sample to be retained by owner.

d) Manufacturers named as acceptable herein are not required to submit samples.

4) Structural Design

a) The structural design, backfill, and installation requirements shall ensure the loads and load factors specified in the AASHTO LRFD Bridge Design Specifications, Section 3 are met.

b) Product shall be tested under minimum installation criteria for short-duration live loads that are calculated to include a 20% increase over the AASHTO Design Truck standard with consideration for impact, multiple vehicle presences, and live load factor.

c) Product shall be tested under maximum burial criteria for long-term dead loads.

d) The engineer may require submission of third-party test data and results in accordance with items 4b and 4c to ensure adequate structural design and performance.

Cover		HS-25 (Unfactored)		HS-25 (Factored)	
English (in)	Metric (mm)	English (ksf)	Metric (kPa)	English (ksf)	Metric (kPa)
24	610	1.89	90.45	4.75	227.43
25	635	1.82	86.96	4.53	216.90
26	660	1.75	83.78	4.34	207.80
27	686	1.69	80.88	4.16	199.18
28	711	1.63	78.24	3.99	191.04
29	737	1.58	75.82	3.84	183.86
30	762	1.54	73.62	3.70	177.16
31	787	1.50	71.60	3.57	170.93
32	813	1.46	69.75	3.45	165.19
33	838	1.42	68.06	3.34	159.92
34	864	1.39	66.51	3.24	155.13
35	889	1.36	65.10	3.14	150.34
36	914	1.33	63.80	3.05	146.03
37	940	1.31	62.62	2.97	142.20
38	965	1.29	61.54	2.90	138.85
39	991	1.26	60.55	2.83	135.50
40	1,016	1.25	59.65	2.76	132.15
41	1,041	1.23	58.54	2.70	129.28
42	1,067	1.21	58.09	2.67	127.84
43	1,092	1.20	57.42	2.60	124.49
44	1,118	1.19	56.81	2.55	122.09
45	1,143	1.18	56.26	2.50	119.70
46	1,168	1.16	55.77	2.46	117.79
47	1,194	1.16	55.33	2.42	115.87
48	1,219	1.15	54.94	2.39	114.43
49	1,245	1.14	54.59	2.36	113.00
50	1,270	1.13	54.29	2.33	111.56
51	1,295	1.13	54.03	2.30	110.12
52	1,321	1.12	53.80	2.27	108.69
53	1,346	1.12	53.62	2.25	107.73
54	1,372	1.12	53.46	2.23	106.77
55	1,397	1.11	53.34	2.21	105.82
56	1,422	1.11	53.24	2.19	104.86
57	1,448	1.11	53.18	2.17	103.90
58	1,473	1.11	53.14	2.16	103.42
59	1,499	1.11	53.12	2.14	102.46
60	1,524	1.11	53.13	2.13	101.98
61	1,549	1.11	53.16	2.12	101.51
62	1,575	1.11	53.21	2.11	101.03
63	1,600	1.11	53.28	2.10	100.55
64	1,626	1.11	53.37	2.09	100.07
65	1,651	1.12	53.48	2.08	99.59
66	1,676	1.12	53.61	2.08	99.59
67	1,702	1.12	53.75	2.07	99.11
68	1,727	1.13	53.91	2.07	99.11
69	1,753	1.13	54.08	2.06	98.63

Cover		HS-25 (Unfactored)		HS-25 (Factored)	
English (in)	Metric (mm)	English (ksf)	Metric (kPa)	English (ksf)	Metric (kPa)
70	1,778	1.13	54.26	2.06	98.63
71	1,803	1.14	54.46	2.06	98.63
72	1,829	1.14	54.67	2.06	98.63
73	1,854	1.15	54.90	2.06	98.63
74	1,880	1.15	55.13	2.06	98.63
75	1,905	1.16	55.38	2.06	98.63
76	1,930	1.16	55.64	2.06	98.63
77	1,956	1.17	55.90	2.06	98.63
78	1,981	1.17	56.18	2.06	98.63
79	2,007	1.18	56.46	2.07	99.11
80	2,032	1.19	56.76	2.07	99.11
81	2,057	1.19	57.06	2.07	99.11
82	2,083	1.20	57.37	2.08	99.59
83	2,108	1.20	57.69	2.08	99.59
84	2,134	1.21	58.02	2.09	100.07
85	2,159	1.22	58.35	2.09	100.07
86	2,184	1.23	58.69	2.10	100.55
87	2,210	1.23	59.04	2.11	101.03
88	2,235	1.24	59.39	2.11	101.03
89	2,261	1.25	59.75	2.12	101.51
90	2,286	1.26	60.11	2.13	101.98
91	2,311	1.26	60.48	2.13	101.98
92	2,337	1.27	60.86	2.14	102.46
93	2,362	1.28	61.24	2.15	102.94
94	2,388	1.29	61.62	2.16	103.42
95	2,413	1.30	62.01	2.17	103.90
96	2,438	1.30	62.41	2.18	104.38
97	2,464	1.31	62.81	2.19	104.86
98	2,489	1.32	63.21	2.20	105.34
99	2,515	1.33	63.62	2.21	105.82
100	2,540	1.34	64.03	2.22	106.29
101	2,565	1.35	64.45	2.23	106.77
102	2,591	1.35	64.87	2.24	107.25
103	2,616	1.36	65.29	2.25	107.73
104	2,642	1.37	65.72	2.27	108.69
105	2,667	1.38	66.15	2.28	109.17
106	2,692	1.39	66.58	2.29	109.65
107	2,718	1.40	67.02	2.30	110.12
108	2,743	1.41	67.45	2.31	110.60
109	2,769	1.42	67.90	2.33	111.56
110	2,794	1.43	68.34	2.34	112.04
111	2,819	1.44	68.79	2.35	112.52
112	2,845	1.45	69.24	2.36	113.00
113	2,870	1.46	69.69	2.38	113.96
114	2,896	1.47	70.15	2.39	114.43

STORMTANK
Expect Results

STORMTANK.COM

info@stormtank.com
+1.610.374.5109

SM021-1_08-18_EN

A BRAND OF BRENTWOOD

brentwoodindustries.com

Appendix G: Drawings

NOTE:

IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO INFORM THEMSELVES OF THE EXACT LOCATION OF, AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES, SERVICES AND STRUCTURES WHETHER ABOVE GROUND OR BELOW GRADE BEFORE COMMENCING THE WORK. SUCH INFORMATION IS NOT NECESSARILY SHOWN ON THE DRAWING, AND WHERE SHOWN, THE ACCURACY CANNOT BE GUARANTEED.

WITH THE SOLE EXCEPTION OF THE BENCHMARK(S) SPECIFICALLY DESCRIBED FOR THIS PROJECT, NO ELEVATION INDICATED OR ASSUMED HEREON IS TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

NOTE:
REFER TO G-1 FOR VERTICAL CONTROL (BENCH MARKS) AND HORIZONTAL CONTROL (NAD-83 UTM CO-ORDINATES) INFORMATION.

