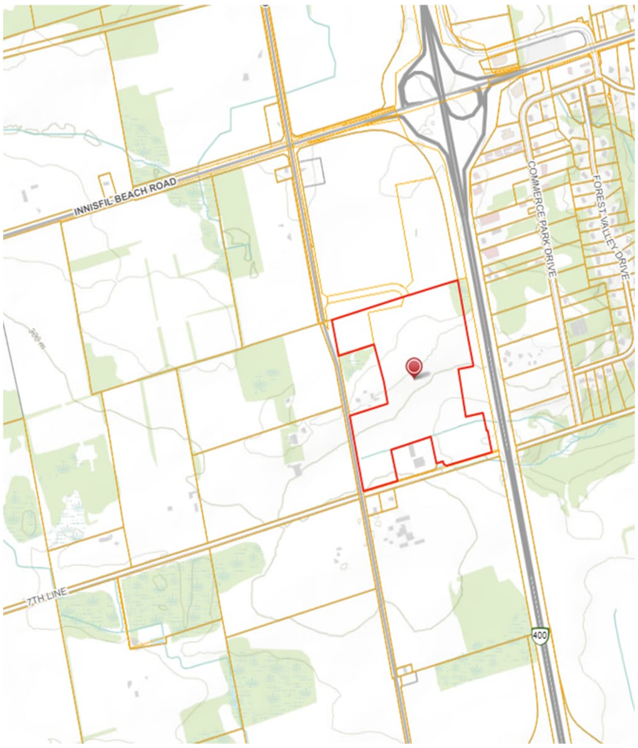
COMMITTEE OF ADJUSTMENT NOTICE OF PUBLIC HEARING
APPLICATION NO. B-007-2025

TAKE NOTICE that an application has been received by the Town of Innisfil from **Kyle Gavin, Applicant**, on behalf of **7131 5th Sideroad Inc., Owner**, for consent under Section 53 of the Planning Act, R.S.O. 1990, c. P.13, as amended for a consent to a conveyance of property.

The subject property is described legally as **INNISFIL CON 7 PT LOT 6 RP 51R44530 PARTS 1 2 AND 4** known municipally as **7131 5th Sideroad** and is zoned **"Industrial Business Park (IBP)".**

The applicant is proposing to sever a portion of the subject lands for the purpose of creating two industrial lots (lot 2 and 3) and associated stormwater management block. The retained parcel (lot 2) will have an approximate lot area of 12.5 ha and an approximate lot frontage of 150.7 m. The first severed lands (lot 3) will have an approximate lot area of 5.9 ha and lot frontage of 114.8 m. The second severed lands is to be conveyed to the Town (lot 1) and will have an approximate lot area of 4.0 ha and an approximate frontage of 30.8 m.

The Committee of Adjustment for the Town of Innisfil will consider this application in person at Town Hall and virtually through Zoom on **Thursday, July 17, 2025, at 6:30 PM.**



To participate in the hearing and/or provide comments, you must register by following the link below or scanning the above QR code: https://innisfil.ca/en/building-and-development/committee-of-adjustment-hearings.aspx

Requests can also be submitted in writing to: Town of Innisfil Committee of Adjustment, 2101 Innisfil Beach Road, Innisfil, Ontario, L9S 1A1 or by email to planning@innisfil.ca.

If you wish to receive a copy of the decision of the Committee of Adjustment in respect of the proposed consent, you must make a written request to the Secretary-Treasurer of the Committee of Adjustment by way of email or regular mail. The Notice of Decision will also explain the process for appealing a decision to the Ontario Land Tribunal (OLT).

Additional information relating to the proposed application is available on the Town of Innisfil website. Accessible formats are available on request, to support participation in all aspects of the feedback process. To request an alternate format please contact Planning Services at planning@innisfil.ca.

Dated: **June 27, 2025**

Sarah Burton Hopkins,
Secretary Treasurer
sburtonhopkins@innisfil.ca
705-436-3710 ext. 3504

7131 5th Side Road

Part of Lot 6, Concession 7

TOWN OF INNISFIL,
COUNTY OF SIMCOE

APPLICATION FOR

CONSENT TO SEVER AND MINOR VARIENCE

PREPARED BY

INNOVATIVE PLANNING SOLUTIONS

647 WELHAM ROAD, UNIT 9A
BARRIE, ONTARIO L4N 0B7
TEL: (705) 812-3281
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ON BEHALF OF

7131 5TH SIDE ROAD INC.

JUNE 12, 2025

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1.0 Introduction

Innovative Planning Solutions has been retained by 7131 5th Sideroad Inc. to complete a Planning Justification Report in relation to applications for a Consent to Sever and Minor Variance application on lands legally described as part of the south half of Lot 6, Concession 7, and known municipally as 7131 5Th Side Road in the Town of Innisfil.

The subject lands possess a total area of 22.45 ha (~55.5 acres). The lands have approximately 151.1 metres of frontage along 5th Sideroad, and 326.8 metres along Highway 400. An overview of the Subject Lands is provided in **Figure 1**.

The subject site is currently designated 'Innisfil Heights Strategic Settlement Employment Area' in the County of Simcoe Official Plan (**Figure 2**), designated as 'Employment Area' in the Town of Innisfil Official Plan (**Figure 3**), and zoned Industrial Business Park (IBP) in the Town of Innisfil Zoning By-Law (**Figure 4**).

The intent of the proposed consent is to sever the lands into three (3) total blocks for industrial use (hereinafter referred to as Lots 1 through 3), and one block for a proposed Stormwater Management Pond (hereinafter referred to as Lot 4) (See **Figure 5** and **Appendix 1**). Further, a Minor Variance is proposed as part of this application in order to permit a outdoor storage as a use on Lot 2, as per the needs of a prospective tenant, ATCO.

It should be noted that two previous applications were made on the Subject Lands in relation to the proposed industrial uses. Application 1 was a proposed Plan of Subdivision (#D12-2022-002). This application was later revised to a Consent to Sever (Application 2). Application 2 was submitted in August of 2024 to sever the site into four (4) parcels including two (2) industrial lots and (2) Stormwater Management ponds. This application was conditionally approved, pending the resolution of the Town of Innisfil's conditions, however the conditions were not cleared in-full. One of the stormwater management ponds (the northern pond) was conveyed to the Town and is no longer part of the land holdings.

A revised concept plan adjusting the originally approved severance has been developed and includes the formation of one additional lot (see Figure 5). The addition of the lot is to facilitate the development of a potential client (ATCO) on Lot 2, who requires a specific lot area, and use.

ATCO Structures is a publicly traded company which sells / leases transportable workforce, residential housing buildings, and space rental products. It has warehouses, storage facilities, and offices across Canada, examples of which are provided as **Appendix 2** of this report. The current ATCO facility in Innisfil is at capacity for storage. As a result, they are looking to expand in order to better meet market demand.

This Report will review the applicable Provincial and Municipal policies to provide necessary rationale for the approval of the proposed development. This Report will review the following documents to demonstrate consistency:

- Planning Act (2024)
- Provincial Planning Statement (2024)
- County of Simcoe Official Plan (2023)
- Lake Simcoe Protection Plan
- Town of Innisfil Official Plan – Our place (2018)
- Town of Innisfil Comprehensive Zoning By-law 080-13 (2013)

LEGEND

Subject Lands

Figure 1
Site Overview

Source: Interactive Map - County of Simcoe

Drawn By: CD | File: 21-1046

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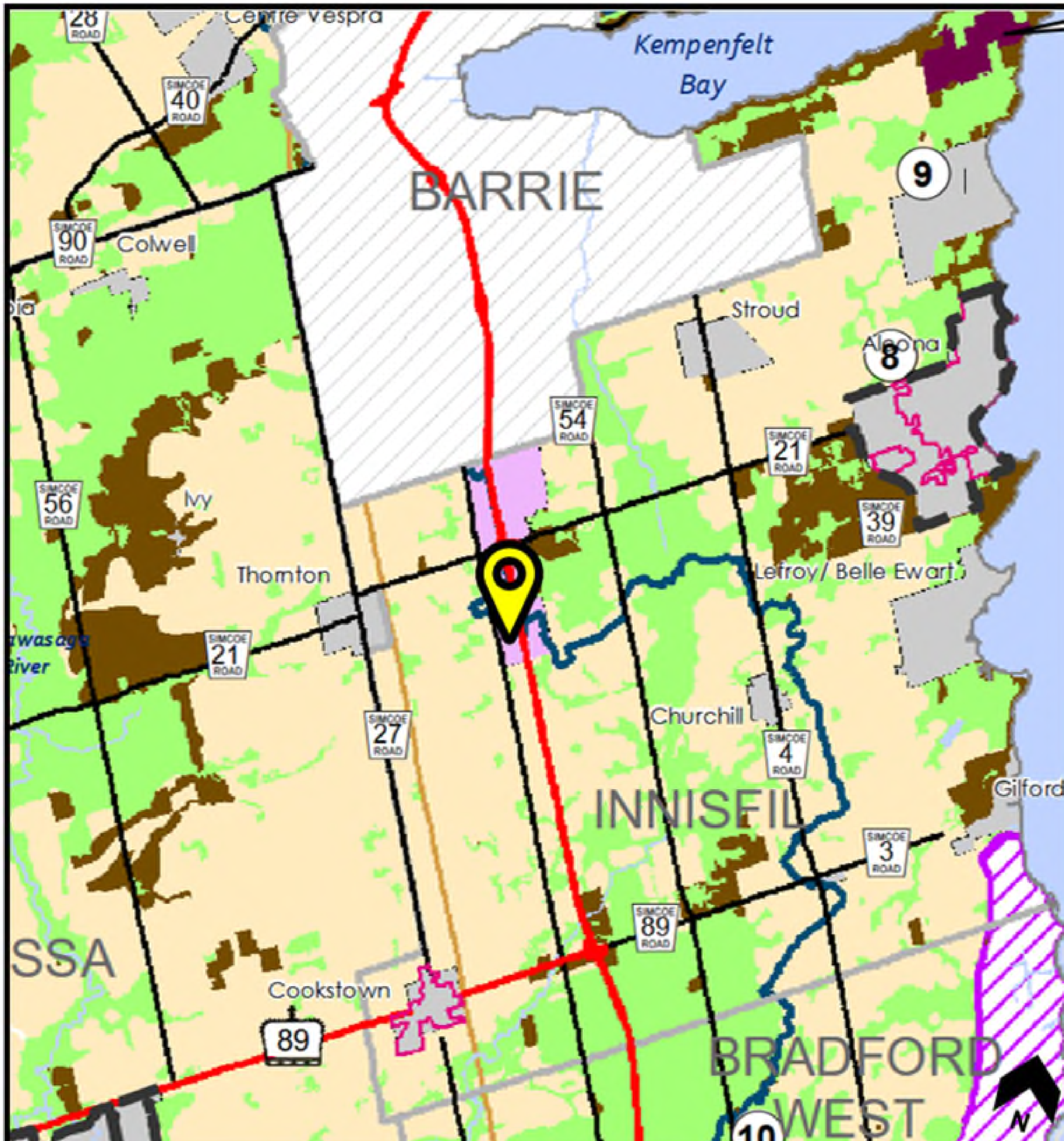

LEGEND

Subject Lands

Strategic Settlement Employment Areas and Economic Employment Districts

Figure 2
County of Simcoe Official Plan Designation

Source: County of Simcoe OP Schedule 5.1

Drawn By: CD	File: 21-1046

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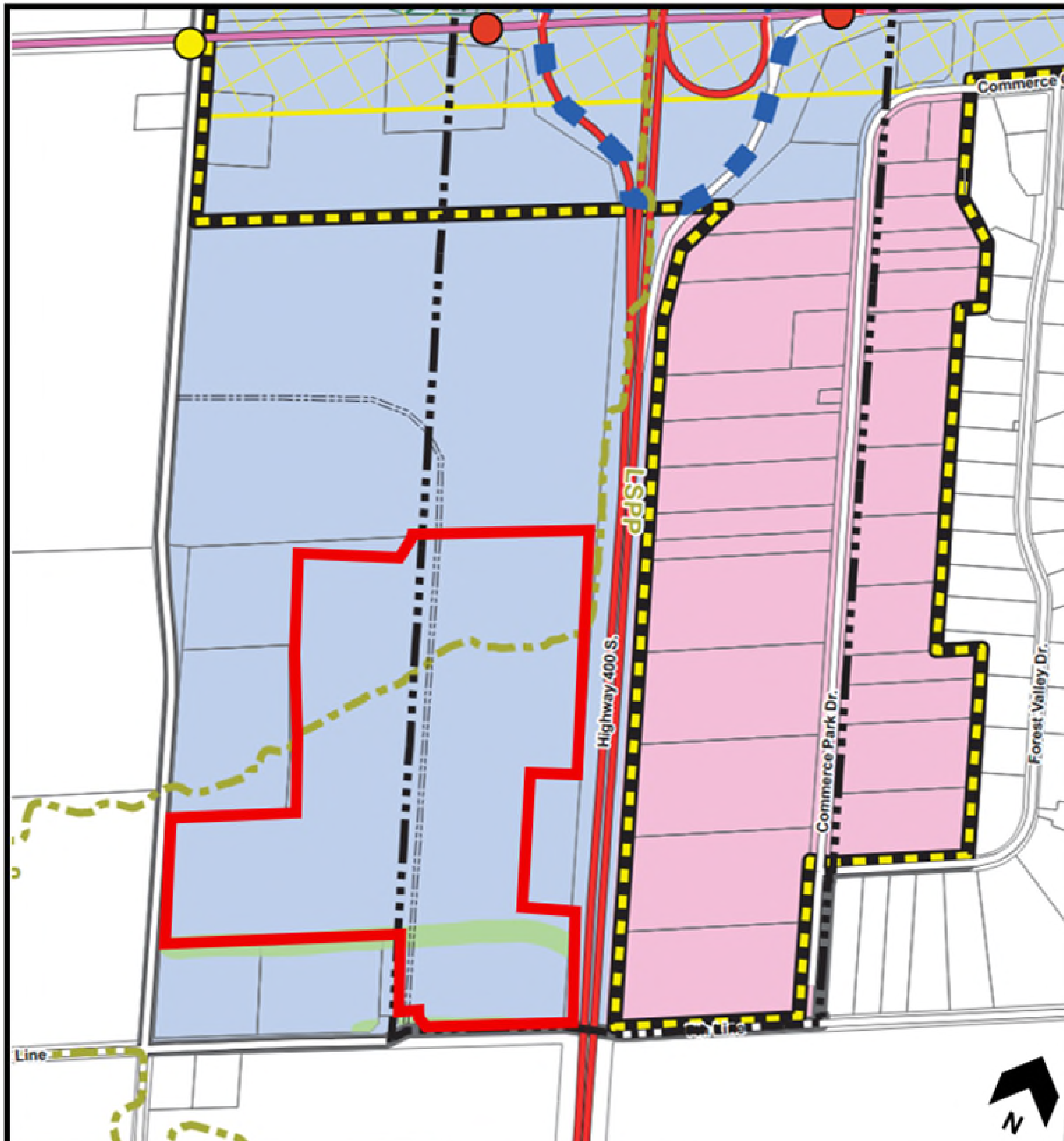

LEGEND

- Subject Lands
- Employment Area
- Primary Visual Impact Area

Figure 3
Town of Innisfil Official Plan Designation

Source: Schedule B6 Innisfil Heights

Drawn By: CD	File: 21-1046

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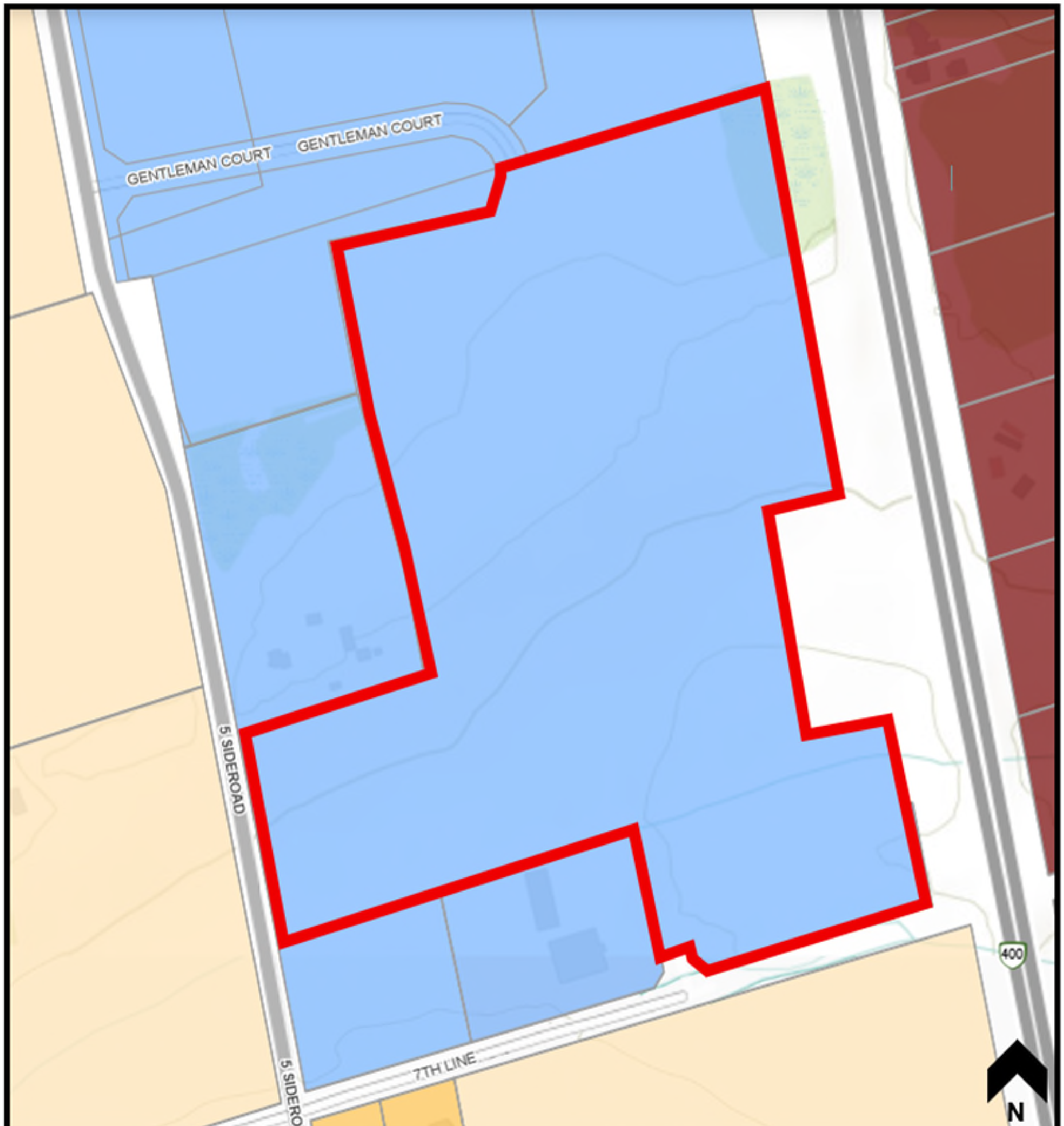

LEGEND

Subject Lands

Industrial Business Park Zone (IBP)

Figure 4
Town of Innisfil Zoning

Source: Interactive Map – Town of Innisfil

Drawn By: CD | File: 21-1046

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2.0 Site Description and Surrounding Uses

The subject site is located in the Town of Innisfil, west of Highway 400 and just south of the County Road 21 (Innisfil Beach Rd) exit, in the Innisfil Heights Strategic Settlement Employment Area.

The subject site is approximately 22.45 ha (~55.5 acres) in area and is accessed by 5th Sideroad to the west, 7th Line to the south, and through the recently developed Gentleman Court to the north. The lands are relatively flat with little vegetation except for a small existing tree area in the northeast corner of the site and boundary trees. The lands are irregular in shape and are currently used for agricultural purposes.

The site is designated Employment Area by the Town of Innisfil Official Plan. The subject lands are also designated in part as a primary visual impact area, as noted by the Official Plan (See **Figure 3**). This area has limitations for development, which are discussed further in Section 5.5 of this report.

The subject site is currently zoned Industrial Business Park (IBP) in the Town of Innisfil Zoning By-Law (See **Figure 4**). The subject lands currently have access to municipal water services, where wastewater is currently provided through a private septic system. It should be noted that municipal wastewater services are planned to be constructed in the near future.

Lands adjacent to the west and south of the property are primarily used for agricultural purposes and are designated Agricultural in the Innisfil Official Plan. The lands to the north, including the lands abutting the subject site east of 5 Sideroad, are part of the Innisfil Heights Settlement Area, are designated Employment Areas, and are zoned Industrial Business Park. At the site directly north of the subject lands (7267 5th Side Road), approval for a 1.3 million square foot industrial warehouse has been obtained and is currently under construction. The rest of the site is bound by

5th Sideroad to the west, 7th Line to the south, and Highway 400 to the east. Mixed Commercial designations are located on the east side of Highway 400.

3.0 Description of Development

As mentioned, there was a previous Draft Plan of Subdivision application and previous Consent to Sever application on these lands. Section 22.8.4 of the Town of Innisfil's Official Plan states that the maximum number of lots approved on one property by consent is three. Given the fact that the previous severance and the proposed SWM pond block (Lot 4) was/ will be conducted through the conveyance of lands to the Municipality, the proposal can now proceed through the Committee of Adjustment process.

The intent of the application is to facilitate the creation of three (3) industrial lots (Lot 1, Lot 2 & Lot 3) and the stormwater management pond block (Lot 4) which will be conveyed to the Town. This would ultimately create three (3) new parcels, one (1) existing, for a total of four (4) parcels. See **Figure 5**.

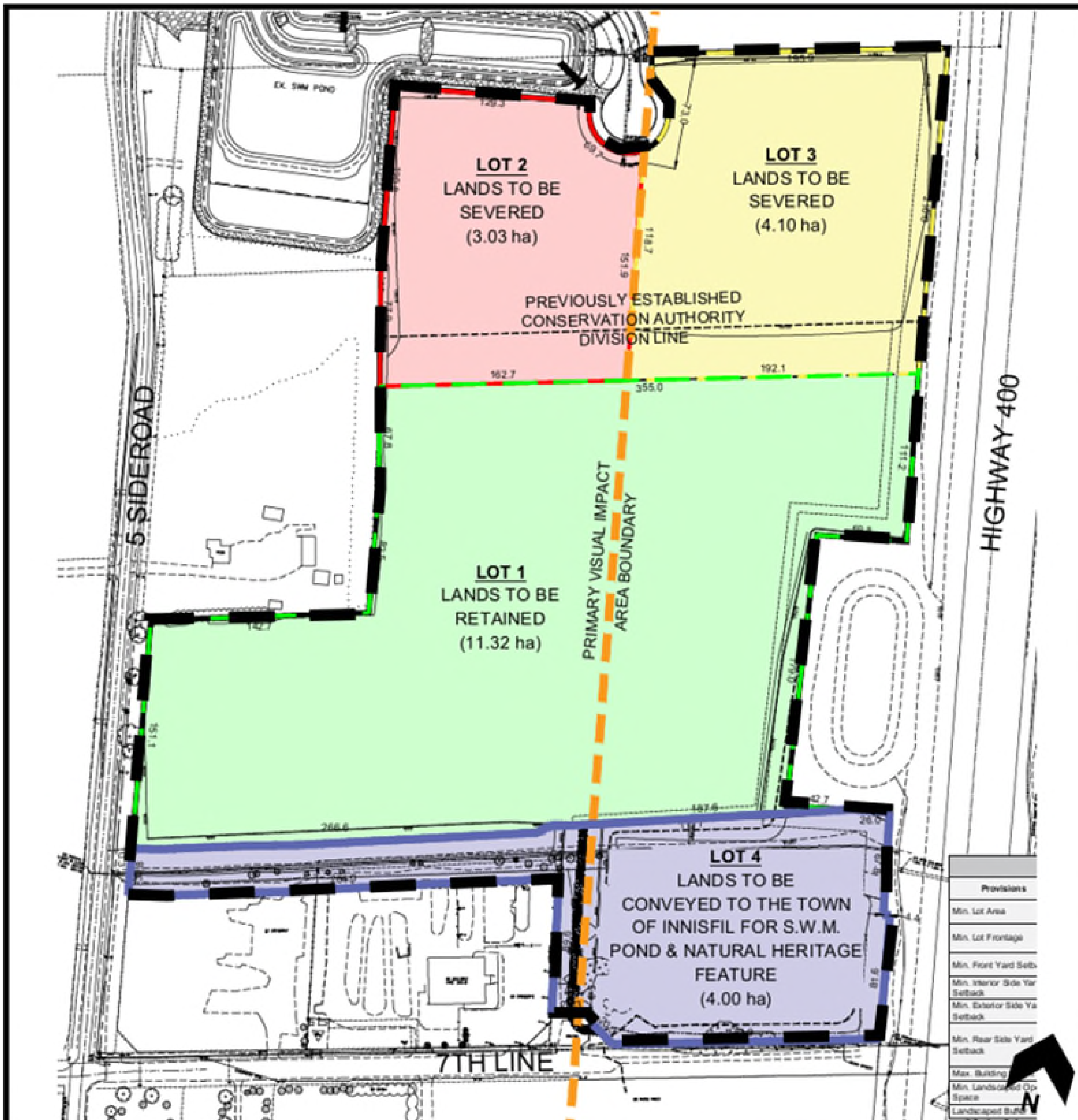
An application for a Minor Variance is also proposed in order to permit outdoor storage as a use on Lot 2. It should be noted that the proposed lot is located outside of the Primary Visual Impact Area Overlay within the Official Plan, as identified by both Figures 3 and 5 of this report.

A chart detailing the Industrial lot statistics is provided below:

Table 1. Zoning Provision Table

Provision	Required	Provided
Lot 1 – Lands to be Retained		
Min. Lot Area	2,000m^2 (0.2 ha)	11.97 ha
Min. Frontage	45.0m (int) 50.0m (ext)	151m (5th Sideroad)
Lot 2 – Lands to be Severed (Proposed Outdoor Storage Facility)		
Min. Lot Area	2,000m^2 (0.2 ha)	3.03 ha
Min. Frontage	45.0m (int) 50.0m (ext)	69.7m (Cul-de-Sac)

Lot 3 – Lands to be Severed		
Min. Lot Area	2,000m^2 (0.2 ha)	3.45 ha
Min. Frontage	45.0m (int) 50.0m (ext)	73.0m (Cul-de-Sac)



LEGEND

Subject Lands

Figure 5
Severance Sketch

Source: IPS – Severance Sketch

Drawn By: A.S.S.	File: 21-1046

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4.0 Technical Reports and Studies

The technical reports and studies needed for this application were completed in preparation for the previous Committee of Adjustment application and Draft Plan of Subdivision application. As the proposal has been revised it requires an additional application through the Committee of Adjustment. The supporting studies that were included in the previous applications are:

- Place Making Brief prepared by IPS
- Traffic Impact Study prepared by GHD (dated January 2022)
- Functional Servicing Report (FSR)/Stormwater Management (SWM) Report prepared by Pearson Engineering (dated January 2022)
- Archaeological Assessment prepared by Irvin Heritage (dated August 2021)
- Phase 1 & 2 Environmental Site Assessment (ESA) prepared by Cambium Inc. (dated October 2021)
- Hydrogeological Assessment Report prepared by Cambium Inc. (dated September 2021)
- Geotechnical Investigation Report prepared by Cambium Inc. (dated August 2021)
- Environmental Impact Study (EIS) prepared by Cambium Inc. (dated January 2022)
- Tree Inventory and Preservation Report prepared by Strybos Barron King Landscape Architecture (dated February 2022)

The above noted studies can be read in conjunction with the further/ revised studies submitted as part of this Committee of Adjustment application, including the following:

- Severance Sketch prepared by IPS (dated June 11, 2025)
- Planning Justification Report (subject document)
- Functional Servicing and Stormwater Management Report, prepared by Pearson Engineering (dated June 12, 2025)

5.0 Planning Policy and Analysis

This Section will outline the applicable planning and development policies guiding the development of the subject lands. Each section will outline applicable polices and contain planning rationale on conformity and development principles. The Planning Act, Provincial Planning Statement, County of Simcoe Official Plan, Lake Simcoe Protection Plan, Town of Innisfil Official Plan and Town of Innisfil Comprehensive Zoning By-law are analyzed below in relation to the proposed development.

5.1 The Planning Act – Provincial Interest

The Planning Act (The Act) is provincial legislation that lays out ground rules to describe how land uses are controlled, and by whom. The Act promotes sustainable development while balancing factors such as economic development, preservation of the natural environment and the creation of healthy communities, within a provincial policy framework focused on provincial interests and fairness.

The policies set out in Section 2 of the Planning Act, inform the Provincial Planning Statement (PPS), and other matters of provincial interest, ensuring consistency with the Act.

Under Section 2 of the Planning Act, key matters of provincial interest include the protection of natural areas and features, protection of agricultural lands, the orderly development of communities, the full range of housing, the appropriate location of growth and development, the promotion of a built form that is well-designed, and the adequate provision and efficient use of transportation, sewage and water services.

The proposed severances align with the direction of the Planning Act, given development concept resulting from it will:

- Contribute to the Township's employment targets;
- Utilize existing/planned water, wastewater, and waste infrastructure / services; and,
- Maintain compatibility between land uses in an area where industrial uses are proposed and intend to continue.

According to the Planning Act, the proposed application aligns with the Province's Interest in land use planning.

5.2 Provincial Planning Statement 2024

Section 3(1) of The Planning Act provides the province with authority to issue policy statements which relate to matters of provincial interest. The Provincial Planning Statement, 2024 (PPS) articulates the provincial interests with regards to land use planning and development policy. It provides a policy-led planning system that: "sets the policy foundation for regulating the development and use of land province-wide, helping achieve the provincial goal of meeting the needs of a fast-growing province while enhancing the quality of life for all Ontarians." (PPS. pg. 2).

This report has reviewed the following PPS policies in relation to the proposed Consent and Minor Variance application, and considers the following matters relevant to the Proposed Development:

Section 2.8 – Employment of the PPS supports an appropriate mix and range of employment uses, with a diversified economical base to accommodate a wide range of economic activities and ancillary uses.

Further, Section 2.8 further clarifies that the intent behind the employment area is for industrial, manufacturing, warehousing, and associated/ ancillary uses. The proposed use is a light industrial use, which is aligned with the intent of the PPS.

Section 2.8 also speaks to protecting employment uses for the long term, with policies enforcing land-use compatibility and preventing lands from being removed from the employment area.

The creation of these industrial lots ensures that the land remains dedicated to employment purposes, maintaining land use compatibility and the long-term viability of the area for industrial activities. The severance also supports the policy's emphasis on ensuring appropriate transitions to adjacent non-employment areas, thereby preserving the integrity and function of the employment zone. The proposed severance not only facilitates economic development but also ensures that the employment area is strategically positioned for sustainable growth and resilience in the future.

For the above stated reasons, the applications are consistent with the PPS.

5.3 Lake Simcoe Protection Plan

The Lake Simcoe Protection Plan (“LSPP”) establishes policies aimed at protecting, improving or restoring the elements that contribute to the ecological health of the Lake Simcoe watershed, including water quality, hydrology, key natural heritage and hydrologic features and their functions, managing the effects of climate change and the impacts of invasive species, and reducing loadings of phosphorus and other nutrients of concern among others. Decisions under the Planning Act are required to conform to the designated policies and have regard to the other policies in the Lake Simcoe Protection Plan.

The southern portion of the subject site is located within the Lake Simcoe Watershed and the LSRCA jurisdiction and is subject to the policies of the LSPP. The key natural heritage and hydrologic features identified (wetlands, fish habitat and permanent stream) have been detailed in terms of how they are and will be maintained within the EIS.

An Environmental Impact Study (EIS) conducted by Cambium has ensured that appropriate setbacks are in place, and that the proposed development can be carried out in a way that will not adversely impact the natural heritage and hydrologic features and functions identified on or adjacent to the subject site.

As a result, the proposed development is in conformity with the applicable policies of the Lake Simcoe Protection Plan.

5.4 County of Simcoe Official Plan

The County of Simcoe Official Plan sets out policy direction for the County's Growth Management Strategy. Key directions include directing growth to serviced areas, protecting the natural heritage system, diversifying economic functions, providing a diverse range of housing, and managing resources. The subject lands are located within the Innisfil Heights Strategic Settlement Employment Area as per the County of Simcoe Official Plan (Schedule 5.1). Section 3.9 of the County OP outlines the growth management strategies for the designation, stating that:

- *Development within Innisfil Heights will be in accordance with the directive issued by the Minister of Infrastructure and boundaries and permitted uses will be outlined in the official plans of the local municipalities*
- *The lands within the Strategic Settlement Employment Areas are considered designated Greenfield and are subject to the density target of the local municipality; Innisfil's minimum density target is 32 residents and jobs/ha.*
- *Natural heritage systems, features, and functions within the Strategic Settlement Employment areas will be identified and protected.*

The proposed severances aim to create appropriately sized, economically viable lots, aligning with County OP policies and the Ministry of Infrastructure's directive for this area. The proposal would support future expansion and operations, enhancing the lot and area's economic viability.

Overall, the proposal conforms to the County of Simcoe Official Plan. It facilitates a more efficient use of employment lands, in line with the objectives of the County's strategic planning and Provincial Growth Plan. This ensures the subject lands contribute effectively to the economic development and competitiveness of the area, reinforcing the County's planning policies and the broader goals of the Ministry of Infrastructure.

5.5 Town of Innisfil Official Plan

The Town of Innisfil's Official Plan, Our Place, sets out goals, objectives and policies for managing growth and development. On January 17, 2018, by By-Law No. 007-18, Council for the Town of Innisfil adopted Our Place, the Town's new Official Plan. On October 9, 2019, Council for the County of Simcoe approved Our Place, after it was approved by the County's Committee of the Whole on September 25, 2019. On November 13, 2018, Our Place came into effect, except for those lands and/or policies that were appealed. As mentioned, the subject site is designated 'Employment Area', in the Town of Innisfil Official Plan, as per Schedule B6 Land Use: Innisfil Heights.

The subject lands fall within the Innisfil Heights Strategic Settlement Employment Area. Section 9.6.1 states that the Council supports industrial development growth by ensuring the inventory of designated vacant industrial lots includes large parcels to attract extensive industries. By creating additional lots within this designated area, the proposal supports the goal of concentrating employment opportunities in a strategic location that is planned for long-term economic growth. This focus not only enhances the area's role as a key employment hub but also ensures that the infrastructure and resources dedicated to this zone are utilized effectively, promoting a more efficient and sustainable economic environment.

The proposal aligns with the Official Plan's aim of creating a fully serviced employment area within the Innisfil Heights Strategic Settlement Employment Area. The new industrial lots will be designed to meet the necessary servicing requirements, ensuring that businesses have access to the infrastructure they need to operate effectively. By facilitating the development of an employment area, this severance contributes to the broader vision of establishing Innisfil Heights as a competitive and attractive location for a diverse range of industries, ultimately supporting the Town's economic development goals.

The proposal to create additional industrial lots is closely aligned with the objectives outlined in Section 12 of the Official Plan, particularly the goal of establishing a gateway around the Highway 400 and Innisfil Beach Road interchange. By developing these lots near this crucial intersection, the proposal directly contributes to enhancing the gateway's function, making it a prominent entrance to the Town of Innisfil and a key location for employment and commercial activities. This positioning not only improves the accessibility and visibility of the area but also supports the broader economic development goals of Innisfil. The proposed industrial lots are also consistent with the permitted uses detailed in Section 12, which include manufacturing, processing, assembling, repairing, warehousing, and distribution. By providing new spaces for these industrial activities, the severance ensures that the employment area can support a diverse range of industries, fostering a resilient economic environment.

Section 12.1.1 specifies that Innisfil Heights, shown on Schedule B6, must be planned to ensure the availability of large lots supporting permitted uses. Unless constrained by environmental features, property configurations, new roads, or existing development, the minimum lot size for undeveloped lands should be 5 hectares, with larger lot sizes encouraged. It should be noted that the 5 ha number is not a prescriptive policy, rather it is a recommendation to ensure the lots can accommodate potential industrial uses.

As this consent to sever application is being sought for a prospective tenant with a specific need/ use envisioned, this recommendation is noted, but the actual market need requires a reduced lot area. This still aligns with the intent of the Official Plan policies, which is to accommodate large scale industrial uses in the Innisfil Heights employment area. Further, the proposed lots meet the requirements for the Industrial

Business Park Zoning, as noted in Section 5.6 of this report. As a result, intent of the policy is met.

It should further be noted that Lot 2 (subject to the Minor Variance application) is not located within the Primary Visual Impact Area, therefore the policies under Section 12.7 of the Official Plan, do not apply.

Since the proposed severance results in appropriately sized lots for industrial uses, offers protection of natural features, and aligns with the permitted uses in the designation, the application conforms to the Town of Innisfil Official Plan.

5.6 Town of Innisfil Comprehensive Zoning By-law 808-13

The subject lands are zoned Industrial Business Park (IBP) under Zoning By-law 080-13. Table 6.1 of the by-law lists the permitted uses in the IBP Zone, which include equipment sales, rental and servicing, and accessory outside storage. The minimum lot area for an IBP zoned property is 2000 m^2, with a minimum lot frontage of 45 meters for interior lots and 50 meters for exterior lots.

No Zoning By-Law Amendment is proposed, however, a Minor Variance is requested on Lot 2 in order to permit outdoor storage as a use on the lot. As previously discussed, the prospective tenant requires outdoor storage as a use for their operations. Lot 2 is located on the western side of the property, away from Highway 400 and falls outside of the Primary Visual Impact Area within the Official Plan. The proposed industrial lots do not include any key natural heritage features, and future buildings / structures will be subject to Zoning By-law standards and provisions.

The application ensures that the new lots will comply with the minimum 2000 m^2 lot area, the 45-meter frontage for interior lots, the 50-meter frontage for exterior lots. Given these considerations, the application complies with the Town's Zoning By-law.

5.7 Planning Act – Tests for Consent to Sever and Use

The Committee of Adjustment bases decisions relative to the four (4) tests for Minor Variances, and three (3) tests for Consent to Sever Applications. When consolidated, the subject application for a Minor Variance and Consent to Sever can be justified by adhering to the following four tests:

1. The Variance is Minor in Nature
2. The Applications Meet the General Intent of the Official Plan;
3. The Applications Meet the General Intent of the Zoning By-Law;
4. The Applications are Appropriate for the Orderly Development of Land and Character of the Surrounding Area

1. The Variance is Minor in Nature

The proposed variance is for outdoor storage as a use on Lot 2. This is a direct result of the prospective tenant, who requires the proposed use as part of their operations. As noted previously in this report, ancillary outdoor storage is already permitted as-of-right by the Zoning By-law and is not prohibited outside of the Primary Visual Impact Area by the Official Plan. The variance proposed would allow outdoor storage as the primary use on the site, which is not a significant change from the established regulations and is located outside the Visual Impact Area in the Official Plan.

Further, vegetative screening and fencing will be planted/ installed to the satisfaction of the Municipality in order to screen the proposal from the surrounding area, including the uses of Highway 400.

2. The Proposal Meets the Intent of the Official Plan

Firstly, the proposal conforms to the Town's Official Plan by contributing to the municipality's growth objectives, ensuring that the severance supports broader urban planning goals within the Innisfil Heights Settlement area. The subject site is within the Innisfil Heights Strategic Settlement Employment Area and is designated 'Employment Area', and 'Key Natural Heritage Features'. The proposal will facilitate the creation of industrial lots, which will provide a full range of employment uses and opportunities to the area. The subject site is also part of a Natural Heritage Feature that will be protected and contained on Lot 4, as illustrated, which will form lands to be conveyed to the Town. The EIS completed by Cambium outlines that appropriate setbacks have been applied so that the feature is adequately protected from any future development within the new lots. For the proposed minor variance, the proposed use is located outside of the Primary Visual Impact Area, no other policies in the Official Plan prohibits the proposed use. For these reasons, the intent of the Official Plan is adhered to.

3. The Proposal Aligns with the Intent of the Zoning By-law

Secondly, the application aligns with the intent of the Zoning By-Law by ensuring that the severed lots maintain appropriate size, frontage, and zoning requirements, thereby preserving the area's development framework. The creation of industrial lots also exceeds the standards of the Industrial Business Park (IBP) zone that the subject site is located in. The IBP Zone permits a variety of industrial uses, including equipment sales, rental, servicing, and accessory outside storage. The proposed severance will create accessible industrial lots that will fully comply with the established zoning regulations, including the minimum lot area of 2,000 m^2 and the required frontages of 45 meters for interior lots and 50 meters for exterior lots. Additionally, the new lots will be located outside any key natural heritage features, and any future development will respect the necessary setbacks as required by the Zoning By-law. Based on the above analysis. The proposal maintains the intent of the Zoning By-law.

4. The Proposal Supports the Orderly Development of the Lands

Lastly, the severance promotes the development and improvement of the land by optimizing its use, enhancing the neighborhood's character. By subdividing the property, the application promotes the effective and efficient use of the land, supporting industrial development in a manner consistent with the site's current zoning and planning designations. The severance will facilitate targeted industrial development, which could attract businesses and create employment opportunities, thereby enhancing the economic vitality of the area. Moreover, the strategic division into large lots allow for more manageable and flexible development, which can be better tailored to meet market demands, further contributing to the improvement and utilization of the land in line with the town's planning objectives. It is also important to note that the severed and retained lots maintain Highway 400 frontage exposure, ensuring the potential for economic marketability to a major transit corridor. The creation of larger industrial parcels of land mirror other parcels within the Innisfil Height's Settlement area while ensuring protection of natural features. This combination maintains character with the opportunity to attract employment uses forming an overall viable development.

6.0 Conclusion

The proposed consent application will facilitate the Consent to Sever and development of four (4) lots (three (3) industrial with one (1) stormwater management block), as well as a minor variance application to permit Outdoor Storage as a use on Lot 2. This Consent to Sever, without the lands that will be conveyed to the Town, propose a total three (3) lots. The application implements the overall intent of redevelopment on the lands and are consistent with or conform to all levels of Planning Policy and represents good planning. The proposed minor variance will allow a prospective tenant, ATCO Structures, to utilize the otherwise vacant employment land in an efficient manner and will be compatible with the uses in the immediate vicinity. Overall, this proposal will provide additional employment options for current and future needs and supports the goals and vision of the Town of Innisfil.

Based on an evaluation of Provincial, County of Simcoe and Town of Innisfil planning policies, as well as the results of the associated technical reports, the proposed application is appropriate for the orderly development on the subject lands and meets the applicable tests of the Planning Act.

Respectfully submitted,

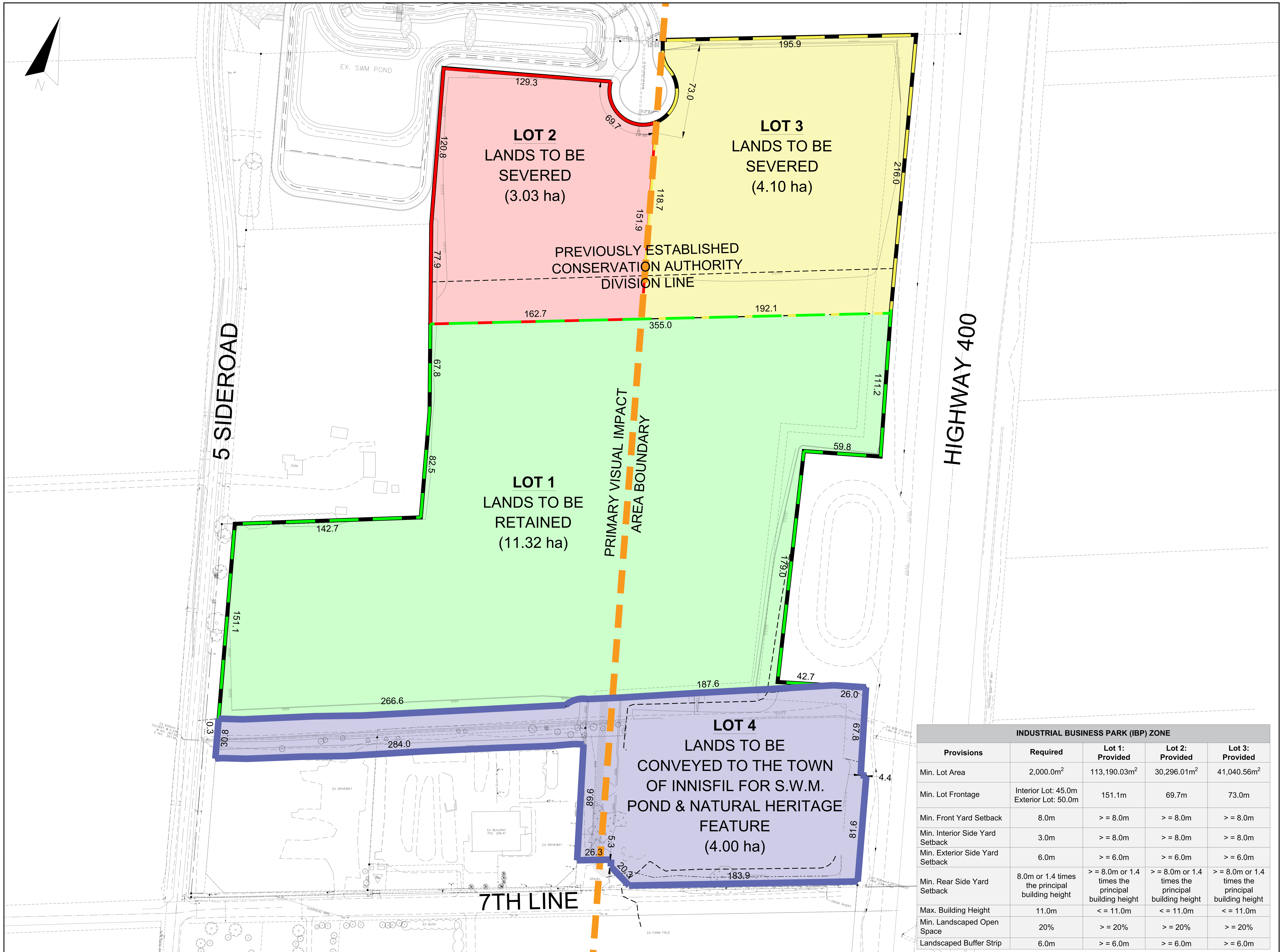
Innovative Planning Solutions

Kyle Galvin, MCIP, RPP
Senior Planner

Cynthia Daffern
Planner

Appendices

APPENDIX 1: SEVERANCE SKETCH



KEY MAP

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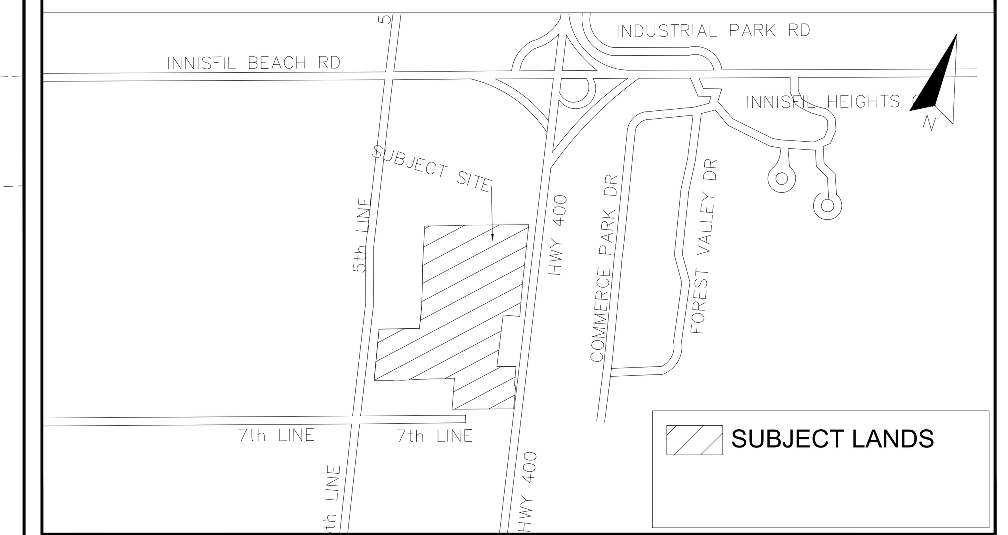

SEVERANCE SKETCH

7131 5 SIDEROAD
PART OF THE SOUTH HALF OF LOT 6
CONCESSION 7
IN THE TOWN OF INNISFIL
COUNTY OF SIMCOE

Scale

0 30 60 90 120 150m

LEGEND

- Subject Site (22.45 ha)
- Lot 1: Lands to be Retained
  - Lot Area: 11.32 ha
  - Lot Frontage : 151.1m (5th Sideroad)
- Lot 2: Lands to be Severed
  - Lot Area: 3.03 ha
  - Lot Frontage: 69.7m (Cul-de-Sac)
- Lot 3: Lands to be Severed
  - Lot Area: 4.10 ha
  - Lot Frontage: 73.0m (Cul-de-Sac)
- Lot 4: Lands to be Conveyed to the Town of Innisfil
  - Lot Area: 4.00ha
  - Lot Frontage: 30.8m (5 Sideroad)

INDUSTRIAL BUSINESS PARK (IBP) ZONE

Provisions	Required	Lot 1: Provided	Lot 2: Provided	Lot 3: Provided
Min. Lot Area	2,000.0m^2	113,190.03m^2	30,296.01m^2	41,040.56m^2
Min. Lot Frontage	Interior Lot: 45.0m Exterior Lot: 50.0m	151.1m	69.7m	73.0m
Min. Front Yard Setback	8.0m	> = 8.0m	> = 8.0m	> = 8.0m
Min. Interior Side Yard Setback	3.0m	> = 8.0m	> = 8.0m	> = 8.0m
Min. Exterior Side Yard Setback	6.0m	> = 6.0m	> = 6.0m	> = 6.0m
Min. Rear Side Yard Setback	8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height
Max. Building Height	11.0m	< = 11.0m	< = 11.0m	< = 11.0m
Min. Landscaped Open Space	20%	> = 20%	> = 20%	> = 20%
Landscaped Buffer Strip	6.0m	> = 6.0m	> = 6.0m	> = 6.0m

SCHEDULE OF REVISIONS

No.	Date	Description	By

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

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PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELHAM RD., UNIT 9, BARRIE, ONTARIO, L4N 0B7
tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date:	June 3, 2025	Drawn By:	A.S.
File:	21-1046	Checked:	K.G.

APPENDIX 2: ATCO SITE REQUIREMENTS

ATCO TORONTO
LAND SEARCH

Needs Assessment

ATCO
always there. anywhere.

WHO WE ARE

ATCO Structures has been a worldwide leader in modular design, manufacturing and construction for more than 75 years. From our very beginnings in workforce housing, we've been at the forefront of this industry, pioneering design and delivery processes, and developing innovative products to meet the essential need for shelter around the globe.

We sell and lease transportable workforce, residential housing buildings and space rental products.

We rent and sell mobile office trailers in various sizes and floor plans to suit our customers' needs. Our rental units are commonly seen at construction sites with the yellow bands. While many of them are relocatable offices, we also have signature offices, blast-resistant offices and dwellings, washrooms and lavatories, steel storage containers, and classrooms.

INTENDED LAND USE

We plan on using the property as an **office**, **workshop**, and **storage yard** for our Toronto space rental business.

The **office** will serve as a workplace for our employees (appx. 10-15) and a place to meet with customers and vendors. We intend to build a brand new appx. 4,000 sqft. Modular Office similar in appearance to the photo below. Contained within will be various offices, meeting spaces, washroom facilities, a lunchroom etc.

A sample photo of a 60'x60' Modular Office.

