

# SERVICING & STORMWATER MANAGEMENT REPORT

## DISTILLERY - 5923 OTTAWA STREET



Project No.: CCO-25-0415

City File No.: D07-12-25-0078

Prepared for:

99117756 Canada Inc.  
C/O Mr. Jack Gulas  
411 Legget Drive, Suite 710  
Ottawa, ON K2K 3C9

Prepared by:

Egis Canada  
115 Walgreen Road  
Carp, ON K0A 1L0

Submitted: October 17, 2024

Revised: Nov. 21, 2025

## Table of Content

|            |                                                      |           |
|------------|------------------------------------------------------|-----------|
| <b>1.0</b> | <b>PROJECT DESCRIPTION</b>                           | <b>1</b>  |
| 1.1        | Purpose                                              | 1         |
| 1.2        | Site Description                                     | 1         |
| 1.3        | Proposed Development and Statistics                  | 2         |
| 1.4        | Existing Conditions and Infrastructure               | 2         |
| 1.5        | Approvals                                            | 2         |
| <b>2.0</b> | <b>BACKGROUND STUDIES, STANDARDS, AND REFERENCES</b> | <b>2</b>  |
| 2.1        | Background Reports / Reference Information           | 2         |
| 2.2        | Applicable Guidelines and Standards                  | 3         |
| <b>3.0</b> | <b>PRE-CONSULTATION SUMMARY</b>                      | <b>4</b>  |
| <b>4.0</b> | <b>WATER SERVICING</b>                               | <b>5</b>  |
| 4.1        | Existing Watermain                                   | 5         |
| 4.2        | Proposed Water Servicing                             | 5         |
| <b>5.0</b> | <b>SANITARY SERVICING</b>                            | <b>7</b>  |
| 5.1        | Existing Sanitary Sewers                             | 7         |
| 5.2        | Proposed Sanitary Servicing                          | 7         |
| <b>6.0</b> | <b>STORM SEWER SERVICING</b>                         | <b>9</b>  |
| 6.1        | Existing Storm Sewers                                | 9         |
| 6.2        | Proposed Storm Servicing                             | 9         |
| <b>7.0</b> | <b>PROPOSED STORMWATER MANAGEMENT</b>                | <b>10</b> |
| 7.1        | Design Criteria                                      | 10        |
| 7.2        | Runoff Coefficient Calculations                      | 10        |
| 7.3        | Pre-Development Drainage                             | 11        |
| 7.4        | Post-Development Drainage                            | 11        |
| 7.5        | Quantity Control                                     | 12        |

|       |                                                        |    |
|-------|--------------------------------------------------------|----|
| 7.6   | Quality Control.....                                   | 14 |
| 7.7   | Village of Richmond Environmental Management Plan..... | 15 |
| 7.7.1 | Treatment Train.....                                   | 15 |
| 7.7.2 | Thermal Mitigation.....                                | 15 |
| 7.7.3 | Water Balance.....                                     | 16 |
| 7.7.4 | Volume Control (7 mm Storm Retention).....             | 16 |
| 7.7.5 | Control 100-Year Post to 2-Year Pre.....               | 16 |
| 7.7.6 | Erosion Potential vs Additional Retention.....         | 17 |
| 7.7.7 | Implementation of LID.....                             | 17 |
| 8.0   | EROSION AND SEDIMENT CONTROL.....                      | 18 |
| 8.1   | Temporary Measures.....                                | 18 |
| 8.2   | Permanent Measures.....                                | 18 |
| 9.0   | SUMMARY.....                                           | 19 |
| 10.0  | CONCLUSIONS.....                                       | 20 |
| 11.0  | STATEMENT OF LIMITATIONS.....                          | 21 |

## Appendices

Appendix A: Site Location Plan

Appendix B: City of Ottawa Pre-Consultation Notes

Appendix C: Watermain Calculations

Appendix D: Sanitary Design

Appendix E: Pre-Development Drainage Plan

Appendix F: Post-Development Drainage Plan

Appendix G: Stormwater Management Calculations

Appendix H: City of Ottawa Design Checklist

## 1.0 PROJECT DESCRIPTION

### 1.1 Purpose

Egis Canada (Egis) has been retained by 99117756 Canada Inc. to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed development located at 5923 Ottawa Street within the City of Ottawa (City).

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City, the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary, and storm sewer servicing for the development, ensuring that proposed services will adequately service the development.

This report should be read in conjunction with the following drawings:

- CCO-25-0415, C101 – Lot Grading and Drainage Plan,
- CCO-25-0415, C102 – Site Servicing Plan,
- CCO-25-0415, C103 – Erosion & Sediment Control Plan,
- CCO-25-0415, PRE – Pre-Development Drainage Area Plan (Appendix 'E'), and
- CCO-25-0415, POST – Post-Development Drainage Area Plan (Appendix 'F').

### 1.2 Site Description

Figure 1: Site Map





The property is located at 5923 Ottawa Street within the City of Ottawa. It is described as Part of Unit 10, Index Plan D-26, geographic township of Goulbourn, City of Ottawa. The land in question covers approximately 2.27 ha and is located near the intersection of Ottawa Street and Eagleson Road. See Site Location Plan in Appendix 'A' for more details.

### 1.3 Proposed Development and Statistics

The proposed development consists of two phases. Phase 1 covers 1.17 ha and proposes a new 651 m<sup>2</sup> ground-floor area building with a distillery/warehouse, restaurant, and retail space. Phase 2 covers 1.10 ha and proposes a new 926 m<sup>2</sup> ground-floor area brewery building. Parking and drive aisles will be provided throughout each phase along with landscaping around the perimeter of the development area. The development will be accessed via the proposed site entrances from Ottawa Street.

### 1.4 Existing Conditions and Infrastructure

The existing site is currently undeveloped with no available municipal services. A municipal ditch fronts the subject site along Ottawa Street. The Smiths Falls Rail Corridor is located northwest of the subject site.

### 1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control approval process. Site plan control requires the City to review, provide concurrence and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Activity and Sector Registry (EASR) through the MECP is expected to be required for stormwater management based on the industrial usage of the site. As industrial activities will only take place indoors and there will be no discharge of process water to the stormwater management system, an Environmental Compliance Approval is not anticipated to be required for stormwater management.

The septic system design has been completed by others with approval under the Ontario Building Code.

## 2.0 BACKGROUND STUDIES, STANDARDS, AND REFERENCES

### 2.1 Background Reports / Reference Information

Background plans and studies that have been completed for the proposed site are listed below:

- Plan of Survey, drawing CCO-25-0415 Ottawa St, prepared by Egis Surveying Inc. and dated July 9, 2024.
- Site Plan, drawing A-001, prepared by N45 Architecture Inc. and dated October 5, 2025.
- Geotechnical Investigation, Proposed Commercial Development, prepared by Paterson Group, and dated July 9, 2025.
- Ditch Hydrologic and Hydraulic Analysis, prepared by JFSA, and dated September 10, 2025  
750 Palladium Drive, Suite 310, Kanata, ON K2V 1C7 | T. 613-836-2184 | F. 613-836-3742  
info.north-america@egis-group.com | www.egis-group.com

- Sewage System Layout Plan, Drawing PH4924-1(rev.5), prepared by Paterson Group, and dated November 7, 2025
- 5923 Ottawa Street Occupancy Alternative Solution Roadmap memorandum, prepared by LRI, and dated August 21, 2025
- 5923 Ottawa Street Distillery water Storage Volume Estimate, prepared by LRI, and dated August 21, 2025
- Village of Richmond Environmental Management Plan, dated June 17, 2010.

## 2.2 Applicable Guidelines and Standards

### City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (Ottawa Sewer Guidelines)
  - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (ISTB-2014-01)
  - Technical Bulletin PIETB-2016-01 City of Ottawa, September 2016. (PIETB-2016-01)
  - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (ISTB-2018-01)
  - Technical Bulletin ISTB-2018-04 City of Ottawa, March 2018. (ISTB-2018-04)
  - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (ISTB-2019-02)
  - Technical Bulletin IWSB-2024-04 City of Ottawa, September 2024. (ISTB-2024-04)
- ◆ Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (Ottawa Water Guidelines)
  - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (ISD-2010-2)
  - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
  - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (ISTB-2018-02)
  - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. (ISTB-2021-03)
  - Technical Bulletin IWSB-2024-05 City of Ottawa, November 2024. (IWSB-2024-05)

### Ministry of Environment, Conservation and Parks:

- ◆ Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. (MECP Stormwater Design Manual)
- ◆ Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (MECP Sewer Design Guidelines)

### Other:

- ◆ Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (FUS Guidelines)

### 3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on March 21<sup>st</sup>, 2024, regarding the proposed site. Specific design parameters to be incorporated within this design include the following:

- Control post-development flows to the 2-year pre-development peak flow rate with  $C=0.5$  or existing, whichever is lesser, for all storms up to and including the 100-year storm event.
- Quality control to be provided up to an enhanced level of treatment (80% TSS Removal).

The notes from the City of Ottawa can be found in Appendix 'B'.

## 4.0 WATER SERVICING

### 4.1 Existing Watermain

The subject site is currently undeveloped with no access to a municipal watermain. Neighbouring properties are serviced by private wells.

### 4.2 Proposed Water Servicing

A new private drilled well and pump system is proposed within each phase to provide the development with domestic water supply. The well servicing Phase 1 has already been installed, and the approximate location is indicated on the Site Servicing Plan. The Phase 2 well, which will be designed and specified by others, will be included on the Servicing Plan once the location has been confirmed. As the development will be phased, it is proposed to temporarily service the Phase 2 building via the Phase 1 well. After the Phase 2 well is drilled, the service from the Phase 1 well to Phase 2 will be abandoned and both buildings will be independently serviced. Please refer to the Hydrogeological Report and Terrain Analysis completed by Paterson Group for well capacity discussion.

Although the building will be serviced via a drilled well and pump system as described above, water demands based on occupancy areas are provided in Table 1, below, for information purposes only. The water demands have been calculated to adhere to the Ottawa Water Guidelines and can be found in Appendix 'C'.

Table 1: Water Supply Design Criteria and Water Demands

| Proposed Development                  | Phase 1               | Phase 2 |
|---------------------------------------|-----------------------|---------|
| Site Area                             | 1.17 ha               | 1.10 ha |
| Commercial                            | 28,000 L/gross ha/day |         |
| Commercial Peaking Factor (Max Day)   | 1.5 x avg. day        |         |
| Commercial Peaking Factor (Peak Hour) | 1.8 x max. day        |         |
| Industrial                            | 35,000 L/gross ha/day |         |
| Industrial Peaking Factor (Max Day)   | 1.5 x avg. day        |         |
| Industrial Peaking Factor (Peak Hour) | 1.8 x max. day        |         |
| Average Day Demand (L/s)              | 0.02                  | 0.04    |
| Maximum Daily Demand (L/s)            | 0.04                  | 0.06    |
| Peak Hourly Demand (L/s)              | 0.06                  | 0.11    |

Fire protection is proposed to be provided by a remote fire protection system comprised of underground water storage tanks, dry hydrants, and a 150 mm diameter private watermain. The underground storage tanks will provide water to the building sprinkler systems as well as the dry hydrants. Both buildings will be equipped with fully supervised sprinkler systems, which require a supervisory signal to indicate conditions that could impair the operation of the system, as well as a water flow alarm to indicate the sprinkler system has been activated. The alarms must be sent to approved receiving facilities identified by the Fire Underwriters Survey.

The minimum required on-site storage volume was determined by LRI and provided in the 5923 Ottawa Street Distillery Water Storage Volume Estimate memo. The recommended on-site storage volume was determined by applying the Superior Tanker Shuttle reduction of 1,900 L/min to the NFPA13 mandated fire duration. The results are summarized in Table 2, below.

Table 2: On-Site Storage Volume Summary

| Proposed Development                                           | Phase 1     | Phase 2     |
|----------------------------------------------------------------|-------------|-------------|
| OBC Flow Rate Requirement                                      | 5,400 L/min | 5,400 L/min |
| OBC Volume Requirement                                         | 177,100 L   | 173,949 L   |
| NFPA13 Volume Requirement                                      | 288,442 L   | 242,574 L   |
| NFPA13 Evaluation w/ Superior Tanker Shuttle Service Reduction | 118,117 L   | 129,024 L   |

As per Table 2, above, a minimum on-site water supply of 130,000 litres has been recommended by LRI. Please refer to the 5923 Ottawa Street Distillery Water Storage Volume Estimate prepared by LRI and included within Appendix 'C' for additional information.

On-site storage for both phases is proposed to be provided by shared underground concrete water storage tanks connected to two dry hydrants as well as the building sprinkler systems. The underground water storage tanks will be located adjacent to the Phase 2 layby area, and will include a draw pipe and chute as per City of Ottawa Figure 5, Figure 10, and standard drawings W51 and W52. A total of three 45,000 litre Boyd Bro's concrete water storage tanks are proposed for a total on-site storage volume of 135,000 litres. Each phase will include a layby area near the site entrance adjacent a private hydrant for firefighting access. A Siamese connection will be located within 45m of each layby area to allow Ottawa Fire Services to supplement sprinkler supply as required.

Please refer to the Site Servicing plan for more information on the servicing layout.

As the site contains high groundwater, a buoyancy review of the underground storage tanks was completed by Paterson Group. Paterson has indicated that ballasting blocks will be required to mitigate flotation of the tanks. Additional details will be provided once the servicing layout is approved and the tank locations are final.

## 5.0 SANITARY SERVICING

### 5.1 Existing Sanitary Sewers

The subject site is currently undeveloped with no access to a municipal sanitary sewer. Neighbouring properties are serviced by private septic systems.

### 5.2 Proposed Sanitary Servicing

A new septic bed located north of the proposed buildings will be installed for each phase and sized to accommodate the development.

Total Daily Design Sanitary Sewage Flow (TDDSSF) for Phases 1 and 2 was calculated by Paterson as 9,367 L/day and 600 L/day, respectively. It is understood that approval of on-site septic treatment will be governed by OBC, as the TDDSSF for each system will be less than 10,000 L/day. Refer to the septic design completed by Paterson Group, which has been submitted to the Ottawa Septic System Office (OSSO) and approved through Septic File #25-176 and #25-177. The permits can be found within Appendix 'D'.

In summary, both the Phase 1 and Phase 2 systems have been designed using Class 4 raised leaching beds in combination with an Ejjen GSF treatment system.

Phase 1 will treat up to 9,367 L/day of Effluent. The Phase 1 system will include a 28,101 L pretreatment tank and an 18,500 L balancing tank complete with a time operated control panel. The sanitary service exiting the building will be 100 mm diameter and sleeved through a 150 mm diameter pipe overlain by rigid insulation boards.

Phase 2 will treat up to 600 L/day of Effluent. The Phase 2 system will include a 3,600 L pretreatment tank and a 450 L balancing tank complete with a time operated control panel. The sanitary service exiting the building will be 100 mm diameter and sleeved through a 150 mm diameter pipe overlain by rigid insulation boards.

As the site contains high groundwater, a buoyancy review is required to mitigate flotation of the septic tanks. As per the Response to City Comments memorandum provided by Paterson Group and dated August 20<sup>th</sup>, 2025, this review was completed as part of the Sewage System Design process and no further action was deemed to be required.

For further design information pertaining to the on-site sewage system, please refer to the septic design completed by Paterson Group.

Although the building will be serviced via a septic system as described above, sanitary demands based on occupancy areas are provided below for information purposes only. The sanitary demands have been calculated to adhere to the Ottawa Sewer Guidelines and can be found in Appendix 'D'. Within the demand calculations, the restaurant area for Phase 1 has been increased to account for outdoor patio seating. The development area was considered instead of the full property area to provide a more reasonable infiltration allowance estimate, as

only a fraction of the property is being developed, and it is unlikely that downstream areas located a significant distance from the septic system will result in increased infiltration.

Sanitary Design Criteria are listed in Table 3, below.

Table 3: Sanitary Design Criteria

| Design Parameter                        | Value                          |
|-----------------------------------------|--------------------------------|
| Phase 1 Development Area                | 0.48 ha                        |
| Phase 2 Development Area                | 0.45 ha                        |
| Commercial Area                         | 280 L/person/day               |
| Industrial – Light Area                 | 35,000 L/gross ha/d            |
| Restaurant Area                         | 125 L/ (9.2 m <sup>2</sup> /d) |
| Institutional/Commercial Peaking Factor | 1.5                            |
| Extraneous Flow Allowance               | 0.33 L/s/ha                    |

Table 4, below, summarizes the estimated wastewater flow from the proposed development. Refer to Appendix 'D' for detailed calculations.

Table 4: Summary of Estimated Sanitary Flow

| Design Parameter                         | Total Flow (L/s) |         |
|------------------------------------------|------------------|---------|
|                                          | Phase 1          | Phase 2 |
| Total Estimated Average Dry Weather Flow | 0.10             | 0.04    |
| Total Estimated Peak Dry Weather Flow    | 0.14             | 0.05    |
| Total Estimated Peak Wet Weather Flow    | 0.27             | 0.17    |

As mentioned above, sanitary demand calculations based on the Ottawa Sewer Guidelines are provided for information only. The sanitary design and septic demand have been completed by Paterson Group based on OBC requirements.

## 6.0 STORM SEWER SERVICING

### 6.1 Existing Storm Sewers

There are no existing storm sewers within the subject site or the adjacent municipal ROW. A municipal ditch fronts the subject site along Ottawa Street. A secondary ditch runs along the south of the Smiths Falls Rail Corridor at the rear of the site.

### 6.2 Proposed Storm Servicing

Runoff collected on the roof of the proposed Phase 1 and 2 buildings will be stored and controlled using flow restricting roof drains. Surface runoff from landscaped areas will be conveyed towards depressed surface storage areas located within the front yard of each phase. One minimum sized orifice for each phase will be used to direct controlled runoff from the surface storage areas to the municipal ditch along Ottawa Street during smaller storm events, while runoff exceeding the release rate of the orifices will be stored within the depressed surface storage areas. A weir is proposed for each surface storage area which will be located above the 100-year storage elevation. The weir will permit greater outflow in the event of a blockage within the system or a storm exceeding the 100-year event.

Runoff will be directed towards oil and grit separator units before discharging to the municipal ditch along Ottawa Street.

See CCO-25-0415 - POST in Appendix 'F' of this report and drawing C102 for more details. The Stormwater Management design for the subject property will be outlined in Section 7.0.



## 7.0 PROPOSED STORMWATER MANAGEMENT

### 7.1 Design Criteria

Stormwater management for the proposed site will be maintained through positive drainage away from the proposed building and towards the proposed depressed surface storage areas. The proposed stormwater management areas will capture and restrict runoff with the use of minimum sized orifices. The emergency overland flow route for the proposed site will be directed southeast towards the municipal ditch along Ottawa Street.

The quantitative and qualitative properties of the storm runoff for both the pre & post development flows are further detailed below. Stormwater Best Management Practices (SWM BMP's) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. These concepts will be explained further in Section 7.7.

In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the RVCA and City:

#### Quality Control

- The site has been designed to achieve an 80% total suspended solids removal (enhanced level of treatment) using oil & grit separator units as part of a treatment train approach.

#### Quantity Control

- Post development 100-year flow is to be restricted to match the 2-year pre-development flow.

### 7.2 Runoff Coefficient Calculations

Runoff values presented in the report have been derived from the Hydrologic & Hydraulic analysis completed by JFSA. Please refer to the "Stratford Foxrun Development – 5923 Ottawa Street, Richmond Ditch Hydrologic and Hydraulic Analysis" for additional information.

Egis provided JFSA with the site area and runoff coefficients to be incorporated into their larger drainage areas. The following coefficients were used to develop an average C for each area:

|                        |      |
|------------------------|------|
| Roofs/Concrete/Asphalt | 0.90 |
| Gravel                 | 0.60 |
| Undeveloped and Grass  | 0.20 |

As per the Ottawa Sewer Guidelines, the 2/5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

### 7.3 Pre-Development Drainage

The existing site drainage limits are demonstrated on the Pre-Development Drainage Area Plans included in Appendix 'E'. The site is 2.27 ha overall, but for the purposes of this report, the pre-development drainage is focused on the area of development. A summary of the Pre-Development Runoff Coefficient Calculations can be found in Table 5, below.

Table 5: Pre-Development Runoff Coefficients Summary

| Drainage Area   | Area (ha) | Runoff Coefficient (2/5-Year) | Runoff Coefficient (100-Year) |
|-----------------|-----------|-------------------------------|-------------------------------|
| A1              | 0.22      | 0.20                          | 0.25                          |
| A2              | 0.26      | 0.20                          | 0.25                          |
| Total (Phase 1) | 0.48      | -                             | -                             |
| A3              | 0.16      | 0.20                          | 0.25                          |
| A4              | 0.29      | 0.20                          | 0.25                          |
| Total (Phase 2) | 0.45      |                               |                               |

Area A1 and A3 represents the portion of the Phase 1 and Phase 2 development directed towards the rear yard in the existing condition, respectively. Areas A2 and A4 represent the portion of the Phase 1 and Phase 2 development areas directed towards the Ottawa Street municipal ditch in the existing condition, respectively.

Runoff directed towards the rear yard is conveyed along the railway ditch before discharging through a 1500 mm diameter culvert to Marlborough Creek, a tributary of the Jock River.

Runoff directed towards Ottawa Street is conveyed along the Ottawa Street and Eagleson Road municipal ditches before turning towards the ditch along the railway track and ultimately discharging through the same 1500 mm diameter culvert to Marlborough Creek. A Ditch Figure can be found within Appendix 'G'.

### 7.4 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-25-0415 - POST in Appendix 'F' of this report for more details. A summary of the Post-Development Runoff Coefficients can be found in Table 6, below.

Table 6: Post-Development Runoff Coefficients Summary

| Drainage Area   | Area (ha) | Runoff Coefficient (2/5-Year) | Runoff Coefficient (100-Year) |
|-----------------|-----------|-------------------------------|-------------------------------|
| B1              | 0.42      | 0.51                          | 0.58                          |
| B2              | 0.07      | 0.90                          | 1.00                          |
| Total (Phase 1) | 0.48      | -                             | -                             |
| B3              | 0.35      | 0.49                          | 0.56                          |
| B4              | 0.09      | 0.90                          | 1.00                          |
| Total (Phase 2) | 0.45      |                               |                               |

Areas B1 represents Phase 1 surface runoff, while area B2 represents the Phase 1 roof area. Area B3 represents Phase 2 surface runoff, and area B4 represents the Phase 2 roof area. See Appendix 'G' for calculations.

For each phase, controlled roof runoff and uncontrolled surface runoff will be directed towards a depressed surface storage area located within the front yard. Phase 1 and Phase 2 will each employ a 75 mm diameter orifice to control outflow from its respective storage area. Each storage area will also include a 0.30m earth weir to allow for outflow in the event of a blockage within the system or a storm exceeding the 100-year event. The restriction of runoff will result in a ponding depth of 0.52m for Phase 1, and 0.66m for Phase 2 during the 100-year storm event. Stormwater management will be independent for each phase.

Runoff will be conveyed from the depressed surface storage areas to oil and grit separator units before discharging to the Ottawa Street municipal ditch.

## 7.5 Quantity Control

The 2- to 100-year post development runoff for the site must be restricted to match the 2-year pre-development flow rate.

JFSA was retained to complete a Hydrologic and Hydraulic analysis of the proposed stormwater management design to confirm there will be no negative impacts to the receiving ditch. A pre- and post-development hydrologic model was created with SWMHYMO, and hydraulic modeling was completed using HEC-RAS.

Table 7, below, summarizes the site release rates and required storage volumes for the post-development condition based on JFSA's analysis. For further information, refer to the memo prepared by JFSA and included in Appendix 'G'.

Table 7: Site Release Rates / Required Storage Volume / Ponding Elevation

|              | Phase 1 (0.48 ha)                |                                    |                   | Phase 2 (0.45 ha)                |                                    |                   |
|--------------|----------------------------------|------------------------------------|-------------------|----------------------------------|------------------------------------|-------------------|
| Storm        | Peak Outflow (m <sup>3</sup> /s) | Required Storage (m <sup>3</sup> ) | Storage Elev. (m) | Peak Outflow (m <sup>3</sup> /s) | Required Storage (m <sup>3</sup> ) | Storage Elev. (m) |
| 2YrCHI3Hr    | 0.033                            | 34                                 | 94.113            | 0.031                            | 38                                 | 94.058            |
| 5YrCHI3Hr    | 0.054                            | 64                                 | 94.189            | 0.049                            | 65                                 | 94.167            |
| 10YrCHI3Hr   | 0.072                            | 85                                 | 94.231            | 0.064                            | 84                                 | 94.220            |
| 25YrCHI3Hr   | 0.094                            | 113                                | 94.284            | 0.083                            | 109                                | 94.280            |
| 50YrCHI3Hr   | 0.109                            | 134                                | 94.323            | 0.096                            | 129                                | 94.323            |
| 100YrCHI3Hr  | 0.130                            | 158                                | 94.364            | 0.114                            | 150                                | 94.366            |
| 2YrSCS24Hr   | 0.036                            | 43                                 | 94.139            | 0.034                            | 45                                 | 94.091            |
| 5YrSCS24Hr   | 0.056                            | 72                                 | 94.205            | 0.051                            | 71                                 | 94.185            |
| 10YrSCS24Hr  | 0.070                            | 91                                 | 94.244            | 0.064                            | 89                                 | 94.232            |
| 25YrSCS24Hr  | 0.088                            | 117                                | 94.292            | 0.080                            | 112                                | 94.286            |
| 50YrSCS24Hr  | 0.101                            | 136                                | 94.327            | 0.090                            | 130                                | 94.325            |
| 100YrSCS24Hr | 0.115                            | 157                                | 94.362            | 0.103                            | 149                                | 94.364            |

Table 8, below, summarizes the Pre- and Post- development peak flow within the Ottawa Street Municipal Ditch at the southeast corner of the property (Junction J1 from the modeling results).

Table 8: Pre- and Post-Development Peak Flow Summary

|            | Peak Flow (m <sup>3</sup> /s) |                  |            |
|------------|-------------------------------|------------------|------------|
| Storm      | Pre-Development               | Post-Development | Difference |
| 2YrCHI3Hr  | 0.015                         | 0.019            | 0.004      |
| 5YrCHI3Hr  | 0.026                         | 0.027            | 0.001      |
| 10YrCHI3Hr | 0.035                         | 0.032            | -0.003     |
| 25YrCHI3Hr | 0.047                         | 0.038            | -0.009     |
| 50YrCHI3Hr | 0.057                         | 0.043            | -0.014     |

|              |       |       |        |
|--------------|-------|-------|--------|
| 100YrCHI3Hr  | 0.067 | 0.048 | -0.019 |
| 2YrSCS24Hr   | 0.024 | 0.024 | 0.000  |
| 5YrSCS24Hr   | 0.038 | 0.032 | -0.006 |
| 10YrSCS24Hr  | 0.049 | 0.037 | -0.012 |
| 25YrSCS24Hr  | 0.062 | 0.044 | -0.018 |
| 50YrSCS24Hr  | 0.073 | 0.049 | -0.024 |
| 100YrSCS24Hr | 0.084 | 0.055 | -0.029 |

As seen in Table 8, above, there will be a minor increase in flow during smaller storm events. The increase in flow is the result of additional area being directed towards the Ottawa Street municipal ditch that was directed towards the rear yard in the existing condition. Outflow during smaller events is controlled by an orifice at the minimum allowable size, and so reducing flow by reducing orifice size is not recommended. Furthermore, based on JFSA's analysis, it has been determined that there will be no negative downstream impact to the roadway or existing buildings resulting from the minor increase in runoff during smaller events.

During larger storm events, the modeling results indicate there will be a reduction in peak flow, and a reduction in the 100-year floodplain.

For more information on the Hydrologic and Hydraulic modeling completed by JFSA, please refer to the memo included in Appendix 'G'.

## 7.6 Quality Control

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. Lot level BMP's typically include temporary retention of the parking lot runoff, minimizing ground slopes and maximizing landscaped areas.

Within areas B1 and B3, surface runoff from the Phase 1 & 2 drive aisle, parking lots, and asphalt loading areas will be directed towards proposed grassed swales located along the phase line and property line. The grassed swales have been designed with minimal slope to reduce runoff velocity and promote filtration and settlement of suspended solids.

The proposed grassed swales will discharge to depressed surface storage areas located within Phase 1 and 2. The depressed surface storage areas will restrict runoff and provide further opportunity for suspended solids removal through filtration and settlement. Removal efficiency of the depressed surface storage area will be most comparable to a dry pond, given that runoff will be temporarily detained during storm events and then released at a controlled rate.

As per the Environmental Design Criteria section of the MECP Stormwater Design Manual, dry ponds can be credited with achieving a Basic 60% long-term suspended solid removal provided the storage volumes identified within Table 3.2 of the Manual are achieved.

For the Phase 1 site, with an imperviousness of 52%, a storage volume of 141 m<sup>3</sup>/ha or 67.7 m<sup>3</sup> is required to achieve a basic long-term 60% TSS removal, based on Table 3.2 of the Manual. The Phase 1 surface storage area will provide up to 158 m<sup>3</sup> of stormwater storage, more than doubling the requirement.

For the Phase 2 site, with an imperviousness of 53%, a storage volume of 144 m<sup>3</sup>/ha or 64.7 m<sup>3</sup> is required to achieve a basic long-term 60% TSS removal, based on Table 3.2 of the Manual. The Phase 2 surface storage area will provide up to 150 m<sup>3</sup> of stormwater storage, again more than doubling the requirement.

To ensure the quality control criteria are met, the depressed surface storage areas will discharge to Stormceptor EFO4 oil and grit separator units located at the outlet of each phase. The EFO4 unit is credited with achieving a TSS removal of 60% based on the ETV particle size distribution. Documentation supporting the 60% removal efficiency can be found within Appendix 'G'.

Given that runoff entering the EFO4 will already have undergone a 60% TSS removal within the depressed surface storage area, there will be a maximum remaining TSS of 40% of the baseline. As a result, runoff leaving the EFO4 units will have a remaining TSS of  $[40\% - (60\% * 40\%)] = 16\%$ , indicating a total TSS removal of 84%. It should be further noted that TSS reduction from the grassed swales has not been accounted for, and so the actual TSS removal efficiency of the site is expected to be increased.

## 7.7 Village of Richmond Environmental Management Plan

As the subject site is located within the Village of Richmond Environmental Management Plan (EMP) study area, the site must conform to the findings of the EMP. Concurrence with the findings and recommendations are listed below:

### 7.7.1 Treatment Train

The proposed stormwater management system will convey runoff within gently sloped swales to a depressed surface storage area where runoff will be stored and released at a controlled rate. This will provide an opportunity for filtration through the vegetated medium, infiltration, and settlement of suspended solids. Before leaving the site, controlled runoff will be directed to an Oil & Grit separator where additional quality treatment will be provided. These lot level, conveyance, and end-of-pipe controls will ensure stormwater quality is properly addressed and 80% TSS reduction is achieved.

### 7.7.2 Thermal Mitigation

As mentioned above, stormwater conveyance will primarily be through gently sloped grass swales, and stormwater will be stored within a landscaped depressed surface storage area before discharging to the municipal ditch. After leaving the site, runoff will travel a minimum 745m within the municipal and railroad ditches

before discharging to Marlborough Creek. With on-site detention of stormwater within landscaped areas and the length of the flow path to the outlet, thermal impacts to the receiving watercourse are not anticipated.

### 7.7.3 Water Balance

Based on the findings of the Hydrogeological Report and Geotechnical Report prepared by Paterson, the site is heavily constrained by high groundwater and soils that are not suitable for infiltration. The borehole results identified that all soils warranted a description containing either clay, silt, clayey, or silty. As per Technical Bulletin IWSB-2024-04, infiltration-type LID practices are not permitted in clay or silt soils, nor in soils that warrant a dual classification with silt or clay as per the USCS.

While the borehole logs identified some areas of glacial till consisting of silty sand that may be suitable for infiltration, the glacial till is most often described as “silty sand to sandy silt”, with a USCS soil classification of ML (inorganic silts of high plasticity) determined from BH3-24 SS3. The glacial till which solely consists of silty sand is also located below the high groundwater elevation of 93.79m – 93.86m identified by the Groundwater Monitoring Program. As per the Hydrogeological Report and Terrain Analysis, the highest elevation of the glacial till layer not containing “sandy silt” or “clayey silt” in the description was at BH2-25, where the top of the glacial till layer was noted at an elevation of 93.71m. As the glacial till layer comprised of silty sand is located below the seasonally high groundwater level, it cannot be incorporated into an infiltration-type LID. Furthermore, there is insufficient grade change within the site to allow for an infiltration-type LID to achieve minimum separation from the high groundwater level specified above.

While the site has been generally designed to promote infiltration with gently sloped grass conveyance swales and stormwater detention within landscaped surface storage areas, implementing an infiltration-type LID practice to ensure water balance will not be permitted, and so undertaking a water balance would not result in any changes to the design.

### 7.7.4 Volume Control (7 mm Storm Retention)

As mentioned above, an infiltration-type LID practice will not be permitted, and so the requirement to retain the first 7 mm of rainfall cannot be achieved through infiltration. Abstraction will be limited to depression storage within the gently sloped swales and stormwater management areas, and through evapotranspiration of the stored surface and roof runoff. Evapotranspiration has been promoted to the greatest extent possible within the design by providing orifice controls with the minimum permissible size. This will detain stormwater on site for long durations, resulting in maximum surface stormwater volumes of 158 m<sup>3</sup> for Phase 1 and 150 m<sup>3</sup> for Phase 2.

### 7.7.5 Control 100-Year Post to 2-Year Pre

Stormwater modeling has been completed by JFSA. The results indicated that while there will be a minor increase in runoff during smaller storm events, the 100-year peak flow will be a reduction compared to existing conditions. Additionally, the proposed stormwater management design will reduce the extent of the 100-year floodplain.

### 7.7.6 Erosion Potential vs Additional Retention

As previously mentioned, the design relies on detention of stormwater runoff and not retention, as an infiltration-based design will not be permitted. Minimum orifice sizes are proposed which result in the maximum on-site storage volume. Modeling has also been completed by JFSA which indicates there will be a reduction in flow leaving the site during larger stormer events.

### 7.7.7 Implementation of LID

LID has been implemented with vegetated swales and depressed vegetated surface storage areas.



## 8.0 EROSION AND SEDIMENT CONTROL

### 8.1 Temporary Measures

Before construction begins, temporary silt fence, straw bale or rock flow check dams will be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The straw bale check dams, silt fence, and rip rap outlet treatments shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the silt fences and check dams as required. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the City and/or Conservation Authority to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions warrant. Please see the Erosion & Sediment Control Plan for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

### 8.2 Permanent Measures

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip rapped area. Additional rip rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / City or Conservation Authority.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

## 9.0 SUMMARY

- A new 651 m<sup>2</sup> distillery and restaurant/retail building is proposed within Phase 1 at 5923 Ottawa Street.
- A new 926 m<sup>2</sup> distillery building is proposed within Phase 2.
- Domestic water servicing will be provided by a new drilled well for each phase, designed by others.
- The Phase 2 building will be serviced by the Phase 1 well in the interim condition.
- Fire protection for Phases 1 and 2 will be provided by a remote hydrant system, sprinkler systems, and underground water storage tanks.
- Sanitary servicing will be provided by new on-site septic systems designed by Paterson.
- Storage for the 2- through 100-year storm events will be provided on the roof of the building and within proposed depressed surface storage areas. Runoff will discharge to the municipal ditch along Ottawa Street.
- Based on the hydrologic and hydraulic modeling completed by JFSA, there will be no negative downstream impact resulting from the stormwater management design.
- Quality control requirements will be achieved with oil and grit separator units as part of a treatment train approach.

## 10.0 CONCLUSIONS

This report has been provided to describe the servicing and stormwater management for the site located 5923 Ottawa Street.

This report is respectfully being submitted for review.

Regards,

Egis Canada Ltd.



Jessica Burden, P.Eng.  
Project Engineer, Land Development  
E: Jessica.burden@egis-group.com

A handwritten signature in cursive script that reads "Francis Valenti".

Francis Valenti, P.Eng.  
Junior Project Engineer, Land Development  
E: francis.valenti@egis-group.com

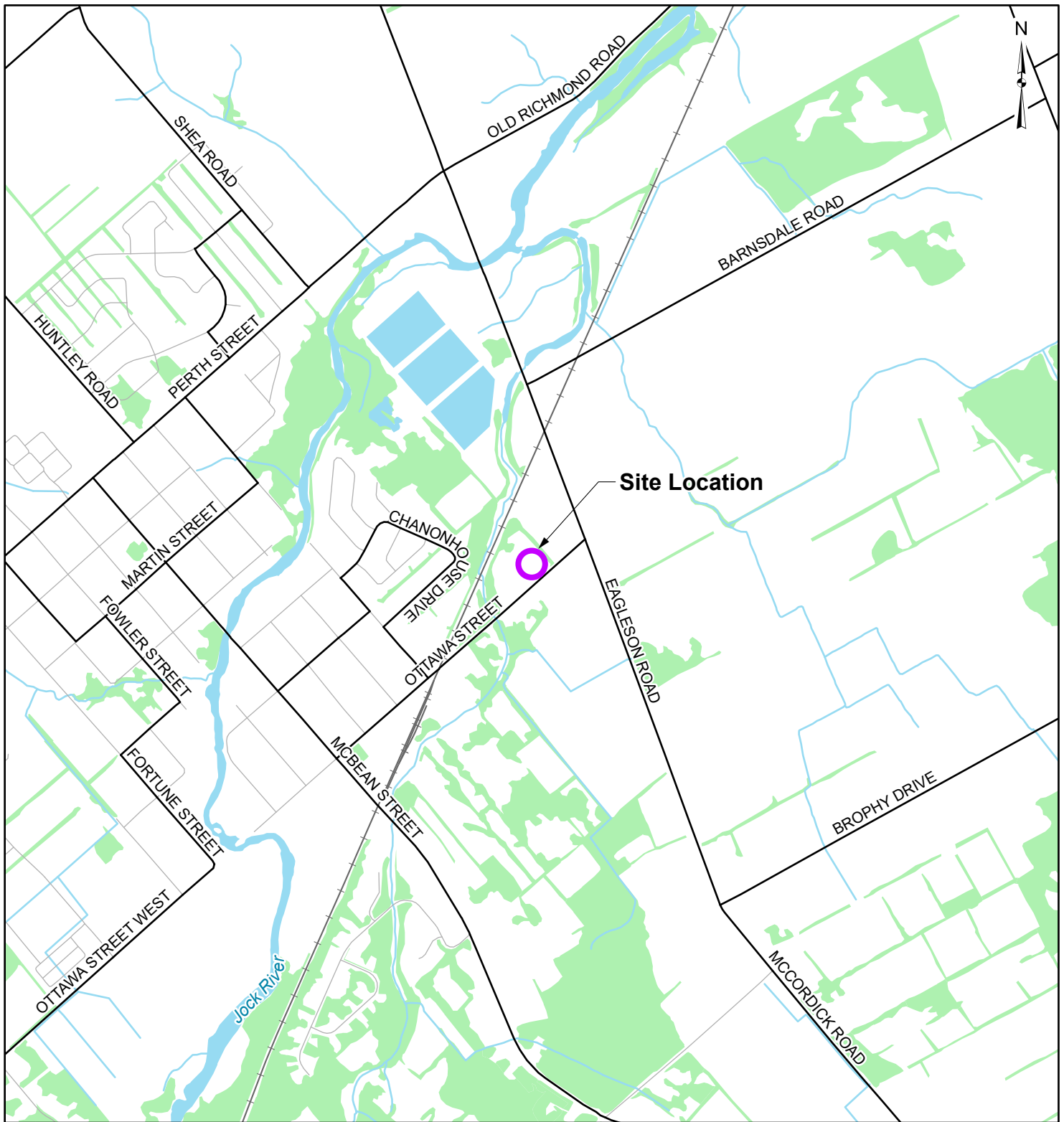
## 11.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of 99117756 Canada Inc. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, City of Ottawa and local approval agencies. Egis Canada reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by Egis Canada and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. Egis Canada accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, Egis Canada should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

## APPENDIX A KEY PLAN



#### LEGEND

-  Site Location
-  Local Road
-  Major Road
-  Railroad
-  Watercourse
-  Waterbody
-  Wooded Area

#### REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2024.



|                                                                                                                                                                         |  |                              |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------|----------------|
| CLIENT:                                                                                                                                                                 |  | 99117756 CANADA INC.         |                |
| PROJECT:                                                                                                                                                                |  | 5923 OTTAWA STREET, RICHMOND |                |
| TITLE:                                                                                                                                                                  |  | SITE LOCATION PLAN           |                |
| <br>115 Walgreen Road, RR3, Carp, ON K0A1L0<br>Tel: 613-836-2184 Fax: 613-836-3742 |  | PROJECT NO: CCO-25-0415      | FIGURE:        |
|                                                                                                                                                                         |  | Date                         | Sep., 04, 2024 |
|                                                                                                                                                                         |  | GIS                          | CZ             |
|                                                                                                                                                                         |  | Checked By                   | AG             |
|                                                                                                                                                                         |  | 1                            |                |

## APPENDIX B BACKGROUND DOCUMENTS

March 27, 2024

Bridgette Alchawa  
Egis Canada Ltd.  
Via email: [bridgette.alchawa@egis-group.com](mailto:bridgette.alchawa@egis-group.com)

**Subject: Pre-Consultation: Meeting Feedback  
Proposed Site Plan Control Application – 5923 Ottawa St**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on March 21, 2024.

**Pre-Consultation Preliminary Assessment**

|                            |                            |                            |                                       |                            |
|----------------------------|----------------------------|----------------------------|---------------------------------------|----------------------------|
| 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input checked="" type="checkbox"/> | 5 <input type="checkbox"/> |
|----------------------------|----------------------------|----------------------------|---------------------------------------|----------------------------|

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

**Next Steps**

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to [planningcirculations@ottawa.ca](mailto:planningcirculations@ottawa.ca).
2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.
3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to complete or repeat the Phase 2 pre-consultation process.