ALL DIMENSIONS AND INFORMATION SHALL BE CHECKED AND VERIFIED ON THE JOB AND ANY DISCREPANCIES MUST BE REPORTED TO THE CONSULTANT BEFORE COMMENCING THE WORK. DRAWINGS ARE NOT TO BE SCALED.

RG ROBINSON AND ASSOCIATES (BARRIE) LTD. A TSH COMPANY

CITY OF BARRIE APPROVED
DATE ....
....
DIRECTOR OF ENGINEERING

LICENCED PROFESSIONAL ENGINEER R.P. PROVENCAL PROVINCE OF ONTARIO

TSH engineers architects planners
Totten Sims Hubicki Associates (1997) Limited
10 High Street
Barrie, Ontario
L4N 1W1
TEL: 705-721-9222
FAX: 705-734-0764
www.tsh.ca

No.	DATE	BY	ISSUES / REVISIONS
1			

CLIENT:
BARRIE HERITAGE DEVELOPMENTS LTD.
BCE PLACE 181 BAY STREET
SUITE 2800
TORONTO ONTARIO
M5J 2T3

"ARTHUR WOLFOND IN TRUST"
BCE PLACE 181 BAY STREET
SUITE 2800
TORONTO ONTARIO
M5J 2T3

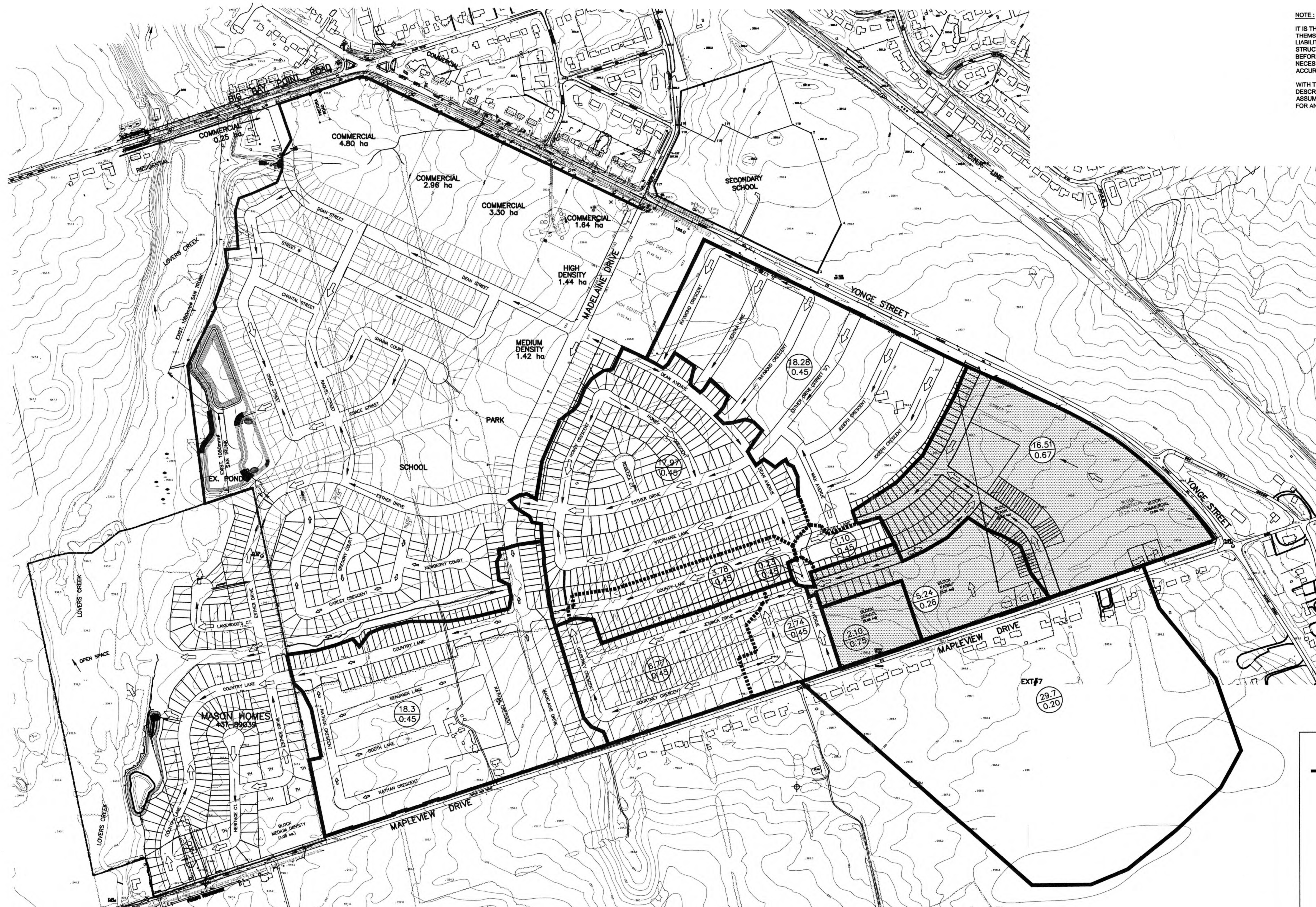
DRAWN BY: P.HAMMELL	CHECKED BY: R.PROVENCAL
DESIGNED BY: R.PROVENCAL	APPROVED BY:
SCALE: 1:1000 STORM	DATE: MAY/05

PROJECT: COUNTRY LANE PHASE III, PART 6 SUBDIVISION / SWALLOW GLEN SUBDIVISION

DRAWING: INTERNAL STORM DRAINAGE PLAN

PROJECT No.: 4400030116

DRAWING No.: G-3



NOTE :

IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO INFORM THEMSELVES OF THE EXACT LOCATION OF, AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES, SERVICES AND STRUCTURES WHETHER ABOVE GROUND OR BELOW GRADE BEFORE COMMENCING THE WORK. SUCH INFORMATION IS NOT NECESSARILY SHOWN ON THE DRAWING, AND WHERE SHOWN, THE ACCURACY CANNOT BE GUARANTEED.

WITH THE SOLE EXCEPTION OF THE BENCHMARK(S) SPECIFICALLY DESCRIBED FOR THIS PROJECT, NO ELEVATION INDICATED OR ASSUMED HEREON IS TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

LEGEND

- STORM DRAINAGE BOUNDARY
- BARRIE HERITAGE SUBDIVISION
- MAJOR SYSTEM FLOW DIRECTION
- MINOR SYSTEM FLOW DIRECTION
- 1.25 — AREA IN HECTARES
- 0.45 — TOTAL PERCENT IMPERVIOUSNESS OR CURVE NUMBER VALUE

ALL DIMENSIONS AND INFORMATION SHALL BE CHECKED AND VERIFIED ON THE JOB AND ANY DISCREPANCIES MUST BE REPORTED TO THE CONSULTANT BEFORE COMMENCING THE WORK. DRAWINGS ARE NOT TO BE SCALED.