The **workshop** will serve as a place to modify, fix, clean, service, maintain our space rental assets. We intend to build a brand new appx. 6,000 sqft. softwall or hardwall structure similar in appearance to the photo below. Contained within will be various tools, machinery, materials as required to complete the aforementioned scopes of work.


A sample exterior photo of a softwall warehouse-use structure.

A sample interior photo of an ATCO service workshop.

The remainder of the available property will be used as a **storage yard.** ATCO Structures Toronto has a large quantity of assets which we will look to store in our yard when they are not on client sites. We are looking to expand our operation in the short-term and this property is of sufficient size to allow for our fleet and operation growth. The storage yard will look similar to the photo below.

A sample photo of an ATCO Structures yard.

ATCO SAMPLE LAYOUT

Below is a sample property layout which we will look to replicate to a degree:

Customers and employees enter the property at the grass island, with parking spaces outside of the office structure. The entrance to the property and parking area are paved. The workshop is adjacent to the office. The storage yard begins past the office structure, with power operated fences for security of assets. The storage yard is compacted, levelled gravel or similar. Truck drivers would enter the storage yard on one side, and leave from the other, either dropping off an asset returning from a customers project, or delivering a new one. There are lighting posts throughout the storage yard. There is illuminated signage at the front of the property on the grass island.

PROPERTY REQUIREMENTS

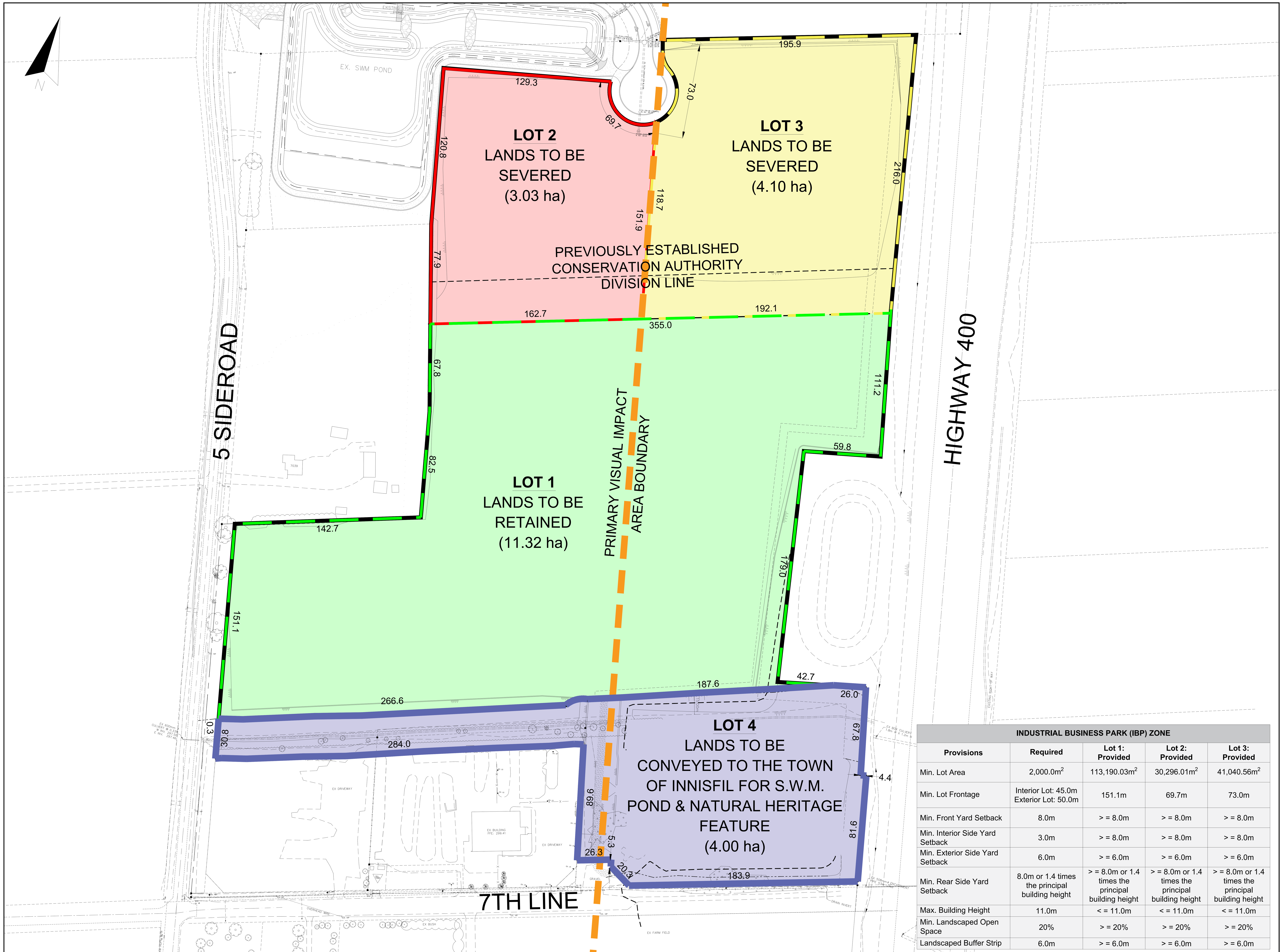
SCOPE	NEEDS DESCRIPTION	PHOTO	TIMELINE
Fencing	-ATCO cost: -Security of assets; landlord to provide fencing around perimeter of storage yard area -Fencing only starts beyond the office structure (see above 'Sample Layout' page) -6' chain link fence with barbed wire		
Paving	-ATCO cost - Paved road to buildings on site, including 20 parking spaces outside of office area		
Access / Egress	-Developer will provide 2 access/ egress points to the property off of the main roadway -ATCO cost to provide grass island area in between the 2 access/egress points, with ATCO signage. -Each access/egress to measure 80' at the narrowest point (close to office), and 120' at the widest point (at the roadway) to allow for trucks to safely turn into property while hauling our assets		

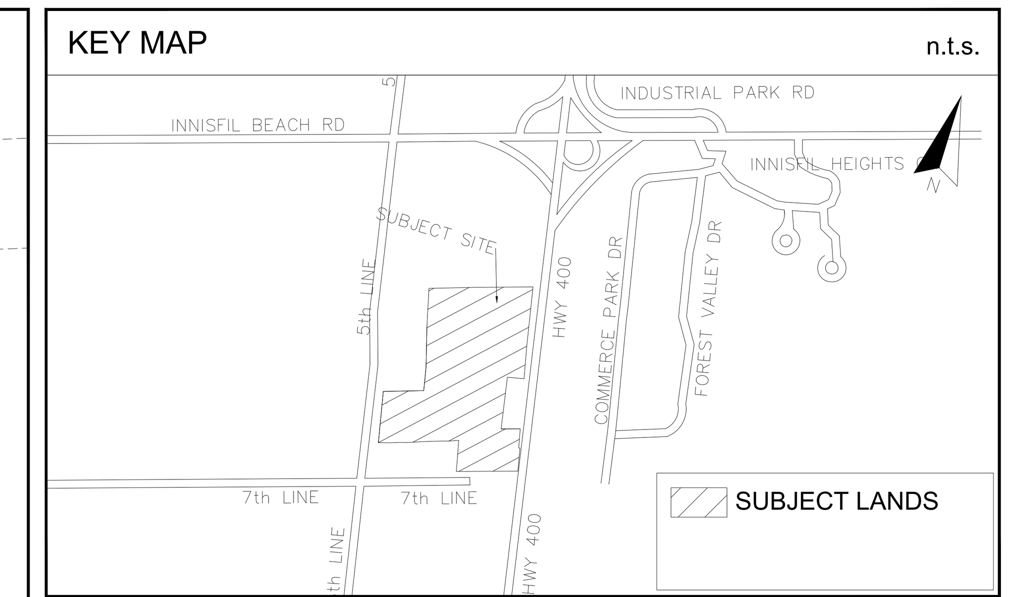
Gates	- ATCO provide 2 power-operated, punch code, lockable gates at each side of the office structure, which protect the fenced-in storage yard area -Gates should be 30’ in width, with power run to location		
Lighting	-ATCO lighting throughout the storage yard area -10 foot-candles requirement - sufficient lighting at property entrance and within parking area outside of office structure		
Clearance	-ATCO requires: 130’ clearance from roadway into property at each access/ egress point for trucks		
Power	-ATCO cost for power/hydro/gas connections from property line to ATCO proposed buildings (office & workshop).Office structure requires 400-600amps, 1ph, 240v -Workshop structure 400 amps, 3ph, 600v.		

	-Additional power on the property as required to provide lighting, power operated fences, signage as required etc. -Final power requirements are subject to change but above is an estimate of the overall business need		
Municipal Water	-Developer to provide water to property line. ATCO cost to connect to municipal water for office/ workshop structures to within 6'-10' from each building		
Septic	-ATCO cost to provide onsite septic tank for office/workshop structures to within 6'-10' from each building		
Ground Conditions	-ATCO cost for compacted, levelled base ground (minimum 1' below finished floor elevation of buildings) for storage yard area -ATCO requires ground compaction to 3,000lbs/sqft for storage yard area -Compacted aggregate or similar for storage yard area -Cannot have water pooling or potholes in storage yard area	 	

Signage	-ATCO cost to provide ATCO business signage on illuminated pole or display at entrance of property -ATCO cost to provide large ATCO business signage facing HWY400 if possible and if will be visible to HWY400 -Will require power to sign from building.		
Utilities	-ATCO cost for natural gas run to workshop for heating -Utilities brought to office structure and workshop as required -Data, WiFi, telephone etc. required to be run to the office structure		

Note that final building footprints, configurations, and types are subject to change (office, workshop).





SEVERANCE SKETCH

7131 5 SIDEROAD
PART OF THE SOUTH HALF OF LOT 6
CONCESSION 7
IN THE TOWN OF INNISFIL
COUNTY OF SIMCOE

Scale: 0 – 30 – 60 – 90 – 120 – 150m

LEGEND

- Subject Site (22.45 ha)
- Lot 1: Lands to be Retained
  - Lot Area: 11.32 ha
  - Lot Frontage : 151.1m (5th Sideroad)
- Lot 2: Lands to be Severed
  - Lot Area: 3.03 ha
  - Lot Frontage: 69.7m (Cul-de-Sac)
- Lot 3: Lands to be Severed
  - Lot Area: 4.10 ha
  - Lot Frontage: 73.0m (Cul-de-Sac)
- Lot 4: Lands to be Conveyed to the Town of Innisfil
  - Lot Area: 4.00ha
  - Lot Frontage: 30.8m (5 Sideroad)

INDUSTRIAL BUSINESS PARK (IBP) ZONE

Provisions	Required	Lot 1: Provided	Lot 2: Provided	Lot 3: Provided
Min. Lot Area	2,000.0m^2	113,190.03m^2	30,296.01m^2	41,040.56m^2
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Min. Interior Side Yard Setback	3.0m	> = 8.0m	> = 8.0m	> = 8.0m
Min. Exterior Side Yard Setback	6.0m	> = 6.0m	> = 6.0m	> = 6.0m
Min. Rear Side Yard Setback	8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height	> = 8.0m or 1.4 times the principal building height
Max. Building Height	11.0m	< = 11.0m	< = 11.0m	< = 11.0m
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Landscaped Buffer Strip	6.0m	> = 6.0m	> = 6.0m	> = 6.0m

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SCHEDULE OF REVISIONS

No.	Date	Description	By

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tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date:	June 3, 2025	Drawn By:	A.S.
File:	21-1046	Checked:	K.G.

Stormwater Management & Servicing Report

7131 5th Sideroad Inc.
Town of Innisfil
County of Simcoe

PEARSON ENGINEERING
PEARSONENG.COM

(Revised June 2025)
August 2024
21042

Table of Contents

Appendices

List of Figures & Drawings

Stormwater Management & Servicing report
7131 5th Sideroad Inc., Innisfil

1. introduction

PEARSON Engineering Ltd. (PEARSON) has been retained by 7131 5th Sideroad Inc. (Client) to prepare a Stormwater Management (SWM) & Servicing Report in support of the proposed Industrial Development located at 7131 5th Sideroad (5th SR) the Town of Innisfil (Town), in the County of Simcoe (County). This FSR is provided to the Town in support of the Draft Plan Approval.

The Project Lands comprise of a total area of approximately 28.1 ha, to be developed into three industrial business park lots and two SWM Pond blocks. The Project Lands are currently agricultural lands bisected by an existing unnamed headwater tributary of Lovers Creek which flows from west to east and is bound by a future industrial development to the north, Highway 400 corridor to the east, 7th Line to the south and 5th SR to the west. The Project lands are on the boundary between the Lake Simcoe Conservation Authority (LSRCA) to the south and the Nottawasaga Valley Conservation Authority (NVCA) to the north. Stormwater Management design criteria will be based on the receiving area. Refer to Figure 1 – Site Location Plan for the location of the site.

2. supporting documents

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

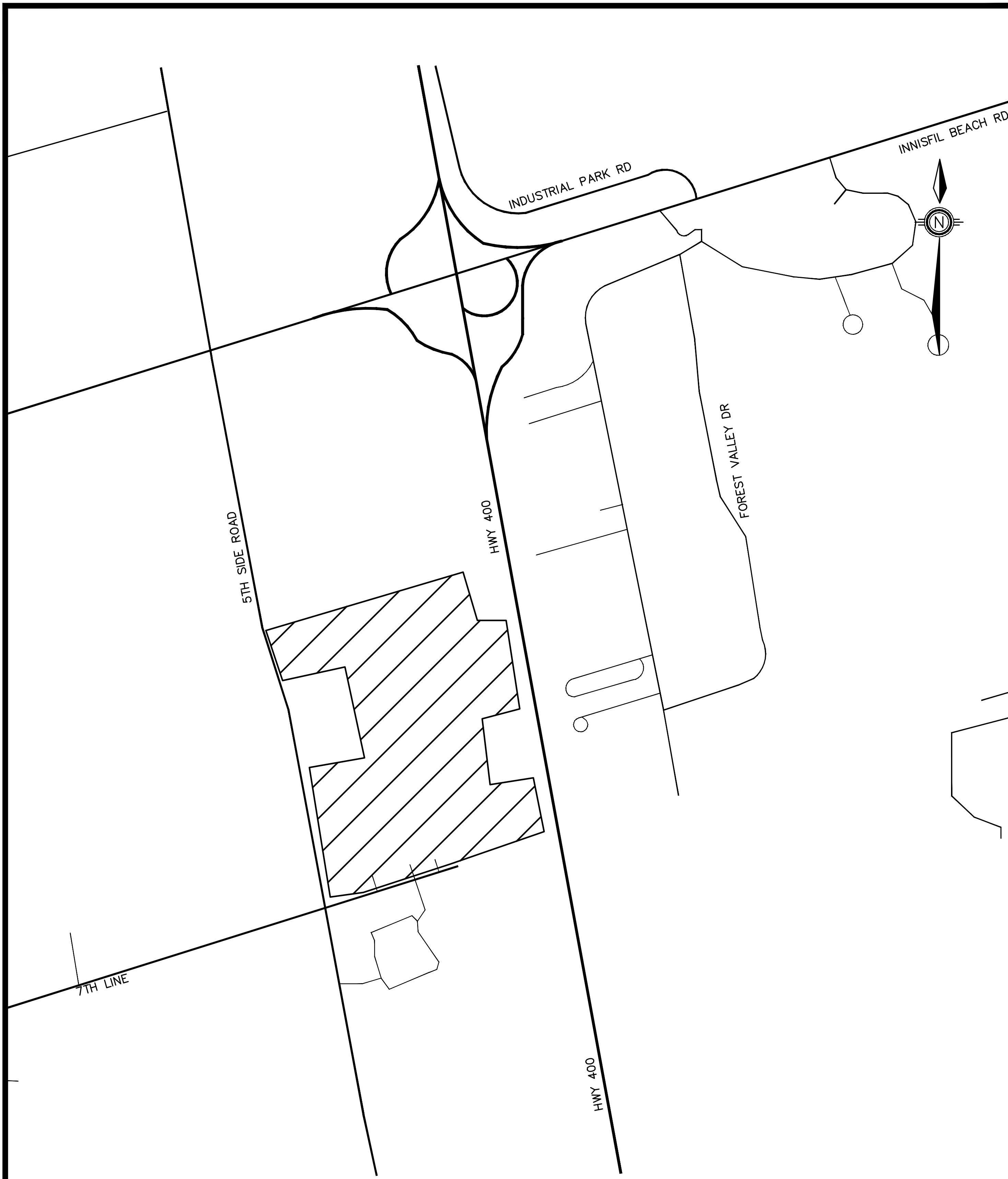
- Ministry of the Environment, Design Guidelines for Sewage Works, 2008
- Ministry of the Environment, Design Guidelines for Drinking-Water Systems, 2008
- The Ministry of the Environment Stormwater Management Planning and Design Manual, March 2003
- Town of Innisfil & InnServices Utilities Inc., Engineering Design Standards and Specifications Manual, May 2022
- Lake Simcoe Region Conservation Authority, Technical Guidelines for Stormwater Management Submissions, April 2022
- Nottawasaga Valley Conservation Authority, Stormwater Technical Guide, December 2013

3. water supply and distribution

3.1. Water Design Criteria

The site is designated as Industrial Business Park (IBP) and has an area of approximately 28.1 ha. Utilizing the Ministry of Environment, Conservation, and Parks (MECP) and Town of Innisfil Guidelines for domestic water use for industrial water demand of 35,000 L/ha/day, an Average Day Demand (ADD) of 11.38 L/s was calculated. A max day factor of 2.00 was utilized which resulted in a Max Day Demand (MDD) of 22.77 L/s and a Peak Rate factor of 4.00 was used in calculating a Peak Hour Demand of 45.53 L/s for the proposed development. Calculations for the domestic water requirements for the site can be found in Appendix A.

The Project Lands are proposed to be serviced by connecting to the existing 400 mm watermain located on the west side of 5th SR. Lot 1 will be serviced with a 200 mm diameter watermain connecting to the 400 mm watermain on 5th SR, and Lots 2 and 3 will be serviced with a 200 mm watermain connecting to the proposed watermain on the future cul-de-sac from the development to the north. The proposed water system layout can be seen on Drawing GS-1 and Drawing GS-2 in Appendix H.



7131 5TH SIDEROAD INC.
TOWN OF INNISFIL

SITE LOCATION PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AMC	HORIZ SCALE	NTS	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	FIG 1
CHECKED BY	GMP	DATE	NOVEMBER 2021	REVISION #	0

As per preliminary discussions with the Town regarding their Town-wide water modeling results, it is predicted that a fire flow of 125 L/s is currently available based on the Phase 1 upgrades that have been completed for the Innisfil Heights Reservoir and Booster Pumping Station (BPS). Future Phase 2 upgrades are anticipated to increase the available flows to the development area.

Fire flow calculations have been completed to ensure sufficient water can be supplied to the site for fire protection. Town of Innisfil Guidelines require a minimum fire flow of 136 L/s and a preferred fire flow of 152 L/s for industrial sites, or the value calculated using the Fire Underwriters Survey (FUS) 2020 guidelines, whichever is greater. Assuming a building construction of non-combustible materials and a fully sprinklered building, the following required fire flows were calculated using the FUS guidelines assuming 30% and 50% lot coverages. As seen in Table 1 below, the required fire flows range from 167 L/s to 400 L/s. Detailed fire flow calculations are included in Appendix A.

Table 1: FUS Required Fire Flow Calculations

Block Area	Required Fire Flow (L/s)	
	Assuming 30% Lot Coverage	Assuming 50% Lot Coverage
Block 2	300	400
Block 3	167	200
Block 4	183	233

A hydrant fire flow test was completed in front of the site on 7th Line in October 2021 indicating that a static pressure of 68 psi was available. This flow test also resulted in a flow of approximately 1,610 GPM (102 L/s) at a residual pressure of 46 psi from the existing hydrant. By extrapolating the results from the hydrant test, approximately 3,820 GPM (241 L/s) of fire flow is expected at a minimum residual pressure of 20 psi. Therefore, it is expected that the proposed water infrastructure can supply the flow as per the Town of Innisfil requirements. Lot coverages and proposed buildings for each lot will be reviewed further at detailed design once a building size is known, and fire storage may be required if the Phase 2 upgrades to the Innisfil Heights Reservoir have not been completed.

4. SANITARY SERVICING

4.1. Background

The Innisfil Heights Sewage Pumping Station 6, Class Environmental Assessment is currently being undertaken by Ainley Group. The pump station is proposed to be located near the intersection of 7th Line and the emergency access road, adjacent to the proposed south SWM Pond. A forcemain is proposed to convey flow westerly along 7th Line to 5th SR, and ultimately connect to the future gravity sewer on IBR, anticipated to be constructed between 2025 and 2028. Coordination for the sanitary sewer and forcemain system will be required with InnServices.

4.2. sanitary design criteria

Utilizing the MECP and Town of Innisfil Guidelines for industrial sewer use of 35,000 L/ha/d, an Average Daily Flow (ADF) of 11.38 L/s. is calculated. Using a Peaking Factor of 4.00 for this project, a Peak Flow of 45.53 L/s is calculated for the entire development. The peak flow including an infiltration allowance of 2.81 L/s/ha was calculated to be 48.34 L/s.

4.3. Temporary Sewage Disposal

Given that the downstream sanitary sewers and pump station are not expected to come online until 2025-2028, temporary measures will have to be completed until downstream infrastructure can be completed. Temporary measures may include the following:

- Temporary septic beds will be utilized to service the individual lots
- Phasing development to align with infrastructure upgrades
- Surface discharge membrane bioreactor or approved equivalent treatment system

Sewage design for each lot will be reviewed further at detailed design once a building size is known and coordinated with the Town's downstream sanitary sewer upgrades.

4.4. Internal Sanitary Sewer System

It is proposed that the sanitary sewers be constructed in accordance with the Town of Innisfil and MECP guidelines to service the Project Site. The proposed sewers will consist of a minimum diameter of 200 mm and will be designed to meet minimum design grades and the required minimum and maximum velocities under flow conditions. Gravity sanitary sewers will be installed within the Access Road Block and along the east property line in an easement adjacent to Highway 400 to service Lots 2 and 3 and to convey sewage southerly to the future pump station location at the southwest corner of South SWM Pond Block adjacent to 7th Line. Each industrial lot will be provided with a separate service connection. The proposed sanitary sewer system for the site can be seen on Drawing SAN- 1 in Appendix H.

5. STORMWATER MANAGEMENT

5.1. Overview

A key component of developing the Project Lands is the need to address SWM issues as well as related environmental concerns. SWM parameters are developed from an understanding of the site's natural systems. This report focuses on the necessary measures to satisfy the approval agencies SWM requirements.

It is understood the objectives of the SWM plan are to:

- Protect life and property from flooding and erosion;
- Maintain water quality for ecological integrity, recreational opportunities, etc.;
- Protect and maintain groundwater flow regime(s);
- Protect aquatic and fishery communities and habitats; and
- Maintain and protect significant natural features.

5.2. ANALYSIS METHODOLOGY

The design of the SWM Facilities for this site has been conducted in accordance with:

- The Ministry of the Environment Stormwater Management Planning and Design Manual, March 2003
- Town of Innisfil & InnServices Utilities Inc., Engineering Design Standards and Specifications Manual, May 2022
- Lake Simcoe Region Conservation Authority, Technical Guidelines for Stormwater Management Submissions, April 2022
- Nottawasaga Valley Conservation Authority, Stormwater Technical Guide, December 2013

In order to design the facilities to meet these requirements, it is essential to select the appropriate modeling methodology for the storm system design. Given the size of the site and the number of catchment areas, the computer model Visual OTTHYMO is appropriate for the design for the SWM system.

5.3. NVCA AND LSRCA WATERSHEDS

The Project Site is approximately 28.1 ha in size and primarily consists of pasture lands and the former Church's Equipment property (now IHL property). A high point through the site splits drainage towards the north (NVCA watershed) and south (LSRCA watershed). The north lands drain towards the Town's municipal drain (Lawson Drain), and the south lands drain to a tributary of Lovers Creek and ultimately crosses under Highway 400. Following discussions with both Conservation Authorities, it was determined that the watershed boundary would remain with approximately a 1.0 ha difference allowed to accommodate the development's layout. The following sections describe the stormwater management design for the two watersheds separately.

5.4. NVCA WATERSHED – SWM POND

5.4.1. EXISTING DRAINAGE CONDITIONS

A total pre-development area of approximately 32 ha drains to an existing 600 mm diameter culvert crossing 5th SR. Of the 32 ha, 8.1 ha is from the existing project lands, and 23.6 ha from the property north of the site (Broccolini lands). Stormwater runoff drains to the northwestern corner of the site towards the roadside ditch adjacent to 5th SR. External flow from an existing house located to the west of the property drains northerly towards the culvert. The culvert is a part of the Lawson Municipal Drain. Refer to Pre-Development Storm Catchment Plan (Drawing STM-1) which shows the existing storm drainage patterns for the development.

The project lands are primarily farmlands with some forested areas along the northern property line and northeast corner. According to the Geotechnical Investigation Report completed by Cambium Inc. (Cambium), dated August 19, 2021, the project site is comprised of various layers of Native Sand to Sandy Silt. The majority of the site has a surface layer of topsoil/organic layer generally consisting of silt and sand, with an underlying layer of sand to silty sand. Groundwater elevations to date were noted at a range of 0.50 m to 3.35 m below existing ground.

5.4.2. Proposed Drainage Conditions

The post-development drainage for the site will generally follow the pre-development drainage patterns. The watershed boundary between LSRCA and NVCA will be adjusted slightly to accommodate the site layout, however the respective watershed areas will not change by more than 1.0 ha as per LSRCA guidelines. The North SWM Pond is proposed to be a shared facility to service both the subject site and Broccolini properties. Following discussions with the Town of Innisfil, the proposed road through the Broccolini lands ends in a cul-de-sac located on the project lands which is to be developed by a separate External Works Agreement. The North SWM Pond has been designed by Novatech and approved by the Town of Innisfil in support of this Agreement and the pond design can be seen on Drawing 122202-SWMF and Stormwater Catchment Plan can be seen on Drawing 122202-POST in Appendix H.

The proposed North SWM Pond will provide quantity and quality control for the development and external Broccolini lands. Some onsite LID design features including rooftop infiltration, volume control, and phosphorus reducing features will be required at the site plan design. If the site exceeds the allowable runoff coefficient of 0.74, additional on-site quantity controls will be required.

Storm sewers will be sized for the minor storm, defined as all storms up to and including the 5-year storm event as per Town standards. Lots 2 and 3 will be provided an individual storm lateral connecting to the Broccolini cul-de-sac. In the event of a storm event greater than the 5-year storm, storm runoff will be conveyed to the proposed Novatech SWM Pond via overland flow. The preliminary layout for stormwater servicing can be found on Drawing STM-2 in Appendix H.

5.4.3. Stormwater Quantity Control

Considerations were taken to reduce post-development peak flows to pre-development values. The proposed drainage from the north portion of the Project site as well as the external Broccolini lands will be conveyed to the wet pond at the northwest corner of the development. As per Novatech's Storm Servicing and SWM Report (SSSWM Report), an allowable runoff coefficient of 0.82 and area of 6.53 ha has been provided for the Project area which drains to the SWM Pond. As the area for Lots 2 and 3 has been increased to 7.13 hectares, the allowable runoff coefficient was recalculated to be 0.74. On-site quantity controls will be required if the runoff coefficient for Lots 2 and 3 exceeds the allowable runoff coefficient of 0.74. Runoff coefficient calculations can be found in Appendix C.

5.4.4. Quality Control

In March 2003 the MECP issued a "Stormwater Management Planning and Design Manual". This manual has been adopted by a variety of agencies including Town of Innisfil. The objective of the Stormwater Quality Control will be to ensure Enhanced Protection quality control as stated in the MECP manual is achieved. To achieve Enhanced Protection, permanent and temporary control of erosion and sediment transport are proposed and are discussed in the following sections.

The developments' active impervious areas pose a risk to stormwater quality through the collection of grit, salt, sand, and oils on the paved surfaces. The proposed Novatech wet SWM Pond has been designed to provide quality control for the site with an allowable runoff coefficient of 0.74. On-site quality controls in the form of OGS units will be required if the runoff coefficient for Lots 2 and 3 exceeds the allowable runoff coefficient of 0.74 in order to meet the required enhanced level quality control and TSS removal.

5.4.5. Water Balance

Since the post-development state will increase the imperviousness of the site, considerations were taken in regard to groundwater recharge to satisfy the Town's and NVCA's water balance criteria. The post-development conditions will reduce the amount of infiltration across the site and therefore infiltration facilities are proposed in order to offset the deficit. As per calculations completed by Cambium, under pre-development conditions, the majority of the project site consists of pasture and forest area, which infiltrates approximately 12,785 m^3 annually. With the assumed level of increased imperviousness of the site, this recharge will be reduced to 2,557 m^3, resulting in a deficit volume of 10,228 m^3.

In order to infiltrate the deficit volume of 10,228 m^3 annually, it would be required to infiltrate stormwater from the rooftop area in infiltration galleries. However, as per the Hydrogeological Report by Cambium Inc. dated August 14, 2024, the minimum 1.0 m separation to the seasonally high groundwater elevation could not be achieved for the majority of the site. Therefore, infiltration facilities will be utilized on Lots 2 and 3 of the development only. It is proposed to infiltrate 25 mm over the rooftop area, increasing the annual infiltration volume by 9,900 m^3 and requiring an infiltration gallery size of 3,106 m^3. Infiltration mitigation measures will be examined in more detail at the detailed design stage. Detailed water balance calculations by Cambium can be seen in Appendix G.

5.4.6. Phosphorous Calculations

Local conservation authorities have determined the importance of reducing phosphorus levels in water courses in this area. The reduction was based on conservative values derived from the NVCA. As such, best efforts are to be employed in order to reduce phosphorus levels to pre-development levels or better.

The development lands within the NVCA watershed generates approximately 1.27 kg of phosphorus annually and the proposed Project will generate approximately 15.41 kg of phosphorus annually if uncontrolled. Best efforts will be used in order to reduce the phosphorus loading as much as is reasonably possible.

To minimize the site's phosphorous discharge, Lots 2 and 3 will require a treatment train approach to be designed at detailed design to minimize the amount of phosphorus discharged from the site. The following assumptions have been made in terms of best management practices (BMPs) with reduction based on NVCA Phosphorus tool:

- Permeable pavers with impermeable liner and perforated underdrain providing filtration rather than infiltration (45% typical phosphorus reduction)
- Rooftop Infiltration in underground storage chambers (100% typical phosphorous reduction)
- Ultimately draining to the downstream wet detention pond (63% typical phosphorus reduction)

5.5. LSRCA watershed – SWM pond

5.5.1. Existing Drainage Conditions

An existing 18.7 ha area from the project lands drains south towards a tributary of Lover's Creek in the LSRCA watershed. Stormwater drains towards an existing channel which bisects the site which drains easterly to a culvert crossing under Highway 400. External flow from an existing house and farmlands located to the west of the property (west of 5th SR) drains south towards the site. Refer to Pre-Development Storm Catchment Plan (Drawing STM-1) which shows the existing storm drainage patterns for the development.

According to the Geotechnical Investigation Report completed by Cambium Inc. (Cambium), dated August 19, 2021, the project site is comprised of various layers of Native Sand to Sandy Silt. The majority of the site has a surface layer of topsoil/organic layer generally consisting of silt and sand, with an underlying layer of sand to silty sand. Groundwater elevations to date were noted at a range of 0.15 m to 2.19 m below existing ground.

The Pre-Development Storm Catchment Plan (Drawing STM-1) shows the existing storm drainage patterns for the development. The pre-development peak flows from the site were calculated using Visual OTTHYMO and are provided in Table 6 below. The peak flow calculations and the pre-development Visual OTTHYMO Parameter calculations can be found in Appendix D.

Table 6: Pre-Development Peak Flows – LSRCA

	25 mm Storm	2 Year Storm	5 Year Storm	10 Year Storm	25 Year Storm	50 Year Storm	100 Year Storm	Regional Storm Hazel
24-Hour SCS Storm (m^3/s)	-	0.30	0.55	0.75	1.02	1.23	1.45	1.81
12-Hour SCS Storm (m^3/s)	-	0.35	0.66	0.89	1.21	1.46	1.72	-
4-Hour Chicago Storm (m^3/s)	0.06	0.16	0.32	0.44	0.62	0.75	0.91	-

5.5.1.1. Drainage Channel

The existing channel that bisects the Project lands is an unnamed headwater tributary of Lovers Creek, which is part of the LSRCA watershed. Based on the investigation completed by Cambium the channel exhibits a permanent flow regime and appears to have been historically straightened. A catchment area of approximately 12.1 ha located west of 5th SR drains through a culvert that crosses 5th SR and through the Project lands.

5.5.2. Proposed Drainage Conditions

The post-development drainage for the site will generally follow the pre-development drainage patterns. The watershed boundary between LSRCA and NVCA will be adjusted slightly to accommodate the site layout, however the respective watershed areas will not change by more than 1.0 ha as per LSRCA guidelines. An allowable runoff coefficient of 0.90 has been utilized for the Industrial lots.

Lot 1 will be provided an individual storm lateral connecting to the south SWM Pond inlet sized for the 5-year storm. The IHL site will connect to the proposed storm sewer in the Access Road Block in the future to drain to the SWM Pond. In the event of a storm event greater than the 5-year storm, the major system storm runoff will be conveyed overland to the proposed south SWM Pond to a low point adjacent to the SWM Pond inlet. The LSRCA watershed portion of the development will be serviced by a SWM Pond to be located at the southeast corner of the site which will provide quantity and quality control for the development for the area draining north. Some onsite LID design features including rooftop infiltration, volume control, and phosphorus reducing features will be required at site plan design. If the sites exceed the allowable runoff coefficient of 0.90 at site plan design on-site quantity controls will be required.

5.5.2.1. Drainage Channel Culvert

A culvert crossing the emergency access road is required to convey the existing channel flows from west of the Project lands. The proposed 730 mm x 1,150 mm culvert conveys flow underneath the emergency access road maintaining the separation of flows from the external catchment and the onsite catchments and has been designed to convey the 100-year storm event flow at 50% blockage without overtopping the access road. During a Regional storm event, stormwater will overtop the access road at an elevation of 297.48 m and will be conveyed to the SWM Pond and ultimately through the emergency weir of the pond to the culvert crossing Highway 400. Culvert sizing calculations can be found in Appendix C.

5.6. SWM Pond Design

The majority of Lot 1 will drain to the proposed south SWM pond. The SWM pond is designed with 4:1 internal side slopes and a 3.0 m wide 7:1 safety shelf on either side of the permanent pool elevation as per MECP Guidelines. The SWM Pond will have a 100-year storm event storage capacity of 13,439 m^3 at an elevation of 295.52 m within the pond. The top of the berm elevation is 296.00 m, providing 0.48 m of freeboard. Rip-rap is placed at the inlet flow location to prevent erosion. The proposed north SWM pond requires 15,040 m^3 at an elevation of 295.68 m to convey the Regional Storm event, providing 0.32 m of freeboard.

An outlet control structure comprised of a reverse slope pipe complete with a center wall with a 190 mm and 590 mm diameter orifice plates located within a center concrete midwall of a manhole structure. A 10.0 m wide major storm control at the northeast corner of the pond will control outflow from the pond and reduce it to pre-development values. The north SWM pond has been designed to provide quantity control for all storm events up to and including the 100-year and regional storm event. The overflow weir at an elevation of 295.50 m is proposed to convey stormwater in case the orifices are blocked or in the case of a storm event greater than a 100-year storm overland to the existing grassed drainage ditch conveying flow east under the Highway 400 corridor. Preliminary pond outflow and corresponding storage requirement can be seen in Table 7 below and details on Drawing PND-1 in Appendix I.

Table 7: South SWM Pond Outflow and Storage

	25 mm Storm	2 Year Storm	5 Year Storm	10 Year Storm	25 Year Storm	50 Year Storm	100 Year Storm	Regional Storm Hazel
24 Hour SCS Storm Events								
Peak Flow (m^3/s)	-	0.09	0.34	0.46	0.58	0.66	0.72	1.69
Storage Volume (m^3)	-	4,852	6,178	7,247	8,721	9,872	11,046	14,810
Elevation (m)	-	294.55	294.72	294.85	295.02	295.15	295.28	295.66
12 Hour SCS Storm Events								
Peak Flow (m^3/s)	-	0.14	0.42	0.53	0.65	0.72	0.78	-
Storage Volume (m^3)	-	5,273	6,778	8,038	9,723	11,032	12,353	-
Elevation (m)	-	294.61	294.79	295.94	295.13	295.27	295.41	-
4 Hour Chicago Storm Events								
Peak Flow (m^3/s)	0.05	0.06	0.17	0.30	0.43	0.49	0.56	-
Storage Volume (m^3)	2,619	4,133	5,400	5,938	6,826	7,553	8,352	-
Elevation (m)	294.24	294.46	294.62	294.73	294.80	294.89	294.08	-

5.6.1. Stormwater Quantity Control

The proposed development will increase the imperviousness of the site and as such the post-development peak flows will increase. It is important to quantify the increase in stormwater runoff rates due to the increased impervious values and attenuate these increases in peak flows. An allowable of 0.90 has been provided for the Industrial lots and 0.50 for the SWM Pond Block area. The calculated post-development runoff coefficient of 0.78 is greater than the pre-development runoff coefficient of 0.16. Runoff coefficient calculations can be found in Appendix C.

Considerations were taken to reduce post-development peak flows to pre-development values. The majority of the proposed drainage from the project will be conveyed to a wet pond at the southeast corner of the development, which has been designed to provide quantity control by retaining flows and releasing them below pre-development values. The proposed SWM Pond will outlet to the existing channel at or below pre-development peak flows.

Table 8 below summarizes the post-development peak flows for the Project Site and by comparing to Table 6, demonstrates that the total site peak flow is below the pre-development peak flows. The proposed storm catchment areas and drainage patterns can be seen on Drawing STM-2. Post-development OTTHYMO modelling output results can be found in Appendix E.

Table 8: Post-Development Peak Flows - LSRCA

	25 mm Storm	2 Year Storm	5 Year Storm	10 Year Storm	25 Year Storm	50 Year Storm	100 Year Storm	Regional Storm Hazel
24-Hour SCS Storm (m^3/s)	-	0.09	0.34	0.46	0.58	0.66	0.72	1.69
12-Hour SCS Storm (m^3/s)	-	0.14	0.42	0.53	0.65	0.72	0.78	-
4-Hour Chicago Storm (m^3/s)	0.05	0.06	0.17	0.30	0.42	0.49	0.56	-

5.5.3.1 Tailwater Analysis

An existing 900 mm diameter CSP culvert located immediately north of the proposed SWM Pond conveys flow from the existing drainage channel from west to east under Highway 400. A culvert analysis to confirm the conveyance capacity was previously completed by McIntosh Perry Consulting Engineers Ltd. as part of their design of the MTO SWM Pond located adjacent to Lot 1. An OTTHYMO model was utilized to calculate the peak flows to the culvert, and the computer modeling software HY-8 was utilized to calculate the culvert capacity.

The original base models were obtained from McIntosh Perry and were modified by adding the proposed development peak flows in order to determine if the culvert would create a backwater effect on the SWM Pond outlet. The analysis concluded that the existing 900 mm diameter CSP culvert has sufficient capacity to convey up to 100-year storm event from the catchment area including flow from the south SWM Pond without any backwater effect on pond. The results of HY-8 model analysis can be found in Appendix F.

The Regional storm peak flow of 4.6 m^3/s is conveyed to the existing culvert, including 2.0 m^3/s from the project site, 1.5 m^3/s from the existing MTO pond north of the site, and 1.1 m^3/s from the external area west of the site. Culvert capacity calculations demonstrate that the culvert required a headwater elevation of 295.27 m which is less than the top of berm elevation of 296.00 m. Therefore, the Project Site's peak flow can be safely conveyed through the SWM Pond's overflow weir and through the existing culvert without overtopping the pond's berm. Detailed calculations can be found in Appendix C.

5.6.2. Volume Control

Since the project site meets the definition of Major Development as per LSRCA Guidelines, considerations were taken to meet the volume control criteria detailed in section 2.2.2. The LSRCA guidelines state that for a new development that creates 500 m^2 or more of impervious surfaces, 25 mm of runoff over the total impervious area of the site is to be retained and treated on site, with flexible alternatives if this criterion cannot be met.

As the Project site is located in a Highly Vulnerable Aquifer (HVA) area, only rooftop water can be infiltrated, however, given the high groundwater, the recommended MECP minimum 1.0 m separation from the groundwater table from the bottom of the infiltration facilities cannot be met. Therefore, it is proposed to meet the LSRCA's Flexible Treatment Alternative #1 of 5 mm, which results in a total volume of 512 m^3.

The majority of the site's paved areas will be graded to direct stormwater towards permeable pavers located within parking stalls near the catchbasins. Given the geometry of the site and expected vehicular transport movements, placement of permeable pavers in the drive aisle is not recommended. The pavers will provide treatment via filtration and are wrapped in an impermeable liner and include a perforated underdrain which is connected to the storm sewer system. Preliminary calculations show that permeable pavers with a surface area of 2% of the parking lot area will meet volume control criteria assuming a paver structure depth consisting of 0.50 m of clear stone. Preliminary volume control calculations are included in Appendix C and will be reviewed further at the detailed design of each lot.

5.6.3. Quality Control

In March 2003 the MECP issued a "Stormwater Management Planning and Design Manual". This manual has been adopted by a variety of agencies including Town of Innisfil. The objective of the Stormwater Quality Control will be to ensure Enhanced Protection quality control as stated in the MECP manual is achieved. To achieve Enhanced Protection, permanent and temporary control of erosion and sediment transport are proposed and are discussed in the following sections.

5.6.3.1. Permanent Quality Control

The development's roadways and paved surfaces pose a risk to stormwater quality through the collection of grit, salt, sand, and oils. The MECP standard stipulates a Total Suspended Solids (TSS) removal of at least 80%. The proposed south SWM Pond has been designed based on the enhanced 80% long-term S.S. removal protection level according to Table 3.2 in the MECP SWM Planning & Design Manual.

A quality control forebay and wet cell have been sized to provide 5,264 m^3 of quality storage, exceeding the calculated required 2,763 m^3 as per MECP Table 3.2, and an extended detention drawdown time of 26.78 hours. The Wet SWM Pond will be designed as per MECP guidelines with a 3.0 m safety shelf at the permanent pool elevation, and internal 4:1 side slope. Detailed calculations can be seen in Appendix C.

5.6.3.2. During Construction Activities

During construction, earth grading and excavation will create the potential for soil erosion and sedimentation. It is imperative that effective environmental and sedimentation controls are in place and maintained throughout the duration of construction activities to ensure stormwater runoff's quality.

Therefore, the following recommendations shall be implemented and maintained during construction to achieve acceptable stormwater runoff quality:

- Installation of silt fence along the entire perimeter of the site to reduce sediment migration onto surrounding properties.
- Installation of a construction entrance mat at the entrance to minimize transportation of sediment onto roadways.
- Restoration of exposed surfaces with vegetative and non-vegetative material as soon as construction schedules permit;
- Installation of filter strips where applicable.
- Reduce stormwater drainage velocities where possible;
- Ensure that disturbed areas are vegetated and stabilized as quickly as possible;

5.6.4. Water Balance

Since the post-development state will increase the imperviousness of the site, considerations were taken in regard to groundwater recharge to satisfy the Town's and LSRCA's water balance criteria. The post-development conditions will reduce the amount of infiltration across the site and therefore infiltration facilities are proposed in order to offset the deficit. Under pre-development conditions, the majority of the project site consists of cropland and existing industrial land uses, which infiltrates approximately 35,756 m^3 annually. With the assumed level of increased imperviousness of the site, this recharge will be reduced to 10,772 m^3, resulting in a deficit volume of 24,984 m^3.

In order to infiltrate the deficit volume of 24,984 m^3 annually, it would be required to infiltrate stormwater from the rooftop area in infiltration galleries. However, as per the Hydrogeological Report by Cambium Inc. dated August 14, 2024, the minimum 1.0 m separation to the seasonally high groundwater elevation could not be achieved as per MECP standards. Therefore, off-site infiltration facilities will be utilized to reduce the water balance deficit for the proposed development.

Off-site compensation will be provided on Lots 2 and 3 of the project site. Infiltration chambers have been sized to infiltrate the 25 mm storm over the rooftop area, reducing the infiltration deficit by 9,900 m^3 to 15,084 m^3. Infiltration mitigation measures will be examined in more detail at the detailed design stage. Cambium's detailed water balance calculations can be seen in Appendix G.

5.6.4.1. Lake Simcoe Water Balance Recharge Offsetting Policy

The LSRCA has implemented a Water Balance Offsetting Policy (WBOP) in July 2021 which has a goal that all new development must match the pre-development infiltration volume. A fee of \$44.97/m^3 and an administration fee of 15% is required for any water balance deficit. Therefore, the estimated required fee for the proposed development is as follows:

LSWBOP Fee = \$44.97 x 15,084 m^3 + 15% Administration fee = \$780,077

As per Section 5.1 of the WBOP, only the greater of the compensation fees for water balance or phosphorous is required and therefore the water balance fee governs for the site. Compensation fee calculations to be examined in more detail at the detailed design stage.

5.6.5. Phosphorus Calculations

Local conservation authorities have determined the importance of reducing phosphorus levels in water courses in this area. The reduction was based on conservative values derived from the LSRCA. As such, best efforts are to be employed in order to reduce phosphorus levels to pre-development levels or better.

The existing site generates approximately 4.88 kg of phosphorus annually and the proposed Project will generate approximately 21.31 kg of phosphorus annually if uncontrolled. Best efforts will be used in order to reduce the phosphorus loading as much as is reasonably possible.

Lot 1 will require a treatment train approach to be designed at detailed design to minimize the amount of phosphorus discharged from the site. The following are the recommended BMPs with reduction values as per the LSRCA Phosphorus Loading Development Tool:

- 512 m^3 of permeable pavers with impermeable liner and perforated underdrain providing filtration rather than infiltration (45% typical phosphorus reduction)
- ultimately draining to the downstream wet detention pond (63% typical phosphorus reduction)

Table 9 below details the anticipated phosphorus loadings for pre-development and post-development conditions based on the above noted treatment train approach and detailed phosphorous loading calculations can be found in Appendix C as well as a summary table demonstrating the portion of the total phosphorous load for each lot.

Table 9: Phosphorus Loadings

	Total P (kg)
Pre-Development	4.88
Uncontrolled Post-Development	21.31
Controlled Post-Development	6.21

5.6.6. Lake Simcoe Phosphorous Offsetting Policy

The LSRCA has implemented a Phosphorus Offsetting Policy in July 2021 which has a goal that all new development must reduce 100% of the phosphorus above pre-development levels leaving the property. A fee of $35,770/kg/year and an administration fee of 15% is required for anything above the pre-development phosphorus loading for the site, with a minimum post-development removal rate of 80%. Therefore, the required fee for the proposed development is as follows:

LSPOP Fee = $35,770 x 2.5 x (6.21 - 4.88) kg + 15% Administration fee = $136,695

As per Section 5.1 of the WBRP, only the greater of the two compensation fees is required and therefore the water balance fee governs for the site. Compensation fee calculations can be seen in Appendix C.

6. Conclusions

The Project Lands can ultimately be serviced by extending services from 5th Sideroad and 7th Line as follows:

- Municipal water extended from the existing municipal watermains on 5th Sideroad.
- Gravity sanitary sewer system to be connected to the future municipal system on 7th Line by way of forcemain and pump station which will be coordinated with the Town ECA.
- Construction of a new SWM Pond in the southeast corner of the property to provide quantity and quality control for lands within the LSRCA watershed
- Connection to the approved SWM Pond in the northwest corner of the property for quantity and quality control for lands within the NVCA watershed.
- LID techniques where soil infiltration and groundwater conditions allow will be utilized at the site plan development stage.

The analysis and conceptual designs outlined in this report demonstrates that the servicing is feasible.

All of which is respectfully submitted,

Pearson Engineering Ltd.