**Supporting Information and Material Requirements**

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.



- a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on [Ottawa.ca](http://Ottawa.ca). These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

### **Consultation with Technical Agencies**

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

### **Planning**

Comments:

Questions:

1. What is the intent for the proposed bar/pub use. Restaurants are a prohibited use per 385r.

**Response:** It is understood that liquor can be sold if it is the product being produced. The current idea for the restaurant is to offer food that is easily prepared, (sandwiches, pizza, etc.) however, applicant suggested that they may be willing to consider different options based on zoning interpretation.

2. What is the idea for the severance component? May not have enough space to achieve the severance once the full build out of the lot is considered.
3. What is the timing of the severance? There are potential concerns regarding a pre-mature severance.

**Response:** The idea is for the severance to occur after the site plan application/approval and the establishment of the site.

### **Official Plan**

1. The subject site is designated Village on Schedule B9 of the Official Plan.
2. The subject site is designated Village Industrial Area on Schedule A of the Village of Richmond Secondary Plan – Volume 2.
  - a. Uses permitted on lands designated Village Industrial Area include: light industrial uses, office, printing plant, service repair shop, small batch brewery, warehouse and heavy equipment and vehicle sales, rental and servicing, research, technology, nurseries, greenhouses, catering, places of assembly, broadcasting and training

- b. Maximum building height - four storeys
- c. Adequate buffering including landscaping and screening will be provided between uses in Industrial Areas to ensure that storage areas and parking areas are screened from adjacent properties

## **Zoning By-law**

- 3. The subject site is zoned RG3 [385r] under the Zoning By-law. The purpose of the RG (Rural General Industrial) is to permit development of light industrial uses in Village designations; accommodate a range of light industrial uses and limited service commercial uses for the travelling public; and, regulate development in a manner that respects adjacent land uses and will have a minimal impact on the surrounding rural area. The RG3 subzone recognizes smaller parcels.
- 4. Permitted uses in the RG3 zone include [S.219 (1)]:
  - n. Light industrial uses
  - t. Warehouse
- 5. Conditional Permitted Uses - The following are permitted subject to the use being located on the same lot as a use listed above.
  - c. Bar
    - A bar must be ancillary to a permitted brewery, winery or distillery and, may not have a gross floor area exceeding the lesser of:
      - 300 square metres, or
      - 25% of the floor area of the brewery, winery or distillery to which it is ancillary.
- 6. The site is subject to Rural Exception 385r which lists restaurants as a prohibited use.**
- 7. The proposal must meet the following 385r Exception Provisions and the RG3 provisions provided in Section 219.
  - a. Minimum front yard – 15m
  - b. Maximum lot coverage – 35 percent
  - c. No maximum building height
- 8. Minimum parking space rates as required by S.101, Table 101.
  - a. Bars – 6 per 100sq.m of g.f.a
  - b. Light industrial use – 0.8 per 100sq.m of g.f.a
  - c. Retail Store – 3.4 per 100sq.m of g.f.a

9. A landscape buffer for the parking lot will be required in accordance Table 110.
10. Outdoor refuse collection and loading areas must be:
  - a. Located at least 9 metres from a lot line abutting a public street
  - b. Located at least 3 metres from any other lot line
  - c. Screened from view by an opaque screen with a minimum height of 2.0 metres
11. Bicycle parking must be provided in accordance with Section 111.
12. If loading spaces are provided, they must be in accordance with Section 113.

### **Discussion and Submission Requirements**

13. Subject Exception Zone prohibits restaurants as a use.
14. Zoning by-law interpretation staff have confirmed that a bar/pub serving food and drink ancillary to the distillery and contained within the same structure would be aligned with the intent of the zoning.
15. If the bar/pub component were to be contained in a separate structure, it would be more closely aligned with a restaurant and would not be permitted under the current zoning.
16. A Site Plan will be required. The plan must be prepared as per the City's [Terms of Reference](#) and must address the following:
  - a. The site plan must clearly identify the required yard setbacks from all existing lot lines
  - b. The Site Plan must clearly identify all existing buildings
  - c. The required landscaped area must be included
  - d. Parking spaces must be clearly defined, as well as the access driveway, and any drive aisles throughout the site
17. A Landscape Plan will be required. The plan must be prepared in accordance with the [Landscape Plan Terms of Reference](#) and include all of the listed general elements as well as detail existing and proposed vegetation.
18. Plan of Survey showing the current site conditions prepared in accordance with the City's [Plan of Survey Terms of Reference](#).

## **Urban Design**

Comments:

### **Submission Requirements:**

19. Urban Design Brief is required.. Please see attached customized Terms of Reference to guide the preparation.
  - i. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference.
  - ii. The proposal is not subject to the Urban Design Review Panel.
20. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of references ( [Planning application submission information and materials | City of Ottawa](#)) the prepare these drawings and studies.
  - i. Design Brief
  - ii. Site Plan
  - iii. Landscape Plan
  - iv. Elevations

**Comments on Preliminary Design** – Applicants are to provide a response to these comments in the Design Brief.

21. The following policies/guidelines apply:
  - a. Village Industrial within the Richmond Secondary Plan
  - b. Design Guidelines for Rural Villages
22. Please reference the direction within the Design Guidelines to help inform the design of the building as the design progresses. The architectural directions in the guidelines should guide the building design as closely as possible.
23. Please ensure that landscaping and tree planting is provided along Ottawa Street frontage.

24. Please ensure that the patio is a comfortable place for patrons and separated from road noise. Please provide screening and perimeter landscaping.

Feel free to contact Lisa Stern, Planner III, for follow-up questions.

### **Engineering**

Comments:

#### 25. Servicing

- a. A **Site Servicing Study** will be required with the Site Plan Control application. This report should be completed exceeding the minimum requirements laid out in the Site Servicing Study Terms of Reference. The report will serve to address how the design of the site complies with City design guidelines, Official Plan policies, among other evaluation criteria noted in the Terms of Reference. Stormwater management, which is a component of the Servicing Study, is required to mitigate the effects of urbanization on the hydrologic cycle including increased runoff and decreased infiltration, of rain and snowmelt. Without proper stormwater management, a site can negatively impact the environment by reducing baseflow, degrading water quality, and increasing flooding and erosion. This leads to reduced diversity of aquatic life, fewer opportunities for human uses of water resources, and loss of property and human life. The City looks to lessen these risks by reviewing development to ensure stormwater management practices are being implemented, infrastructure is resilient to future climate conditions, including extreme weather events, and using low impact development where feasible to manage smaller, infrequent events. The Official Plan, which receives authority through the Planning Act, identifies in Policy 6, section 2.2.3, that flooding is the costliest type of natural disaster in Canada.
- b. There is no public service capacity currently available to have the option of extending public services to the proposed development. Development therefore must be on the basis of private services. The Village has a limited municipal water network and limited sanitary network & pump station capacity. Any planned growth would need to include network, and possibly plant, upgrades to support proposed development, which is likely too onerous for the scope of this development.
- c. In terms of the Stormwater Management for the Site Plan Control application, the quantity criteria will be that the 100-yr post development peak flow rate must match the 2-year pre-development

peak flow rate. As part of complete Site Plan Control application, whether development or redevelopment, the report must identify and mitigate the impacts of additional runoff resulting from increased imperviousness through measures such as site-specific stormwater management postulated in policy 6, section 4.7.1 of the Official Plan.

- d. In terms of a Stormwater Management approach, runoff volume control should proceed in the following hierarchical order, with each step exhausted before proceeding to the next:
  - 1. Retention (infiltration, reuse, or evapotranspiration),
  - 2. Low Impact Development (LID) filtration, and
  - 3. Conventional Stormwater management. Conventional stormwater management, should proceed only once Maximum Extent Possible has been attained for Steps 1 and 2 for retention and filtration.
- e. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less as described in the Sewer Design Guidelines, Second Edition, document no. SDG002, October 2012, City of Ottawa, including technical bulletins ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04, ISTB-2019-02, section 8.3.7.3.
- f. A calculated time of concentration cannot be less than 10 minutes as described in section 5.1.4 of the Sewer Design Guidelines.
- g. The water quality control should be an enhanced level treatment, 80% long term suspended sediment removal. The City will be looking for a treatment train approach for water quality treatment. Reporting of TSS removal shall be extensive and if peer reviewed and published papers are relied on for conclusions, the conclusions shall be patently clear and the report shall show overwhelming agreement.
- h. Runoff will need to be conveyed to a legal and sufficient outlet. If it is proposed to discharge storm water to the existing ditches in the ROW, the ditches will need to be shown to provide continuous flow to an outlet. This comment is sourced from the Official Plan which notes in policy 8, section 4.7.1, that proof of legal and sufficient outlet for proposed stormwater management and drainage systems will be required as a condition of future Site Plan Control.
  - i. The 1 in 100-year floodplain is present along the rear portion of the lot. Any site alteration within this area requires a permit from the Conservation Authority. The Official Plan, in section

10.1.1, notes that development and site alteration shall not be permitted in the 1 in 100 year flood plain.

- j. Low Impact Development (LID) is to be implemented as per the bulletin from the former MOECC (now MECP) titled Expectations RE: Stormwater Management released in February 2015. The infiltration target for the site is typically determined from an applicable higher-level study, which is confirmed through on-site infiltration/percolation testing. The reporting should identify the treatment train of processes proposed for the development. The Official Plan defines LID as a stormwater management strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible. LID comprises a set of site design strategies that minimize runoff through distributed, small scale structural practices that mimic natural or predevelopment hydrology through the processes of infiltration, evapotranspiration, harvesting, filtration and detention of stormwater. These practices can effectively remove nutrients, pathogens and metals from runoff, and they reduce the volume and intensity of stormwater flows. The City has released a document titled 'Low Impact Development Technical Guidance Report – Implementation in Areas with Potential Hydrogeological Constraints' which aids sites which may have constraints such as low permeability or high groundwater.
- k. The anticipated water demands (average day, maximum daily, and maximum hour) must be presented and justified for any hydrogeological pumping test rate. The pumping rate should be the maximum daily demand rate. The Ottawa Design Guidelines – Water Distribution provide information for determining water demand rates for the proposed zoning or uses in Table 4.2 – Consumption Rates.

## 26. Fire Services

- a. The Site Servicing Study must include a section addressing the provision of a **water supply for fire suppression**, determination of the required fire flow, and confirmation of whether any on-site storage will be required. It is the responsibility of the owner to ensure that an adequate water supply for firefighting is provided. The FUS (Fire Underwriters Survey) methodology, as opposed to the OBC methodology shall be applied for all rural areas.
  - i. It is anticipated that mitigative measures, including on-site storage, will be required given the group F, division 1 for distilleries. This occupancy is considered a high hazard occupancy under the Ontario Building Code. There will be risks with regards to the flammable or explosive off-gasses or

vapours, that must be contemplated and appropriately mitigated by the reporting.

- ii. The project, due to the proposed occupancy, will not be eligible to forgo the requirement for on-site fire retention storage.
  - iii. As mentioned the Phase 1 meeting, the applicant could retain a fire safety consultant to aid in the preparation of the FUS calculations. The specialist fire-fighting consultant would review a number of factors and could propose an alternative approach satisfactory to Development Review and the City's Fire Protection Engineer, Allan Evans.
  - iv. Enhanced review will be invoked should the construction coefficient chosen be less than 1.
- b. Fire Routes now require designation with By-law through the Site Plan process by contacting [fireroutes@ottawa.ca](mailto:fireroutes@ottawa.ca) once preliminary Site Plan approval has been provided.

## 27. Grading

- a. A **Grading and Drainage Plan** will be required with the Site Plan Control application identifying the existing and proposed drainage patterns and their relationship with the surface runoff control. As part of a complete Site Plan Control application, the Grading and Drainage Plan should identify and implement site, grading, building, and servicing design measures to protect new development from flooding as per policy 6, section 4.7.1 of the Official Plan. The Grading and Drainage Plan forms part of the requirements for Site Plan Control applications noted in the Studies and Plan Identification List, provided with the feedback documents.
- b. The Plan should have a note that references the horizontal and vertical datums that were used and tied into to complete the project. The drawing should also make reference (on the face of the plan) to a site benchmark that can be used by anyone with a level to carry out checks on the particular project.

## 28. Erosion and Sediment Control

- a. An **Erosion and Sediment Control Plan** will be required with the Site Plan Control Application. Erosion and sediment control plans shall have regard to Canadian Standards Association (CSA) W202 Erosion and Sediment Control Inspection and Monitoring Standard (as amended).

## 29. Geotechnical



- a. A **Geotechnical Study** will be required with the Site Plan Control application. The report should provide sufficient soils and engineering information to confirm that the site(s) are suitable or can be made suitable for development based on the requirements of the Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa.
- b. It is highly likely that sensitive marine clays will be encountered on the site. If the presence of clays is confirmed, enhanced investigations must be undertaken with vane shear, Atterberg limits, shrinkage, size, grade raise restriction, consolidation, sensitivity, and liquefaction analysis-amongst others.
- c. As the site is potentially underlain by compressible marine clays, long term groundwater monitoring will be required to support the development. Groundwater elevations are anticipated to be high (shallow) given the location in Richmond. The capacity of the deposit to accept additional load depends on the groundwater level. The Stormwater Management and LID design will also be impacted by the groundwater level.

### 30. Hydrogeological and Terrain Analysis Requirements (private servicing)

- a. A **Hydrogeological and Terrain Analysis** will be required for the Site Plan Control application to establish that there is an adequate quantity and quality of groundwater to support the proposed development(s). The requirements for the Hydrogeological and Terrain Analysis Report are outlined in the City of Ottawa Hydrogeological and Terrain Analysis Guidelines, Section 5.0 for Site Plans. The study forms part of the requirements for Site Plan Control applications noted in the Studies and Plan Identification List, provided with the feedback documents.
- b. Note that the onsite well would provide groundwater which serves the public and thus may be considered a regulated small drinking water system under O.Reg. 319/08: Small Drinking Water Systems. The application would also need to contact and incorporate any requirements set by medical officers of health or Ottawa Public Health. Any requirements related to the regulated small drinking water system must be fulfilled prior to the use of the system. "drinking water system" means a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water and that includes, (a) any thing used for the collection, production, treatment, storage, supply or distribution of water and (b) a well or intake that serves as the source or entry point of raw water supply for the system;

- c. The supply well must be tested to confirm water quantity and quality suitability prior to site plan approval. Support must be provided for the pump test rate; which should be the maximum day rate. The rate should consider the actual use, or potential uses permitted through zoning if unknown.
- d. The parameters of water quality that will be tested will be the “subdivision suite” (known to local well testing laboratories), as well as trace metals and VOCs. Requirements are outlined in the Hydrogeological and Terrain Analysis Guidelines, City of Ottawa, March 2021. The report should also provide an assessment of adjacent land uses and concerns and determine if any other parameters need to be tested (e.g. petroleum hydrocarbons, etc.).
- e. The Hydrogeological and Terrain Analysis Report should outline potential on-site activities and risks to existing groundwater users and identify measures that should be implemented to protect the aquifer in the long-term.
- f. Bollards, or other means of preventing vehicle access, will need to be provided between areas with vehicle access and the existing or proposed well(s).
- g. Results from nearby wells indicate a potential for exceedances for hardness, colour, total dissolved solids (TDS), turbidity, chloride, iron, and sodium.
- h. A Septic System Impact Assessment must be completed as part of the Hydrogeological and Terrain Analysis Report, as per the City’s Hydrogeological and Terrain Analysis Report Guidelines and MECP Guideline D-5-4, please refer to the HGTA for the predictive assessment for commercial/industrial developments (not residential developments).
  - i. Note that compact gravel will be considered impermeable in the septic impact assessment unless accompanied by field testing to confirm infiltration rates.
  - ii. Since this application is a site plan (not lot creation or zoning) septic treatment (i.e. tertiary treatment with nitrate dilution) may be considered as part of the septic impact assessment calculations. A system certified though NSF or BNQ should be recommended.
- i. If the expected sewage daily design flow is 10,000 L/d or less, the septic permit from the Ottawa Septic System Office must be issued prior to Site Plan Approval being granted.

- j. If the sewage design flow from sewage systems exceeds 10,000 L/d, a Reasonable Use Assessment must accompany the application to the City. Sewage systems with design flows exceeding 10,000 L/d require the issuance of an Environmental Compliance Approval (ECA) from the MECP prior to Site Plan Approval being granted.
- k. Bollards, or other means of preventing vehicle access, will need to be provided between areas with vehicle access and the proposed septic system(s).
- l. Technical consultation with the hydrogeological report reviewer is encouraged, please contact the City hydrogeologist, Obai Mohammed and copy the project manager listed below to schedule a technical consultation.

### 31. Noise and Vibration

- a. A **Noise Control Study** is required with the Site Plan Control Application. Noise studies are required for new noise sensitive land uses in proximity to surface transportation (road and rail). The site is within the influence area of a Protected Transportation Corridor (identified on Schedule C2 of the Official Plan) for which the noise impacts must be contemplated. A Noise Feasibility Study is required for development proposals within 250 meters of a secondary main railway line or within 500 meters of a principal main railway line.
  - i. The Ministry of Ontario's NPC-300 Environmental Noise Guideline, for which the City's ENCG were based, defines a noise sensitive land use as a property of a person that accommodates a building used for a noise sensitive commercial purpose. The definition goes on to say that from a land use planning perspective, a noise sensitive land use may be comprised of spaces that are noise sensitive and spaces that are not noise sensitive. The outdoor living area (OLA) associated with a noise sensitive land use is considered a noise sensitive space.
  - ii. The City's Environmental Noise Control Guidelines identify that noise sensitive land uses includes other land uses that may contain outdoor and/or outdoor areas/spaces where an intruding noise may create an adverse effect, which appears to be the case for the proposal.
- b. The City will require a vibration study if there is proposed development within 75 metres of the railway right of way, based on Official Plan section 10.2.1.

- c. The owner of the rail corridor will be able to provide scoping for the future works in the rail corridor which will guide the classification as principal or secondary main rail line in terms of the preparation of the noise feasibility study.

### 32. Rail Safety

- a. A **Rail Proximity Study** will be required with the application to address rail safety, implement risk mitigation best practices, and to inform any development setbacks required based on proximity to the rail corridor. The Official Plan notes, in section 10.2.1, that land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 must follow rail safety and risk mitigation best practices to determine appropriate development setbacks. The FCM-RAC Guidelines for New Development or its successor shall apply in this case.
  - i. One of the elements of the report will be to contemplate the use of safety barriers to reduce the risks associated with railway incidents by intercepting or deflecting derailed cars in order to reduce or eliminate potential loss of life and damage to property. The standard safety barrier is an earthen berm, which is intended to absorb the energy of derailed cars, slowing them down and limiting the distance they travel outside of the railway right-of-way. The berm works by intercepting the movement of a derailed car. As the car travels into the berm, it is pulled down by gravity, causing the car to begin to dig into the earth, and pulling it into the intervening earthen mass, slowing it down, and eventually bringing it to a stop.

33. An MECP Environmental Compliance Approval would be required for the proposed stormwater management facilities, LID works, or sewage works if the exemption requirements of O.Reg. 525/98 are not met. It appears based on the proposal that an ECA would be required given the industrial use. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation.

- a. Please note that the process for ECAs is undergoing changes and may be different upon time of submission. Currently, once the development application has been submitted, a request can be made to the City to consider a Transfer of Review (ToR) ECA for SWM works (ponds, ditches, culverts, etc.) for private property, instead of a direct submission ECA. This is subject to approval by the City and MECP. Note that the ECA requirements are currently in transition towards the linear ECA process and more details may become available depending on application submission timeline. It is

recommended to check with the City when the development application is submitted to confirm the ECA process at that time.

#### 34. Phase One Environmental Site Assessment

- a. A **Phase One Environmental Site Assessment (ESA)**, and possibly Phase Two ESA as deemed required by the Phase 1 ESA, is required for the proposed Site Plan Control application. This mandatory report serves to ensure that development only takes place on sites where the environmental conditions are suitable for the proposed use in accordance with provincial legislation and regulations. The City's Historic Land Use Inventory identifies that there is a potentially contaminating use of a Motor Vehicle Repair Shop, repair and service at 5949 Ottawa which should be contemplated by the environmental consultant.

#### 35. Construction constraints

- a. More detailed constraints may be provided in the Phase 2 Pre-Application Consultation Meeting as the conceptual drawing has provided more detail.

#### 36. Background studies

- a. Village of Richmond Master Servicing Study
- b. Village of Richmond Environmental Management Plan
- c. Village of Richmond Community Design Plan

#### 37. Severance

- a. In terms of the requirements for a future proposed severance, there will be engineering conditions placed on the application. It is recommended that the applicant reach out to the Development Review All Wards group who now handles commenting on Committee of Adjustment applications.
  - i. It is anticipated that a condition will be for a Hydrogeological and Terrain Analysis report to demonstrate the adequacy of the groundwater and area/septic dilution to accommodate the development.
  - ii. It is anticipated that a condition for independent water, sanitary and storm servicing will be place. Each lot should have their own independent systems which do not cross the property line.

- iii. It is anticipated that Noise Studies, Phase 1 ESA, and Rail Safety reports would be required as conditions of the severance.

Feel free to contact Travis Smith, Infrastructure Project Manager, for follow-up questions.

## **Transportation**

Comments:

38. A TIA is not required.

39. ROW Protection:

- a. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.
- b. See [Schedule C16 of the Official Plan](#).
- c. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.
- d. ROW must be unincumbered and conveyed at no cost to the City. Note that conveyance of the ROW/corner triangle will be required prior to registration of the SP agreement. Additional information on the conveyance process can be provided upon request.

40. Clear throat requirement is 8m. Ensure this length is provided. The clear throat length is measured from the ends of the driveway curb return radii at the roadway and the point of first conflict on-site. Note the minimum throat length provided must be maintained with the future ROW protection (as applicable).

41. Signalization of Eagleson Road and Ottawa Street is identified on the Development Charges Bylaw. Warrants have not yet been met for this intersection.

42. As the proposed site is commercial/industrial, AODA legislation applies.

- a. Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
- b. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

- c. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.  
<https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards>

43. On site plan:

- a. Ensure site access meets the City's Private Approach Bylaw.
- b. Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.
- c. Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
- d. Turning movement diagrams required for internal movements (loading areas, garbage).
- e. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
- f. Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.).

Feel free to contact Josiane Gervais, Transportation Project Manager, for follow-up questions.

## **Environment**

Comments:

- 44. Backs onto floodplain associated with Marlborough Creek. The village of Richmond EMP (2010) indicates that the floodplain on this property contains a "local woodlot". Since the site plan indicates that the woodlot in the floodplain will be retained, we have no significant natural heritage concerns with the proposal.
- 45. There is potential for species at risk on the site, particularly in the wooded portion of the site this can be addressed through a Tree Conservation Report since the most likely concerns are related to forest dwelling species like butternut trees, black ash, and bats (addressed through timing windows). Accordingly we recommend a Tree Conservation Report be prepared to address the potential presences of these species within 25 m of

the proposed site alteration. The TCR will also need to address the concerns of our Planning Foresters as well as the information above.

46. Bird-safe design - Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here:  
[https://documents.ottawa.ca/sites/documents/files/birdsafedesign\\_guidelines\\_en.pdf](https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf)

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

### **Forestry**

Comments:

47. A tree permit will not be required as part of this application, as there are no City Trees within the right-of-way fronting the site, and impacts to private trees in the rural area are not regulated by the tree by-law.
48. The following Tree Conservation Report (TCR) guidelines have been adapted from the Schedule E of the Tree Protection By-law – for more information on these requirements please contact [julian.alvarez-barkham@ottawa.ca](mailto:julian.alvarez-barkham@ottawa.ca)
- a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    - i. An approved TCR is a requirement of Site Plan approval.
  - b. The TCR must contain 2 separate plans:
    - i. Plan/Map 1 - show existing conditions with tree cover information.
    - ii. Plan/Map 2 - show proposed development with tree cover information.
  - c. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition.
    - i. For ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table.
  - d. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)



- e. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
    - i. Compensation may be required for the removal of city owned trees.
  - f. The removal of trees on a property line will require the permission of both property owners.
  - g. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available on the Tree Protection Specification or by searching Ottawa.ca.
    - i. The location of tree protection fencing must be shown on the plan;
    - ii. Show the critical root zone of the retained trees.
  - h. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
49. The following Landscape Plan (LP) guidelines have been adapted from Schedule E of the Tree Protection By-law – for more information on these requirements please contact [julian.alvarez-barkham@ottawa.ca](mailto:julian.alvarez-barkham@ottawa.ca)
- a. Please ensure any retained trees are shown on the LP.
  - b. Minimum Setbacks
    - i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    - ii. Maintain 2.5m from curb.
  - c. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
  - d. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.
  - e. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
  - f. Tree specifications
    - i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    - ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

- g. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
- h. No root barriers, dead-man anchor systems, or planters are permitted.
- i. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
- j. Hard surface planting
  - i. If there are hard surface plantings, a planting detail must be provided.
  - ii. Curb style planter design is highly recommended.
  - iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- k. Trees are to be planted at grade.
- l. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

| Tree Type/Size | Single Tree Soil Volume (m3) | Multiple Tree Soil Volume (m3/tree) |
|----------------|------------------------------|-------------------------------------|
| Ornamental     | 15                           | 9                                   |
| Columnar       | 15                           | 9                                   |
| Small          | 20                           | 12                                  |
| Medium         | 25                           | 15                                  |
| Large          | 30                           | 18                                  |
| Conifer        | 25                           | 15                                  |

- i. It is strongly suggested that the proposed species list include a column listing the available soil volume.
- m. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- n. The City requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

- o. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. **Please provide a projection of the future canopy cover for the site to 40 years.**

Feel free to contact Julian Alvarez-Barkham, Forester, for follow-up questions.

### **Parkland**

Comments:

- 50. Parkland Dedication will be required in accordance with [By-law No. 2022-280](#).
- 51. The applicable parkland dedication rate for Industrial and Commercial uses is 2% of the gross land area. For Commercial and Industrial redevelopment, gross land area means the portion of the property that is impacted by the development, but not including any hazard lands or natural heritage features identified in the Official Plan, an approved Secondary Plan, or through an environmental impact study accepted by the City;
- 52. The applicant is advised that they must identify on the survey, site plan or supporting plan the portion of the property impacted by the development, for the purpose of calculating gross land area. The property appears to be impacted by floodplain. Floodplains may be excluded from the area subject to parkland dedication.
- 53. Parks & Facilities Planning is requesting payment of **Cash-in-lieu-of-Parkland** for this development. The value of the land, equivalent to the Parkland Dedication requirement, will be determined as of the day before planning approval is given for the development. A property valuation will be completed by the City prior to site plan approval at the owner's cost.
- 54. The conveyance of parkland or the payment of cash-in-lieu of parkland is required unless it can be demonstrated, that the required parkland conveyance or cash-in-lieu of parkland, or combination thereof, has been previously satisfied in accordance with the Planning Act.
- 55. The application notes a future severance of the lot. The owner is advised that if they provide CIL of parkland for the entirety of the subject property prior to severance, they should not be required to provide further parkland dedication at the time of lot creation.



Feel free to contact Anissa McAlpine, Parks Planner, for follow-up questions.

### **Conservation Authority**

Comments:

- 56. No concerns with the proposal as no physical development is occurring within the floodplain or regulated area.

Feel free to contact Eric Lalande, Rideau Valley Conservation Authority, for follow-up questions.

### **Other**

The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

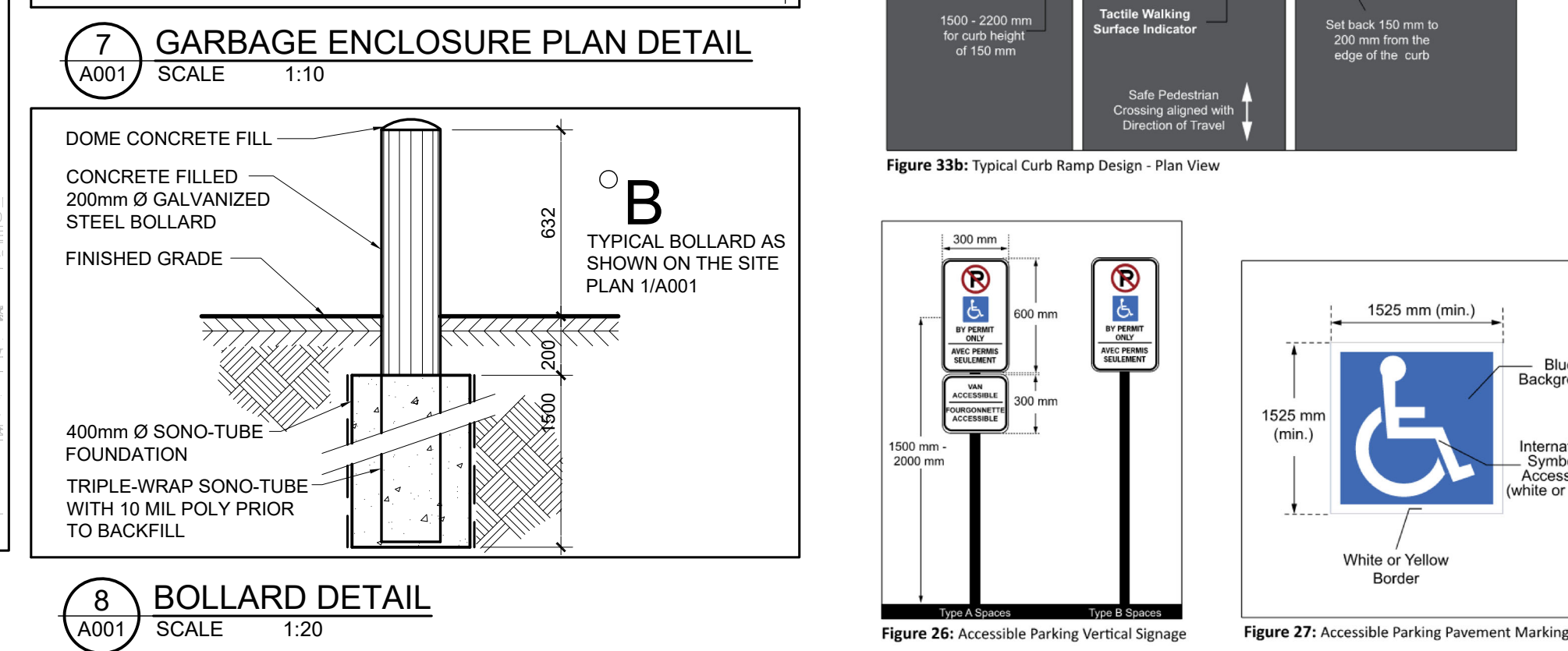
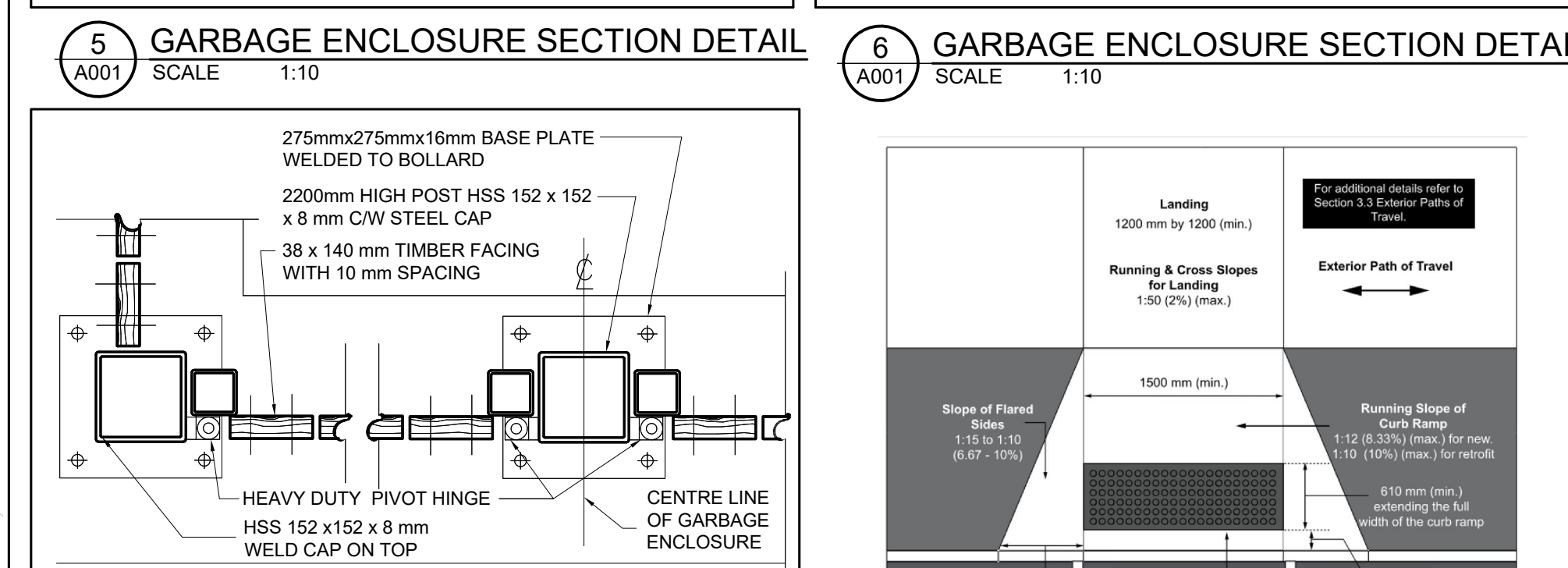
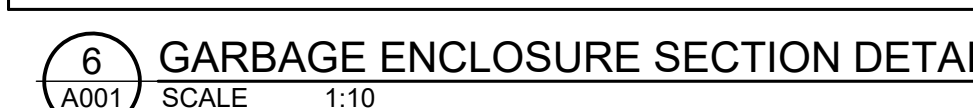
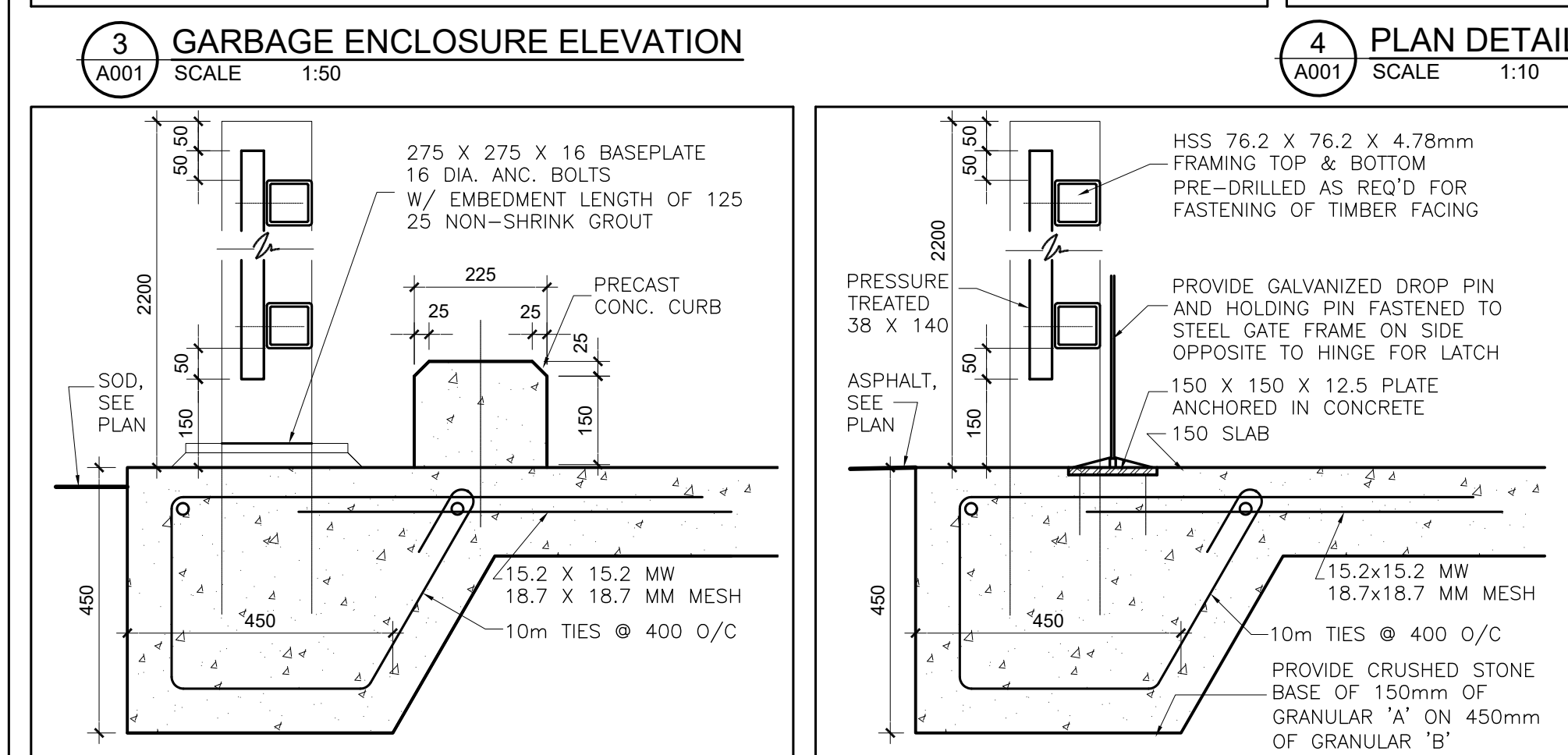
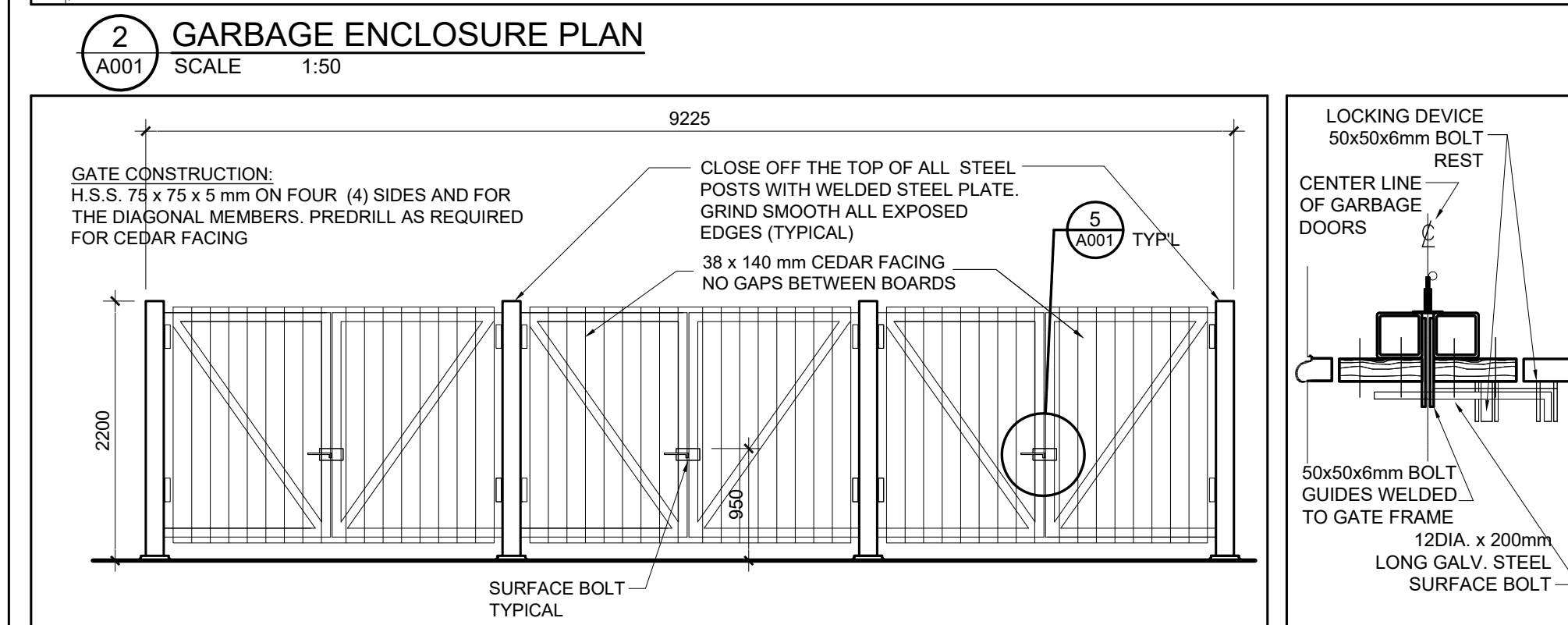
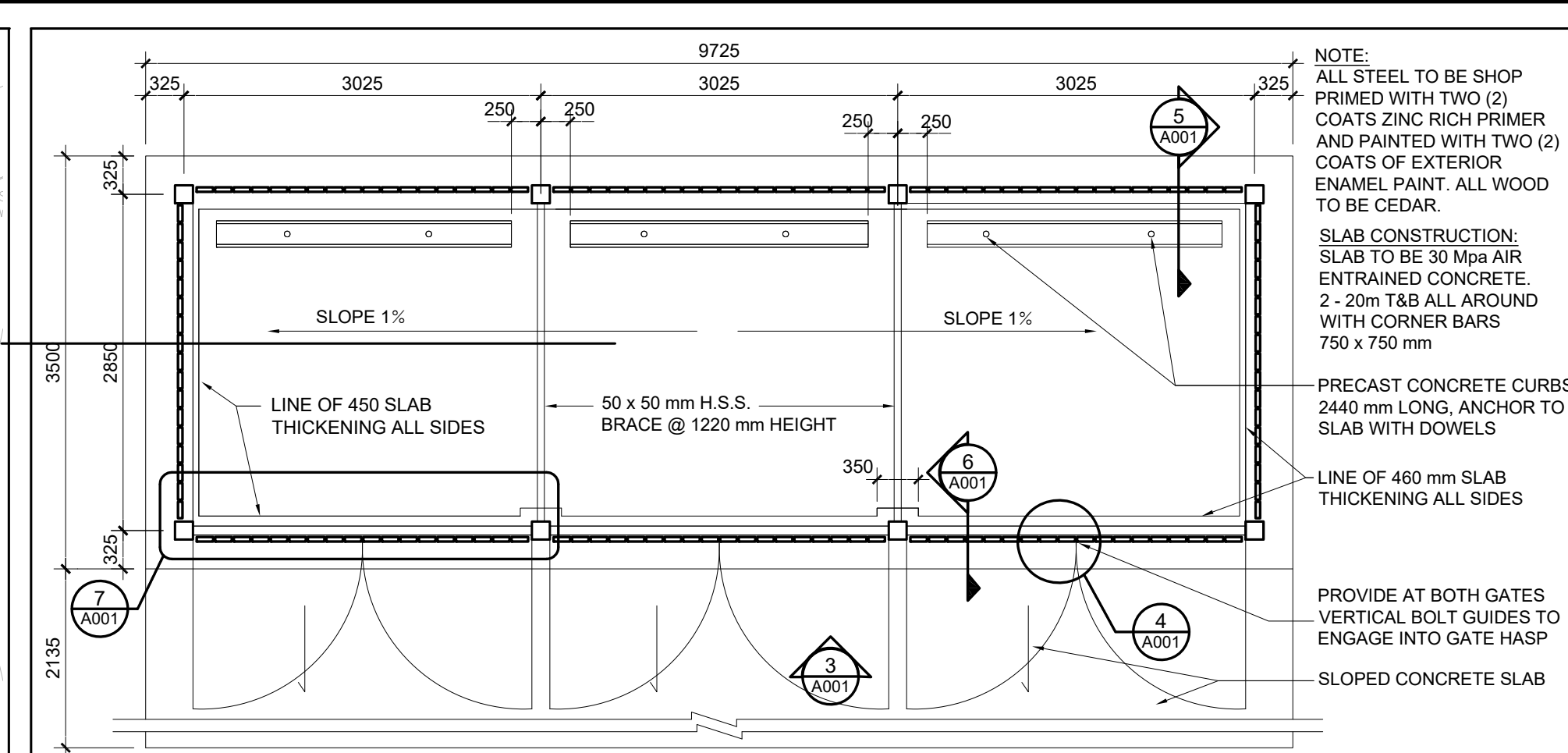
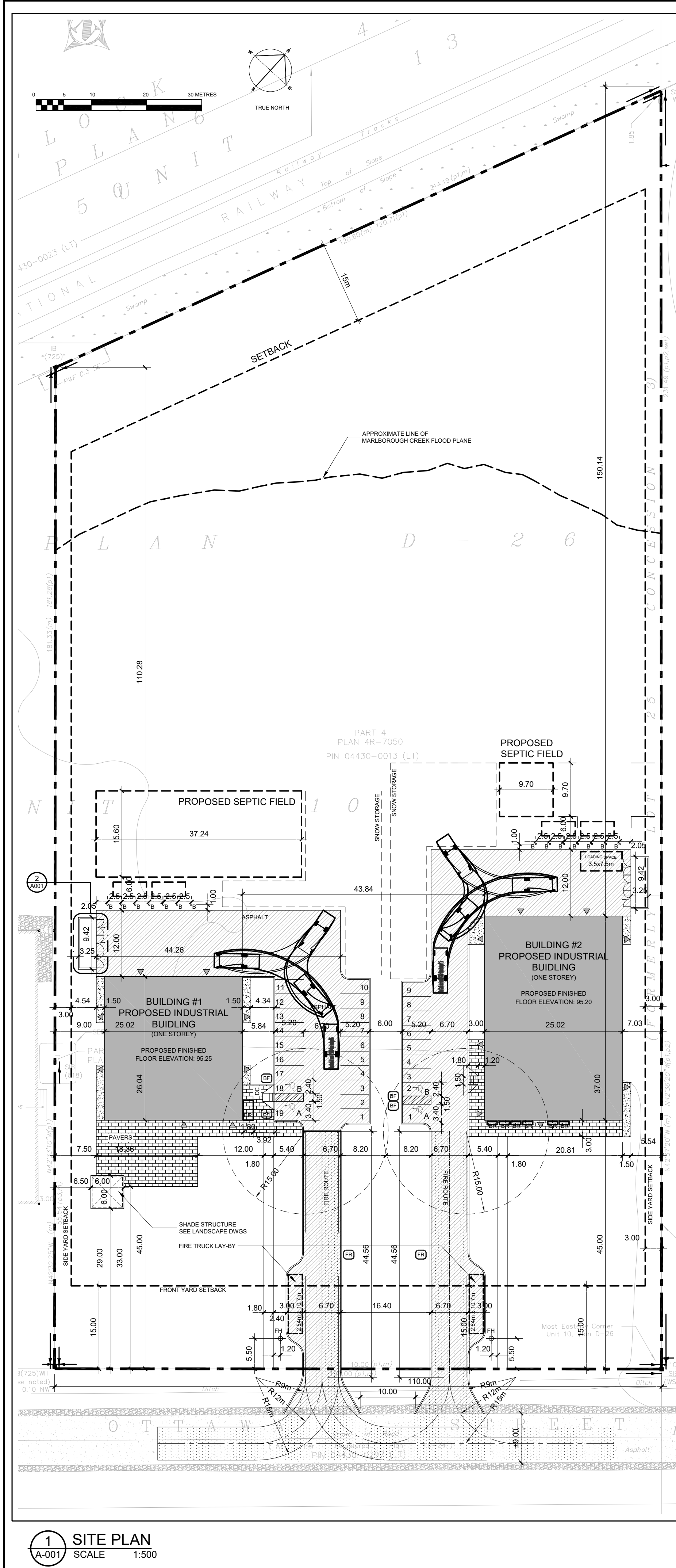
- a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.
- b. Please refer to the HPDS information attached and [ottawa.ca/HPDS](http://ottawa.ca/HPDS) for more information.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,  
Stephan Kukkonen