RG ROBINSON AND ASSOCIATES (BARRIE) LTD.
A TSH COMPANY

CITY OF BARRIE
APPROVED
DATE . . . .
. . . .
DIRECTOR OF ENGINEERING

LICENCED PROFESSIONAL ENGINEER
R.P. PROVENCAL
PROVINCE OF ONTARIO

TSH
engineers architects planners
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TEL: 705-721-9222
FAX: 705-734-0764
www.tsh.ca

No.	DATE	BY	ISSUES / REVISIONS
1			

CLIENT:
BARRIE HERITAGE DEVELOPMENTS LTD.
5060 SPECTRUM WAY
SUITE 505
MISSISSAUGA, ONTARIO
L4W 5N5

'ARTHUR WOLFOND IN TRUST'
5060 SPECTRUM WAY
SUITE 505
MISSISSAUGA, ONTARIO
L4W 5N5

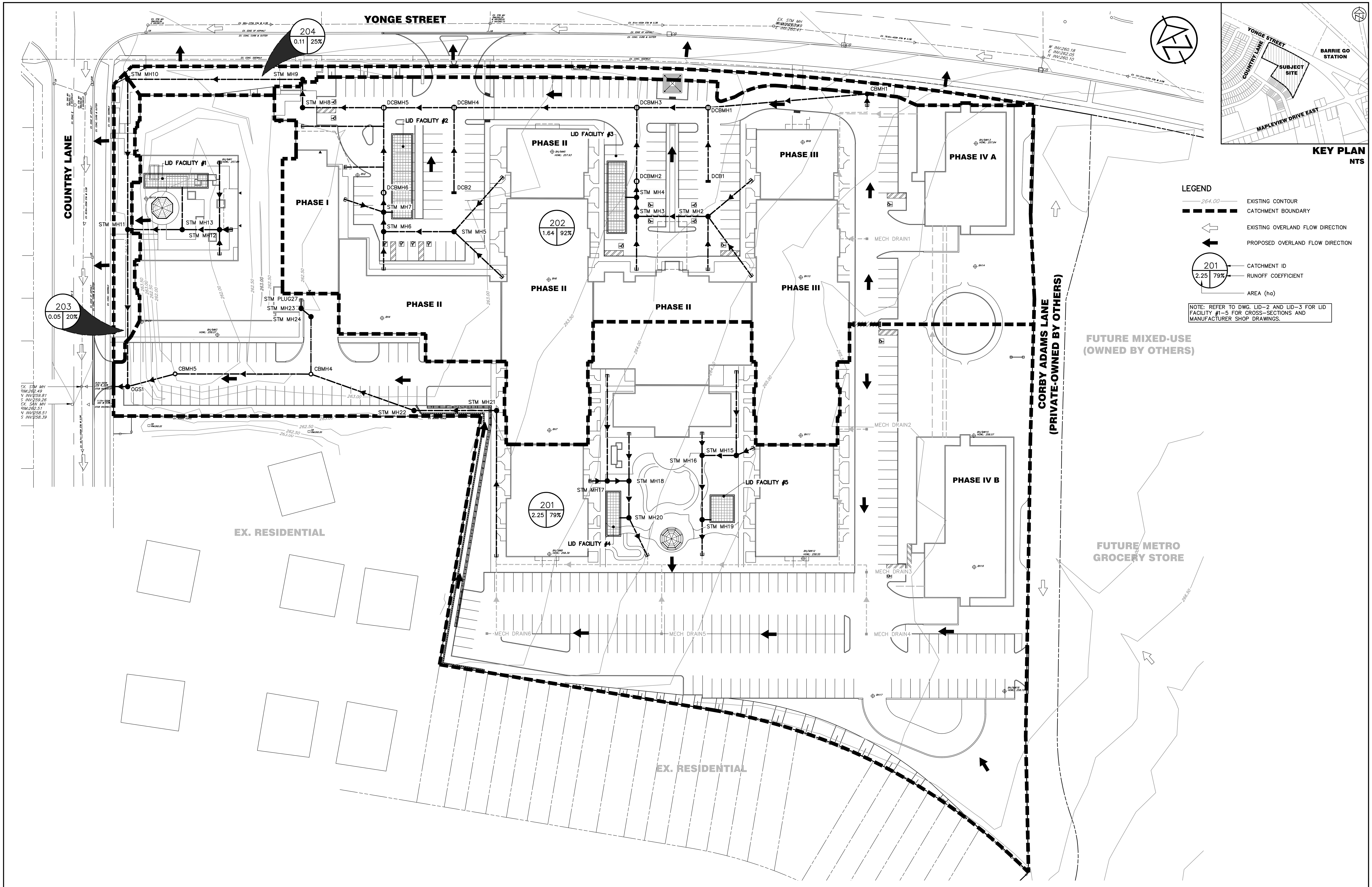
DRAWN BY: P.HAMMELL	CHECKED BY: R.PROVENCAL
DESIGNED BY: R.PROVENCAL	APPROVED BY:
SCALE: 1:1000	DATE: MAY/05

PROJECT:
COUNTRY LANE PHASE III, PART 6 SUBDIVISION & SWALLOW GLEN SUBDIVISION

DRAWING:
EXTERNAL STORM DRAINAGE PLAN

PROJECT No. : 4400030116

DRAWING No. G-4



DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES AND LEGAL BOUNDARIES SHOWN ON THIS PLAN FROM SURVEY COMPLETED BY KRCMAR SURVEYORS LTD., OLS, DATED FEBRUARY 2022.

SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED SEPTEMBER 6, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m

MNR No. 0011931U460S – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH–EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH–EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24
2.	ISSUED FOR BUILDING PERMIT APPROVAL	AUG. 15/24
3.	SITE PLAN APPROVAL – SECOND SUBMISSION	SEPT. 6/24

ENGINEER STAMP

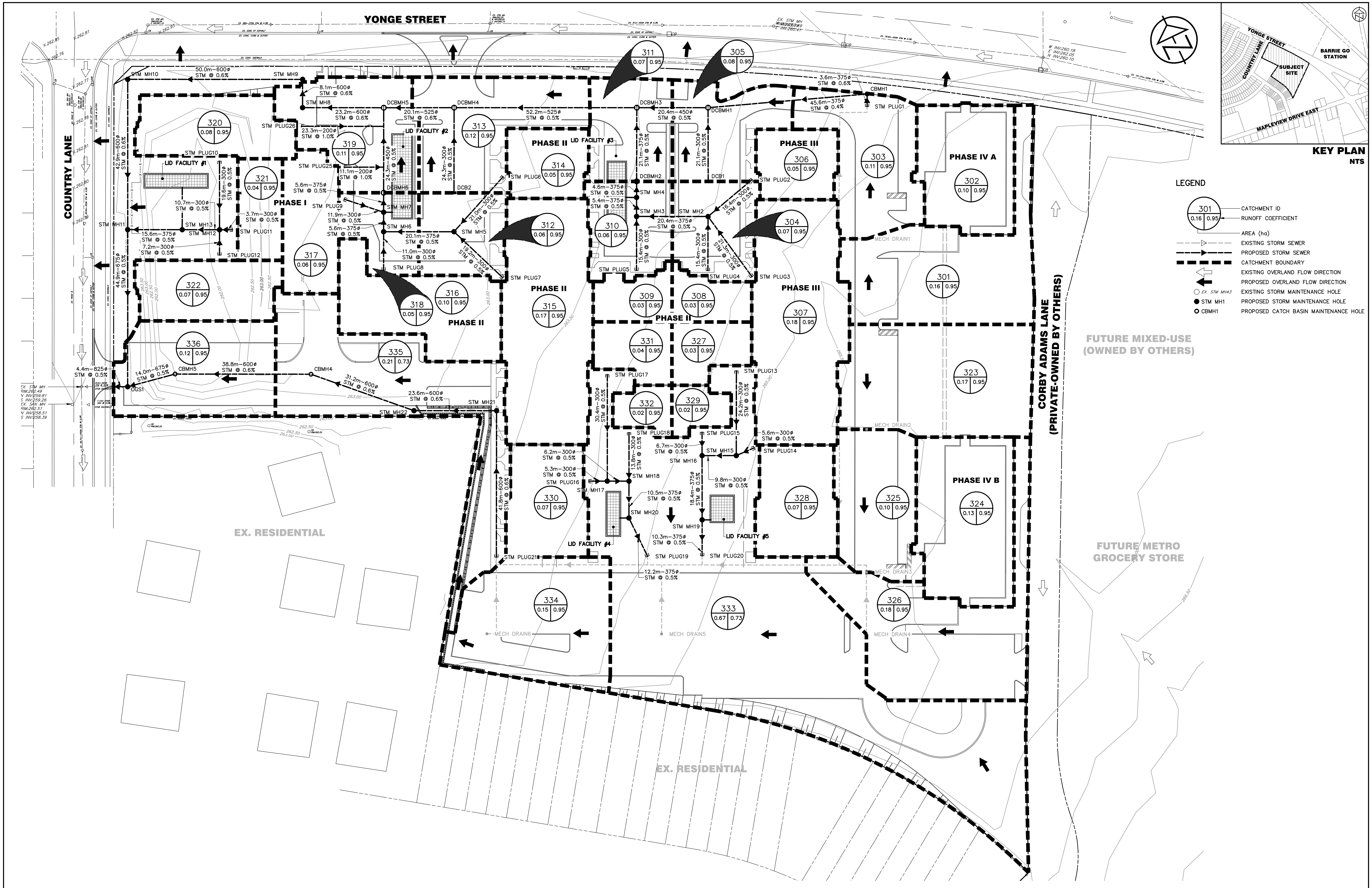
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

TATHAM ENGINEERING

POST–DEVELOPMENT DRAINAGE PLAN

DESIGN: LC	FILE: 422426	DWG:	DP-1
DRAWN: LQ/JLM	DATE: APRIL 2024		
CHECK: BFS/NM	SCALE: 1:500		

Drawing Name: 422426–DP01.dwg, Plotted: Sep 09, 2024



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No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24
2.	ISSUED FOR BUILDING PERMIT APPROVAL	AUG. 15/24
3.	SITE PLAN APPROVAL – SECOND SUBMISSION	SEPT. 6/24

ENGINEER STAMP

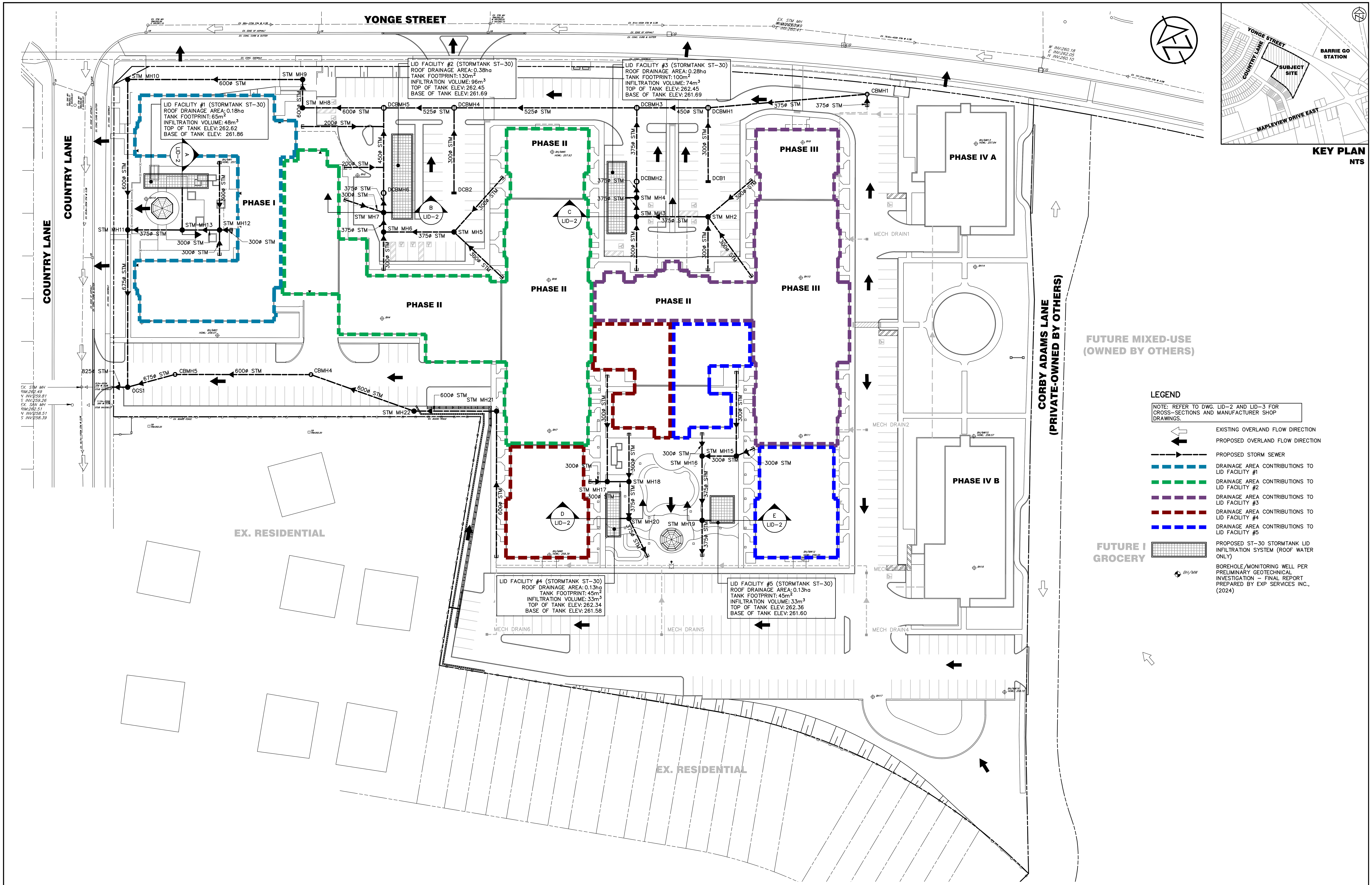
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