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Gary Pearson, P. Eng.
Principal

LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

Appendix A

Water Demand Calculations and Supporting Information

7131 5th Sideroad, Innisfil
Water Flow Calculations

Design Criteria

Demand per capita (Q):	225	L/cap/day	
Peak Rate Factor (Max. Hour)	4.13	(Table 3-3: Peaking Factors, MOE Design Guidelines for Drinking-Water Systems)	
Max. Day Factor	2.75	(Table 3-3: Peaking Factors, MOE Design Guidelines for Drinking-Water Systems)	

Site Data

Description	Density		Units	Flow Rate		Peaking Factors	
Industrial (General)	28.1	ha	1 units	35,000	L/ha/d	MAX DAY FACTOR*	2.00
						PEAK RATE FACTOR*	4.00
						*From MECP Manual based on Industrial Land Use	

<u>Calculate Average Day Demand (ADD)</u>

ADD	=	35,000	x	28
ADD	=	983,500	L/day	
ADD	=	11.38	L/s	

<u>Calculate Max Day Flow</u>

MDF	=	11.38	x	2.00
MDF	=	22.77	L/s	

<u>Calculate Peak Hour Demand</u>

PHD	=	11.38	x	4.00
PHD	=	45.53	L/s	

7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 1 (30% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	33,930 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse Height
*Building Area Assumed to be 30% of Lot Coverage (Block 1)

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Farmland	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Ex. Industrial	> 100	> 30.1	0%
West Ex. Farm Building	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors

A = 33,930 + 8483

A = 42,413 m²

RFF = 36,246 L/min

Round to Nearest 1,000 L/min RFF = 36,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

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Correction Factors:

Contents Charge		0	L/min	
RFF Adjusted for Contents	E =	36,000	L/min	*As per "Water Supply for Public Fire Protection" pg.20 note H:*
Reduction For Sprinkler	F =	18,000	L/min	***RFF*** = **E - F + G**
RFF w/ Sprinkler Reduction		18,000	L/min	
Exposure Charge	G =	0	L/min	RFF = 36000 L/min - 18000 L/min + 0 L/min
RFF w/ Exposure Charge		18,000	L/min	RFF = 18000 L/min
Required Fire Flow:	**RFF =**	18,000	L/min	
Round to Nearest 1,000 L/min	**RFF =**	**18,000**	**L/min**	
	RFF=	**4,752**	**GPM**	
	RFF =	**300**	**L/s**	

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7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 1 (50% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	56,550 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse
*Building Area Assumed to be 50% of Lot Coverage (Block 1)

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Farmland	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Ex. Industrial	> 100	> 30.1	0%
West Ex. Farm Building	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors
A = 56,550 + 14138
A = 70,688 m²

RFF = 46,793 L/min
Round to Nearest 1,000 L/min RFF = 47,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		0	L/min
RFF Adjusted for Contents	**E =**	47,000	L/min
Reduction For Sprinkler	**F =**	23,500	L/min
RFF w/ Sprinkler Reduction		23,500	L/min
Exposure Charge	**G =**	0	L/min
RFF w/ Exposure Charge		23,500	L/min
Required Fire Flow:	**RFF =**	23,500	L/min
Round to Nearest 1,000 L/min	**RFF =**	**24,000**	**L/min**
	RFF=	**6,336**	**GPM**
	RFF =	**400**	**L/s**

As per "Water Supply for Public Fire Protection" pg.20 note H:

RFF = **E - F + G**

RFF = 47000 L/min - 23500 L/min + 0 L/min

RFF = 23500 L/min

7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 2 (30% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	9,120 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse
*Building Area Assumed to be 30% of Lot Coverage (Block 2)

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Industrial	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Prop. Industrial	> 100	> 30.1	0%
West Ex. Farm Building	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: C = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors

A = 9,120 + 2280

A = 11,400 m²

RFF = 18,792 L/min

Round to Nearest 1,000 L/min RFF = 19,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

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Correction Factors:

Contents Charge		0	L/min	
RFF Adjusted for Contents	E =	19,000	L/min	*As per "Water Supply for Public Fire Protection" pg.20 note H:*
Reduction For Sprinkler	F =	9,500	L/min	***RFF*** = **E - F + G**
RFF w/ Sprinkler Reduction		9,500	L/min	
Exposure Charge	G =	0	L/min	RFF = 19000 L/min - 9500 L/min + 0 L/min
RFF w/ Exposure Charge		9,500	L/min	RFF = 9500 L/min
Required Fire Flow:	RFF =	9,500	L/min	
Round to Nearest 1,000 L/min	**RFF =**	**10,000**	**L/min**	
	RFF=	**2,640**	**GPM**	
	RFF =	**167**	**L/s**	

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7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 2 (50% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	15,200 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse
*Building Area Assumed to be 50% of Lot Coverage (Block 2)

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Industrial	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Prop. Industrial	> 100	> 30.1	0%
West Ex. Farm Building	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 0.80 Non-Combustible

Required Fire Flow: ***RFF* = 220 x *C* x √*A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors

A = 15,200 + 3800

A = 19,000 m²

RFF = 24,260 L/min

Round to Nearest 1,000 L/min RFF = 24,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		0	L/min
RFF Adjusted for Contents	**E =**	24,000	L/min
Reduction For Sprinkler	**F =**	12,000	L/min
RFF w/ Sprinkler Reduction		12,000	L/min
Exposure Charge	**G =**	0	L/min
RFF w/ Exposure Charge		12,000	L/min
Required Fire Flow:	**RFF =**	12,000	L/min
Round to Nearest 1,000 L/min	**RFF =**	**12,000**	**L/min**
	RFF=	**3,168**	**GPM**
	RFF =	**200**	**L/s**

As per "Water Supply for Public Fire Protection" pg.20 note H:

RFF = **E - F + G**

RFF = 24000 L/min - 12000 L/min + 0 L/min

RFF = 12000 L/min

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7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 3 (30% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	12,300 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse
*Building Area Assumed to be 30% of Lot Coverage (Block 2)

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Industrial	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Prop. Industrial	> 100	> 30.1	0%
West Prop. Industrial	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors

A = 12,300 + 3075

A = 15,375 m²

RFF = 21,823 L/min

Round to Nearest 1,000 L/min RFF = 22,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		0	L/min
RFF Adjusted for Contents	**E =**	22,000	L/min
Reduction For Sprinkler	**F =**	11,000	L/min
RFF w/ Sprinkler Reduction		11,000	L/min
Exposure Charge	**G =**	0	L/min
RFF w/ Exposure Charge		11,000	L/min
Required Fire Flow:	**RFF =**	11,000	L/min
Round to Nearest 1,000 L/min	**RFF =**	**11,000**	**L/min**
	RFF=	**2,904**	**GPM**
	RFF =	**183**	**L/s**

As per "Water Supply for Public Fire Protection" pg.20 note H:

RFF = **E - F + G**

RFF = 22000 L/min - 11000 L/min + 0 L/min

RFF = 11000 L/min

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7131 5th Sideroad, Innisfil
Fire Flow Calculations - Lot 3 (50% Lot Coverage)

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Date: 2025-06-12
Project: Rinomato, Innisfil
Project Number: 21042

Location:	7131 5th Sideroad, Innisfil	
OBC Occupancy:	Industrial Occupencies	
Building Foot Print:	20,500 m^2 *	
# of Stories:	2	**Industrial Building**

Note: Assumed to be 2 Storeys based on Warehouse
*Building Area Assumed to be 50% of Lot Coverage (Block 2)

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 | Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 Sprinkler Standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Combustible **Charge:** 0%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Prop. Industrial	> 100	> 30.1	0%
East Ex. Highway Corridor	> 100	> 30.1	0%
South Prop. Industrial	> 100	> 30.1	0%
West Prop. Industrial	> 100	> 30.1	0%
		Total:	**0%**

Separation Distance	Charge
0.0 - 3.0 m	10% -15%
3.1 - 10.0 m	6% - 11%
10.1 - 20.0 m	3% - 8%
20.1 - 30.0 m	0% - 4%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: C = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 25% of Adjoining Floors

A = 20,500 + 5125

A = 25,625 m²

RFF = 28,174 L/min

Round to Nearest 1,000 L/min RFF = 28,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		0	L/min
RFF Adjusted for Contents	**E =**	28,000	L/min
Reduction For Sprinkler	**F =**	14,000	L/min
RFF w/ Sprinkler Reduction		14,000	L/min
Exposure Charge	**G =**	0	L/min
RFF w/ Exposure Charge		14,000	L/min
Required Fire Flow:	**RFF =**	14,000	L/min
Round to Nearest 1,000 L/min	**RFF =**	**14,000**	**L/min**
	RFF=	**3,696**	**GPM**
	RFF =	**233**	**L/s**

As per "Water Supply for Public Fire Protection" pg.20 note H:

RFF = **E - F + G**

RFF = 28000 L/min - 14000 L/min + 0 L/min
RFF = 14000 L/min

Appendix B

Sanitary Calculations and Supporting Information

7131 5th Sideroad, Innisfil
Sanitary Flow Calculations

Design Criteria

Flow per Capita (Q):	225	L/cap/day		
Peak Flow:	Qp = P * Q * M / 86,400 + I * A			
Peaking Factor (Harmon Formula):	M = 1 + (14 / (4 + (P / 1,000) ^ 0.5))		Where:	2.0 <= "M" <= 4.0
Peak Extraneous Flow (I):	0.10	L/s/ha		

Site Data

Description	Density		Units	Flow Rate	
Industrial (General)	28.1	ha	1 units	35,000	L/ha/d

Calculate Average Daily Flows

ADF	=	35,000	x	28.10
ADF	=	983,500	L/day	
ADF	=	11.38	L/s	

Calculate Peaking Factor

$$M = 1 + \frac{14}{4 + \left(\frac{28}{1,000}\right)^{0.5}} + 0.1 * 0.12$$

M = 4.37

Use Max Peaking Factor 4

Calculate Peak Flow

Qp	=	11.38	x	4.00
	=	45.53	L/s	
Infiltration Allowance	=	0.10	x	28.1
	=	2.81	L/s	
Qp (Inc. Infiltration Allowance)	=	48.34	L/s	

7131 5th Sideroad, Innisfil
Sanitary Sewer Pipe Design Sheet

n = 0.013

$Q_{Residential}$ = (P/1000)*Q*M (Q = 225 L/day/person)

M = 1+(14/(4+(P/1000)$^{0.5}$ (1.5 <= M <= 4)

Q_i = 0.23 L/ha/day

$Q_{Industrial}$ = 35 m^3/ha/day

Q_{tot} = $Q_{Industrial}$ + Q_i

Date: 12-Jun-25

File: 21042

Contract/Project: 7131 5th Sideroad, Innisfil

Areas	Manhole From	Manhole To	Area (ha)	Area (ACC.)	M	Industrial Flow (L/s)	Length (m)	Q_i (ACC.) (L/s)	Total Q (L/s)	D (mm)	S (%)	Q Full (L/s)	V Full (m/s)	Percent Full (%)
1	STUB	MH 1A	3.04	3.04	4.00	4.93	4.0	0.70	5.63	200	5.00	73.35	2.33	7.67
-	MH 1A	MH 2A	0.00	3.04	4.00	4.93	90.0	0.00	4.93	200	1.00	32.80	1.04	15.02
2	MH 2A	MH 3A	3.80	6.84	4.00	11.08	81.3	0.87	11.96	200	1.00	32.80	1.04	36.45
-	MH 3A	MH 4A	0.00	6.84	4.00	11.08	6.3	0.87	11.96	200	2.00	46.39	1.48	25.77
-	MH 4A	MH 5A	0.00	6.84	4.00	11.08	88.4	0.70	11.78	200	3.00	56.82	1.81	20.74
-	MH 5A	MH 6A	0.00	6.84	4.00	11.08	58.5	0.70	11.78	200	0.50	23.20	0.74	50.79
-	MH 6A	MH 7A	0.00	6.84	4.00	11.08	66.8	0.70	11.78	200	0.50	23.20	0.74	50.79
-	MH 7A	MH 8A	0.00	6.84	4.00	11.08	66.8	0.70	11.78	200	0.50	23.20	0.74	50.79
-	MH 8A	MH 9A	0.00	6.84	4.00	11.08	66.8	0.70	11.78	200	0.50	23.20	0.74	50.79
-	MH 9A	MH 10A	0.00	6.84	4.00	11.08	54.5	0.70	11.78	200	0.50	23.20	0.74	50.79
-	MH 10A	MH 11A	0.00	6.84	4.00	11.08	59.5	0.70	11.78	200	0.50	23.20	0.74	50.79
3	MH 11A	MH 12A	10.80	17.64	4.00	28.58	51.4	3.18	31.77	300	0.75	83.76	1.18	37.93
-	MH 12A	MH 13A	0.00	17.64	4.00	28.58	90.0	0.70	29.28	300	0.50	68.39	0.97	42.82
-	MH 13A	PUMP	0.00	17.64	4.00	28.58	23.7	0.70	29.28	300	0.50	68.39	0.97	42.82

Appendix C

Stormwater Management Calculations and Supporting Documents

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7131 5th Sideroad, Innisfil
Calculation of Visual OTTHYMO Parameters

											Total Imperviousness (%)	Runoff Coeffecient (C)	CN Number	Intial Abstraction (IA)
TIMP	=	0%	0%	0%	100%	100%	60%	56%	40%	90%				
CN Number	=	59	68	46	100	100	100	74	61	92				
C	=	0.15	0.15	0.08	0.95	0.95	0.60	0.60	0.50	0.90				
IA	=	5.0	7.0	10.0	2.0	2.0	5.0	2.0	4.0	2.3				
Surface Cover	=	Grass	Cultivated	Forest	Asphalt	Ex. Building	Gravel	ROW	SWM Pond	Prop. Block Area				
Pre-Development	Total Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)				
100	186948	39897	134037	0	0	1243	11770	0	0	0	4%	0.18	68.3	6.4
101	8878	8878	0	0	0	0	0	0	0	0	0%	0.18	59.0	5.0
102	62271	0	62271	0	0	0	0	0	0	0	0%	0.15	68.0	7.0
103	223046	166931	0	44270	0	3086	8760	0	0	0	4%	0.16	58.6	6.0
104	113129	105133	0	2928	2465	1161	1442	0	0	0	4%	0.18	60.5	5.0
105	8291	6062	0	1885	0	344	0	0	0	0	4%	0.17	57.7	6.0
106	314123	78041	214062	22020	0	0	0	0	0	0	0%	0.00	64.2	6.7
107	19156	0	19156	0	0	0	0	0	0	0	0%	0.00	68.0	7.0
Pre Total	935843	404942	429527	71103	2465	5834	21972	0	0	0	2%	0.16	63.5	6.3
Post-Development	Total Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area 0	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)				
200	134516	0	0	0	0	0	0	0	20831	113685	82%	0.84	87.2	2.6
201	8657	6428	0	1885	0	344	0	0	0	0	4%	0.17	57.8	6.0
202	11309	11309	0	0	0	0	0	0	0	0	0%	0.15	59.0	5.0
203	29961	0	0	0	0	0	0	0	0	29961	90%	0.90	92.0	2.3
204	5277	2443	0	2834	0	0	0	0	0	0	0%	0.11	52.0	7.7
205	71690	0	0	0	0	0	0	2514	0	69176	89%	0.89	91.4	2.3
206	32148	29707	0	386	1376	0	0	0	679	0	5%	0.19	60.6	4.9
207	113306	108238	0	0	2465	1161	1442	0	0	0	4%	0.18	60.8	4.9
208	222727	166611	0	44270	0	3086	8760	0	0	0	4%	0.16	58.6	6.0
209	36788	0	0	0	0	0	0	0	32588	4200	46%	0.55	64.5	3.8
Post Total	666379	324736	0	49375	3841	4591	10202	2514	54097	217022	35%	0.44	65	4.4

Notes:
- Catchment Area 203 is assume to be 90% imperviousness. See site plan for Project Number 21042.01 (SP-2021-006) - IHL Warehouse Design for more information.
- Catchment Area 209's Runoff Coeffeceint of 0.55 is based on the SWM Pond Design completed by Novatech. Refer to External Works Drawings for Pond Design.

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7131 5th Sideroad, Innisfil
Pre-Development OTTHYMO Parameters

Drainage ID	=	**100**		
Grassed Area	=	3.99	ha	
Cultivated Area	=	13.40		
Impervious Area	=	1.30	ha	
Total Area	=	18.69	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	

CN Value is as follows:

CN	=	68.3	(From calculation of Visual Otthymo Parameters sheet)

IA Value is as follows:

IA	=	6.41	(From calculation of Visual Otthymo Parameters sheet)

Runoff Coefficient Value is as follows:

C	=	0.21	(From calculation of runoff coefficient)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation — $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	467	m
Elevation 1 (El_1)	=	306.47	m
Elevation 2 (El_2)	=	295.21	m
Slope (S)	=	0.024	m/m
Time of Concentration (T_c)	=	49.93	mins
Total Time of Concentration (T_c)	=	49.93	mins
	=	0.83	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture	
Length	=	467	m
Slope	=	0.024	m/m
Velocity	=	0.36	m/s
Time of Concentration (T_c)	=	0.36	hrs
Total Time of Concentration (T_c)	=	0.36	hrs

Governing Time to Peak

Airport Equation

T_c	=	0.83	hrs
T_p (Tp = 2/3 Tc)	=	0.55	hrs

Drainage ID	**=**	**101**		
Grassed Area	=	0.89	ha	
Total Area	=	0.89	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	59.0	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	5.00	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.00	(From calculation of runoff coefficient)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	167	m
Elevation 1 (El_1)	=	295.00	m
Elevation 2 (El_2)	=	294.20	m
Slope (S)	=	0.005	m/m
Time of Concentration (T_c)	=	59.21	mins
Total Time of Concentration (T_c)	=	59.21	mins
	=	0.99	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	167	m
Slope	=	0.005	m/m
Velocity	=	0.16	m/s
Time of Concentration (T_c)	=	0.29	hrs
Total Time of Concentration (T_c)	=	0.29	hrs

Governing Time to Peak

Airport Equation

T_c	=	0.99	hrs
T_p (Tp = 2/3 Tc)	=	0.66	hrs

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Drainage ID	**=**	**103**		
Grassed Area	=	16.69	ha	
Forest Area	=	4.43	ha	
Impervious Area	=	1.18	ha	
Total Area	=	22.30	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	58.6	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	5.95	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.16	(From calculation of runoff coefficient sheet)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation		$T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$	
Length (L)	=	573	m
Elevation 1 (El_1)	=	303.84	m
Elevation 2 (El_2)	=	294.00	m
Slope (S)	=	0.017	m/m
Time of Concentration (T_c)	=	60.95	mins
Total Time of Concentration (T_c)	=	60.95	mins
	=	1.02	hrs

Uplands Method			
Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	573	m
Slope	=	0.017	m/m
Velocity	=	0.30	m/s
Time of Concentration (T_c)	=	31.69	mins
Total Time of Concentration (T_c)	=	0.53	hrs

Governing Time to Peak

Uplands Method			
T_c	=	1.02	hrs
T_p (Tp = 2/3 Tc)	=	0.68	hrs

Drainage ID	**=**	**104**		
Forest Area	=	0.29	ha	
Grassed Area	=	10.51	ha	
Impervious Area	=	0.51		
Total Area	=	11.31	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	60.5	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	5.03	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.18	(From calculation of runoff coefficient)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation: $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	361	m
Elevation 1 (El_1)	=	304.00	m
Elevation 2 (El_2)	=	297.99	m
Slope (S)	=	0.017	m/m
Time of Concentration (T_c)	=	48.11	mins
Total Time of Concentration (T_c)	=	48.11	mins
	=	0.80	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	361	m
Slope	=	0.017	m/m
Velocity	=	0.30	m/s
Time of Concentration (T_c)	=	0.34	hrs
Total Time of Concentration (T_c)	=	0.34	hrs

Governing Time to Peak

Airport Equation

T_c	=	0.80	hrs
T_p (Tp = 2/3 Tc)	=	0.53	hrs

Drainage ID	**=**	**105**		
Forested Area	=	0.19		
Grassed Area	=	0.61	ha	
Impervious Area	=	0.03		
Total Area	=	0.83		

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	57.7	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	6.01	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.17	(From calculation of runoff coefficient)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation		$T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$	
Length (L)	=	144	m
Elevation 1 (El_1)	=	305.00	m
Elevation 2 (El_2)	=	303.15	m
Slope (S)	=	0.013	m/m
Time of Concentration (T_c)	=	34.19	mins
Total Time of Concentration (T_c)	=	34.19	mins
	=	0.57	hrs

Uplands Method			
Section	=	1	
Land Cover	=	Pasture	
Length	=	144	m
Slope	=	0.013	m/m
Velocity	=	0.26	m/s
Time of Concentration (T_c)	=	0.15	hrs
Total Time of Concentration (T_c)	=	0.15	hrs

Governing Time to Peak

Airport Equation			
T_c	=	0.57	hrs
T_p (Tp = 2/3 Tc)	=	0.38	hrs

7131 5th Sideroad, Innisfil
Post-Development OTTHYMO Parameters

Drainage ID	**=**	**201**		
Impervious Area	=	0.03	ha	
Pervious Area	=	0.83	ha	
Total Area	=	0.87	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	57.8	(Pasture as per LSRCA Guidelines)
IA Value is as follows:			
IA	=	6.0	(Pasture as per LSRCA Guidelines)
Runoff Coefficient Value is as follows:			
C	=	0.17	(Pasture as per LSRCA Guidelines)

CN Value is as follows:

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	83	m
Elevation 1 (El_1)	=	305.00	m
Elevation 2 (El_2)	=	304.00	m
Slope (S)	=	0.012	m/m
Time of Concentration (T_c)	=	26.06	mins
Total Time of Concentration (T_c)	=	26.06	mins
	=	0.43	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	83	m
Slope	=	0.012	m/m
Velocity	=	0.25	m/s
Time of Concentration (T_c)	=	0.09	hrs
Total Time of Concentration (T_c)	=	0.09	hrs

Governing Time to Peak

Airport Equation

T_c	=	0.43	hrs
T_p (Tp = 2/3 Tc)	=	0.29	hrs

Drainage ID	**=**	**202**		
Pervious Area	=	1.13	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	

CN Value is as follows:

CN	=	59	(Pasture as per LSRCA Guidelines)

IA Value is as follows:

IA	=	5	(Pasture as per LSRCA Guidelines)

Runoff Coefficient Value is as follows:

C	=	0.15	(Pasture as per LSRCA Guidelines)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	190	m
Elevation 1 (El_1)	=	294.50	m
Elevation 2 (El_2)	=	292.91	m
Slope (S)	=	0.008	m/m
Time of Concentration (T_c)	=	45.30	mins
Total Time of Concentration (T_c)	=	45.30	mins
	=	0.75	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	190	m
Slope	=	0.008	m/m
Velocity	=	0.21	m/s
Time of Concentration (T_c)	=	0.25	hrs
Total Time of Concentration (T_c)	=	0.25	hrs

Governing Time to Peak

Airport Equation

T_c	=	0.75	hrs
T_p (Tp = 2/3 Tc)	=	0.50	hrs

Drainage ID	**=**	**204**		
Grassed Area	=	0.24	ha	
Forest Area	=	0.28	ha	
Impervious Area	=	0.00	ha	
Total Area	=	0.53	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	52.0	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	7.69	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.11	(From calculation of Runoff coefficient sheet)
CN Value is as follows:			
CN	=	59.0	(Pasture as per NVCA Guidelines)
IA Value is as follows:			
IA	=	5	(Pasture as per NVCA Guidelines)
Runoff Coefficient Value is as follows:			
C	=	0.15	(Pasture as per NVCA Guidelines)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation $T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$

Length (L)	=	286.5	m
Elevation 1 (El_1)	=	298.68	m
Elevation 2 (El_2)	=	296.85	m
Slope (S)	=	0.006	m/m
Time of Concentration (T_c)	=	63.27	mins
Total Time of Concentration (T_c)	=	63.27	mins
	=	1.05	hrs

Uplands Method

Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	286.5	m
Slope	=	0.006	m/m
Velocity	=	0.18	m/s
Time of Concentration (T_c)	=	0.43	hrs
Total Time of Concentration (T_c)	=	0.43	hrs

Governing Time to Peak

Airport Equation

T_c	=	1.05	hrs
T_p (Tp = 2/3 Tc)	=	0.70	hrs

Drainage ID	**=**	**208**		
Forest Area	=	4.43	ha	
Grassed Area	=	16.66	ha	
Impervious Area	=	1.18	ha	
Total Area	=	22.27	ha	

Based on the Hydrogeological Assessment by Cambium we have assumed a Soil Group of:

Hydrologic Soils Group:	=	AB	
CN Value is as follows:			
CN	=	58.6	(From calculation of Visual Otthymo Parameters sheet)
IA Value is as follows:			
IA	=	5.95	(From calculation of Visual Otthymo Parameters sheet)
Runoff Coefficient Value is as follows:			
C	=	0.55	(From calculation of Runoff coefficient sheet)

Find Time to Peak using Airport Equation and Uplands Method

Airport Equation		$T_c = 3.26(1.1 - c)L^{0.5}S_w^{-0.33}$	
Length (L)	=	573	m
Elevation 1 (El_1)	=	303.84	m
Elevation 2 (El_2)	=	294.00	m
Slope (S)	=	0.017	m/m
Time of Concentration (T_c)	=	36.13	mins
Total Time of Concentration (T_c)	=	36.13	mins
	=	0.60	hrs

Uplands Method			
Section	=	1	
Land Cover	=	Pasture & Forest	
Length	=	573	m
Slope	=	0.017	m/m
Velocity	=	0.30	m/s
Time of Concentration (T_c)	=	0.53	hrs
Total Time of Concentration (T_c)	=	0.53	hrs

Governing Time to Peak

Airport Equation			
T_c	=	0.60	hrs
T_p (Tp = 2/3 Tc)	=	0.40	hrs
D_T (1/5 T_p)	=	4.8	mins

PEARSON ENGINEERING

7131 5th Sideroad, Innisfil
Stage-Storage-Discharge Table
South Stormwater Management Pond

Elevation (m)	Forebay Area (m^2)	Main Cell Area (m^2)	Total Area (m^2)	Inc. Volume (m^3)	Quality Control Vol. (m^3)	Quatity Control Vol. (m^3)	Orifice 1 Head (m)	Orifice 1 Flow (m^3/s)	Orifice 2 Head (m)	Orifice 2 Flow (m^3/s)	Weir Head (m)	Weir Flow (m^3/s)	Total Flow (m^3/s)
292.30	146	2246	2,392	0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.40	182	2338	2,520	246	246		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.50	218	2432	2,650	259	504		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.60	257	2526	2,783	272	776		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.70	296	2622	2,918	285	1,061		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.80	337	2719	3,057	299	1,360		0.000	0.000	0.000	0.000	0.000	0.000	0.000
292.90	380	2818	3,197	313	1,672		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.00	423	2917	3,341	327	1,999		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.10	469	3018	3,487	341	2,341		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.20	515	3120	3,636	356	2,697		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.30	563	3224	3,787	371	3,068		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.40	623	3349	3,972	388	3,456		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.50	711	3523	4,234	410	3,866		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.60	804	3701	4,505	437	4,303		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.70	903	3883	4,785	465	4,767		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.80		5152	5,152	497	5,264		0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.80		5152	5,152	0		0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
293.90		5543	5,543	535		535	0.005	0.000	0.000	0.000	0.000	0.000	0.000
294.00		5850	5,850	570		1,104	0.105	0.026	0.000	0.000	0.000	0.000	0.026
294.10		6165	6,165	601		1,705	0.205	0.036	0.000	0.000	0.000	0.000	0.036
294.20		6491	6,491	633		2,338	0.305	0.044	0.000	0.000	0.000	0.000	0.044
294.30		6991	6,991	674		3,012	0.405	0.050	0.000	0.000	0.000	0.000	0.050
294.40		7248	7,248	712		3,724	0.505	0.056	0.000	0.000	0.000	0.000	0.056
294.50		7503	7,503	738		4,461	0.605	0.062	0.000	0.000	0.000	0.000	0.062
294.60		7755	7,755	763		5,224	0.705	0.066	0.005	0.054	0.000	0.000	0.120
294.70		8005	8,005	788		6,012	0.805	0.071	0.105	0.247	0.000	0.000	0.318
294.80		8250	8,250	813		6,825	0.905	0.075	0.205	0.345	0.000	0.000	0.421
294.90		8567	8,567	841		7,666	1.005	0.079	0.305	0.421	0.000	0.000	0.501
295.00		8797	8,797	868		8,534	1.105	0.083	0.405	0.486	0.000	0.000	0.569
295.10		9023	9,023	891		9,425	1.205	0.087	0.505	0.542	0.000	0.000	0.629
295.20		9250	9,250	914		10,339	1.305	0.090	0.605	0.593	0.000	0.000	0.684
295.30		9480	9,480	936		11,275	1.405	0.094	0.705	0.641	0.000	0.000	0.734
295.40		9711	9,711	960		12,235	1.505	0.097	0.805	0.685	0.000	0.000	0.782
295.50		9951	9,951	983		13,218	1.605	0.100	0.905	0.726	0.000	0.000	0.826
295.60		10201	10,201	1,008		14,226	1.705	0.103	1.005	0.765	0.100	0.314	1.182
295.70		10418	10,418	1,031		15,257	1.805	0.106	1.105	0.802	0.200	1.185	2.093
295.80		10668	10,668	1,054		16,311	1.905	0.109	1.205	0.837	0.300	2.383	3.330
295.90		10934	10,934	1,080		17,391	2.005	0.112	1.305	0.872	0.400	3.859	4.842
296.00		11197	11,197	1,107		18,497	2.105	0.115	1.405	0.904	0.500	5.585	6.604

Orifice 1	
Diameter	190 mm
Invert Elevation	293.80
Orifice Constant	0.63
Orifice Centroid	293.90
Orifice Flow Formula	$0.80\pi(D/2000)^2x(2x9.81xH)^{0.5}$

Orifice 2	
Diameter	590 mm
Invert Elevation	294.30
Orifice Constant	0.63
Orifice Centroid	294.60
Orifice Flow Formula	$0.80\pi(D/2000)^2x(2x9.81xH)^{0.5}$

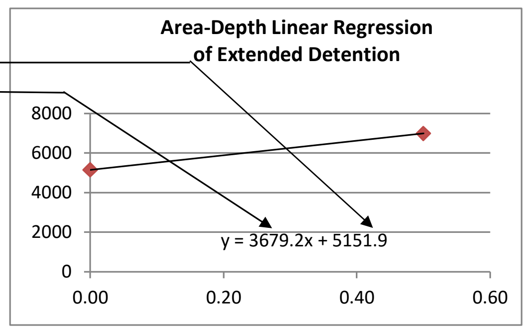
Major Storm Control Weir	
Width	10.00 m
Invert of Weir	295.50 m
Weir Flow Formula	$1.7WH^{1.5}$

7131 5th Sideroad, Innisfil
Extended Detention Drawdown Time - South Pond

Orifice Invert Elevation	=	293.80	m
Size of Orifice	=	190	mm
Orifice Centroid	=	293.90	m
Orifice Constant	=	0.63	

Elevation (m)	Area (m^2)	Volume (m^3)	Cum. Volume (m^3)	Depth over Orifice (m)	Head (m)	Flow (m^3/s)
293.80	5152	0	0	0.00	0.00	0.0000
293.90	5543	535	535	0.10	0.00	0.0056
294.00	5850	570	1104	0.20	0.11	0.0256
294.10	6165	601	1705	0.30	0.21	0.0358
294.20	6491	633	2338	0.40	0.31	0.0437
294.30	6991	674	3012	0.50	0.41	0.0504
294.40	7248	712	3724	0.60	0.51	0.0562
294.50	7503	738	4461	0.70	0.61	0.0615
294.60	7755	763	5224	0.80	0.71	0.0664
294.70	8005	788	6012	0.90	0.81	0.0710
294.80	8250	813	6825	1.00	0.91	0.0753
294.90	8567	841	7666	1.10	1.01	0.0793
295.00	8797	868	8534	1.20	1.11	0.0832
295.10	9023	891	9425	1.30	1.21	0.0869
295.20	9250	914	10339	1.40	1.31	0.0904

Elevation of Perm. Pool	293.80	m
Intercept of Regression	4896	C_3
Slope of Regression	3334.70	C_2
Elevation of 25 mm Storm	294.28	m
Depth over Orifice Centroid	0.48	m
Orifice Area	0.03	sq.m
Drawdown Time	26.78	hrs.



PEARSON ENGINEERING

7131 5th Sideroad, Innisfil
Quality Control Calculations - South SWM Pond

Find Wet Cell Volumes Required for Proposed Subdivision:

Area	=	13.45	ha
% Total Impervious	=	82%	

From MOE SWMPPD Manual Table 3.2, Level 1 Quality Volumes for a wet pond:

Level 1 Quality Volumes for a wet pond:

70%	=	225	m^3/ha
85%	=	250	m^3/ha

Therefore,

82%	=	245	m^3/ha

Sicne 40 m^3/ha is for extended detention, therefore, the permanent pool volume is: 247 m^3/ha - 40 m^3/ha = 207 m^3/ha

Volume Required	=	Area	x	Volume Req'd
	=	13.45	x	205
	=	2,763	m^3	
Volume Provided	=	5,264	m^3	

Therefore, the forebay is adeqautely sized as per the MECP requirements.

Forebay 1 Calculations for proposed Subdivision:

Settling Calculations as per MOE Equation 4.5:

Length to Width Ratio of Forebay (r)	=	3.50	
Peak Flow (2 year) from pond (Q)	=	0.21	m^3/s
Settling Velocity (V)	=	0.0003	m/s

Forebay Length (D) = $\frac{\sqrt{(rQ)}}{V}$

= 49 m

Provided = 84 m

Dispersion Length as per MOE Equation 4.6:

5 Year Inlet Flow Rate (Q)	=	3.37	m^3/s
Depth of Permanent Pool (d)	=	1.50	m
Desired Velocity (V)	=	0.5	m/s

Dispersion Length = $\frac{8Q}{dV}$

= 36 m

Provided = 84 m

Minimum Forebay Deep Zone Bottom Width as per MOE Equation 4.7:

Dispersion Length = 36 m

Width = Dispersion Length/8

= 4 m

Provided = 6 m

7131 5th Sideroad, Innisfil
Sediment Drying Calculations

Find Wet Cell Volumes Required for Proposed Subdivision:

Area	=	14.32	ha				
% Total Impervious	=	78%					

Annual Sediment Loading

70%	=	2.80	m^3/ha/year
85%	=	3.80	m^3/ha/year

Therefore,

78%	=	3.30	m^3/ha/year

As per Town of Innisfil Criteria sediment drying area has been sized for a minimum of 10 years of accumulation:

Volume Required	=	Area		x	Annual Loading	x	Years
	=	14.32		x	3.30	x	10
	=	473	m^3				

Bottom Area of Area	=	728.35	m
Top Area of Area	=	13.77	m
Height of Sediment Drying Area	=	1.50	m
Volume Provided	=	557	m^3

Therefore, the Sediment drying area meets Town of Innisfil sizing requirments.

PEARSON ENGINEERING

7131 5th Sideroad, Innisfil
Emergency Overflow Weir Calculations

Emergency Overflow Weir

Total Height (H)	=	0.50	m
Bottom Width (W)	=	10.00	m
Side Slopes (S)	=	10:1	
Angle at the Apex (θ)	=	84.2	
	=	1.47	rad
Downstream Length	=	12.80	m

As per NVCA guidelines, calculate trapezoidal weir as a rectangle and two triangles.

Rectangular Weir Coefficient

$$C_D = \frac{(-1.04 \times 10^4 + 3.42 \times 10^6 \times (H/L))}{(1+\ 2.13 \times 10^6 \times (H/L) - 2.35 \times 10^5 \times (H/L)^2)}$$

C_D (H = 0.50 m) = 1.49

Triangular Weir Coefficient

$$C_D = \frac{(-1.01 \times 10^{-5} + 1.44 \times 10^2 \times (H/L))}{(1 + 1.15 \times 10^2 \times (H/L) - 4.77 \times (H/L)^2)}$$

C_D (H = 0.50 m) = 1.03

Rectangular Weir Capacity:

Q = $C_D \times W \times H^{1.5}$
Q = $1.24 \times 30 \times (0.50)^{1.5}$
Q = 5.257 m^3/s

Triangular Weir Capacity:

Q = $C_D \times \tan(\theta/2) \times H^{2.5}$
Q = $0.76 \times \tan(1.05/2) \times (0.50)^{2.5}$
Q = 0.164 m^3/s

Overflow Weir Capacity:

Q = $Q_{rec} + 2 \times Q_{tri}$
Q = $1.304 + 2 \times 0.001$
Q = 5.585 m^3/s

Tabluated values for overflow weir parameters required for the Stage-Storage-Discharge Table can be seen below

Elevation (m)	Weir Head (m)	Rectangular Discharge Coefficient m^3/s	Rectangular Weir Flow m^3/s	Triangular Discharge Coefficient m^3/s	Triangular Weir Flow m^3/s	Total Weir Flow m^3/s	Total Weir Velocity m/s
295.50	0.00	0.00	0.000	0.00	0.000	0.000	0.00
295.60	0.10	0.98	0.310	0.59	0.002	0.314	0.20
295.70	0.20	1.30	1.159	0.80	0.013	1.185	0.38
295.80	0.30	1.40	2.302	0.91	0.041	2.383	0.51
295.90	0.40	1.45	3.679	0.98	0.090	3.859	0.51
296.00	0.50	1.49	5.257	1.03	0.164	5.585	0.61

The uncontrolled 100 year flow for the 24 Hour SCS Storm is 6.51 m^3/s (Visual OTTHYMO hydrograph 503)
Therefore, the Overflow Weir conveys the uncontrolled 100 Year Storm at an elevation of 295.58

PEARSON ENGINEERING

7131 5th Sideroad, Innisfil
Volume Control - LSRCA

Volume Control Required

Impervious Area	=	102317	m^2	
Volume Control	=	102,317	x	0.025
	=	2557.92		

Therefore, 2558m³ per year of volume control is required for the proposed project.

Due to site constraints 25 mm volume control cannot be achieved on-site, Flexible Alternative #1 of 5 mm over the site's impervious area is proposed.

Volume Control	=	102317	x	0.005
	=	512	m^3	
Proposed Volume	=	512	m^3	

7131 5th Sideroad, Innisfil
LSRCA Permeable Pavers Sizing Calculations

Infiltration volumes from MOE Stormwater Management Planning and Design Manual to size Permeable Pavers
Table 3.2 Water Quality Storage Requirements are as follows:

Design Area Total	=	11.37	ha		
Total Imperviousness	=	95%			
Storage Volume	=	42.7	m^3/ha		(Enhanced 80% long-term S.S. removal)
Area 1 Storage Volume Required	=	11.37		x	42.7
	=	485.1	m^3		

The required storage volume as per the Volume Control sheet is 512 m^3. As such the permeable pavers area sized to provide that volume.

Find Storage Volume provided in Permeable Pavers:

Area of Pavers (A)	=	2560.0	m^2
Depth of Trench (d)	=	0.50	m
Storage Volume (V)	=	0.4(A x d)	
	=	512.0	m^3

		Required		**Provided**	
Area Storage Volume	=	485.1	m^3	512.0	m^3

Use Equation 4.12 to find Area of Permeable Pavers:

Area Design Volume (V)	=	512.0	m^3
Depth of Controlling Filter Medium (d)	=	0.50	m
Coefficient of Permeability of the Controlling Filter Media (k)	=	15.0	mm/hr
Operating Head of Water On the Filter (h)	=	0.15	m
Design Drawdown Time (t)	=	24	hr

Surface Area Of Filter (A) = $\frac{1000Vd}{k(h+d)t}$

= 1094.0 m^2

		Required		**Provided**	
Area 1 Surface Area	=	1094.0	m^2	2560.0	m^2

Assuming the parking lot is 50% of the block area, the minimum percentage of the parking lot required to be permeable is:

Total Parking Lot Area	=	Total Block Area	x	0.50
	=	113685	x	0.50
	=	56843		
% Parking Lot Area	=	Requried Area	/	Parking Lot Area
	=	1094		56843
	=	2%		

7131 5th Sideroad, Innisfil
Phosphorus Budget - LSRCA

Lovers Creek	Cropland	High Intensity Industrial	Hay / Pasture	Low Intensity Development	Open Water
Phosphorus Export (kg/ha/year)	0.16	1.82	0.07	0.07	0.26

Pre-Development Condition

	Cropland	High Intensity Industrial	Hay / Pasture	Low Intensity Development	Open Water
Area (ha)	13.40	1.30	3.99	0.00	0.00
Total P (kg)	2.14	2.37	0.28	0.09	0.00
Total Pre-Development P (kg)		**4.88**			

Post-Development Condition (Uncontrolled):

	Cropland	High Intensity Industrial	Hay / Pasture	Low Intensity Development	Open Water
Area (ha):	0.00	11.37	1.13	0.00	2.08
Total P (kg) :	0.00	20.69	0.08	0.00	0.54
Total Uncontrolled Post-Development (kg):		**21.31**			

Post-Development Condition (Controlled):

Uncontrolled Area :	Cropland	High Intensity Industrial	Hay / Pasture	Low Intensity Development	Open Water
Area (ha):	0.00	0.00	1.13	0.00	0.00
Total P (kg) :	0.00	0.00	0.08	0.00	0.00
Total Uncontrolled (kg):		**0.08**			

Area Draining to Permeable Pavers	Cropland	High Intensity Industrial	Hay / Pasture		Open Water
Area (ha):	0.00	5.68	0.00		0.00
Total P (kg) :	0.00	10.35	0.00		0.00
Sand or Media Filters					
Total P (kg):		10.35			
Sand or Media Filters Proficiency (%):		45			
P Removed (kg):		4.66			
P Remaining (kg):		5.69			

Area Draining to Wet Detention Pond	Cropland	High Intensity Industrial	Hay / Pasture		Open Water
Area (ha):	0.00	5.68	0.00		2.08
Total P (kg) :	0.00	10.35	0.00		0.54
Wet Detention Ponds					
P from Pavers (kg):		5.69			
Total P (kg):		16.58			
Wet Detention Ponds Proficiency (%):		63			
P Removed (kg):		10.44			
P Remaining (kg):		6.13			
Total Post-Development P (kg):		**6.21**			

Phosphorus Budget Calculation

As per LSRCA Phosphorus Offsetting Fee Policy, dated July 2021, the required fee for the development is:

Phosphorus Budget = 2.5 x 2.08 x $35,770 + 15% Administration Fee
= $136,695

7131 5th Sideroad, Innisfil
Water Balance Calculations -LSRCA

Pre Development Recharge

Precipitation data taken from Environment Canada information for the City of Barrie

As per Cambium Hydrogeological Investigation dated August 14, 2024, an annual infiltration volume for the project site is approximately 35,756 m^3.

Annual Site Area Recharge Volume = 35,756 m^3

Therefore, 35756m^3 per year of recharge volume is required for the proposed project.

Post Development Recharge

As per Cambium Hydrogeological Investigation dated August 14, 2023, an annual infiltration volume for the project under proposed conditions is approximately 10,772 m^3.

Annual Site Area Recharge Volume = 10,798 m^3

Therefore, post development infiltration deficit is as follows;

Deficit Volume = Pre Development - Post Development
= 35,756 - 10,798
= 24,958 m^3

7131 5th Sideroad, Innisfil
Stage-Storage-Discharge Table
South Temporary Sediment Pond

Elevation (m)	Area (m^2)	Inc. Volume (m^3)	Quality Control Vol. (m^3)	Quatity Control Vol. (m^3)	Orifice 1 Head (m)	Orifice 1 Flow (m^3/s)	Total Flow (m^3/s)
292.30	1,595	0	0		0.000	0.000	0.000
292.40	1,856	173	173		0.000	0.000	0.000
292.50	1,974	192	364		0.000	0.000	0.000
292.60	2,095	203	568		0.000	0.000	0.000
292.70	2,218	216	783		0.000	0.000	0.000
292.80	2,344	228	1,011		0.000	0.000	0.000
292.90	2,473	241	1,252		0.000	0.000	0.000
293.00	2,604	254	1,506		0.000	0.000	0.000
293.10	2,737	267	1,773		0.000	0.000	0.000
293.20	2,874	281	2,054		0.000	0.000	0.000
293.30	3,012	294	2,348		0.000	0.000	0.000
293.40	3,185	310	2,658		0.000	0.000	0.000
293.50	3,437	331	2,989		0.000	0.000	0.000
293.60	3,699	357	3,346		0.000	0.000	0.000
293.70	3,969	383	3,729		0.000	0.000	0.000
293.80	4,254	411	4,140		0.000	0.000	0.000
293.80	4,254	0		0	0.000	0.000	0.000
293.90	5,386	482		482	0.025	0.000	0.000
294.00	6,193	579		1,061	0.125	0.017	0.017
294.10	6,840	652		1,713	0.225	0.023	0.023
294.20	7,326	708		2,421	0.325	0.028	0.028
294.30	8,351	784		3,205	0.425	0.032	0.032
294.40	8,527	844		4,049	0.525	0.036	0.036
294.50	8,702	861		4,910	0.625	0.039	0.039
294.60	8,877	879		5,789	0.725	0.042	0.042
294.70	9,051	896		6,686	0.825	0.045	0.045
294.80	9,225	914		7,599	0.925	0.047	0.047
294.90	9,399	931		8,531	1.025	0.050	0.050
295.00	9,574	949		9,479	1.125	0.052	0.052
295.10	9,750	966		10,445	1.225	0.055	0.055
295.20	9,928	984		11,429	1.325	0.057	0.057
295.30	10,106	1,002		12,431	1.425	0.059	0.059
295.40	10,284	1,020		13,451	1.525	0.061	0.061
295.50	10,494	1,039		14,489	1.625	0.063	0.063
295.60	10,668	1,058		15,548	1.725	0.065	0.065
295.70	10,841	1,075		16,623	1.825	0.067	0.067
295.80	11,009	1,093		17,716	1.925	0.068	0.068
295.90	11,175	1,109		18,825	2.025	0.070	0.070
296.00	11,465	1,132		19,957	2.125	0.072	0.072

Orifice 1	
Diameter	150 mm
Invert Elevation	293.80
Orifice Constant	0.63
Orifice Centroid	293.88
Orifice Flow Formula	$0.80\pi(D/2000)^2x(2x9.81xH)^{0.5}$

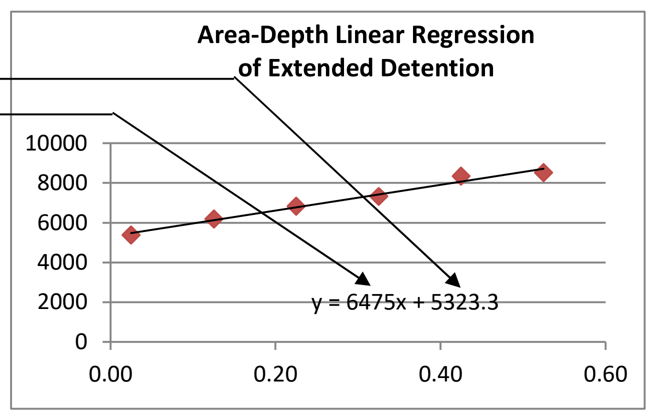
7131 5th Sideroad, Innisfil
Extended Detention Drawdown Time
South Temporary Sediment Pond

Orifice Invert Elevation	=	293.80	m
Size of Orifice	=	150	mm
Orifice Centroid	=	293.88	m
Orifice Constant	=	0.63	

Required Active Storage = 17.51 x 185
= 3239 m^3

Elevation (m)	Area (m^2)	Volume (m^3)	Cum. Volume (m^3)	Depth over Orifice (m)	Head (m)	Flow (m^3/s)
293.80	4254	0	0	0.00	0.00	0.0000
293.90	5386	482	482	0.10	0.03	0.0078
294.00	6193	579	1061	0.20	0.13	0.0174
294.10	6840	652	1713	0.30	0.23	0.0234
294.20	7326	708	2421	0.40	0.33	0.0281
294.30	8351	784	3205	0.50	0.43	0.0321
294.40	8527	844	4049	0.60	0.53	0.0357
294.50	8702	861	4910	0.70	0.63	0.0390
294.60	8877	879	5789	0.80	0.73	0.0420
294.70	9051	896	6686	0.90	0.83	0.0448
294.80	9225	914	7599	1.00	0.93	0.0474
294.90	9399	931	8531	1.10	1.03	0.0499
295.00	9574	949	9479	1.20	1.13	0.0523
295.10	9750	966	10445	1.30	1.23	0.0546
295.20	9928	984	11429	1.40	1.33	0.0568

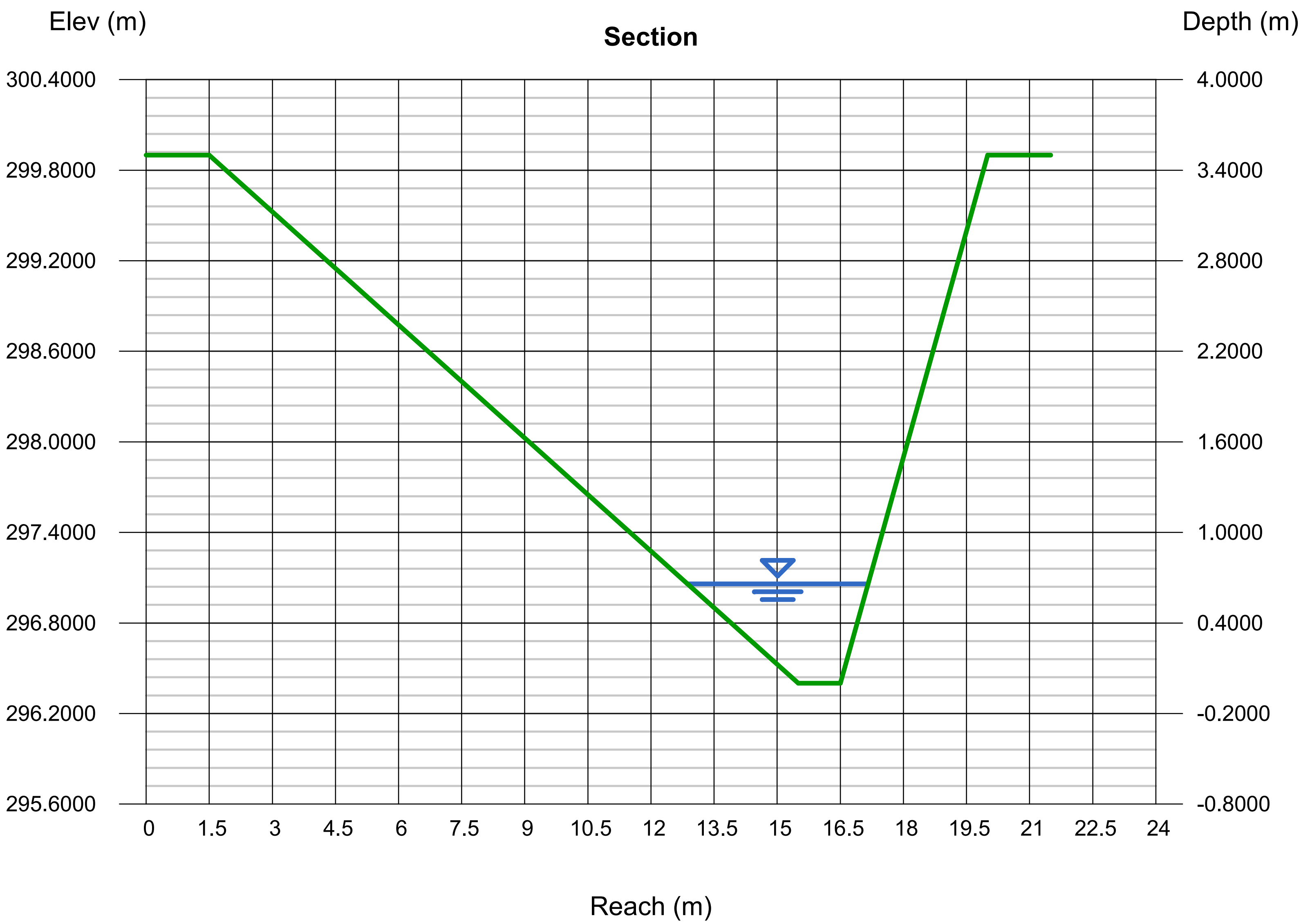
Elevation of Perm. Pool	293.80	m
Intercept of Regression	5323	C_3
Slope of Regression	6475.00	C_2
Elevation 185m^3/ha Storage	294.3	m
Depth over Orifice Centroid	0.43	m
Orifice Area	0.02	sq.m
Drawdown Time	46.44	hrs.