c.c. Smith Travis - Infrastructure Project Manager  
Josiane Gervais - Transportation Project Manager  
Lisa Stern – Planner III (Urban Design)  
Matthew Hayley – Environmental Planner  
Julian Alvarez-Barkham – Planning Forester  
Anissa McAlpine – Parks Planner  
Eric Lalande – Rideau Valley Conservation Authority

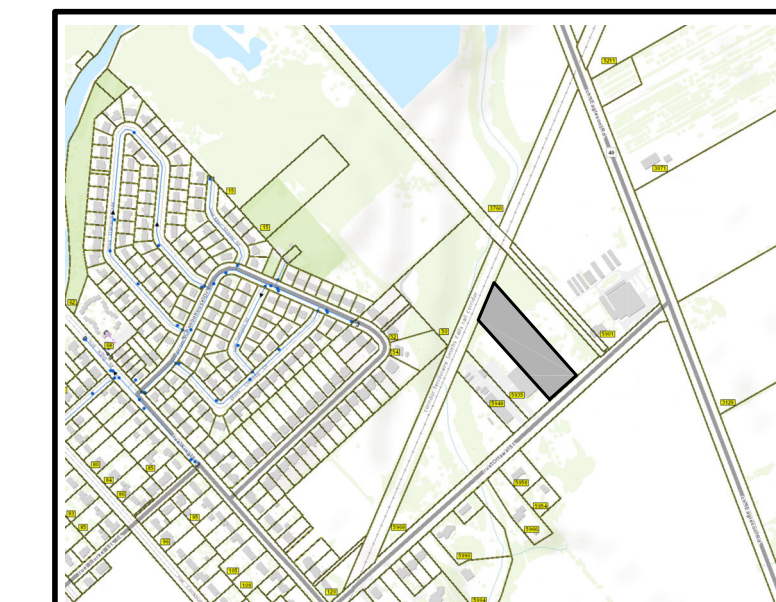
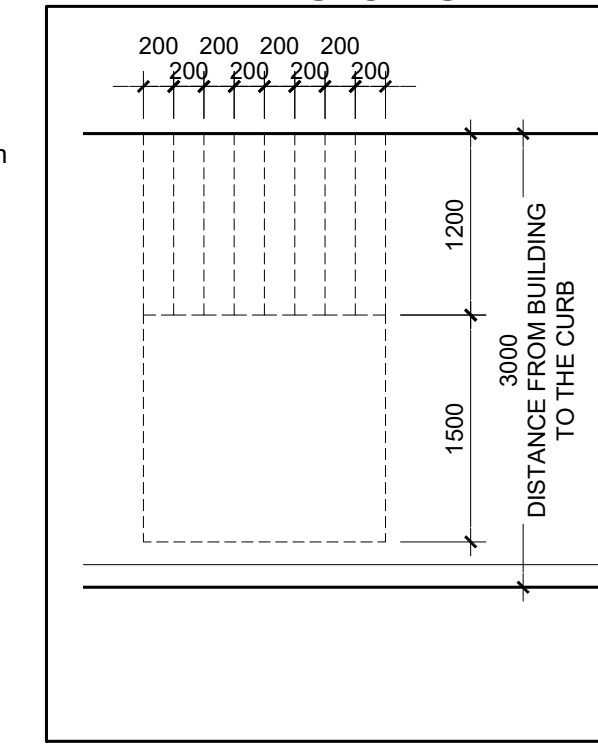




| ZONING INFORMATION                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                              |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| NOTE: ALL ZONING DEFINITIONS AND REQUIREMENTS AS PER CITY OF OTTAWA ZONING BY-LAW 2008-250 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                              |
| ZONING MECHANISM                                                                           | REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PROVIDED                                                                                                                                     |
| DEFINITION                                                                                 | R3 (385) RURAL GENERAL INDUSTRIAL ZONE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BUILDING #1: WAREHOUSE, RETAIL STORE, BAR (25%)<br>BUILDING #2: WAREHOUSE                                                                    |
| MIN. LOT WIDTH                                                                             | 30.0 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 110.0 m                                                                                                                                      |
| MIN. LOT AREA                                                                              | 2,000 m <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 22,680 m <sup>2</sup> (± 5.6 Acres)                                                                                                          |
| MIN. FRONT YARD SETBACK                                                                    | 15.0 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 45.0 m                                                                                                                                       |
| MIN. REAR YARD SETBACK                                                                     | 15.0 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 110.0 m                                                                                                                                      |
| MIN. INTERIOR SIDE YARD SETBACK                                                            | 3.0 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.0 m                                                                                                                                        |
| MAX. LOT COVERAGE                                                                          | 35%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2.85%                                                                                                                                        |
| PARKING LANDSCAPE BUFFER                                                                   | FOR A PARKING LOT CONTAINING 10-100 SPACES:<br>ABUTTING A STREET = 3 m<br>NOT ABUTTING A STREET = 1.5 m                                                                                                                                                                                                                                                                                                                                                                                                                    | ABUTTING A STREET 3 m<br>NOT ABUTTING A STREET 3 m                                                                                           |
| STANDARD PARKING SPACE                                                                     | 2.6m WIDTH x 5.2m LENGTH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.6m WIDTH x 5.2m LENGTH                                                                                                                     |
| PARALLEL PARKING SPACE                                                                     | 2.6m WIDTH x 6.7m LENGTH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.6m WIDTH x 6.7m LENGTH                                                                                                                     |
| ACCESSIBLE PARKING SPACE                                                                   | 3.4x5.2m (A); 2.4x5.2m(B)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.4x5.2m (A); 2.4x5.2m(B)                                                                                                                    |
| PARKING REQUIREMENTS                                                                       | BUILDING#1:<br>LIGHT INDUSTRIAL USE (N49): 0.8 PER 100 m <sup>2</sup> OF GFA (3.45 REQUIRED)<br>RETAIL STORE (N79): 3.4 PER 100m <sup>2</sup> OF GFA (2.75 REQUIRED)<br>BAR (N15): 6 PER 100m <sup>2</sup> OF GFA (6.48 REQUIRED)<br>TOTAL REQUIRED: 12.725<br>BUILDING#2:<br>LIGHT INDUSTRIAL USE (N49): 0.8 PER 100 m <sup>2</sup> OF GFA (3.45 REQUIRED)<br>RETAIL STORE (N79): 3.4 PER 100m <sup>2</sup> OF GFA (2.75 REQUIRED)<br>BAR (N15): 6 PER 100m <sup>2</sup> OF GFA (6.48 REQUIRED)<br>TOTAL REQUIRED: 12.725 | BUILDING#1:<br>19 PARKING SPACES<br>BUILDING#2:<br>9 PARKING SPACES                                                                          |
| BARRIER FREE ACCESSIBLE                                                                    | AS PER CITY OF OTTAWA ACCESSIBILITY DESIGN STANDARDS, PARAGRAPH 3.1.2, TABLE 3<br>1 TYPE 'A', 1 TYPE 'B'                                                                                                                                                                                                                                                                                                                                                                                                                   | BUILDING#1:<br>2 ACCESSIBLE PARKING SPACES (1xTYPE 'A' + 1xTYPE 'B')<br>BUILDING#2:<br>2 ACCESSIBLE PARKING SPACES (1xTYPE 'A' + 1xTYPE 'B') |
| LOADING SPACES                                                                             | GFA 350-999m <sup>2</sup> - 0 required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0 PROVIDED                                                                                                                                   |
| BICYCLE PARKING RATE                                                                       | BUILDING#1:<br>LIGHT INDUSTRIAL USE: 1 PER 1,000 m <sup>2</sup> OF GFA (0.4365 REQUIRED)<br>RETAIL STORE: 1 PER 250 m <sup>2</sup> OF GFA (0.32 REQUIRED)<br>BAR: 1 PER 1,500 m <sup>2</sup> OF GFA (0.072) TOTAL REQUIRED: 0.8285<br>BUILDING#2:<br>LIGHT INDUSTRIAL USE: 1 PER 1,000 m <sup>2</sup> OF GFA (0.4365 REQUIRED)                                                                                                                                                                                             | BUILDING#1:<br>6 BICYCLE SPACES<br>BUILDING#2:<br>6 BICYCLE SPACES                                                                           |

| SYMBOL LEGEND:       |                                                                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ▲ ▼                  | BLDG ENTRANCE/EXIT                                                                                                                                                                           |
| — FDC                | FIRE DEPARTMENT CON                                                                                                                                                                          |
| — FH                 | NEW FIRE HYDRANT                                                                                                                                                                             |
| — WM                 | WATER METER                                                                                                                                                                                  |
| — DC                 | NEW DEPRESSED CURB                                                                                                                                                                           |
| —                    | NEW CURB                                                                                                                                                                                     |
| —                    | PROPERTY LINE                                                                                                                                                                                |
| —                    | NEW CHAIN LINK FENCE                                                                                                                                                                         |
| — B                  | BOLLARD                                                                                                                                                                                      |
| — BR                 | BIKE RACKS                                                                                                                                                                                   |
| SIGNAGE LEGEND:      |                                                                                                                                                                                              |
| — BF                 | BF PARKING                                                                                                                                                                                   |
| — FR                 | FIRE ROUTE                                                                                                                                                                                   |
| —                    | FIRE ROUTE (AS PER OBC 3.2.5):<br>• 6m WIDE<br>• 12m CENTRE LINE RADIUS<br>• 3m CLEAR OF ANY OBSTRUCTIONS AND/OR BUILDINGS<br>• 15m TO FRONT ENTRANCE<br>• 90m MAX TO TURN AROUND FACILITIES |
| GROUND COVER LEGEND: |                                                                                                                                                                                              |
| — GRASS              | CONCRETE                                                                                                                                                                                     |
| — ASPHALT            | PAVERS                                                                                                                                                                                       |

## BICYCLE PARKING DIMENSIONS



OWNER:  
99117756 CANADA INC. c/o JACK GULAS  
411 LEGGET DRIVE, SUITE 710, OTTAWA, ONTARIO, K2K 3C9

| no. | revision                     | date    |
|-----|------------------------------|---------|
| 4   | ISSUED FOR SPA               | 09OCT25 |
| 3   | ISSUED FOR SPA               | 29JUL25 |
| 2   | ISSUED FOR SPA               | 15MAY25 |
| 1   | ISSUED FOR SITE PLAN CONTROL | 07OCT24 |

**N45 ARCHITECTURE INC.**  
71 Bank Street, 7th floor - Ottawa, Ontario, K1P 5N2  
tel. 613.224.0095 fax 613.224.9811

project  
**FOXRUN RICHMOND**  
5923 OTTAWA STREET  
OTTAWA, ON  
project north  
seal  
ONTARIO ASSOCIATION OF ARCHITECTS  
VLADIMIR POPOVIC  
LICENCE 5918

| drawing title                                                                                                                   |                         |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| SITE PLAN                                                                                                                       |                         |
| scale<br>AS NOTED                                                                                                               | drawn by<br>NF          |
| date<br>JUNE 2022                                                                                                               | checked by<br>VP        |
| project number<br>24-826                                                                                                        | drawing number<br>A-001 |
| CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS. |                         |
| revision<br>-                                                                                                                   |                         |



## APPENDIX C WATERMAIN CALCULATIONS

## 000-25-0415 - 5923 Ottawa Street - Water Demands - Phase 1

|                   |                    |
|-------------------|--------------------|
| Project:          | 5923 Ottawa Street |
| Project No.:      | 000-25-0415        |
| Designed By:      | FV                 |
| Checked By:       | AG                 |
| Date:             | September 10, 2025 |
| Development Area: | 0.48 gross ha      |

|                                 |        |
|---------------------------------|--------|
| Commercial                      | 190 m2 |
| Industrial - Light (Distillery) | 432 m2 |

### AVERAGE DAILY DEMAND

| DEMAND TYPE                   | AMOUNT                                | UNITS                     |
|-------------------------------|---------------------------------------|---------------------------|
| Residential                   | 280                                   | L/c/d                     |
| Industrial - Light            | 35,000                                | L/gross ha/d              |
| Industrial - Heavy            | 55,000                                | L/gross ha/d              |
| Shopping Centres              | 2,500                                 | L/(1000m <sup>2</sup> /d) |
| Hospital                      | 900                                   | L/(bed/day)               |
| Schools                       | 70                                    | L/(Student/d)             |
| Trailer Park with no Hook-Ups | 340                                   | L/(space/d)               |
| Trailer Park with Hook-Ups    | 800                                   | L/(space/d)               |
| Campgrounds                   | 225                                   | L/(campsite/d)            |
| Mobile Home Parks             | 1,000                                 | L/(Space/d)               |
| Motels                        | 150                                   | L/(bed-space/d)           |
| Hotels                        | 225                                   | L/(bed-space/d)           |
| Tourist Commercial            | 28,000                                | L/gross ha/d              |
| Other Commercial              | 28,000                                | L/gross ha/d              |
| AVERAGE DAILY DEMAND          | Residential                           | 0.00 L/s                  |
|                               | Commercial/ Industrial/ Institutional | 0.02 L/s                  |

### MAXIMUM DAILY DEMAND

| DEMAND TYPE          | AMOUNT                                | UNITS        |
|----------------------|---------------------------------------|--------------|
| Residential          | 9.5 x avg. day                        | L/c/d        |
| Industrial           | 1.5 x avg. day                        | L/gross ha/d |
| Commercial           | 1.5 x avg. day                        | L/gross ha/d |
| Institutional        | 1.5 x avg. day                        | L/gross ha/d |
| MAXIMUM DAILY DEMAND | Residential                           | 0.00 L/s     |
|                      | Commercial/ Industrial/ Institutional | 0.04 L/s     |

### MAXIMUM HOUR DEMAND

| DEMAND TYPE         | AMOUNT                                | UNITS        |
|---------------------|---------------------------------------|--------------|
| Residential         | 14.3 x avg. day                       | L/c/d        |
| Industrial          | 1.8 x max. day                        | L/gross ha/d |
| Commercial          | 1.8 x max. day                        | L/gross ha/d |
| Institutional       | 1.8 x max. day                        | L/gross ha/d |
| MAXIMUM HOUR DEMAND | Residential                           | 0.00 L/s     |
|                     | Commercial/ Industrial/ Institutional | 0.06 L/s     |

WATER DEMAND DESIGN FLOWS PER UNIT COUNT  
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

|                      |      |     |
|----------------------|------|-----|
| AVERAGE DAILY DEMAND | 0.02 | L/s |
| MAXIMUM DAILY DEMAND | 0.04 | L/s |
| MAXIMUM HOUR DEMAND  | 0.06 | L/s |

## 000-25-0415 - 5923 Ottawa Street - Water Demands - Phase 2

|                   |                    |
|-------------------|--------------------|
| Project:          | 5923 Ottawa Street |
| Project No.:      | 000-25-0415        |
| Designed By:      | FV                 |
| Checked By:       | AG                 |
| Date:             | September 10, 2025 |
| Development Area: | 0.45 gross ha      |

Industrial - Light (Brewery)

926 m2

### AVERAGE DAILY DEMAND

| DEMAND TYPE                   | AMOUNT                                | UNITS                     |
|-------------------------------|---------------------------------------|---------------------------|
| Residential                   | 280                                   | L/c/d                     |
| Industrial - Light            | 35,000                                | L/gross ha/d              |
| Industrial - Heavy            | 55,000                                | L/gross ha/d              |
| Shopping Centres              | 2,500                                 | L/(1000m <sup>2</sup> /d) |
| Hospital                      | 900                                   | L/(bed/day)               |
| Schools                       | 70                                    | L/(Student/d)             |
| Trailer Park with no Hook-Ups | 340                                   | L/(space/d)               |
| Trailer Park with Hook-Ups    | 800                                   | L/(space/d)               |
| Campgrounds                   | 225                                   | L/(campsite/d)            |
| Mobile Home Parks             | 1,000                                 | L/(Space/d)               |
| Motels                        | 150                                   | L/(bed-space/d)           |
| Hotels                        | 225                                   | L/(bed-space/d)           |
| Tourist Commercial            | 28,000                                | L/gross ha/d              |
| Other Commercial              | 28,000                                | L/gross ha/d              |
| AVERAGE DAILY DEMAND          | Residential                           | 0.00 L/s                  |
|                               | Commercial/ Industrial/ Institutional | 0.04 L/s                  |

### MAXIMUM DAILY DEMAND

| DEMAND TYPE          | AMOUNT                                | UNITS        |
|----------------------|---------------------------------------|--------------|
| Residential          | 9.5 x avg. day                        | L/c/d        |
| Industrial           | 1.5 x avg. day                        | L/gross ha/d |
| Commercial           | 1.5 x avg. day                        | L/gross ha/d |
| Institutional        | 1.5 x avg. day                        | L/gross ha/d |
| MAXIMUM DAILY DEMAND | Residential                           | 0.00 L/s     |
|                      | Commercial/ Industrial/ Institutional | 0.06 L/s     |

### MAXIMUM HOUR DEMAND

| DEMAND TYPE         | AMOUNT                                | UNITS        |
|---------------------|---------------------------------------|--------------|
| Residential         | 14.3 x avg. day                       | L/c/d        |
| Industrial          | 1.8 x max. day                        | L/gross ha/d |
| Commercial          | 1.8 x max. day                        | L/gross ha/d |
| Institutional       | 1.8 x max. day                        | L/gross ha/d |
| MAXIMUM HOUR DEMAND | Residential                           | 0.00 L/s     |
|                     | Commercial/ Industrial/ Institutional | 0.10 L/s     |

WATER DEMAND DESIGN FLOWS PER UNIT COUNT

CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

|                      |      |     |
|----------------------|------|-----|
| AVERAGE DAILY DEMAND | 0.04 | L/s |
| MAXIMUM DAILY DEMAND | 0.06 | L/s |
| MAXIMUM HOUR DEMAND  | 0.10 | L/s |



4

3

2

1

D

D

C

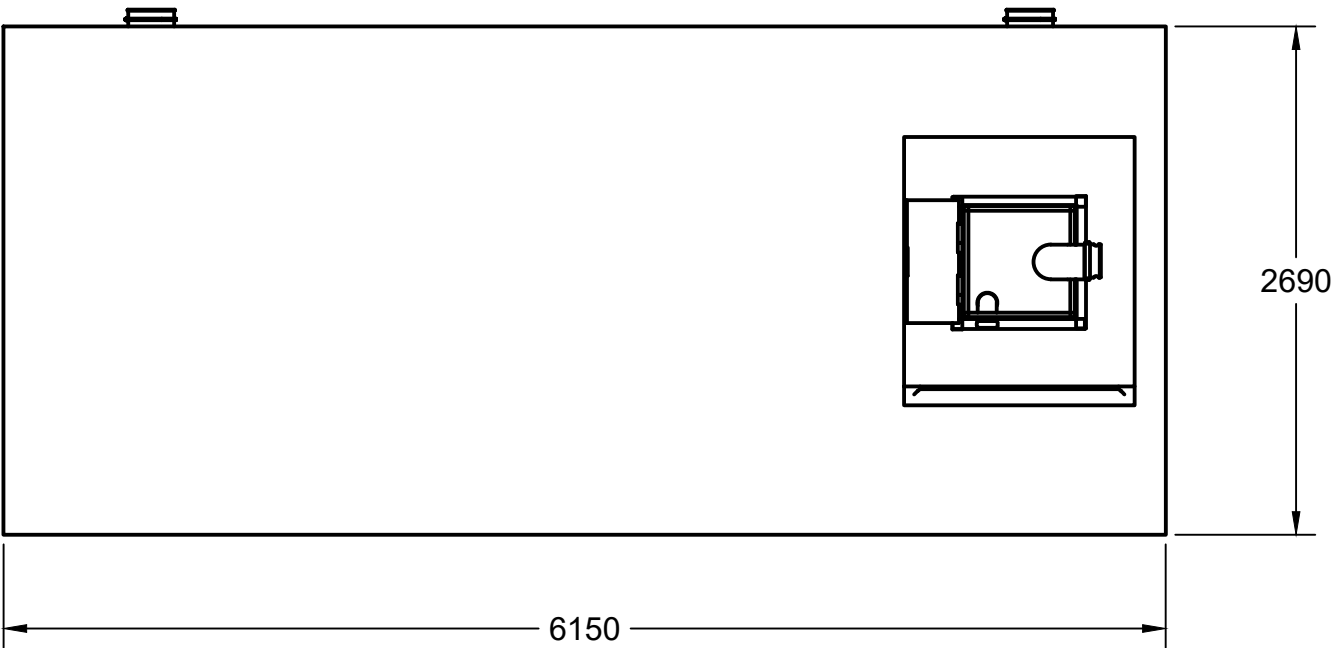
C

B

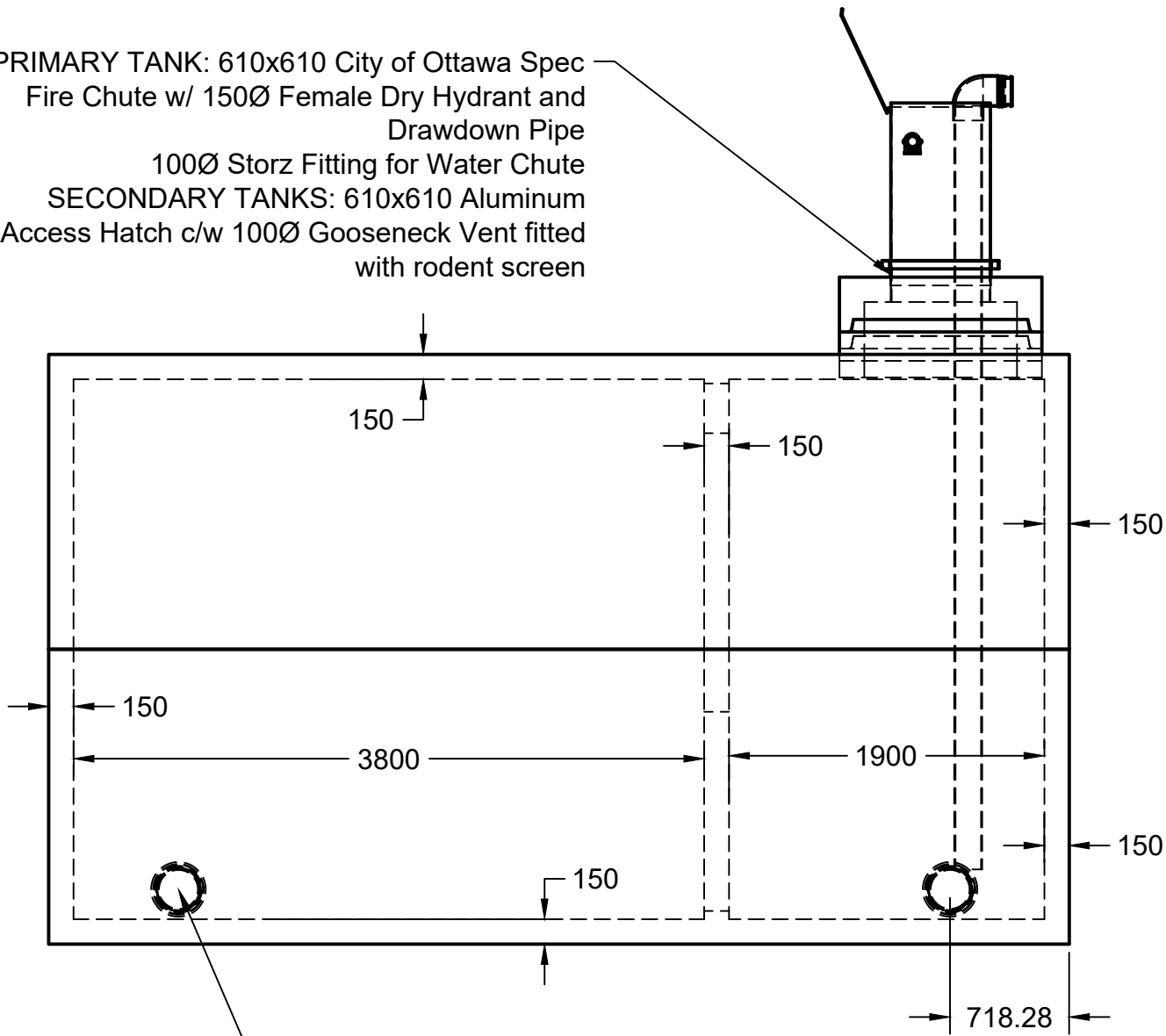
B

A

A



PRIMARY TANK: 610x610 City of Ottawa Spec Fire Chute w/ 150Ø Female Dry Hydrant and Drawdown Pipe  
100Ø Storz Fitting for Water Chute  
SECONDARY TANKS: 610x610 Aluminum Access Hatch c/w 100Ø Gooseneck Vent fitted with rodent screen



2- 200Ø Interconnection Bootseals For Multiple Tank Cluster Systems

TOTAL VOLUME: 45000L

CONCRETE: 35MPa WITH 5-8% AIR ENTRAINMENT  
NON SULPHATE RESISTANT

REINFORCING: GRADE 400W CONFORMING TO CSA G30.18  
15M @ 200mm ON CENTRE EACH WAY  
ADDITIONAL 15M AROUND PERIMETER AT SEAM BETWEEN

SECTIONS 15M x900mm ON DIAGONAL AT EACH CORNER OF LID OPENING

WEIGHT: TOP SECTION 19000KGS  
BOTTOM SECTION 19000KGS  
TOTAL 38000KGS

MAXIMUM BURIAL DEPTH: 1200MM OF GROUND COVER IN AREA OF NON-VEHICULAR TRAFFIC

WATER TIGHTNESS: 2X ROWS CON-SEAL CS-102 MASTIC SEALANT BETWEEN SECTIONS. SEALANT APPLIED ONSITE BY BOYD BROS CONCRETE ACCORDING TO MANUFACTURER'S RECOMMENDED METHOD

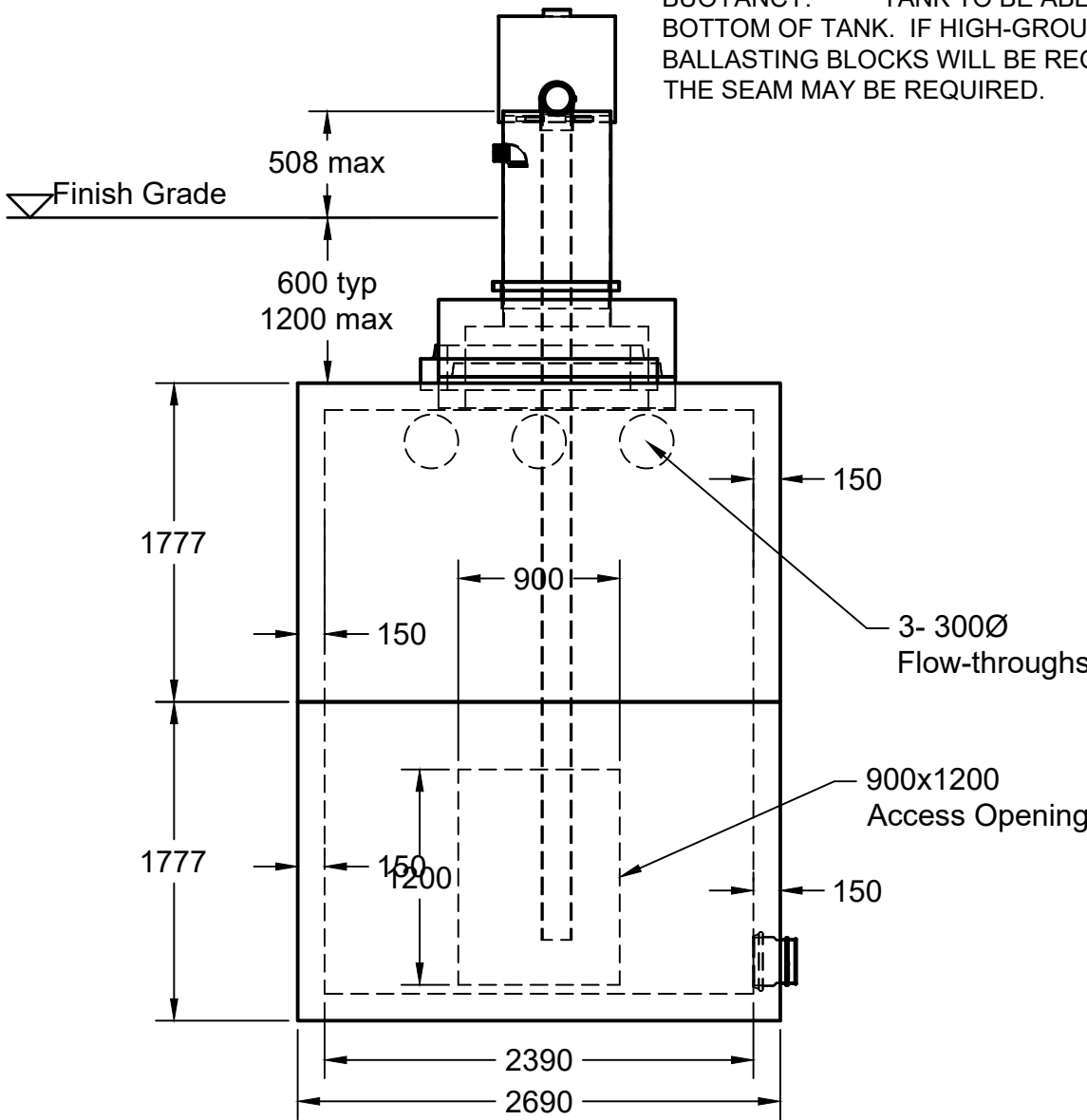
PIPE/WALL CONNECTIONS: 200mmØ Flexible Rubber Bootseal for PVC Supply Line

ACCESS OPENINGS:  
PRIMARY TANK: 610X610 CITY OF OTTAWA SPEC FIRE CHUTE FOR FIRETRUCK CONNECTION  
SECONDARY ACCESS (OPTIONAL) :1200x1300 CAST-IN RISER FLANGE WITH 610X610 DRIP PROOF ALUMINUM ACCESS HATCH  
900X1200 OPENING IN DIVIDER WALL FOR ACCESS TO BOTH CHAMBERS FROM ONE ACCESS POINT

OPTIONAL STAINLESS STEEL BOLT-ON LADDER OPTIONAL

TANK DESIGN CONFORMS TO CSA STANDARD B66-15 WITH A NON-TRAFFIC LOAD ON TOP, AND WITH HEAVY TRUCK LOADING DIRECTLY ADJACENT TO TANK TO ACCOMMODATE FIRE TRUCK TO BE WITHIN 1M OF WATER DRAW-DOWN CHUTE, AS PER FIRE DEPT.

BUOYANCY: TANK TO BE ABLE TO WITHSTAND GROUNDWATER UP 2.0M FROM BOTTOM OF TANK. IF HIGH-GROUNDWATER LEVEL IS IN EXCESS OF THIS, ADDITIONAL BALLASTING BLOCKS WILL BE REQUIRED. ADDITIONAL WATERPROOFING MEASURES AT THE SEAM MAY BE REQUIRED.



5450 Cuddy St Osgoode, ON K0A 2W0  
tel: (613) 826.2318 fax: (613) 826.3679  
toll free: 888.846.6664  
website: www.boydbrosconcrete.ca  
email: info@boydbrosconcrete.ca

PROJECT  
**Boyd Bros Concrete**

TITLE  
**45000 Fire Tank**

|                                  |                             |           |
|----------------------------------|-----------------------------|-----------|
| DRAWN Rob Sanna 6/19/23 APPROVED |                             |           |
| SIZE<br>C                        | DWG NAME<br>45000 Fire Tank | REV<br>3  |
| SCALE 1:40                       | WEIGHT 35000kgs             | SHEET 1/1 |



August 21, 2025

Jack Gulas  
Stratford Foxrun  
6286 Prince of Wales Drive  
North Gower, ON  
K0A 2T0

**EMAIL:** jack@stratfordfoxrun.com  
CC: josh.laginski@outlook.com

Dear Jack:

**RE: 5923 OTTAWA STREET DISTILLERY WATER STORAGE VOLUME ESTIMATE  
LRI FILE 2025-04-0654**

**PROJECT DESCRIPTION**

The project at 5923 Ottawa Street, Ottawa, ON includes two buildings on one site to be used for a mix of industrial and assembly occupancies. Building 1 includes a distillery, mezzanine-level offices, a bar/tasting area, a retail store, and an outdoor patio. Building 2 includes a brewery, some storage space, a bottling line, and associated office space for staff of the site's operations.

The buildings are subject to the 2024 Ontario Building Code (OBC), and as such, are required to be supplied with water for firefighting purposes. The site and surrounding area are not connected to a municipal water supply for firefighting. As a result, water must be stored on site for this purpose. This letter is intended to summarize LRI's analysis of the buildings, the OBC, and OFS documentation regarding the applicable rules and regulations which help assess the required amount of water to be stored on site.

For clarity, the analysis below is based upon the design information available at this time, and is considered an order of magnitude estimate, subject to refinement when the sprinkler and fire pump systems for the buildings are designed. This detailed design is most commonly completed following building permit submission. The objective of the analysis is to explain the fire safety rationale applied to the buildings and to assist the design team and reviewers in aligning on an acceptable water volume to be stored on a general basis.





## BUILDING DESCRIPTION

The subject site includes two buildings: Building 1, and Building 2. These buildings have the following characteristics based on the provided architectural drawings:

### Building 1:

- One storey in building height, with mezzanine
- 8.5 m in height
- 647 m<sup>2</sup> in building area
- Sprinklered throughout
- Occupancies include:
  - Distillery
  - Offices
  - Bar/assembly
  - Retail

### Building 2:

- One storey in building height, with mezzanine
- 8.5 m in height
- 926 m<sup>2</sup> in building area
- Sprinklered throughout
- Occupancies include:
  - Mashing/bottling
  - Brewery
  - Storage mezzanine
  - Offices

## CODE REQUIREMENTS

In conformance with OBC 3.2.5.7 “every building shall be provided with an adequate water supply for firefighting”. As clarified by OBC Appendix A-3.2.5.7.(2) for sprinklered buildings, “water supply additional to that required by the sprinkler systems should be provided for firefighting using fire hoses in accordance with the hose stream demands and water supply durations for different hazard classifications as specified in NFPA 13, “Installation of Sprinkler Systems”.

Since the buildings are sprinklered, the water storage volume estimate, therefore, needs to provide sufficient water for the sprinklers to operate, plus necessary hose demands from fire crews.

In conformance with Technical Bulletin IWSTB-2024-05, rural fire flow calculation methods are to follow the Appendix J flow chart. Specifically, since both buildings are required to be sprinklered for insurance reasons, the highlighted green path will be followed:

## Appendix J

## RURAL FIRE FLOW CALCULATION PROCESS

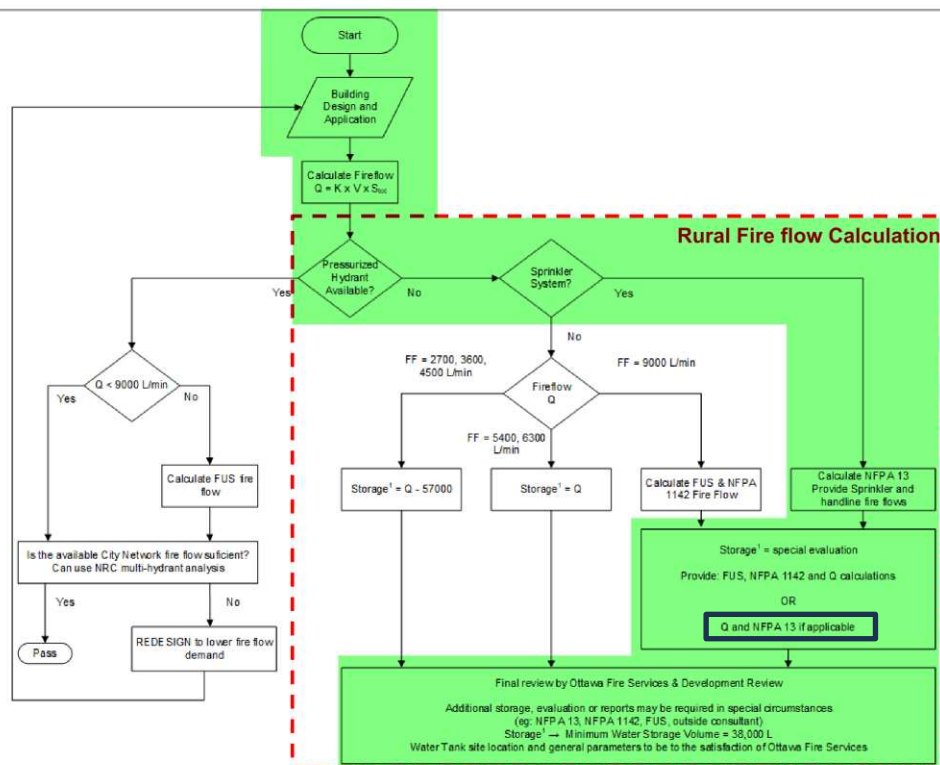


Figure J.1: Rural Fire Flow Calculation Process.