STORM SEWER CATCHMENT PLAN

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:
DRAWN: LQ/JLM	DATE: APRIL 2024	STM-1
CHECK: BFS/NM	SCALE: 1:500	

Drawing Name: 422426-STM01.dwg, Plotted: Sep 09, 2024



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ENGINEER STAMP

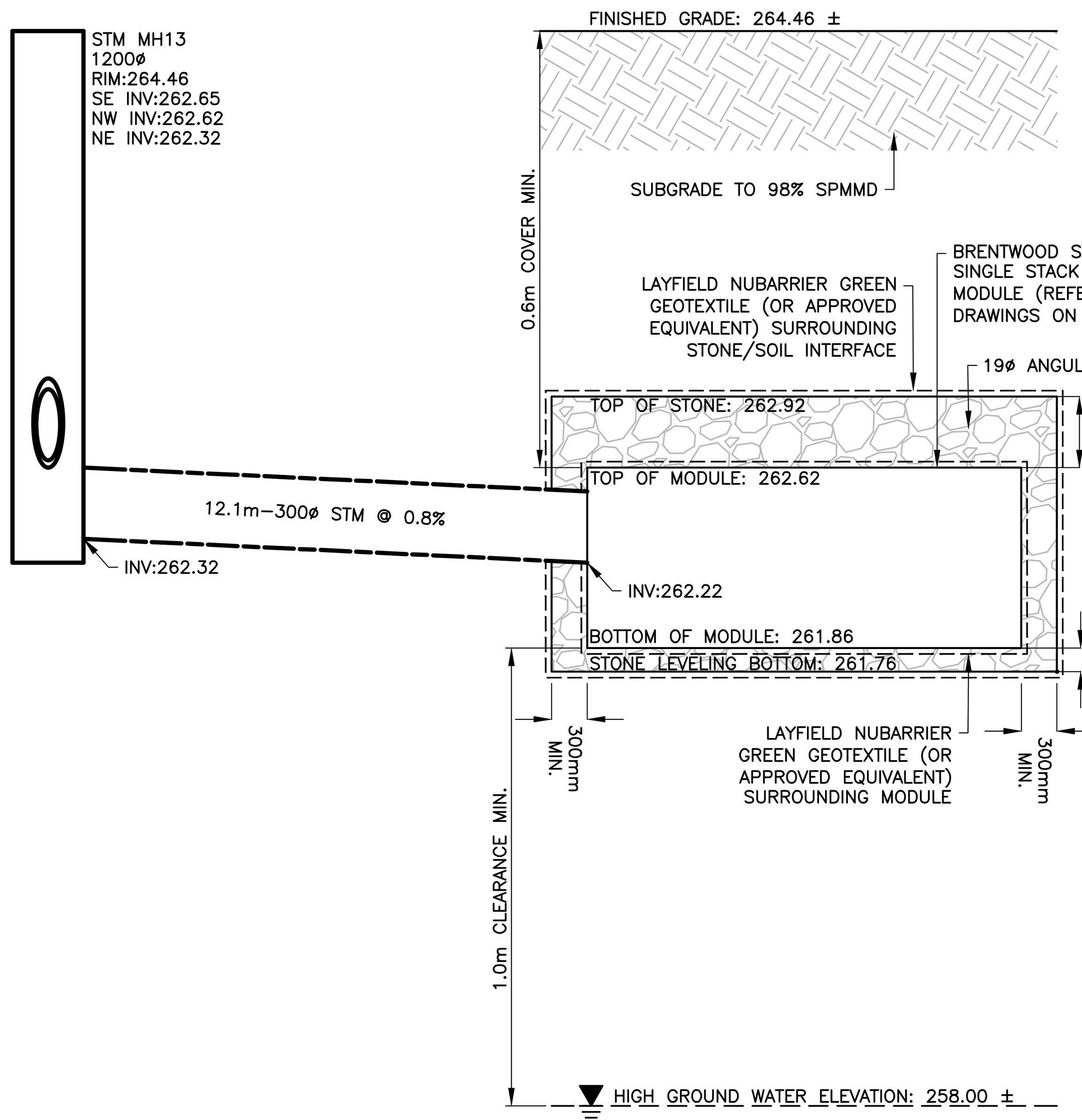
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