Channel Report

Channel - 100 Year Storm

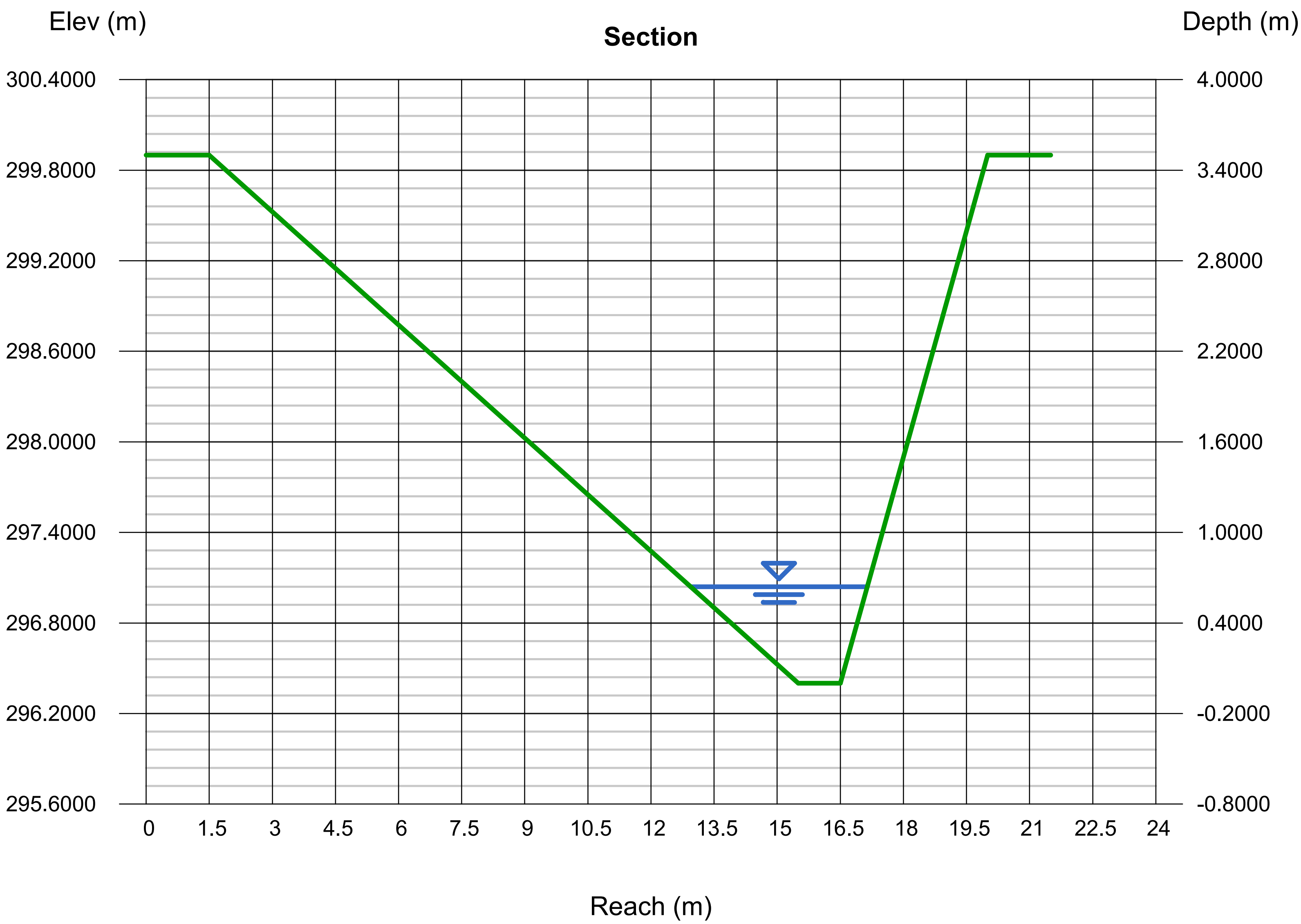
Trapezoidal		**Highlighted**	
Bottom Width (m)	= 1.0000	Depth (m)	= 0.6584
Side Slopes (z:1)	= 4.0000, 1.0000	Q (cms)	= 1.2700
Total Depth (m)	= 3.5000	Area (sqm)	= 1.7420
Invert Elev (m)	= 296.4000	Velocity (m/s)	= 0.7290
Slope (%)	= 0.6000	Wetted Perim (m)	= 4.6456
N-Value	= 0.055	Crit Depth, Yc (m)	= 0.3962
		Top Width (m)	= 4.2918
Calculations		EGL (m)	= 0.6855
Compute by:	Known Q		
Known Q (cms)	= 1.2700		



Channel Report

Channel - Regional Storm

Trapezoidal		**Highlighted**	
Bottom Width (m)	= 1.0000	Depth (m)	= 0.6401
Side Slopes (z:1)	= 4.0000, 1.0000	Q (cms)	= 1.1900
Total Depth (m)	= 3.5000	Area (sqm)	= 1.6643
Invert Elev (m)	= 296.4000	Velocity (m/s)	= 0.7150
Slope (%)	= 0.6000	Wetted Perim (m)	= 4.5443
N-Value	= 0.055	Crit Depth, Yc (m)	= 0.3840
		Top Width (m)	= 4.2004
Calculations		EGL (m)	= 0.6662
Compute by:	Known Q		
Known Q (cms)	= 1.1900		



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Thursday, Feb 16 2023

Street A - 730 mm x 1150 mm Elliptical Culvert Embedded 200 mm for 100 Year Storm

Invert Elev Dn (m)	=	293.2200
Pipe Length (m)	=	22.5000
Slope (%)	=	6.1777
Invert Elev Up (m)	=	294.6100
Rise (mm)	=	530.0
Shape	=	Elliptical
Span (mm)	=	1150.0
No. Barrels	=	1
n-Value	=	0.024
Culvert Type	=	Horizontal Ellipse Concrete
Culvert Entrance	=	Square edge w/headwall (H)
Coeff. K,M,c,Y,k	=	0.01, 2, 0.0398, 0.67, 0.5

Embankment

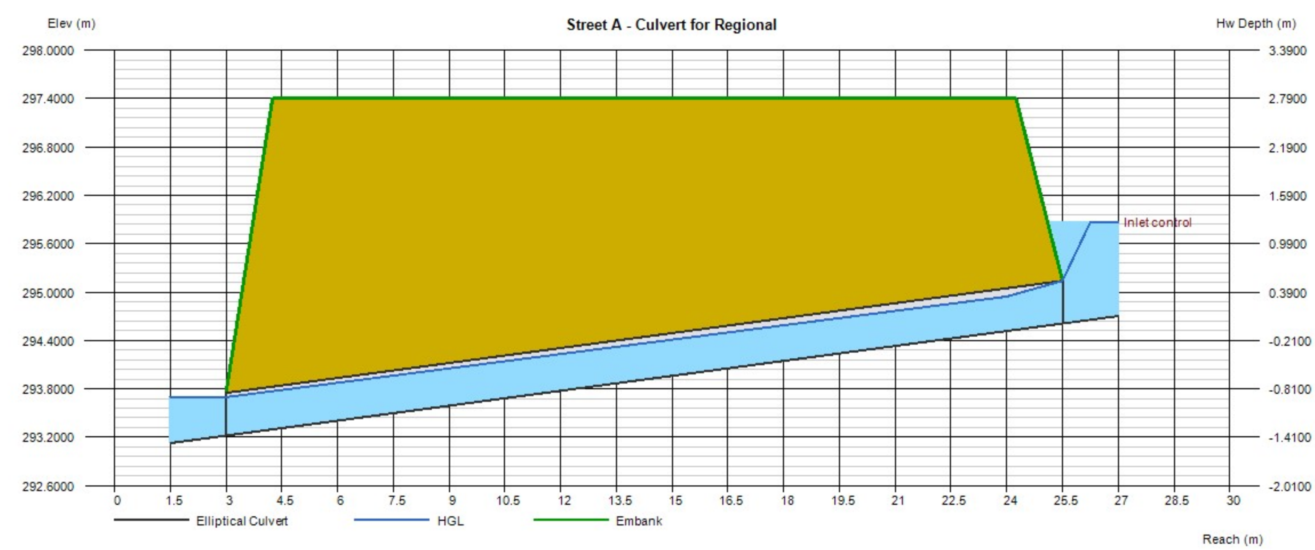
Top Elevation (m)	=	297.4000
Top Width (m)	=	20.0000
Crest Width (m)	=	12.5500

Calculations

Qmin (cms)	=	1.2700
Qmax (cms)	=	1.2700
Tailwater Elev (m)	=	(dc+D)/2

Highlighted

Qtotal (cms)	=	1.2700
Qpipe (cms)	=	1.2700
Qovertop (cms)	=	0.0000
Veloc Dn (m/s)	=	2.7635
Veloc Up (m/s)	=	3.0494
HGL Dn (m)	=	293.6970
HGL Up (m)	=	295.0340
Hw Elev (m)	=	295.8678
Hw/D (m)	=	2.3732
Flow Regime	=	Inlet Control



Culvert Report

Street A - 730 mm x 1150 mm Elliptical Culvert Embedded 200 mm for Regional Storm

Invert Elev Dn (m)	= 293.2200
Pipe Length (m)	= 22.5000
Slope (%)	= 6.1777
Invert Elev Up (m)	= 294.6100
Rise (mm)	= 530.0
Shape	= Elliptical
Span (mm)	= 1150.0
No. Barrels	= 1
n-Value	= 0.024
Culvert Type	= Horizontal Ellipse Concrete
Culvert Entrance	= Square edge w/headwall (H)
Coeff. K,M,c,Y,k	= 0.01, 2, 0.0398, 0.67, 0.5

Embankment

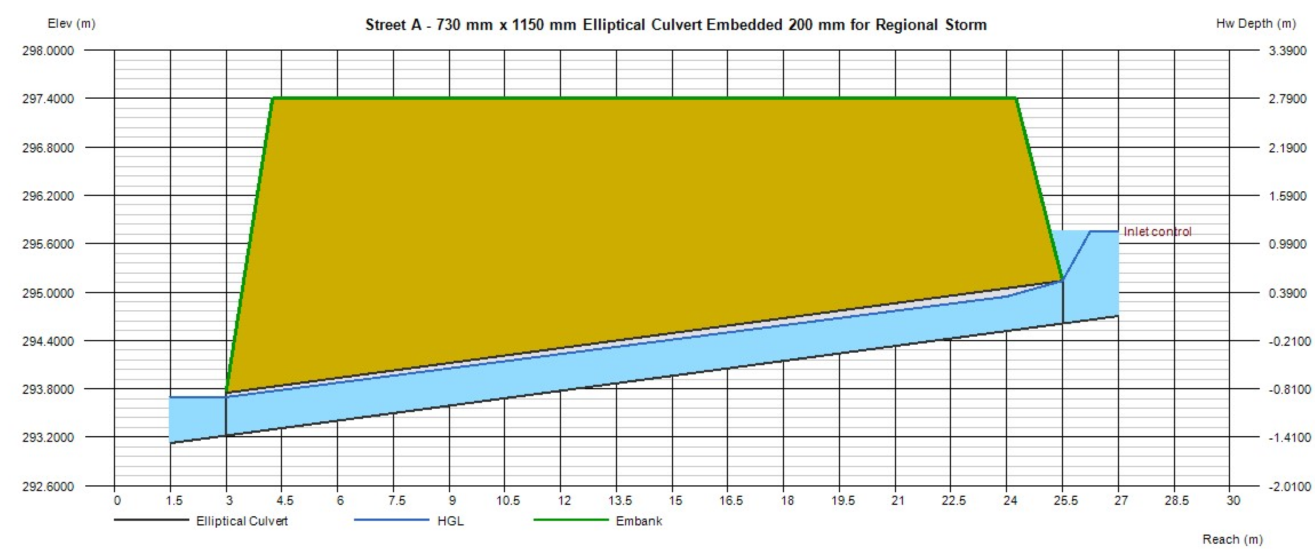
Top Elevation (m)	= 297.4000
Top Width (m)	= 20.0000
Crest Width (m)	= 12.5500

Calculations

Qmin (cms)	= 1.1900
Qmax (cms)	= 1.1900
Tailwater Elev (m)	= (dc+D)/2

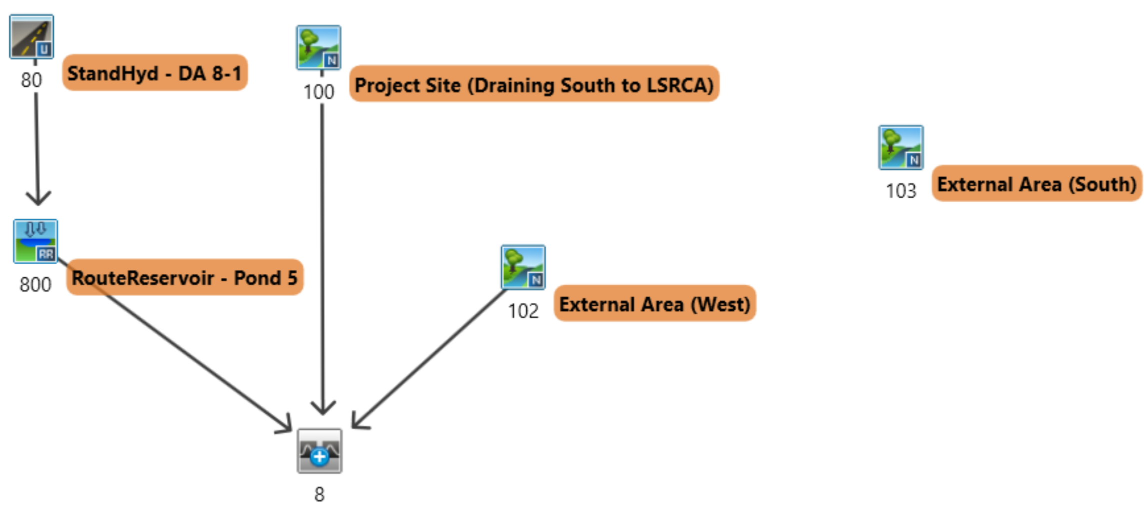
Highlighted

Qtotal (cms)	= 1.1900
Qpipe (cms)	= 1.1900
Qovertop (cms)	= 0.0000
Veloc Dn (m/s)	= 2.5895
Veloc Up (m/s)	= 2.8573
HGL Dn (m)	= 293.6970
HGL Up (m)	= 295.0340
Hw Elev (m)	= 295.7556
Hw/D (m)	= 2.1616
Flow Regime	= Inlet Control



Appendix D

Pre-development Visual Otthymo Modelling



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        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
Developed and Distributed by Smart City Water Inc
```



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


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DATE: 06-07-2023                            TIME: 03:28:16

USER:



COMMENTS: ____________________________________________________________


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  ************************************************
  ** SIMULATION : Run 01                        **
  ************************************************



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|                  |              ata\Local\Temp\
|                  |              e3f32f85-15d5-499d-96c2-7232fe40f633\09e908db
| Ptotal= 36.95 mm |    Comments: 2yr_4hr_chi
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.00    0.00 |  1.17   18.78 |  2.33    4.89 |  3.50    2.55
                  0.17    2.47 |  1.33   83.11 |  2.50    4.28 |  3.67    2.39
                  0.33    2.82 |  1.50   24.57 |  2.67    3.82 |  3.83    2.26
                  0.50    3.31 |  1.67   13.01 |  2.83    3.46 |  4.00    2.15
                  0.67    4.05 |  1.83    9.01 |  3.00    3.17 |
                  0.83    5.30 |  2.00    6.97 |  3.17    2.93 |
                  1.00    7.98 |  2.17    5.73 |  3.33    2.72 |

------------------------------------------------------------------------------------------------


--------------------
| CALIB            |
```

```
| NASHYD   (  0103)|   Area    (ha)=  23.19   Curve Number   (CN)= 59.4
|ID= 1 DT= 6.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.78

         NOTE:  RAINFALL WAS TRANSFORMED TO   6.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.100	0.00	1.200	11.58	2.300	5.73	3.40	2.79
0.200	0.82	1.300	18.78	2.400	5.17	3.50	2.72
0.300	2.47	1.400	61.67	2.500	4.89	3.60	2.55
0.400	2.70	1.500	83.11	2.600	4.28	3.70	2.50
0.500	2.82	1.600	24.57	2.700	4.13	3.80	2.39
0.600	3.31	1.700	20.72	2.800	3.82	3.90	2.30
0.700	3.56	1.800	13.01	2.900	3.58	4.00	2.26
0.800	4.05	1.900	10.34	3.000	3.46	4.10	2.15
0.900	4.88	2.000	9.01	3.100	3.17	4.20	1.43
1.000	5.30	2.100	6.97	3.200	3.09		
1.100	7.98	2.200	6.56	3.300	2.93		

```
     Unit Hyd Qpeak  (cms)=   1.136

     PEAK FLOW       (cms)=   0.127 (i)
     TIME TO PEAK    (hrs)=   2.600
     RUNOFF VOLUME    (mm)=   4.684
     TOTAL RAINFALL   (mm)=  36.955
     RUNOFF COEFFICIENT   =   0.127

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=  12.18   Curve Number   (CN)= 60.7
|ID= 1 DT= 6.0 min |   Ia      (mm)=   5.20   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.55

         NOTE:  RAINFALL WAS TRANSFORMED TO   6.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.100	0.00	1.200	11.58	2.300	5.73	3.40	2.79
0.200	0.82	1.300	18.78	2.400	5.17	3.50	2.72
0.300	2.47	1.400	61.67	2.500	4.89	3.60	2.55
0.400	2.70	1.500	83.11	2.600	4.28	3.70	2.50
0.500	2.82	1.600	24.57	2.700	4.13	3.80	2.39
0.600	3.31	1.700	20.72	2.800	3.82	3.90	2.30
0.700	3.56	1.800	13.01	2.900	3.58	4.00	2.26
0.800	4.05	1.900	10.34	3.000	3.46	4.10	2.15
0.900	4.88	2.000	9.01	3.100	3.17	4.20	1.43
1.000	5.30	2.100	6.97	3.200	3.09		
1.100	7.98	2.200	6.56	3.300	2.93		

```
     Unit Hyd Qpeak  (cms)=   0.846

     PEAK FLOW       (cms)=   0.092 (i)
     TIME TO PEAK    (hrs)=   2.200
     RUNOFF VOLUME    (mm)=   5.139
     TOTAL RAINFALL   (mm)=  36.955
     RUNOFF COEFFICIENT   =   0.139
```

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0100)|   Area    (ha)=  18.65   Curve Number   (CN)= 68.3
|ID= 1 DT= 7.0 min |   Ia      (mm)=   6.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.59

         NOTE:  RAINFALL WAS TRANSFORMED TO   7.0 MIN. TIME STEP.


                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.117    0.00 | 1.167    7.98 | 2.217    6.44 |  3.27    2.96
                 0.233    1.41 | 1.283   18.78 | 2.333    5.73 |  3.38    2.84
                 0.350    2.52 | 1.400   55.54 | 2.450    4.89 |  3.50    2.72
                 0.467    2.82 | 1.517   74.75 | 2.567    4.54 |  3.62    2.55
                 0.583    3.17 | 1.633   24.57 | 2.683    4.21 |  3.73    2.46
                 0.700    3.52 | 1.750   16.31 | 2.800    3.82 |  3.85    2.37
                 0.817    4.05 | 1.867   11.87 | 2.917    3.56 |  3.97    2.26
                 0.933    5.12 | 1.983    9.01 | 3.033    3.38 |  4.08    2.18
                 1.050    6.45 | 2.100    7.26 | 3.150    3.17 |  4.20    1.54

     Unit Hyd Qpeak  (cms)=   1.207

     PEAK FLOW       (cms)=   0.164 (i)
     TIME TO PEAK    (hrs)=   2.217
     RUNOFF VOLUME    (mm)=   6.289
     TOTAL RAINFALL   (mm)=  36.955
     RUNOFF COEFFICIENT   =   0.170

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB              |
| STANDHYD (  0080)|   Area    (ha)=  12.63
|ID= 1 DT= 1.0 min |   Total Imp(%)=  33.00   Dir. Conn.(%)=  33.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        4.17         8.46
     Dep. Storage     (mm)=        1.00         5.00
     Average Slope     (%)=        1.00         2.00
     Length            (m)=      290.17        40.00
     Mannings n           =       0.013        0.250

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


                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.017    0.00 | 1.067    7.98 | 2.117    6.97 |  3.17    3.17
                 0.033    0.00 | 1.083    7.98 | 2.133    6.97 |  3.18    2.93
                 0.050    0.00 | 1.100    7.98 | 2.150    6.97 |  3.20    2.93
                 0.067    0.00 | 1.117    7.98 | 2.167    6.97 |  3.22    2.93
                 0.083    0.00 | 1.133    7.98 | 2.183    5.73 |  3.23    2.93
                 0.100    0.00 | 1.150    7.98 | 2.200    5.73 |  3.25    2.93
                 0.117    0.00 | 1.167    7.98 | 2.217    5.73 |  3.27    2.93
                 0.133    0.00 | 1.183   18.78 | 2.233    5.73 |  3.28    2.93
                 0.150    0.00 | 1.200   18.78 | 2.250    5.73 |  3.30    2.93
```

0.167	0.00	1.217	18.78	2.267	5.73	3.32	2.93
0.183	2.47	1.233	18.78	2.283	5.73	3.33	2.93
0.200	2.47	1.250	18.78	2.300	5.73	3.35	2.72
0.217	2.47	1.267	18.78	2.317	5.73	3.37	2.72
0.233	2.47	1.283	18.78	2.333	5.73	3.38	2.72
0.250	2.47	1.300	18.78	2.350	4.89	3.40	2.72
0.267	2.47	1.317	18.78	2.367	4.89	3.42	2.72
0.283	2.47	1.333	18.78	2.383	4.89	3.43	2.72
0.300	2.47	1.350	83.11	2.400	4.89	3.45	2.72
0.317	2.47	1.367	83.11	2.417	4.89	3.47	2.72
0.333	2.47	1.383	83.11	2.433	4.89	3.48	2.72
0.350	2.82	1.400	83.11	2.450	4.89	3.50	2.72
0.367	2.82	1.417	83.11	2.467	4.89	3.52	2.55
0.383	2.82	1.433	83.11	2.483	4.89	3.53	2.55
0.400	2.82	1.450	83.11	2.500	4.89	3.55	2.55
0.417	2.82	1.467	83.11	2.517	4.28	3.57	2.55
0.433	2.82	1.483	83.11	2.533	4.28	3.58	2.55
0.450	2.82	1.500	83.11	2.550	4.28	3.60	2.55
0.467	2.82	1.517	24.57	2.567	4.28	3.62	2.55
0.483	2.82	1.533	24.57	2.583	4.28	3.63	2.55
0.500	2.82	1.550	24.57	2.600	4.28	3.65	2.55
0.517	3.31	1.567	24.57	2.617	4.28	3.67	2.55
0.533	3.31	1.583	24.57	2.633	4.28	3.68	2.39
0.550	3.31	1.600	24.57	2.650	4.28	3.70	2.39
0.567	3.31	1.617	24.57	2.667	4.28	3.72	2.39
0.583	3.31	1.633	24.57	2.683	3.82	3.73	2.39
0.600	3.31	1.650	24.57	2.700	3.82	3.75	2.39
0.617	3.31	1.667	24.57	2.717	3.82	3.77	2.39
0.633	3.31	1.683	13.01	2.733	3.82	3.78	2.39
0.650	3.31	1.700	13.01	2.750	3.82	3.80	2.39
0.667	3.31	1.717	13.01	2.767	3.82	3.82	2.39
0.683	4.05	1.733	13.01	2.783	3.82	3.83	2.39
0.700	4.05	1.750	13.01	2.800	3.82	3.85	2.26
0.717	4.05	1.767	13.01	2.817	3.82	3.87	2.26
0.733	4.05	1.783	13.01	2.833	3.82	3.88	2.26
0.750	4.05	1.800	13.01	2.850	3.46	3.90	2.26
0.767	4.05	1.817	13.01	2.867	3.46	3.92	2.26
0.783	4.05	1.833	13.01	2.883	3.46	3.93	2.26
0.800	4.05	1.850	9.01	2.900	3.46	3.95	2.26
0.817	4.05	1.867	9.01	2.917	3.46	3.97	2.26
0.833	4.05	1.883	9.01	2.933	3.46	3.98	2.26
0.850	5.30	1.900	9.01	2.950	3.46	4.00	2.26
0.867	5.30	1.917	9.01	2.967	3.46	4.02	2.15
0.883	5.30	1.933	9.01	2.983	3.46	4.03	2.15
0.900	5.30	1.950	9.01	3.000	3.46	4.05	2.15
0.917	5.30	1.967	9.01	3.017	3.17	4.07	2.15
0.933	5.30	1.983	9.01	3.033	3.17	4.08	2.15
0.950	5.30	2.000	9.01	3.050	3.17	4.10	2.15
0.967	5.30	2.017	6.97	3.067	3.17	4.12	2.15
0.983	5.30	2.033	6.97	3.083	3.17	4.13	2.15
1.000	5.30	2.050	6.97	3.100	3.17	4.15	2.15
1.017	7.98	2.067	6.97	3.117	3.17	4.17	2.15
1.033	7.98	2.083	6.97	3.133	3.17		
1.050	7.98	2.100	6.97	3.150	3.17		

```
Max.Eff.Inten.(mm/hr)=      83.11          8.67
           over (min)        5.00         24.00
Storage Coeff.  (min)=       5.21 (ii)    23.98 (ii)
Unit Hyd. Tpeak (min)=       5.00         24.00
Unit Hyd. peak  (cms)=       0.22          0.05
                                                      *TOTALS*
PEAK FLOW       (cms)=       0.80          0.10         0.814 (iii)
TIME TO PEAK    (hrs)=       1.52          1.93          1.52
RUNOFF VOLUME    (mm)=      35.95          6.50         16.22
```

```
    TOTAL RAINFALL   (mm)=      36.96         36.96           36.96
    RUNOFF COEFFICIENT   =       0.97          0.18            0.44


      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  67.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0800)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.2310      0.4576
                          0.0066     0.0417   |   0.2570      0.5171
                          0.0093     0.0880   |   0.2806      0.5778
                          0.0114     0.1359   |   0.3023      0.6397
                          0.0132     0.1854   |   1.0214      0.7026
                          0.0148     0.2366   |   2.3182      0.7666
                          0.1218     0.2894   |   3.9909      0.8316
                          0.1668     0.3438   |   5.9676      0.8977
                          0.2016     0.3999   |   8.2066      0.9649

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0080)     12.630      0.814      1.52       16.22
   OUTFLOW: ID= 1 (  0800)     12.630      0.013      4.58       10.14

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.64
                    TIME SHIFT OF PEAK FLOW         (min)=184.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.1891

-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):    18.65   0.164     2.22     6.29
      + ID2= 2 (  0102):    12.18   0.092     2.20     5.14
        ==========================================================
        ID = 3 (  0008):    30.83   0.256     2.20     5.83

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

--------------------
| ADD HYD  (  0008)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0008):    30.83   0.256     2.20     5.83
      + ID2= 2 (  0800):    12.63   0.013     4.58    10.14
        ==========================================================
        ID = 1 (  0008):    43.46   0.267     2.20     7.09

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

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


      V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\20abf0cf-4992-4bbe-a55d-240a0adcba47\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\20abf0cf-4992-4bbe-a55d-240a0adcba47\scena


DATE: 06-07-2023                          TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 02                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\441c6d51-a635-49b5-ba39-85d6
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.25  2.50   9.09 0.18   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\441c6d51-a635-49b5-ba39-85d6
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.18  2.20   9.79 0.19   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                     10.0
    [ Ptot= 50.52 mm ]
    fname                  :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\441c6d51-a635-49b5-ba39-85d6
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD           0100  1  7.0   18.65    0.32  2.22  12.01 0.24   0.000
    [CN=68.3         ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                     10.0
    [ Ptot= 50.52 mm ]
    fname                  :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\441c6d51-a635-49b5-ba39-85d6
    remark: 5yr_4hr_chi
*
 ** CALIB STANDHYD         0080  1  1.0   12.63    1.14  1.52  24.48 0.48   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0800  1  1.0   12.63    0.07  4.20  15.36  n/a   0.000
*
    ADD [  0100+  0102]    0008  3  6.0   30.83    0.49  2.20  11.13  n/a   0.000
*
    ADD [  0008+  0800]    0008  1  1.0   43.46    0.51  2.20  12.36  n/a   0.000
*
```

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

      V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\e0d2aea3-612c-4a45-a39e-755b159178e0\scena
  Summary          filename:           C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\e0d2aea3-612c-4a45-a39e-755b159178e0\scena


DATE: 06-07-2023                           TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 03                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7d369f10-af03-4407-a938-8de5
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD         0103  1  6.0   23.19    0.35  2.50  12.68 0.21   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                10.0
    [ Ptot= 59.69 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7d369f10-af03-4407-a938-8de5
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD         0102  1  6.0   12.18    0.25  2.20  13.56 0.23   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname                :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7d369f10-af03-4407-a938-8de5
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.44  2.22  16.59 0.28   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                 10.0
    [ Ptot= 59.69 mm ]
    fname                :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7d369f10-af03-4407-a938-8de5
    remark: 10yr_4hr_chi
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    1.45  1.53  30.52 0.51   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.13  3.35  21.24  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    0.69  2.20  15.39  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    0.76  2.30  17.09  n/a   0.000
*
```

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\21a324b8-324f-40f2-b2d1-54f06a8183cb\scena
  Summary          filename:           C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\21a324b8-324f-40f2-b2d1-54f06a8183cb\scena


DATE: 06-07-2023                           TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 04                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7dbb36ed-96c0-4e50-9ea4-63fa
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.49  2.50  17.82 0.25   0.000
    [CN=59.4        ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7dbb36ed-96c0-4e50-9ea4-63fa
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.34  2.20  18.92 0.27   0.000
    [CN=60.7        ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    10.0
    [ Ptot= 71.24 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7dbb36ed-96c0-4e50-9ea4-63fa
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.62  2.22  23.00 0.32   0.000
    [CN=68.3         ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    10.0
    [ Ptot= 71.24 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\7dbb36ed-96c0-4e50-9ea4-63fa
    remark: 25yr_4hr_chi
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    1.79  1.53  38.54 0.54   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.17  3.22  28.96  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    0.96  2.20  21.38  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    1.11  2.20  23.59  n/a   0.000
*
```

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


       V     V   I    SSSSS  U   U     A    L              (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\db072d86-2199-448e-bc1e-1137b6c24f22\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\db072d86-2199-448e-bc1e-1137b6c24f22\scena


DATE: 06-07-2023                            TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 05                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\922c1a80-8568-4248-be93-bf8b
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.60  2.50  21.84 0.27   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\922c1a80-8568-4248-be93-bf8b
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.42  2.20  23.10 0.29   0.000
    [CN=60.7         ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                   10.0
    [ Ptot= 79.45 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\922c1a80-8568-4248-be93-bf8b
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD            0100  1  7.0   18.65    0.75  2.22  27.95 0.35   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                   10.0
    [ Ptot= 79.45 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\922c1a80-8568-4248-be93-bf8b
    remark: 50yr_4hr_chi
*
 ** CALIB STANDHYD          0080  1  1.0   12.63    2.08  1.53  44.50 0.56   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:                0800  1  1.0   12.63    0.20  3.22  34.70  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0   30.83    1.17  2.20  26.02  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0   43.46    1.35  2.20  28.55  n/a   0.000
*
```

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\dc8f4b41-8623-4bd5-9e49-ea165808e7d9\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\dc8f4b41-8623-4bd5-9e49-ea165808e7d9\scena


DATE: 06-07-2023                           TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 06                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\75ea23c6-a0bf-4e9b-9c59-77bf
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.73  2.50  26.08 0.30   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  10.0
    [ Ptot= 87.58 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\75ea23c6-a0bf-4e9b-9c59-77bf
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.51  2.20  27.49 0.31   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    10.0
    [ Ptot= 87.58 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\75ea23c6-a0bf-4e9b-9c59-77bf
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.91  2.22  33.10 0.38   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    10.0
    [ Ptot= 87.58 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\75ea23c6-a0bf-4e9b-9c59-77bf
    remark: 100yr_4hr_chi
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    2.35  1.53  50.57 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.23  3.18  40.57  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    1.41  2.20  30.88  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    1.62  2.20  33.69  n/a   0.000
*
```

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


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\da5f3c28-5fb5-491e-bc02-6193d3b579fa\scena
  Summary          filename:         C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\da5f3c28-5fb5-491e-bc02-6193d3b579fa\scena


DATE: 06-07-2023                           TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 07                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\35adffe5-ed3c-4d8f-9261-88a2
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD           0103  1  6.0   23.19    0.22 12.70  10.79 0.20   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname                :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\35adffe5-ed3c-4d8f-9261-88a2
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD           0102  1  6.0   12.18    0.16 12.50  11.57 0.21   0.000
    [CN=60.7         ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    15.0
    [ Ptot= 55.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\35adffe5-ed3c-4d8f-9261-88a2
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD            0100  1  7.0   18.65    0.30 12.48  14.19 0.26   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    15.0
    [ Ptot= 55.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\35adffe5-ed3c-4d8f-9261-88a2
    remark: 2yr_24hr_scs
*
 ** CALIB STANDHYD          0080  1  1.0   12.63    0.77 12.02  27.38 0.50   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:                0800  1  1.0   12.63    0.03 16.08  12.23  n/a   0.000
*
    ADD [  0100+  0102]     0008  3  6.0   30.83    0.46 12.50  13.15  n/a   0.000
*
    ADD [  0008+  0800]     0008  1  1.0   43.46    0.47 12.50  12.88  n/a   0.000
*
```

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


      V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\b8d99189-a611-4bdc-9b61-6e0bde8af906\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\b8d99189-a611-4bdc-9b61-6e0bde8af906\scena


DATE: 06-07-2023                          TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 08                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\afda407d-1c95-4acc-9000-4c50
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.43 12.70  20.11 0.26   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  15.0
    [ Ptot= 76.00 mm ]
    fname                 :                     C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\afda407d-1c95-4acc-9000-4c50
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.31 12.40  21.31 0.28   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                   15.0
    [ Ptot= 76.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\afda407d-1c95-4acc-9000-4c50
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD         0100  1  7.0   18.65    0.55 12.48  25.83 0.34   0.000
    [CN=68.3           ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                   15.0
    [ Ptot= 76.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\afda407d-1c95-4acc-9000-4c50
    remark: 5yr_24hr_scs
*
 ** CALIB STANDHYD       0080  1  1.0   12.63    1.23 12.02  41.97 0.55   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0800  1  1.0   12.63    0.14 13.07  26.61  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0   30.83    0.86 12.50  24.04  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0   43.46    0.98 12.50  24.79  n/a   0.000
*
```

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


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\0cfdb567-d3a2-449c-8da7-2933a0e12264\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\0cfdb567-d3a2-449c-8da7-2933a0e12264\scena


DATE: 06-07-2023                           TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 09                        **
  ************************************************

  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= 89.90 mm ]
    fname                  :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\d9e18f4c-021b-478a-ac87-3ecf
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD           0103  1  6.0   23.19    0.59 12.70  27.34 0.30   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                   15.0
    [ Ptot= 89.90 mm ]
    fname                  :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\d9e18f4c-021b-478a-ac87-3ecf
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD           0102  1  6.0   12.18    0.42 12.40  28.79 0.32   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                  15.0
    [ Ptot= 89.90 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\d9e18f4c-021b-478a-ac87-3ecf
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.75 12.48  34.62 0.39   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                  15.0
    [ Ptot= 89.90 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\d9e18f4c-021b-478a-ac87-3ecf
    remark: 10yr_24hr_scs
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    1.58 12.02  52.33 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.19 13.03  36.86  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    1.16 12.50  32.31  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    1.34 12.50  33.63  n/a   0.000
*
```

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


       V     V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\634db696-cf15-41fb-b566-bc9c827854c2\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\634db696-cf15-41fb-b566-bc9c827854c2\scena


DATE: 06-07-2023                           TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 10                        **
  ************************************************

  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=107.50 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\6705da12-f884-4770-a938-7679
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.81 12.70  37.45 0.35   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\6705da12-f884-4770-a938-7679
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.58 12.40  39.23 0.36   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    15.0
    [ Ptot=107.50 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\6705da12-f884-4770-a938-7679
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD           0100  1  7.0   18.65    1.02 12.48  46.67 0.43   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    15.0
    [ Ptot=107.50 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\6705da12-f884-4770-a938-7679
    remark: 25yr_24hr_scs
*
 ** CALIB STANDHYD         0080  1  1.0   12.63    2.05 12.02  66.07 0.61   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0800  1  1.0   12.63    0.24 13.02  50.48  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0   30.83    1.59 12.50  43.72  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0   43.46    1.82 12.50  45.69  n/a   0.000
*
```

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


      V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\6e5e4da1-759c-4b24-87ba-80f5c57e5707\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\6e5e4da1-759c-4b24-87ba-80f5c57e5707\scena


DATE: 06-07-2023                          TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 11                        **
  ************************************************

  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=120.60 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\ad33bbdd-f2a1-46c0-ba64-d4d4
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0103  1  6.0   23.19    1.00 12.70  45.57 0.38   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\ad33bbdd-f2a1-46c0-ba64-d4d4
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.70 12.40  47.58 0.39   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    15.0
    [ Ptot=120.60 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\ad33bbdd-f2a1-46c0-ba64-d4d4
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0100  1  7.0   18.65    1.23 12.48  56.19 0.47   0.000
    [CN=68.3         ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    15.0
    [ Ptot=120.60 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\ad33bbdd-f2a1-46c0-ba64-d4d4
    remark: 50yr_24hr_scs
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    2.43 12.02  76.66 0.64   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.27 13.02  60.99  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    1.92 12.50  52.78  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    2.19 12.50  55.16  n/a   0.000
*
```

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



       V     V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\ac1e7a28-874b-4c1d-b468-c4f8042e8bd8\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\ac1e7a28-874b-4c1d-b468-c4f8042e8bd8\scena


DATE: 06-07-2023                            TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 12                        **
  ************************************************

  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\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\e8ae8d37-38d9-4edc-b490-d8ee
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0103  1  6.0   23.19    1.19 12.70  54.05 0.40   0.000
    [CN=59.4         ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                 15.0
    [ Ptot=133.60 mm ]
    fname                  :                  C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\e8ae8d37-38d9-4edc-b490-d8ee
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.83 12.40  56.29 0.42   0.000
    [CN=60.7         ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    15.0
    [ Ptot=133.60 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\e8ae8d37-38d9-4edc-b490-d8ee
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0100  1  7.0    18.65    1.45 12.48  66.01 0.49   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    15.0
    [ Ptot=133.60 mm ]
    fname                    :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\e8ae8d37-38d9-4edc-b490-d8ee
    remark: 100yr_24hr_scs
*
 ** CALIB STANDHYD        0080  1  1.0    12.63    2.79 12.02  87.43 0.65   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0    12.63    0.30 13.02  71.66  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0    30.83    2.28 12.50  62.16  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0    43.46    2.57 12.50  64.92  n/a   0.000
*
```

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


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\64e09a02-6eef-44f1-bdaa-e9ea1fea5040\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\64e09a02-6eef-44f1-bdaa-e9ea1fea5040\scena


DATE: 06-07-2023                          TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 13                        **
  ************************************************

  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= 25.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\488f9f1e-ddcd-40a5-a62d-34a1
    remark: 25mm4hr
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.04  2.80   1.87 0.07   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                   10.0
    [ Ptot= 25.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\488f9f1e-ddcd-40a5-a62d-34a1
    remark: 25mm4hr
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.03  2.30   2.13 0.09   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                   10.0
    [ Ptot= 25.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\488f9f1e-ddcd-40a5-a62d-34a1
    remark: 25mm4hr
*
 ** CALIB NASHYD            0100  1  7.0    18.65     0.06  2.45   2.52 0.10   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                   10.0
    [ Ptot= 25.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\488f9f1e-ddcd-40a5-a62d-34a1
    remark: 25mm4hr
*
 ** CALIB STANDHYD          0080  1  1.0    12.63     0.45  1.53   9.76 0.39   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:                0800  1  1.0    12.63     0.01  4.63   7.34  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0    30.83     0.09  2.40   2.36  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0    43.46     0.10  2.40   3.81  n/a   0.000
*
```

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


      V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\21170916-1c4d-48d3-8787-6b6dc9864ee7\scena
  Summary            filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\21170916-1c4d-48d3-8787-6b6dc9864ee7\scena


DATE: 06-07-2023                          TIME: 03:28:16

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 14                        **
  ************************************************

  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                  60.0
    [ Ptot=212.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\bd1941b2-3f42-4603-a37c-281d
    remark: hazel-hr
*
 ** CALIB NASHYD          0103  1  6.0   23.19    1.88 11.00 111.79 0.53   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    READ STORM                  60.0
    [ Ptot=212.00 mm ]
    fname                  :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\bd1941b2-3f42-4603-a37c-281d
    remark: hazel-hr
*
 ** CALIB NASHYD          0102  1  6.0   12.18    1.08 10.40 115.19 0.54   0.000
    [CN=60.7          ]
```

```
    [ N = 3.0:Tp 0.55]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\bd1941b2-3f42-4603-a37c-281d
    remark: hazel-hr
*
 ** CALIB NASHYD          0100  1  7.0   18.65    1.81 10.50 130.66 0.62   0.000
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname                   :                   C:\Users\aregmi\AppData\Local\Temp
\e3f32f85-15d5-499d-96c2-7232fe40f633\bd1941b2-3f42-4603-a37c-281d
    remark: hazel-hr
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    1.54 10.00 156.08 0.74   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    1.47 10.10 142.59  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    2.89 10.50 124.54  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    4.26 10.30 129.79  n/a   0.000
*
```

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

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\b4086b58-50ea-4cd3-9737-df6264030356\scena
  Summary          filename:           C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\b4086b58-50ea-4cd3-9737-df6264030356\scena


DATE: 06-07-2023                           TIME: 03:28:18

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 15                       **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.27  6.70  10.79 0.20   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.20  6.50  11.57 0.21   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.35  6.53  14.19 0.26   0.000
```

```
    [CN=68.3           ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                  6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB STANDHYD       0080  1  1.0   12.63    0.97  5.97  27.38 0.50   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0800  1  1.0   12.63    0.06  8.22  16.14  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0   30.83    0.55  6.50  13.16  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0   43.46    0.56  6.50  14.03  n/a   0.000
*
 FINISH

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

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


       V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\54445ad5-0ac0-4fba-96d0-6a406dc551dc\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\54445ad5-0ac0-4fba-96d0-6a406dc551dc\scena


DATE: 06-07-2023                           TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 16                        **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                 6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD           0103  1  6.0   23.19    0.51  6.70  20.11 0.26   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                 6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD           0102  1  6.0   12.18    0.37  6.50  21.31 0.28   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                 6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD           0100  1  7.0   18.65    0.66  6.53  25.85 0.34   0.000
```

```
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                 6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB STANDHYD        0080  1  1.0   12.63    1.57  6.00  41.97 0.55   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0800  1  1.0   12.63    0.16  7.05  30.50  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    1.02  6.50  24.06  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    1.18  6.50  25.93  n/a   0.000
*
```

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


       V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\416b149a-ab90-4abc-8b8b-9880198e97c8\scena
  Summary           filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\416b149a-ab90-4abc-8b8b-9880198e97c8\scena


DATE: 06-07-2023                           TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 17                        **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                   6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.70  6.70  27.34 0.30   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                   6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.50  6.40  28.79 0.32   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                   6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD          0100  1  7.0   18.65    0.89  6.53  34.64 0.39   0.000
```

```
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                       6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB STANDHYD          0080  1  1.0    12.63    2.00  6.00  52.33 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:                0800  1  1.0    12.63    0.21  7.00  40.63  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0    30.83    1.39  6.50  32.33  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0    43.46    1.59  6.50  34.75  n/a   0.000
*
```

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2012)
       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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\2c2c3f8b-e64d-4f20-95a5-e34dc57b0a50\scena
  Summary           filename:           C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\2c2c3f8b-e64d-4f20-95a5-e34dc57b0a50\scena


DATE: 06-07-2023                            TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 18                        **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD          0103  1  6.0   23.19    0.97  6.70  37.45 0.35   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD          0102  1  6.0   12.18    0.69  6.40  39.23 0.36   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD          0100  1  7.0   18.65    1.21  6.53  46.70 0.43   0.000
```

```
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB STANDHYD         0080  1  1.0   12.63    2.60  6.00  66.07 0.61   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0800  1  1.0   12.63    0.26  6.98  53.99  n/a   0.000
*
    ADD [  0100+  0102]  0008  3  6.0   30.83    1.90  6.50  43.75  n/a   0.000
*
    ADD [  0008+  0800]  0008  1  1.0   43.46    2.15  6.50  46.73  n/a   0.000
*
```

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


      V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\72c5b5f7-ee9c-481f-bbe9-e3e77fce4ec6\scena
  Summary          filename:          C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\72c5b5f7-ee9c-481f-bbe9-e3e77fce4ec6\scena


DATE: 06-07-2023                          TIME: 03:28:17

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 19                        **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                   6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD           0103  1  6.0   23.19    1.18  6.70  45.57 0.38   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                   6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD           0102  1  6.0   12.18    0.84  6.40  47.58 0.39   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                   6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD           0100  1  7.0   18.65    1.46  6.53  56.22 0.47   0.000
```

```
    [CN=68.3           ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB STANDHYD          0080  1  1.0    12.63    3.09  6.00  76.66 0.64   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:                0800  1  1.0    12.63    0.29  7.00  64.29  n/a   0.000
*
    ADD [  0100+  0102]     0008  3  6.0    30.83    2.30  6.50  52.82  n/a   0.000
*
    ADD [  0008+  0800]     0008  1  1.0    43.46    2.59  6.50  56.15  n/a   0.000
*
```

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

      V    V   I    SSSSS  U   U    A    L             (v 6.2.2012)
      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\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\9e57d22b-29e6-4733-9500-23423d889a3d\scena
  Summary          filename:           C:\Users\aregmi\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\9e57d22b-29e6-4733-9500-23423d889a3d\scena


DATE: 06-07-2023                           TIME: 03:28:18

USER:


COMMENTS: ____________________________________________________________


  ************************************************
  ** SIMULATION : Run 20                        **
  ************************************************

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

      START @  0.00 hrs
      --------------------
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0103  1  6.0   23.19    1.41  6.70  54.05 0.40   0.000
    [CN=59.4          ]
    [ N = 3.0:Tp 0.78]
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0102  1  6.0   12.18    1.00  6.40  56.29 0.42   0.000
    [CN=60.7          ]
    [ N = 3.0:Tp 0.55]
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0100  1  7.0   18.65    1.72  6.42  66.05 0.49   0.000
```
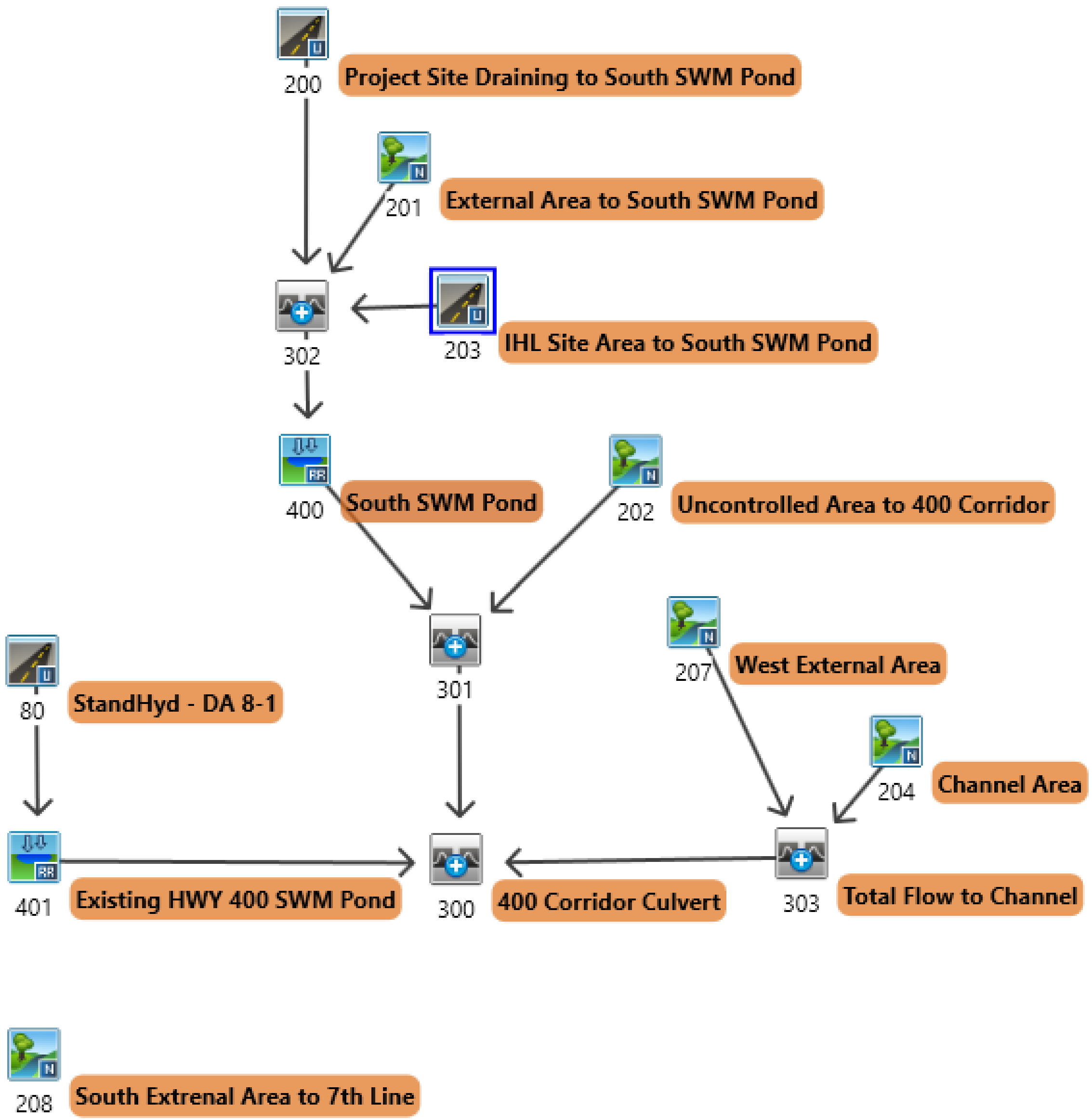

```
    [CN=68.3          ]
    [ N = 3.0:Tp 0.59]
*
    MASS STORM                       6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB STANDHYD         0080  1  1.0   12.63    3.56  6.00  87.43 0.65   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0800  1  1.0   12.63    0.63  6.55  74.91  n/a   0.000
*
    ADD [  0100+  0102]   0008  3  6.0   30.83    2.72  6.50  62.20  n/a   0.000
*
    ADD [  0008+  0800]   0008  1  1.0   43.46    3.34  6.50  65.89  n/a   0.000
*
```

Appendix E

Post-Development Visual OTTHYMO Modelling



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

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output               filename:       C:\Users\nparmar\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\778832a6-757d-431b-ba0f-e58726125f70\scen
  Summary          filename:           C:\Users\nparmar\AppData\Local\Civica\VH5
\fb2faa40-6aae-43f9-8f1d-f2fc6e0bc008\778832a6-757d-431b-ba0f-e58726125f70\scen


DATE: 06-12-2025                            TIME: 01:05:20

USER:



COMMENTS: ____________________________________________________________


---------------------------------------------------------------------------------------------------
--------------------------
  ************************************************
  ** SIMULATION : run 01                        **
  ************************************************



--------------------
|    READ STORM    |    Filename: C:\Users\nparmar\AppD
|                  |              ata\Local\Temp\
|                  |              a75bf0ed-b17a-423a-b9eb-3b1e1431b629\488f9f1e
| Ptotal= 25.00 mm |    Comments: 25mm4hr
--------------------
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.00    2.07 |  1.00    5.70 |  2.00    5.19 |  3.00    2.80
                 0.17    2.27 |  1.17   10.78 |  2.17    4.47 |  3.17    2.62
                 0.33    2.52 |  1.33   50.21 |  2.33    3.95 |  3.33    2.48
                 0.50    2.88 |  1.50   13.37 |  2.50    3.56 |  3.50    2.35
                 0.67    3.38 |  1.67    8.29 |  2.67    3.25 |  3.67    2.23
                 0.83    4.18 |  1.83    6.30 |  2.83    3.01 |  3.83    2.14

-------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0204)|   Area    (ha)=   0.53   Curve Number   (CN)= 51.9
```