The following section outlines the methodology used for the storage volume estimates to permit OFS review.

### METHODOLOGY

#### OBC-based Q volume analysis:

The following analysis uses the OBC-prescribed method to assess volumes based on the following inputs:

$Q = K \times V \times Stot$ , where

$Q$  = minimum supply of water in litres

$K$  = water supply coefficient from the OBC

$V$  = total building volume in cubic metres ( $m^3$ )

$Stot$  = total of spatial coefficient values from property line exposures on all sides.



**Building 1:**

| Variable | Value                                       | Notes                                                                                                                                                 |
|----------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q        | 177,100 L, with 5,400 LPM minimum flow rate |                                                                                                                                                       |
| K        | 23                                          | Conservatively assumes Group F, Division 1 occupancy despite pending alternative solution. Also assumes compliant 3.2.2. noncombustible construction. |
| V        | 5,500                                       | Based on area and building height                                                                                                                     |
| Stot     | 1.4                                         | 0.4 penalty assigned to southwest face with limiting distance of 9 m                                                                                  |

**Building 2:**

| Variable | Value                                       | Notes                                                                                             |
|----------|---------------------------------------------|---------------------------------------------------------------------------------------------------|
| Q        | 173,949 L, with 5,400 LPM minimum flow rate |                                                                                                   |
| K        | 17                                          | Assumes Group F, Division 2 occupancy. Also assumes compliant 3.2.2. noncombustible construction. |
| V        | 7,871                                       | Based on area and building height                                                                 |
| Stot     | 1.3                                         | 0.3 penalty assigned to southeast face with limiting distance of 7 m                              |

Based on the OBC volume Q analysis presented above, the calculated minimum supply of water required storage volumes of up to approximately 177,100 L for Building 1, or 173,949 L for Building 2. This translates to a minimum required flowrate of 5,400 LPM for both buildings at 30 minutes of supply duration.

As outlined in IWST-2024-05, for a proposed building equipped with a sprinkler system designed in accordance with NFPA 13, the OBC calculations noted above should be completed, and an additional NFPA 13 special evaluation may be carried out to determine the sprinkler water storage requirements.

**NFPA 13-based volume analysis:**

As the buildings will both be protected by automatic sprinkler systems, Appendix A demonstrates water volume calculations for the sprinkler systems anticipated to be designed for each building. It should be noted that these volumes are estimates, and final hydraulic designs will dictate the final volume requirements. At this time, the expected volume is to include sufficient water to supply the most demanding hydraulic area assuming one fire in one building at a time, includes for a 20% factor calculated based on water volumes discharged by the sprinklers, and considers NFPA 13-mandated hose demand calculations.



The calculations assume a sprinkler design on a “room area” method wherein different rooms must be individual enclosed fire compartments to permit the hydraulic area to be shrunk to the size of the room. This assumes that a fire separation will contain the fire during the time required for sprinkler operation.

The following tables summarize the assumed hazard classifications for the rooms. These assumptions are based off a combination of NFPA 13 compliance requirements, requirements described by the Distilled Spirits Council of the United States (DISCUS), and based on LRI’s expectation that the distillery/bar occupancy approach will require an alternative solution and correspondingly increases sprinkler density to improve suppression potential in support of that effort.

| Room                   | Area (ft <sup>2</sup> )                                                            | Expected Occupancy Classification                             |
|------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Building 1</b>      |                                                                                    |                                                               |
| Grain Handling         | 238                                                                                | Ordinary Hazard Group 2                                       |
| Brewing/bottling       | 2,383                                                                              | Ordinary Hazard Group 2 (aligns with DISCUS recommendations)  |
| Boiler Room            | 277                                                                                | Ordinary Hazard Group 1                                       |
| Still house/still room | 965                                                                                | Extra Hazard Group 1 to support alternative solution approach |
| Office Mezzanine       | 1,182                                                                              | Light Hazard                                                  |
| Kitchen                | 190                                                                                | Ordinary Hazard Group 1*                                      |
| Bar                    | 1,632 (hydraulic area assumed limited to 1500 ft <sup>2</sup> )                    | Light Hazard*                                                 |
| Retail                 | 885                                                                                | Ordinary Hazard Group 2                                       |
| <b>Building 2</b>      |                                                                                    |                                                               |
| Mashing/brewing        | 6,050 (hydraulic area assumed limited to 2000 ft <sup>2</sup> per DISCUS)          | Ordinary Hazard Group 2                                       |
| Bottling               | 2,370 (hydraulic area assumed limited to 3000 ft <sup>2</sup> or room area DISCUS) | Ordinary Hazard Group 2                                       |
| Office and admin area  | 1,095                                                                              | Light Hazard                                                  |
| Storage mezzanine      | 1,185                                                                              | Ordinary Hazard Group 2                                       |

\* Note that depending on the hydraulic design, the kitchen and portions of the bar may end up being calculated together as a remote area. Their cumulative effect has been considered in Appendix A

As depicted in Appendix A, based on the NFPA 13 analysis presented above, expected storage volumes for both sprinkler and hose demand would result in required storage volumes of up to approximately 288,000 L for Building 1, or 243,000 L for Building 2. Both of these values are very high, and represent the provision of at least 100% of the NFPA 13-mandated volumes for both sprinkler operation and hose demands, for durations ranging between 30 minutes and 90 minutes (depending on NFPA 13 criteria). In order to provide a more reasonable estimate, in light of the IWSTRB documentation and OFS firefighting capacity, the following section evaluates the impact that water shuttling can have on the required storage volume.



### **Influence of OFS Superior Tanker Shuttle level on the required storage volume:**

IWSTB 2024-05 does not explicitly clarify if or how OFS Superior Tanker Shuttle service contributes to NFPA 13-derived water storage volume analysis. As a result, engineering judgement and alignment with the AHJ is necessary.

In conformance with IWSTB 2024-05, OFS is capable of delivering 1,900 LPM within 5 minutes of arrival. As such, some credit should be permissible to account for the fire department's ability to replenish stored water volumes during a fire. As a result, the proposed storage volumes consider a reduction of 1,900 LPM for the NFPA 13 mandated duration of the fire as a reasonable value. This effectively replenishes the hose demand required for higher hazard occupancies and exceeds that required for lower hazard occupancies. The resultant conclusions presented below and in Appendix A represent an amount of water stored that exceeds the minimum required by IWSTB 2024-05, is comparable to OBC-required amounts for unsprinklered buildings, and represents the ability of the system to automatically supply the sprinklers for the NFPA 13-derived duration of the fire without extra volumes. In other words, sufficient water is expected to be stored to supply the sprinklers automatically, allow initial fire crews to have access to water for hose lines, and provide time for shuttling water to start supplementing the available stored water.

|                                                                | <b>Building 1</b> | <b>Building 2</b> |
|----------------------------------------------------------------|-------------------|-------------------|
| OBC based Q Evaluation                                         | 177,100 L         | 173,949 L         |
| NFPA 13 Evaluation                                             | 288,442 L         | 242,574 L         |
| NFPA 13 Evaluation w/Superior Tanker Shuttle Service Reduction | 118,117 L         | 129,024 L         |

### **CONCLUSION**

This letter summarizes LRI's review of the proposed building project at 5923 Ottawa Street, and the required firefighting water volumes to be stored on site.

As the buildings are sprinklered, and in conformance with IWSTB 2024-05, a special assessment aligning with NFPA 13 has been provided. This is summarized in Appendix A.

The resultant water volume to be stored is expected to be designed to accommodate the highest required volume of either building, is to be shared between both buildings, and assumes one fire in one building at a time. This assumption is reasonable, especially given the large separation distance between both buildings on the same property.

The resultant water volume also considers the impact of OFS water shuttling on the required amount.

Based on this analysis, stored water volumes of approximately 130,000 L are recommended at this time, with final volumes being determined based on detailed sprinkler and fire pump design criteria.



Sincerely,  
**LRI ENGINEERING**

**Matthew Hopley, M.Eng., P.Eng [AB]**  
Branch Manager - Alberta

Reviewed by,  
**LRI ENGINEERING**



**Jin Chen, M.Eng., P.Eng.**  
Associate



NFPA 13 Water Volume Estimate Analysis

LRI Engineering

Date

21-Aug-25

Site

5923 Ottawa Street

Prepared By

Matthew Hopley

Reviewed By

Jin Chen

| Building 1                             |            |                   |              |                    |                |                   |                    |              |              |                           |                          |
|----------------------------------------|------------|-------------------|--------------|--------------------|----------------|-------------------|--------------------|--------------|--------------|---------------------------|--------------------------|
| Safety Margin on Sprinkler only<br>20% |            |                   |              |                    |                |                   |                    |              |              |                           |                          |
|                                        | Area (ft2) | Density (gpm/ft2) | Volume (gpm) | Duration (minutes) | Capacity (L)   | Hose Demand (gpm) | Duration (minutes) | Capacity (L) | Combined (L) | Shuttling Allowance (lpm) | Total Storage Volume (L) |
| Grain Handling (OH2)                   | 238        | 0.2               | 47.6         | 60                 | <b>10,810</b>  | 250               | 60                 | 56,700       | 69,672       | -1,893                    | -43,878                  |
| Brewing and Bottling/Process (DISCUS)  | 3000       | 0.2               | 600          | 60                 | <b>136,260</b> | 250               | 60                 | 56,700       | 220,212      | -1,893                    | 106,662                  |
| Boiler Room (OH1)                      | 277        | 0.15              | 41.55        | 60                 | <b>9,436</b>   | 250               | 60                 | 56,700       | 68,023       | -1,893                    | -45,527                  |
| Distillery (DISCUS)                    | 965        | 0.2               | 193          | 90                 | <b>65,745</b>  | 500               | 90                 | 170,100      | 248,995      | -1,893                    | 78,670                   |
| Distillery (as EH1 for AS)             | 965        | 0.3               | 289.5        | 90                 | <b>98,618</b>  | 500               | 90                 | 170,100      | 288,442      | -1,893                    | <b>118,117</b>           |
| Office Mezzanine (LH)                  | 1182       | 0.1               | 118.2        | 30                 | <b>13,422</b>  | 100               | 30                 | 11,340       | 27,446       | -1,893                    | -29,329                  |
| Kitchen (OH1)                          | 190        | 0.15              | 28.5         | 60                 | <b>6,472</b>   | 250               | 60                 | 56,700       | 64,467       | -1,893                    | 60                       |
| Bar (LH) (limited to 1500 ft2)         | 1632       | 0.1               | 150          | 30                 | <b>17,033</b>  | 100               | 30                 | 11,340       | 31,779       | -1,893                    | 30                       |
| Kitchen + Bar                          |            |                   |              |                    | <b>23,505</b>  | 250               | 60                 | 56,700       | 84,906       | -1,893                    | -28,644                  |
| Retail (OH2)                           | 885        | 0.15              | 132.75       | 60                 | <b>30,148</b>  | 250               | 60                 | 56,700       | 92,877       | -1,893                    | -20,673                  |

| Building 2                             |            |                   |              |                    |                |                   |                    |              |              |                           |                          |
|----------------------------------------|------------|-------------------|--------------|--------------------|----------------|-------------------|--------------------|--------------|--------------|---------------------------|--------------------------|
| Safety Margin on Sprinkler only<br>20% |            |                   |              |                    |                |                   |                    |              |              |                           |                          |
|                                        | Area (ft2) | Density (gpm/ft2) | Volume (gpm) | Duration (minutes) | Capacity (L)   | Hose Demand (gpm) | Duration (minutes) | Capacity (L) | Combined (L) | Shuttling Allowance (lpm) | Total Storage Volume (L) |
| Mashing (DISCUS), 2000 sqft max area   | 6050       | 0.2               | 400          | 60                 | <b>90,840</b>  | 250               | 60                 | 56,700       | 165,708      | -1,893                    | 52,158                   |
| Bottling, 3000 sqft max area           | 2370       | 0.2               | 474          | 60                 | <b>107,645</b> | 500               | 60                 | 113,400      | 242,574      | -1,893                    | <b>129,024</b>           |
| Office and admin (light hazard)        | 1095       | 0.1               | 109.5        | 30                 | <b>12,434</b>  | 100               | 30                 | 11,340       | 26,260       | -1,893                    | -30,515                  |
| Storage mezzanine (OH2)                | 1185       | 0.2               | 237          | 60                 | <b>53,823</b>  | 250               | 60                 | 56,700       | 121,287      | -1,893                    | 7,737                    |



August 21, 2025

Jack Gulas  
Stratford Foxrun  
6286 Prince of Wales Drive  
North Gower, ON  
K0A 2T0

**EMAIL:** jack@stratfordfoxrun.com  
CC: josh.laginski@outlook.com

Dear Jack:

**RE: 5923 OTTAWA STREET OCCUPANCY ALTERNATIVE SOLUTION ROADMAP  
LRI FILE 2025-08-0269**

**INTRODUCTION**

The project at 5923 Ottawa Street, Ottawa, ON includes two buildings on one site to be used for a mix of industrial and assembly occupancies. This letter is intended to help provide relevant information regarding the intended design and compliance process relative to the occupancy classification for the distillery building (Building 1). This letter's framework (or roadmap) summarizes important parts of the analysis that have been undertaken for the project, as well as future elements to be incorporated into the design of the building to align the design and use of the building to meet the level of safety required by the OBC. The overall approach will require an alternative solution to be submitted as part of the building permit process. This letter is not considered to be a formal alternative solution, but is instead, intended to allow project stakeholders to understand what future submissions will include to help inform processes such as development permit approval.

**CONCEPT DISCUSSION**

Building 1 at 5923 Ottawa Street, Ottawa, ON will include a distillery, some mezzanine offices, a bar/tasting area, a retail store, and an outdoor patio. The second building (Building 2) is an industrial building intended to comply with the acceptable solutions of the building code and is understood to be treated primarily as a Group F, Division 2 major occupancy (with other lower hazard subsidiary occupancies).

Buildings are required to be classified as a function of their major occupancies. OBC Article 3.1.2.1 specifies that a building is to be classified in conformance with this Article and includes Appendix A, Division B-3.1.2.1.(1) which gives examples of various occupancies, including distilleries as an example of a Group F, Division 1 high hazard industrial occupancy.





Similarly, OFC Sentence 4.9.1.1.(2) outlines that the “parts of a building in which distilled beverage alcohol is distilled, processed or stored in bulk shall be classified as high hazard industrial occupancies”.

The definition of distillery is generally understood to have not considered the potential for smaller operations. Conversely, “craft” or “micro” distilleries are not defined in any meaningful sense within the Building/Fire codes. Notwithstanding, absent a definition of “sufficient quantities” and “special fire hazard”, the strict application of the Code to all distilleries in all cases fails to acknowledge that where the quantities of alcohol are moderate and where fire safety features are sufficient, the level of risk of craft distilleries can be managed to an extent where the hazard is comparable to a medium-hazard industrial occupancy.

As a result, consideration pertaining to the OBC and the construction of distilleries must be reviewed in order to develop a compliant structure. The approach to protection in this design intends to incorporate features which limit the potential for fires and explosion with multiple layers of active and passive fire safety features. Explosion risks are mitigated by reducing the probability of an explosion occurring in the first place, rather than mitigating the consequence of the explosion through deflagration venting which offers little protection to those near the hazard. In addition to the use of mitigating design features, the use of a risk index serves to quantify what can be considered a “special fire hazard”, and at what point a fire hazard is no longer “special”. This risk indexing demonstrates that in combination with the safety features described in this report, that restricting the size and risks posed by the distillery itself further meets the requirements of the Code.

As this is a small craft distillery which processes and produces significantly smaller amounts of products, it is proposed that the hazard associated with the operation is considerably lower than the original intent of the Code, which did not consider the potential for smaller craft-style distilleries. The conclusion of this report is that where a sufficiently small, appropriately fire-protected distillery is installed in a building, the level of risk presented by the craft distillery is at least as low as a comparable medium-hazard industrial Group F, Division 2 occupancy. The future alternative solution will also provide details on requirements from the Building and Fire Codes which are considered essential for distillery operations of any size. The sections of this letter below provide an overview of how the subject distillery will be assessed in terms of occupancy classification, and outline the provided means to mitigate the design related risk to a level that aligns with the OBC requirements for medium-hazard industrial occupancies.

## **BUILDING DESCRIPTION**

The subject site includes a distillery within Building 1, which consists of the following:

- One storey in building height, with mezzanine
- 8.5 m in height
- 647 m<sup>2</sup> in building area
- Sprinklered throughout
- Occupancies include:
  - Distillery
  - Offices
  - Bar/assembly
  - Retail



## **DISTILLERY PROCESS DESCRIPTION**

The distillery portion of the building (still house) consists of distillation equipment located in one fire compartment within Building 1. The still house will be fire separated from the remainder of the building and includes the following equipment that includes alcohol above 20% ABV (which is the concentration at which the OFC defines the subject liquids as distilled beverage alcohol).

- Four totes containing 2,000 L each (8,000 L);
- One Doubler containing 500 L;
- One Pot Still containing 3,500 L;
- Two column Stills containing approximately 100 L each during use (200 L);

The total volume of higher proof ethanol above 20% ABV then totals approximately 12,200 L at varying concentrations above 20% ABV, ranging up to 95% ABV at the highest concentration.

## **CODE REQUIREMENTS**

When assessing required fire safety features, it is important to assess the overall risk that a given process presents, which considers both the probability and magnitude of various hazards. In order to effectively analyze, identify, and mitigate the relevant hazards, a rigorous, practical, repeatable, and industry-accepted methodology needs to be applied. The objective of the assessment is to review a proposed process (the distillery), assess the hazards, and where necessary, add mitigating measures to reduce the level of risk such that it aligns with that accepted by the OBC.

Ultimately, the assessment in the future alternative solution will demonstrate that the occupancy will present a comparable level of risk as that posed by a medium-hazard industrial occupancy. The assessment considers more simplistic properties, such as fuel load concentrations, but also incorporates more advanced assessments to better highlight where necessary process changes or additional protection may be required.

## **METHODOLOGY**

To mitigate the potential damage and harm that could arise from a fire or explosion occurring from within the distillery portion of the building, extra protection measures will be provided to both reduce the probability of explosions and limit the consequences of a fire or explosion should one occur. A measure must be provided to demonstrate that the proposed design mitigates the risks of fires and explosions to the level required by Code to permit the classification of the unit as a Group F, Division 2 major occupancy. For this project, it is proposed to use the DOW Fire and Explosion risk index (DOW F&EI) to provide a quantitative, relative measurement of the site's risk profile.

Fire risk indexes serve a role in fire protection by striking a balance between qualitative approaches which may or may not provide adequate detail or granularity, and fully quantitative methods which can be expensive, labour intensive, slow, and which tend to require specialist knowledge to adequately judge. "[The DOW F&EI guide] is intended to provide a direct and logical approach for determining the probable "risk exposure" of a process plant and to suggest approaches to fire protection and loss prevention design. An important application of the F&EI is to help decide when a more detailed quantitative risk analysis is warranted, as well as the appropriate depth of such a study"<sup>1</sup>.

---

<sup>1</sup> Society of Fire Protection Engineers, SFPE Handbook of Fire Protection Engineering, 5<sup>th</sup> Edition, page 3162



The DOW F&EI method was developed by the Dow Chemical corporation where the first edition was released in 1964. Since its first release, the index has been used by DOW and other entities in the chemical industry. The current version, the 7<sup>th</sup> edition was released in 1994 and is still in use today. The DOW F&EI is “the leading hazard index recognized by the chemical industry” and “provides key information to help evaluate the overall risk from fire and explosion”<sup>2</sup>. The method follows a regimented step-by-step process which is applied to each process unit of a plant. Expertise in selecting specific penalty values is needed, but the available guide to how each should be applied helps explain the rationale behind selecting certain values.

The full DOW F&EI follows a thirteen-step process to determine a variety of outputs which includes the index score, the area of exposure, a damage factor, and additional economic measurements used to analyse process plant layouts and designs. For the purpose of this analysis, the critical output of the analysis is to assess the F&EI score. This score is a function of the process material factor, general process hazard penalties, and special process hazard penalties.

The base score without loss control credit factors applied will be reviewed. Furthermore, an offset version of the score will be reviewed considering the methods proposed by Gupta<sup>3</sup>. The base DOW F&EI score will be considered appropriate where it does not exceed the threshold for “intermediate” hazards (a score of 127 or lower in the DOW F&EI). The offset score will be evaluated, and relevant mitigating features will be added to achieve an offset score in the “moderate” hazard range (a score of 96 or lower). Scores below this threshold can generally be managed through standard fire protection and building design measures, would not represent a special fire hazard, and would more closely align with the hazards typical of a medium-hazard industrial occupancy.

| DEGREE OF HAZARD FOR F&EI |                  |
|---------------------------|------------------|
| F&EI INDEX RANGE          | DEGREE OF HAZARD |
| 1 - 60                    | Light            |
| 61 - 96                   | Moderate         |
| 97 - 127                  | Intermediate     |
| 128 - 158                 | Heavy            |
| 159 - up                  | Severe           |

### TYPICAL MITIGATING MEASURES

As outlined in the previous section, the use of the DOW F&EI analysis will firstly evaluate the proposed process and associated process units within the still house. Where a given process unit (or the collective group of units) produces an unacceptably high index score, the process can be adjusted to present a lower overall risk. Ways to address the raw hazard index score include process equipment changes like volume or operating pressure, ventilation within the process unit area, improving spill control or drainage, amongst other inherent features within the distillery area. The processes would be adjusted such that the raw score remains in the acceptable range (127 or lower) as indicated above, and then

<sup>2</sup> American Institute of Chemical Engineers, DOW’s Fire & Explosion Index Hazard Classification Guide, 7<sup>th</sup> Edition, 1994, Page 1.

<sup>3</sup> J.P Gupta, G. Khemani, M. S. Mannan, “Calculation of Fire and Explosion Index (F&EI) value for the Dow Guide taking credit for the loss control measures”, Journal of Loss Prevention in the Process Industries, Issue 16, 2003, pages 235-241.



mitigating features are added to the building design to reduce that score to an “offset” value that is in the “moderate” range or below.

The following offset measures are used in the DOW F&EI and can be considered as the design develops and have been used in various distilleries, but for clarity, are not all necessarily required pending design development:

- Emergency power;
- Emergency cooling systems;
- Explosion control;
- Emergency shutdown systems;
- Computer control (as opposed to manual process units);
- Written/detailed operating instructions (including emergency procedures);
- Leak detection;
- Sprinkler systems;
- Hand extinguishers/monitors.

From an OBC and OFC perspective, the following features must be considered and, where deemed necessary, incorporated into a given design in order to assess a given craft distillery as a medium-hazard industrial occupancy and to meet the objective and functional statements:

| Rapid fire spread mitigation                                                                                                                                                  | Explosion risk mitigation                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Limited maximum capacities of flammable liquids                                                                                                                               | Flammable vapour detection                                                                  |
| Emergency containment and drainage                                                                                                                                            | Closures and if they must be integrated with an LEL detection system                        |
| Enhanced sprinkler protection within the distillery                                                                                                                           | Integration of LEL detection system and fire alarm system                                   |
| Fire separations between occupancies and from exits                                                                                                                           | Ventilation throughout distillery                                                           |
| Noncombustible construction, with combustible elements only where it is permissible                                                                                           | Still pressure relief and tank venting routed to the outside, with flame arrestors on vents |
| Combustible content limits below those historically associated with high-hazard industrial occupancies, and which align well with modern medium-hazard industrial occupancies | Appropriate pressure relief of still equipment                                              |
|                                                                                                                                                                               | Still pressure monitoring                                                                   |
|                                                                                                                                                                               | Process interlocks (both for still piping and ventilation)                                  |
|                                                                                                                                                                               | Classified electrical equipment within hazardous areas                                      |
|                                                                                                                                                                               | Indirect fired stills, no open flames to heat process equipment                             |
|                                                                                                                                                                               | Computer temperature still control                                                          |



By completing this analysis, adjusting necessary design parameters within the context of the building permit submission package alongside the responsible Professionals, it will be shown that the process units and proposed occupancy classification can align with the requirements for a Group F, Division 2 medium-hazard industrial occupancy.

### OTHER APPROVED DISTILLERIES

A range of distilleries have been analyzed and approved using the method outlined above, with LRI's involvement including:

- Ogham Craft Spirits Micro-Distillery, Ottawa, ON
- Burwood Distillery, Calgary, AB
- True Wild Distillery, Calgary, AB
- Spirit in Niagara Distillery, Niagara, ON

### CONCLUSION

The proposed project to be located at 5923 Ottawa Street, Ottawa, includes two buildings located on one site. Building 1 includes a distillery area within the building to be used for the production of craft spirits. Since this necessarily involves the production and handling of distilled beverage alcohol, as indicated by the OBC Appendix and OFC, the acceptable solutions would ordinarily mandate this be classified as a Group F, Division 1 high hazard industrial occupancy. As explained in this letter, these requirements have historically been included as a result of prior production volume mandates and used for large-scale industrial processes. No consideration is given in either code for the size, volume, and protective features that might be included in a distillery which can thereby reduce the overall risk to a level below a "special fire hazard", the defining characteristic of this occupancy's definition.

As such, the distillery occupancy in Building 1 is proposed to be analyzed using a combination of fuel load assessment and semi-quantitative risk indexing to confirm the overall risk level that the craft distillery poses. Once analyzed, appropriate and necessary fire and explosion protection features will be added in order to mitigate the level of risk presented by the distillery to align with that permitted by Group F, Division 2, medium hazard industrial occupancies. As such, the OBC-related design features, and related engineering design, should consider the building as a Group F, Division 2 occupancy, while distillery-specific protective features will be incorporated as outlined above to protect the distillery and adjacent areas. This approach has been applied, accepted, and built in a number of jurisdictions using the same rationale and design approach, further demonstrating its acceptability in principal.

Sincerely,  
**LRI ENGINEERING**

Matthew Hopley, M.Eng., P.Eng [AB]  
Branch Manager - Alberta

Reviewed by,  
**LRI ENGINEERING**

Jin Chen, M.Eng., P.Eng.  
Associate

## APPENDIX D SANITARY DESIGN



## 000-25-0415 - 5923 Ottawa Street - Sanitary Demands - Phase 1

|                                 |                    |
|---------------------------------|--------------------|
| Project:                        | 5923 Ottawa Street |
| Project No.:                    | 000-25-0415        |
| Designed By:                    | FV                 |
| Checked By:                     | JB                 |
| Date:                           | May 5, 2025        |
| Site Area                       | 0.48 Gross ha      |
| Commercial Area (Retail)        | 90 m <sup>2</sup>  |
| Industrial - Light (Distillery) | 432 m <sup>2</sup> |
| Restaurant                      | 363 m <sup>2</sup> |

### DESIGN PARAMETERS

|                                          |             |
|------------------------------------------|-------------|
| Institutional/ Commercial Peaking Factor | 1.5         |
| Mannings coefficient (n)                 | 0.013       |
| Infiltration allowance                   | 0.33 L/s/Ha |

### EXTRANEOUS FLOW ALLOWANCES

| Infiltration / Inflow | Flow (L/s) |
|-----------------------|------------|
| Dry                   | 0.02       |
| Wet                   | 0.13       |
| Total                 | 0.16       |

### AVERAGE DAILY DEMAND

| DEMAND TYPE                | AMOUNT | UNITS                     | POPULATION / AREA | Flow (L/s) |
|----------------------------|--------|---------------------------|-------------------|------------|
| Residential                | 280    | L/c/d                     |                   | 0.0        |
| Industrial - Light**       | 35,000 | L/gross ha/d              | 0.04              | 0.02       |
| Industrial - Heavy**       | 55,000 | L/gross ha/d              |                   | 0          |
| Commercial / Amenity       | 2,800  | L/(1000m <sup>2</sup> /d) | 90                | 0.00       |
| Restaurant                 | 125    | L/(9.2m <sup>2</sup> /d)  | 363               | 0.06       |
| Schools                    | 70     | L/(Student/d)             |                   | 0          |
| Trailer Parks no Hook-Ups  | 340    | L/(space/d)               |                   | 0          |
| Trailer Park with Hook-Ups | 800    | L/(space/d)               |                   | 0          |
| Campgrounds                | 225    | L/(campsite/d)            |                   | 0          |
| Mobile Home Parks          | 1,000  | L/(Space/d)               |                   | 0          |
| Motels                     | 150    | L/(bed-space/d)           |                   | 0          |
| Hotels                     | 225    | L/(bed-space/d)           |                   | 0          |
| Office                     | 75     | L/7.0m <sup>2</sup> /d    |                   | 0          |
| Tourist Commercial         | 28,000 | L/gross ha/d              |                   | 0          |
| Other Commercial           | 28,000 | L/gross ha/d              |                   | 0          |

|                          |      |     |
|--------------------------|------|-----|
| AVERAGE RESIDENTIAL FLOW | 0.00 | L/s |
| PEAK RESIDENTIAL FLOW    | 0.00 | L/s |
| AVERAGE ICI FLOW         | 0.08 | L/s |
| TOTAL PEAK ICI FLOW      | 0.12 | L/s |

### TOTAL SANITARY DEMAND

|                                          |      |     |
|------------------------------------------|------|-----|
| TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW | 0.10 | L/s |
| TOTAL ESTIMATED PEAK DRY WEATHER FLOW    | 0.14 | L/s |
| TOTAL ESTIMATED PEAK WET WEATHER FLOW    | 0.27 | L/s |

## 000-25-0415 - 5923 Ottawa Street - Sanitary Demands - Phase 2

|              |                    |
|--------------|--------------------|
| Project:     | 5923 Ottawa Street |
| Project No.: | 000-25-0415        |
| Designed By: | FV                 |
| Checked By:  | JB                 |
| Date:        | May 5, 2025        |

|                                 |                    |
|---------------------------------|--------------------|
| Site Area                       | 0.45 Gross ha      |
| Industrial - Light (Distillery) | 926 m <sup>2</sup> |

### DESIGN PARAMETERS

|                                          |             |
|------------------------------------------|-------------|
| Institutional/ Commercial Peaking Factor | 1.5         |
| Mannings coefficient (n)                 | 0.013       |
| Infiltration allowance                   | 0.33 L/s/Ha |

### EXTRANEOUS FLOW ALLOWANCES

| Infiltration / Inflow | Flow (L/s) |
|-----------------------|------------|
| Dry                   | 0.02       |
| Wet                   | 0.13       |
| Total                 | 0.15       |

### AVERAGE DAILY DEMAND

| DEMAND TYPE                | AMOUNT | UNITS                     | POPULATION / AREA | Flow (L/s) |
|----------------------------|--------|---------------------------|-------------------|------------|
| Residential                | 280    | L/c/d                     |                   | 0          |
| Industrial - Light**       | 35,000 | L/gross ha/d              | 0.04              | 0.02       |
| Industrial - Heavy**       | 55,000 | L/gross ha/d              |                   | 0          |
| Commercial / Amenity       | 2,800  | L/(1000m <sup>2</sup> /d) |                   | 0          |
| Restaurant                 | 125    | L/(9.2m <sup>2</sup> /d)  |                   | 0          |
| Schools                    | 70     | L/(Student/d)             |                   | 0          |
| Trailer Parks no Hook-Ups  | 340    | L/(space/d)               |                   | 0          |
| Trailer Park with Hook-Ups | 800    | L/(space/d)               |                   | 0          |
| Campgrounds                | 225    | L/(campsite/d)            |                   | 0          |
| Mobile Home Parks          | 1,000  | L/(Space/d)               |                   | 0          |
| Motels                     | 150    | L/(bed-space/d)           |                   | 0          |
| Hotels                     | 225    | L/(bed-space/d)           |                   | 0          |
| Office                     | 75     | L/7.0m <sup>2</sup> /d    |                   | 0          |
| Tourist Commercial         | 28,000 | L/gross ha/d              |                   | 0          |
| Other Commercial           | 28,000 | L/gross ha/d              |                   | 0          |

|                          |      |     |
|--------------------------|------|-----|
| AVERAGE RESIDENTIAL FLOW | 0.00 | L/s |
| PEAK RESIDENTIAL FLOW    | 0.00 | L/s |
| AVERAGE IQ FLOW          | 0.02 | L/s |
| TOTAL PEAK IQ FLOW       | 0.03 | L/s |

### TOTAL SANITARY DEMAND

|                                          |      |     |
|------------------------------------------|------|-----|
| TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW | 0.04 | L/s |
| TOTAL ESTIMATED PEAK DRY WEATHER FLOW    | 0.05 | L/s |
| TOTAL ESTIMATED PEAK WET WEATHER FLOW    | 0.17 | L/s |

# Application for a Permit to Construct or Demolish

This form is authorized under subsection 8(1.1) of the *Building Code Act, 1992*

|                                                                                                                                                                                                                                           |             |                                                                                                                                                                                                                                                                    |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>For use by Principal Authority</b>                                                                                                                                                                                                     |             |                                                                                                                                                                                                                                                                    |                              |
| Application number:                                                                                                                                                                                                                       |             | Permit number (if different):                                                                                                                                                                                                                                      |                              |
| Date received:                                                                                                                                                                                                                            |             | Roll number:                                                                                                                                                                                                                                                       |                              |
| Application submitted to: <b>Ottawa Septic System Office</b>                                                                                                                                                                              |             | <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>RVCA RECEIVED</b><br/> <b>JUN 09 2025</b><br/> REFER TO: _____ </div> <div style="margin-left: 20px; color: blue; font-weight: bold;"> SEPTIC FILE #<br/> 25-176<br/> OTTAWA </div> |                              |
| (Name of municipality, upper-tier municipality, board of health or conservation authority)                                                                                                                                                |             |                                                                                                                                                                                                                                                                    |                              |
| <b>A. Project information</b>                                                                                                                                                                                                             |             |                                                                                                                                                                                                                                                                    |                              |
| Building number, street name                                                                                                                                                                                                              |             | Unit number                                                                                                                                                                                                                                                        | Lot/con.                     |
| 5923 Ottawa street                                                                                                                                                                                                                        |             |                                                                                                                                                                                                                                                                    |                              |
| Municipality                                                                                                                                                                                                                              | Postal code | Plan number/other description                                                                                                                                                                                                                                      |                              |
| Ottawa (Richmond)                                                                                                                                                                                                                         | K0A 2Z0     |                                                                                                                                                                                                                                                                    |                              |
| Project value est. \$                                                                                                                                                                                                                     |             | Area of work (m <sup>2</sup> )                                                                                                                                                                                                                                     |                              |
|                                                                                                                                                                                                                                           |             |                                                                                                                                                                                                                                                                    |                              |
| <b>B. Purpose of application</b>                                                                                                                                                                                                          |             |                                                                                                                                                                                                                                                                    |                              |
| <input checked="" type="checkbox"/> New construction <input type="checkbox"/> Addition to an existing building <input type="checkbox"/> Alteration/repair <input type="checkbox"/> Demolition <input type="checkbox"/> Conditional Permit |             |                                                                                                                                                                                                                                                                    |                              |
| Proposed use of building                                                                                                                                                                                                                  |             | Current use of building                                                                                                                                                                                                                                            |                              |
| Commercial                                                                                                                                                                                                                                |             |                                                                                                                                                                                                                                                                    |                              |
| Description of proposed work                                                                                                                                                                                                              |             |                                                                                                                                                                                                                                                                    |                              |
| To construct a new class 4 sewage system, Eljen NSF 245 Denitrification treatment system: Eljen DN450                                                                                                                                     |             |                                                                                                                                                                                                                                                                    |                              |
| Sewage System 'A'                                                                                                                                                                                                                         |             |                                                                                                                                                                                                                                                                    |                              |
| <b>C. Applicant</b>                                                                                                                                                                                                                       |             |                                                                                                                                                                                                                                                                    |                              |
| Applicant is: <input type="checkbox"/> Owner or <input checked="" type="checkbox"/> Authorized agent of owner                                                                                                                             |             |                                                                                                                                                                                                                                                                    |                              |
| Last name                                                                                                                                                                                                                                 | First name  | Corporation or partnership                                                                                                                                                                                                                                         |                              |
| Van de Glind                                                                                                                                                                                                                              | Hendrik     | Paterson Group Inc.                                                                                                                                                                                                                                                |                              |
| Street address                                                                                                                                                                                                                            |             | Unit number                                                                                                                                                                                                                                                        | Lot/con.                     |
| 9 Auriga Drive                                                                                                                                                                                                                            |             |                                                                                                                                                                                                                                                                    |                              |
| Municipality                                                                                                                                                                                                                              | Postal code | Province                                                                                                                                                                                                                                                           | E-mail                       |
| Ottawa                                                                                                                                                                                                                                    | K2E 7T9     | ON                                                                                                                                                                                                                                                                 | hvandeglind@patersongroup.ca |
| Telephone number                                                                                                                                                                                                                          | Fax         | Cell number                                                                                                                                                                                                                                                        |                              |
| 613-226-7381                                                                                                                                                                                                                              |             |                                                                                                                                                                                                                                                                    |                              |
| <b>D. Owner (if different from applicant)</b>                                                                                                                                                                                             |             |                                                                                                                                                                                                                                                                    |                              |
| Last name                                                                                                                                                                                                                                 | First name  | Corporation or partnership                                                                                                                                                                                                                                         |                              |
| Gulas                                                                                                                                                                                                                                     | Jack        | 99117756 Canada Inc.                                                                                                                                                                                                                                               |                              |
| Street address                                                                                                                                                                                                                            |             | Unit number                                                                                                                                                                                                                                                        | Lot/con.                     |
| 411 Leggett Drive, Suite 710                                                                                                                                                                                                              |             |                                                                                                                                                                                                                                                                    |                              |
| Municipality                                                                                                                                                                                                                              | Postal code | Province                                                                                                                                                                                                                                                           | E-mail                       |
| Ottawa                                                                                                                                                                                                                                    | K2K 3C9     | ON                                                                                                                                                                                                                                                                 | jack@stratfordfoxrun.com     |
| Telephone number                                                                                                                                                                                                                          | Fax         | Cell number                                                                                                                                                                                                                                                        |                              |
| 613-862-0087                                                                                                                                                                                                                              |             |                                                                                                                                                                                                                                                                    |                              |

| <b>E. Builder (optional)</b> |             |                                            |        |  |
|------------------------------|-------------|--------------------------------------------|--------|--|
| Last name                    | First name  | Corporation or partnership (if applicable) |        |  |
| Street address               | Unit number | Lot/con.                                   |        |  |
| Municipality                 | Postal code | Province                                   | E-mail |  |
| Telephone number             | Fax         | Cell number                                |        |  |

SEPTIC FILE #  
 25-176  
 OTTAWA

RVCA RECEIVED  
 JUN 09 2025  
 REFER TO: Yes ☒ No ☒

| <b>F. Tarion Warranty Corporation (Ontario New Home Warranty Program)</b>                                                          |                          |     |                                        |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----|----------------------------------------|
| i. Is proposed construction for a new home as defined in the <i>Ontario New Home Warranties Plan Act</i> ? If no, go to section G. | <input type="checkbox"/> | Yes | <input checked="" type="checkbox"/> No |
| ii. Is registration required under the <i>Ontario New Home Warranties Plan Act</i> ?                                               | <input type="checkbox"/> | Yes | <input checked="" type="checkbox"/> No |
| iii. If yes to (ii) provide registration number(s): _____                                                                          |                          |     |                                        |

| <b>G. Required Schedules</b>                                                                         |  |
|------------------------------------------------------------------------------------------------------|--|
| i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities. |  |
| ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.  |  |

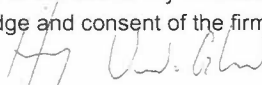
| <b>H. Completeness and compliance with applicable law</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                         |                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------|
| i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) of Division C of the <i>Building Code</i> (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted).<br>Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the <i>Building Code Act, 1992</i> , to be paid when the application is made. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> .                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.                                                                                                                                                                                                                | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| iv) The proposed building, construction or demolition will not contravene any applicable law.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

| <b>I. Declaration of applicant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <div style="display: flex; justify-content: space-between;"> <div style="width: 80%;"> <p><u>Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</u></p> <p style="text-align: center;">(print name)</p> </div> <div style="width: 15%;"> <p>declare that:</p> </div> </div> <ol style="list-style-type: none"> <li>1. The information contained in this application, attached schedules, attached plans and specifications, and other attached documentation is true to the best of my knowledge.</li> <li>2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.</li> </ol> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;"> <p><u>June 6, 2025</u></p> <p>Date</p> </div> <div style="width: 60%; text-align: center;"> <br/> <p>Signature of applicant</p> </div> </div> |  |

Personal information contained in this form and schedules is collected under the authority of subsection 8(1.1) of the *Building Code Act, 1992*, and will be used in the administration and enforcement of the *Building Code Act, 1992*. Questions about the collection of personal information may be addressed to: a) the Chief Building Official of the municipality or upper-tier municipality to which this application is being made, or, b) the inspector having the powers and duties of a chief building official in relation to sewage systems or plumbing for an upper-tier municipality, board of health or conservation authority to whom this application is made, or, c) Director, Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay St., 2nd Floor. Toronto, M5G 2E5 (416) 585-6666.

## Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

| <b>A. Project Information</b>                                                                                                                                                                                                       |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Building number, street name<br>5923 Ottawa Street                                                                                                                                                                                  |                                                                                                                                                                                           | Unit no.                                                                                                                                                                                                     | Lot/con.                               |
| Municipality<br>Ottawa (Richmond)                                                                                                                                                                                                   | Postal code<br>K0A 2Z0                                                                                                                                                                    | Plan number/ other description                                                                                                                                                                               |                                        |
| <b>B. Individual who reviews and takes responsibility for design activities</b>                                                                                                                                                     |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Name<br>Hendrik Van de Glind, L.E.T., C.E.T.                                                                                                                                                                                        |                                                                                                                                                                                           | Firm<br>Paterson Group Inc.                                                                                                                                                                                  |                                        |
| Street address<br>9 Auriga Drive                                                                                                                                                                                                    |                                                                                                                                                                                           | Unit no.                                                                                                                                                                                                     | Lot/con.                               |
| Municipality<br>Ottawa                                                                                                                                                                                                              | Postal code<br>K2E 7T9                                                                                                                                                                    | Province<br>ON                                                                                                                                                                                               | E-mail<br>hvandeglind@patersongroup.ca |
| Telephone number<br>613-226-7381                                                                                                                                                                                                    | Fax number                                                                                                                                                                                | Cell number                                                                                                                                                                                                  |                                        |
| <b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1. of Division C]</b>                                                                                                          |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| <input type="checkbox"/> House<br><input type="checkbox"/> Small Buildings<br><input type="checkbox"/> Large Buildings<br><input type="checkbox"/> Complex Buildings                                                                | <input type="checkbox"/> HVAC – House<br><input type="checkbox"/> Building Services<br><input type="checkbox"/> Detection, Lighting and Power<br><input type="checkbox"/> Fire Protection | <input type="checkbox"/> Building Structural<br><input type="checkbox"/> Plumbing – House<br><input type="checkbox"/> Plumbing – All Buildings<br><input checked="" type="checkbox"/> On-site Sewage Systems |                                        |
| Description of designer's work<br>On-site Sewage System Design                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| <b>D. Declaration of Designer</b>                                                                                                                                                                                                   |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| I, <u>Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</u> declare that (choose one as appropriate):<br>(print name)                                                                                                           |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Individual BCIN: <u>111499</u>                                                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Firm BCIN: <u>29346</u>                                                                                                                                                                                                             |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.                                                    |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Individual BCIN: _____                                                                                                                                                                                                              |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Basis for exemption from registration: _____                                                                                                                                                                                        |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| The design work is exempt from the registration and qualification requirements of the Building Code.                                                                                                                                |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| Basis for exemption from registration and qualification: _____                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| I certify that:                                                                                                                                                                                                                     |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| 1. The information contained in this schedule is true to the best of my knowledge.                                                                                                                                                  |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| 2. I have submitted this application with the knowledge and consent of the firm.                                                                                                                                                    |                                                                                                                                                                                           |                                                                                                                                                                                                              |                                        |
| June 6, 2025<br>Date                                                                                                                                                                                                                |                                                                                                                                                                                           | <br>Signature of Designer                                                                                                |                                        |

**NOTE:**

1. For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) (c) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
2. Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of practice, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.





## Schedule 2: Sewage System Installer Information

|                                                                                                                                                                                                                             |                            |                                                                                                      |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------|----------|
| <b>A. Project Information</b>                                                                                                                                                                                               |                            |                                                                                                      |          |
| Building number, street name <b>5923 Ottawa Street</b>                                                                                                                                                                      |                            | Unit number                                                                                          | Lot/con. |
| Municipality <b>Ottawa (Richmond)</b>                                                                                                                                                                                       | Postal code <b>K0A 2Z0</b> | Plan number/ other description                                                                       |          |
| <b>B. Sewage system installer</b>                                                                                                                                                                                           |                            |                                                                                                      |          |
| Is the installer of the sewage system engaged in the business of constructing on-site, installing, repairing, servicing, cleaning or emptying sewage systems, in accordance with Building Code Article 3.3.1.1, Division C? |                            |                                                                                                      |          |
| <input type="checkbox"/> Yes (Continue to Section C)                                                                                                                                                                        |                            | <input type="checkbox"/> No (Continue to Section E)                                                  |          |
|                                                                                                                                                                                                                             |                            | <input checked="" type="checkbox"/> Installer unknown at time of application (Continue to Section E) |          |
| <b>C. Registered installer information (where answer to B is "Yes")</b>                                                                                                                                                     |                            |                                                                                                      |          |
| Name                                                                                                                                                                                                                        |                            | BCIN                                                                                                 |          |
| Street address                                                                                                                                                                                                              |                            | Unit number                                                                                          | Lot/con. |
| Municipality                                                                                                                                                                                                                | Postal code                | Province                                                                                             | E-mail   |
| Telephone number                                                                                                                                                                                                            | Fax                        | Cell number                                                                                          |          |
| <b>D. Qualified supervisor information (where answer to section B is "Yes")</b>                                                                                                                                             |                            |                                                                                                      |          |
| Name of qualified supervisor(s)                                                                                                                                                                                             |                            | Building Code Identification Number (BCIN)                                                           |          |
|                                                                                                                                                                                                                             |                            | <b>25-176</b>                                                                                        |          |
|                                                                                                                                                                                                                             |                            | <b>OTTAWA</b>                                                                                        |          |
| <b>E. Declaration of Applicant:</b>                                                                                                                                                                                         |                            |                                                                                                      |          |
| I <u>Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</u> declare that:                                                                                                                                                |                            |                                                                                                      |          |
| (print name)                                                                                                                                                                                                                |                            |                                                                                                      |          |
| I am the applicant for the permit to construct the sewage system. If the installer is unknown at time of application, I shall submit a new Schedule 2 prior to construction when the installer is known;                    |                            |                                                                                                      |          |
| <u>OR</u>                                                                                                                                                                                                                   |                            |                                                                                                      |          |
| I am the holder of the permit to construct the sewage system, and am submitting a new Schedule 2, now that the installer is known.                                                                                          |                            |                                                                                                      |          |
| I certify that:                                                                                                                                                                                                             |                            |                                                                                                      |          |
| 1. The information contained in this schedule is true to the best of my knowledge.                                                                                                                                          |                            |                                                                                                      |          |
| 2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.                                                                                                               |                            |                                                                                                      |          |
| <b>June 6, 2025</b>                                                                                                                                                                                                         |                            | <u>H. Van de Glind</u>                                                                               |          |
| Date                                                                                                                                                                                                                        |                            | Signature of applicant                                                                               |          |

SEPTIC FILE #  
25-176  
OTTAWA

RVCA RECEIVED  
JUN 09 2025  
REFER TO:



## Schedule 4: Proposed Services

### Complete Sections 1 through 7

#### Do Not Complete

Permit number: \_\_\_\_\_

Revision number: \_\_\_\_\_

Date \_\_\_\_\_

#### 1 Engineered

- ☒ Yes  
☐ No

#### 2 Water supply

- ☒ Proposed  
☐ Existing

#### 3 Use

- ☐ Apartment  
☐ Dwelling  
☒ Commercial  
☒ Industrial

#### 4 Type of work proposed

- ☒ New Installation  
☐ Replacement  
☐ Alteration

#### 5 Type of Well

- ☐ Dug/Bored/Sandpoint well  
☒ Drilled well  
☐ Municipal  
☐ Other

#### 6 Residential Sewage Design Flow Info.

Bedrooms \_\_\_\_\_  
House (floor area) \_\_\_\_\_ m<sup>2</sup>  
People \_\_\_\_\_  
Total Fixture Units \_\_\_\_\_ (Schedule 8)  
Residential Flow \_\_\_\_\_ L/day

#### 7 Sewage Design Flow Other Occupancies

Design Flow 9367 L/day  
Detailed sewage flow calculations:  
Refer to PGI Drawings No. PH4924-2(rev.3)

#### 8 Type of System

- ☐ Class 2 – Leaching Pit  
☐ Class 3 – Cesspool

Treatment Unit Eljen GSF A-42 (DN450)

#### ☐ Class 4 – Trench (Schedule 9)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☐ Class 4 – Filter Media (Schedule 10)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☐ Class 4 – Shallow Buried Trench

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☒ Class 4 – BMEC Area Bed (Schedule 11)

- ☒ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☐ Class 4 – "Type A" Dispersal (Schedule 13)

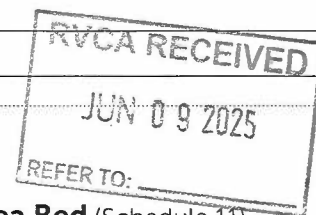
- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☐ Class 4 – "Type B" Dispersal (Schedule 14)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

#### ☐ Class 5 – Holding Tank (9000L min)

- ☐ Tank/Treatment Unit/Pump Chamber ONLY  
☐ Effluent Filter/Risers ONLY  
☐ Other \_\_\_\_\_



SEPTIC FILE #  
25-176  
OTTAWA



## Schedule 5: Sewage System Details

SEPTIC FILE #  
25-176  
OTTAWA

### Do Not Complete

Permit number:

Revision number:

Date

### Complete below

**Type of System** Eljen GSF A-42 Modules (DN 450) (Schedule 4)

Septic/Holding Tank Size: 28,101 (Litres)

Make: \_\_\_\_\_

Septic Tank Effluent Filter Make: OBC Approved

Model: (Polylok PL-525 or equivalent)

Treatment Unit - Make & Model: Eljen GSF A-42 Modules (DN450)

Number of Units: 110

Refer to Typical Drawing #: PH4924-1&2(rev.3)

Pump ☒ Syphon ☐

Pump(s) required: Yes

Pump Rate: 391 + Charge L/15min Hour

### Mantle Information

Native or imported = min. 15m in N/A direction(s)

Slope subgrade \_\_\_\_\_ % slope

\_\_\_\_\_ direction(s)

**Note:** Alarm required for all pumping systems

Installed ☐ Inside TBD By Installer @

☐ Outside time of Installation

Site to be Scarified (If clay) Yes ☒ No ☐

Clay Seal Required (If bedrock) Yes ☐ No ☐

### ☐ Trench

Distribution Pipe Length \_\_\_\_\_ m

Loading Area \_\_\_\_\_ m<sup>2</sup>

Type of Chamber \_\_\_\_\_

Length of Chamber \_\_\_\_\_ m

### ☐ Dispersal Bed

#### ☒ BMEC ☐ Type A ☐ Type B

Stone N/A m<sup>2</sup>

Sand 837.9 m<sup>2</sup>

Pipe 134.2 m<sup>2</sup>

Linear Loading 11.2 L/m<sup>2</sup>

### ☐ Shallow Buried Trench

Pipe Length \_\_\_\_\_ m<sup>2</sup>

Pipe \_\_\_\_\_

### ☐ Filter Media Bed

Stone \_\_\_\_\_ m

Extended Base \_\_\_\_\_ m<sup>2</sup>

Pipe \_\_\_\_\_

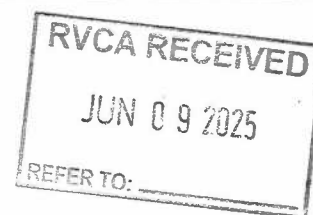
Weight of Filter Media \_\_\_\_\_ Kg

Loading Area \_\_\_\_\_ m<sup>2</sup>

☐ Tank/Treatment Unit/Pump Chamber Replacement **ONLY**

☐ Effluent Filter & Riser **ONLY**

Construction Notes:







**Schedule 6: Soil and Water**  
Table Information (Minimum depth of test pit: 2 metres)

SEPTIC FILE #

25-176

OTTAWA

RVCA RECEIVED

JUN 09 2025

**Do Not Complete**

Permit number:

Revision number:

Date

Name of Applicant/Agent: Paterson Group Inc.

Date: June 17, 2024

Time:

Applicant/Agent Signature:

Inspector:

Date:

Time:

Inspector Signature:

| EG ( ) | Soil Description |
|--------|------------------|
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |

Professional Engineers  
Ontario

Licensed Engineering Technologist

Name: H. G. VAN DE GLIND  
Number: 100647862  
Limitations: Inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.

Association of Professional Engineers of Ontario

T-time 35 Min/cm

| EG ( ) | Soil Description |
|--------|------------------|
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |

Test pits not available for inspection.  
Engineer assumes all liability for soil and HGWT info/elev's.

T-time Min/cm

| EG ( ) | Soil Description |
|--------|------------------|
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |

T-time Min/cm

| EG ( ) | Soil Description |
|--------|------------------|
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |
| m      |                  |

T-time Min/cm

**Legend**

BR Bedrock  
HGWT High ground water table  
EG Existing grade

GWT Ground water table  
M metres  
T percolation rate



## Schedule 7: Layout Section

**Do Not Complete**

Permit number:

Revision number:

Date

Scale: 1 Block = \_\_\_\_\_

- Dug Well
- Drilled Well

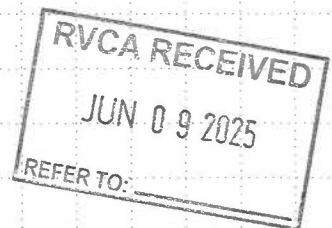
- ▲ Neighbouring Homes
- ◇ Benchmark

- Tile Drainage
- \_\_\_ Property Line

SEPTIC FILE #

25-176

OTTAWA



### Elevations (metric only)

B.M. 94.86 m

B.M Description Top of spike in hydro pole across  
from East Property Line of 5935 Ottawa Street

Exact Location \_\_\_\_\_

### Min. of 5 elevations in proposed system area (in X pattern)

|                      |                            |
|----------------------|----------------------------|
| X <sub>1</sub> _____ | X <sub>2</sub> _____       |
| X <sub>3</sub> _____ | X <sub>4</sub> _____       |
| X <sub>5</sub> _____ | X <sub>6</sub> (toe) _____ |
| X <sub>7</sub> _____ | X <sub>8</sub> _____       |



SEPTIC FILE #

25-176

**Schedule 8: Fixture unit count****Do Not Complete**

Permit number:

Revision number:

Date

| Fixtures                                                                                                          | # Existing | + | # Proposed | X | unit count | = | Fixture Count |
|-------------------------------------------------------------------------------------------------------------------|------------|---|------------|---|------------|---|---------------|
| <b>Bathroom</b>                                                                                                   |            |   |            |   |            |   |               |
| <b>Bathroom group</b> (toilet, sink and tub or shower) installed in the <b>same room</b>                          |            | + |            | X | 6          | = | 0.00          |
| Bathtub with/without overhead shower                                                                              |            | + |            | X | 1.5        | = | 0.00          |
| Shower stall                                                                                                      |            | + |            | X | 1.5        | = | 0.00          |
| Wash basin (SINK) (1½ inch trap)                                                                                  | 6          | + |            | X | 1.5        | = | 9.00          |
| Watercloset (TOILET) tank operated                                                                                | 6          | + |            | X | 4          | = | 24.00         |
| Bidet                                                                                                             |            | + |            | X | 1          | = | 0.00          |
| <b>Kitchen</b>                                                                                                    |            |   |            |   |            |   |               |
| Dishwasher                                                                                                        | 2          | + |            | X | 1          | = | 2.00          |
| Sink with/without garbage grinder(s), domestic and other small type single, double or 2 single with a common trap | 5          | + |            | X | 1.5        | = | 7.50          |
| <b>Other</b>                                                                                                      |            |   |            |   |            |   |               |
| Domestic washing machine                                                                                          |            | + |            | X | 1.5        | = | 0.00          |
| Combination sink and laundry tray single or double (Installed on 1½ trap)                                         |            | + |            | X | 1.5        | = | 0.00          |
| <b>Total*</b>                                                                                                     |            |   |            |   |            | = | 42.50         |

**\*Insert the TOTAL in section 5 of Schedule 4 (O.Reg 151/13 Table 7.4.9.3)**

1. Sump pumps and floor drains are not to be connected to the sewage system. Connection of such fixtures to a sewage system may lead to a hydraulic failure of the said system. The above mentioned fixtures should be discharged separately to an approved Class 2 (leaching pit) sewage system.

2. Where laundry waste is not more than 20% of the total daily design sanitary sewage flow, it may discharge to a sewage system (Part 8, OBC, 8.1.3.1(2)).

Agent/Owner signature

June 6, 2025

Date



TIC FILE #

25-177

N42°37'20"W

OTTAWA

SEPTIC FILE #

25-175

OTTAWA

RECEIVED

9 2025

## NOTE:

SEWAGE SYSTEM 'B' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 600 L/DAY WHEN BALANCED OVER 7 DAYS.

NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 40 min/cm

MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01

ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.

PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

## NOTE:

SEWAGE SYSTEM 'A' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 9,367 L/DAY WHEN BALANCED OVER 7 DAYS.

NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 35 min/cm

MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01

ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.

PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

PART 4  
R.P. 4R-7050PART 1  
R.P. 4R-13387

100mmØ PVC PIPE TO BE INSTALLED @ 2% (min.) SLOPE AND SHALL BE SLEEVED THROUGH A 150mmØ PVC SDR28 PIPE AND OVERLAIN BY 75mm T x 600mm W RIGID INSULATION BOARDS UNDER ASPHALT. PATERSON TO REVIEW COVER UPON COMPLETION OF LOT GRADING AND DRAINAGE.

TYP.  
2 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. = 94.90m(min.)  
OUTLET INV. = 94.80m (min.)

ELJEN SAMPLING PAN  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS  
2 RUNS OF 4 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.42m  
MODULAR BASE ELEV. @ FOOT = 94.40m

TYP.  
100mmØ VENT PIPE INSTALLED IN 150mmØ LANDSCAPE VALVE COVER

TYP.  
100mmØ SOLID PVC FOOTER PIPE  
INV. = 94.58m

NOTE:  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

NOTE:  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

TYP.  
100mmØ VENT PIPE INSTALLED IN 150mmØ LANDSCAPE VALVE COVER

100mmØ PERFORATED PVC SEPTIC PIPE  
INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.83m  
FOOT INV. = 94.78m

3m L - 100mmØ PVC PIPE WITH ELBOW @ 2% (min.) SLOPE  
2 CELLS OF 5 RUNS OF 11 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.65m  
MODULAR BASE ELEV. @ FOOT = 94.60m

ELJEN SAMPLING PAN  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS

ELJEN SPECIFIED SAND AREA  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 37.24m x 22.50m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

18,500L (min.) BALANCING TANK c/w TIME OPERATED EFFLUENT 1/2 H.P. DUPLEX PUMPS AND AUDIBLE / VISUAL HIGH WATER ALARM.  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• PUMPING SYSTEM SHALL BE TIME DOSED TO OPERATE EVERY HOUR AND ALTERNATE BETWEEN CELLS.  
• POLY RISER AND COVER ASSEMBLY  
• INLET INV. = 94.40m±  
• TOP OF TANK (max.) = 94.75m±  
• FINISHED GRADE = 95.40m

NEW 3,600L PRETREATMENT TANK c/w  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• POLYLOK PL-525 EFFLUENT FILTER  
• POLY RISER & COVER ASSEMBLY (2)  
• INLET INV. = 94.27m±  
• OUTLET INV. = 94.22m±  
• TOP OF TANK = 94.55m±  
• FINISHED GRADE = 95.15m

38mmØ PVC SCH 40 PIPE FORCEMAIN  
• SHALL BE INSTALLED TO GRAVITY DRAIN TO THE TANK.  
• ENTIRE LENGTH OF FORCEMAIN SHALL BE BEDDED OF A MINIMUM OF 150mm OF OPSS GRANULAR A, AND SHALL BE COVERED WITH A MINIMUM OF 300mm OF OPSS GRANULAR A.  
• ALL GRANULAR A MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 98% SPMDD.

100mmØ PERFORATED PVC SEPTIC PIPE INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.60m  
FOOT INV. = 94.58m

ELJEN SPECIFIED SAND AREA  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 9.60m x 9.68m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

TYP.  
2 x LARGE 4 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. = 95.10m(min.)  
OUTLET INV. = 95.00m (min.)

EXISTING MONITORING WELL TO BE DECOMMISSIONED

PROPOSED INDUSTRIAL BUILDING (ONE STOREY)  
PROPOSED FINISHED FLOOR ELEVATION: 95.25

100mmØ PVC PIPE TO BE INSTALLED @ 2% (min.) SLOPE AND SHALL BE SLEEVED THROUGH A 150mmØ PVC SDR28 PIPE AND OVERLAIN BY 75mm T x 600mm W RIGID INSULATION BOARDS UNDER ASPHALT.  
OUTLET ELEV. @ PROPOSED BUILDING = 94.79m±

EXISTING DRILLED WELL TO BE DECOMMISSIONED

EXISTING DRILLED WELL No. 5935 2 Storey Block and Metal Clad Building

NEW 28,101L PRETREATMENT TANK c/w  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS  
• POLYLOK PL-525 EFFLUENT FILTER  
• POLY RISER & COVER ASSEMBLY (2)  
• INLET INV. = 94.50m±  
• OUTLET INV. = 94.45m±  
• TOP OF TANK = 94.80m±  
• FINISHED GRADE = 95.40m

TBM:  
TOP OF SPIKE IN HYDRO POLE ACROSS FROM EAST PROPERTY LINE OF 5935 OTTAWA STREET  
GEODETTIC ELEV. = 94.86m

NOTE:  
INTERNAL GREASE TRAPS SHALL BE PROVIDED ON KITCHEN FIXTURES.

Professional Engineers  
Ontario  
Licensed Engineering Technologist  
Name: H. G. VAN DE GLIND  
Number: 100647862  
Limitations: Inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.  
Association of Professional Engineers of Ontario

LEGEND:  
• Bore Hole Location  
• Existing Ground Surface Elev. (m)  
• Proposed Ground Surface Elev. (m)  
• Proposed Subgrade Elev. (m)  
• Groundwater Elev. (m) - Mar.6/22  
• Finished Floor Elev. (m)  
• Existing Structure  
• Proposed Structure

BENCHMARK INFORMATION:  
TBM: Top of Spike in Hydro Pole Across from East Property Line of 5935 Ottawa Street  
Approximate Geodetic Elevation = 94.86m  
REFERENCE:  
Topographic Information obtained from Plan of Survey of Part of Unit 10 Index Plan D-26 Geographic Township of Goulbourn City of Ottawa, dated July 9, 2024, by egis Surveying Inc.  
Baseplan Obtained from Site Plan No. A-001, dated May 2025, by N45 Architecture Inc.

All Units are in meters unless otherwise specified

Consultant  
PATERSON GROUP  
5 AURIGA DRIVE  
OTTAWA, ON  
K2E 7S8  
TEL (613) 226-7351

|          |                               |      |
|----------|-------------------------------|------|
| 04/06/25 | Issued for Septic Permit      | 3    |
| 14/05/25 | Issued with Revised Site Plan | 2    |
| 03/10/24 | Issued with Revised Site Plan | 1    |
| 20/09/24 | Issued for Preliminary Review | 0    |
| DD/MM/YY | Description                   | Rev. |

Client:  
Project:  
STRATFORD FOXRUN  
PROPOSED WAREHOUSE / RESTAURANT  
5923 OTTAWA STREET  
OTTAWA (RICHMOND), ONTARIO

Drawing:  
SEWAGE SYSTEM LAYOUT PLAN  
SEWAGE SYSTEM 'A' AND 'B'

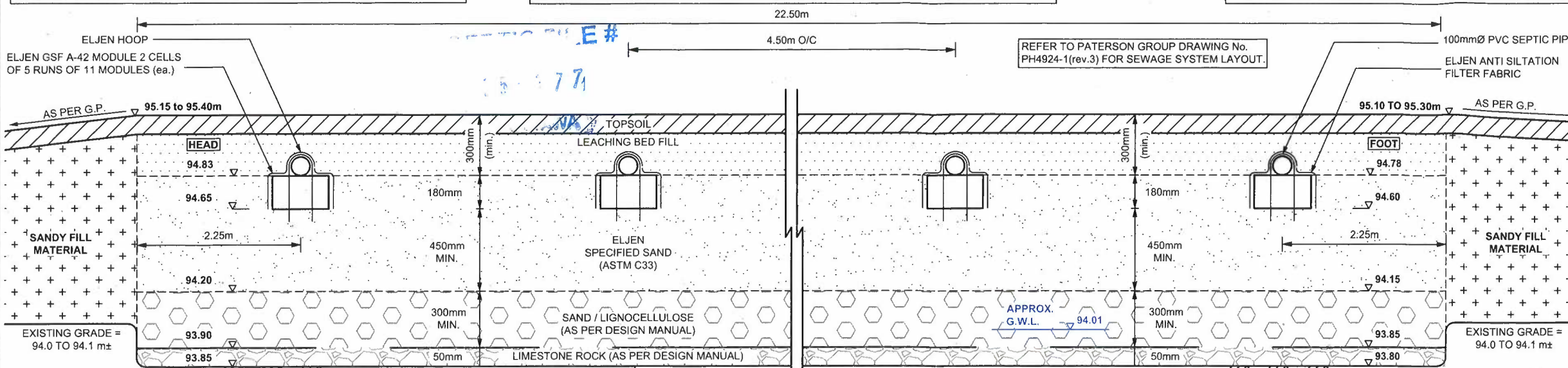
Scale: 1:600  
Date: 06/2025  
Drawing no.: PH4924-1(rev.3)  
Drawn by: HV  
Checked by: MK



COVER MATERIAL TO CONSIST OF LEACHING BED FILL FOLLOWED BY APPROX. 100mm OF SANDY TOPSOIL. LEACHING BED TO BE VEGETATED AS SOON AS POSSIBLE.

SEWAGE SYSTEM DESIGN, SPECIFICATION, DETAILS AND NOTES HAVE BEEN COMPLETED IN ACCORDANCE WITH ELJEN DENITRIFICATION SUPPLEMENTAL DESIGN AND INSTALLATION MANUAL.

FINAL GRADING SHALL BE SUITABLY SHAPED TO DIRECT SURFACE WATER AWAY FROM THE PROPOSED SEWAGE SYSTEM.



## NOTES:

### 1) ESTIMATE OF DAILY SEWAGE FLOW (Q)

THE PROPOSED SEWAGE SYSTEM HAS BEEN DESIGNED TO SUPPORT A COMMERCIAL TYPE USAGE CONSISTING OF OFFICE, STORE, WAREHOUSE AND RESTAURANT SPACE. THE DAILY DESIGN SEWAGE FLOW RATE IS CALCULATED IN ACCORDANCE WITH O.B.C. TABLE 8.2.1.3.B. **INTERNAL GREASE TRAP SHALL BE PROVIDED FOR KITCHEN FIXTURES.**

OFFICE SPACE:  
• (70m<sup>2</sup> / 9.3) x 75 L/DAY = 565 L/DAY  
STORE SPACE:  
• 75.25m<sup>2</sup> x 5 L/DAY = 376.25 L/DAY  
WAREHOUSE SPACE:  
• 2 LOADING BAY x 150 L/DAY = 300 L/DAY  
RESTAURANT/BAR:  
65 SEATS x 125 L/DAY = 8,125 L/DAY

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW = 9,367 L/DAY

### 2) SOIL CONDITIONS

SOILS INFORMATION GATHERED BY PATERSON GROUP INC. ON JUNE 17, 2024. REFER TO PATERSON GROUP REPORT PG7381-1 FOR FULL SOILS BREAKDOWN.

BH 4-24, ELEV. 94.11m

0-0.13 TOPSOIL AND ORGANICS  
0.13-3.33 GLACIAL TILL: DENSE BROWN SILTY SAND, TO SANDY SILT WITH GRAVEL, COBBLES AND BOULDERS, SOME TO TRACE CLAY

- G.W.L. @ 0.10m DEPTH (94.01m)

### 3) PRETREATMENT TANK

- TANK SHALL BE CONNECTED TO BUILDING BY A 150mm Ø PVC PIPE SLEEVED THROUGH A 200mm Ø PVC SDR 28 PIPE AND OVERLAIN WITH 50mm T x 600mm W RIGID INSULATION BOARDS (UNDER ROADWAY) AND SHALL BE INSTALLED AT 2.0% (min.) SLOPE TO THE PRETREATMENT TANK.
- MINIMUM WORKING CAPACITY OF PRETREATMENT TANK = (3 x Q) = 3 x 9,367 L/DAY = 28,101 L (min.)
- IT IS RECOMMENDED THAT A NEW 28,101L (min.) TWO-COMPARTMENT SEPTIC TANK BE INSTALLED.
- AN OBC APPROVED EFFLUENT FILTER (I.E. POLYLOK PL-525 EFFLUENT FILTER, OR EQUIVALENT) SHALL BE INSTALLED ON THE OUTLET PIPE IN THE PRETREATMENT TANK.
- THE ACCESS LIDS TO THE TANK OPENINGS SHALL BE EXTENDED TO THE GROUND SURFACE. INSTALL RISERS AND COVERS TO SUIT.
- ACCESS LIDS SHALL INCLUDE SAFETY DEVICES AS PER CSA B66-21.
- TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER MATERIAL.
- TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.

### 4) BALANCING TANK

- INSTALL A 18,500L (min.) BALANCING TANK IN SERIES AND DOWNSTREAM FROM THE NEW SEPTIC TANK.
- A TIME OPERATED ALTERNATING DUPLEX PUMPING SYSTEM (I.E. MYERS ME3F, OR SIMILAR) AND A HIGH WATER ALARM SHALL BE INSTALLED IN THE BALANCING TANK.
- THE TIME OPERATIONAL PUMPING SYSTEM SHALL OPERATE EVERY HOUR (I.E. 391 L/DUSE + VOLUME TO CHARGE THE SYSTEM) AND SHALL ALTERNATE BETWEEN EACH CELL.
- A 3mm Ø DRAIN HOLE SHALL BE INSTALLED IN THE UNDERSIDE OF THE FORCEMAIN IN THE BALANCING TANK NEAR THE WALL CONNECTION.
- RISERS WITH A COVER SHALL BE INSTALLED OVER THE BALANCING TANK TO PROVIDE ACCESS FROM THE GROUND SURFACE.
- DISCHARGE PIPING FOR PUMP SHALL BE CONFIGURED SUCH THAT THE PUMP IS EASILY SERVICED FROM THE GROUND SURFACE.

### 5) DISTRIBUTION BOX / FORCEMAIN

- A 38mm Ø (NOMINAL) PVC SCH 40 FORCEMAIN (2) SHALL BE USED TO CARRY THE EFFLUENT FROM THE BALANCING TANK TO EACH 3m L x 100mm Ø PVC SEWER PIPE.
- 100mm SEWER PIPE SHALL DRAIN BY GRAVITY TO A 5 OUTLET DISTRIBUTION BOX.
- THE FORCE MAIN SHALL BE INSTALLED TO GRAVITY DRAIN TO THE BALANCING TANK.
- THE FORCE MAIN SHALL BE OVERLAIN WITH 50mm T x 600mm CW RIGID INSULATION.
- THE DISTRIBUTION BOX SHALL BE EQUIPPED WITH AN INLET Baffle AND OUTLET PIPES (5).
- EACH PIPING RUN SHALL BE FED BY A 5 OUTLET DISTRIBUTION BOX.
- THE DISTRIBUTION BOX SHALL BE CONNECTED TO THE DISTRIBUTION PIPING RUNS USING 100mm Ø SOLID PVC SEWER PIPE @ 2% (min.) SLOPE.

### 6) LEACHING BED SIZING CRITERIA

- NO. OF MODULES REQUIRED = Q/95 = 9,367/95 = 98.6 MODULES
- USE 2 CELLS OF 5 RUNS OF 11 (110) ELJEN GSF A-42 MODULES EACH
- SAND AREA REQUIRED = Q/400 = 9,367/(35)/400 = 819.7m<sup>2</sup>
- SAND AREA PROVIDED = 37.24m x 22.50m = 837.90m<sup>2</sup> (min.)

### 7) LEACHING BED CONSTRUCTION GUIDELINES

- REMOVE ALL EXISTING TOPSOIL, AND ANY FILL WITHIN LIMITS OF THE SAND AREA AND SUBEXCAVATE TO AT LEAST ELEVATION 93.80m TO 93.85m, WHICHEVER IS GREATER. RE-ESTABLISH THE SPECIFIED CONTACT LEVEL USING SELECT SAND FILL, WHERE REQUIRED.
- THE SUBGRADE SURFACE SHALL BE SCARIFIED, **UNDER DRY CONDITIONS**.
- PLACE A 50mm MIN. THICK LAYER OF LIMESTONE ROCK OVER THE SUITABLY PREPARED SUBGRADE.
- LIMESTONE ROCK SHALL NO SMALLER THAN 25mm IN DIAMETER UP TO 50mm IN DIAMETER. THE ROCK SHALL CONTAIN GREATER THAN 15% LIMESTONE AS PER ELJEN DENITRIFICATION SUPPLEMENTAL DESIGN AND INSTALLATION MANUAL.
- PLACE A 300mm THICK LAYER OF SAND / LIGNOCELLULOSE OVER THE LIMESTONE ROCK LAYER.
- SAND / LIGNOCELLULOSE SHALL CONSIST OF WOOD CHIPS OR SAW DUST FROM HARD WOOD TREES THAT HAVE NOT BEEN FURTHER PROCESSED BY CHEMICALS. THE 300mm SAND AND LIGNOCELLULOSE LAYER SHALL BE 50/50 EQUAL MIXTURE OF ASTM C33 SAND AND WOOD CHIPS FROM HARD WOOD TREES. THE MIXTURE MUST NOT EXCEED 60/40 IN FAVOR OF THE MORE WOOD TO SAND.
- PLACE A 450mm MIN. THICK LAYER OF ELJEN SPECIFIED SAND FILL OVER THE LEACHING BED FILL.
- THE ELJEN SPECIFIED SAND FILL SHALL CONSIST OF WASHED SAND MEETING THE REQUIREMENTS OF ASTM C33 "STANDARD SPECIFICATION FOR CONCRETE AGGREGATES" WITH LESS THAN 5% PASSING 0.075mm SIEVE. ELJEN SPECIFIED SAND FILL SHALL BE PRE-APPROVED BY THE CONSULTANT.
- THE MODULES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- THE MODULES SHALL BE INSTALLED AT A SLOPE OF 0.3% (min.) TO 0.5% (max.), END TO END AND WITH THE WHITE DEMARCATION LINE FACING UP.
- THE MODULAR BASE LEVEL (ELEV. 94.60m AT THE FOOT, TO 94.65m AT THE HEAD) SHALL BE ESTABLISHED WITH ELJEN SPECIFIED SAND FILL, HAVING A MINIMUM THICKNESS OF 450mm BELOW THE MODULES.
- THE ELJEN MODULES SHALL BE FED BY GRAVITY BY A 100mm Ø PVC SEWER PIPE @ 2% (min.) SLOPE FROM THE DISTRIBUTION BOX
- THE DISTRIBUTION PIPE SHALL CONSIST OF A 100mm Ø PERFORATED PVC PIPE CENTRED OVER THE MODULES. THE PIPE SHALL BE SECURED TO THE TOP OF THE MODULES USING AN ELJEN HOOP (MINIMUM 1 HOOP PER MODULE).
- THE INVERT LEVEL OF THE DISTRIBUTION PIPE SHALL BE SET ON THE MODULES AT ELEVATION 94.78m AT THE FOOT TO 94.83m AT THE HEAD. THE END OF THE PIPE RUNS SHALL BE CONNECTED TO A 100mm Ø SOLID PVC FOOTER PIPE
- INSTALL ELJEN SYSTEM SAMPLING DEVICE AS PER MANUFACTURER'S RECOMMENDATIONS.
- THE ELJEN ANTI-SILTATION FILTER FABRIC SHALL BE SPREAD LENGTHWISE OVER THE PERFORATED SEPTIC PIPE AND DOWN THE SIDES OF THE MODULES. ENSURE ENDS OF MODULES ARE ALSO COVERED WITH FABRIC.
- THE MODULES SHALL BE BACKFILLED, WITH ELJEN SPECIFIED SAND FILL TO AT LEAST THE TOP OF THE ELJEN MODULES, FOLLOWED BY 200mm (min.) OF LEACHING BED FILL, FOLLOWED BY 100mm OF SANDY TOPSOIL, WITHIN THE LIMITS OF THE SAND AREA. THE BED AREA SHOULD BE VEGETATED AS SOON AS POSSIBLE.
- LEACHING BED SAND FILL SHALL BE UNIFORM SAND WITH GRADING LIMITS SIMILAR TO 100% PASSING 13.2mm SIEVE, LESS THAN 5% PASSING 0.075mm SIEVE, AND HAVING A PERCOLATION TIME OF 6 TO 8 min/cm. LEACHING BED FILL SHALL BE PRE-APPROVED BY THE CONSULTANT.

- THE SIDES OF THE BED SHOULD BE SLOPED AT 3H:1V OR SHALLOWER.
- VENT SYSTEM SHALL BE INSTALLED ON THE FOOTER PIPE. CONNECT A 100mm Ø PVC VENT PIPE TO FOOTER PIPE, EXTENDING TO GROUND SURFACE. VENT PIPE TO BE INSTALLED IN 150mm Ø LANDSCAPE VALVE COVER.

### 8) MINIMUM CLEARANCE DISTANCE FROM DISTRIBUTION PIPE

- 5.6m FROM ANY PROPERTY LINE
- 7.6m FROM ANY STRUCTURE: 5.0m FROM ANY BASEMENTLESS STRUCTURE
- 17.6m FROM ANY DRILLED WELL
- 5.0m FROM ANY TREE (UNLESS OTHERWISE APPROVED)

### 9) MINIMUM CLEARANCE DISTANCE FROM TANK(S)

- 1.5m FROM ANY STRUCTURE
- 15.0m FROM ANY DRILLED OR DUG WELL
- 3.0m FROM ANY PROPERTY LINE

### 10) GENERAL

- SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.**
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT TRAFFIC LOADING.
- THE BACKFILLING OF THE SEWAGE SYSTEM SHOULD MINIMIZE THE RISK OF OVER COMPACTION WITH THE USE RUBBER TRACKED EQUIPMENT AND BY AVOIDING THE CREATION OF ANY CONSTRUCTION ROUTES OR PATHWAYS OVER THE SYSTEM.
- ANY NEW IRRIGATION / SPRINKLER SYSTEM SHOULD NOT BE USED IN PROXIMITY OF THE PROPOSED SEWAGE SYSTEM.
- ENSURE WALKWAYS AND/OR SHURBBERY ARE NOT PLACED WITHIN PROXIMITY OF THE TANKAGE.
- THE BACKWASH WATERS FROM ANY WATER TREATMENT UNIT, SUCH AS WATER SOFTENER, SHOULD NOT DISCHARGE INTO THE SEWAGE SYSTEM.
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED FOR THE USE OF A GARBAGE DISPOSAL.
- SEWAGE SYSTEM INSTALLER SHALL BE QUALIFIED AND REGISTERED UNDER PART 8 OF THE ONTARIO BUILDING CODE AND SHALL BE AN AUTHORIZED ELJEN TREATMENT SYSTEM INSTALLER.
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST BY-LAWS, CODES AND REGULATIONS.
- CONTRACTOR SHALL REVIEW DRAWINGS IN DETAIL AND SHALL INFORM THE CONSULTANT OF ANY ERRORS AND/OR OMISSIONS ON DESIGN DRAWINGS IMMEDIATELY.
- CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND PROTECT ALL EXISTING UNDERGROUND SERVICES.
- CONTRACTOR SHALL VISIT THE SITE AND REVIEW ALL DOCUMENTATION TO BECOME FAMILIAR WITH THE SITE AND SUBSURFACE SOIL CONDITIONS TO DETERMINE SUITABLE METHODS OF CONSTRUCTION.
- THE MANUFACTURER PROVIDES A LIMITED WARRANTY OF THE SYSTEM COMPONENTS. THE OWNER OF THE SYSTEM MUST SIGN A MAINTENANCE AGREEMENT WITH THE MANUFACTURER'S REPRESENTATIVE. THE HOMEOWNER IS RESPONSIBLE FOR THE ANNUAL FEES ASSOCIATED WITH THE MAINTENANCE.
- THE FIRM OF PATERSON GROUP INC. HAS PROVIDED DESIGN SERVICES ONLY FOR THE SUBJECT SEWAGE SYSTEM. THE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES AND OUR INTERPRETATION OF PART 8 OF THE ONTARIO BUILDING CODE.
- INSPECTIONS BY THE CONSULTANT DURING THE INSTALLATION OF THE SYSTEM IS A REQUIREMENT OF SOME REGULATING AUTHORITIES AND IS STRONGLY RECOMMENDED BY THIS FIRM.
- THE PROPERTY LINE / SEPARATION DISTANCES SHOULD BE CONFIRMED PRIOR TO CONSTRUCTION.
- CONSTRUCTION INSPECTIONS DURING THE INSTALLATION OF THE SEWAGE SYSTEM MAY BE REQUIRED BY THE REGULATING AUTHORITY AND ARE STRONGLY RECOMMENDED BY THIS FIRM. IF THIS FIRM IS TO COMPLETE ANY CONSTRUCTION INSPECTION(S), ADDITIONAL FEES MAY BE APPLIED. CONFIRMATION OF PAYMENT WILL BE REQUIRED PRIOR TO THE INSPECTION.
- THE TEST HOLE INFORMATION PROVIDED, IS INTENDED TO BE USED FOR DESIGN PURPOSES ONLY, AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. IF DISCREPANCIES ARE FOUND DURING THE CONSTRUCTION PROCESS, IT IS THE CLIENT'S RESPONSIBILITY TO CONTACT THIS FIRM TO MAKE ANY NECESSARY COMMENTS OR REVISIONS. ADDITIONAL REVISIONS ARE NOT CONSIDERED PART OF THE DESIGN WORKS AND WILL BE CONSIDERED AS AN ADDITIONAL COST.