LOW IMPACT DEVELOPMENT CATCHMENT PLAN

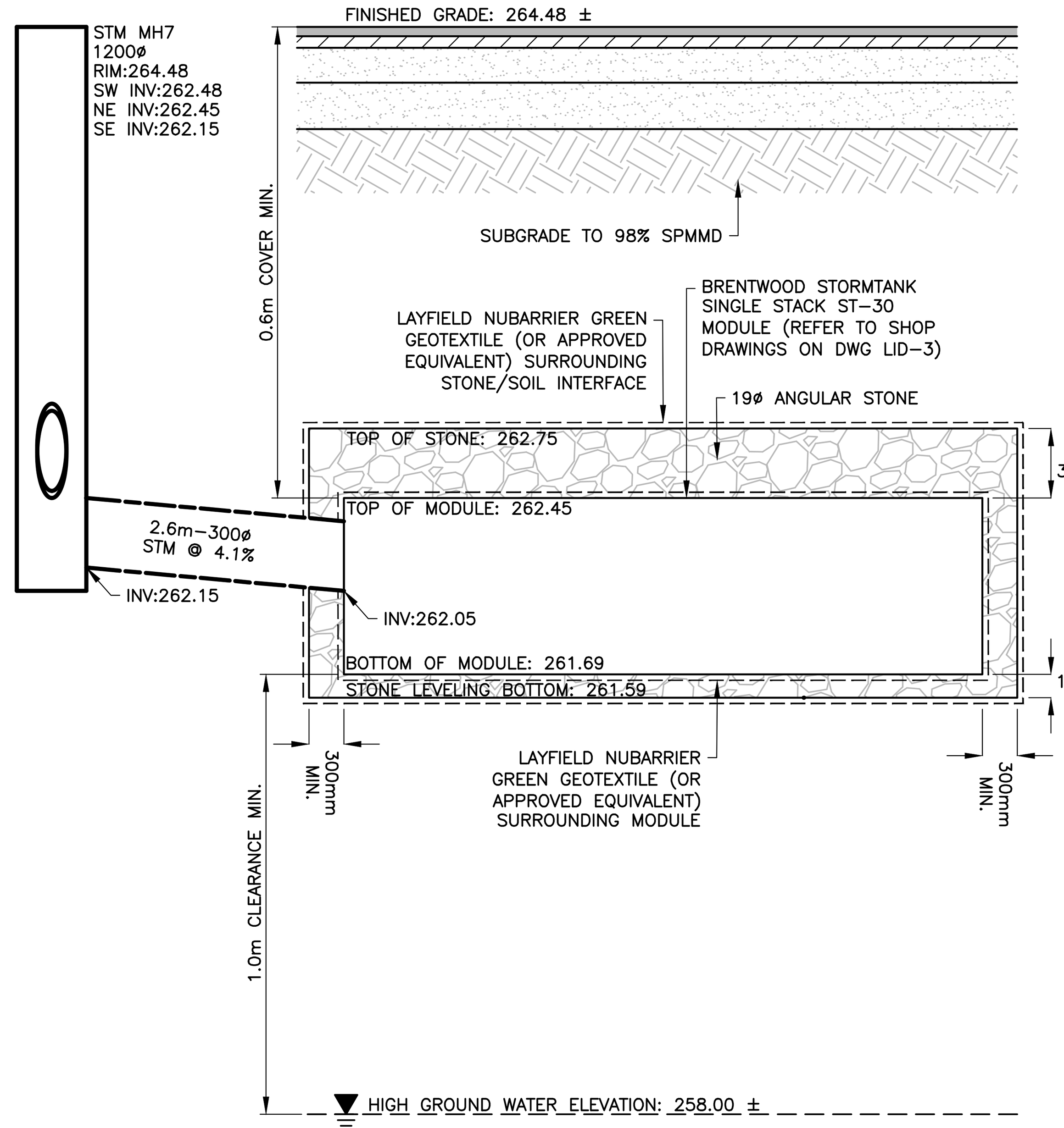
TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG: **LID-1**
DRAWN: LQ/JLM	DATE: APRIL 2024	
CHECK: BFS/NM	SCALE: 1:500	

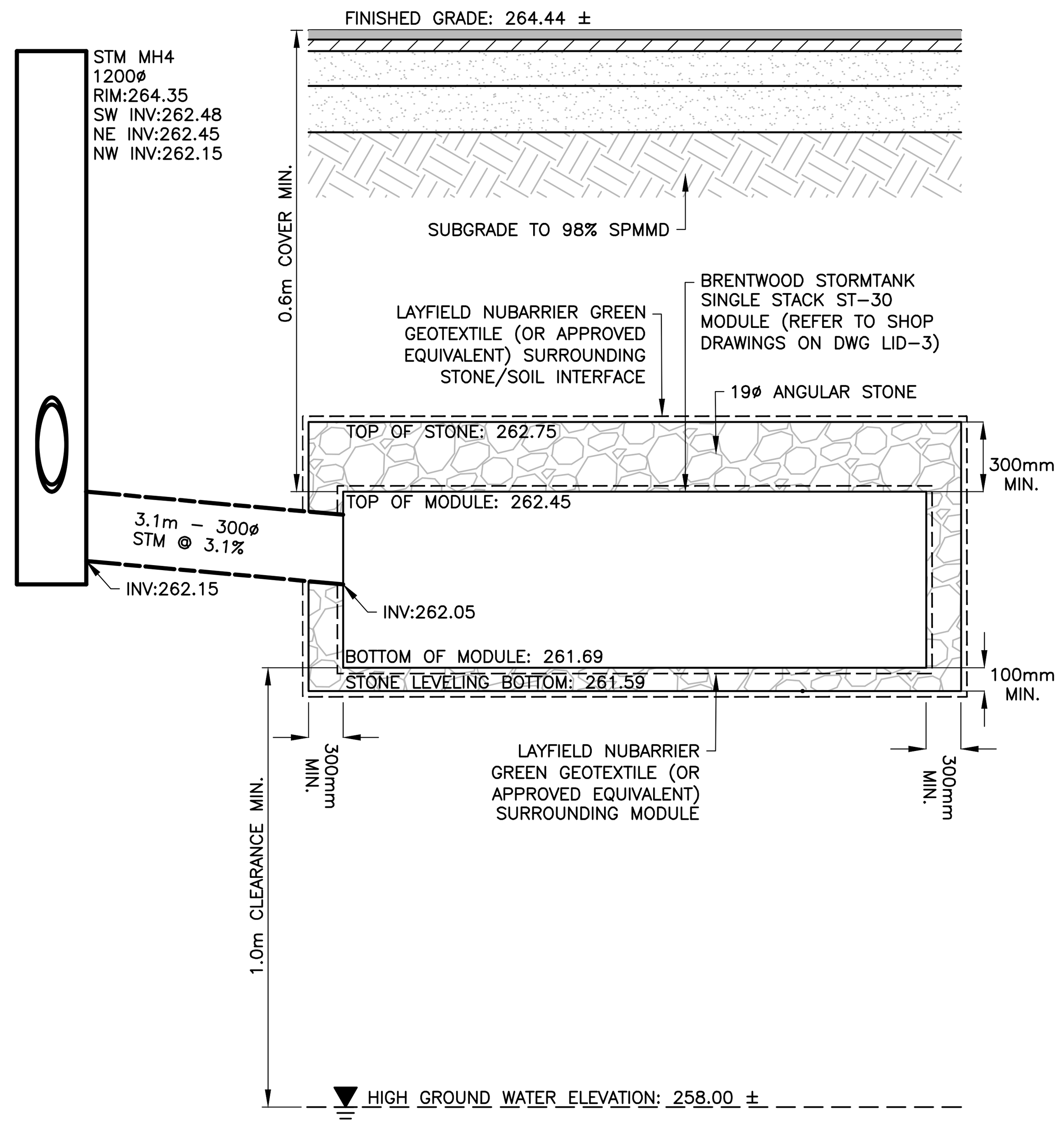
Drawing Name: 422426-LID01.dwg, Plotted: Sep 09, 2024