```
|ID= 1 DT= 1.0 min |   Ia      (mm)=   7.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.70
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	2.07	1.017	5.70	2.017	5.19	3.02	2.80
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.050	2.07	1.050	5.70	2.050	5.19	3.05	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14

```
              0.933    4.18 | 1.933    6.30 | 2.933    3.01 |  3.93    2.14
              0.950    4.18 | 1.950    6.30 | 2.950    3.01 |  3.95    2.14
              0.967    4.18 | 1.967    6.30 | 2.967    3.01 |  3.97    2.14
              0.983    4.18 | 1.983    6.30 | 2.983    3.01 |  3.98    2.14
              1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

     Unit Hyd Qpeak  (cms)=   0.029

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   2.817
     RUNOFF VOLUME    (mm)=   1.181
     TOTAL RAINFALL   (mm)=  24.996
     RUNOFF COEFFICIENT   =   0.047

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD   (  0207)|   Area    (ha)=  11.31   Curve Number   (CN)= 60.8
|ID= 1 DT= 1.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.53

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


                              ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.017    2.07 | 1.017    5.70 | 2.017    5.19 |  3.02    2.80
              0.033    2.07 | 1.033    5.70 | 2.033    5.19 |  3.03    2.80
              0.050    2.07 | 1.050    5.70 | 2.050    5.19 |  3.05    2.80
              0.067    2.07 | 1.067    5.70 | 2.067    5.19 |  3.07    2.80
              0.083    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
              0.100    2.07 | 1.100    5.70 | 2.100    5.19 |  3.10    2.80
              0.117    2.07 | 1.117    5.70 | 2.117    5.19 |  3.12    2.80
              0.133    2.07 | 1.133    5.70 | 2.133    5.19 |  3.13    2.80
              0.150    2.07 | 1.150    5.70 | 2.150    5.19 |  3.15    2.80
              0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
              0.183    2.27 | 1.183   10.78 | 2.183    4.47 |  3.18    2.62
              0.200    2.27 | 1.200   10.78 | 2.200    4.47 |  3.20    2.62
              0.217    2.27 | 1.217   10.78 | 2.217    4.47 |  3.22    2.62
              0.233    2.27 | 1.233   10.78 | 2.233    4.47 |  3.23    2.62
              0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
              0.267    2.27 | 1.267   10.78 | 2.267    4.47 |  3.27    2.62
              0.283    2.27 | 1.283   10.78 | 2.283    4.47 |  3.28    2.62
              0.300    2.27 | 1.300   10.78 | 2.300    4.47 |  3.30    2.62
              0.317    2.27 | 1.317   10.78 | 2.317    4.47 |  3.32    2.62
              0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
              0.350    2.52 | 1.350   50.21 | 2.350    3.95 |  3.35    2.48
              0.367    2.52 | 1.367   50.21 | 2.367    3.95 |  3.37    2.48
              0.383    2.52 | 1.383   50.21 | 2.383    3.95 |  3.38    2.48
              0.400    2.52 | 1.400   50.21 | 2.400    3.95 |  3.40    2.48
              0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
              0.433    2.52 | 1.433   50.21 | 2.433    3.95 |  3.43    2.48
              0.450    2.52 | 1.450   50.21 | 2.450    3.95 |  3.45    2.48
              0.467    2.52 | 1.467   50.21 | 2.467    3.95 |  3.47    2.48
              0.483    2.52 | 1.483   50.21 | 2.483    3.95 |  3.48    2.48
              0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
              0.517    2.88 | 1.517   13.37 | 2.517    3.56 |  3.52    2.35
              0.533    2.88 | 1.533   13.37 | 2.533    3.56 |  3.53    2.35
              0.550    2.88 | 1.550   13.37 | 2.550    3.56 |  3.55    2.35
              0.567    2.88 | 1.567   13.37 | 2.567    3.56 |  3.57    2.35
              0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
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                 0.600    2.88 | 1.600   13.37 | 2.600    3.56 |  3.60    2.35
                 0.617    2.88 | 1.617   13.37 | 2.617    3.56 |  3.62    2.35
                 0.633    2.88 | 1.633   13.37 | 2.633    3.56 |  3.63    2.35
                 0.650    2.88 | 1.650   13.37 | 2.650    3.56 |  3.65    2.35
                 0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
                 0.683    3.38 | 1.683    8.29 | 2.683    3.25 |  3.68    2.23
                 0.700    3.38 | 1.700    8.29 | 2.700    3.25 |  3.70    2.23
                 0.717    3.38 | 1.717    8.29 | 2.717    3.25 |  3.72    2.23
                 0.733    3.38 | 1.733    8.29 | 2.733    3.25 |  3.73    2.23
                 0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
                 0.767    3.38 | 1.767    8.29 | 2.767    3.25 |  3.77    2.23
                 0.783    3.38 | 1.783    8.29 | 2.783    3.25 |  3.78    2.23
                 0.800    3.38 | 1.800    8.29 | 2.800    3.25 |  3.80    2.23
                 0.817    3.38 | 1.817    8.29 | 2.817    3.25 |  3.82    2.23
                 0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
                 0.850    4.17 | 1.850    6.30 | 2.850    3.01 |  3.85    2.14
                 0.867    4.18 | 1.867    6.30 | 2.867    3.01 |  3.87    2.14
                 0.883    4.18 | 1.883    6.30 | 2.883    3.01 |  3.88    2.14
                 0.900    4.18 | 1.900    6.30 | 2.900    3.01 |  3.90    2.14
                 0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
                 0.933    4.18 | 1.933    6.30 | 2.933    3.01 |  3.93    2.14
                 0.950    4.18 | 1.950    6.30 | 2.950    3.01 |  3.95    2.14
                 0.967    4.18 | 1.967    6.30 | 2.967    3.01 |  3.97    2.14
                 0.983    4.18 | 1.983    6.30 | 2.983    3.01 |  3.98    2.14
                 1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

      Unit Hyd Qpeak  (cms)=   0.815

      PEAK FLOW       (cms)=   0.032 (i)
      TIME TO PEAK    (hrs)=   2.300
      RUNOFF VOLUME    (mm)=   2.196
      TOTAL RAINFALL   (mm)=  24.996
      RUNOFF COEFFICIENT   =   0.088

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0303)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (  0204):     0.53   0.001     2.82     1.18
       + ID2= 2 (  0207):    11.31   0.032     2.30     2.20
         ==================================================
         ID = 3 (  0303):    11.84   0.032     2.32     2.15

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0202)|   Area    (ha)=   1.13   Curve Number   (CN)= 59.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.50

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


                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                   hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                 0.017    2.07 | 1.017    5.70 | 2.017    5.19 |  3.02    2.80
                 0.033    2.07 | 1.033    5.70 | 2.033    5.19 |  3.03    2.80
                 0.050    2.07 | 1.050    5.70 | 2.050    5.19 |  3.05    2.80
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0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.950	4.18	1.950	6.30	2.950	3.01	3.95	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
0.983	4.18	1.983	6.30	2.983	3.01	3.98	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

```
Unit Hyd Qpeak  (cms)=   0.086

PEAK FLOW       (cms)=   0.003 (i)
TIME TO PEAK    (hrs)=   2.267
RUNOFF VOLUME    (mm)=   2.034
TOTAL RAINFALL   (mm)=  24.996
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RUNOFF COEFFICIENT = 0.081

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
| CALIB                |
| NASHYD   (  0201)|   Area    (ha)=   0.87   Curve Number   (CN)= 57.8
|ID= 1 DT= 1.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.29
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NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	2.07	1.017	5.70	2.017	5.19	3.02	2.80
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.050	2.07	1.050	5.70	2.050	5.19	3.05	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23

0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.950	4.18	1.950	6.30	2.950	3.01	3.95	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
0.983	4.18	1.983	6.30	2.983	3.01	3.98	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

```
Unit Hyd Qpeak  (cms)=   0.115

PEAK FLOW       (cms)=   0.003 (i)
TIME TO PEAK    (hrs)=   1.917
RUNOFF VOLUME    (mm)=   1.764
TOTAL RAINFALL   (mm)=  24.996
RUNOFF COEFFICIENT   =   0.071

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| CALIB              |
| STANDHYD (  0200)|   Area     (ha)=  13.45
|ID= 1 DT= 1.0 min |   Total Imp(%)=  82.00   Dir. Conn.(%)=  70.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       11.03         2.42
     Dep. Storage     (mm)=        1.00         5.00
     Average Slope     (%)=        1.00         2.00
     Length            (m)=      299.44        40.00
     Mannings n           =       0.013        0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	2.07	1.017	5.70	2.017	5.19	3.02	2.80
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.050	2.07	1.050	5.70	2.050	5.19	3.05	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48

0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.950	4.18	1.950	6.30	2.950	3.01	3.95	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
0.983	4.18	1.983	6.30	2.983	3.01	3.98	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

```
Max.Eff.Inten.(mm/hr)=      50.21          9.71
          over (min)         6.00         12.00
Storage Coeff.  (min)=       6.50 (ii)    11.90 (ii)
Unit Hyd. Tpeak (min)=       6.00         12.00
Unit Hyd. peak  (cms)=       0.18          0.09
                                                       *TOTALS*
PEAK FLOW       (cms)=       1.00          0.04          1.018 (iii)
TIME TO PEAK    (hrs)=       1.53          1.67           1.53
RUNOFF VOLUME    (mm)=      24.00          3.78          17.93
TOTAL RAINFALL   (mm)=      25.00         25.00          25.00
RUNOFF COEFFICIENT   =       0.96          0.15           0.72


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN*  =  59.0    Ia = Dep. Storage  (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
      THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB                |
| STANDHYD (  0203)|   Area    (ha)=   2.99
|ID= 1 DT= 1.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  75.00
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.69	0.30
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	141.19	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.017	2.07	1.017	5.70	2.017	5.19	3.02	2.80
0.033	2.07	1.033	5.70	2.033	5.19	3.03	2.80
0.050	2.07	1.050	5.70	2.050	5.19	3.05	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23

```
                0.850    4.17 | 1.850    6.30 | 2.850    3.01 |  3.85    2.14
                0.867    4.18 | 1.867    6.30 | 2.867    3.01 |  3.87    2.14
                0.883    4.18 | 1.883    6.30 | 2.883    3.01 |  3.88    2.14
                0.900    4.18 | 1.900    6.30 | 2.900    3.01 |  3.90    2.14
                0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
                0.933    4.18 | 1.933    6.30 | 2.933    3.01 |  3.93    2.14
                0.950    4.18 | 1.950    6.30 | 2.950    3.01 |  3.95    2.14
                0.967    4.18 | 1.967    6.30 | 2.967    3.01 |  3.97    2.14
                0.983    4.18 | 1.983    6.30 | 2.983    3.01 |  3.98    2.14
                1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

     Max.Eff.Inten.(mm/hr)=      50.21         69.42
               over (min)         5.00          9.00
     Storage Coeff.  (min)=       4.14 (ii)     8.29 (ii)
     Unit Hyd. Tpeak (min)=       5.00          9.00
     Unit Hyd. peak  (cms)=       0.26          0.13
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.27          0.04          0.305 (iii)
     TIME TO PEAK    (hrs)=       1.52          1.60           1.52
     RUNOFF VOLUME    (mm)=      24.00         14.06          21.51
     TOTAL RAINFALL   (mm)=      25.00         25.00          25.00
     RUNOFF COEFFICIENT   =       0.96          0.56           0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0302)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):     13.45   1.018     1.53    17.93
      + ID2= 2 (  0201):      0.87   0.003     1.92     1.76
        ===================================================
        ID = 3 (  0302):     14.32   1.019     1.53    16.95

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

--------------------
| ADD HYD  (  0302)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0302):     14.32   1.019     1.53    16.95
      + ID2= 2 (  0203):      2.99   0.305     1.52    21.51
        ===================================================
        ID = 1 (  0302):     17.31   1.319     1.53    17.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0400)|      OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
     **** WARNING : FIRST OUTFLOW IS NOT ZERO.
                           0.0260     0.1100   |   0.5690      0.8500
                           0.0360     0.1700   |   0.6290      0.9400
                           0.0440     0.2300   |   0.6840      1.0300
```

```
                          0.0500      0.3000    |   0.7340      1.1300
                          0.0560      0.3700    |   0.7820      1.2200
                          0.0620      0.4500    |   0.8260      1.3200
                          0.1200      0.5200    |   1.1820      1.4200
                          0.3180      0.6000    |   2.0930      1.5300
                          0.4210      0.6800    |   3.3300      1.6300
                          0.5010      0.7700    |   4.8420      1.7400

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0302)     17.310      1.319      1.53      17.74
   OUTFLOW: ID= 1 (  0400)     17.310      0.047      4.12      16.30

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.55
                   TIME SHIFT OF PEAK FLOW        (min)=155.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.2631

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--------------------
| ADD HYD  (  0301)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
        ID1= 1 (  0202):      1.13   0.003      2.27     2.03
      + ID2= 2 (  0400):     17.31   0.047      4.12    16.30
        ===================================================
        ID = 3 (  0301):     18.44   0.048      4.07    15.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0080)|   Area    (ha)=  12.63
|ID= 1 DT= 1.0 min |   Total Imp(%)=  33.00   Dir. Conn.(%)=  33.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.17          8.46
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     290.17         40.00
     Mannings n           =      0.013         0.250

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


                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs   mm/hr
                 0.017    2.07 | 1.017     5.70 | 2.017     5.19 |  3.02    2.80
                 0.033    2.07 | 1.033     5.70 | 2.033     5.19 |  3.03    2.80
                 0.050    2.07 | 1.050     5.70 | 2.050     5.19 |  3.05    2.80
                 0.067    2.07 | 1.067     5.70 | 2.067     5.19 |  3.07    2.80
                 0.083    2.07 | 1.083     5.70 | 2.083     5.19 |  3.08    2.80
                 0.100    2.07 | 1.100     5.70 | 2.100     5.19 |  3.10    2.80
                 0.117    2.07 | 1.117     5.70 | 2.117     5.19 |  3.12    2.80
                 0.133    2.07 | 1.133     5.70 | 2.133     5.19 |  3.13    2.80
                 0.150    2.07 | 1.150     5.70 | 2.150     5.19 |  3.15    2.80
                 0.167    2.07 | 1.167     5.70 | 2.167     5.19 |  3.17    2.80
                 0.183    2.27 | 1.183    10.78 | 2.183     4.47 |  3.18    2.62
                 0.200    2.27 | 1.200    10.78 | 2.200     4.47 |  3.20    2.62
                 0.217    2.27 | 1.217    10.78 | 2.217     4.47 |  3.22    2.62
                 0.233    2.27 | 1.233    10.78 | 2.233     4.47 |  3.23    2.62
                 0.250    2.27 | 1.250    10.78 | 2.250     4.47 |  3.25    2.62
                 0.267    2.27 | 1.267    10.78 | 2.267     4.47 |  3.27    2.62
```

0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.950	4.18	1.950	6.30	2.950	3.01	3.95	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
0.983	4.18	1.983	6.30	2.983	3.01	3.98	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

```
Max.Eff.Inten.(mm/hr)=      50.21          2.20
          over (min)         6.00         39.00
Storage Coeff.  (min)=       6.38 (ii)    38.85 (ii)
Unit Hyd. Tpeak (min)=       6.00         39.00
Unit Hyd. peak  (cms)=       0.18          0.03
                                                       *TOTALS*
PEAK FLOW       (cms)=       0.44          0.03          0.446 (iii)
TIME TO PEAK    (hrs)=       1.53          2.32           1.53
RUNOFF VOLUME    (mm)=      24.00          2.76           9.76
TOTAL RAINFALL   (mm)=      25.00         25.00          25.00
RUNOFF COEFFICIENT   =       0.96          0.11           0.39


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN*  =  67.0    Ia = Dep. Storage  (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
      THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

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-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0401)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.2310      0.4576
                          0.0066     0.0417    |   0.2570      0.5171
                          0.0093     0.0880    |   0.2806      0.5778
                          0.0114     0.1359    |   0.3023      0.6397
                          0.0132     0.1854    |   1.0214      0.7026
                          0.0148     0.2366    |   2.3182      0.7666
                          0.1218     0.2894    |   3.9909      0.8316
                          0.1668     0.3438    |   5.9676      0.8977
                          0.2016     0.3999    |   8.2066      0.9649

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0080)     12.630     0.446      1.53        9.76
   OUTFLOW: ID= 1 (  0401)     12.630     0.010      4.63        7.34

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.30
                   TIME SHIFT OF PEAK FLOW        (min)=186.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1101

-------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0301):    18.44   0.048     4.07    15.42
      + ID2= 2 (  0303):    11.84   0.032     2.32     2.15
        ===================================================
        ID = 3 (  0300):    30.28   0.078     2.40    10.23

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


--------------------
| ADD HYD  (  0300)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0300):    30.28   0.078     2.40    10.23
      + ID2= 2 (  0401):    12.63   0.010     4.63     7.34
        ===================================================
        ID = 1 (  0300):    42.91   0.087     2.43     9.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0208)|   Area    (ha)=  22.30   Curve Number   (CN)= 58.6
|ID= 1 DT= 1.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

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


                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.017    2.07 | 1.017    5.70 | 2.017    5.19 |  3.02    2.80
                 0.033    2.07 | 1.033    5.70 | 2.033    5.19 |  3.03    2.80
```

0.050	2.07	1.050	5.70	2.050	5.19	3.05	2.80
0.067	2.07	1.067	5.70	2.067	5.19	3.07	2.80
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.100	2.07	1.100	5.70	2.100	5.19	3.10	2.80
0.117	2.07	1.117	5.70	2.117	5.19	3.12	2.80
0.133	2.07	1.133	5.70	2.133	5.19	3.13	2.80
0.150	2.07	1.150	5.70	2.150	5.19	3.15	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.183	2.27	1.183	10.78	2.183	4.47	3.18	2.62
0.200	2.27	1.200	10.78	2.200	4.47	3.20	2.62
0.217	2.27	1.217	10.78	2.217	4.47	3.22	2.62
0.233	2.27	1.233	10.78	2.233	4.47	3.23	2.62
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.267	2.27	1.267	10.78	2.267	4.47	3.27	2.62
0.283	2.27	1.283	10.78	2.283	4.47	3.28	2.62
0.300	2.27	1.300	10.78	2.300	4.47	3.30	2.62
0.317	2.27	1.317	10.78	2.317	4.47	3.32	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.350	2.52	1.350	50.21	2.350	3.95	3.35	2.48
0.367	2.52	1.367	50.21	2.367	3.95	3.37	2.48
0.383	2.52	1.383	50.21	2.383	3.95	3.38	2.48
0.400	2.52	1.400	50.21	2.400	3.95	3.40	2.48
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.433	2.52	1.433	50.21	2.433	3.95	3.43	2.48
0.450	2.52	1.450	50.21	2.450	3.95	3.45	2.48
0.467	2.52	1.467	50.21	2.467	3.95	3.47	2.48
0.483	2.52	1.483	50.21	2.483	3.95	3.48	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.517	2.88	1.517	13.37	2.517	3.56	3.52	2.35
0.533	2.88	1.533	13.37	2.533	3.56	3.53	2.35
0.550	2.88	1.550	13.37	2.550	3.56	3.55	2.35
0.567	2.88	1.567	13.37	2.567	3.56	3.57	2.35
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.600	2.88	1.600	13.37	2.600	3.56	3.60	2.35
0.617	2.88	1.617	13.37	2.617	3.56	3.62	2.35
0.633	2.88	1.633	13.37	2.633	3.56	3.63	2.35
0.650	2.88	1.650	13.37	2.650	3.56	3.65	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.683	3.38	1.683	8.29	2.683	3.25	3.68	2.23
0.700	3.38	1.700	8.29	2.700	3.25	3.70	2.23
0.717	3.38	1.717	8.29	2.717	3.25	3.72	2.23
0.733	3.38	1.733	8.29	2.733	3.25	3.73	2.23
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.767	3.38	1.767	8.29	2.767	3.25	3.77	2.23
0.783	3.38	1.783	8.29	2.783	3.25	3.78	2.23
0.800	3.38	1.800	8.29	2.800	3.25	3.80	2.23
0.817	3.38	1.817	8.29	2.817	3.25	3.82	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.850	4.17	1.850	6.30	2.850	3.01	3.85	2.14
0.867	4.18	1.867	6.30	2.867	3.01	3.87	2.14
0.883	4.18	1.883	6.30	2.883	3.01	3.88	2.14
0.900	4.18	1.900	6.30	2.900	3.01	3.90	2.14
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
0.933	4.18	1.933	6.30	2.933	3.01	3.93	2.14
0.950	4.18	1.950	6.30	2.950	3.01	3.95	2.14
0.967	4.18	1.967	6.30	2.967	3.01	3.97	2.14
0.983	4.18	1.983	6.30	2.983	3.01	3.98	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

```
Unit Hyd Qpeak  (cms)=   4.259

PEAK FLOW       (cms)=   0.081 (i)
TIME TO PEAK    (hrs)=   1.767
RUNOFF VOLUME    (mm)=   1.818
```

```
     TOTAL RAINFALL   (mm)=  24.996
     RUNOFF COEFFICIENT   =   0.073

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

```
********************************
** SIMULATION:run 01          **
********************************
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB NASHYD           0204  1  1.0    0.53    0.00  2.82   1.18 0.05   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB NASHYD           0207  1  1.0   11.31    0.03  2.30   2.20 0.09   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]    0303  3  1.0   11.84    0.03  2.32   2.15  n/a   0.000
*
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB NASHYD           0202  1  1.0    1.13    0.00  2.27   2.03 0.08   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB NASHYD           0201  1  1.0    0.87    0.00  1.92   1.76 0.07   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB STANDHYD         0200  1  1.0   13.45    1.02  1.53  17.93 0.72   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                         10.0
    [ Ptot= 25.00 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 ** CALIB STANDHYD         0203  1  1.0    2.93    0.30  1.52  21.51 0.86   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]    0302  3  1.0   14.32    1.02  1.53  16.95  n/a   0.000
```

```
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    1.31  1.53  17.72  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.05  4.12  16.29  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.05  4.07  15.41  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 25.00 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 *  CALIB STANDHYD       0080  1  1.0   12.63    0.45  1.53   9.76 0.39   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.01  4.63   7.34  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    0.08  2.40  10.22  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    0.09  2.43   9.37  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 25.00 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\488f9f1e-ddcd-40a5-a62d-34a
    remark: 25mm4hr
*
 *  CALIB NASHYD         0208  1  1.0   22.30    0.08  1.77   1.82 0.07   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 02          **
********************************
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.00  2.52   3.23 0.09   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.09  2.22   5.25 0.14   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.09  2.22   5.16  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 36.95 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
```

```
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.01  2.17   4.90 0.13   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                  10.0
    [ Ptot= 36.95 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.01  1.88   4.43 0.12   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  10.0
    [ Ptot= 36.95 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    1.86  1.52  27.64 0.75   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                  10.0
    [ Ptot= 36.95 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    0.54  1.52  33.05 0.89   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]   0302  3  1.0   14.32    1.86  1.52  26.23  n/a   0.000
*
    ADD [  0302+  0203]   0302  1  1.0   17.25    2.40  1.52  27.39  n/a   0.000
*
 ** Reservoir
    OUTFLOW:              0400  1  1.0   17.25    0.06  4.25  24.54  n/a   0.000
*
    ADD [  0202+  0400]   0301  3  1.0   18.38    0.06  2.43  23.33  n/a   0.000
*
    READ STORM                  10.0
    [ Ptot= 36.95 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    0.81  1.52  16.22 0.44   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    0.01  4.58  10.14  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.22    0.16  2.23  16.21  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.85    0.17  2.23  14.42  n/a   0.000
*
    READ STORM                  10.0
    [ Ptot= 36.95 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\09e908db-3d6b-411d-ae83-e69
    remark: 2yr_4hr_chi
*
```

```
 *  CALIB NASHYD         0208  1  1.0   22.30    0.27  1.73   4.55 0.12   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 03          **
********************************
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.00  2.48   6.59 0.13   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.17  2.20   9.94 0.20   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.18  2.20   9.79  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.02  2.15   9.33 0.18   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.02  1.87   8.62 0.17   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    2.57  1.52  39.08 0.77   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
```

```
 ** CALIB STANDHYD        0203  1  1.0     2.93    0.74  1.52  46.32 0.92   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0    14.32    2.58  1.52  37.23  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0    17.25    3.31  1.52  38.77  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0    17.25    0.17  3.42  34.72  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0    18.38    0.18  3.35  33.16  n/a   0.000
*
    READ STORM                  10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 *  CALIB STANDHYD        0080  1  1.0    12.63    1.14  1.52  24.48 0.48   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0    12.63    0.07  4.20  15.36  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0    30.22    0.30  2.35  24.00  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0    42.85    0.32  3.05  21.46  n/a   0.000
*
    READ STORM                  10.0
    [ Ptot= 50.52 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\441c6d51-a635-49b5-ba39-85d
    remark: 5yr_4hr_chi
*
 *  CALIB NASHYD          0208  1  1.0    22.30    0.53  1.73   8.85 0.18   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 04          **
********************************
    READ STORM                  10.0
    [ Ptot= 59.69 mm ]
    fname          :          C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD          0204  1  1.0     0.53    0.01  2.47   9.40 0.16   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                  10.0
    [ Ptot= 59.69 mm ]
    fname          :          C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD          0207  1  1.0    11.31    0.24  2.18  13.74 0.23   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0    11.84    0.24  2.18  13.54  n/a   0.000
*
    READ STORM                  10.0
```

```
    [ Ptot= 59.69 mm ]
    fname          :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD           0202  1  1.0    1.13    0.02  2.15  12.94 0.22   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                   10.0
    [ Ptot= 59.69 mm ]
    fname          :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB NASHYD           0201  1  1.0    0.87    0.02  1.85  12.05 0.20   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                   10.0
    [ Ptot= 59.69 mm ]
    fname          :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB STANDHYD         0200  1  1.0   13.45    3.07  1.52  47.02 0.79   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                   10.0
    [ Ptot= 59.69 mm ]
    fname          :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 ** CALIB STANDHYD         0203  1  1.0    2.99    0.90  1.52  55.35 0.93   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    3.08  1.52  44.89  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.31    3.97  1.52  46.70  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.31    0.31  2.72  42.52  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.44    0.32  2.63  40.71  n/a   0.000
*
    READ STORM                   10.0
    [ Ptot= 59.69 mm ]
    fname          :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 *  CALIB STANDHYD         0080  1  1.0   12.63    1.45  1.53  30.52 0.51   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.13  3.35  21.24  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.28    0.55  2.37  30.09  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.91    0.64  2.48  27.48  n/a   0.000
*
    READ STORM                   10.0
    [ Ptot= 59.69 mm ]
```

```
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7d369f10-af03-4407-a938-8de
    remark: 10yr_4hr_chi
*
 *  CALIB NASHYD          0208  1  1.0   22.30    0.75  1.72  12.37 0.21   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 05          **
********************************
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.01  2.45  13.50 0.19   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.33  2.18  19.12 0.27   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.34  2.18  18.87  n/a   0.000
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.03  2.13  18.07 0.25   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.03  1.85  16.98 0.24   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
    fname         :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    3.72  1.52  57.19 0.80   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                   10.0
    [ Ptot= 71.24 mm ]
```

```
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 ** CALIB STANDHYD        0203  1  1.0     2.99    1.07  1.50  66.76 0.94    0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0    14.32    3.73  1.52  54.74  n/a    0.000
*
    ADD [  0302+  0203]  0302  1  1.0    17.31    4.80  1.52  56.82  n/a    0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0    17.31    0.43  2.55  52.46  n/a    0.000
*
    ADD [  0202+  0400]  0301  3  1.0    18.44    0.45  2.42  50.35  n/a    0.000
*
    READ STORM                  10.0
    [ Ptot= 71.24 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 *  CALIB STANDHYD        0080  1  1.0    12.63    1.79  1.53  38.54 0.54    0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0    12.63    0.17  3.22  28.96  n/a    0.000
*
    ADD [  0301+  0303]  0300  3  1.0    30.28    0.79  2.25  38.04  n/a    0.000
*
    ADD [  0300+  0401]  0300  1  1.0    42.91    0.94  2.30  35.37  n/a    0.000
*
    READ STORM                  10.0
    [ Ptot= 71.24 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\7dbb36ed-96c0-4e50-9ea4-63f
    remark: 25yr_4hr_chi
*
 *  CALIB NASHYD          0208  1  1.0    22.30    1.06  1.72  17.39 0.24    0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 06          **
********************************
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD          0204  1  1.0     0.53    0.01  2.45  16.76 0.21    0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                  10.0
    [ Ptot= 79.45 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD          0207  1  1.0    11.31    0.41  2.17  23.32 0.29    0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
```

```
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.42  2.18  23.03  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD           0202  1  1.0    1.13    0.04  2.13  22.09 0.28   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB NASHYD           0201  1  1.0    0.87    0.04  1.85  20.84 0.26   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB STANDHYD         0200  1  1.0   13.45    4.20  1.52  64.53 0.81   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 ** CALIB STANDHYD         0203  1  1.0    2.93    1.18  1.50  74.90 0.94   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    4.21  1.52  61.88  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    5.39  1.52  64.09  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.49  2.55  59.57  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.52  2.40  57.26  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 *  CALIB STANDHYD         0080  1  1.0   12.63    2.08  1.53  44.50 0.56   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.20  3.22  34.70  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    0.93  2.22  43.85  n/a   0.000
*
```

```
    ADD [  0300+  0401]  0300  1  1.0   42.85    1.11  2.25  41.15  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 79.45 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\922c1a80-8568-4248-be93-bf8
    remark: 50yr_4hr_chi
*
 *  CALIB NASHYD         0208  1  1.0   22.30    1.30  1.72  21.33 0.27   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 07         **
********************************
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.01  2.43  20.23 0.23   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.49  2.17  27.74 0.32   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.50  2.17  27.40  n/a   0.000
*
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.05  2.13  26.32 0.30   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.05  1.83  24.92 0.28   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    4.69  1.52  71.87 0.82   0.000
```

```
    [I%=70.0:S%= 2.00]
*
    READ STORM                    10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    1.32  1.50  82.96 0.95   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]   0302  3  1.0   14.32    4.70  1.52  69.02  n/a   0.000
*
    ADD [  0302+  0203]   0302  1  1.0   17.25    6.01  1.52  71.39  n/a   0.000
*
 ** Reservoir
    OUTFLOW:              0400  1  1.0   17.25    0.56  2.50  66.71  n/a   0.000
*
    ADD [  0202+  0400]   0301  3  1.0   18.38    0.60  2.37  64.23  n/a   0.000
*
    READ STORM                    10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    2.35  1.53  50.57 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    0.23  3.18  40.57  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.22    1.10  2.22  49.80  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.85    1.31  2.23  47.08  n/a   0.000
*
    READ STORM                    10.0
    [ Ptot= 87.58 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\75ea23c6-a0bf-4e9b-9c59-77b
    remark: 100yr_4hr_chi
*
 *  CALIB NASHYD          0208  1  1.0   22.30    1.58  1.72  25.50 0.29   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 08          **
********************************
    MASS STORM                     6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.00  6.72   7.91 0.14   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                     6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.19  6.48  11.74 0.21   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]   0303  3  1.0   11.84    0.20  6.48  11.57  n/a   0.000
```

```
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD           0202  1  1.0    1.13    0.02  6.45  11.04 0.20   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB NASHYD           0201  1  1.0    0.87    0.02  6.20  10.24 0.19   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB STANDHYD         0200  1  1.0   13.45    2.05  5.97  42.94 0.78   0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 ** CALIB STANDHYD         0203  1  1.0    2.93    0.58  5.95  50.73 0.92   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]    0302  3  1.0   14.32    2.06  5.97  40.95  n/a   0.000
*
    ADD [  0302+  0203]    0302  1  1.0   17.25    2.64  5.95  42.61  n/a   0.000
*
 ** Reservoir
    OUTFLOW:               0400  1  1.0   17.25    0.14  7.47  35.73  n/a   0.000
*
    ADD [  0202+  0400]    0301  3  1.0   18.38    0.15  7.32  34.21  n/a   0.000
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 *  CALIB STANDHYD         0080  1  1.0   12.63    0.97  5.97  27.38 0.50   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:               0401  1  1.0   12.63    0.06  8.22  16.14  n/a   0.000
*
    ADD [  0301+  0303]    0300  3  1.0   30.22    0.32  6.55  25.34  n/a   0.000
*
    ADD [  0300+  0401]    0300  1  1.0   42.85    0.33  6.55  22.63  n/a   0.000
*
    MASS STORM                    6.0
    [ Ptot= 55.00 mm ]
*
 *  CALIB NASHYD           0208  1  1.0   22.30    0.66  6.10  10.51 0.19   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 09          **
********************************
    MASS STORM                    6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD           0204  1  1.0    0.53    0.01  6.68  15.36 0.20   0.000
    [CN=51.9          ]
```

```
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.36  6.47  21.52 0.28   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.37  6.47  21.25  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.04  6.43  20.37 0.27   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.04  6.20  19.18 0.25   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    3.01  5.95  61.44 0.81   0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    0.84  5.93  71.48 0.94   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    3.03  5.95  58.87  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    3.87  5.95  61.01  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.42  6.55  53.63  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.45  6.52  51.59  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
  * CALIB STANDHYD        0080  1  1.0   12.63    1.57  6.00  41.97 0.55   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.16  7.05  30.50  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    0.82  6.48  39.70  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    0.97  6.52  36.99  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot= 76.00 mm ]
*
  * CALIB NASHYD          0208  1  1.0   22.30    1.25  6.10  19.64 0.26   0.000
    [CN=58.6          ]
```

```
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 10          **
********************************
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.01  6.68  21.27 0.24   0.000
    [CN=51.9        ]
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.48  6.47  29.04 0.32   0.000
    [CN=60.8        ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.50  6.47  28.70  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.05  6.43  27.57 0.31   0.000
    [CN=59.0        ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.05  6.20  26.13 0.29   0.000
    [CN=57.8        ]
    [ N = 3.0:Tp 0.29]
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    3.69  5.95  73.98 0.82   0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 ** CALIB STANDHYD       0203  1  1.0    2.99    1.03  5.93  85.27 0.95   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    3.72  5.95  71.07  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.31    4.74  5.95  73.52  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.31    0.53  6.52  65.95  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.44    0.58  6.48  63.59  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot= 89.90 mm ]
*
 *  CALIB STANDHYD       0080  1  1.0   12.63    2.00  6.00  52.33 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.21  7.00  40.63  n/a   0.000
```

```
*
    ADD [  0301+  0303]  0300  3  1.0   30.28    1.08  6.47  49.95  n/a    0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.91    1.28  6.48  47.21  n/a    0.000
*
    MASS STORM                 6.0
    [ Ptot= 89.90 mm ]
*
 *  CALIB NASHYD         0208  1  1.0   22.30    1.72  6.10  26.73 0.30    0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 11          **
********************************
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.02  6.67  29.71 0.28    0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.67  6.47  39.52 0.37    0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.68  6.47  39.08  n/a    0.000
*
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.07  6.43  37.65 0.35    0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.07  6.18  35.90 0.33    0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    4.55  5.95  90.12 0.84    0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                 6.0
    [ Ptot=107.50 mm ]
*
 ** CALIB STANDHYD       0203  1  1.0    2.93    1.23  5.93 102.76 0.96    0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    4.59  5.95  86.83  n/a    0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    5.81  5.95  89.53  n/a    0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.65  6.52  81.70  n/a    0.000
*
```

```
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.71  6.47  78.99  n/a   0.000
*
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 *  CALIB STANDHYD       0080  1  1.0   12.63    2.60  6.00  66.07 0.61   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.26  6.98  53.99  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    1.40  6.47  63.35  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    1.65  6.48  60.59  n/a   0.000
*
    MASS STORM                    6.0
    [ Ptot=107.50 mm ]
*
 *  CALIB NASHYD         0208  1  1.0   22.30    2.38  6.10  36.67 0.34   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 12          **
********************************
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.02  6.67  36.60 0.30   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD         0207  1  1.0   11.31    0.81  6.45  47.90 0.40   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.83  6.47  47.39  n/a   0.000
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.08  6.42  45.75 0.38   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.09  6.18  43.77 0.36   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    5.25  5.95 102.28 0.85   0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                    6.0
    [ Ptot=120.60 mm ]
*
```

```
 ** CALIB STANDHYD        0203  1  1.0    2.93    1.40  5.93 115.80 0.96   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]   0302  3  1.0   14.32    5.29  5.95  98.73  n/a   0.000
*
    ADD [  0302+  0203]   0302  1  1.0   17.25    6.67  5.95 101.63  n/a   0.000
*
 ** Reservoir
    OUTFLOW:              0400  1  1.0   17.25    0.72  6.52  93.59  n/a   0.000
*
    ADD [  0202+  0400]   0301  3  1.0   18.38    0.80  6.47  90.65  n/a   0.000
*
    MASS STORM                 6.0
    [ Ptot=120.60 mm ]
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    3.09  6.00  76.66 0.64   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    0.29  7.00  64.29  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.22    1.63  6.47  73.70  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.85    1.92  6.47  70.93  n/a   0.000
*
    MASS STORM                 6.0
    [ Ptot=120.60 mm ]
*
 *  CALIB NASHYD          0208  1  1.0   22.30    2.91  6.10  44.66 0.37   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 13         **
********************************
    MASS STORM                 6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.03  6.67  43.87 0.33   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    MASS STORM                 6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.96  6.45  56.63 0.42   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]   0303  3  1.0   11.84    0.99  6.45  56.06  n/a   0.000
*
    MASS STORM                 6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.10  6.42  54.20 0.41   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    MASS STORM                 6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.10  6.18  52.01 0.39   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
```

```
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB STANDHYD      0200  1  1.0   13.45    5.91  5.95 114.45 0.86   0.000
    [I%=70.0:S%= 2.00]
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 ** CALIB STANDHYD      0203  1  1.0    2.93    1.56  5.93 128.75 0.96   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    5.97  5.95 110.66  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    7.50  5.95 113.73  n/a   0.000
*
 ** Reservoir
    OUTFLOW:            0400  1  1.0   17.25    0.79  6.53 105.45  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.88  6.47 102.30  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 *  CALIB STANDHYD      0080  1  1.0   12.63    3.56  6.00  87.43 0.65   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:            0401  1  1.0   12.63    0.63  6.55  74.91  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    1.87  6.47  84.19  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    2.49  6.52  81.45  n/a   0.000
*
    MASS STORM                  6.0
    [ Ptot=133.60 mm ]
*
 *  CALIB NASHYD        0208  1  1.0   22.30    3.47  6.10  53.03 0.40   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 14          **
********************************
    READ STORM                 15.0
    [ Ptot= 55.00 mm ]
    fname       :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD        0204  1  1.0    0.53    0.00 12.70   5.81 0.11   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                 15.0
    [ Ptot= 55.00 mm ]
    fname       :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD        0207  1  1.0   11.31    0.16 12.47   9.02 0.16   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
```

```
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.16 12.48   11.57  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD         0202  1  1.0    1.13    0.02 12.43    8.48 0.15   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB NASHYD         0201  1  1.0    0.87    0.02 12.20    7.95 0.14   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    1.59 12.02   42.94 0.78   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 ** CALIB STANDHYD       0203  1  1.0    2.99    0.46 12.00   50.73 0.92   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    1.61 12.02   40.95  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.31    2.06 12.00   42.64  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.31    0.09 14.22   29.66  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.44    0.10 14.22   28.52  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot= 55.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 *  CALIB STANDHYD       0080  1  1.0   12.63    0.77 12.02   27.38 0.50   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.03 16.08   12.23  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.28    0.24 12.58   21.89  n/a   0.000
*
```

```
    ADD [  0300+  0401]  0300  1  1.0   42.91    0.26 12.60  19.05  n/a   0.000
*
    READ STORM                    15.0
    [ Ptot= 55.00 mm ]
    fname        :       C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\35adffe5-ed3c-4d8f-9261-88a
    remark: 2yr_24hr_scs
*
 *  CALIB NASHYD          0208  1  1.0   22.30    0.54 12.10   8.22 0.15   0.000
    [CN=58.6           ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 15          **
********************************
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.01 12.68  11.54 0.15   0.000
    [CN=51.9           ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.30 12.47  16.82 0.22   0.000
    [CN=60.8           ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.30 12.47  21.25  n/a   0.000
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.03 12.43  15.91 0.21   0.000
    [CN=59.0           ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.03 12.18  15.16 0.20   0.000
    [CN=57.8           ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    2.35 12.00  61.44 0.81   0.000
```

```
    [I%=70.0:S%= 2.00]
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 ** CALIB STANDHYD         0203  1  1.0    2.93    0.64 12.00  71.48 0.94   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    2.38 12.00  58.87  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    3.01 12.00  61.01  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.34 12.63  46.22  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.37 12.60  44.63  n/a   0.000
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 *  CALIB STANDHYD         0080  1  1.0   12.63    1.23 12.02  41.97 0.55   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.14 13.07  26.61  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    0.67 12.52  35.47  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    0.79 12.57  32.86  n/a   0.000
*
    READ STORM                    15.0
    [ Ptot= 76.00 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\afda407d-1c95-4acc-9000-4c5
    remark: 5yr_24hr_scs
*
 *  CALIB NASHYD           0208  1  1.0   22.30    1.03 12.10  15.63 0.21   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 16          **
********************************
    READ STORM                    15.0
    [ Ptot= 89.90 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD           0204  1  1.0    0.53    0.01 12.68  16.15 0.18   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                    15.0
    [ Ptot= 89.90 mm ]
    fname      :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
```

```
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.40 12.45   22.88 0.25   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.41 12.47   28.70  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 89.90 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.04 12.42   21.72 0.24   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                 15.0
    [ Ptot= 89.90 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.04 12.18   20.82 0.23   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                 15.0
    [ Ptot= 89.90 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    2.86 12.00   73.98 0.82   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                 15.0
    [ Ptot= 89.90 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    0.76 12.00   85.27 0.95   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    2.89 12.00   71.07  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    3.65 12.00   73.48  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.46 12.60   58.01  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.50 12.57   56.14  n/a   0.000
*
    READ STORM                 15.0
    [ Ptot= 89.90 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    1.58 12.02   52.33 0.58   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
```

```
    OUTFLOW:              0401  1  1.0    12.63    0.19 13.03  36.86  n/a    0.000
*
    ADD [  0301+  0303]   0300  3  1.0    30.22    0.91 12.48  45.39  n/a    0.000
*
    ADD [  0300+  0401]   0300  1  1.0    42.85    1.09 12.52  42.88  n/a    0.000
*
    READ STORM                  15.0
    [ Ptot= 89.90 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\d9e18f4c-021b-478a-ac87-3ec
    remark: 10yr_24hr_scs
*
 *  CALIB NASHYD            0208  1  1.0    22.30    1.42 12.10  21.44 0.24   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 17          **
********************************
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD            0204  1  1.0     0.53    0.02 12.67  22.79 0.21   0.000
    [CN=51.9         ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD            0207  1  1.0    11.31    0.55 12.45  31.40 0.29   0.000
    [CN=60.8         ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]   0303  3  1.0    11.84    0.57 12.45  39.08  n/a    0.000
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD            0202  1  1.0     1.13    0.05 12.42  29.91 0.28   0.000
    [CN=59.0         ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB NASHYD            0201  1  1.0     0.87    0.06 12.18  28.85 0.27   0.000
    [CN=57.8         ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
```

```
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    3.54 12.00  90.12 0.84   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    0.93 12.00 102.76 0.96   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]   0302  3  1.0   14.32    3.58 12.00  86.83  n/a   0.000
*
    ADD [  0302+  0203]   0302  1  1.0   17.25    4.50 12.00  89.53  n/a   0.000
*
 ** Reservoir
    OUTFLOW:              0400  1  1.0   17.25    0.58 12.58  73.47  n/a   0.000
*
    ADD [  0202+  0400]   0301  3  1.0   18.38    0.64 12.53  71.27  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    2.05 12.02  66.07 0.61   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    0.24 13.02  50.48  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.22    1.20 12.47  58.66  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.85    1.43 12.50  56.25  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=107.50 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\6705da12-f884-4770-a938-767
    remark: 25yr_24hr_scs
*
 *  CALIB NASHYD          0208  1  1.0   22.30    1.96 12.10  29.66 0.28   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 18          **
********************************
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.02 12.67  28.24 0.23   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                  15.0
```

```
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.68 12.45  38.25 0.32   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]  0303  3  1.0   11.84    0.69 12.45  47.39  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.07 12.42  36.52 0.30   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.07 12.18  35.35 0.29   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    4.04 12.00 102.28 0.85   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 ** CALIB STANDHYD        0203  1  1.0    2.93    1.04 12.00 115.80 0.96   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    4.09 12.00  98.73  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    5.13 12.00 101.63  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.66 12.58  85.20  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.72 12.53  82.77  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
```

```
 *  CALIB STANDHYD        0080  1  1.0   12.63    2.43 12.02  76.66 0.64   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    0.27 13.02  60.99  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.22    1.41 12.47  68.91  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.85    1.67 12.48  66.58  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=120.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\ad33bbdd-f2a1-46c0-ba64-d4d
    remark: 50yr_24hr_scs
*
 *  CALIB NASHYD          0208  1  1.0   22.30    2.40 12.10  36.30 0.30   0.000
    [CN=58.6          ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 19          **
********************************
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0204  1  1.0    0.53    0.02 12.67  34.04 0.25   0.000
    [CN=51.9          ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0207  1  1.0   11.31    0.80 12.45  45.44 0.34   0.000
    [CN=60.8          ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]   0303  3  1.0   11.84    0.82 12.45  56.06  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.08 12.42  43.47 0.33   0.000
    [CN=59.0          ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :      C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.09 12.18  42.19 0.32   0.000
    [CN=57.8          ]
    [ N = 3.0:Tp 0.29]
```

```
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB STANDHYD       0200  1  1.0   13.45    4.56 12.00 114.46 0.86   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 ** CALIB STANDHYD       0203  1  1.0    2.93    1.16 12.00 128.75 0.96   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]  0302  3  1.0   14.32    4.62 12.00 110.66  n/a   0.000
*
    ADD [  0302+  0203]  0302  1  1.0   17.25    5.79 12.00 113.73  n/a   0.000
*
 ** Reservoir
    OUTFLOW:             0400  1  1.0   17.25    0.72 12.58  97.00  n/a   0.000
*
    ADD [  0202+  0400]  0301  3  1.0   18.38    0.80 12.52  94.37  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 *  CALIB STANDHYD       0080  1  1.0   12.63    2.79 12.02  87.43 0.65   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:             0401  1  1.0   12.63    0.30 13.02  71.66  n/a   0.000
*
    ADD [  0301+  0303]  0300  3  1.0   30.22    1.62 12.45  79.36  n/a   0.000
*
    ADD [  0300+  0401]  0300  1  1.0   42.85    1.91 12.47  77.09  n/a   0.000
*
    READ STORM                  15.0
    [ Ptot=133.60 mm ]
    fname     :     C:\Users\nparmar\AppData\Local\Temp\355f5a2f-b377-4e66-8dba-
aae718ccd8e6\e8ae8d37-38d9-4edc-b490-d8e
    remark: 100yr_24hr_scs
*
 *  CALIB NASHYD         0208  1  1.0   22.30    2.86 12.10  43.29 0.32   0.000
    [CN=58.6         ]
    [ N = 3.0:Tp 0.20]
*
********************************
** SIMULATION:run 20          **
********************************
    READ STORM                  60.0
    [ Ptot=212.00 mm ]
    fname       :       C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB NASHYD         0204  1  1.0    0.53    0.04 11.03  94.92 0.45   0.000
```

```
    [CN=51.9            ]
    [ N = 3.0:Tp 0.70]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname        :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB NASHYD          0207  1  1.0   11.31    1.02 10.42 115.65 0.55   0.000
    [CN=60.8            ]
    [ N = 3.0:Tp 0.53]
*
    ADD [  0204+  0207]   0303  3  1.0   11.84    1.05 10.43 114.72  n/a   0.000
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname        :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB NASHYD          0202  1  1.0    1.13    0.10 10.37 111.73 0.53   0.000
    [CN=59.0            ]
    [ N = 3.0:Tp 0.50]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname        :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB NASHYD          0201  1  1.0    0.87    0.08 10.08 108.41 0.51   0.000
    [CN=57.8            ]
    [ N = 3.0:Tp 0.29]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname        :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB STANDHYD        0200  1  1.0   13.45    1.87 10.00 189.31 0.89   0.000
    [I%=70.0:S%= 2.00]
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
    fname        :         C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 ** CALIB STANDHYD        0203  1  1.0    2.99    0.44 10.00 206.97 0.98   0.000
    [I%=75.0:S%= 2.00]
*
    ADD [  0200+  0201]   0302  3  1.0   14.32    1.95 10.00 184.40  n/a   0.000
*
    ADD [  0302+  0203]   0302  1  1.0   17.31    2.39 10.00 188.30  n/a   0.000
*
 ** Reservoir
    OUTFLOW:              0400  1  1.0   17.31    1.70 11.03 177.41  n/a   0.000
*
    ADD [  0202+  0400]   0301  3  1.0   18.44    1.79 11.03 173.39  n/a   0.000
*
    READ STORM                    60.0
    [ Ptot=212.00 mm ]
```