SEPTIC FILE #  
25-176  
OTTAWA



Professional Engineers  
Ontario

Licensed Engineering Technologist

Name: H. G. VAN DE GLIND

Number: 100647862

Limitations: Inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.

Association of Professional Engineers of Ontario

|          |                               |      |
|----------|-------------------------------|------|
| 04/06/25 | Issued for Septic Permit      | 3    |
| 14/05/25 | Issued with Revised Site Plan | 2    |
| 03/10/24 | Issued with Revised Site Plan | 1    |
| 20/09/24 | Issued for Preliminary Review | 0    |
| DD/MM/YY | DESCRIPTION                   | REV. |

Consultant:



PATERSON  
GROUP

5 AURIGA DRIVE  
OTTAWA, ON  
K2E 7S9  
TEL (613) 226-7361

Client:

STRATFORD FOXRUN

Project:

PROPOSED WAREHOUSE /  
RESTAURANT

5923 OTTAWA STREET  
OTTAWA (RICHMOND), ONTARIO

Drawing:

SEWAGE SYSTEM  
DETAILS AND NOTES  
SEWAGE SYSTEM 'A'

Scale:

N.T.S.

Drawn by:

HV

Date:

06/2025

Checked by:

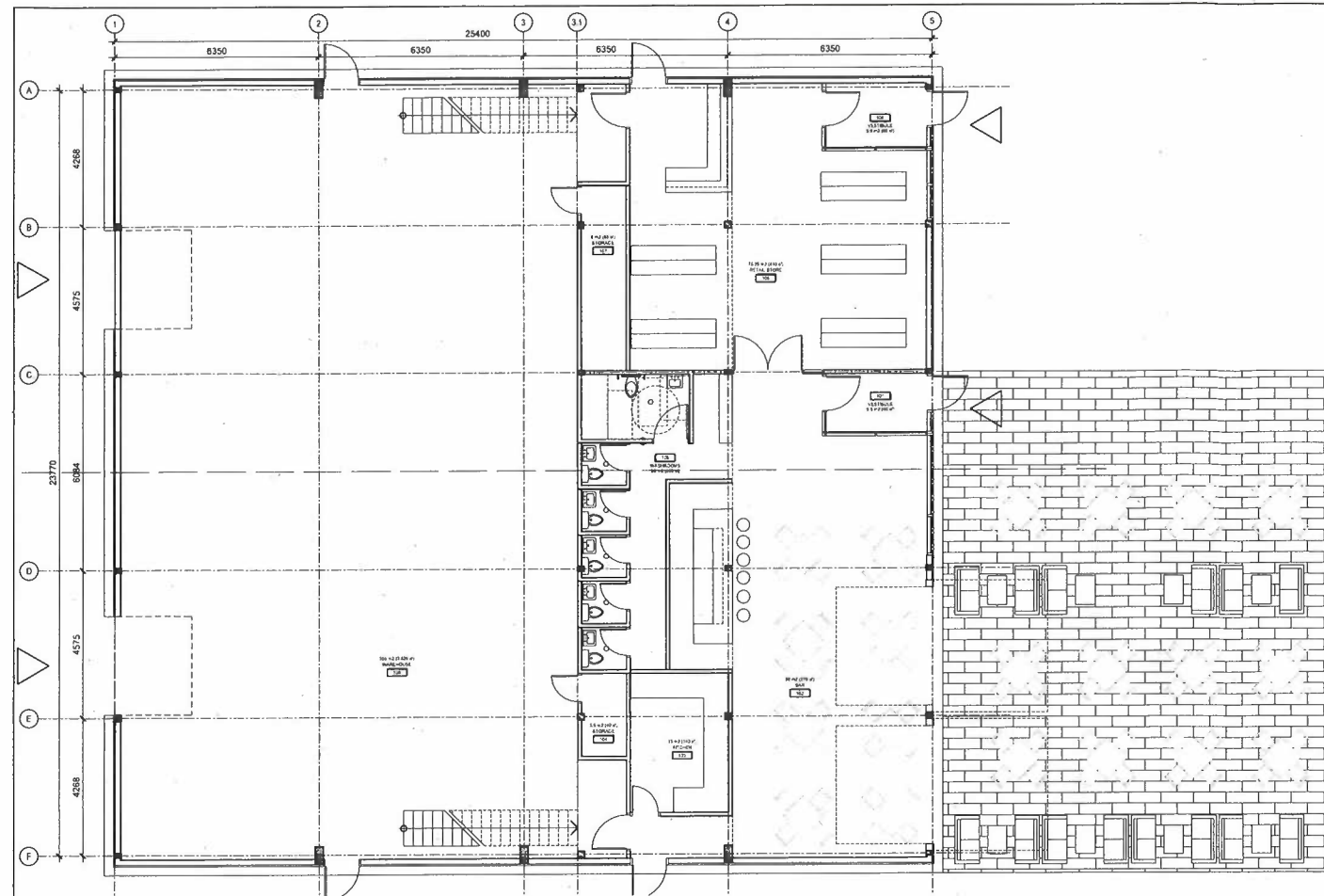
MK

Drawing No.:

PH4924-2(rev.3)

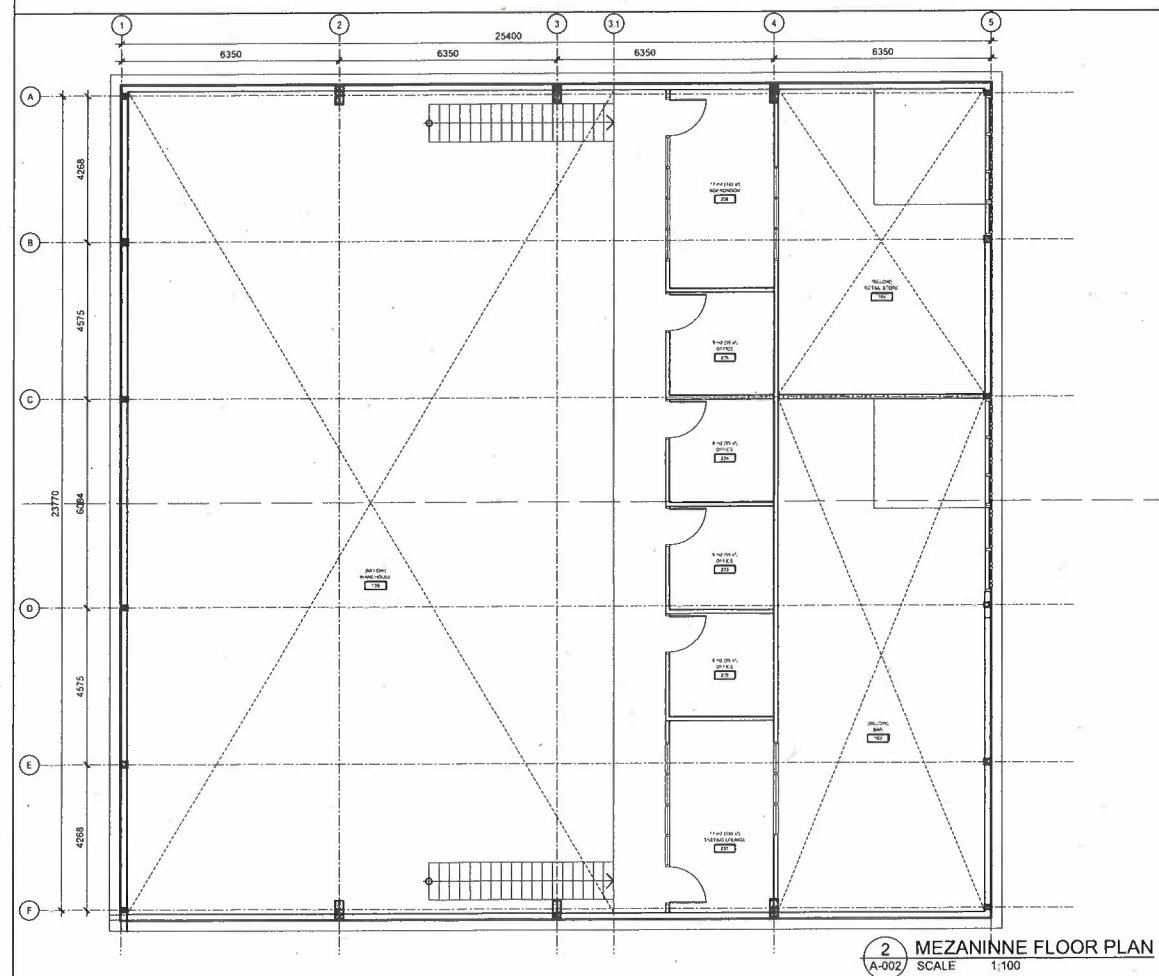
p:\autocad drawings\hydrogeology\ph4924-2 stratford foxrun -  
jack gulas - 5923 ottawa street richmond\ph4924-2(rev.3).dwg



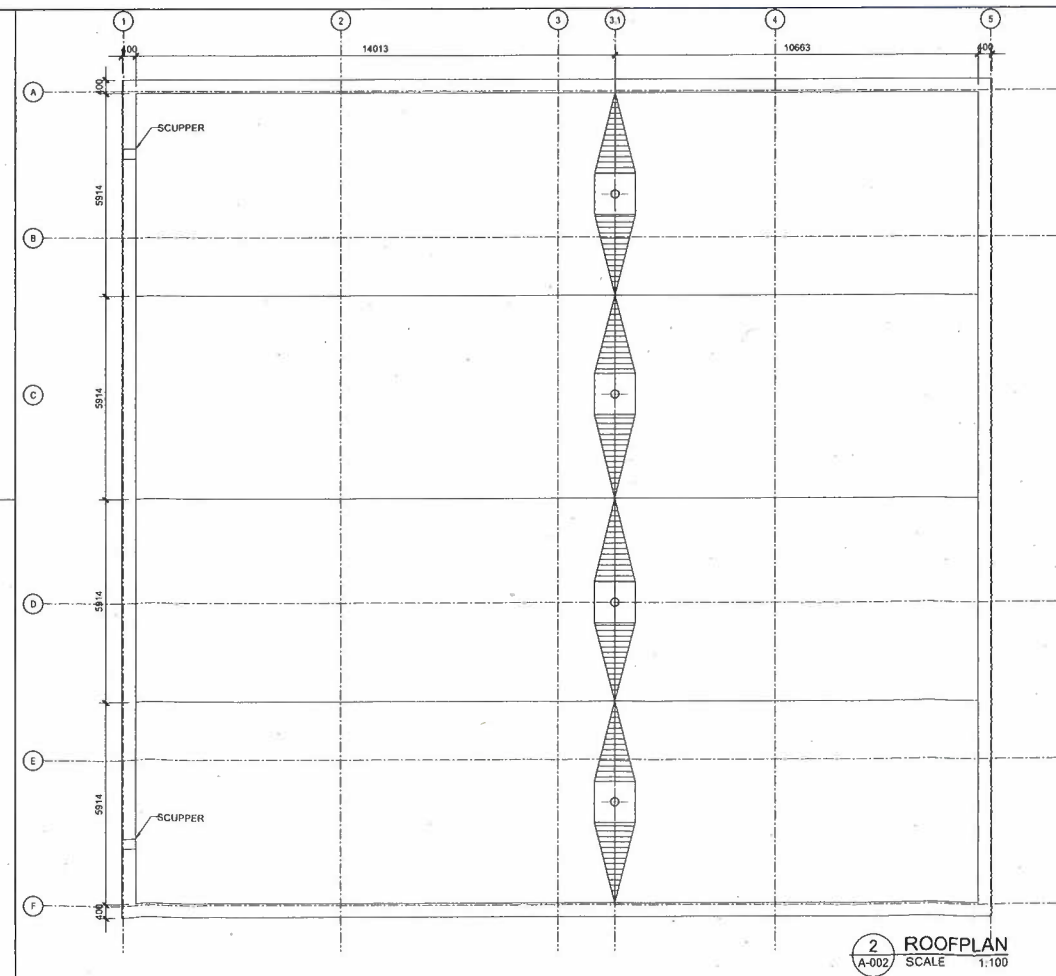


1 GROUND FLOOR PLAN  
A-002 SCALE 1:100

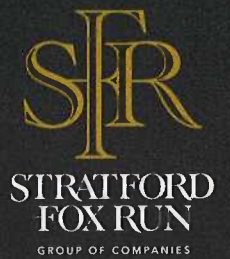
BUILDING 1  
SEWAGE SYSTEM "A"  
25-176



2 MEZANINNE FLOOR PLAN  
A-002 SCALE 1:100



2 ROOFPLAN  
A-002 SCALE 1:100



|     |                              |         |
|-----|------------------------------|---------|
| 3   | ISSUED FOR SPA               | 08MAY25 |
| 2   | ISSUED FOR SITE PLAN CONTROL | 19NOV24 |
| 1   | ISSUED FOR SITE PLAN CONTROL | 07OCT24 |
| no. | revision                     | date    |

**N45 ARCHITECTURE INC.**  
71 Bank Street, 7th floor - Ottawa, Ontario, K1P 5N2  
tel. 613.224.0095 fax 613.224.9811

|               |                                  |  |
|---------------|----------------------------------|--|
| project       | <b>FOXRUN RICHMOND</b>           |  |
|               | 5923 OTTAWA STREET<br>OTTAWA, ON |  |
| project north | seal                             |  |
|               |                                  |  |

|                                                                                                                                 |                    |                |               |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|---------------|
| drawing title                                                                                                                   | <b>FLOOR PLANS</b> |                |               |
| scale                                                                                                                           | AS NOTED           | drawn by       | NF            |
| date                                                                                                                            | OCT 2022           | checked by     | VP            |
| project number                                                                                                                  | 24-826             | drawing number | <b>A-002</b>  |
| CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS. |                    |                | revision<br>- |



Permit  
Part 8 – Sewage System  
Ontario Building Code

|                     |
|---------------------|
| Do Not Complete     |
| Permit No 25-176    |
| Revision No         |
| Date                |
| Related Application |

A copy of this permit must be posted on the property at all time during construction. OBC, Division C — Part 1, Section 1.3.2.1

This permit verifies that the on-site sewage system was reviewed and approved for construction under the Ontario Building Code Act ( Building Code Act, 1992, S.O. 1992, c. 23) and Ontario Building Code (O. Reg. 163/24) as amended.

Inspected & Recommended by: Matt Panciuk Owner: 99117756 Canada Inc.  
Inspection Date & Time: Weather:  
Address: 5923 Ottawa Street - System A Legal:  
In the former Township/City of Goulbourn

Design Flow for Commercial / Institutional / Industrial (as per Table 8.2.13.B)

Q: 9,367 L/day

|                 |                       |          |                              |                                         |                                        |
|-----------------|-----------------------|----------|------------------------------|-----------------------------------------|----------------------------------------|
| septic tank     | 28,101(min)           | L        | weigh bills for Eljen Sand   | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| effluent filter | Required              |          | grain size analysis required | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| pump rate       | 391 + Charge          | L/15 MIN | site to be scarified         | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| treatment unit  | Eljen GSF A42(DN 450) |          | clay seal inspection         | <input type="checkbox"/> yes            | <input checked="" type="checkbox"/> no |
| number of units | 110                   |          | mantle required              | <input type="checkbox"/> yes            | <input checked="" type="checkbox"/> no |
|                 |                       |          | sub-grade inspection         | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |

ELEVATION ☐ In Ground ☐ Partially Raised ☒ Fully Raised

TYPE OF SYSTEM

☐ Trench

☒ Pipe and Stone or ☐ Chambers

type of chamber  
loading area m<sup>2</sup>  
total trench length m  
trench configuration

☒ Dispersal Bed

☒ BMEC ☐ Type A ☐ Type B

stone m<sup>2</sup>  
sand 837.9 m<sup>2</sup>  
pipe 2 cells of 5 runs of 11 modules @ 4.5m o/c  
weight of sand kg

☐ Shallow Buried Trench

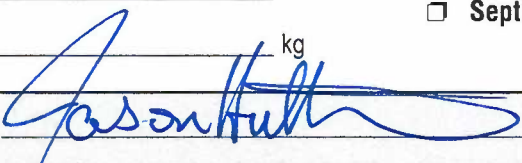
pipe length m  
orifice spacing m

☐ Filter Media Bed

stone m<sup>2</sup>  
extended base m<sup>2</sup>  
pipe  
weight of filter media kg  
loading area m<sup>2</sup>

☐ Class 5 Holding Tank

☐ Septic Tank Only

Manager, Septic System Approvals:  Permit Date: August 5, 2025

Comments: 1. Scarification inspection required prior to placement of sand fill.  
2. One existing monitoring well and one existing drilled well to be decommissioned on site by a licensed well driller and documentation of the decommissioned wells provided to the RVCA.

☒ maintenance/pumping required ☒ ESA permit # required ☐ engineer to verify  
☐ Class 5 Holding Tank approval only valid for three years from date of issue ☒ subgrade ☐ squirt height

Manager, Septic System Approvals: Revision Date:

Comments:



# Application for a Permit to Construct or Demolish

This form is authorized under subsection 8(1.1) of the *Building Code Act, 1992*

|                                                                                                                                                                                                                                           |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|
| <b>For use by Principal Authority</b>                                                                                                                                                                                                     |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Application number:                                                                                                                                                                                                                       |             |             | Permit number (if different):                                                                                                                                                                                                                                                                                                             |             |          |
| Date received:                                                                                                                                                                                                                            |             |             | Roll number:                                                                                                                                                                                                                                                                                                                              |             |          |
| Application submitted to: <b>Ottawa Septic System Office</b><br><small>(Name of municipality, upper-tier municipality, board of health or conservation authority)</small>                                                                 |             |             | <div style="border: 2px solid blue; padding: 5px; transform: rotate(-5deg); display: inline-block;"> <b>RVCA RECEIVED</b><br/> <b>JUN 09 2025</b><br/> <b>REFER TO:</b> </div> <div style="color: blue; font-weight: bold; margin-top: 10px;">             SEPTIC FILE #<br/>             25-177<br/>             OTTAWA           </div> |             |          |
| <b>A. Project information</b>                                                                                                                                                                                                             |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Building number, street name                                                                                                                                                                                                              |             |             |                                                                                                                                                                                                                                                                                                                                           | Unit number | Lot/con. |
| 5923 Ottawa street                                                                                                                                                                                                                        |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Municipality                                                                                                                                                                                                                              |             | Postal code | Plan number/other description                                                                                                                                                                                                                                                                                                             |             |          |
| Ottawa (Richmond)                                                                                                                                                                                                                         |             | K0A 2Z0     |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Project value est. \$                                                                                                                                                                                                                     |             |             | Area of work (m <sup>2</sup> )                                                                                                                                                                                                                                                                                                            |             |          |
|                                                                                                                                                                                                                                           |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| <b>B. Purpose of application</b>                                                                                                                                                                                                          |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| <input checked="" type="checkbox"/> New construction <input type="checkbox"/> Addition to an existing building <input type="checkbox"/> Alteration/repair <input type="checkbox"/> Demolition <input type="checkbox"/> Conditional Permit |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Proposed use of building                                                                                                                                                                                                                  |             |             | Current use of building                                                                                                                                                                                                                                                                                                                   |             |          |
| Commercial                                                                                                                                                                                                                                |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Description of proposed work                                                                                                                                                                                                              |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| To construct a new class 4 sewage system, Eljen NSF 245 Denitrification treatment system: Eljen DN450                                                                                                                                     |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Sewage System 'B'                                                                                                                                                                                                                         |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| <b>C. Applicant</b>                                                                                                                                                                                                                       |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Applicant is: <input type="checkbox"/> Owner or <input checked="" type="checkbox"/> Authorized agent of owner                                                                                                                             |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Last name                                                                                                                                                                                                                                 |             | First name  | Corporation or partnership                                                                                                                                                                                                                                                                                                                |             |          |
| Van de Glind                                                                                                                                                                                                                              |             | Hendrik     | Paterson Group Inc.                                                                                                                                                                                                                                                                                                                       |             |          |
| Street address                                                                                                                                                                                                                            |             |             |                                                                                                                                                                                                                                                                                                                                           | Unit number | Lot/con. |
| 9 Auriga Drive                                                                                                                                                                                                                            |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Municipality                                                                                                                                                                                                                              | Postal code | Province    | E-mail                                                                                                                                                                                                                                                                                                                                    |             |          |
| Ottawa                                                                                                                                                                                                                                    | K2E 7T9     | ON          | hvandeglind@patersongroup.ca                                                                                                                                                                                                                                                                                                              |             |          |
| Telephone number                                                                                                                                                                                                                          | Fax         | Cell number |                                                                                                                                                                                                                                                                                                                                           |             |          |
| 613-226-7381                                                                                                                                                                                                                              |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| <b>D. Owner (if different from applicant)</b>                                                                                                                                                                                             |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Last name                                                                                                                                                                                                                                 |             | First name  | Corporation or partnership                                                                                                                                                                                                                                                                                                                |             |          |
| Gulas                                                                                                                                                                                                                                     |             | Jack        | 99117756 Canada Inc.                                                                                                                                                                                                                                                                                                                      |             |          |
| Street address                                                                                                                                                                                                                            |             |             |                                                                                                                                                                                                                                                                                                                                           | Unit number | Lot/con. |
| 411 Legget Drive, Suite 710                                                                                                                                                                                                               |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |
| Municipality                                                                                                                                                                                                                              | Postal code | Province    | E-mail                                                                                                                                                                                                                                                                                                                                    |             |          |
| Ottawa                                                                                                                                                                                                                                    | K2K 3C9     | ON          | jack@stratfordfoxrun.com                                                                                                                                                                                                                                                                                                                  |             |          |
| Telephone number                                                                                                                                                                                                                          | Fax         | Cell number |                                                                                                                                                                                                                                                                                                                                           |             |          |
| 613.862.0087                                                                                                                                                                                                                              |             |             |                                                                                                                                                                                                                                                                                                                                           |             |          |

| <b>E. Builder (optional)</b> |             |                                            |          |
|------------------------------|-------------|--------------------------------------------|----------|
| Last name                    | First name  | Corporation or partnership (if applicable) |          |
| Street address               |             | Unit number                                | Lot/con. |
| Municipality                 | Postal code | Province                                   | E-mail   |
| Telephone number             | Fax         | Cell number                                |          |

SEPTIC FILE #  
 25-177  
 P.A.W.A.

| <b>F. Tarion Warranty Corporation (Ontario New Home Warranty Program)</b>                                                          |                              |                                        |  |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|--|
| i. Is proposed construction for a new home as defined in the <i>Ontario New Home Warranties Plan Act</i> ? If no, go to section G. | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |  |
| ii. Is registration required under the <i>Ontario New Home Warranties Plan Act</i> ?                                               | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |  |
| iii. If yes to (ii) provide registration number(s): _____                                                                          |                              |                                        |  |

| <b>G. Required Schedules</b>                                                                         |  |
|------------------------------------------------------------------------------------------------------|--|
| i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities. |  |
| ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.  |  |

| <b>H. Completeness and compliance with applicable law</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------|
| i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) of Division C of the Building Code (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted).<br>Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the <i>Building Code Act, 1992</i> , to be paid when the application is made. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> .                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.                                                                                                                                                                                                         | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| iv) The proposed building, construction or demolition will not contravene any applicable law.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

| <b>I. Declaration of applicant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> <p style="font-size: 1.2em; margin: 0;">Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</p> <p style="font-size: 0.8em; margin: 5px 0;">(print name)</p> </div> <div style="width: 35%; text-align: right;"> <p style="margin: 0;">declare that:</p> </div> </div> <div style="margin-top: 10px;"> <p>1. The information contained in this application, attached schedules, attached plans and specifications, and other attached documentation is true to the best of my knowledge.</p> <p>2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;"> <p style="font-size: 1.1em; margin: 0;">June 6, 2025</p> <p style="font-size: 0.8em; margin: 5px 0;">Date</p> </div> <div style="width: 60%; text-align: center;"> <p style="font-size: 0.8em; margin: 5px 0;">Signature of applicant</p> </div> </div> |  |

RVCA RECEIVED  
 JUN 09 2025  
 REFER TO: \_\_\_\_\_

Personal information contained in this form and schedules is collected under the authority of subsection 8(1.1) of the *Building Code Act, 1992*, and will be used in the administration and enforcement of the *Building Code Act, 1992*. Questions about the collection of personal information may be addressed to: a) the Chief Building Official of the municipality or upper-tier municipality to which this application is being made, or, b) the inspector having the powers and duties of a chief building official in relation to sewage systems or plumbing for an upper-tier municipality, board of health or conservation authority to whom this application is made, or, c) Director, Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay St., 2nd Floor. Toronto, M5G 2E5 (416) 585-6666.



## Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

|                                                                                                                                                                                                                                     |                                                        |                                                            |                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|----------------------------------------|
| <b>A. Project Information</b>                                                                                                                                                                                                       |                                                        |                                                            |                                        |
| Building number, street name<br>5923 Ottawa Street                                                                                                                                                                                  |                                                        | Unit no.                                                   | Lot/con.                               |
| Municipality<br>Ottawa (Richmond)                                                                                                                                                                                                   | Postal code<br>K0A 2Z0                                 | Plan number/ other description                             |                                        |
| <b>B. Individual who reviews and takes responsibility for design activities</b>                                                                                                                                                     |                                                        |                                                            |                                        |
| Name<br>Hendrik Van de Glind, L.E.T., C.E.T.                                                                                                                                                                                        |                                                        | Firm<br>Paterson Group Inc.                                |                                        |
| Street address<br>9 Auriga Drive                                                                                                                                                                                                    |                                                        | Unit no.                                                   | Lot/con.                               |
| Municipality<br>Ottawa                                                                                                                                                                                                              | Postal code<br>K2E 7T9                                 | Province<br>ON                                             | E-mail<br>hvandeglind@patersongroup.ca |
| Telephone number<br>613-226-7381                                                                                                                                                                                                    | Fax number                                             | Cell number                                                |                                        |
| <b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1. of Division C]</b>                                                                                                          |                                                        |                                                            |                                        |
| <input type="checkbox"/> House                                                                                                                                                                                                      | <input type="checkbox"/> HVAC – House                  | <input type="checkbox"/> Building Structural               |                                        |
| <input type="checkbox"/> Small Buildings                                                                                                                                                                                            | <input type="checkbox"/> Building Services             | <input type="checkbox"/> Plumbing – House                  |                                        |
| <input type="checkbox"/> Large Buildings                                                                                                                                                                                            | <input type="checkbox"/> Detection, Lighting and Power | <input type="checkbox"/> Plumbing – All Buildings          |                                        |
| <input type="checkbox"/> Complex Buildings                                                                                                                                                                                          | <input type="checkbox"/> Fire Protection               | <input checked="" type="checkbox"/> On-site Sewage Systems |                                        |
| Description of designer's work<br>On-site Sewage System Design                                                                                                                                                                      |                                                        |                                                            |                                        |
| <b>D. Declaration of Designer</b>                                                                                                                                                                                                   |                                                        |                                                            |                                        |
| I, <u>Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</u> declare that (choose one as appropriate):<br>(print name)                                                                                                           |                                                        |                                                            |                                        |
| I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. |                                                        |                                                            |                                        |
| Individual BCIN: <u>111499</u>                                                                                                                                                                                                      |                                                        |                                                            |                                        |
| Firm BCIN: <u>29346</u>                                                                                                                                                                                                             |                                                        |                                                            |                                        |
| I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.                                                    |                                                        |                                                            |                                        |
| Individual BCIN: _____                                                                                                                                                                                                              |                                                        |                                                            |                                        |
| Basis for exemption from registration: _____                                                                                                                                                                                        |                                                        |                                                            |                                        |
| The design work is exempt from the registration and qualification requirements of the Building Code.                                                                                                                                |                                                        |                                                            |                                        |
| Basis for exemption from registration and qualification: _____                                                                                                                                                                      |                                                        |                                                            |                                        |
| I certify that:                                                                                                                                                                                                                     |                                                        |                                                            |                                        |
| 1. The information contained in this schedule is true to the best of my knowledge.                                                                                                                                                  |                                                        |                                                            |                                        |
| 2. I have submitted this application with the knowledge and consent of the firm.                                                                                                                                                    |                                                        |                                                            |                                        |
| June 6, 2025                                                                                                                                                                                                                        |                                                        | Signature of Designer                                      |                                        |
| Date                                                                                                                                                                                                                                |                                                        | Signature of Designer                                      |                                        |

SEPTIC FILE #

25 - 177

OTTAWA

RVCA RECEIVED

JUN 09 2025

REFER TO: \_\_\_\_\_

### NOTE:

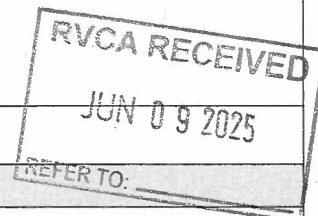
- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) (c) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of practice, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.





## Schedule 2: Sewage System Installer Information

|                                                                                                                                                                                                                             |                     |                                                                                                      |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------|----------|
| <b>A. Project Information</b>                                                                                                                                                                                               |                     |                                                                                                      |          |
| Building number, street name 5923 Ottawa Street                                                                                                                                                                             |                     | Unit number                                                                                          | Lot/con. |
| Municipality Ottawa (Richmond)                                                                                                                                                                                              | Postal code K0A 2Z0 | Plan number/ other description                                                                       |          |
| <b>B. Sewage system installer</b>                                                                                                                                                                                           |                     |                                                                                                      |          |
| Is the installer of the sewage system engaged in the business of constructing on-site, installing, repairing, servicing, cleaning or emptying sewage systems, in accordance with Building Code Article 3.3.1.1, Division C? |                     |                                                                                                      |          |
| <input type="checkbox"/> Yes (Continue to Section C)                                                                                                                                                                        |                     | <input type="checkbox"/> No (Continue to Section E)                                                  |          |
|                                                                                                                                                                                                                             |                     | <input checked="" type="checkbox"/> Installer unknown at time of application (Continue to Section E) |          |
| <b>C. Registered installer information (where answer to B is "Yes")</b>                                                                                                                                                     |                     |                                                                                                      |          |
| Name                                                                                                                                                                                                                        |                     | BCIN                                                                                                 |          |
| Street address                                                                                                                                                                                                              |                     | Unit number                                                                                          | Lot/con. |
| Municipality                                                                                                                                                                                                                | Postal code         | Province                                                                                             | E-mail   |
| Telephone number                                                                                                                                                                                                            | Fax                 | Cell number                                                                                          |          |
| <b>D. Qualified supervisor information (where answer to section B is "Yes")</b>                                                                                                                                             |                     |                                                                                                      |          |
| Name of qualified supervisor(s)                                                                                                                                                                                             |                     | Building Code Identification Number (BCIN)                                                           |          |
|                                                                                                                                                                                                                             |                     |                                                                                                      |          |
| <b>E. Declaration of Applicant:</b>                                                                                                                                                                                         |                     |                                                                                                      |          |
| I <u>Hendrik Van de Glind, L.E.T., C.E.T. - Paterson Group</u> declare that:                                                                                                                                                |                     |                                                                                                      |          |
| (print name)                                                                                                                                                                                                                |                     |                                                                                                      |          |
| I am the applicant for the permit to construct the sewage system. If the installer is unknown at time of application, I shall submit a new Schedule 2 prior to construction when the installer is known;                    |                     |                                                                                                      |          |
| OR                                                                                                                                                                                                                          |                     |                                                                                                      |          |
| I am the holder of the permit to construct the sewage system, and am submitting a new Schedule 2, now that the installer is known.                                                                                          |                     |                                                                                                      |          |
| I certify that:                                                                                                                                                                                                             |                     |                                                                                                      |          |
| 1. The information contained in this schedule is true to the best of my knowledge.                                                                                                                                          |                     |                                                                                                      |          |
| 2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.                                                                                                               |                     |                                                                                                      |          |
| June 6, 2025                                                                                                                                                                                                                |                     | Signature of applicant                                                                               |          |
| Date                                                                                                                                                                                                                        |                     | OTTAWA                                                                                               |          |



SEPTIC FILE #  
25-177  
OTTAWA



## Schedule 4: Proposed Services

### Complete Sections 1 through 7

#### Do Not Complete

Permit number:

Revision number:

Date

#### 1 Engineered

- ☒ Yes  
☐ No

#### 2 Water supply

- ☒ Proposed  
☐ Existing

#### 3 Use

- ☐ Apartment  
☒ Dwelling  
☒ Commercial  
☐ Industrial

SEPTIC FILE #  
25-177

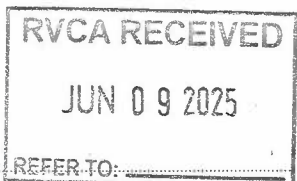
OTTAWA

#### 4 Type of work proposed

- ☒ New Installation  
☐ Replacement  
☐ Alteration

#### 5 Type of Well

- ☐ Dug/Bored/Sandpoint well  
☒ Drilled well  
☐ Municipal  
☐ Other



#### 6 Residential Sewage Design Flow Info.

Bedrooms \_\_\_\_\_  
House (floor area) \_\_\_\_\_ m<sup>2</sup>  
People \_\_\_\_\_  
Total Fixture Units \_\_\_\_\_ (Schedule 8)  
Residential Flow \_\_\_\_\_ L/day

#### 7 Sewage Design Flow Other Occupancies

Design Flow 600 L/day

Detailed sewage flow calculations:

Refer to PGI Drawings No. PH4924-3(rev.3)

#### 8 Type of System

- ☐ Class 2 – Leaching Pit  
☐ Class 3 – Cesspool

Treatment Unit Eljen GSF A-42 (DN450)

##### ☐ Class 4 – Trench (Schedule 9)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

##### ☐ Class 4 – Filter Media (Schedule 10)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

##### ☐ Class 4 – Shallow Buried Trench

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

##### ☒ Class 4 – BMEC Area Bed (Schedule 11)

- ☒ Fully raised  
☐ Partially raised  
☐ In-ground

##### ☐ Class 4 – "Type A" Dispersal (Schedule 13)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

##### ☐ Class 4 – "Type B" Dispersal (Schedule 14)

- ☐ Fully raised  
☐ Partially raised  
☐ In-ground

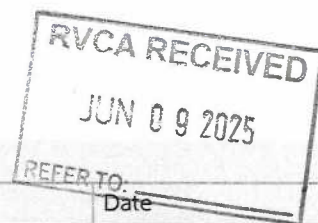
##### ☐ Class 5 – Holding Tank (9000L min)

- ☐ Tank/Treatment Unit/Pump Chamber ONLY  
☐ Effluent Filter/Risers ONLY  
☐ Other \_\_\_\_\_



# Schedule 5: Sewage System Details

OTTAWA



## Do Not Complete

Permit number:

Revision number:

### Complete below

**Type of System** Eljen GSF A-42 Modules (DN 450) (Schedule 4)

Septic/Holding Tank Size: 3,600 (Litres)

Make: \_\_\_\_\_

Septic Tank Effluent Filter Make: OBC Approved

Model: (Polylok PL-250 or equivalent)

Treatment Unit - Make & Model: Eljen GSF A-42 Modules (DN450)

Number of Units: 8

Refer to Typical Drawing #: PH4924-1&3(rev.3)

Pump ☒ Syphon ☐

Pump(s) required: Yes

Pump Rate: 25 + Charge L/15min Hour

### Mantle Information

Native or imported = min. 15m in N/A direction(s)

Slope subgrade \_\_\_\_\_ % slope

\_\_\_\_\_ direction(s)

**Note:** Alarm required for all pumping systems

Installed ☐ Inside ☐ TBD By Installer @

☐ Outside time of Installation

Site to be Scarified (If clay) Yes ☒ No ☐

Clay Seal Required (If bedrock) Yes ☐ No ☐

### ☐ Trench

Distribution Pipe Length \_\_\_\_\_ m

Loading Area \_\_\_\_\_ m<sup>2</sup>

Type of Chamber \_\_\_\_\_

Length of Chamber \_\_\_\_\_ m

### ☐ Dispersal Bed

#### ☒ BMEC ☐ Type A ☐ Type B

Stone N/A m<sup>2</sup>

Sand 92.9 m<sup>2</sup>

Pipe 9.76 m<sup>2</sup>

Linear Loading 6.5 L/m<sup>2</sup>

### ☐ Shallow Buried Trench

Pipe Length \_\_\_\_\_ m<sup>2</sup>

Pipe \_\_\_\_\_

### ☐ Filter Media Bed

Stone \_\_\_\_\_ m

Extended Base \_\_\_\_\_ m<sup>2</sup>

Pipe \_\_\_\_\_

Weight of Filter Media \_\_\_\_\_ Kg

Loading Area \_\_\_\_\_ m<sup>2</sup>

☐ Tank/Treatment Unit/Pump Chamber Replacement **ONLY**

☐ Effluent Filter & Riser **ONLY**

Construction Notes:







## Schedule 7: Layout Section

### Do Not Complete

Permit number: \_\_\_\_\_

Revision number: \_\_\_\_\_

Date \_\_\_\_\_

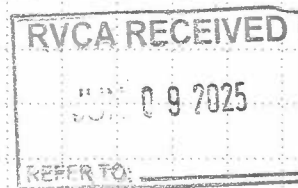
Scale: 1 Block = \_\_\_\_\_

- Dug Well
- Drilled Well

- ▲ Neighbouring Homes
- ◇ Benchmark

- Tile Drainage
- \_\_\_ Property Line

SEPTIC FILE #  
25-177  
OTTAWA



#### Elevations (metric only)

B.M. 94.86 m

B.M Description Top of spike in hydro pole across  
from East Property Line of 5935 Ottawa Street

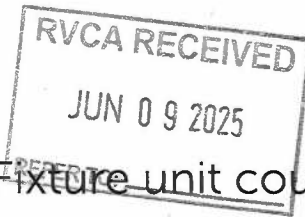
Exact Location \_\_\_\_\_

#### Min. of 5 elevations in proposed system area (in X pattern)

|                      |                            |
|----------------------|----------------------------|
| X <sub>1</sub> _____ | X <sub>2</sub> _____       |
| X <sub>3</sub> _____ | X <sub>4</sub> _____       |
| X <sub>5</sub> _____ | X <sub>6</sub> (toe) _____ |
| X <sub>7</sub> _____ | X <sub>8</sub> _____       |



## Schedule 8: Fixture unit count



SEPTIC FILE #

25-177

OTTAWA

### Do Not Complete

Permit number: Revision number: Date

| Fixtures                                                                                                          | # Existing | + | # Proposed | X | unit count | = | Fixture Count |
|-------------------------------------------------------------------------------------------------------------------|------------|---|------------|---|------------|---|---------------|
| <b>Bathroom</b>                                                                                                   |            |   |            |   |            |   |               |
| <b>Bathroom group</b> (toilet, sink and tub or shower) installed in the <b>same room</b>                          |            | + |            | X | 6          | = | 0.00          |
| Bathtub with/without overhead shower                                                                              |            | + |            | X | 1.5        | = | 0.00          |
| Shower stall                                                                                                      |            | + |            | X | 1.5        | = | 0.00          |
| Wash basin (SINK) (1½ inch trap)                                                                                  | 3          | + |            | X | 1.5        | = | 4.50          |
| Watercloset (TOILET) tank operated                                                                                | 3          | + |            | X | 4          | = | 12.00         |
| Bidet                                                                                                             |            | + |            | X | 1          | = | 0.00          |
| <b>Kitchen</b>                                                                                                    |            |   |            |   |            |   |               |
| Dishwasher                                                                                                        | 1          | + |            | X | 1          | = | 1.00          |
| Sink with/without garbage grinder(s), domestic and other small type single, double or 2 single with a common trap | 1          | + |            | X | 1.5        | = | 1.50          |
| <b>Other</b>                                                                                                      |            |   |            |   |            |   |               |
| Domestic washing machine                                                                                          |            | + |            | X | 1.5        | = | 0.00          |
| Combination sink and laundry tray single or double (Installed on 1½ trap)                                         |            | + |            | X | 1.5        | = | 0.00          |
| <b>Total*</b>                                                                                                     |            |   |            |   |            | = | 19.00         |

### \*Insert the TOTAL in section 5 of Schedule 4 (0.Reg 151/13 Table 7.4.9.3)

1. Sump pumps and floor drains are not to be connected to the sewage system. Connection of such fixtures to a sewage system may lead to a hydraulic failure of the said system. The above mentioned fixtures should be discharged separately to an approved Class 2 (leaching pit) sewage system.

2. Where laundry waste is not more than 20% of the total daily design sanitary sewage flow, it may discharge to a sewage system (Part 8, OBC, 8.1.3.1(2)).

*Hy U. G. W.*

June 6, 2025

Agent/Owner signature

Date



## NOTE:

SEWAGE SYSTEM 'B' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 600 L/DAY WHEN BALANCED OVER 7 DAYS.

NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 40 min/cm

MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01

ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.

PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

## NOTE:

SEWAGE SYSTEM 'A' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 9,367 L/DAY WHEN BALANCED OVER 7 DAYS.

NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 35 min/cm

MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01

ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.

PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

PART 4  
R.P. 4R-7050PART 1  
R.P. 4R-13387

100mm Ø PVC PIPE TO BE INSTALLED @ 2% (min.) SLOPE AND SHALL BE SLEEVED THROUGH A 150mm Ø PVC SDR28 PIPE AND OVERLAIN BY 75mm T x 600mm W RIGID INSULATION BOARDS UNDER ASPHALT. PATERSON TO REVIEW COVER UPON COMPLETION OF LOT GRADING AND DRAINAGE.

TYP.  
2 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. = 94.90m (min.)  
OUTLET INV. = 94.80m (min.)