A LID-2 LOW IMPACT DEVELOPMENT FACILITY #1
NTS



B LID-2 LOW IMPACT DEVELOPMENT FACILITY #2
NTS



C LID-2 LOW IMPACT DEVELOPMENT FACILITY #3
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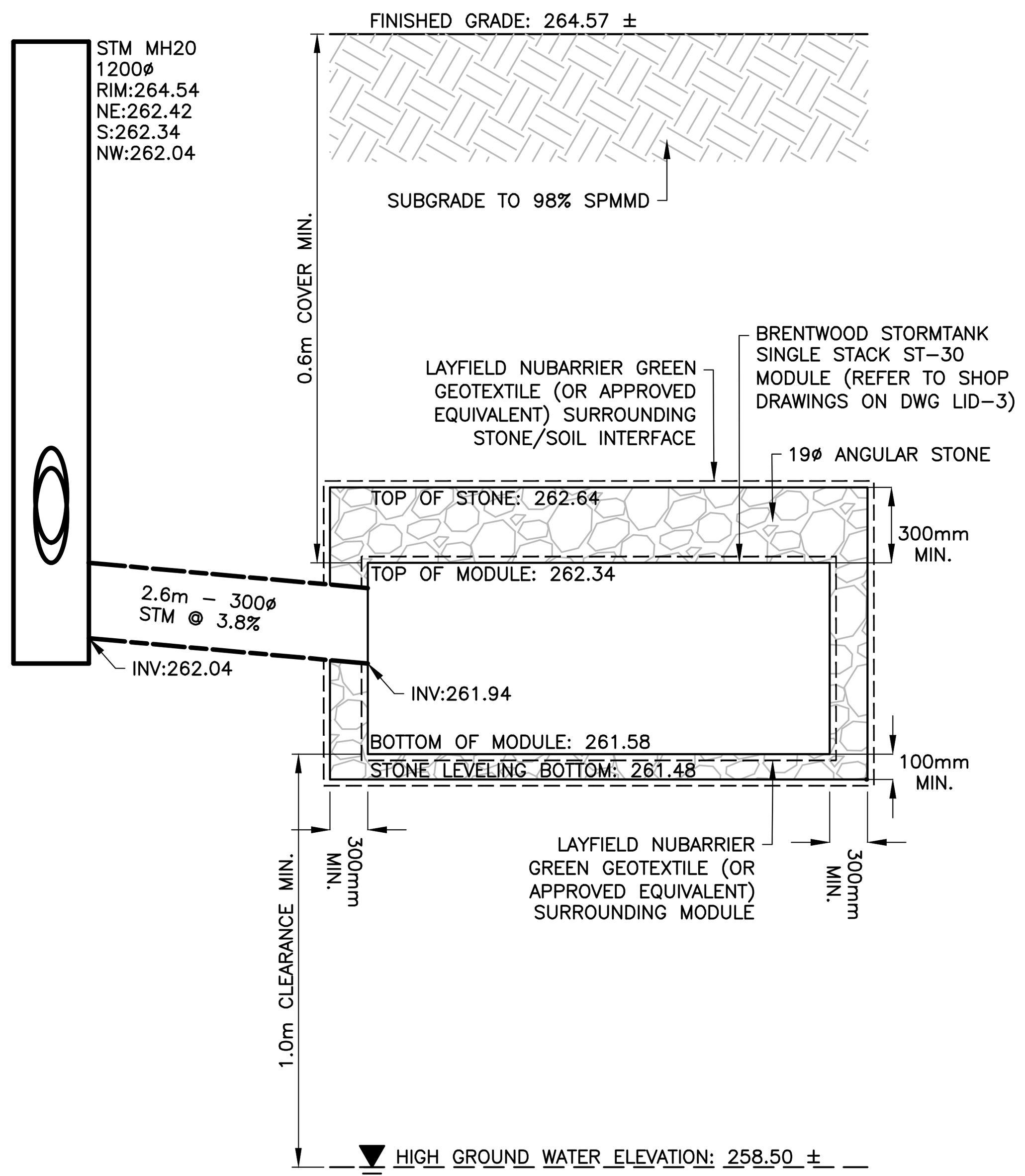
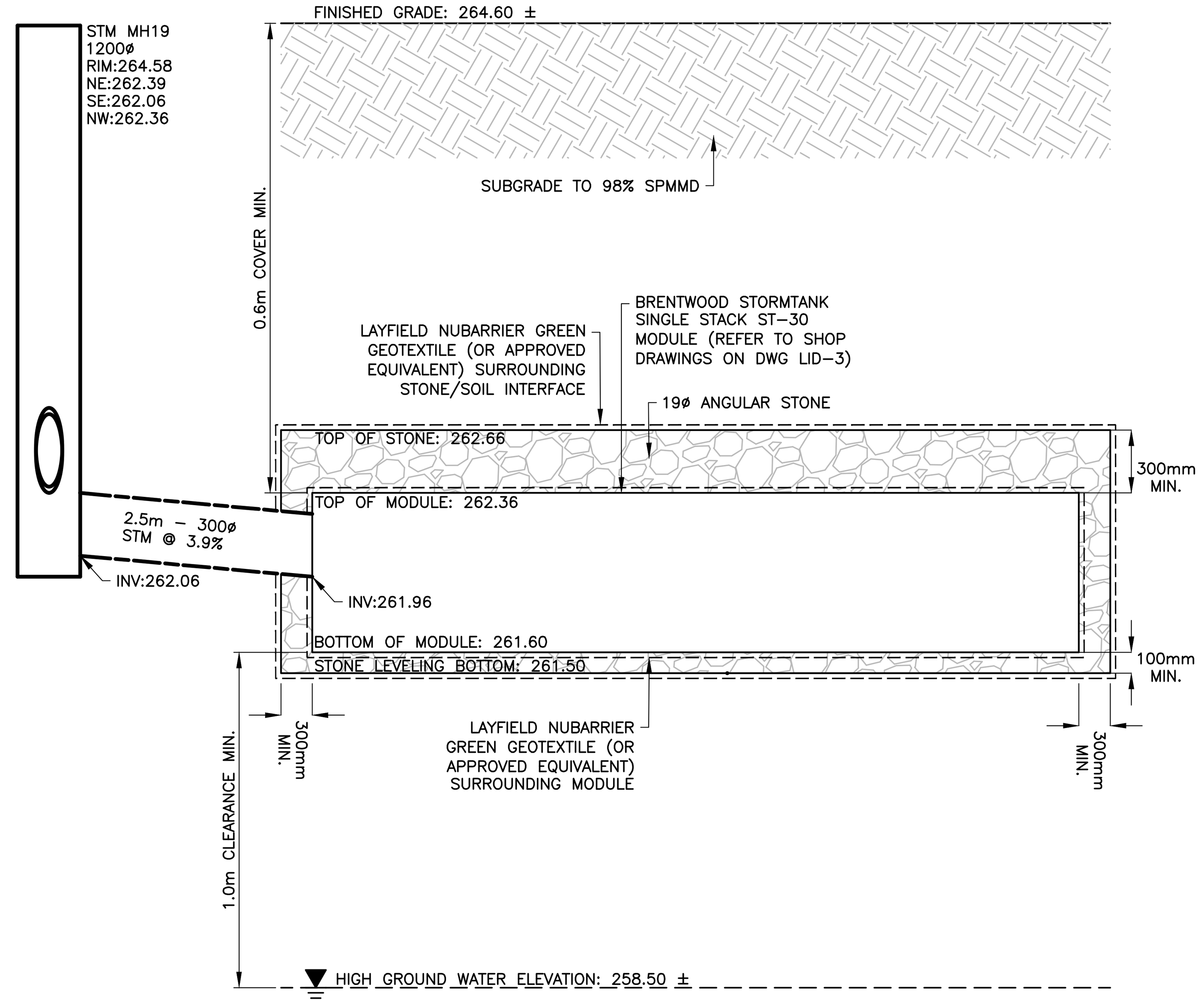