```
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 *  CALIB STANDHYD        0080  1  1.0   12.63    1.54 10.00 156.08 0.74   0.000
    [I%=33.0:S%= 2.00]
*
 ** Reservoir
    OUTFLOW:              0401  1  1.0   12.63    1.47 10.10 142.59  n/a   0.000
*
    ADD [  0301+  0303]   0300  3  1.0   30.28    2.79 11.02 150.45  n/a   0.000
*
    ADD [  0300+  0401]   0300  1  1.0   42.91    3.99 11.00 148.14  n/a   0.000
*
    READ STORM                  60.0
    [ Ptot=212.00 mm ]
    fname        :        C:\Users\nparmar\AppData\Local\Temp\a75bf0ed-b17a-423a-
b9eb-3b1e1431b629\bd1941b2-3f42-4603-a37c-281
    remark: hazel-hr
*
 *  CALIB NASHYD          0208  1  1.0   22.30    2.24 10.03 110.10 0.52   0.000
    [CN=58.6        ]
    [ N = 3.0:Tp 0.20]
*
```

Appendix F

Hy-8 Model Results

HY-8 Culvert Analysis Report

Culvert Data: Culvert 58

Site Data - Culvert 58

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 292.17 m

Outlet Station: 83.00 m

Outlet Elevation: 291.90 m

Number of Barrels: 1

Culvert Data Summary - Culvert 58

Barrel Shape: Concrete Box

Barrel Span: 1520.00 mm

Barrel Rise: 1200.00 mm

Barrel Material: Concrete

Embedment: 120.00 mm

Barrel Manning's n: 0.0120 (top and sides)

Manning's n: 0.0350 (bottom)

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

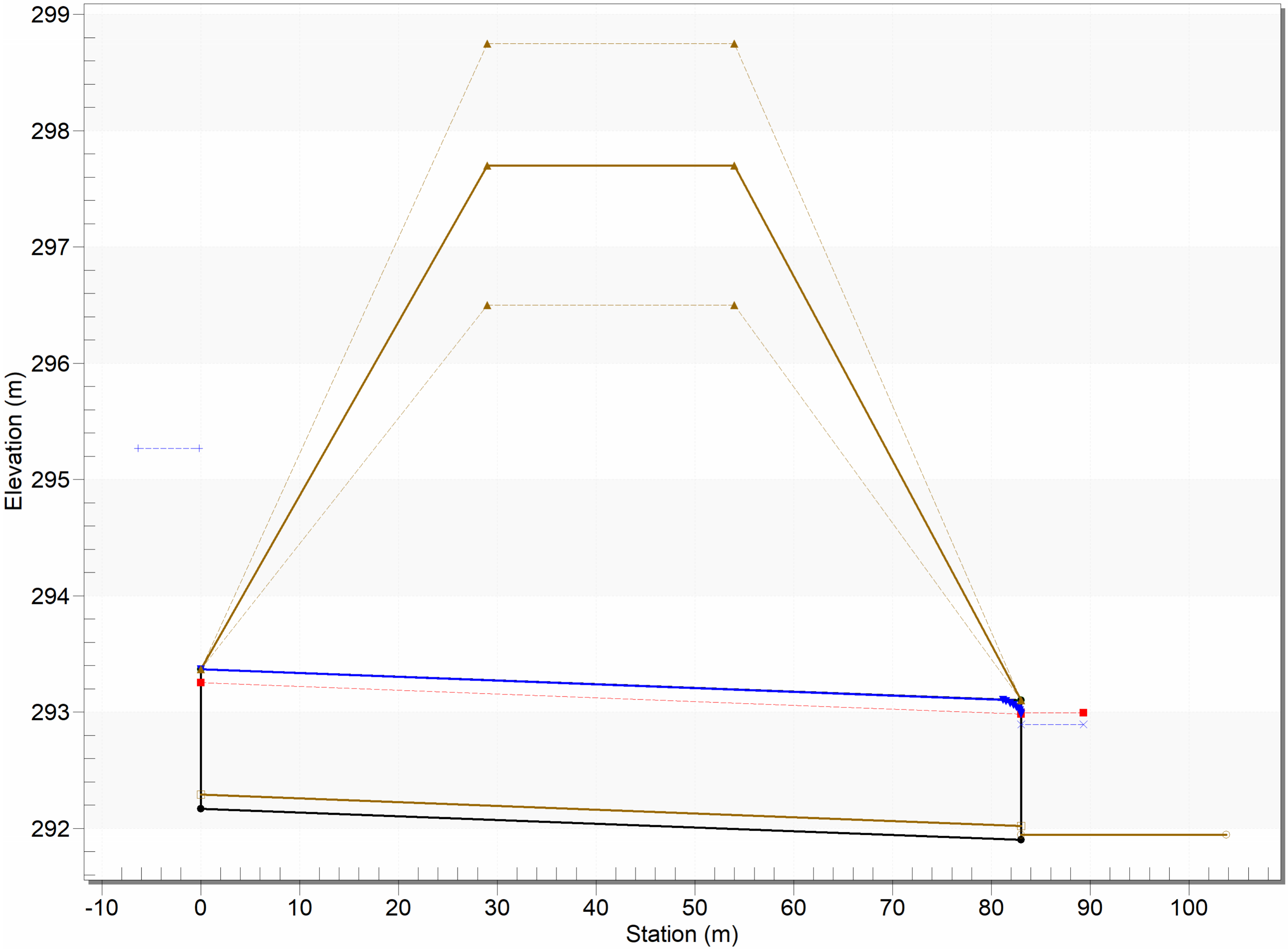
Culvert Crossing: Crossing 58 Ultimate Post Modified

Water Surface Profiles

Discharge Names	Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth(m)	Outlet Control Depth(m)	Flow Type	Length Full (m)	Length Free (m)
2-year	0.41	0.41	292.68	0.33	0.39	3-M2t	0.00	83.00
5-year	1.02	1.02	292.99	0.61	0.70	3-M2t	0.00	83.00
10-year	1.33	1.33	293.12	0.72	0.83	3-M2t	0.00	83.00
25-year	1.70	1.70	293.26	0.85	0.97	3-M2t	0.00	83.00
50-Year	1.97	1.97	293.35	0.94	1.06	3-M2t	0.00	83.00
100-Year	2.60	2.60	293.55	1.14	1.26	3-M2t	0.00	83.00
Check Flow	4.50	4.50	295.27	1.83	2.98	7-M2c	81.17	1.83

Crossing - Crossing 58 Ultimate Post Modified, Design Discharge - 4.50 cms

Culvert - Culvert 58, Culvert Discharge - 4.50 cms



Appendix G

Cambium Water Balance Calculations

CAMBIUM

Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario

THORNTHWAITE-TYPE MONTHLY WATER-BALANCE MODEL

modified from Dingman 2002: Box 7-3 (pg 315) using ET model of Hamon (1963)

Input Data | Computed Values

Surplus 394 mm/yr

Weather Station Location: **Innisfil, ON** **Latitude:** **44.2** **degree**

Solar Declination (degree)	-20.6	-12.6	-1.5	10.0	19.0	23.1	21.0	13.4	2.6	-9.0	-18.5	-23.0
DayLength (hr)*	9.1	10.3	11.8	13.3	14.6	15.3	14.9	13.8	12.3	10.8	9.5	8.7

Available Water Storage Capacity 0.18 m/m **Root Depth** 1000 mm **SOILmax** 180.0 mm

MONTHLY WATER BALANCE DATA

Temperatures in C, water-balance terms in mm.

Month:	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Year**
====================	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	====	=====
TEMPERATURE (T)	-7.7	-6.6	-2.1	5.6	12.3	17.9	20.8	19.7	15.3	8.7	2.7	-3.5	
PRECIPITATION (P)	82.5	61.8	58.1	62.2	82.4	84.8	77.2	89.9	94.0	77.5	88.9	73.6	933
RAIN	16.6	16.0	29.2	56.6	82.3	84.8	77.2	89.9	94.0	75.2	66.0	22.2	710
SNOW	66	46	29	6	0	0	0	0	0	2	23	51	223
MELT FACTOR (F)	0.00	0.00	0.00	0.93	1.00	1.00	1.00	1.00	1.00	1.00	0.45	0.00	
PACK	130	176	205	14	0	0	0	0	0	0	13	64	
MELT	0	0	0	196	14	0	0	0	0	2	10	0	223
INPUT (W)	17	16	29	253	96	85	77	90	94	78	76	22	933
POTENTIAL ET (PET)	0	0	0	39	68	96	116	100	67	40	23	0	548
NET INPUT (ΔW)	17	16	29	214	29	-12	-38	-10	27	38	54	22	
SOIL MOISTURE (SOIL)	180	180	180	180	180	169	136	129	156	180	180	180	
ΔSOIL	0	0	0	0	0	-11	-32	-7	27	24	0	0	0
ET	0	0	0	39	68	96	110	97	67	40	23	0	539
SURPLUS=W-ET-ΔSOIL	17	16	29	214	29	0	0	0	0	14	54	22	394

Notes:

Precipitation, Rain, Temperature, and Latitude are inputted parameters

SOILmax = available water storage capacity * root depth

m = month

D = Day length (hrs) $=2*\cos^{-1}(-\tan(\text{Latitude})*\tan(\text{Declination}))/0.2618$ [calculation is in radians]

$SNOW_m = P_m - RAIN_m$

$F_m = 0$ if $T_m <= 0°C$; $F_m = 0.167*T_m$ if $0°C<T_m<6°C$; $F_m = 1$ if $T_m>=6°C$

$PACK_m = (1-F_m)*(SNOW_m+PACK_{m-1})$

$MELT = F_m*(SNOW_m+PACK_{m-1})$

$W_m = RAIN_m+MELT_m$.

PET = 0 if $T_m<0$; otherwise PET = $2.98*0.611*\exp(17.3*T_m/(T_m+237))/(T_m+237.2)$*Number of days in month [Hamon ET model (1963)]

$\Delta W_m = W_m - PET_m$

SOIL = $\min\{[\Delta W_m+SOIL_{m-1}], SOILmax\}$, if ΔWm>0; otherwise SOIL = $SOIL_{m-1}* \exp(\Delta W/SOILmax)$

$\Delta SOIL = SOIL_{m-1} - SOIL_m$

ET = PET if $W_m > PET$; otherwise, $ET=W_m-\Delta SOIL$

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - LSRCA Lot 1

1 Climate Information		
Precipitation	933	mm/yr
Actual Evapotranspiration	539	mm/yr
Water Surplus	394	mm/yr

2 Infiltration Rates		
Table 2 Approach - Infiltration factors		
Topography: Rolling Land	0.2	
Soil Type: medium combinations of silt and loam	0.25	
Cover: Cultivated land/Woodland	0.1	
Total Infiltration Factor	**0.55**	
Infiltration (Water Surplus * Infiltration Factor)	**217**	mm/yr
Run-off (Water Surplus - Infiltration)	**177**	mm/yr

Table 3 Approach - Typical Recharge Rates		
Coarse Sand and Gravel	>250	mm/yr
Fine to medium sand	200-250	mm/yr
Silty sand to sandy silt	150-200	mm/yr
Silt	125-150	mm/yr
Clayey Silt	100- 125	mm/yr
Clay	<100	mm/yr

Site development area is underlain predominantly by silty sand to sandy silt to silt materials

Based on the above, the recharge rate is typically	150-200	mm/yr

3 Pre-Development Property Statistics	**ha**	**m^2**
Total Paved Area	0.00	0
Total Roof Area	0.00	0
Total Landscape Area	4.00	40,000
Total	**4.00**	**40,000**

4 Post-Development Property Statistics	**ha**	**m^2**
Total Paved Area	1.53	15,293
Total Roof Area	0.00	0
Total Landscape Area	2.47	24,707
Total	**4.00**	**40,000**

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - LSRCA Lot 1

5 Pre-Development Water Balance

Land Use		Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Impervious Areas	Paved Area	-	-	-	-	-
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	40,000	37,320	21,560	8,668	7,092
	Totals	40,000	37,320	21,560	8,668	7,092
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

6 Post-Development Water Balance

Land Use		Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Impervious Areas	Paved Area	15,293	14,268	1,427	-	12,842
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	24,707	23,052	13,317	5,354	4,381
	Totals	40,000	37,320	14,744	5,354	17,222
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

7 Comparison of Pre- and Post -Development

	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Pre-Development	37,320	21,560	8,668	7,092
Post-Development	37,320	14,744	5,354	17,222
Change in Volume	-	- 6,816	- 3,314	10,130
Change in %	-	- 32	- 38	143

8 Requirement for Infiltration of Roof Run-off

Volume of Pre-Development Infiltration (m^3/yr)	8,668
Volume of Post-Development Infiltration (m^3/yr)	5,354
Deficit from Pre to Post Development Infiltration (m^3/yr)	3,314
Percentage of Roof Runoff required to match the pre-development infiltration (%)	NA

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - LSRCA Lot 2

1 Climate Information		
Precipitation	933	mm/yr
Actual Evapotranspiration	539	mm/yr
Water Surplus	394	mm/yr
2 Infiltration Rates		
Table 2 Approach - Infiltration factors		
Topography: Rolling Land	0.2	
Soil Type: medium combinations of silt and loam	0.25	
Cover: Cultivated land/Woodland	0.1	
Total Infiltration Factor	**0.55**	
Infiltration (Water Surplus * Infiltration Factor)	**217**	mm/yr
Run-off (Water Surplus - Infiltration)	**177**	mm/yr
Table 3 Approach - Typical Recharge Rates		
Coarse Sand and Gravel	>250	mm/yr
Fine to medium sand	200-250	mm/yr
Silty sand to sandy silt	150-200	mm/yr
Silt	125-150	mm/yr
Clayey Silt	100- 125	mm/yr
Clay	<100	mm/yr

Site development area is underlain predominantly by silty sand to sandy silt to silt materials

Based on the above, the recharge rate is typically	150-200	mm/yr

3 Pre-Development Property Statistics	**ha**	**m^2**
Total Paved Area	0.00	0
Total Roof Area	0.00	0
Total Landscape Area	12.50	125,000
Total	**12.50**	**125,000**

4 Post-Development Property Statistics	**ha**	**m^2**
Total Paved Area	5.00	50,000
Total Roof Area	5.00	50,000
Total Landscape Area	2.50	25,000
Total	**12.50**	**125,000**

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - LSRCA Lot 2

5 Pre-Development Water Balance

Land Use		Area (m²)	Precipitation (m³)	Evapotranspiration (m³)	Infiltration (m³)	Run-off (m³)
Impervious Areas	Paved Area	-	-	-	-	-
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	125,000	116,625	67,375	27,088	22,163
	Totals	125,000	116,625	67,375	27,088	22,163
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

6 Post-Development Water Balance

Land Use		Area (m²)	Precipitation (m³)	Evapotranspiration (m³)	Infiltration (m³)	Run-off (m³)
Impervious Areas	Paved Area	50,000	46,650	4,665	-	41,985
	Roof Area	50,000	46,650	4,665	-	41,985
Pervious Areas	Landscape Area	25,000	23,325	13,475	5,418	4,433
	Totals	125,000	116,625	22,805	5,418	88,403
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

7 Comparison of Pre- and Post -Development

	Precipitation (m³)	Evapotranspiration (m³)	Infiltration (m³)	Run-off (m³)
Pre-Development	116,625	67,375	27,088	22,163
Post-Development	116,625	22,805	5,418	88,403
Change in Volume	-	- 44,570	- 21,670	66,240
Change in %	-	- 66	- 80	299

8 Requirement for Infiltration of Roof Run-off

Volume of Pre-Development Infiltration (m³/yr)	27,088
Volume of Post-Development Infiltration (m³/yr)	5,418
Deficit from Pre to Post Development Infiltration (m³/yr)	21,670
Percentage of Roof Runoff required to match the pre-development infiltration (%)	52
Deficit including Lot 1 and Lot 2	24,984
Percentage of Roof Runoff required to compensate for combined deficit	60

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - NVCA Lot 3

1	**Climate Information**		
	Precipitation	933	mm/yr
	Actual Evapotranspiration	539	mm/yr
	Water Surplus	394	mm/yr
2	**Infiltration Rates**		
	Table 2 Approach - Infiltration factors		
	Topography: Rolling Land	0.2	
	Soil Type: medium combinations of silt and loam	0.25	
	Cover: Cultivated land/Woodland	0.1	
	Total Infiltration Factor	**0.55**	
	Infiltration (Water Surplus * Infiltration Factor)	**217**	mm/yr
	Run-off (Water Surplus - Infiltration)	**177**	mm/yr
	Table 3 Approach - Typical Recharge Rates		
	Coarse Sand and Gravel	>250	mm/yr
	Fine to medium sand	200-250	mm/yr
	Silty sand to sandy silt	150-200	mm/yr
	Silt	125-150	mm/yr
	Clayey Silt	100- 125	mm/yr
	Clay	<100	mm/yr
	Site development area is underlain predominantly by silty sand to sandy silt to silt materials		
	Based on the above, the recharge rate is typically	150-200	mm/yr

		ha	m^2
3	**Pre-Development Property Statistics**	**ha**	**m^2**
	Total Paved Area	0.00	0
	Total Roof Area	0.00	0
	Total Landscape Area	5.90	59,000
	Total	**5.90**	**59,000**
4	**Post-Development Property Statistics**	**ha**	**m^2**
	Total Paved Area	2.36	23,600
	Total Roof Area	2.36	23,600
	Total Landscape Area	1.18	11,800
	Total	**5.90**	**59,000**

CAMBIUM

Pre- and Post-Development Water Balance Calculations

7131 5th Sideroad, Innisfil, Ontario - NVCA Lot 3

5 Pre-Development Water Balance

Land Use		Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Impervious Areas	Paved Area	-	-	-	-	-
	Roof Area	-	-	-	-	-
Pervious Areas	Landscape Area	59,000	55,047	31,801	12,785	10,461
	Totals	59,000	55,047	31,801	12,785	10,461
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

6 Post-Development Water Balance

Land Use		Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Impervious Areas	Paved Area	23,600	22,019	2,202	-	19,817
	Roof Area	23,600	22,019	2,202	-	19,817
Pervious Areas	Landscape Area	11,800	11,009	6,360	2,557	2,092
	Totals	59,000	55,047	10,764	2,557	41,726
Assuming no infiltration occurring in paved and roof areas, and 10% of precipitation to be evaporated from paved and roof areas.						

7 Comparison of Pre- and Post -Development

	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-off (m^3)
Pre-Development	55,047	31,801	12,785	10,461
Post-Development	55,047	10,764	2,557	41,726
Change in Volume	-	- 21,037	- 10,228	31,265
Change in %	-	- 66	- 80	299

8 Requirement for Infiltration of Roof Run-off

Volume of Pre-Development Infiltration (m^3/yr)	12,785
Volume of Post-Development Infiltration (m^3/yr)	2,557
Deficit from Pre to Post Development Infiltration (m^3/yr)	10,228
Percentage of Roof Runoff required to match the pre-development infiltration (%)	52

Appendix H

Novatech and Pearson Engineering Drawings

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1	ISSUED FOR EXTERNAL WORKS APPLICATION	AUG 31/23	MJH

SCALE: 1:1250

DESIGN: MJH/DMM
CHECKED: MJH
DRAWN: DMM
CHECKED: MJH
APPROVED: JLS

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
TOWN OF INNISFIL
7267 5th SIDE ROAD

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 122202
REV: REV # 1
DRAWING No. 122202-POST

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
2	ISSUED FOR EXTERNAL WORKS APPLICATION	AUG 31/23	MJH
1	ISSUED FOR MTO REVIEW	APR 20/23	MJH

SCALE 1:500

DESIGN MJH/DMM
CHECKED MJH
DRAWN DMM
CHECKED MJH