ELJEN SAMPLING PAN  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS

2 RUNS OF 4 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.42m  
MODULAR BASE ELEV. @ FOOT = 94.40m

TYP.  
100mm Ø VENT PIPE INSTALLED IN 150mm Ø LANDSCAPE VALVE COVER

TYP.  
100mm Ø SOLID PVC FOOTER PIPE  
INV. = 94.58m

NOTE:  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

NOTE:  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

TYP.  
100mm Ø VENT PIPE INSTALLED IN 150mm Ø LANDSCAPE VALVE COVER

TYP.  
100mm Ø SOLID PVC FOOTER PIPE  
INV. = 94.78m

100mm Ø PERFORATED PVC SEPTIC PIPE  
INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.83m  
FOOT INV. = 94.78m

3m L - 100mm Ø PVC PIPE WITH ELBOW @ 2% (min.) SLOPE

2 CELLS OF 5 RUNS OF 11 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.65m  
MODULAR BASE ELEV. @ FOOT = 94.60m

ELJEN SAMPLING PAN  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS

ELJEN SPECIFIED SAND AREA  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 37.24m x 22.50m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

18,500L (min.) BALANCING TANK c/w TIME OPERATED EFFLUENT 1/2 H.P. DUPLEX PUMPS AND AUDIBLE / VISUAL HIGH WATER ALARM.  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• PUMPING SYSTEM SHALL BE TIME DOSED TO OPERATE EVERY HOUR AND ALTERNATE BETWEEN CELLS.  
• POLY RISER AND COVER ASSEMBLY  
• INLET INV. = 94.40m±  
• TOP OF TANK (max.) = 94.75m±  
• FINISHED GRADE = 95.40m

NEW 3,600L PRETREATMENT TANK c/w  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• POLYLOK PL-525 EFFLUENT FILTER  
• POLY RISER & COVER ASSEMBLY (2)  
• INLET INV. = 94.27m±  
• OUTLET INV. = 94.22m±  
• TOP OF TANK = 94.55m±  
• FINISHED GRADE = 95.15m

PROPOSED INDUSTRIAL BUILDING  
(ONE STOREY)

38mm Ø PVC SCH 40 PIPE FORCEMAIN  
• SHALL BE INSTALLED TO GRAVITY DRAIN TO THE TANK.  
• ENTIRE LENGTH OF FORCEMAIN SHALL BE BEDDED OF A MINIMUM OF 150mm OF OPSS GRANULAR A, AND SHALL BE COVERED WITH A MINIMUM OF 300mm OF OPSS GRANULAR A.  
• ALL GRANULAR A MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 98% SPMDD.

100mm Ø PERFORATED PVC SEPTIC PIPE INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.60m  
FOOT INV. = 94.58m

ELJEN SPECIFIED SAND AREA  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 9.60m x 9.68m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

TYP.  
2 x LARGE 4 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. = 95.10m (min.)  
OUTLET INV. = 95.00m (min.)

EXISTING MONITORING WELL TO BE DECOMMISSIONED

PROPOSED INDUSTRIAL BUILDING  
(ONE STOREY)

PROPOSED FINISHED FLOOR ELEVATION: 95.25

PAVERS

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

CONCRETE

Professional Engineers  
Ontario

Licensed Engineering Technologist

Name: H. G. VAN DE GLIND  
Number: 100647862

Limitations: Inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.

Association of Professional Engineers of Ontario

| LEGEND:                           | BENCHMARK INFORMATION:                                                                                                                                                                 |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bore Hole Location                | TBM: Top of Spike in Hydro Pole Across from East Property Line of 5935 Ottawa Street<br>Approximate Geodetic Elevation = 94.86m                                                        |
| Existing Ground Surface Elev. (m) | REFERENCE:                                                                                                                                                                             |
| Proposed Ground Surface Elev. (m) | Topographic Information obtained from Plan of Survey of Part of Unit 10 Index Plan D-26<br>Geographic Township of Goulbourn City of Ottawa, dated July 9, 2024, by egis Surveying Inc. |
| Proposed Subgrade Elev. (m)       | Baseplan Obtained from Site Plan No. A-001,<br>dated May 2025, by N45 Architecture Inc.                                                                                                |
| Groundwater Elev. (m) - Mar.6/22  |                                                                                                                                                                                        |
| Finished Floor Elev. (m)          |                                                                                                                                                                                        |
| Existing Structure                |                                                                                                                                                                                        |
| Proposed Structure                |                                                                                                                                                                                        |

All Units are in meters unless otherwise specified

Consultant

04/06/25 Issued for Septic Permit 3

14/05/25 Issued with Revised Site Plan 2

03/10/24 Issued with Revised Site Plan 1

20/09/24 Issued for Preliminary Review 0

DD/MM/YY Description Rev.

Client: STRATFORD FOXRUN

Project: PROPOSED WAREHOUSE / RESTAURANT

5923 OTTAWA STREET

OTTAWA (RICHMOND), ONTARIO

Drawing: SEWAGE SYSTEM LAYOUT PLAN

SEWAGE SYSTEM 'A' AND 'B'

PH4924-1(rev.3)

Scale: 1:600

Date: 06/2025

Drawn by: HV

Checked by: MK

Drawing no.:

PH4924-1(rev.3)



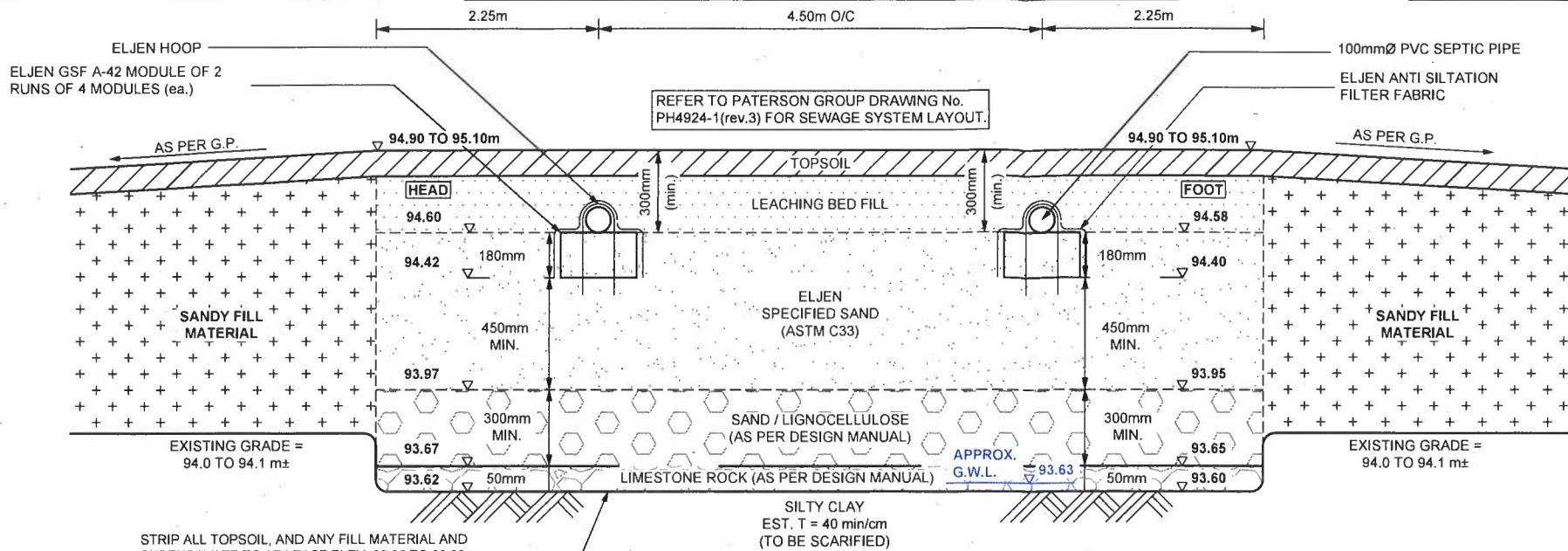
9 AURIGA DRIVE  
OTTAWA, ON  
K2E 7S5  
TEL: (613) 228-7381



COVER MATERIAL TO CONSIST OF LEACHING BED FILL FOLLOWED BY APPROX. 100mm OF SANDY TOPSOIL. LEACHING BED TO BE VEGETATED AS SOON AS POSSIBLE.

SEWAGE SYSTEM DESIGN, SPECIFICATION, DETAILS AND NOTES HAVE BEEN COMPLETED IN ACCORDANCE WITH ELJEN DENITRIFICATION SUPPLEMENTAL DESIGN AND INSTALLATION MANUAL.

FINAL GRADING SHALL BE SUITABLY SHAPED TO DIRECT SURFACE WATER AWAY FROM THE PROPOSED SEWAGE SYSTEM.



## NOTES:

### 1) ESTIMATE OF DAILY SEWAGE FLOW (Q)

THE PROPOSED SEWAGE SYSTEM HAS BEEN DESIGNED TO SUPPORT A COMMERCIAL TYPE USAGE CONSISTING OF OFFICE, AND WAREHOUSE SPACE. THE DAILY DESIGN SEWAGE FLOW RATE IS CALCULATED IN ACCORDANCE WITH O.B.C. TABLE 8.2.1.3.B.

#### OFFICE SPACE:

- 4 EMPLOYEES x 75 L/DAY = 300 L/DAY

#### WAREHOUSE SPACE:

- 2 LOADING BAY x 150 L/DAY = 300 L/DAY

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW = 600 L/DAY

### 2) SOIL CONDITIONS

SOILS INFORMATION GATHERED BY PATERSON GROUP INC. ON APRIL 17, 2025. REFER TO PATERSON GROUP REPORT PG73781-1Rev.2 FOR FULL SOILS BREAKDOWN.

BH 1-25, ELEV. 94.07m

|           |                                                                                            |
|-----------|--------------------------------------------------------------------------------------------|
| 0-0.08    | TOPSOIL AND ORGANICS                                                                       |
| 0.08-1.45 | BROWN SILTY CLAY                                                                           |
| 1.45-6.60 | GLACIAL TILL: BROWN SILTY SAND WITH GRAVEL, COBBLES BOULDERS AND CLAY (GREY @ 3.73m DEPTH) |

- G.W.L. @ 0.05m DEPTH (93.54m)

### 1) PRETREATMENT TANK

- TANK SHALL BE CONNECTED TO BUILDING BY A 150mm Ø PVC PIPE SLEEVED THROUGH A 200mm Ø PVC SDR 28 PIPE AND OVERLAIN WITH 50mm T x 600mm W RIGID INSULATION BOARDS (UNDER ROADWAY) AND SHALL BE INSTALLED AT 2.0% (min.) SLOPE TO THE PRETREATMENT TANK.
- MINIMUM WORKING CAPACITY OF PRETREATMENT TANK = (3 x Q) OR 3,600 L (min.) = 3,600 L (min.)
- IT IS RECOMMENDED THAT A NEW 3,600L (min.) TWO-COMPARTMENT SEPTIC TANK BE INSTALLED.
- AN OBC APPROVED EFFLUENT FILTER (I.E. POLYLOK PL-525 EFFLUENT FILTER, OR EQUIVALENT) SHALL BE INSTALLED ON THE OUTLET PIPE IN THE PRETREATMENT TANK.
- THE ACCESS LIDS TO THE TANK OPENINGS SHALL BE EXTENDED TO THE GROUND SURFACE. INSTALL RISERS AND COVERS TO SUIT.
- ACCESS LIDS SHALL INCLUDE SAFETY DEVICES AS PER CSA B66-21.
- TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER MATERIAL.
- TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.

### 4) BALANCING TANK

- INSTALL A 450L (min.) BALANCING TANK IN SERIES AND DOWNSTREAM FROM THE NEW SEPTIC TANK.
- A TIME OPERATED ALTERNATING DUPLEX PUMPING SYSTEM (I.E. MYERS ME3F, OR SIMILAR) AND A HIGH WATER ALARM SHALL BE INSTALLED IN THE BALANCING TANK.
- THE TIME OPERATIONAL PUMPING SYSTEM SHALL OPERATE EVERY HOUR (I.E. 25 L/DSE + VOLUME TO CHARGE THE SYSTEM) AND SHALL ALTERNATE BETWEEN EACH CELL.
- A 3mm Ø DRAIN HOLE SHALL BE INSTALLED IN THE UNDERSIDE OF THE FORCEMAIN IN THE BALANCING TANK NEAR THE WALL CONNECTION.
- RISERS WITH A COVER SHALL BE INSTALLED OVER THE BALANCING TANK TO PROVIDE ACCESS FROM THE GROUND SURFACE.
- DISCHARGE PIPING FOR PUMP SHALL BE CONFIGURED SUCH THAT THE PUMP IS EASILY SERVICED FROM THE GROUND SURFACE.

### 5) DISTRIBUTION BOX / FORCEMAIN

- A 38mm Ø (NOMINAL) PVC SCH 40 FORCEMAIN (2) SHALL BE USED TO CARRY THE EFFLUENT FROM THE BALANCING TANK TO EACH 3m L x 100mm Ø PVC SEWER PIPE.

- 100mm SEWER PIPE SHALL DRAIN BY GRAVITY TO A 2 OUTLET DISTRIBUTION BOX.
- THE FORCE MAIN SHALL BE INSTALLED TO GRAVITY DRAIN TO THE BALANCING TANK.
- THE FORCE MAIN SHALL BE OVERLAIN WITH 50mm T x 600mm C/W RIGID INSULATION.
- THE DISTRIBUTION BOX SHALL BE EQUIPPED WITH AN INLET BAFFLE AND OUTLET PIPES (2).
- EACH PIPING RUN SHALL BE FED BY A 2 OUTLET DISTRIBUTION BOX.
- THE DISTRIBUTION BOX SHALL BE CONNECTED TO THE DISTRIBUTION PIPING RUNS USING 100mm Ø SOLID PVC SEWER PIPE @ 2% (min.) SLOPE.

### 6) LEACHING BED SIZING CRITERIA

- NO. OF MODULES REQUIRED =  $Q/95 = 600/95 = 6.3$  MODULES
- USE 2 RUNS OF 4 (8) ELJEN GSF A-42 MODULES EACH
- SAND AREA REQUIRED =  $QT/400 = 600(40)/400 = 60m^2$
- SAND AREA PROVIDED =  $9.60m \times 9.68m = 92.9m^2$  (min.)

### 7) LEACHING BED CONSTRUCTION GUIDELINES

- REMOVE ALL EXISTING TOPSOIL, AND ANY FILL WITHIN LIMITS OF THE SAND AREA AND SUBEXCAVATE TO AT LEAST ELEVATION 93.60m TO 93.62m, WHICHEVER IS GREATER. RE-ESTABLISH THE SPECIFIED CONTACT LEVEL USING SELECT SAND FILL, WHERE REQUIRED.
- THE SUBGRADE SURFACE SHALL BE SCARIFIED, UNDER DRY CONDITIONS.
- PLACE A 50mm MIN. THICK LAYER OF LIMESTONE ROCK OVER THE SUITABLY PREPARED SUBGRADE.
- LIMESTONE ROCK SHALL NO SMALLER THAN 25mm IN DIAMETER UP TO 50mm IN DIAMETER. THE ROCK SHALL CONTAIN GREATER THAN 15% LIMESTONE AS PER ELJEN DENITRIFICATION SUPPLEMENTAL DESIGN AND INSTALLATION MANUAL.
- PLACE A 300mm THICK LAYER OF SAND / LIGNOCELLULOSE OVER THE LIMESTONE ROCK LAYER.
- SAND / LIGNOCELLULOSE SHALL CONSIST OF WOOD CHIPS OR SAW DUST FROM HARD WOOD TREES THAT HAVE NOT BEEN FURTHER PROCESSED BY CHEMICALS. THE 300mm SAND AND LIGNOCELLULOSE LAYER SHALL BE 50/50 EQUAL MIXTURE OF ASTM C33 SAND AND WOOD CHIPS FROM HARD WOOD TREES. THE MIXTURE MUST NOT EXCEED 60/40 IN FAVOR OF THE MORE WOOD TO SAND.
- PLACE A 450mm MIN. THICK LAYER OF ELJEN SPECIFIED SAND FILL OVER THE LEACHING BED FILL.
- THE ELJEN SPECIFIED SAND FILL SHALL CONSIST OF WASHED SAND MEETING THE REQUIREMENTS OF ASTM C33 "STANDARD SPECIFICATION FOR CONCRETE AGGREGATES" WITH LESS THAN 5% PASSING 0.075mm SIEVE. ELJEN SPECIFIED SAND FILL SHALL BE PRE-APPROVED BY THE CONSULTANT.
- THE MODULES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- THE MODULES SHALL BE INSTALLED AT A SLOPE OF 0.3% (min.) TO 0.5% (max.), END TO END AND WITH THE WHITE DEMARCATION LINE FACING UP.
- THE MODULAR BASE LEVEL (ELEV. 94.40m AT THE FOOT, TO 94.42m AT THE HEAD) SHALL BE ESTABLISHED WITH ELJEN SPECIFIED SAND FILL, HAVING A MINIMUM THICKNESS OF 450mm BELOW THE MODULES.
- THE ELJEN MODULES SHALL BE FED BY GRAVITY BY A 100mm Ø PVC SEWER PIPE @ 2% (min.) SLOPE FROM THE DISTRIBUTION BOX.
- THE DISTRIBUTION PIPE SHALL CONSIST OF A 100mm Ø PERFORATED PVC PIPE CENTRED OVER THE MODULES. THE PIPE SHALL BE SECURED TO THE TOP OF THE MODULES USING AN ELJEN HOOP (MINIMUM 1 HOOP PER MODULE).
- THE INVERT LEVEL OF THE DISTRIBUTION PIPE SHALL BE SET ON THE MODULES AT ELEVATION 94.58m AT THE FOOT TO 94.60m AT THE HEAD. THE END OF THE PIPE RUNS SHALL BE CONNECTED TO A 100mm Ø SOLID PVC FOOTER PIPE.
- INSTALL ELJEN SYSTEM SAMPLING DEVICE AS PER MANUFACTURER'S RECOMMENDATIONS.
- THE ELJEN ANTI-SILTATION FILTER FABRIC SHALL BE SPREAD LENGTHWISE OVER THE PERFORATED SEPTIC PIPE AND DOWN THE SIDES OF THE MODULES. ENSURE ENDS OF MODULES ARE ALSO COVERED WITH FABRIC.
- THE MODULES SHALL BE BACKFILLED, WITH ELJEN SPECIFIED SAND FILL TO AT LEAST THE TOP OF THE ELJEN MODULES, FOLLOWED BY 200mm (min.) OF LEACHING BED FILL, FOLLOWED BY 100mm OF SANDY TOPSOIL, WITHIN THE LIMITS OF THE SAND AREA. THE BED AREA SHOULD BE VEGETATED AS SOON AS POSSIBLE.
- LEACHING BED SAND FILL SHALL BE UNIFORM SAND WITH GRADING LIMITS SIMILAR TO 100% PASSING 13.2mm SIEVE, LESS THAN 5% PASSING 0.075mm SIEVE, AND HAVING A PERCOLATION TIME OF 6 TO 8 min/cm. LEACHING BED FILL SHALL BE PRE-APPROVED BY THE CONSULTANT.
- THE SIDES OF THE BED SHOULD BE SLOPED AT 3H:1V OR SHALLOWER.
- VENT SYSTEM SHALL BE INSTALLED ON THE FOOTER PIPE. CONNECT A 100mm Ø PVC VENT PIPE TO FOOTER PIPE, EXTENDING TO GROUND SURFACE. VENT PIPE TO BE INSTALLED IN 150mm Ø LANDSCAPE VALVE COVER.

### 8) MINIMUM CLEARANCE DISTANCE FROM DISTRIBUTION PIPE

- 5.6m FROM ANY PROPERTY LINE
- 7.6m FROM ANY STRUCTURE: 5.0m FROM ANY BASEMENTLESS STRUCTURE
- 17.6m FROM ANY DRILLED WELL
- 5.0m FROM ANY TREE (UNLESS OTHERWISE APPROVED)

### 9) MINIMUM CLEARANCE DISTANCE FROM TANK(S)

- 1.5m FROM ANY STRUCTURE
- 15.0m FROM ANY DRILLED OR DUG WELL
- 3.0m FROM ANY PROPERTY LINE

### 10) GENERAL

- SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT TRAFFIC LOADING.
- THE BACKFILLING OF THE SEWAGE SYSTEM SHOULD MINIMIZE THE RISK OF OVER COMPACTION WITH THE USE RUBBER TRACKED EQUIPMENT AND BY AVOIDING THE CREATION OF ANY CONSTRUCTION ROUTES OR PATHWAYS OVER THE SYSTEM.
- ANY NEW IRRIGATION / SPRINKLER SYSTEM SHOULD NOT BE USED IN PROXIMITY OF THE PROPOSED SEWAGE SYSTEM.
- ENSURE WALKWAYS AND/OR SHURBBERY ARE NOT PLACED WITHIN PROXIMITY OF THE TANKAGE.
- THE BACKWASH WATERS FROM ANY WATER TREATMENT UNIT, SUCH AS WATER SOFTENER, SHOULD NOT DISCHARGE INTO THE SEWAGE SYSTEM.
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED FOR THE USE OF A GARBAGE DISPOSAL.
- SEWAGE SYSTEM INSTALLER SHALL BE QUALIFIED AND REGISTERED UNDER PART 8 OF THE ONTARIO BUILDING CODE AND SHALL BE AN AUTHORIZED ELJEN TREATMENT SYSTEM INSTALLER.
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST BY-LAWS, CODES AND REGULATIONS.
- CONTRACTOR SHALL REVIEW DRAWINGS IN DETAIL AND SHALL INFORM THE CONSULTANT OF ANY ERRORS AND/OR OMISSIONS ON DESIGN DRAWINGS IMMEDIATELY.
- CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND PROTECT ALL EXISTING UNDERGROUND SERVICES.
- CONTRACTOR SHALL VISIT THE SITE AND REVIEW ALL DOCUMENTATION TO BECOME FAMILIAR WITH THE SITE AND SUBSURFACE SOIL CONDITIONS TO DETERMINE SUITABLE METHODS OF CONSTRUCTION.
- THE MANUFACTURER PROVIDES A LIMITED WARRANTY OF THE SYSTEM COMPONENTS. THE OWNER OF THE SYSTEM MUST SIGN A MAINTENANCE AGREEMENT WITH THE MANUFACTURER'S REPRESENTATIVE. THE HOMEOWNER IS RESPONSIBLE FOR THE ANNUAL FEES ASSOCIATED WITH THE MAINTENANCE.
- THE FIRM OF PATERSON GROUP INC. HAS PROVIDED DESIGN SERVICES ONLY FOR THE SUBJECT SEWAGE SYSTEM. THE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES AND OUR INTERPRETATION OF PART 8 OF THE ONTARIO BUILDING CODE.
- INSPECTIONS BY THE CONSULTANT DURING THE INSTALLATION OF THE SYSTEM IS A REQUIREMENT OF SOME REGULATING AUTHORITIES AND IS STRONGLY RECOMMENDED BY THIS FIRM.
- THE PROPERTY LINE / SEPARATION DISTANCES SHOULD BE CONFIRMED PRIOR TO CONSTRUCTION.
- CONSTRUCTION INSPECTIONS DURING THE INSTALLATION OF THE SEWAGE SYSTEM MAY BE REQUIRED BY THE REGULATING AUTHORITY AND ARE STRONGLY RECOMMENDED BY THIS FIRM. IF THIS FIRM IS TO COMPLETE ANY CONSTRUCTION INSPECTION(S), ADDITIONAL FEES MAY BE APPLIED. CONFIRMATION OF PAYMENT WILL BE REQUIRED PRIOR TO THE INSPECTION.
- THE TEST HOLE INFORMATION PROVIDED, IS INTENDED TO BE USED FOR DESIGN PURPOSES ONLY, AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. IF DISCREPANCIES ARE FOUND DURING THE CONSTRUCTION PROCESS, IT IS THE CLIENT'S RESPONSIBILITY TO CONTACT THIS FIRM TO MAKE ANY NECESSARY COMMENTS OR REVISIONS. ADDITIONAL REVISIONS ARE NOT CONSIDERED PART OF THE DESIGN WORKS AND WILL BE CONSIDERED AS AN ADDITIONAL COST.



Professional Engineers  
Ontario

### Licensed Engineering Technologist

Name: H. G. VAN DE GLIND

Number: 100647862

Limitations: inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.

Association of Professional Engineers of Ontario

| 04/06/25 | Issued for Septic Permit      | 3    |
|----------|-------------------------------|------|
| 14/05/25 | Issued with Revised Site Plan | 2    |
| 03/10/24 | Issued with Revised Site Plan | 1    |
| 20/09/24 | Issued for Preliminary Review | 0    |
| DD/MM/YY | DESCRIPTION                   | REV. |

Consultant:



PATERSON  
GROUP

9 AURIGA DRIVE  
OTTAWA, ON  
K2E 7S9  
TEL (613) 226-7581

Client:

**STRATFORD FOXRUN**

Project:

**PROPOSED WAREHOUSE /  
RESTAURANT**

**5923 OTTAWA STREET  
OTTAWA (RICHMOND), ONTARIO**

Drawing:

**SEWAGE SYSTEM  
DETAILS AND NOTES  
SEWAGE SYSTEM 'B'**

Scale:

N.T.S.

Drawn by:

HV

Date:

06/2025

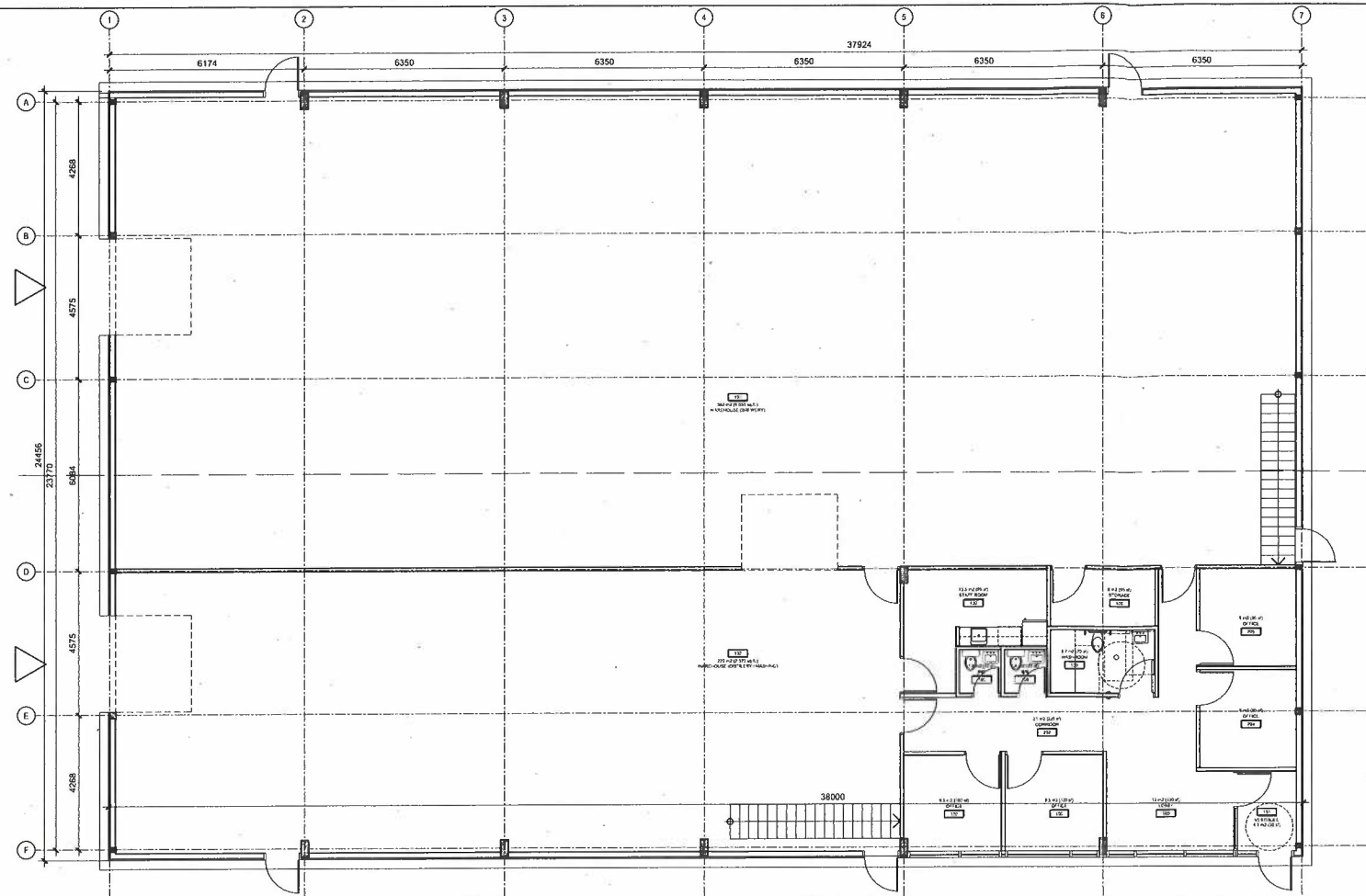
Checked by:

MK

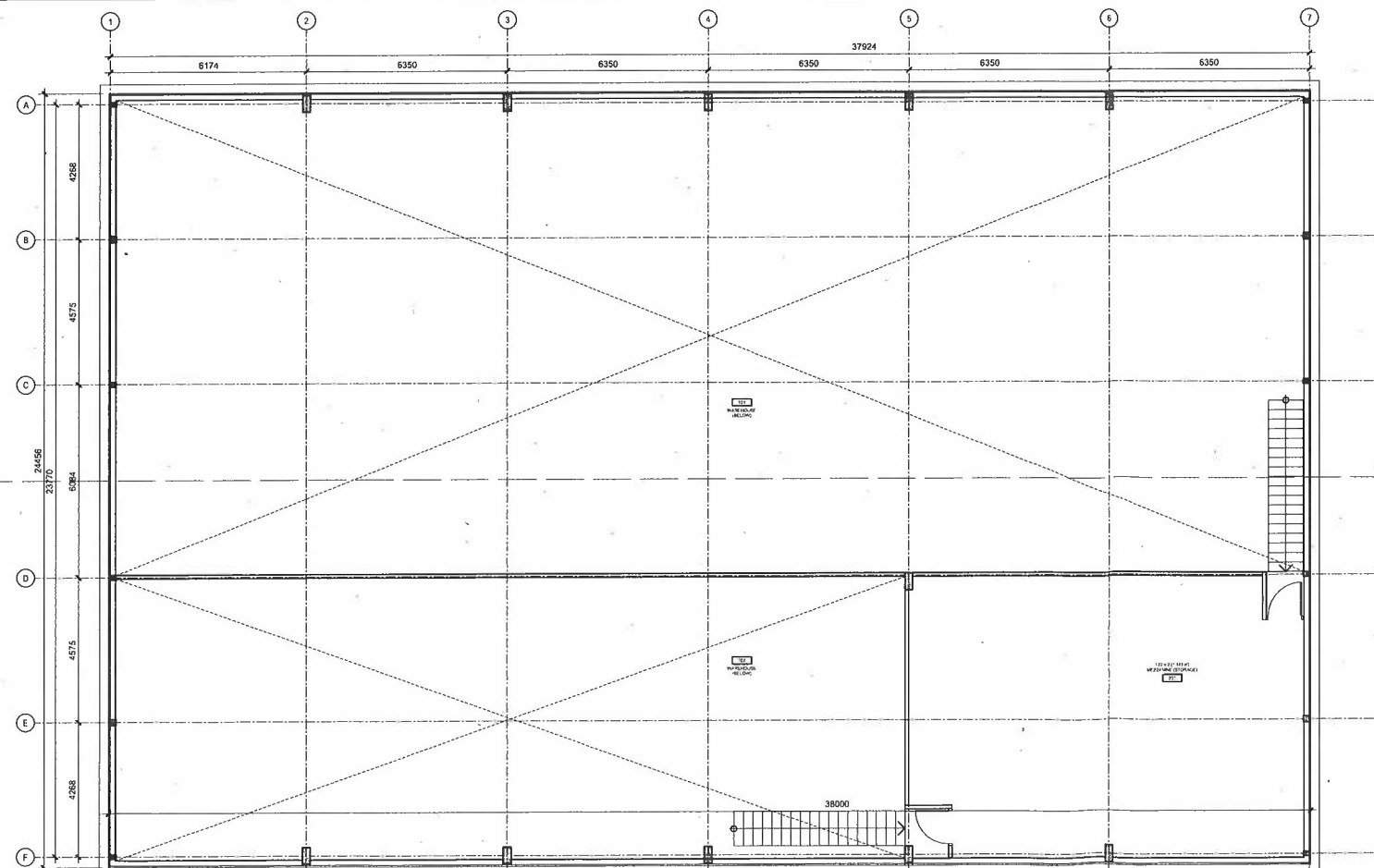
Drawing No.:

**PH4924-3(rev.3)**

p:\autocad drawings\hydrogeology\ph4924\ph4924 - stratford foxrun -  
jack gulas - 5923 ottawa street richmond\ph4924-3(rev.3).dwg

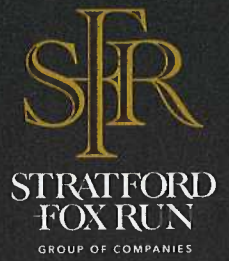


1 GROUND FLOOR PLAN  
A-004 SCALE 1:100



2 MEZZANINE FLOOR PLAN  
A-004 SCALE 1:100

BUILDING 2  
SEWAGE SYSTEM "B"  
25-177



|     |                |         |
|-----|----------------|---------|
| 01  | ISSUED FOR SPA | 08MAY25 |
| no. | revision       | date    |

**N45 ARCHITECTURE INC.**  
71 Bank Street, 7th floor - Ottawa, Ontario, K1P 5N2  
tel. 613.224.0095 fax 613.224.9811

|                                  |                 |
|----------------------------------|-----------------|
| project                          | FOXRUN RICHMOND |
| 5923 OTTAWA STREET<br>OTTAWA, ON |                 |
| project north                    | seal            |
|                                  |                 |

|                                                                                                                                 |                  |
|---------------------------------------------------------------------------------------------------------------------------------|------------------|
| drawing title                                                                                                                   | BREWERY BUILDING |
| scale                                                                                                                           | AS NOTED         |
| date                                                                                                                            | MARCH 2025       |
| project number                                                                                                                  | 24-826           |
| drawn by                                                                                                                        | NF               |
| checked by                                                                                                                      | VP               |
| drawing number                                                                                                                  | A-004            |
| CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS. | revision         |
|                                                                                                                                 | -                |





Permit  
Part 8 – Sewage System  
Ontario Building Code

Do Not Complete  
Permit No 25-177  
Revision No \_\_\_\_\_  
Date \_\_\_\_\_  
Related Application \_\_\_\_\_

A copy of this permit must be posted on the property at all time during construction. OBC, Division C — Part 1, Section 1.3.2.1

This permit verifies that the on-site sewage system was reviewed and approved for construction under the Ontario Building Code Act ( Building Code Act, 1992, S.O. 1992, c. 23) and Ontario Building Code (O. Reg. 163/24) as amended.

Inspected & Recommended by: Matt Panciuk Owner: 99117756 Canada Inc.  
Inspection Date & Time: \_\_\_\_\_ Weather: \_\_\_\_\_  
Address: 5923 Ottawa Street - System B Legal: \_\_\_\_\_  
In the former Township/City of Goulbourn

Design Flow for Commercial / Institutional / Industrial (as per Table 8.2.1.3.B)

Q: 600 L/day

|                 |                              |                              |                                         |                                        |
|-----------------|------------------------------|------------------------------|-----------------------------------------|----------------------------------------|
| septic tank     | <u>3600(min)</u> L           | weigh bills for Eljen Sand   | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| effluent filter | <u>YES</u>                   | grain size analysis required | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| pump rate       | <u>25 + Charge</u> L/15 MIN  | site to be scarified         | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |
| treatment unit  | <u>Eljen GSF A42(DN 450)</u> | clay seal inspection         | <input type="checkbox"/> yes            | <input checked="" type="checkbox"/> no |
| number of units | <u>8</u>                     | mantle required              | <input type="checkbox"/> yes            | <input checked="" type="checkbox"/> no |
|                 |                              | sub-grade inspection         | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> no            |

ELEVATION ☐ In Ground ☐ Partially Raised ☒ Fully Raised

TYPE OF SYSTEM

☐ Trench

☒ Pipe and Stone or ☐ Chambers

type of chamber \_\_\_\_\_  
loading area \_\_\_\_\_ m<sup>2</sup>  
total trench length \_\_\_\_\_ m  
trench configuration \_\_\_\_\_

☒ Dispersal Bed

☒ BMEC ☐ Type A ☐ Type B

stone \_\_\_\_\_ m<sup>2</sup>  
sand 92.9 m<sup>2</sup>  
pipe 2 runs of 4 modules @ 4.5m o/c  
weight of sand \_\_\_\_\_ kg

☐ Shallow Buried Trench

pipe length \_\_\_\_\_ m  
orifice spacing \_\_\_\_\_ m

☐ Filter Media Bed

stone \_\_\_\_\_ m<sup>2</sup>  
extended base \_\_\_\_\_ m<sup>2</sup>  
pipe \_\_\_\_\_  
weight of filter media \_\_\_\_\_ kg  
loading area \_\_\_\_\_ m<sup>2</sup>

☐ Class 5 Holding Tank

☐ Septic Tank Only

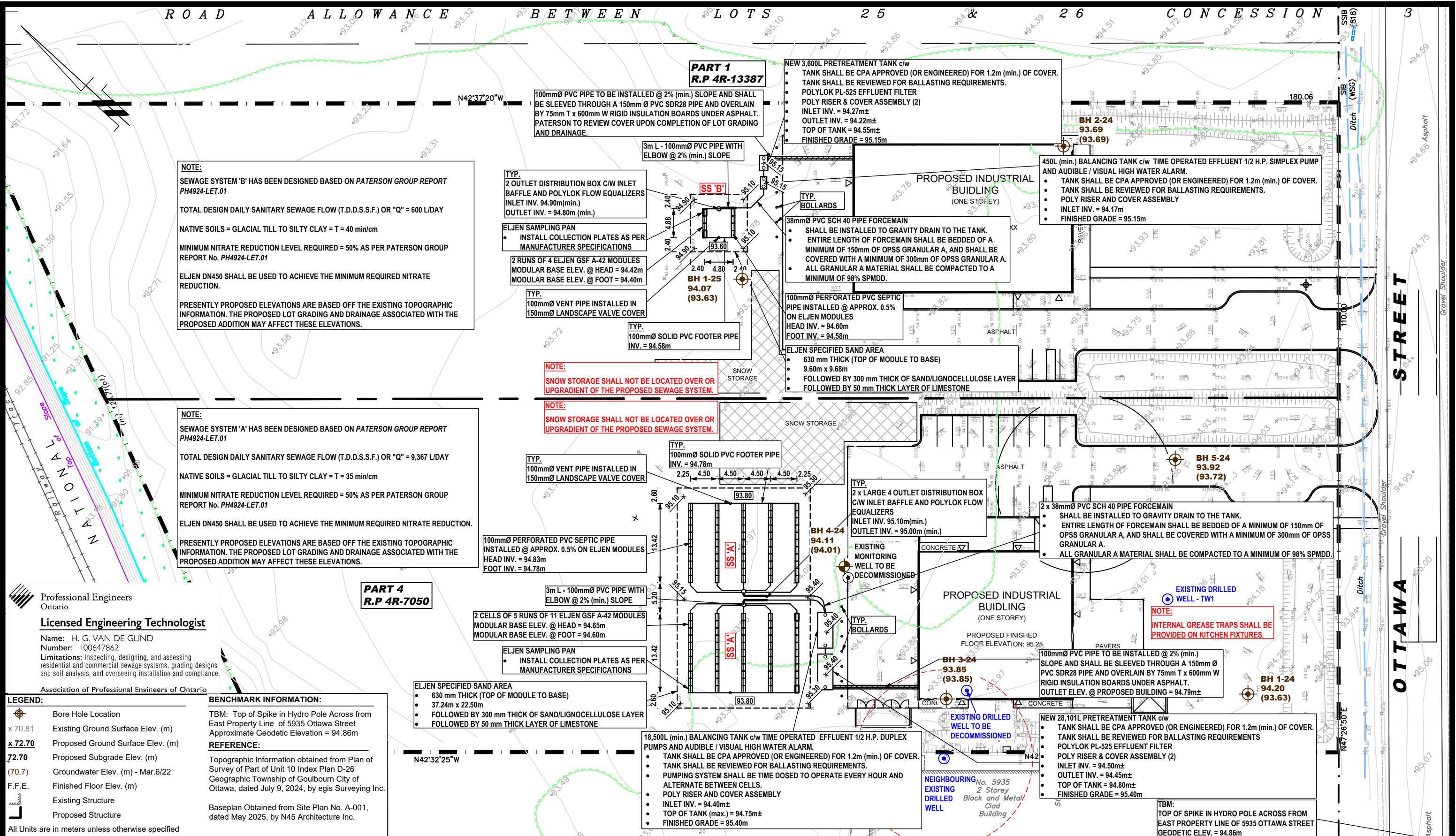
Manager, Septic System Approvals: [Signature] Permit Date: August 5, 2025

Comments: 1. Scarification inspection required prior to placement of sand fill.

☒ maintenance/pumping required ☒ ESA permit # required ☐ engineer to verify  
☐ Class 5 Holding Tank approval only valid for three years from date of issue ☒ subgrade  
☐ squirt height

Manager, Septic System Approvals: \_\_\_\_\_ Revision Date: \_\_\_\_\_

Comments: \_\_\_\_\_



**NOTE:**  
SEWAGE SYSTEM 'B' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01  
TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 600 L/DAY  
NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 40 min/cm  
MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01  
ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.  
PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

**NOTE:**  
SEWAGE SYSTEM 'A' HAS BEEN DESIGNED BASED ON PATERSON GROUP REPORT PH4924-LET.01  
TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F.) OR "Q" = 9,367 L/DAY  
NATIVE SOILS = GLACIAL TILL TO SILTY CLAY = T = 35 min/cm  
MINIMUM NITRATE REDUCTION LEVEL REQUIRED = 50% AS PER PATERSON GROUP REPORT No. PH4924-LET.01  
ELJEN DN450 SHALL BE USED TO ACHIEVE THE MINIMUM REQUIRED NITRATE REDUCTION.  
PRESENTLY PROPOSED ELEVATIONS ARE BASED OFF THE EXISTING TOPOGRAPHIC INFORMATION. THE PROPOSED LOT GRADING AND DRAINAGE ASSOCIATED WITH THE PROPOSED ADDITION MAY AFFECT THESE ELEVATIONS.