D LID-2 LOW IMPACT DEVELOPMENT FACILITY #4
NTS



E LID-2 LOW IMPACT DEVELOPMENT FACILITY #5
NTS

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DRAWING REFERENCES

TOPOGRAPHIC FEATURES AND LEGAL BOUNDARIES SHOWN ON THIS PLAN FROM SURVEY COMPLETED BY KRCMAR SURVEYORS LTD., OLS, DATED FEBRUARY 2022.

SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED SEPTEMBER 6, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m
MNR No. 0011931U460S - SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH-EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

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ENGINEER STAMP

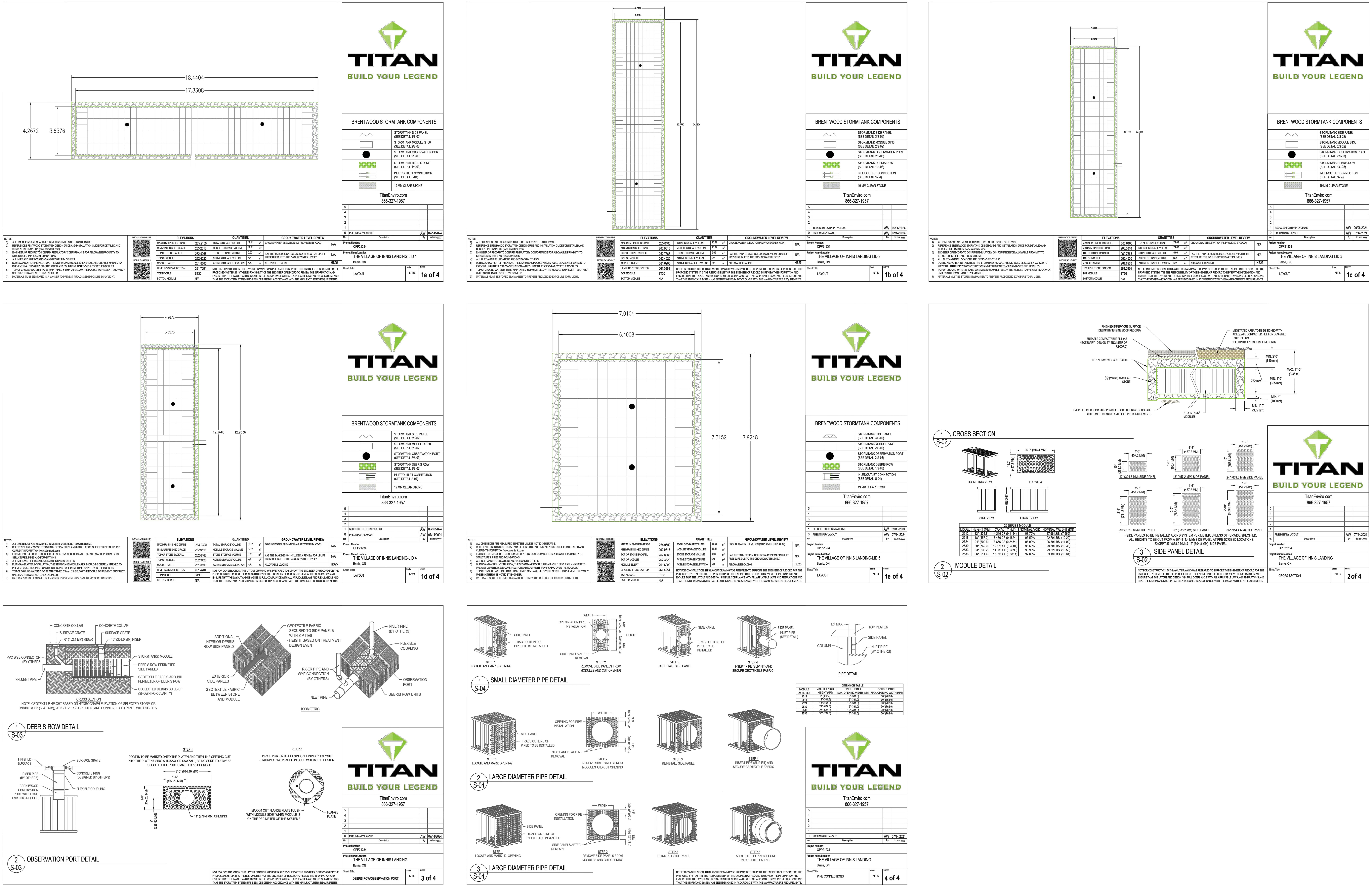
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

LOW IMPACT DEVELOPMENT FACILITY CROSS-SECTIONS

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:
DRAWN: LQ/JLM	DATE: APRIL 2024	LID-2
CHECK: BFS/NM	SCALE: -	

Drawing Name: 422426-LID02.dwg, Plotted: Sep 09, 2024



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ENGINEER STAMP

THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

TATHAM ENGINEERING

LOW IMPACT DEVELOPMENT FACILITY
SHOP DRAWINGS

DESIGN: LC	FILE: 422426	DWG:
DRAWN: LQ/JLM	DATE: APRIL 2024	**LID-3**
CHECK: BFS/NM	SCALE: –	

Drawing Name: 422426–LID03.dwg, Plotted: Sep 09, 2024

SCALE:

0 25 50 75 100 125 m

LEGEND:

- ◉ BOREHOLE /MONITORING WELL (EXP, 2022)
- XX.XX GROUNDWATER ELEVATION (m asl) AS MEASURED ON FEBRUARY 10, 2022
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE SITE BOUNDARY

exp.

DRAWN BY: AC

CHECKED BY: JS

GROUNDWATER CONTOUR PLAN

FIGURE: 6

HYDROGEOLOGICAL INVESTIGATION AND WATER BALANCE ASSESSMENT
800 YONGE STREET
BARRIE, ONTARIO

PROJECT NUMBER: GTR-21023592-A0

DATE: FEBRUARY 2022