APPROVED JLS

NOVATECH
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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
TOWN OF INNISFIL
7267 5th SIDE ROAD

DRAWING NAME
STORMWATER MANAGEMENT FACILITY PLAN 1/2

PROJECT No. 122202
REV # 2
DRAWING No. 122202-SWMF

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

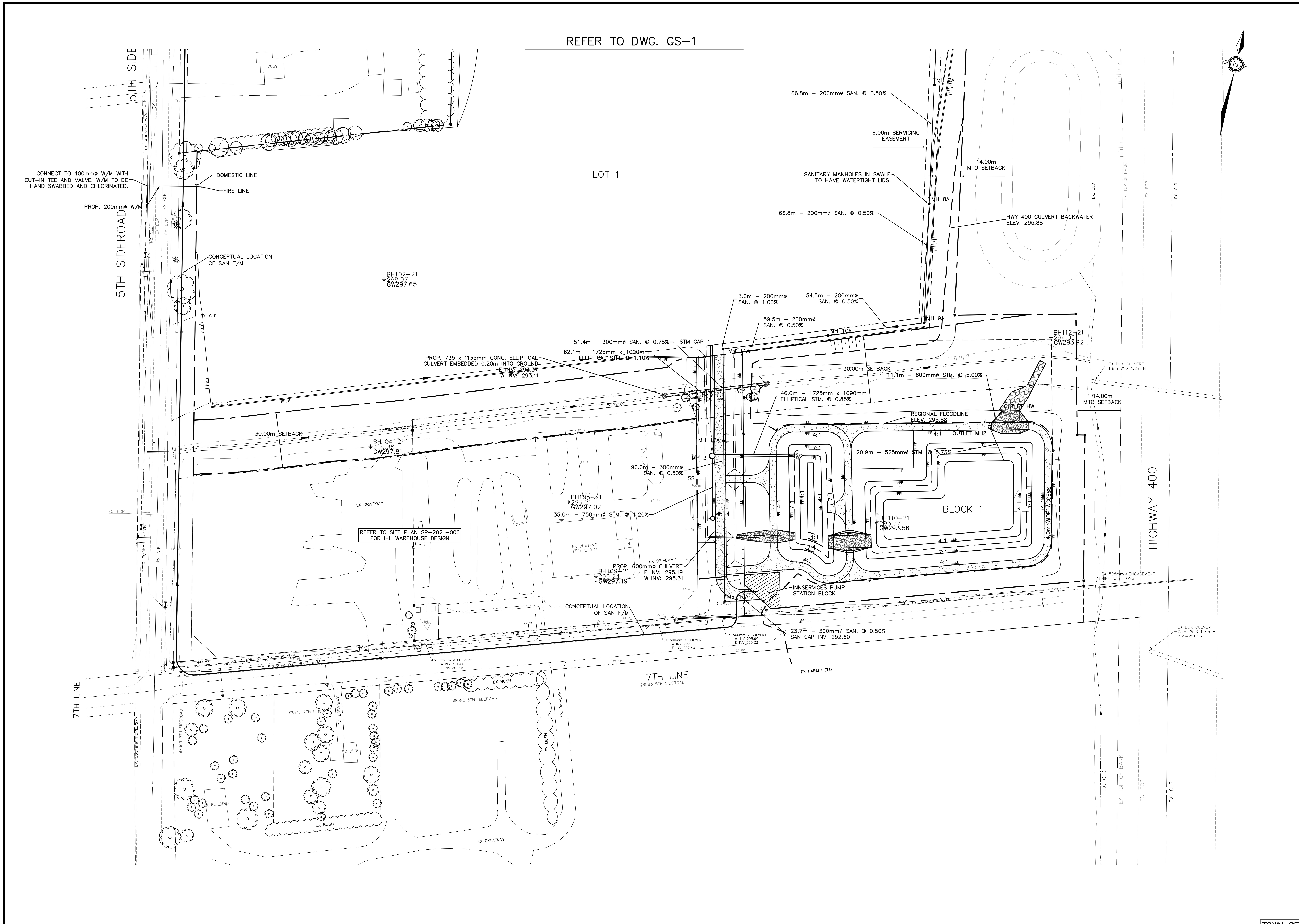
LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

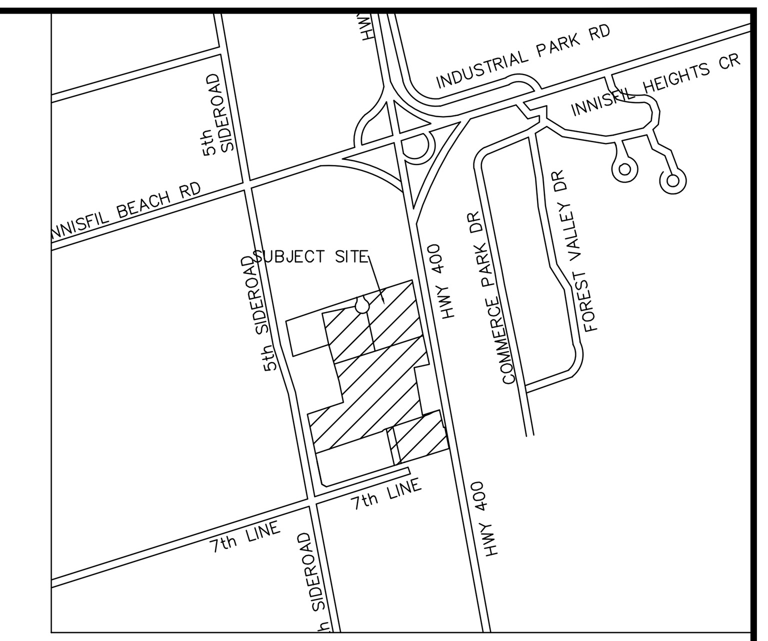
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

GENERAL SERVICING PLAN
1 OF 2

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	N/A	DRAWING #	GS-1
CHECKED BY	GMP/MWD	DATE	AUG 2024	REVISION #	1





KEY PLAN
NTS

LEGEND

CB	CATCH BASIN
DCB	DOUBLE CATCH BASIN
1	STORM MANHOLE
1A	SANITARY MANHOLE
EX. CB	EX. CATCH BASIN
EX. DCB	EX. DOUBLE CATCH BASIN
EX. MH	EX. STORM MANHOLE
EX. HYD	EX. FIRE HYDRANT
H&V	PROP. FIRE HYDRANT
VB	WATER VALVE
CS	CURB STOP
	PROPERTY LINE
	HWY 400 CULVERT BACKWATER
BH114-21 304.44 GW298.58	BOREHOLE NO. EX. GROUND ELEVATION GROUNDWATER ELEVATION AS PER CAMBIUM GROUNDWATER REPORT DATED MARCH 15, 2023

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

LICENCED PROFESSIONAL ENGINEER M.W. DEJEAN June 12, 2025 PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

GENERAL SERVICING PLAN
2 OF 2

TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	N/A	DRAWING #	GS-2
CHECKED BY	GMP/MWD	DATE	AUG 2024	REVISION #	1

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
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BENCHMARK

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LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

SANITARY CATCHMENT PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1250	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	N/A	DRAWING #	SAN-1
CHECKED BY	GMP/MWD	DATE	AUG 2024	REVISION #	1

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NO.	REVISION NOTE	DATE	BY
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BENCHMARK

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7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

PRE-DEVELOPMENT STORM CATCHMENT PLAN

TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:2000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	N/A	DRAWING #	STM-1
CHECKED BY	GMP/MWD	DATE	AUG 2024	REVISION #	1

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

LICENCED PROFESSIONAL ENGINEER — M.W. DEJEAN — June 12, 2025 — PROVINCE OF ONTARIO

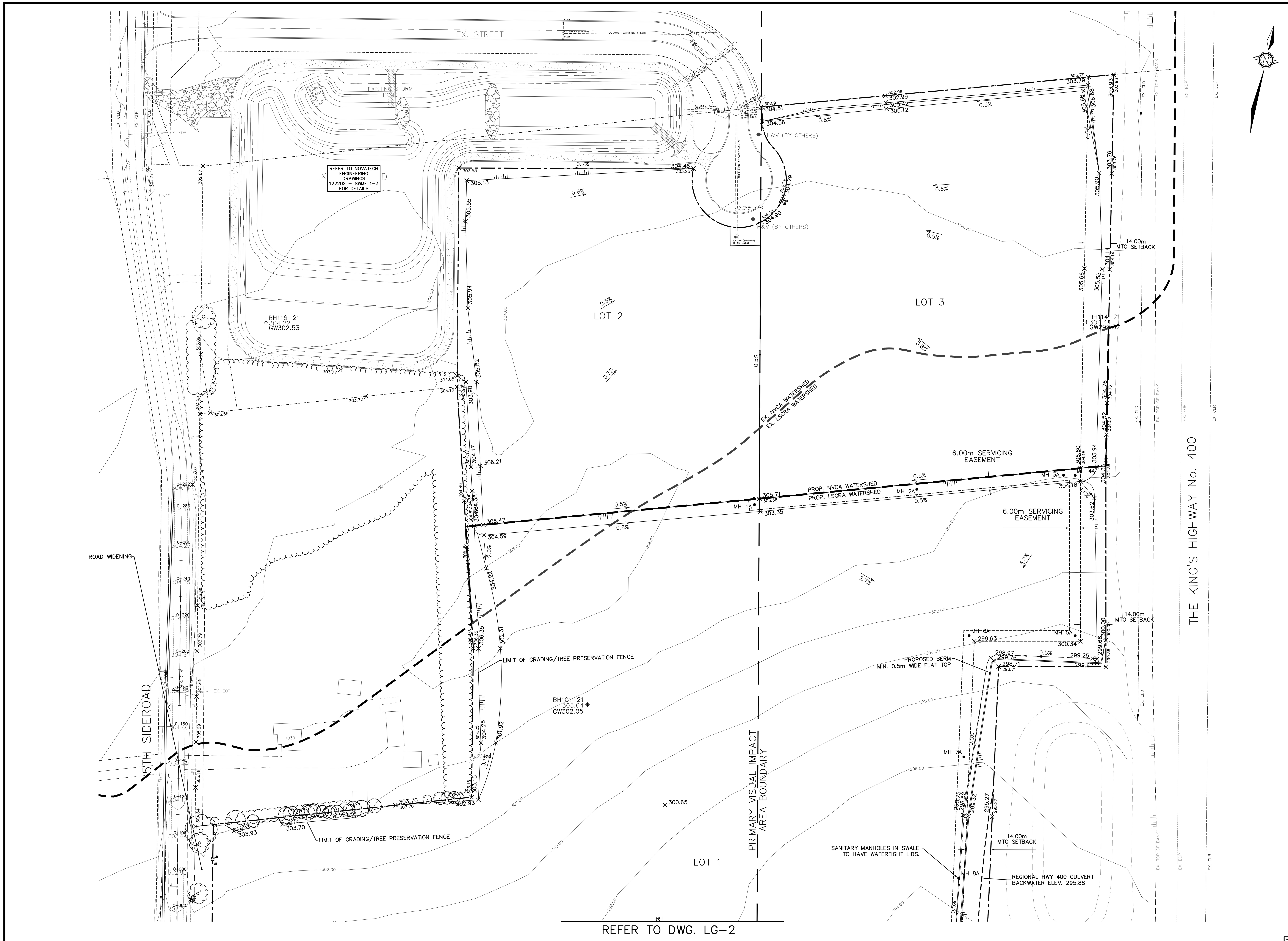
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

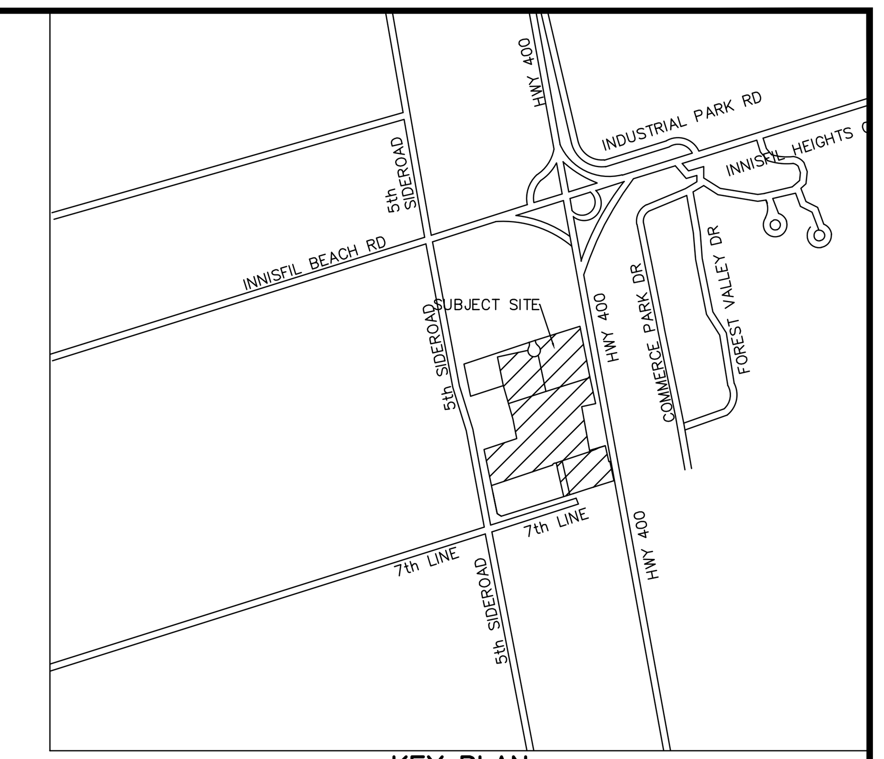
POST-DEVELOPMENT STORM CATCHMENT PLAN

TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:2500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	N/A	DRAWING #	STM-2
CHECKED BY	GMP/MWD	DATE	AUG 2024	REVISION #	1





KEY PLAN
NTS

LEGEND

CB	CATCH BASIN
DCB	DOUBLE CATCH BASIN
DCBMH	DOUBLE CATCH BASIN–MANHOLE
CBMH	CATCH BASIN–MANHOLE
1	STORM MANHOLE
1A	SANITARY MANHOLE
	SERVICE CAP
H&V	FIRE HYDRANT
VB	WATER VALVE
	HYDRO TRANSFORMER
	LIGHT STANDARD
250.00 / 248.00	PROPOSED ELEVATION / EXISTING ELEVATION
0.8%	PROPOSED GRADE
	HIGH POINT
	LOW POINT
	GRADE BREAK
	PROPERTY LINE
	DRAINAGE SWALE
BH114-21 304.44 GW298.58	BOREHOLE NO. EX. GROUND ELEVATION GROUNDWATER ELEVATION AS PER CAMBIUM GROUNDWATER REPORT DATED MARCH 15, 2023
	HWY 400 CULVERT BACKWATER ELEV
	WATERSHED BOUNDARY

NO.	REVISION NOTE	DATE	BY
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BENCHMARK

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LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

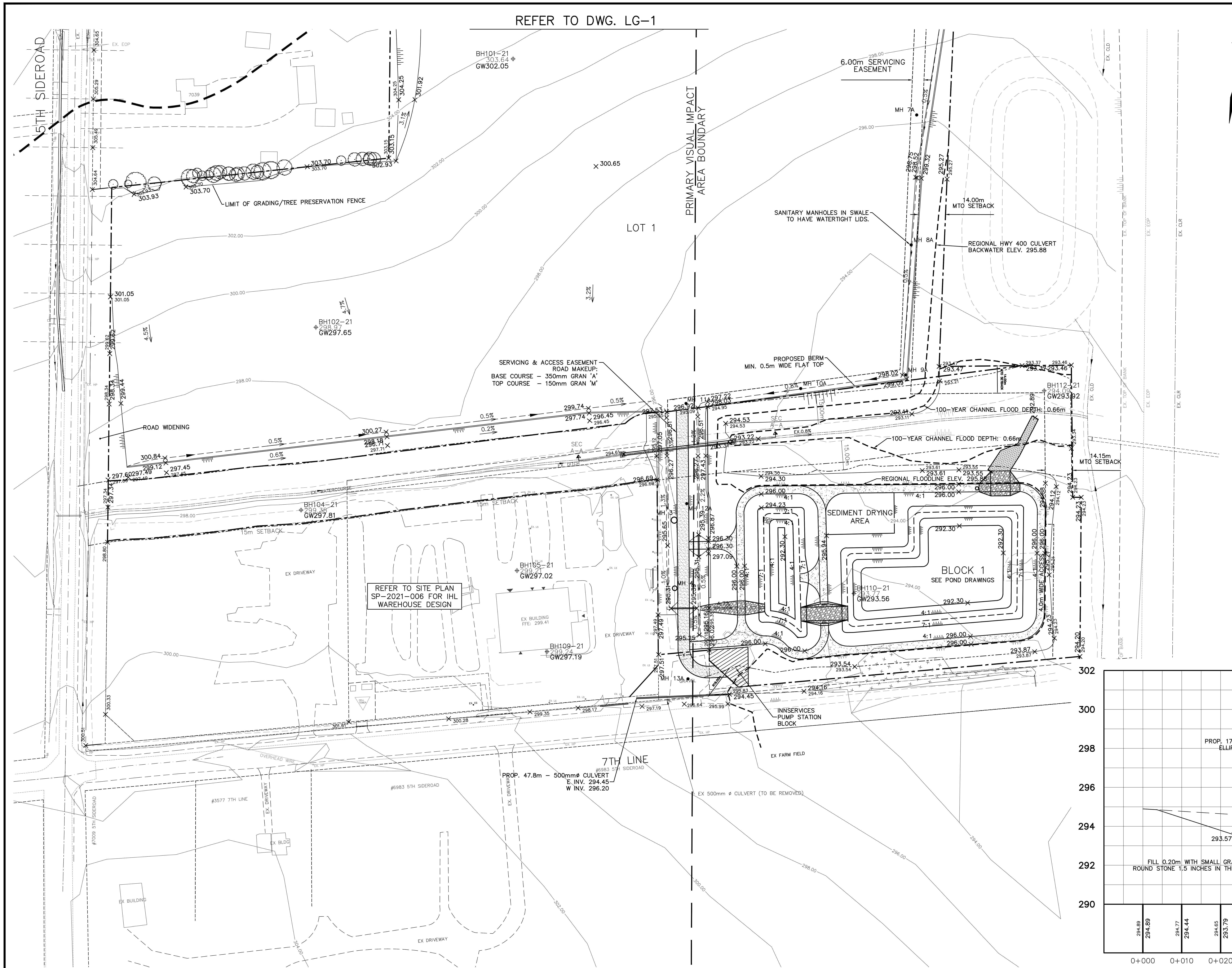
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

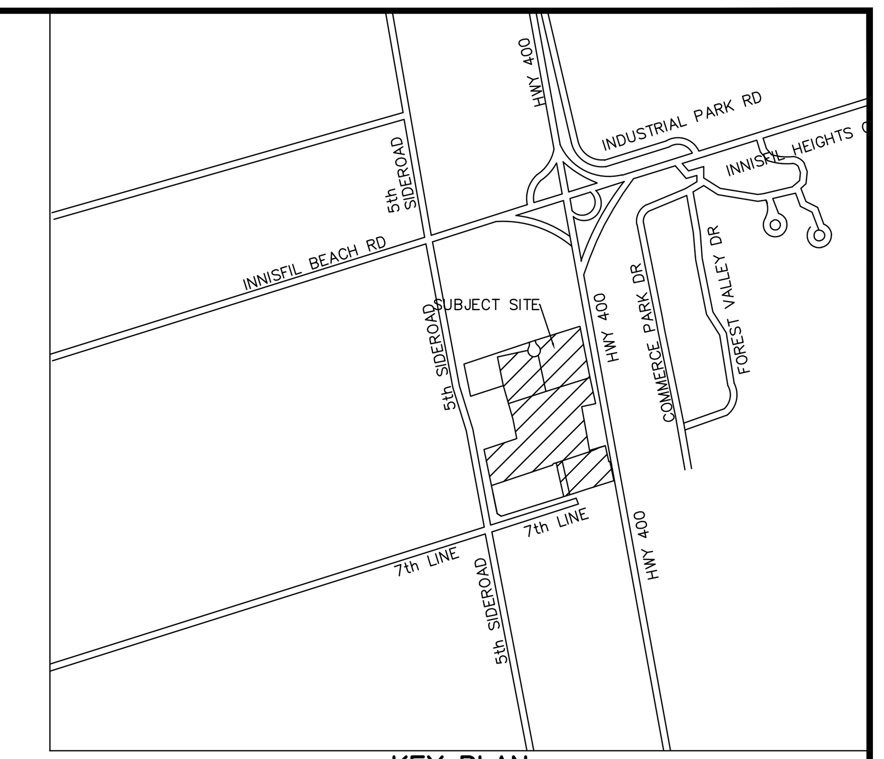
LOT GRADING PLAN
1 OF 2

TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	LG-1
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1

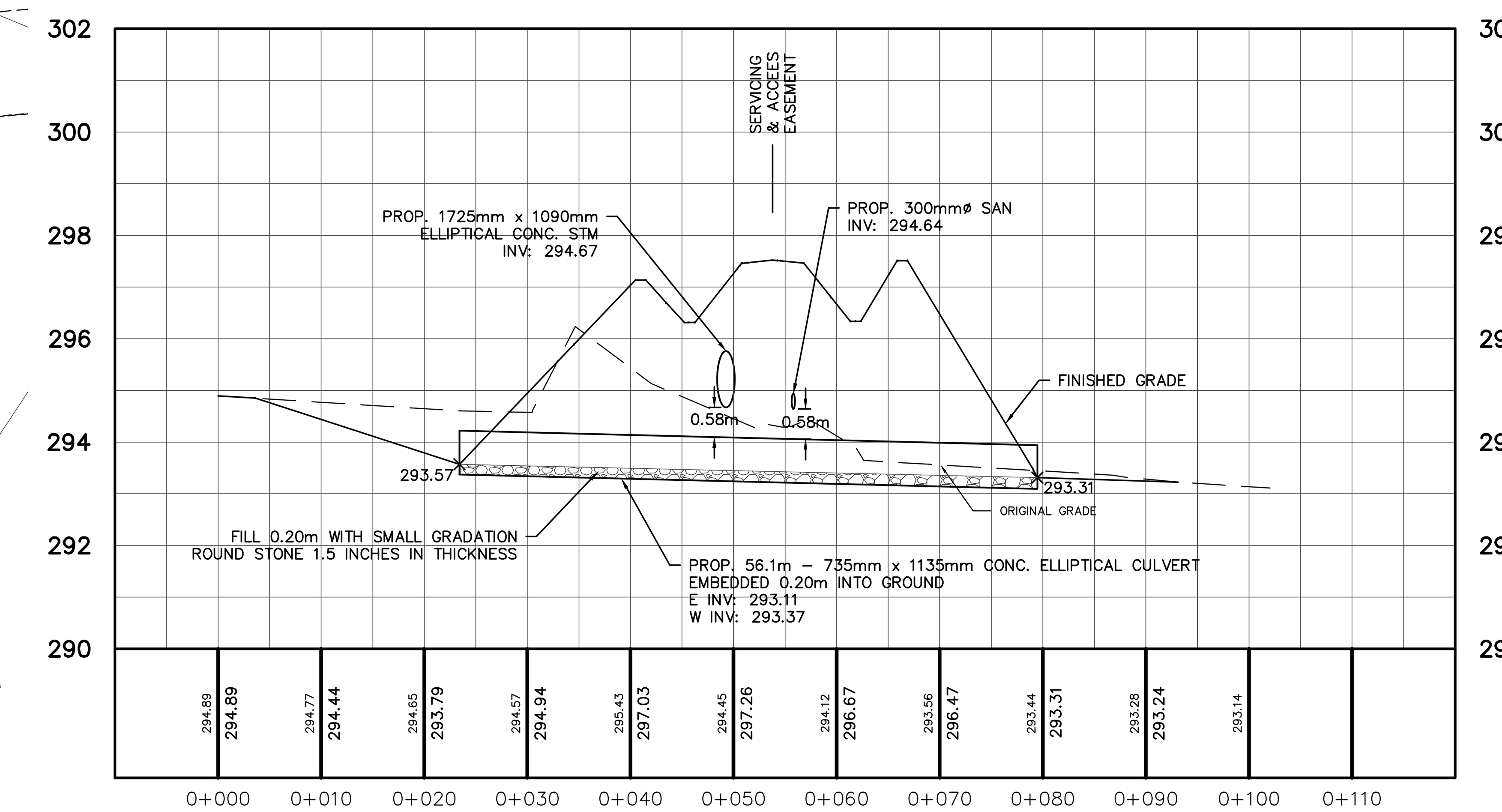




KEY PLAN
NTS

LEGEND

CB	CATCH BASIN
DCB	DOUBLE CATCH BASIN
DCBMH	DOUBLE CATCH BASIN-MANHOLE
CBMH	CATCH BASIN-MANHOLE
1	STORM MANHOLE
1A	SANITARY MANHOLE
	SERVICE CAP
H&V	FIRE HYDRANT
VB	WATER VALVE
	HYDRO TRANSFORMER
	LIGHT STANDARD
250.00 / 248.00	PROPOSED ELEVATION / EXISTING ELEVATION
0.8%	PROPOSED GRADE
	HIGH POINT
	LOW POINT
	GRADE BREAK
	PROPERTY LINE
	DRAINAGE SWALE
BH114-21 304.44 GW298.58	BOREHOLE NO. EX. GROUND ELEVATION GROUNDWATER ELEVATION AS PER CAMBIUM GROUNDWATER REPORT DATED MARCH 15, 2023
	REGIONAL HWY 400 CULVERT BACKWATER ELEV



SECTION A–A
HORIZ 1:500
VERT: 1:25

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
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BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

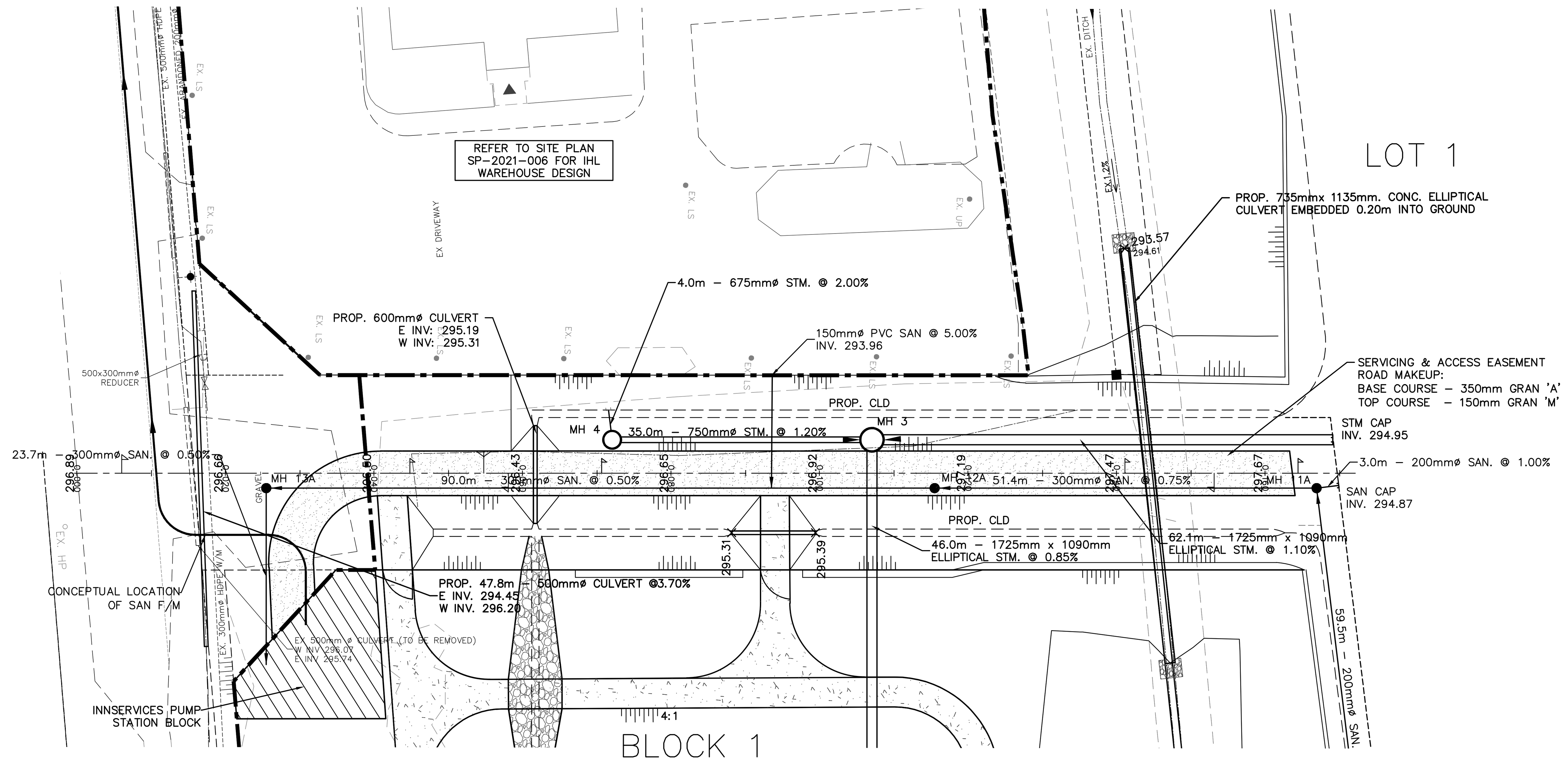
LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

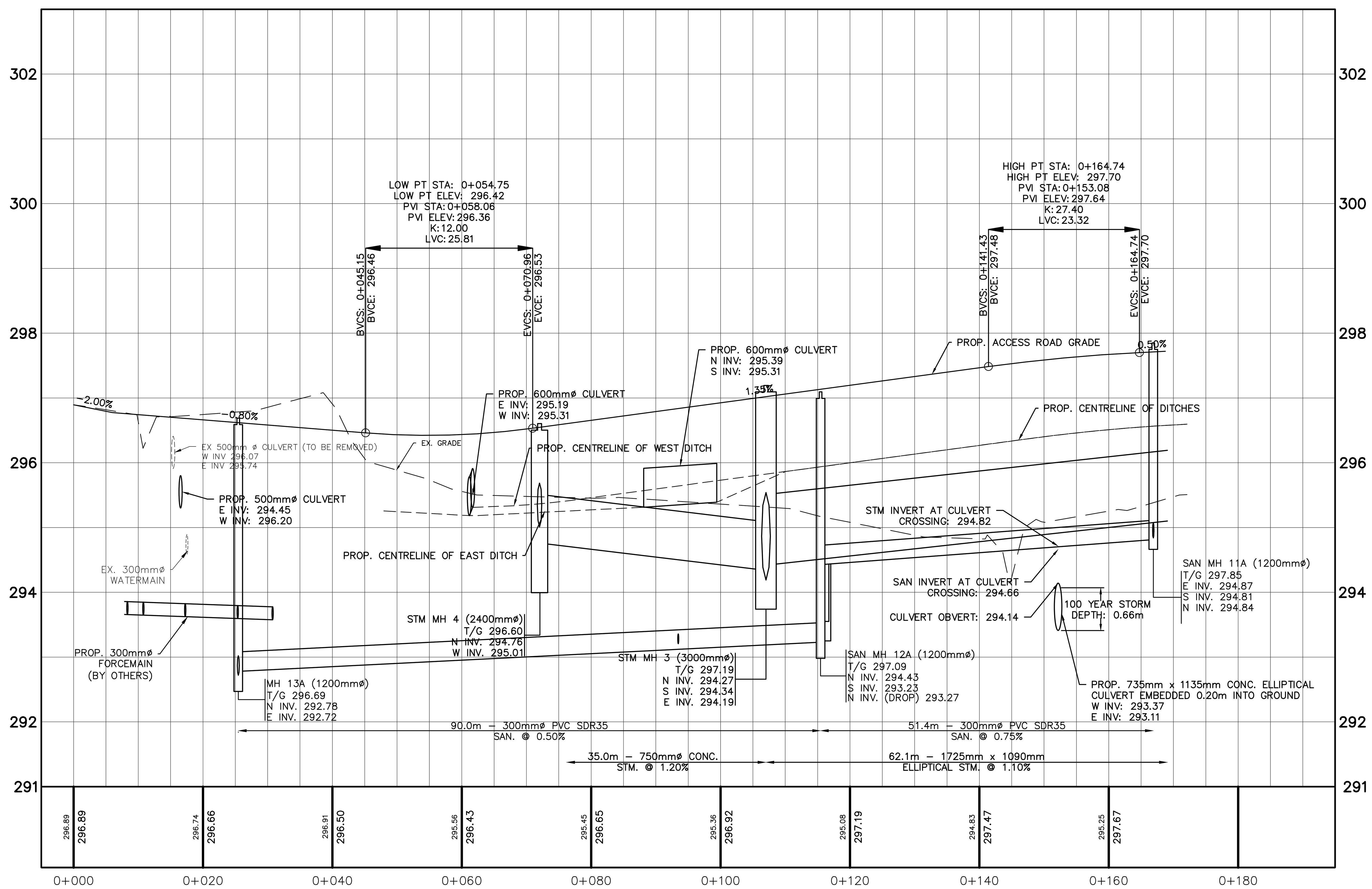
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

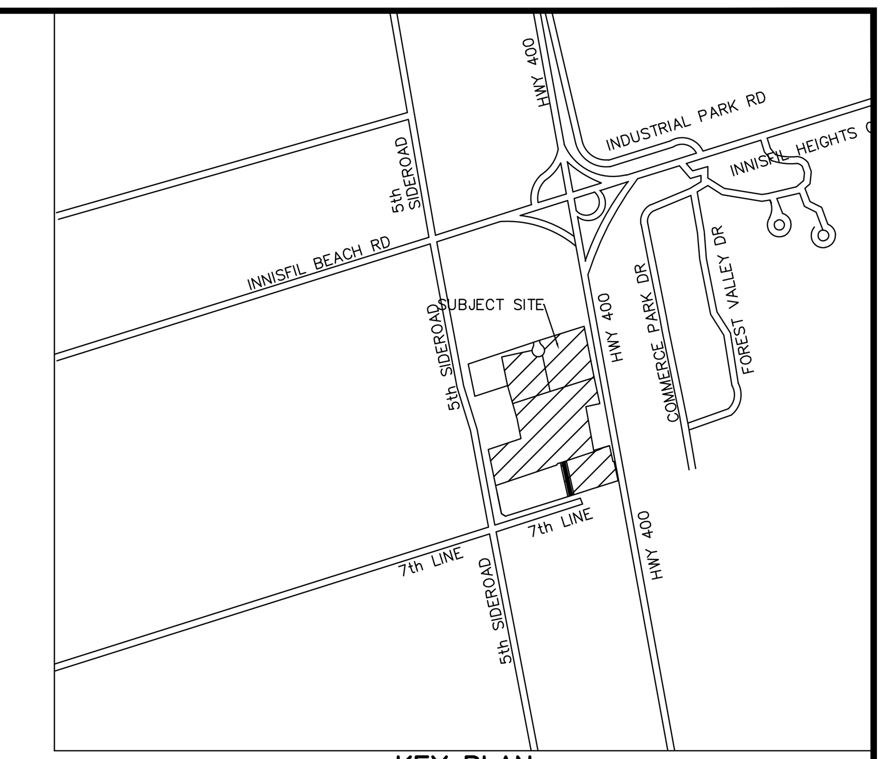
LOT GRADING PLAN
2 OF 2

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	LG-2
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1







KEY PLAN
NTS

LEGEND

- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- DCBMH — DOUBLE CATCH BASIN–MANHOLE
- CBMH — CATCH BASIN–MANHOLE
- 1 — STORM MANHOLE
- 1A — SANITARY MANHOLE
- SERVICE CAP
- H&V — FIRE HYDRANT
- VB — WATER VALVE
- HYDRO TRANSFORMER
- LIGHT STANDARD
- 250.00 / *248.00* — PROPOSED ELEVATION / *EXISTING ELEVATION*
- 0.8% — PROPOSED GRADE
- PROPERTY LINE

EXISTING SERVICES ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY EXISTING SERVICE INVERTS AND LOCATIONS PRIOR TO COMMENCEMENT OF ANY WORKS.

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
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BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

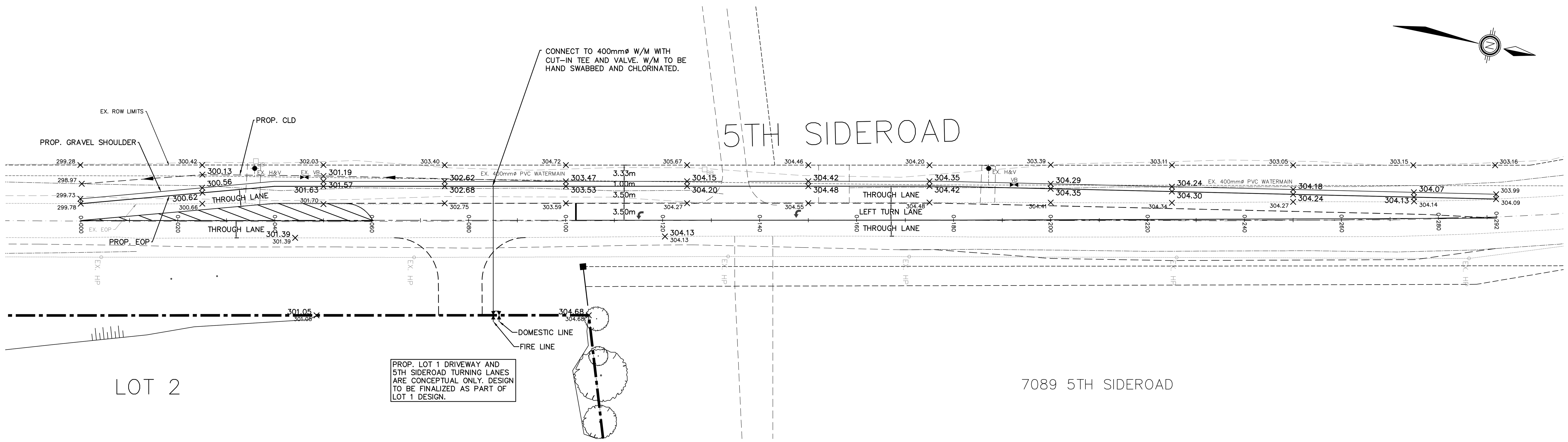
LICENSED PROFESSIONAL ENGINEER — M.W. DEJEAN — June 12, 2025 — PROVINCE OF ONTARIO

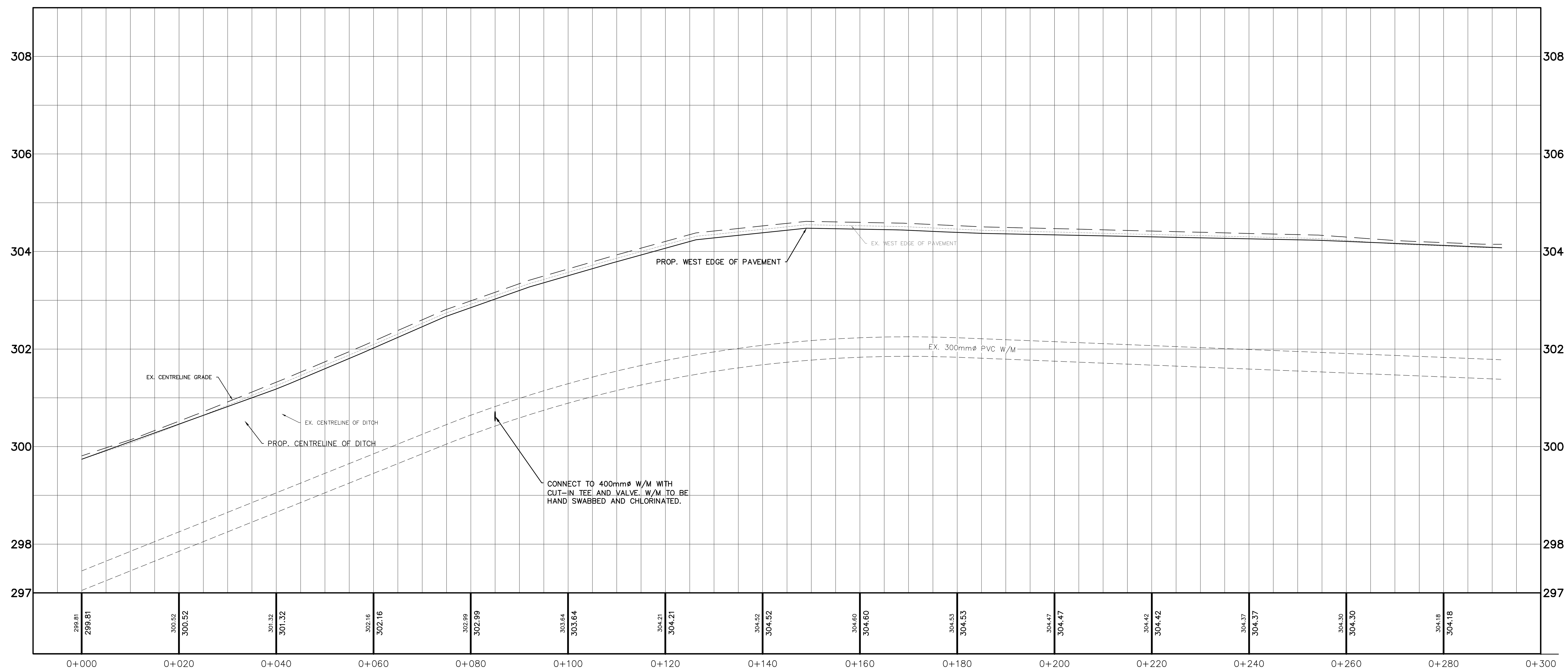
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

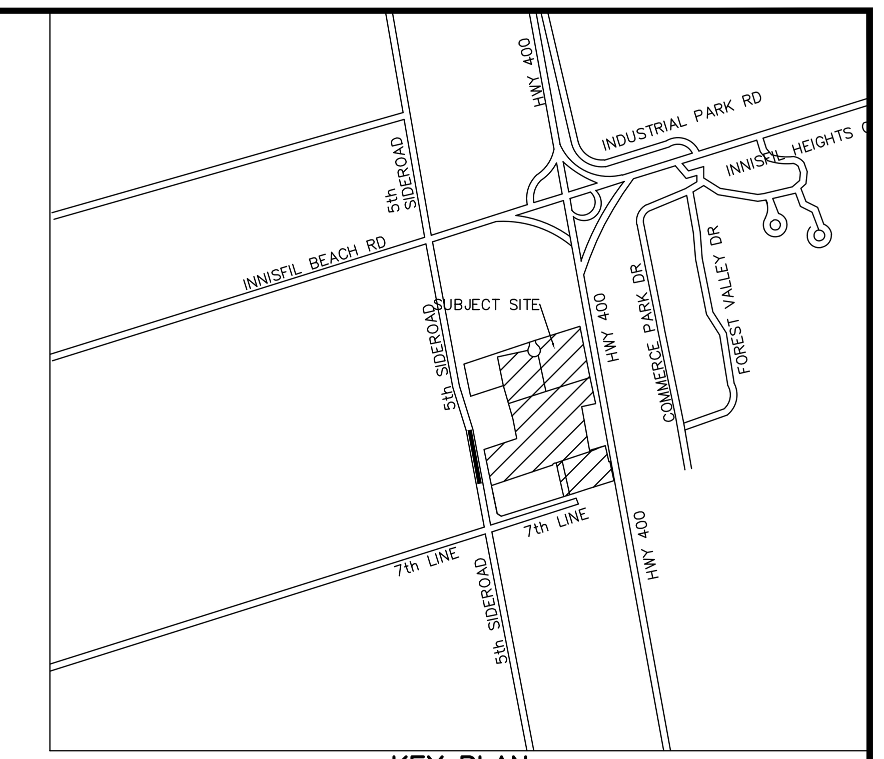
PLAN AND PROFILE
SERVICING & ACCESS EASEMENT
STA 0+000 TO 0+325.58

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	1:50	DRAWING #	PP-1
CHECKED BY	GMP/MWD	DATE	JAN. 2022	REVISION #	1







KEY PLAN
NTS

LEGEND

CB	CATCH BASIN
DCB	DOUBLE CATCH BASIN
DCBMH	DOUBLE CATCH BASIN–MANHOLE
CBMH	CATCH BASIN–MANHOLE
1	STORM MANHOLE
1A	SANITARY MANHOLE
	SERVICE CAP
H&V	FIRE HYDRANT
VB	WATER VALVE
	HYDRO TRANSFORMER
	LIGHT STANDARD
250.00 / 248.00	PROPOSED ELEVATION / EXISTING ELEVATION
0.8%	PROPOSED GRADE
	PROPERTY LINE

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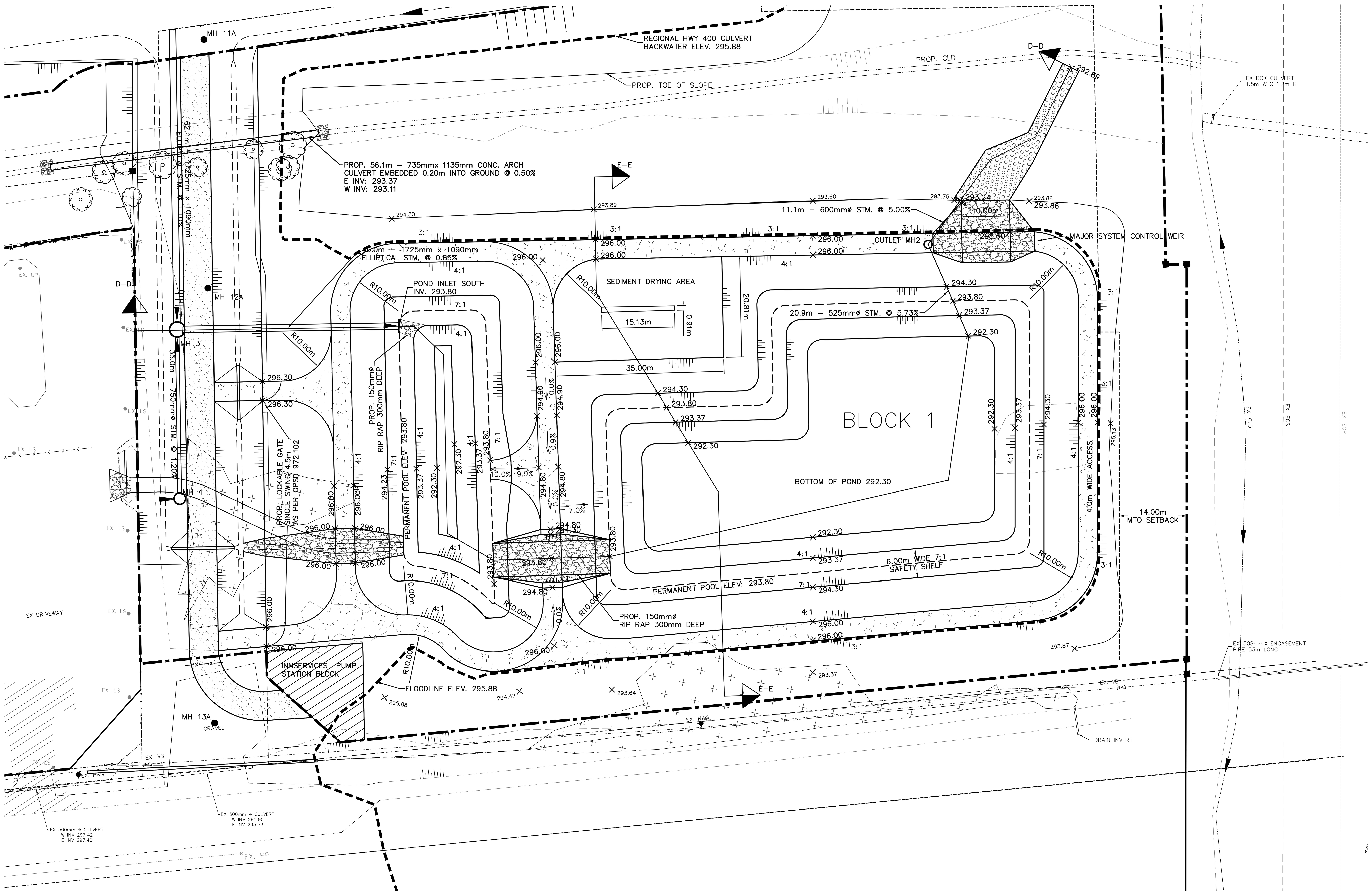
June 12, 2025
PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

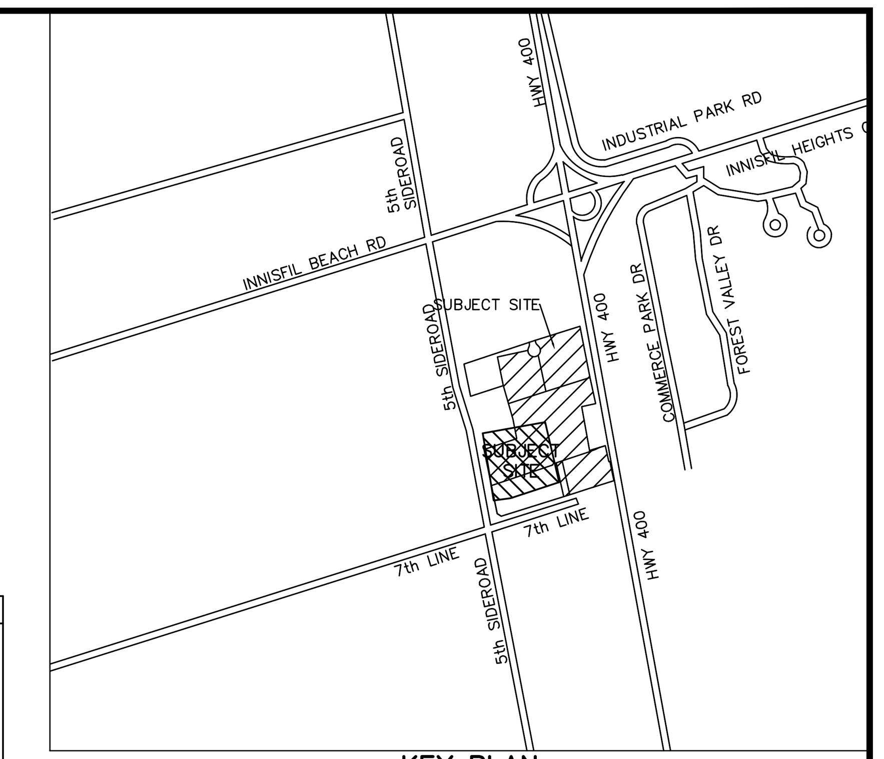
PLAN AND PROFILE
5TH SIDEROAD
STA 0+000 TO 0+291.96

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	1:50	DRAWING #	PP–2
CHECKED BY	GMP/MWD	DATE	JAN. 2022	REVISION #	1



SWM POND – SOUTH		
	ELEVATION (m)	VOLUME (m^3)
QUALITY CONTROL	293.80	4100
QUANTITY CONTROL	295.70	16700
INLET TO POND	293.80	
OUTLET TO CHANNEL	295.45	
TOP OF BERM	296.00	



KEY PLAN
NTS

LEGEND

CB	CATCH BASIN
DCB	DOUBLE CATCH BASIN
DCBMH	DOUBLE CATCH BASIN–MANHOLE
CBMH	CATCH BASIN–MANHOLE
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1A	SANITARY MANHOLE
	SERVICE CAP
H&V	FIRE HYDRANT
VB	WATER VALVE
250.00 / *248.00*	PROPOSED ELEVATION / *EXISTING ELEVATION*
0.8%	PROPOSED GRADE
	PROPERTY LINE
	REGIONAL HWY 400 CULVERT BACKWATER ELEV. 295.88

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BENCHMARK

LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

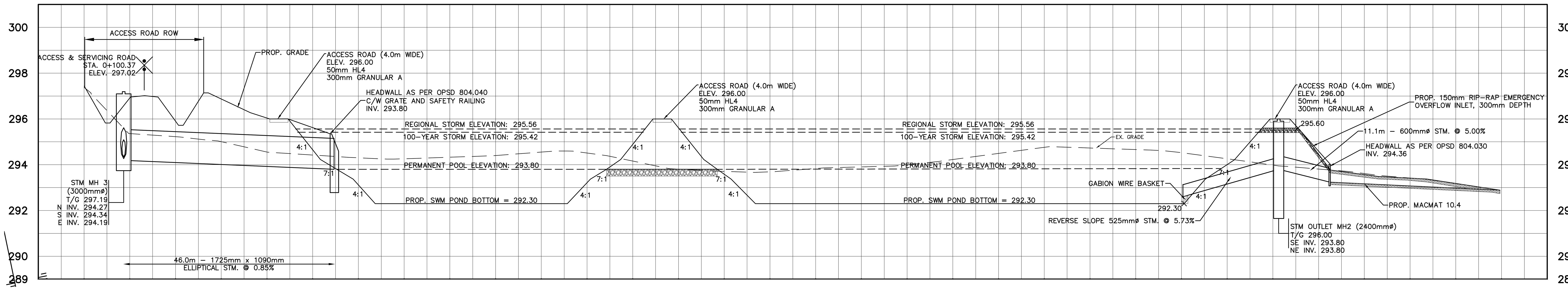
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL SUBDIVISION

SOUTH STORMWATER MANAGEMENT POND

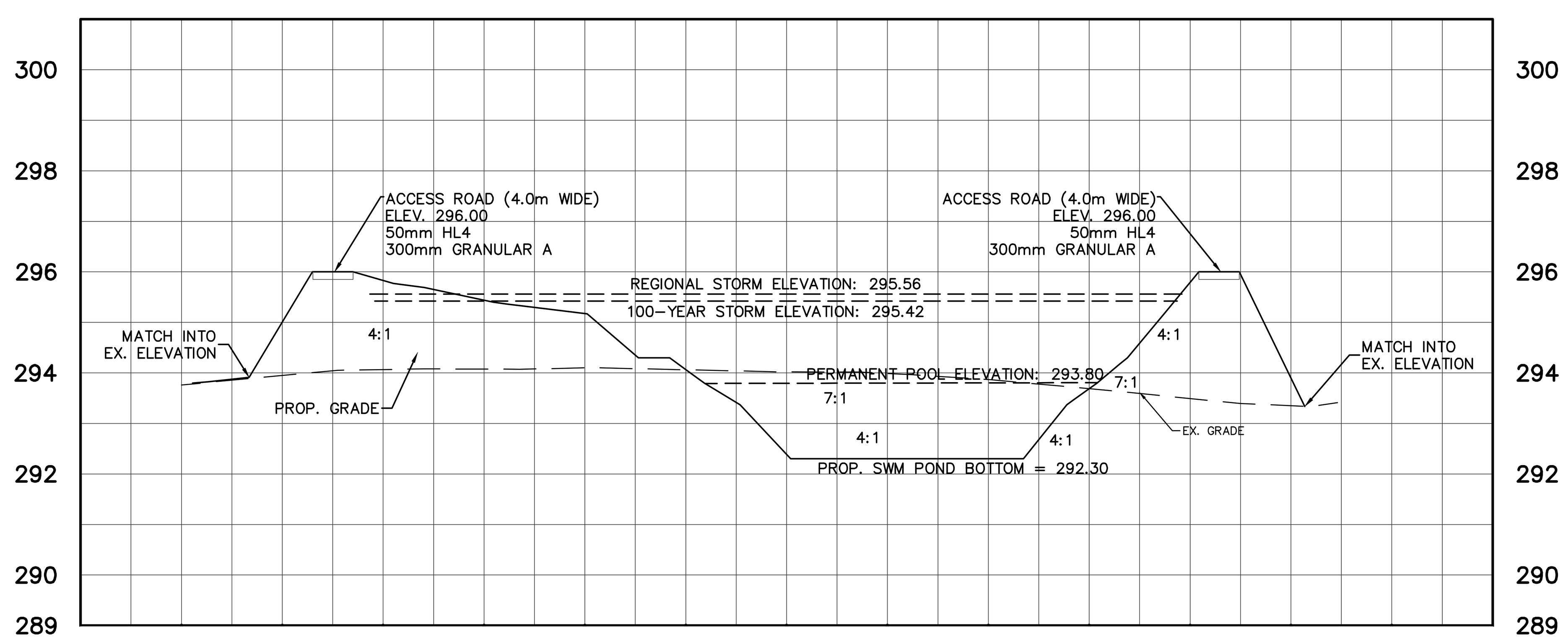
TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

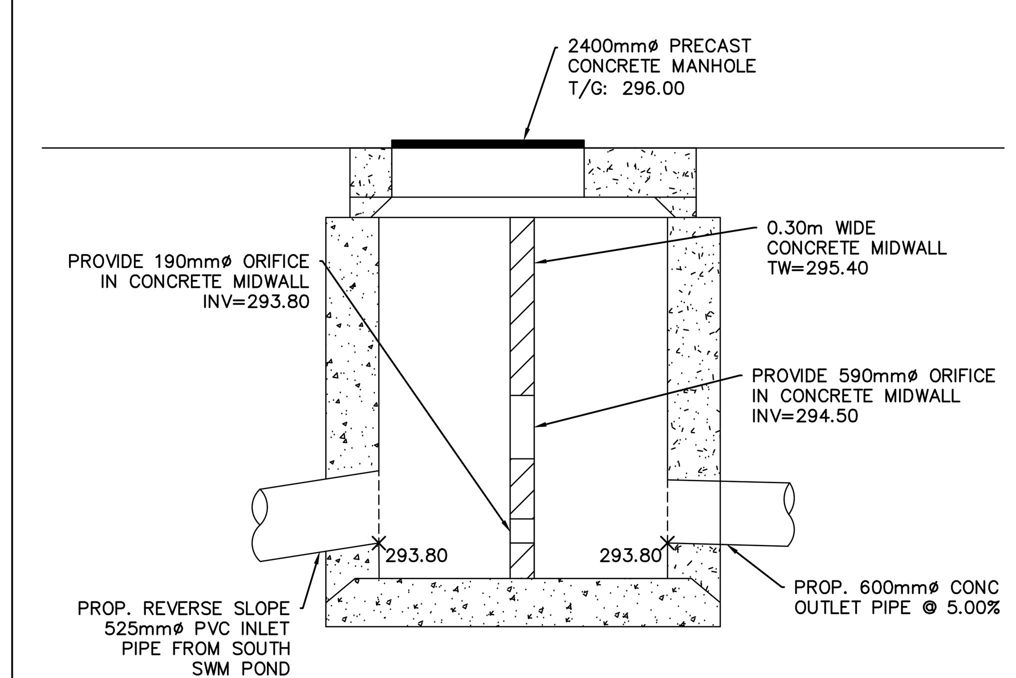
DESIGNED BY TJCA/TWC	HORIZ SCALE 1:500	PROJECT # 21042
DRAWN BY TWC	VERT SCALE	DRAWING # PND–1
CHECKED BY GMP/MWD	DATE MAY 2021	REVISION # 1



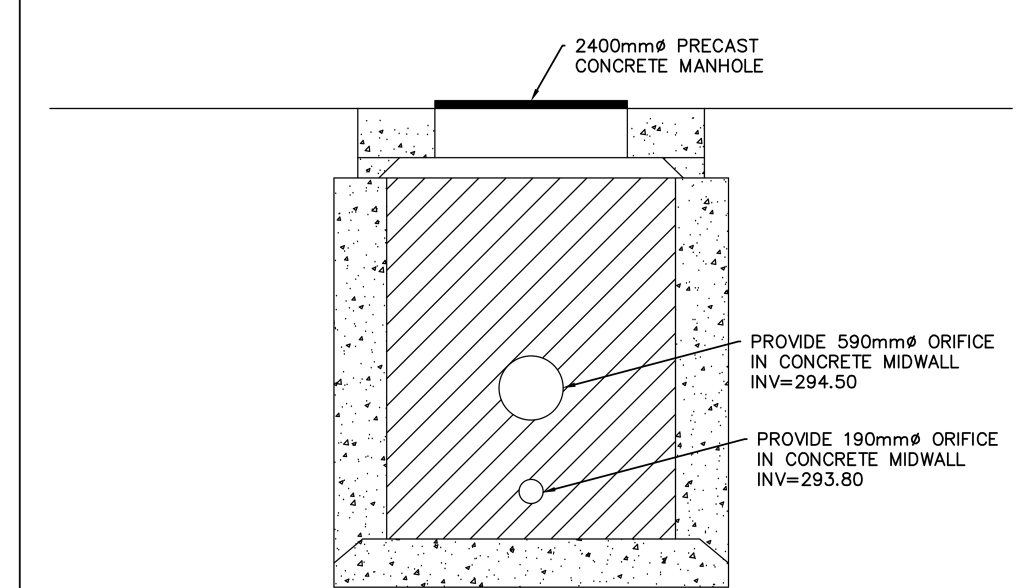
SOUTH STORMWATER MANAGEMENT POND
SECTION D–D



SOUTH STORMWATER MANAGEMENT POND
SECTION E–E



OUTLET MH2 – PROFILE VIEW
SCALE: NTS



OUTLET MH2 – MIDWALL SECTION VIEW
SCALE: NTS

NO.	REVISION NOTE	DATE	BY
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M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

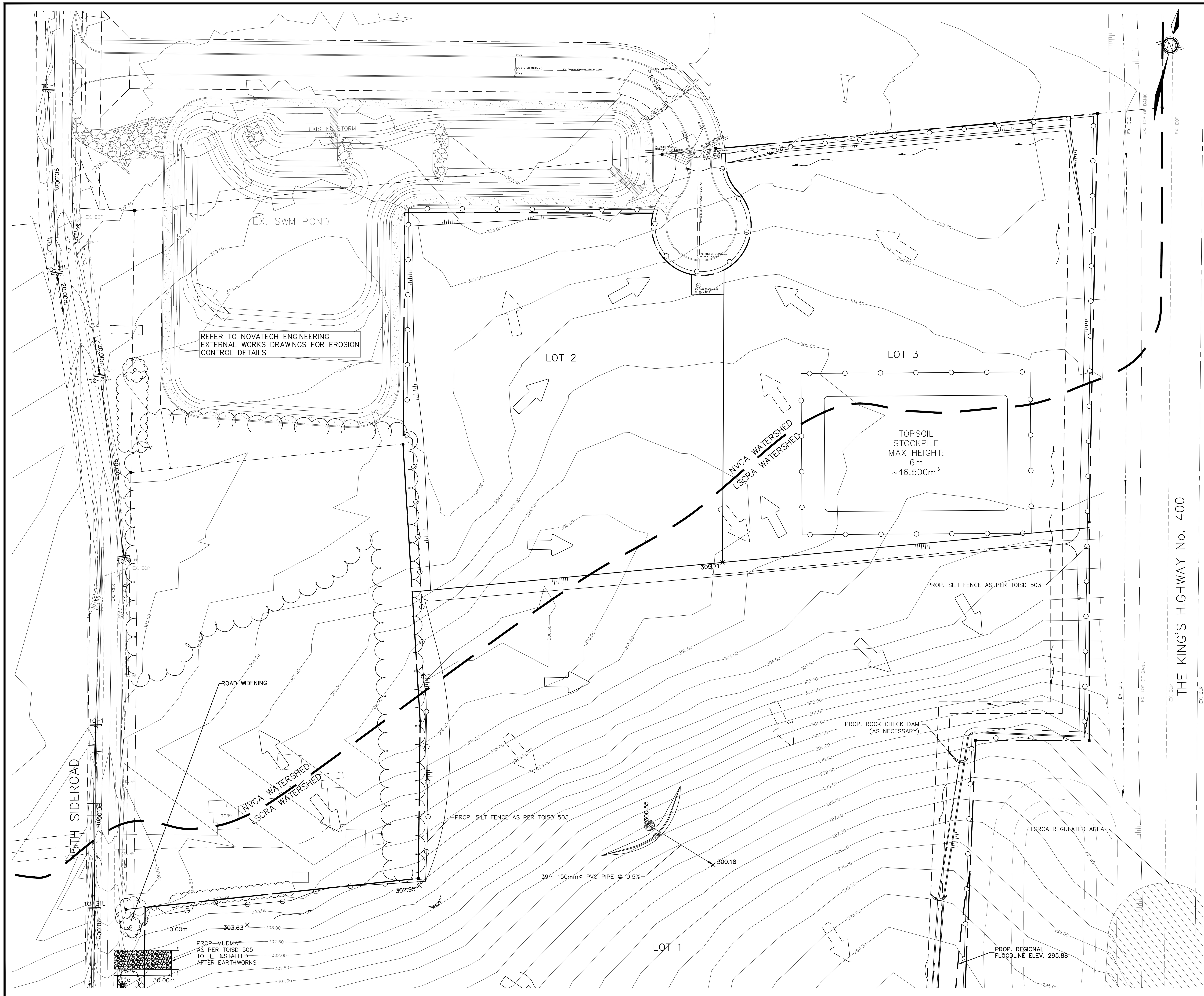
7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL SUBDIVISION

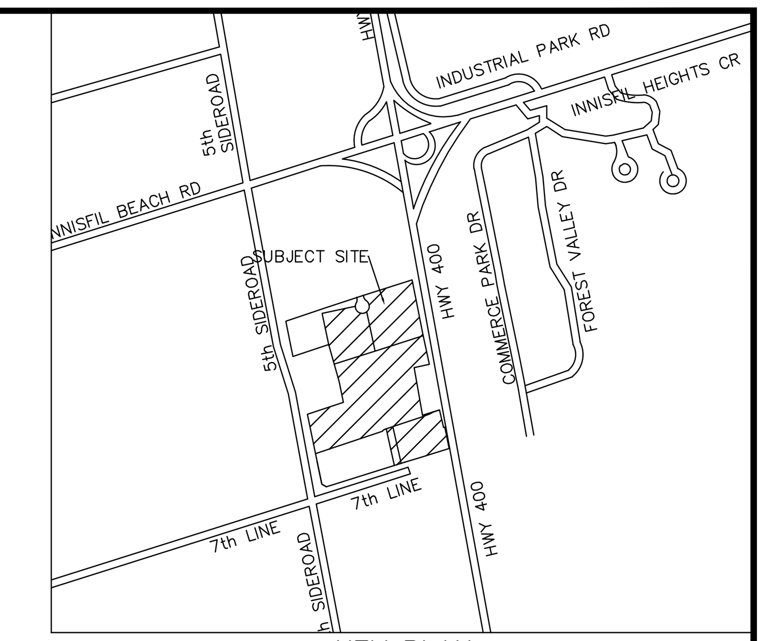
SOUTH STORMWATER MANAGEMENT POND CROSS–SECTIONS

TOWN OF INNISFIL APPLICATION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE	1:100	DRAWING #	PND–2
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1





KEY PLAN
NTS

SEQUENCE OF CONSTRUCTION

1. ENGINEER TO BE NOTIFIED PRIOR TO INITIATION OF ANY ON SITE WORKS.
2. SILT FENCE AS PER DETAIL TOISD 503. CONSTRUCTION ACCESS MATS, SWALE, AND CHECK DAMS AS PER CITY STANDARD ARE TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS ONSITE.
3. VEGETATION REMOVAL MAY COMMENCE AFTER ALL SILT FENCE IS INSTALLED AND APPROVED BY THE ENGINEER.
4. EROSION CONTROL MEASURES TO BE MAINTAINED AS DIRECTED BY THE ENGINEER DURING THE CONSTRUCTION PERIOD. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
5. ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED WITH SEED, SOD, MULCH OR OTHER ADEQUATE COVERING, AS INSTRUCTED BY THE ENGINEER.
6. SILT FENCE IS TO BE MAINTAINED UNTIL SITE IS VEGETATED OR APPROVAL IS GIVEN FROM THE TOWN OF INNISFIL.

CONSTRUCTION NOTES FOR SEDIMENT & EROSION CONTROL

1. DISTURBED AREAS THAT HAVE FAILED TO HAVE STABLE GROUND COVER ESTABLISHED SHALL BE PROTECTED WITH A SILTATION CONTROL FENCE OR STRAW MULCH ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION BECOMES ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
2. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE ADMINISTRATOR.
3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR. SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S SUGGESTED SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK, AND AFTER EVERY RAINFALL EVENT.
5. MUD MATS AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. MUD MATS SHALL BE CONSTRUCTED IN ACCORDANCE TO TOWNSHIP STANDARDS.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 577, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS WELL AS ALL APPLICABLE MUNICIPAL STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METERS ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. CONTRACTOR IS RESPONSIBLE FOR MUD TRACKING PREVENTION AND MAINTENANCE ON ADJACENT ROADWAYS.
10. ANY NATIVE SOIL EXPOSED FOR MORE THAN 30 DAYS SHOULD BE SEEDED WITH NATIVE MIX.
11. ANY TOPSOIL STOCK PILES TO HAVE SLOPES OF 2 TO 1.
12. THE SITE TRAILER LOCATION, EQUIPMENT STORAGE, REFUELING AREA AND HYDROCARBON STORAGE ARE TO BE LOCATED OUTSIDE OF THE REGULATED AREA LIMIT.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR CLEAN-UP AND RESTORATION, INCLUDING ALL COSTS, DUE TO RELEASE OF SEDIMENT FROM THE SITE.
14. MECP SPILLS ACTION CENTRE: 1-866-663-8477.

SILT FENCING TO BE USED AROUND AREAS OF INFILTRATION AS PER TOISD 503. FENCING TO REMAIN DURING ALL CONSTRUCTION AND ONLY TO BE REMOVED PRIOR TO ASPHALT PLACEMENT.

NO WORKS SHALL COMMENCE WITHIN THE REGULATED LIMITS UNTIL SUCH TIME THAT A FILL PERMIT IS ISSUED BY THE LSRCA.

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

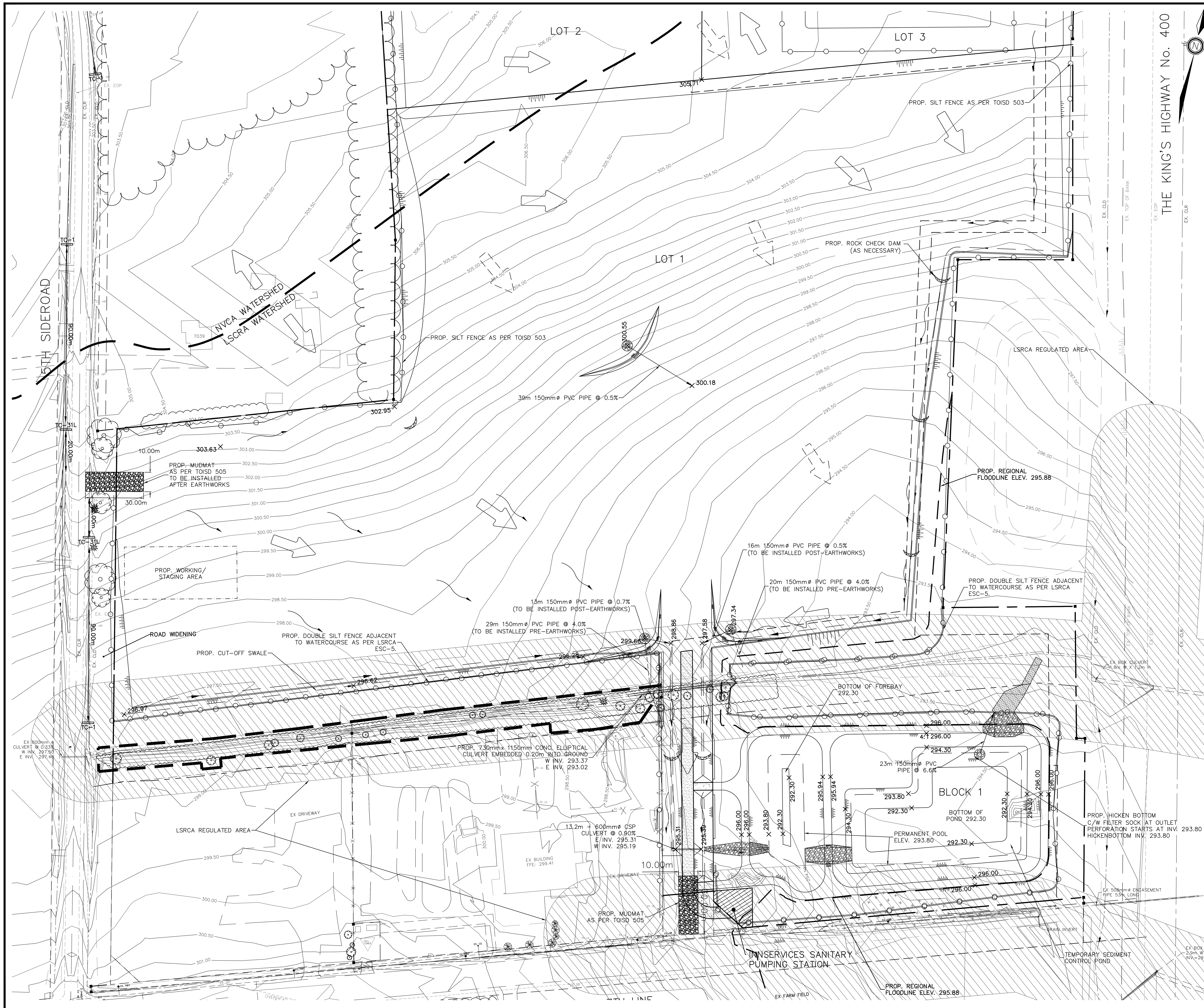
LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

EROSION AND SEDIMENT CONTROL PLAN
NORTH

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	EP-1
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1



TEMPORARY SEDIMENT POND DESIGN:

CATCHMENT AREA
17.51ha

REQUIRED WET POND VOLUME
125m³ PER HECTARE
17.51ha x 125m³
TOTAL REQUIRED VOLUME = 2189m³

PROVIDED WET POND VOLUME
MAIN POND + FOREBAY = TOTAL VOLUME
3421m³ + 724m³ = 4145m³

REQUIRED ACTIVE STORAGE VOLUME
125m³ PER HECTARE
17.51ha x 125m³
TOTAL REQUIRED VOLUME = 2189m³

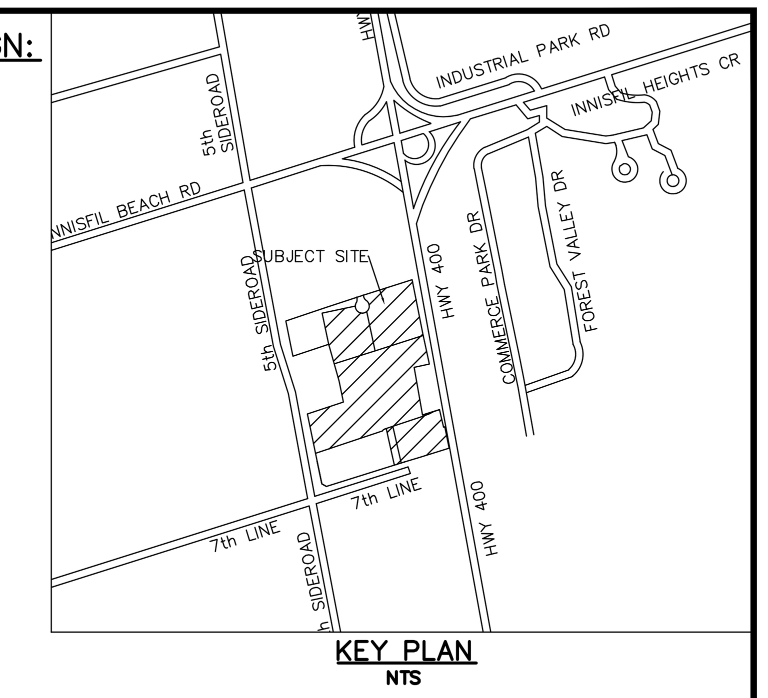
PROVIDED ACTIVE STORAGE VOLUME
MAIN POND + FOREBAY = TOTAL VOLUME
9656m³ + 3834m³ = 13490m³

WET POND DEPTH
MAIN POND = 1.50m
FOREBAY = 1.50m

ACTIVE STORAGE DEPTH
MAIN POND = 1.60m
FOREBAY = 1.60m

MAXIMUM FOREBAY VOLUME
MAXIMUM ALLOWABLE VOLUME ≤33% OF PERMANENT POOL
4145m³ x 33% = 1382m³
FOREBAY VOLUME = 724m³

DRAWDOWN CALCULATIONS
ELEVATION OF PERM. POOL = 1.50m
ACTIVE STORAGE ELEVATION = 1.60m
SIZE OF ORIFICE = 150mmø
DRAWDOWN TIME = 37 hrs



KEY PLAN
NTS

LEGEND

- EROSION CONTROL ROAD CROSSING CULVERT
- DRAINAGE SLOPE & DIRECTION
- PROPOSED DRAINAGE FLOW
- EXISTING DRAINAGE FLOW
- 150mm RIPRAP
- TEMPORARY SILT FENCE (SEE DETAIL ON DWG. ND-2)
- ROCK CHECK DAM
- PROPERTY LINE
- LSRCA REGULATED AREA

SEQUENCE OF CONSTRUCTION

1. ENGINEER TO BE NOTIFIED PRIOR TO INITIATION OF ANY ON SITE WORKS.
2. SILT FENCE AS PER DETAIL TOISD 503. CONSTRUCTION ACCESS MATS, SWALE, AND CHECK DAMS AS PER CITY STANDARD ARE TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS ONSITE.
3. VEGETATION REMOVAL MAY COMMENCE AFTER ALL SILT FENCE IS INSTALLED AND APPROVED BY THE ENGINEER.
4. EROSION CONTROL MEASURES TO BE MAINTAINED AS DIRECTED BY THE ENGINEER DURING THE CONSTRUCTION PERIOD. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
5. ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED WITH SEED, SOD, MULCH OR OTHER ADEQUATE COVERING, AS INSTRUCTED BY THE ENGINEER.
6. SILT FENCE IS TO BE MAINTAINED UNTIL SITE IS VEGETATED OR APPROVAL IS GIVEN FROM THE TOWN OF INNISFIL.

CONSTRUCTION NOTES FOR SEDIMENT & EROSION CONTROL

1. DISTURBED AREAS THAT HAVE FAILED TO HAVE STABLE GROUND COVER ESTABLISHED SHALL BE PROTECTED WITH A SILTATION CONTROL FENCE OR STRAW MULCH ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION BECOMES ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
2. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE ADMINISTRATOR.
3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR. SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S SUGGESTED SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK, AND AFTER EVERY RAINFALL EVENT.
5. MUD MATS AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. MUD MATS SHALL BE CONSTRUCTED IN ACCORDANCE TO TOWNSHIP STANDARDS.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 577, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS WELL AS ALL APPLICABLE MUNICIPAL STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METERS ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. CONTRACTOR IS RESPONSIBLE FOR MUD TRACKING PREVENTION AND MAINTENANCE ON ADJACENT ROADWAYS.
10. ANY NATIVE SOIL EXPOSED FOR MORE THAN 30 DAYS SHOULD BE SEEDED WITH NATIVE MIX.
11. ANY TOPSOIL STOCK PILES TO HAVE SLOPES OF 2 TO 1.
12. THE SITE TRAILER LOCATION, EQUIPMENT STORAGE, REFUELING AREA AND HYDROCARBON STORAGE ARE TO BE LOCATED OUTSIDE OF THE REGULATED AREA LIMIT.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR CLEAN-UP AND RESTORATION, INCLUDING ALL COSTS, DUE TO RELEASE OF SEDIMENT FROM THE SITE.
14. MECP SPILLS ACTION CENTRE: 1-866-663-8477.

SILT FENCING TO BE USED AROUND AREAS OF INFILTRATION AS PER TOISD 503. FENCING TO REMAIN DURING ALL CONSTRUCTION AND ONLY TO BE REMOVED PRIOR TO ASPHALT PLACEMENT.

NO WORKS SHALL COMMENCE WITHIN THE REGULATED LIMITS UNTIL SUCH TIME THAT A FILL PERMIT IS ISSUED BY THE LSRCA.

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

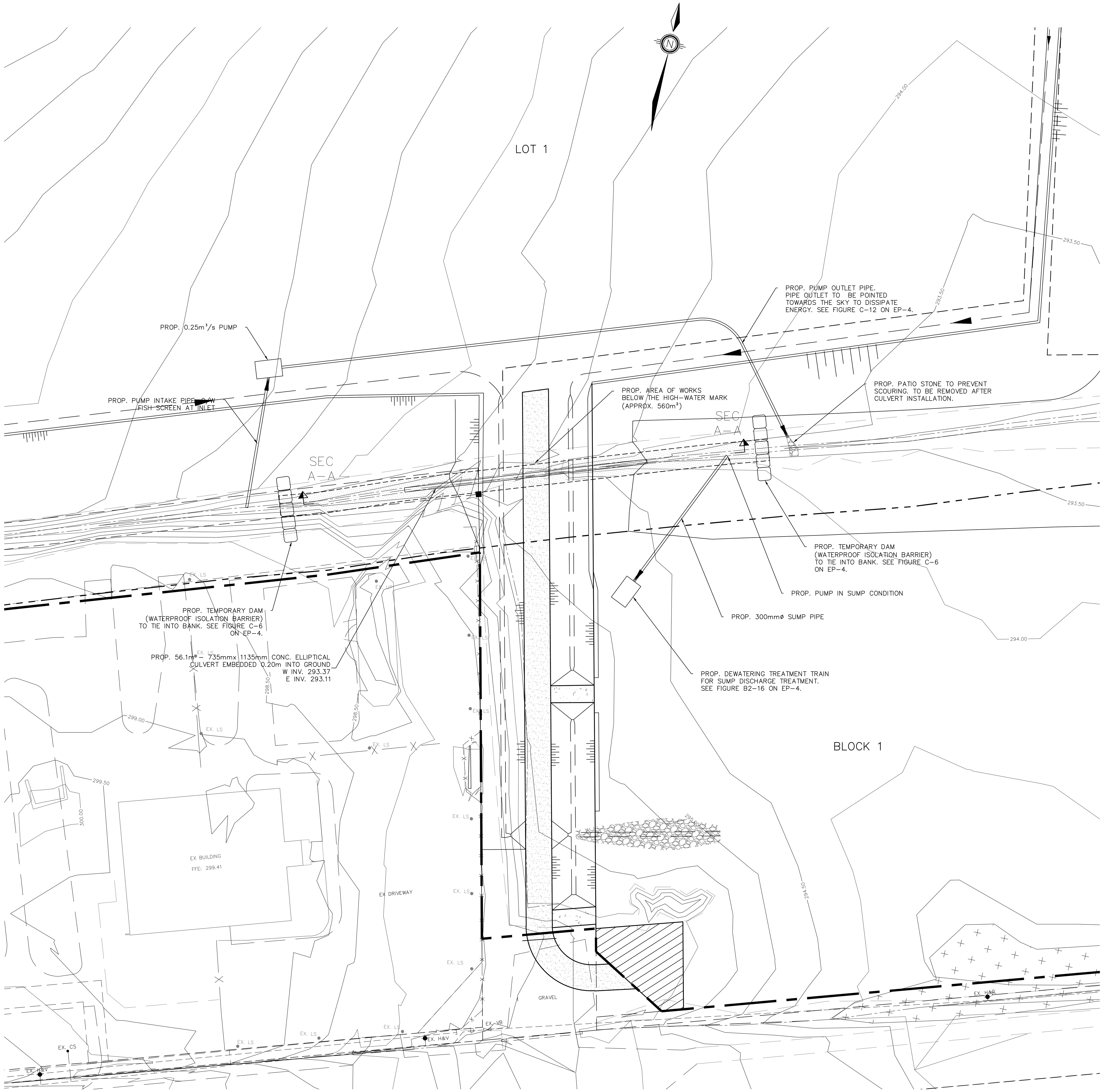
LICENCED PROFESSIONAL ENGINEER M.W. DEJEAN June 12, 2025 PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

EROSION AND SEDIMENT CONTROL PLAN SOUTH

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1000	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	EP-2
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1



SEQUENCE OF CONSTRUCTION

1. ENGINEER TO BE NOTIFIED PRIOR TO INITIATION OF ANY ON SITE WORKS.
2. SILT FENCE AS PER DETAIL TOISD 503. CONSTRUCTION ACCESS MATS, SWALE, AND CHECK DAMS AS PER CITY STANDARD ARE TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS ONSITE.
3. VEGETATION REMOVAL MAY COMMENCE AFTER ALL SILT FENCE IS INSTALLED AND APPROVED BY THE ENGINEER.
4. EROSION CONTROL MEASURES TO BE MAINTAINED AS DIRECTED BY THE ENGINEER DURING THE CONSTRUCTION PERIOD. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
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CONSTRUCTION NOTES FOR SEDIMENT & EROSION CONTROL

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3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR. SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S SUGGESTED SPECIFICATIONS.
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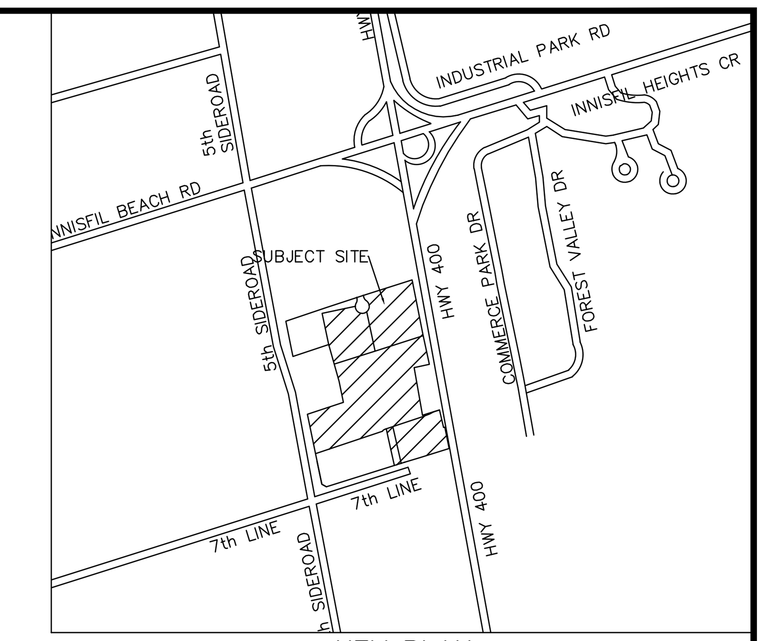
5. MUD MATS AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. MUD MATS SHALL BE CONSTRUCTED IN ACCORDANCE TO TOWNSHIP STANDARDS.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 577, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS WELL AS ALL APPLICABLE MUNICIPAL STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METERS ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. CONTRACTOR IS RESPONSIBLE FOR MUD TRACKING PREVENTION AND MAINTENANCE ON ADJACENT ROADWAYS.
10. ANY NATIVE SOIL EXPOSED FOR MORE THAN 30 DAYS SHOULD BE SEEDED WITH NATIVE MIX.
11. ANY TOPSOIL STOCK PILES TO HAVE SLOPES OF 2 TO 1.
12. THE SITE TRAILER LOCATION, EQUIPMENT STORAGE, REFUELING AREA AND HYDROCARBON STORAGE ARE TO BE LOCATED OUTSIDE OF THE REGULATED AREA LIMIT.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR CLEAN-UP AND RESTORATION, INCLUDING ALL COSTS, DUE TO RELEASE OF SEDIMENT FROM THE SITE.
14. MECP SPILLS ACTION CENTRE: 1-866-663-8477.

ENVIRONMENTAL NOTES

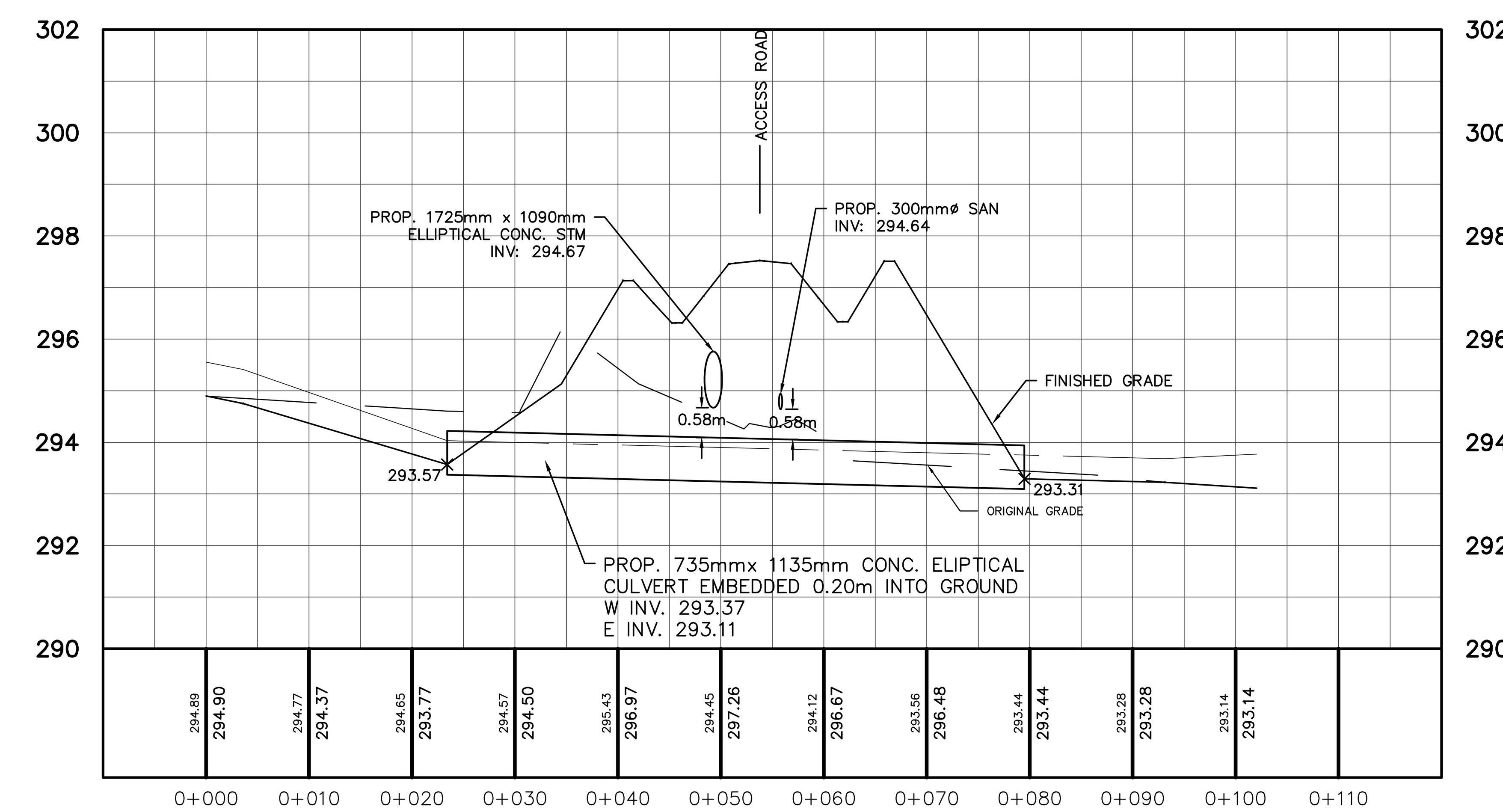
1. ENSURE THAT ANY APPROVALS, LICENCES, AND PERMITS THAT ARE NECESSARY ARE SECURED PRIOR TO COMMENCING APPLICABLE CONSTRUCTION ACTIVITIES, AND THAT ALL NOTIFICATIONS RELATED TO THE APPROVALS, LICENCES, AND PERMITS ARE PROVIDED AS REQUIRED.
2. ALL WORK BELOW THE HIGH-WATER MARK SHOULD BE COMPLETED IN ISOLATION OF FLOWS, TO FACILITATE WORK 'IN THE DRY'.
3. IF WATER IS PRESENT AT THE TIME OF THE RELOCATION, THE WORK AREA SHOULD BE ISOLATED USING COFFERDAMS AND DEWATERED TO FACILITATE WORK IN THE DRY. A QUALIFIED AQUATIC ECOLOGIST SHOULD BE ON-SITE DURING THE INSTALLATION OF THE ISOLATION TO ENSURE ACTIVITIES DO NOT ADVERSELY IMPACT THE AQUATIC ENVIRONMENT.
4. PRIOR TO ANY DEWATERING ACTIVITIES, A FISH SALVAGE SHOULD BE CONDUCTED BY A QUALIFIED AQUATIC ECOLOGIST UNDER A LICENSE TO COLLECT FISH FOR SCIENTIFIC PURPOSES (LCFSP) ISSUED BY MNRF.
5. A PUMP BY-PASS SYSTEM SHALL BE INSTALLED TO DIVERT FLOWS AROUND THE PROJECT SITE DURING CONSTRUCTION. DEWATERING DISCHARGE HOSES WILL BE DIRECTED TO A SILT BAG DESIGNED TO LIMIT FINE SEDIMENT INPUT, AND DIRECTED TO AN AREA 30 M FROM THE WATERCOURSE OR INTO A VEGETATED AREA. ALL PUMP INTAKES WILL BE FITTED WITH SUITABLY SIZED SCREENING TO PREVENT ENTRAINMENT AND IMPINGEMENT OF FISH.
6. ANY EQUIPMENT, MACHINERY, OR TOOLS USED IN OR IMMEDIATELY ADJACENT TO THE WATER SHOULD BE CLEAN AND MAINTAINED IN GOOD REPAIR. ALL MACHINERY SHOULD BE INSPECTED FOR FLUID LEAKS OR OTHER POTENTIAL POLLUTANTS.
7. IN-WATER WORK SHOULD BE COMPLETED WITHIN THE APPROPRIATE IN-WATER TIMING WINDOWS TO RESPECT SENSITIVE LIFE STAGES OF THE AQUATIC COMMUNITY, INCLUDING FISH. THE APPLICABLE TIMING WINDOW FOR THE PROPOSED WORK IS JULY 16 TO SEPTEMBER 30 (INCLUSIVE) OF ANY GIVEN YEAR, AS PER MNRF GUIDELINES.



KEY PLAN
NTS

LEGEND

	EROSION CONTROL ROAD CROSSING CULVERT
5%	DRAINAGE SLOPE & DIRECTION
	PROPOSED DRAINAGE FLOW
	EXISTING DRAINAGE FLOW
	150mm RIPRAP
	TEMPORARY SILT FENCE (SEE DETAIL ON DWG. ND-2)
	ROCK CHECK DAM
	PROPERTY LINE
	AREA OF WORKS BELOW THE HIGH-WATER MARK



SECTION A-A
HORIZ 1:500
VERT: 1:25

SILT FENCING TO BE USED AROUND AREAS OF INFILTRATION AS PER TOISD 503. FENCING TO REMAIN DURING ALL CONSTRUCTION AND ONLY TO BE REMOVED PRIOR TO ASPHALT PLACEMENT.

NO WORKS SHALL COMMENCE WITHIN THE REGULATED LIMITS UNTIL SUCH TIME THAT A FILL PERMIT IS ISSUED BY THE LSRCA.

TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

LICENCED PROFESSIONAL ENGINEER
M.W. DEJEAN
June 12, 2025
PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

EROSION AND SEDIMENT CONTROL PLAN
TEMPORARY WATERCOURSE DIVERSION

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

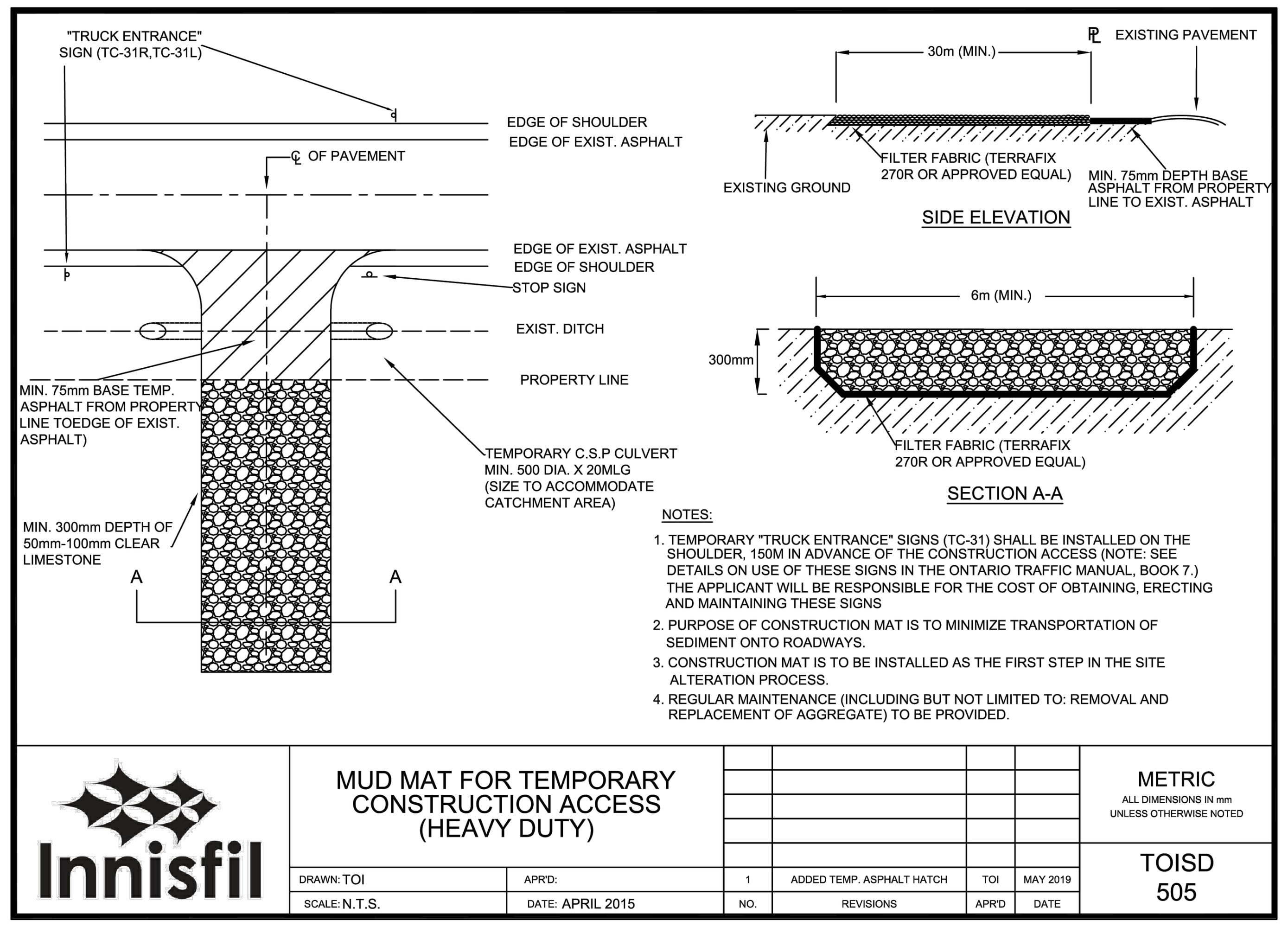
DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	EP-3
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL SEDIMENT CONTROL MEASURES SUCH AS SEDIMENT CONTROL FENCE, TEMPORARY PONDS, CONSTRUCTION ACCESS MATS, SEDIMENT TRAPS, SWALES AND CHECK DAMS MUST BE INSTALLED PRIOR TO THE COMMENCEMENT OF SITE WORKS.
2. SEDIMENT CONTROLS SHOULD BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY SIGNIFICANT RAINFALL EVENT. REPAIRS TO ESC MEASURES MUST BE COMPLETED IN A TIMELY MANNER TO PREVENT SEDIMENT MIGRATION.
3. ADDITIONAL MATERIALS SUCH AS CLEAR STONE, FILTER FABRIC, PUMPS, HOSES AND SILTSOXX TO BE KEPT ONSITE AT ALL TIMES FOR CONDUCTING REPAIRS TO SEDIMENT CONTROL MEASURES.
4. ALL DISTURBED AREAS LEFT INACTIVE FOR MORE THAN THIRTY DAYS ARE TO BE STABILIZED.
5. THE STABILIZATION SEED MIXTURE IS TO BE AS SPECIFIED ON THE EROSION AND SEDIMENT CONTROL PLAN.
6. THE STABILIZATION SEED MIXTURE IS TO BE APPLIED AT A MINIMUM RATE OF 25 kg/ha.
7. ENGINEERED CHANGES TO THE ESC MEASURES MAY BE NEEDED AS SITE CONDITIONS CHANGE THROUGHOUT THE CONSTRUCTION PROCESS. THESE UPDATES MUST REFLECT BEST MANAGEMENT PRACTICES TO CONTROL SEDIMENT AND EROSION ONSITE AND SHOULD BE COMPLETED BASED ON DIRECTION FROM THE SITE ENGINEER. ADDITIONAL MEASURES MAY BE REQUIRED AS DIRECTED BY AN ENGINEER THROUGHOUT THE CONSTRUCTION PROCESS.
8. THE CONSTRUCTION ENTRANCE MAT IS TO BE INSTALLED AS THE FIRST STEP IN THE SITE ALTERATION PROCESS.
9. SEDIMENT CONTROL FENCE IS TO BE INSTALLED DOWNSLOPE OF ALL DISTURBED AREAS. A DOUBLE ROW OF SEDIMENT CONTROL FENCE IS TO BE INSTALLED SURROUNDING ALL NATURAL HERITAGE FEATURES AND AS DIRECTED BY THE SITE ENGINEER. SEDIMENT CONTROL FENCE IS TO BE AS PER LSRCA STANDARD ESC-4 or ESC-5 AS A MINIMUM. LIGHT DUTY SEDIMENT CONTROL FENCE IS NOT ACCEPTABLE.
10. CUT-OFF SWALES OR DITCHES ARE TO BE INSTALLED AS SHOWN ON THE ESC PLANS AND AS NECESSARY BASED ON CHANGING SITE CONDITIONS TO DIRECT OVERLAND FLOW TO THE APPROPRIATE SEDIMENT TRAP OR TEMPORARY SEDIMENT POND.
11. CHECK DAMS ARE TO BE INSTALLED IN ALL SWALES AND DITCHES IN ACCORDANCE WITH DRAWING LSRCA ESC-2, AS A MINIMUM
12. TEMPORARY SEDIMENT TRAP(S) ARE TO BE CONSTRUCTED AT THE BEGINNING OF SITE GRADING AND IF THE SITE DRAINAGE CHANGES DURING CONSTRUCTION. IT MAY BE NECESSARY FOR TEMPORARY SWALES TO BE CONSTRUCTED TO DIRECT SITE FLOWS TO THE TEMPORARY SEDIMENT TRAP(S) DURING ROUGH GRADING AND AS CONSTRUCTION PROGRESSES.
13. TEMPORARY SEDIMENT POND(S) ARE TO BE CONSTRUCTED AT THE BEGINNING OF SITE GRADING AND IF THE SITE DRAINAGE CHANGES DURING CONSTRUCTION. IT MAY BE NECESSARY FOR TEMPORARY SWALES TO BE CONSTRUCTED TO DIRECT SITE FLOWS TO THE TEMPORARY SEDIMENT POND(S) DURING ROUGH GRADING AND AS CONSTRUCTION PROGRESSES.
14. FILTREXX SILTSOXX OR APPROVED EQUIVALENT TO BE INSTALLED DOWNSTREAM FROM SEDIMENT TRAP AND TEMPORARY SEDIMENT POND OUTLETS TO A MINIMUM HEIGHT OF 300mm.
15. IF STOCKPILES ARE USED ON-SITE FOR THE STORAGE OF EXCESS MATERIAL, THEY ARE TO BE IN ACCORDANCE WITH DETAIL DRAWING LSRCA ESC-6 OR BETTER.
16. ANY DEWATERING OCCURRING ONSITE MUST BE IN ACCORDANCE WITH AN APPROVED DEWATERING PLAN. ADDITIONAL DEWATERING REQUIREMENTS MAY BE DEEMED NECESSARY AND SHALL BE IMPLEMENTED AS DIRECTED BY THE ENGINEER, CONTRACT ADMINISTRATOR OR LOCAL MUNICIPALITY.
17. THE SITE TRAILER IS TO BE LOCATED ONLY AT THE DESIGNATED LOCATION SHOWN ON THE PLANS.
18. EQUIPMENT AND HYDROCARBON STORAGE IS TO OCCUR ONLY WITHIN THE DESIGNATED AREA SHOWN ON THE PLANS.
19. REFUELING IS TO TAKE PLACE ONLY WITHIN THE DESIGNATED AREA SHOWN ON THE PLANS AND SHALL BE A MINIMUM OF THIRTY METRES FROM ANY WATERCOURSE OR ENVIRONMENTALLY SENSITIVE AREA.
20. AN APPROVED SPILLS MANAGEMENT PLAN IS TO BE KEPT ONSITE.
21. SPILL CLEANUP EQUIPMENT SUCH AS ABSORPTIVE MEDIA IS TO BE MAINTAINED ONSITE FOR IMMEDIATE USE IN THE EVENT OF A SPILL.
22. SPILLS ARE TO BE REPORTED IMMEDIATELY TO THE MOECC SPILLS ACTION CENTRE AT 1-800-268-6060.
23. THE CONTRACTOR WILL BE RESPONSIBLE FOR CLEAN-UP AND RESTORATION, INCLUDING ALL COSTS, DUE TO THE RELEASE OF SEDIMENT FROM THE SITE.
24. LOW IMPACT DEVELOPMENT (LID) MEASURES ARE NOT TO BE USED AS SEDIMENT CONTROL DEVICES.
25. ADDITIONAL SEDIMENT CONTROL DEVICES MAY BE DEEMED NECESSARY AND AS SITE CONDITIONS CHANGE AND SHALL BE INSTALLED AS DIRECTED BY THE SITE ENGINEER, CONTRACT ADMINISTRATOR OR LOCAL MUNICIPALITY.

NO.	REVISION	DATE
1	SWM GUIDELINES UPDATE	06.2016

EROSION AND SEDIMENT CONTROL PLAN NOTES — DATE: 06.2016 — SCALE: NTS — LSRCA ESC-1



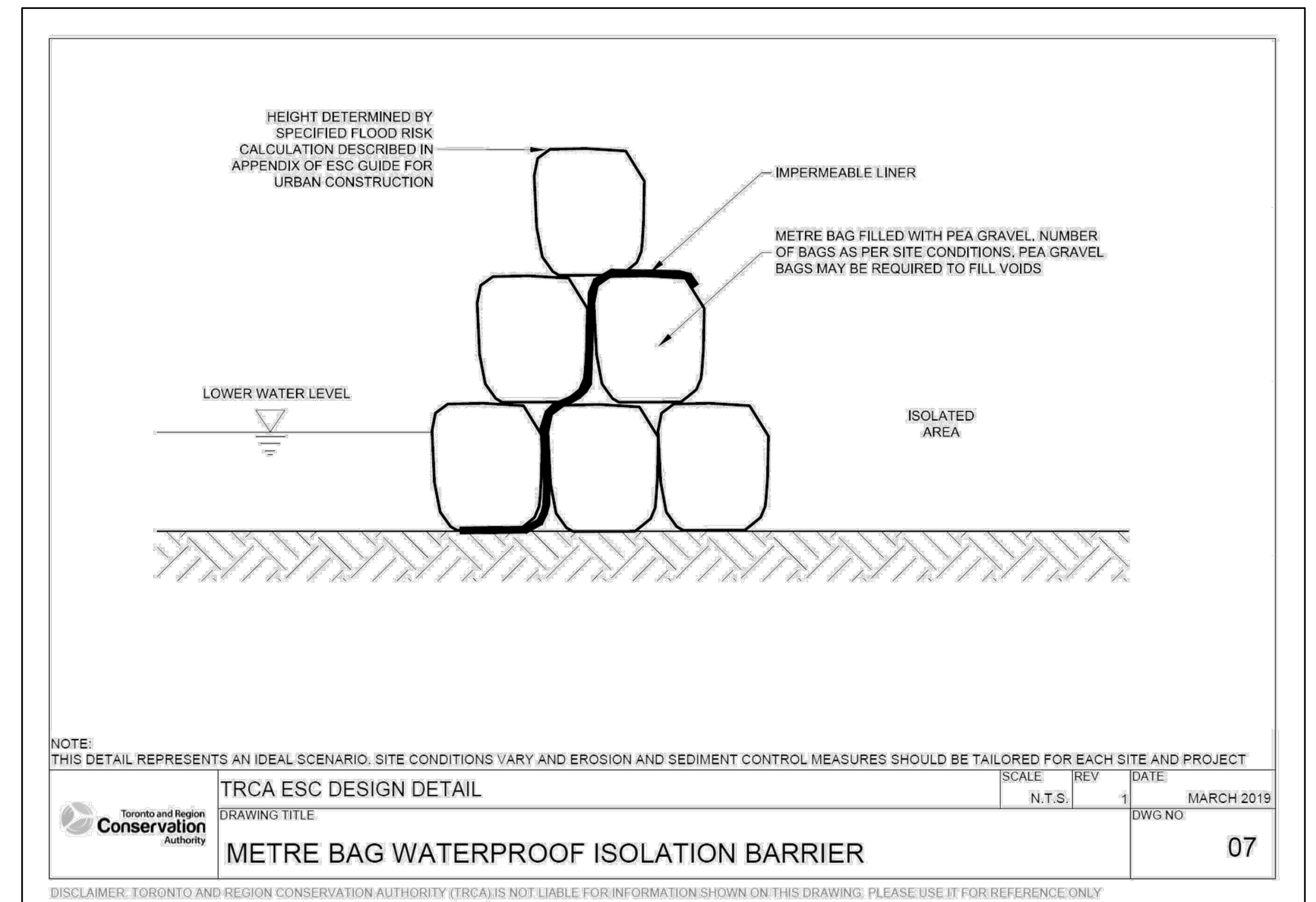


Figure C6: Design detail for waterproof isolation barrier constructed using metre bags

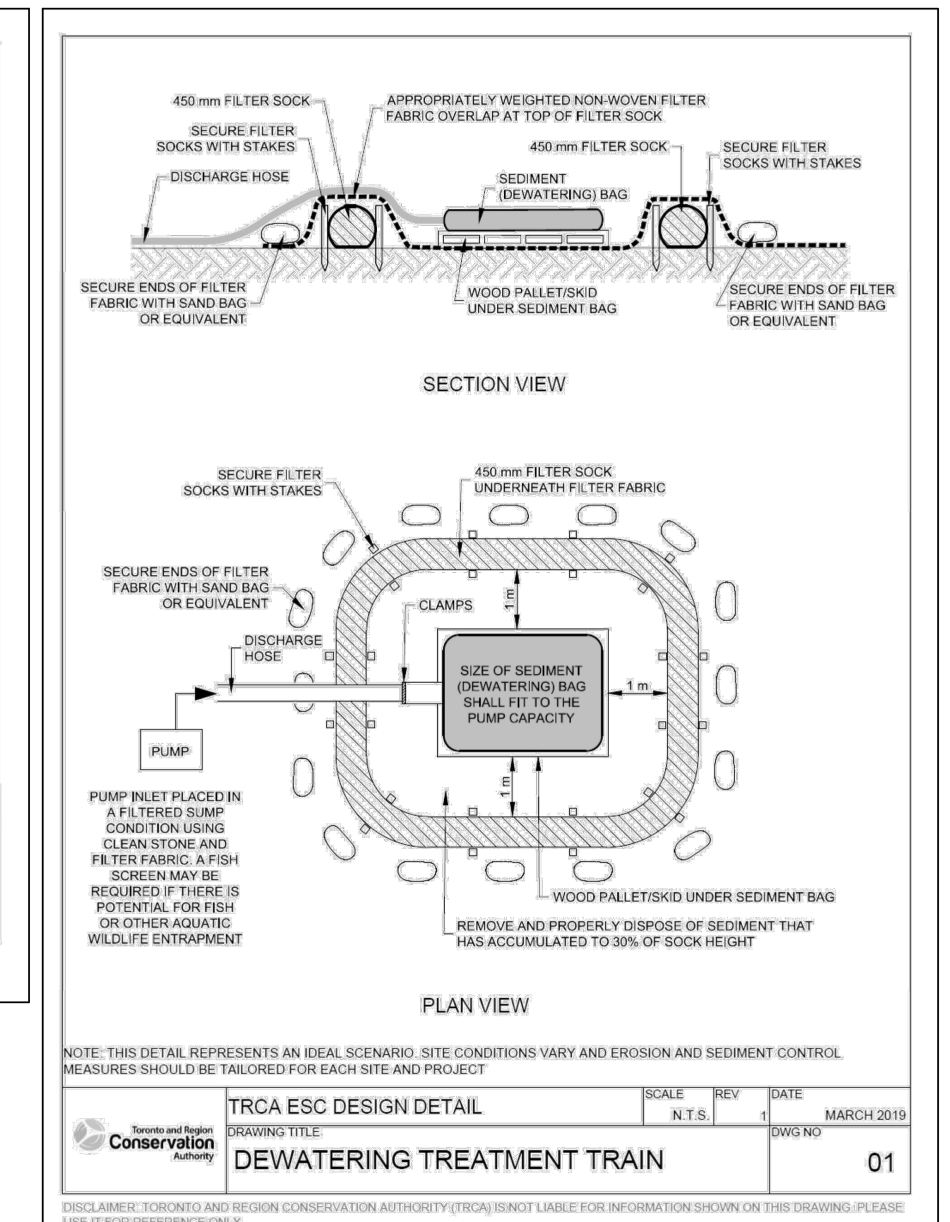
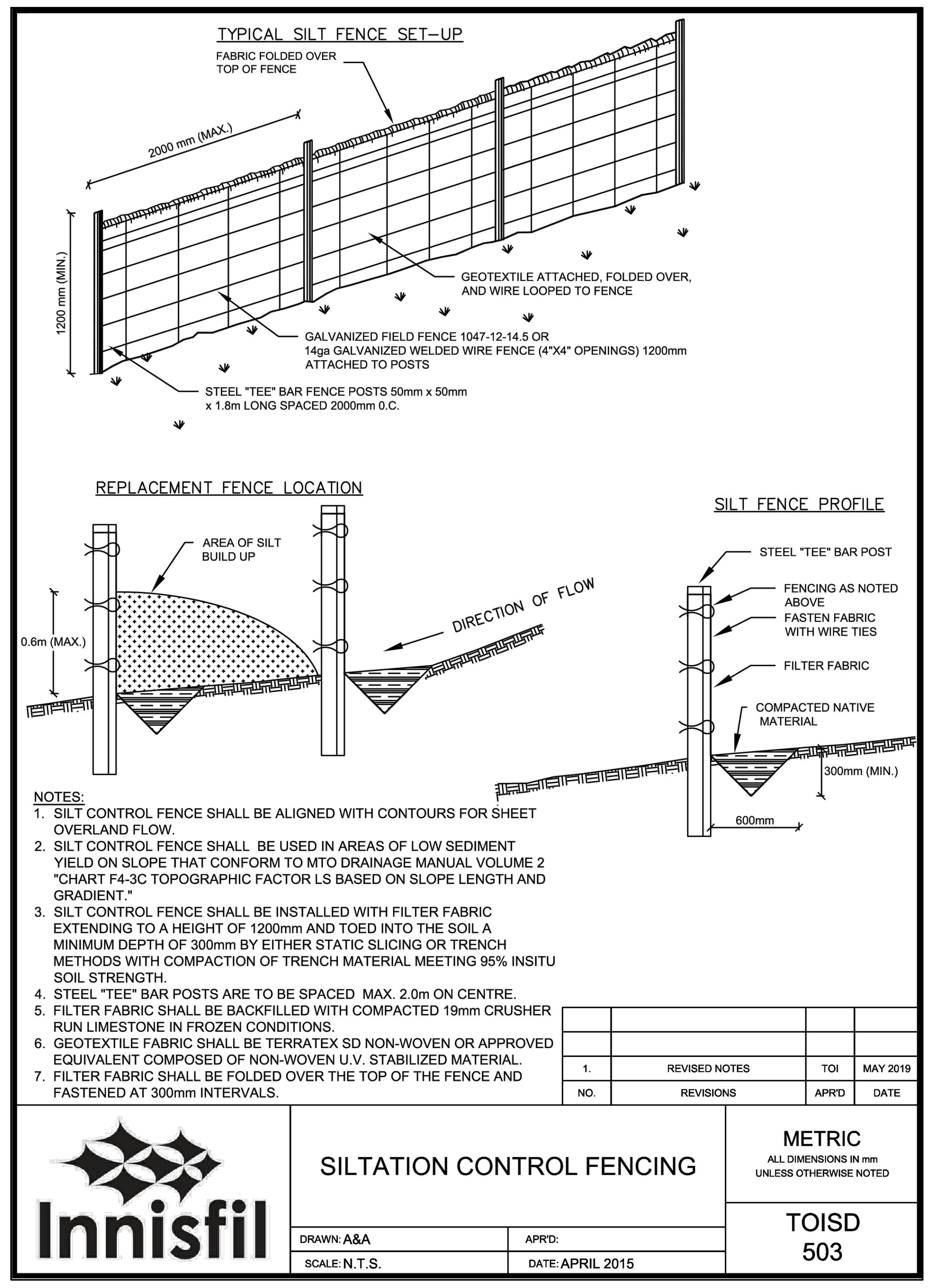
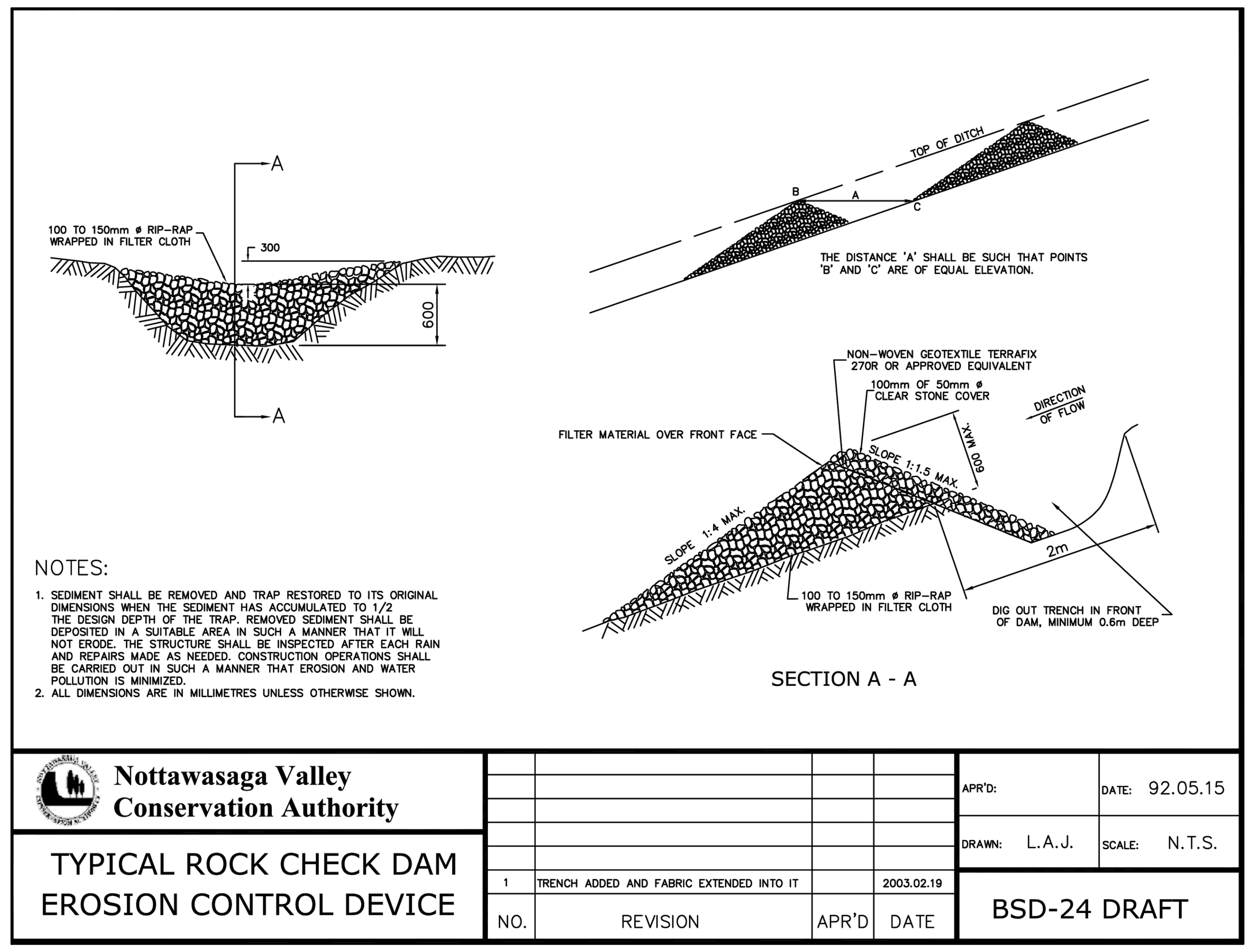


Figure B2-16: Dewatering bag treatment train (unfrozen conditions)





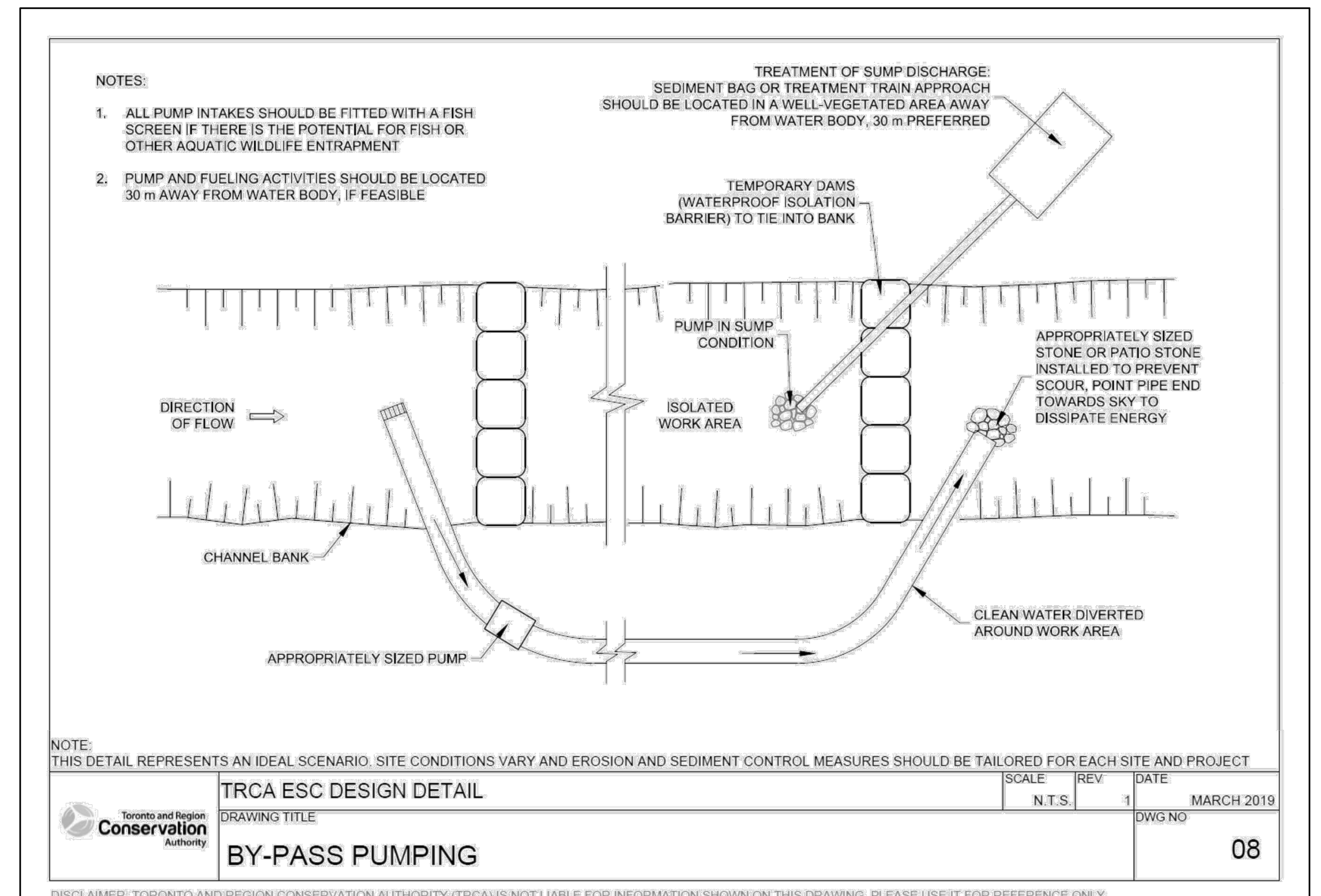
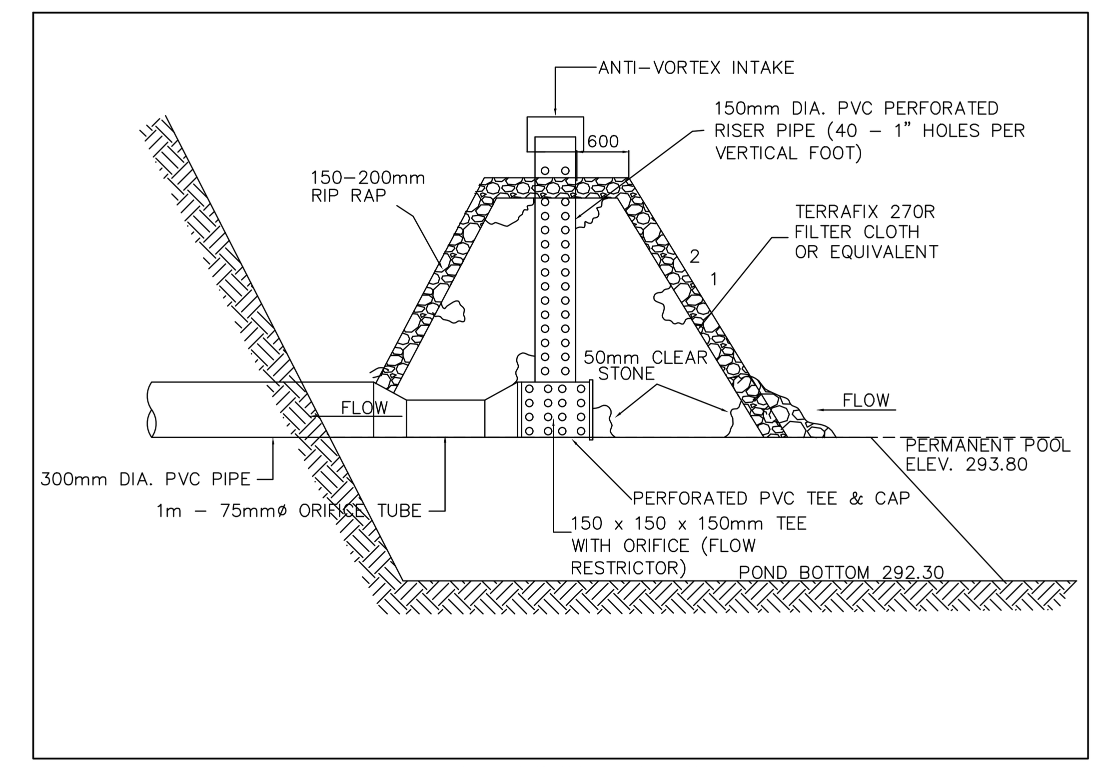
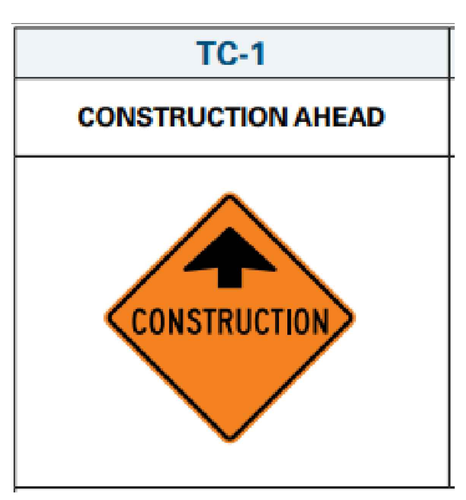


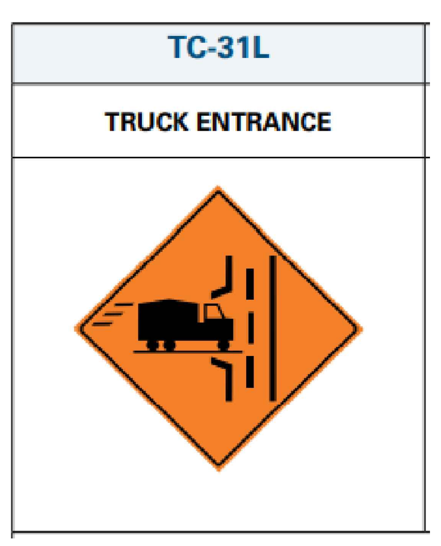
Figure C12: Design detail for watercourse diversion using bypass pumping and dewatering to maintain a dry isolated work area



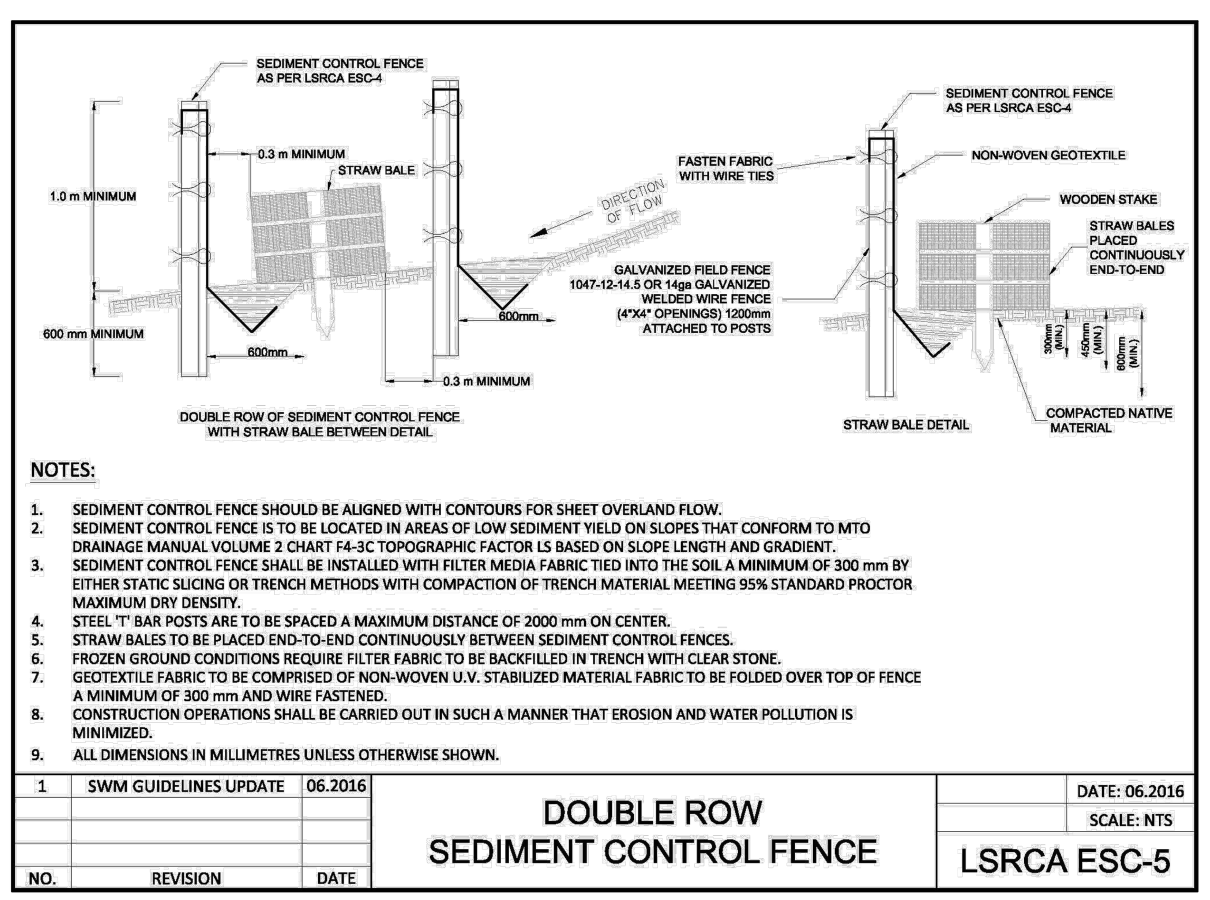
HICKENBOTTOM DETAIL
N.T.S.

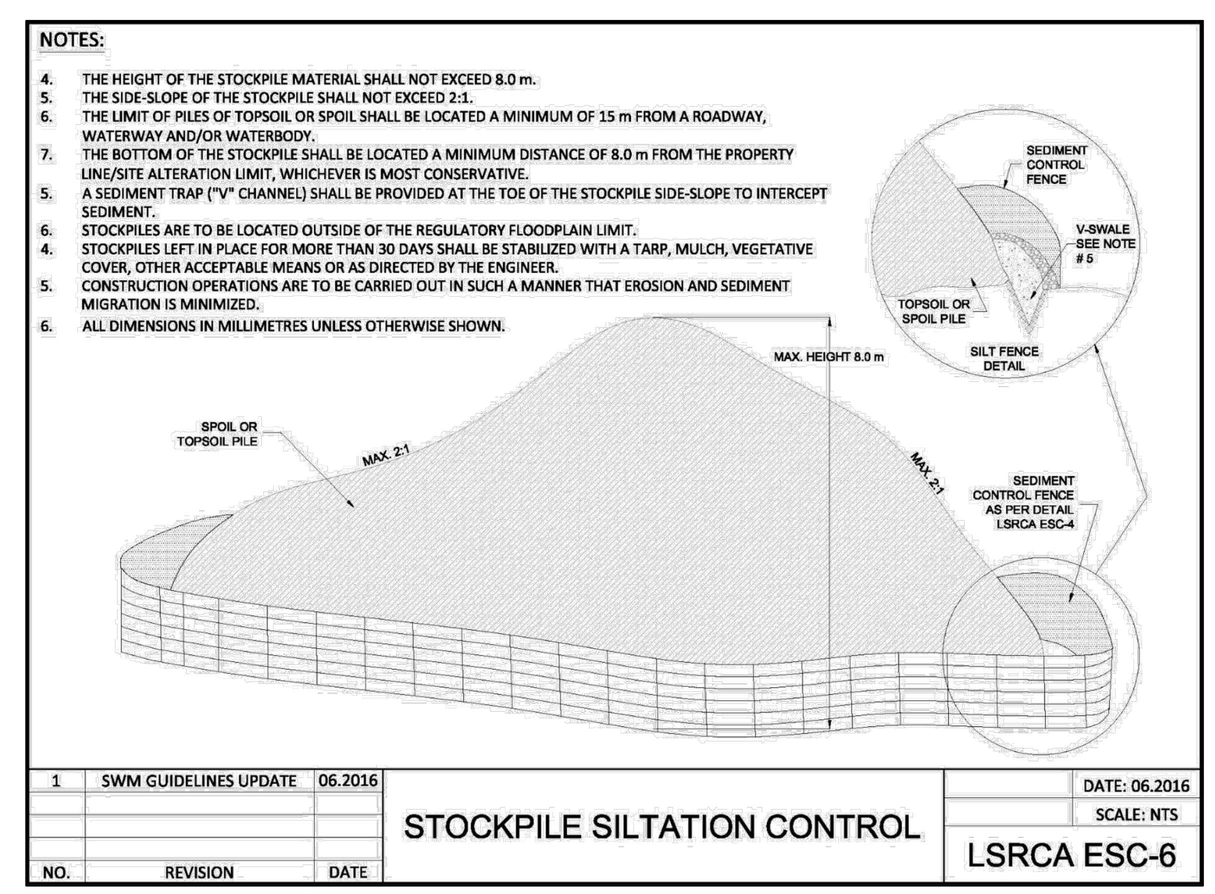


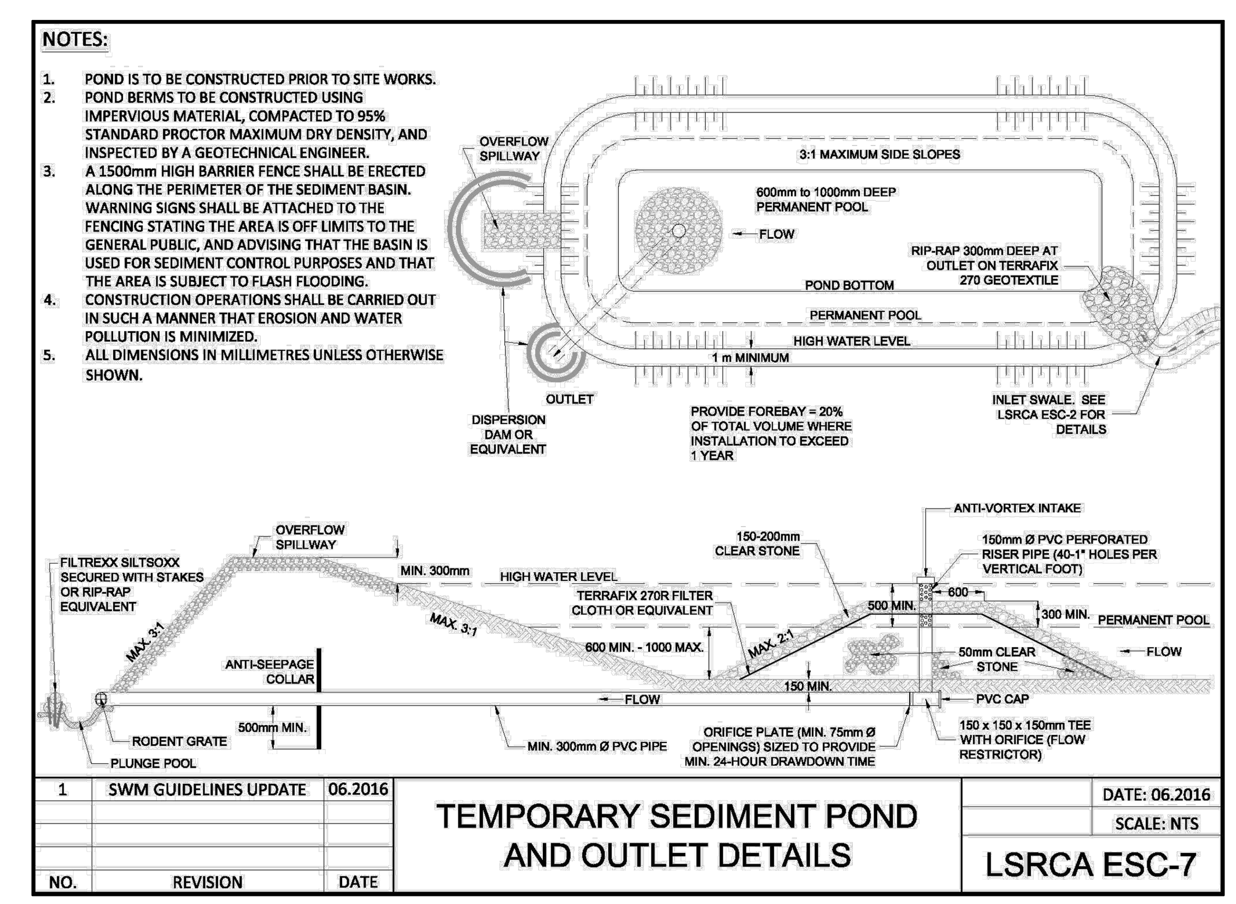
TC-1 CONSTRUCTION AHEAD SIGN



TC-31L TRUCK ENTRANCE SIGN







TOWN OF INNISFIL APPLICATION

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER LOT SEVERANCE	06/12/25	TWC

BENCHMARK

TOPOGRAPHIC SURVEY PREPARED BY WAHBA SURVEYING, DATED JULY 7, 2021.

LICENCED PROFESSIONAL ENGINEER — M.W. DEJEAN — June 12, 2025 — PROVINCE OF ONTARIO

7131 5TH SIDEROAD INC.
TOWN OF INNISFIL
INDUSTRIAL DEVELOPMENT

EROSION AND SEDIMENT CONTROL PLAN DETAILS

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	TJCA/TWC	HORIZ SCALE	1:1500	PROJECT #	21042
DRAWN BY	TWC	VERT SCALE		DRAWING #	EP-4
CHECKED BY	GMP/MWD	DATE	MAY 2021	REVISION #	1

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