**PART 1  
R.P. 4R-13387**  
100mmØ PVC PIPE TO BE INSTALLED @ 2% (min.) SLOPE AND SHALL BE SLEEVED THROUGH A 150mm Ø PVC SDR28 PIPE AND OVERLAIN BY 75mm T x 600mm W RIGID INSULATION BOARDS UNDER ASPHALT. PATERSON TO REVIEW COVER UPON COMPLETION OF LOT GRADING AND DRAINAGE.

**TYP.**  
2 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. 94.90m(min.)  
OUTLET INV. = 94.80m (min.)

**ELJEN SAMPLING PAN**  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS  
2 RUNS OF 4 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.42m  
MODULAR BASE ELEV. @ FOOT = 94.40m

**TYP.**  
100mmØ VENT PIPE INSTALLED IN 150mmØ LANDSCAPE VALVE COVER

**TYP.**  
100mmØ SOLID PVC FOOTER PIPE  
INV. = 94.58m

**NOTE:**  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

**NOTE:**  
SNOW STORAGE SHALL NOT BE LOCATED OVER OR UPGRADIENT OF THE PROPOSED SEWAGE SYSTEM.

**TYP.**  
100mmØ VENT PIPE INSTALLED IN 150mmØ LANDSCAPE VALVE COVER

100mmØ PERFORATED PVC SEPTIC PIPE INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.83m  
FOOT INV. = 94.78m

3m L - 100mmØ PVC PIPE WITH ELBOW @ 2% (min.) SLOPE

2 CELLS OF 5 RUNS OF 11 ELJEN GSF A-42 MODULES  
MODULAR BASE ELEV. @ HEAD = 94.65m  
MODULAR BASE ELEV. @ FOOT = 94.60m

**ELJEN SAMPLING PAN**  
• INSTALL COLLECTION PLATES AS PER MANUFACTURER SPECIFICATIONS

**ELJEN SPECIFIED SAND AREA**  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 37.24m x 22.50m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

18,500L (min.) BALANCING TANK c/w TIME OPERATED EFFLUENT 1/2 H.P. DUPLEX PUMPS AND AUDIBLE / VISUAL HIGH WATER ALARM.  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• PUMPING SYSTEM SHALL BE TIME DOSED TO OPERATE EVERY HOUR AND ALTERNATE BETWEEN CELLS.  
• POLY RISER AND COVER ASSEMBLY  
• INLET INV. = 94.40m±  
• TOP OF TANK (max.) = 94.75m±  
• FINISHED GRADE = 95.40m

NEW 3,600L PRETREATMENT TANK c/w  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• POLYLOK PL-525 EFFLUENT FILTER  
• POLY RISER & COVER ASSEMBLY (2)  
• INLET INV. = 94.27m±  
• OUTLET INV. = 94.22m±  
• TOP OF TANK = 94.55m±  
• FINISHED GRADE = 95.15m

**PROPOSED INDUSTRIAL BUILDING (ONE STOREY)**  
38mmØ PVC SCH 40 PIPE FORCEMAIN  
• SHALL BE INSTALLED TO GRAVITY DRAIN TO THE TANK.  
• ENTIRE LENGTH OF FORCEMAIN SHALL BE BEDDED OF A MINIMUM OF 150mm OF OPSS GRANULAR A, AND SHALL BE COVERED WITH A MINIMUM OF 300mm OF OPSS GRANULAR A.  
• ALL GRANULAR A MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 98% SPMD.

100mmØ PERFORATED PVC SEPTIC PIPE INSTALLED @ APPROX. 0.5% ON ELJEN MODULES  
HEAD INV. = 94.60m  
FOOT INV. = 94.58m

**ELJEN SPECIFIED SAND AREA**  
• 630 mm THICK (TOP OF MODULE TO BASE)  
• 9.60m x 9.68m  
• FOLLOWED BY 300 mm THICK OF SAND/LIGNOCELLULOSE LAYER  
• FOLLOWED BY 50 mm THICK LAYER OF LIMESTONE

**TYP.**  
2 x LARGE 4 OUTLET DISTRIBUTION BOX C/W INLET Baffle AND POLYLOK FLOW EQUALIZERS  
INLET INV. 95.10m(min.)  
OUTLET INV. = 95.00m (min.)

EXISTING MONITORING WELL TO BE DECOMMISSIONED

**TYP.**  
BOLLARDS

**PROPOSED INDUSTRIAL BUILDING (ONE STOREY)**  
PROPOSED FINISHED FLOOR ELEVATION: 95.25

100mmØ PVC PIPE TO BE INSTALLED @ 2% (min.) SLOPE AND SHALL BE SLEEVED THROUGH A 150mm Ø PVC SDR28 PIPE AND OVERLAIN BY 75mm T x 600mm W RIGID INSULATION BOARDS UNDER ASPHALT.  
OUTLET ELEV. @ PROPOSED BUILDING = 94.79m±

EXISTING DRILLED WELL - TW1  
**NOTE:**  
INTERNAL GREASE TRAPS SHALL BE PROVIDED ON KITCHEN FIXTURES.

NEIGHBOURING EXISTING DRILLED WELL  
No. 5935 2 Storey Block and Metal Clad Building

BH 2-24  
93.69  
(93.69)

450L (min.) BALANCING TANK c/w TIME OPERATED EFFLUENT 1/2 H.P. SIMPLEX PUMP AND AUDIBLE / VISUAL HIGH WATER ALARM.  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS.  
• POLY RISER AND COVER ASSEMBLY  
• INLET INV. = 94.17m  
• FINISHED GRADE = 95.15m

2 x 38mmØ PVC SCH 40 PIPE FORCEMAIN  
• SHALL BE INSTALLED TO GRAVITY DRAIN TO THE TANK.  
• ENTIRE LENGTH OF FORCEMAIN SHALL BE BEDDED OF A MINIMUM OF 150mm OF OPSS GRANULAR A, AND SHALL BE COVERED WITH A MINIMUM OF 300mm OF OPSS GRANULAR A.  
• ALL GRANULAR A MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 98% SPMD.

BH 3-24  
93.85  
(93.85)

NEW 28,101L PRETREATMENT TANK c/w  
• TANK SHALL BE CPA APPROVED (OR ENGINEERED) FOR 1.2m (min.) OF COVER.  
• TANK SHALL BE REVIEWED FOR BALLASTING REQUIREMENTS  
• POLYLOK PL-525 EFFLUENT FILTER  
• POLY RISER & COVER ASSEMBLY (2)  
• INLET INV. = 94.50m±  
• OUTLET INV. = 94.45m±  
• TOP OF TANK = 94.80m±  
• FINISHED GRADE = 95.40m

**TBM:**  
TOP OF SPIKE IN HYDRO POLE ACROSS FROM EAST PROPERTY LINE OF 5935 OTTAWA STREET  
GEODETIC ELEV. = 94.86m

Professional Engineers Ontario  
**Licensed Engineering Technologist**  
Name: H. G. VAN DE GLIND  
Number: 100647862  
Limitations: Inspecting, designing, and assessing residential and commercial sewage systems, grading designs and soil analysis, and overseeing installation and compliance.  
Association of Professional Engineers of Ontario

**LEGEND:**  
• Bore Hole Location  
x 70.81 Existing Ground Surface Elev. (m)  
x 72.70 Proposed Ground Surface Elev. (m)  
72.70 Proposed Subgrade Elev. (m)  
(70.7) Groundwater Elev. (m) - Mar.6/22  
F.F.E. Finished Floor Elev. (m)  
Existing Structure  
Proposed Structure  
All Units are in meters unless otherwise specified

**BENCHMARK INFORMATION:**  
TBM: Top of Spike in Hydro Pole Across from East Property Line of 5935 Ottawa Street  
Approximate Geodetic Elevation = 94.86m  
**REFERENCE:**  
Topographic Information obtained from Plan of Survey of Part of Unit 10 Index Plan D-26 Geographic Township of Goulbourn City of Ottawa, dated July 9, 2024, by egis Surveying Inc.  
Baseplan Obtained from Site Plan No. A-001, dated May 2025, by N45 Architecture Inc.

Consultant  
**PATERSON GROUP**  
9 AURIGA DRIVE  
OTTAWA, ON  
K1E 7S9  
TEL: (613) 226-7381

|          |                                        |      |
|----------|----------------------------------------|------|
| 07/11/25 | Well Information Revised               | 5    |
| 14/08/25 | Revised as per City of Ottawa Comments | 4    |
| 04/06/25 | Issued for Septic Permit               | 3    |
| 14/05/25 | Issued with Revised Site Plan          | 2    |
| DD/MM/YY | Description                            | Rev. |

Client:  
**STRATFORD FOXRUN**  
Project:  
**PROPOSED WAREHOUSE / RESTAURANT**  
5923 OTTAWA STREET  
OTTAWA (RICHMOND), ONTARIO

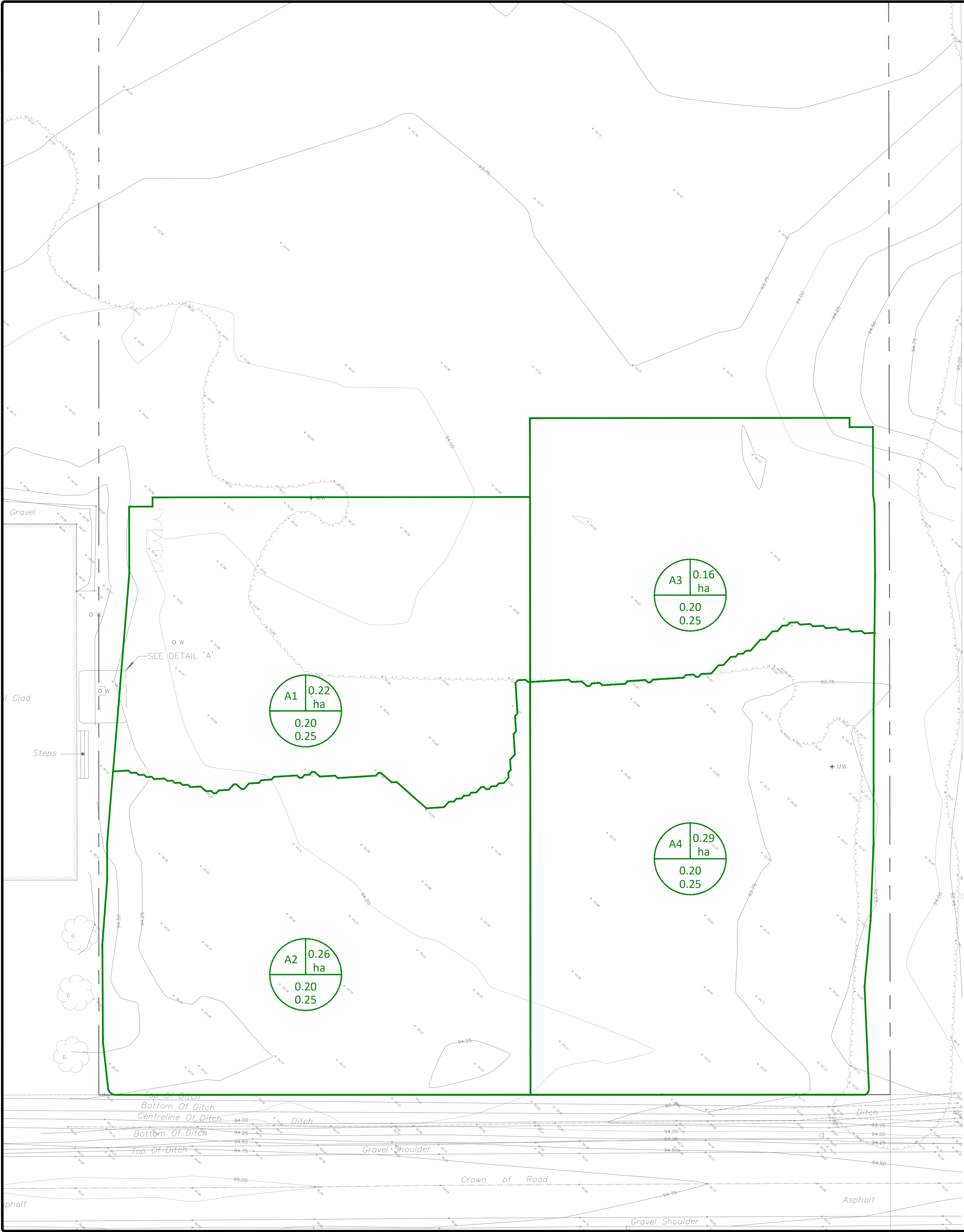
Drawing:  
**SEWAGE SYSTEM LAYOUT PLAN**  
**SEWAGE SYSTEM 'A' AND 'B'**

Scale: 1:600  
Date: 11/2025  
Drawing no.: **PH4924-1(rev.5)**  
Drawn by: HV  
Checked by: MK

## APPENDIX E PRE-DEVELOPMENT DRAINAGE PLAN

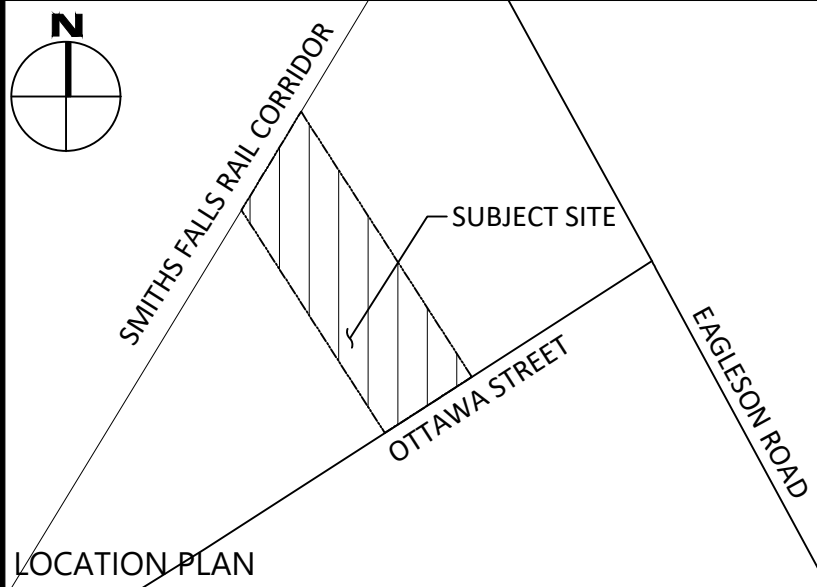


\\BAMAR\_U\Infrastructure\2025\CCO-25-0415\99117756 Canada Inc. SPS Distillery & Warehouse\_0303 Ottawa Street\12 Drawings\CCO-25-0415 - Presentation.dwg  
User: JACQUES LEBLANC Date: 2025-06-11 10:00:00  
\\BAMAR\_U\Infrastructure\2025\CCO-25-0415\99117756 Canada Inc. SPS Distillery & Warehouse\_0303 Ottawa Street\12 Drawings\CCO-25-0415 - Presentation.dwg  
User: JACQUES LEBLANC Date: 2025-06-11 10:00:00

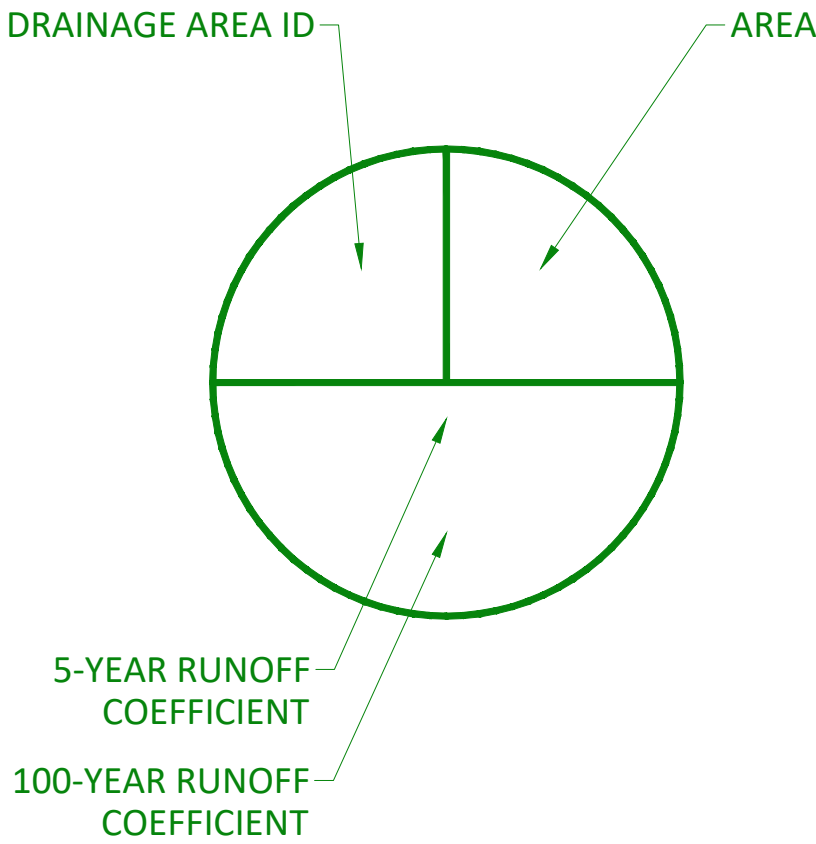


GENERAL NOTES

1. THE ORIGINAL TOPOGRAPHY, GROUND ELEVATION AND SURVEY DATA SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY, AND IMPLY NO GUARANTEE OF ACCURACY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
2. THE CONTRACTOR IS TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY BEFORE COMMENCING CONSTRUCTION.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
4. THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
5. RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
6. EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURBING AND DEBRIS, OFF SITE AS DIRECTED BY THE ENGINEER AND THE CITY.
7. TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN FILL TO BE PLACED IN FILL AREAS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
8. CONTRACTOR TO MINIMIZE THE ACTUAL LIMITS OF REMOVALS AND DISTURBED AREA WHEREVER POSSIBLE, AND SHALL MAKE THEIR OWN JUDGEMENT AND ACCOUNT FOR ALL MATERIAL AND LABOUR REQUIRED FOR ADEQUATELY REINSTATING THE AREA TO PRE-CONSTRUCTION CONDITIONS OR BETTER, AND BEAR THE COST OF THE SAME. NO ADDITIONAL PAYMENT WILL BE MADE FOR REINSTATEMENT WORK NOT SHOWN ON THE CONTRACT DRAWING AS A DIRECT RESULT FROM CONSTRUCTION.
9. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION, AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS.
11. DO NOT ALTER GRADING OF THE SITE WITHOUT PRIOR APPROVAL OF THE ENGINEER/CITY.
12. ALL ROADWAY, PARKING LOT, AND GRADING WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR IS TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING.
13. CONTACT THE CITY FOR INSPECTION OF ROUGH GRADING OF PARKING LOTS, ROADWAYS AND LANDSCAPED AREAS PRIOR TO PLACEMENT OF ASPHALT AND TOPSOIL. ALL DEFICIENCIES NOTED SHALL BE RECTIFIED TO THE CITY'S SATISFACTION PRIOR TO PLACEMENT OF ANY ASPHALT, TOPSOIL, SEED & MULCH AND/OR SOD.
14. ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION, IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
15. ELECTRICAL, GAS, TELEPHONE AND TELEVISION SERVICE LOCATIONS ARE SUBJECT TO THE INDIVIDUAL AGENCY:
  - ELECTRICAL SERVICE - HYDRO ONE,
  - GAS SERVICE - ENBRIDGE,
  - TELEPHONE SERVICE - BELL CANADA,
  - TELEVISION SERVICE - ROGERS.
16. INSTALLATION TO BE IN ACCORDANCE WITH CURRENT CODES AND STANDARDS OF APPROVAL AGENCIES HYDRO ONE, BELL AND THE CITY.
17. CONTRACTOR TO ENSURE ALL APPLICABLE OPS SPECIFICATIONS ARE FOLLOWED DURING CONSTRUCTION.
18. ALL PROPOSED CURB TO BE CONCRETE BARRIER CURB UNLESS OTHERWISE SPECIFIED.



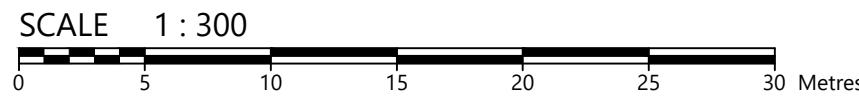
LEGEND



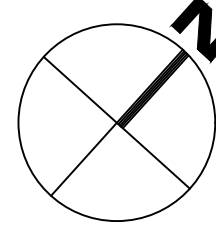
**FOR REVIEW ONLY**  
**NOT FOR CONSTRUCTION**

|     |                              |               |
|-----|------------------------------|---------------|
|     |                              |               |
|     |                              |               |
|     |                              |               |
|     |                              |               |
|     |                              |               |
|     |                              |               |
| 2   | ISSUED FOR REVIEW            | AUG. 12, 2025 |
| 1   | ISSUED FOR SITE PLAN CONTROL | JUN. 06, 2025 |
| No. | Revisions                    | Date          |

Check and verify all dimensions before proceeding with the work. Do not scale drawings



115 Walgreen Road, R.R.3  
Carp, ON K0A 1L0  
Tel: 613-836-2184  
Fax: 613-836-3742  
www.egis-group.com



Stamp:

Client:

99117756 CANADA INC.  
411 LEGGET DRIVE, SUITE 710  
OTTAWA, ON K2K 3C9

Project:

DISTILLERY & WAREHOUSE  
5923 OTTAWA STREET

Drawing Title:

PRE-DEVELOPMENT DRAINAGE AREA PLAN

Scale:

1:300

Project Number:

CCO-25-0415

Drawn By:

FV

Checked By:

AG

Drawing Number:

Designed By:

AG

PRE

#XXXXX

D07-12-25-0078

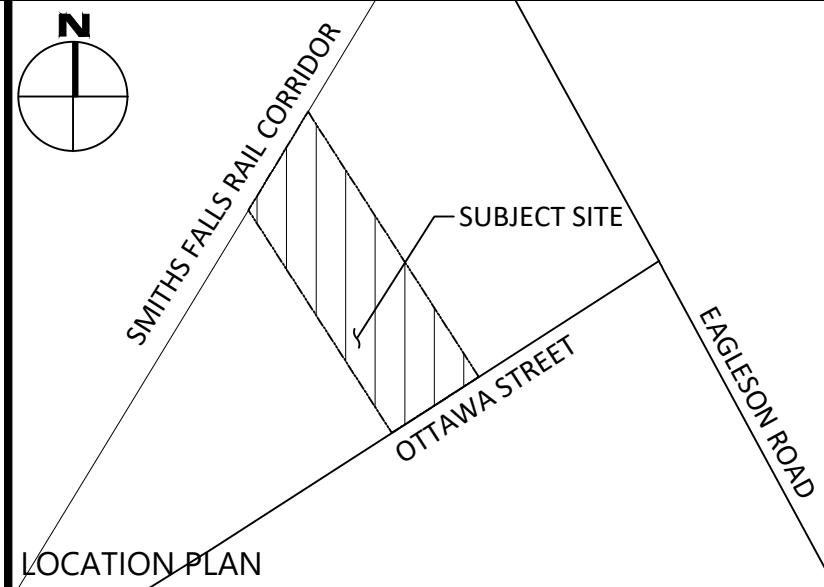
## APPENDIX F POST-DEVELOPMENT DRAINAGE PLAN





1. THE ORIGINAL TOPOGRAPHY, GROUND ELEVATION AND SURVEY DATA SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY, AND ARE NOT A GUARANTEE OF ACCURACY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
2. THE CONTRACTOR IS TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY BEFORE COMMENCING CONSTRUCTION.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
4. THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES, INCLUDING ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS A DISCREPANCY, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY.
5. RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
6. EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURB, SIDEWALKS, OR OTHERS AS DIRECTED BY THE ENGINEER AND THE CITY.
7. TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN AND DISTURBED AREAS AND AREAS COMPACTED TO 95% STANDARD PROCTOR DENSITY.
8. THE CONTRACTOR TO MINIMIZE THE ACTUAL LIMITS OF DISTURBANCE AND DISTURBANCE AS FAR AS POSSIBLE AND SHALL MAKE THEIR OWN JUDGEMENT AND ACCOUNT FOR ALL MATERIAL REMOVED REQUIRED FOR ADEQUATELY REINSTATING THE AREA TO PRE-CONSTRUCTION CONDITIONS OR BETTER, AND BEAR THE COST OF ANY ADDITIONAL MATERIALS THAT WILL BE MADE FOR REINSTATEMENT WORK NOT SHOWN ON THE CONTRACT DRAWINGS AS A DIRECT RESULT OF CONSTRUCTION.

- ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE PROTECTION, REMOVAL OR PROTECTION OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS.
- DO NOT ALTER GRADING OF THE SITE WITHOUT PRIOR APPROVAL OF THE ENGINEER/CITY.
- ALL ROADWAY, PARKING LOT, AND GRADING WORK SHALL BE IN ACCORDANCE WITH THE CITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR IS TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING.
- CONTACT THE CITY FOR INSPECTION OF ROUGH GRADING OF PARKING LOTS, ROADWAYS AND LANDSCAPED AREAS PRIOR TO PLACEMENT OF CURBS AND SIDEWALKS. ANY DISCREPANCY NOTED SHALL BE RECTIFIED TO THE CITY'S SATISFACTION PRIOR TO THE LAYDOWN OF ASPHALT, TOPSOIL, SEED & MULCH AND/OR SOIL.
- ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY.
- ELECTRICAL, GAS, TELEPHONE AND TELEVISION SERVICE LOCATIONS ARE SUBJECT TO THE INDIVIDUAL AGENCY:
  - GAS SERVICE - ENBRIDGE
  - TELEPHONE SERVICE - BELL CANADA,
  - TELEVISION SERVICE - ROGERS
- INSTALLATION TO BE IN ACCORDANCE WITH CURBS AND STANDARDS OF APPROVAL AGENCIES HYDRO ONE, BELL AND THE CITY.
- CONTRACTOR TO ENSURE ALL APPLICABLE OPS SPECIFICATIONS ARE FOLLOWED DURING CONSTRUCTION.
- ALL PROPOSED CURBS TO BE CONCRETE BARRIER CURBS UNLESS OTHERWISE SPECIFIED.

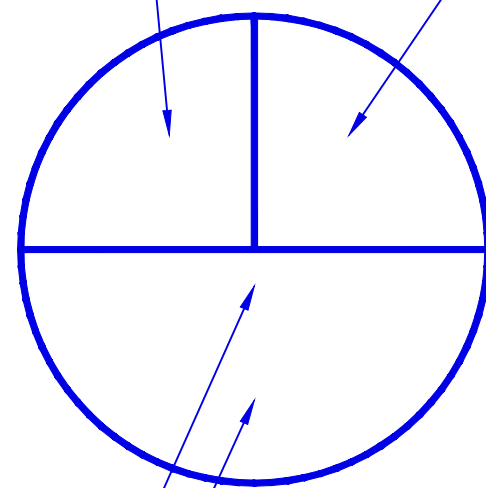


~~LOCATION PLAN~~

LEGEND

DRAINAGE AREA ID-

- AREA

5-YEAR RUNOFF  
COEFFICIENT100-YEAR RUNOFF  
COEFFICIENT

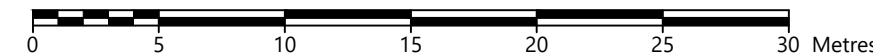
**FOR REVIEW ONLY**  
*NOT FOR CONSTRUCTION*

|     |                              |               |
|-----|------------------------------|---------------|
|     |                              |               |
|     |                              |               |
|     |                              |               |
|     |                              |               |
|     |                              |               |
| 3   | ISSUED FOR REVIEW            | NOV. 17, 2025 |
| 2   | ISSUED FOR REVIEW            | AUG. 11, 2025 |
| 1   | ISSUED FOR SITE PLAN CONTROL | JUN. 06, 2025 |
| No. | Revisions                    | Date          |

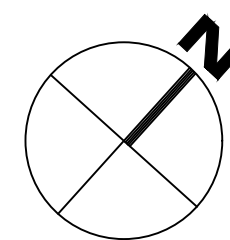
Check and verify all dimensions before proceeding with the work.

Do not scale drawings

SCALE 1 : 300



115 Walgreen Road, R.R.3  
Carp, ON K0A 1L0  
Tel: 613-836-2184  
Fax: 613-836-3742  
[www.egis-group.com](http://www.egis-group.com)



Stamp

Client

99117756 CANADA INC.  
411 LEGGET DRIVE, SUITE 710  
OTTAWA, ON K2K 3C9

Project:

**DISTILLERY & WAREHOUSE**  
5923 OTTAWA STREET

Drawing Title:

## POST-DEVELOPMENT DRAINAGE AREA PLAN

Scale:

1:300

Drawn By:

EV

Checked By:

AG

Project Number:

CCO-25-0415

Drawing Number

## POST

#XXXXXX

D07-12-25-0078

## APPENDIX G STORMWATER MANAGEMENT CALCULATIONS

| Tc<br>(min) | Intensity<br>(mm/ hr) |        |          |
|-------------|-----------------------|--------|----------|
|             | 2-Year                | 5-Year | 100-Year |
| 20          | 52.0                  | 70.3   | 120.0    |
| 10          | 76.8                  | 104.2  | 178.6    |

| C-Values   |      |
|------------|------|
| Impervious | 0.90 |
| Gravel     | 0.60 |
| Pervious   | 0.20 |

#### Pre-Development Runoff Coefficient

| Drainage Area | Impervious Area (m <sup>2</sup> ) | Gravel (m <sup>2</sup> ) | Pervious Area (m <sup>2</sup> ) | Average C (2-Year) | Average C (100-Year) |                                |
|---------------|-----------------------------------|--------------------------|---------------------------------|--------------------|----------------------|--------------------------------|
| A1            | 0                                 | 0                        | 2,219                           | 0.20               | 0.25                 | Ph.1 Drainage to Rear Yard     |
| A2            | 0                                 | 0                        | 2,583                           | 0.20               | 0.25                 | Ph.1 Drainage to Ottawa Street |

#### Pre-Development Runoff Calculations

| Drainage Area | Area (ha) | C 2/ 5-Year | C 100-Year |                                |
|---------------|-----------|-------------|------------|--------------------------------|
| A1            | 0.222     | 0.20        | 0.25       | Ph.1 Drainage to Rear Yard     |
| A2            | 0.258     | 0.20        | 0.25       | Ph.1 Drainage to Ottawa Street |
| Total         | 0.480     |             |            |                                |

#### Post-Development Runoff Coefficient

| Drainage Area | Impervious Area (m <sup>2</sup> ) | Gravel (m <sup>2</sup> ) | Pervious Area (m <sup>2</sup> ) | Average C (2-year) | Average C (100-year) |                            |
|---------------|-----------------------------------|--------------------------|---------------------------------|--------------------|----------------------|----------------------------|
| B1            | 1,844                             | 0                        | 2,307                           | 0.51               | 0.58                 | Ph.1 Surface Restricted    |
| B2            | 651                               | 0                        | 0                               | 0.90               | 1.00                 | Ph.2 Building - Restricted |

#### Post-Development Runoff Calculations

| Drainage Area | Area (ha) | C 2-Year | C 100-Year |                            |
|---------------|-----------|----------|------------|----------------------------|
| B1            | 0.415     | 0.51     | 0.58       | Ph.1 Surface Restricted    |
| B2            | 0.065     | 0.90     | 1.00       | Ph.2 Building - Restricted |
| Total         | 0.480     |          |            |                            |

| Tc<br>(min) | Intensity<br>(mm/ hr) |        |          |
|-------------|-----------------------|--------|----------|
|             | 2-Year                | 5-Year | 100-Year |
| 20          | 52.0                  | 70.3   | 120.0    |
| 10          | 76.8                  | 104.2  | 178.6    |

| C-Values   |      |
|------------|------|
| Impervious | 0.90 |
| Gravel     | 0.60 |
| Pervious   | 0.20 |

#### Pre-Development Runoff Coefficient

| Drainage Area | Impervious Area (m <sup>2</sup> ) | Gravel (m <sup>2</sup> ) | Pervious Area (m <sup>2</sup> ) | Average C (2-Year) | Average C (100-Year) |                                |
|---------------|-----------------------------------|--------------------------|---------------------------------|--------------------|----------------------|--------------------------------|
| A3            | 0                                 | 0                        | 1,604                           | 0.20               | 0.25                 | Ph.2 Drainage to Rear Yard     |
| A4            | 0                                 | 0                        | 2,858                           | 0.20               | 0.25                 | Ph.2 Drainage to Ottawa Street |

#### Pre-Development Runoff Calculations

| Drainage Area | Area (ha) | C 2/ 5-Year | C 100-Year |                                |
|---------------|-----------|-------------|------------|--------------------------------|
| A3            | 0.160     | 0.20        | 0.25       | Ph.2 Drainage to Rear Yard     |
| A4            | 0.286     | 0.20        | 0.25       | Ph.2 Drainage to Ottawa Street |
| Total         | 0.446     |             |            |                                |

#### Post-Development Runoff Coefficient

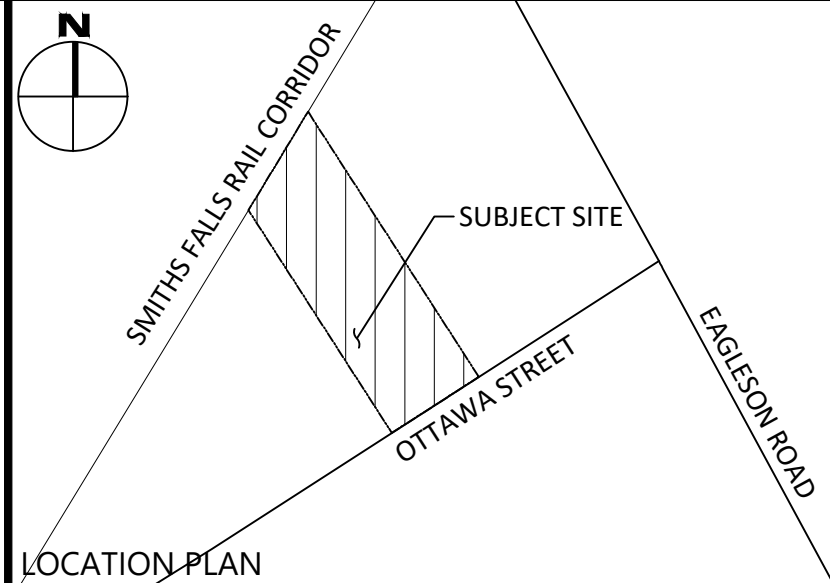
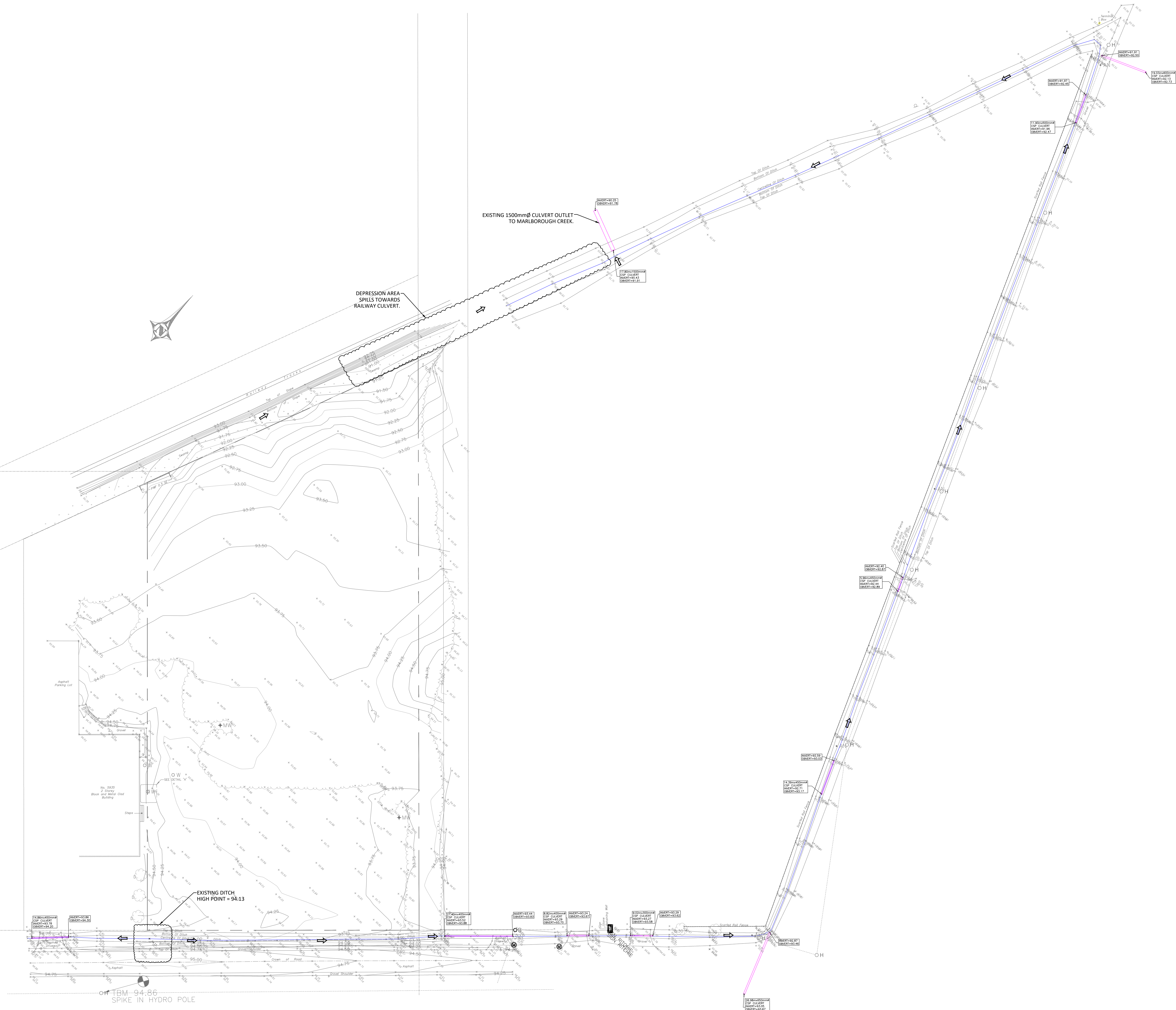
| Drainage Area | Impervious Area (m <sup>2</sup> ) | Gravel (m <sup>2</sup> ) | Pervious Area (m <sup>2</sup> ) | Average C (2-year) | Average C (100-year) |                            |
|---------------|-----------------------------------|--------------------------|---------------------------------|--------------------|----------------------|----------------------------|
| B3            | 1,460                             | 0                        | 2,076                           | 0.49               | 0.56                 | Ph.2 Surface Restricted    |
| B4            | 926                               | 0                        | 0                               | 0.90               | 1.00                 | Ph.2 Building - Restricted |

#### Post-Development Runoff Calculations

| Drainage Area | Area (ha) | C 2-Year | C 100-Year |                            |
|---------------|-----------|----------|------------|----------------------------|
| B3            | 0.354     | 0.49     | 0.56       | Ph.2 Surface Restricted    |
| B4            | 0.093     | 0.90     | 1.00       | Ph.2 Building - Restricted |
| Total         | 0.446     |          |            |                            |



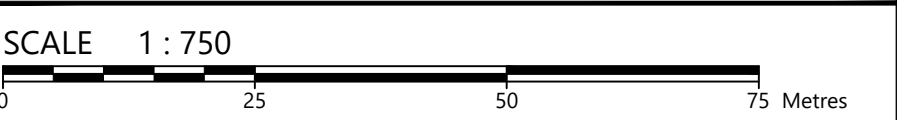
\\na\map\1\Infrastructure\2025\CCO-25-0415\99117756 Canada Inc. SPS Distillery & Warehouse, 5923 Ottawa Street\12 Drawings\Drainage\Figures\CCO-25-0415 - Presentation - Distilling  
ASX PROJECTS - Thermal Paper August 02, 2025 11:41:10 AM C:\STANDARD.DWG



- LEGEND
- DRAINAGE DIRECTION
  - DRAINAGE DITCH
  - EXISTING CULVERT

**FOR REVIEW ONLY**  
**NOT FOR CONSTRUCTION**

|                                                                                         |                   |               |
|-----------------------------------------------------------------------------------------|-------------------|---------------|
|                                                                                         |                   |               |
|                                                                                         |                   |               |
|                                                                                         |                   |               |
|                                                                                         |                   |               |
|                                                                                         |                   |               |
|                                                                                         |                   |               |
| 1                                                                                       | ISSUED FOR REVIEW | AUG. 07, 2025 |
| No.                                                                                     | Revisions         | Date          |
| Check and verify all dimensions before proceeding with the work. Do not scale drawings. |                   |               |



115 Walgreen Road, R.R.3  
Carp, ON K0A 1L0  
Tel: 613-836-2184  
Fax: 613-836-3742  
www.egis-group.com

Stamp:

Client:  
**99117756 CANADA INC.**  
411 LEGGET DRIVE, SUITE 710  
OTTAWA, ON K2K 3C9

Project:  
**DISTILLERY & WAREHOUSE**  
5923 OTTAWA STREET

Drawing Title:  
**EXISTING DITCH DRAINAGE FIGURE**

|              |       |                 |             |
|--------------|-------|-----------------|-------------|
| Scale:       | 1:750 | Project Number: | CCO-25-0415 |
| Drawn By:    | FV    | Drawing Number: | C104        |
| Checked By:  | CJM   |                 |             |
| Designed By: | FV    |                 |             |

D07-12-XX-XXXX

#XXXXX





## Adjustable Accutrol Weir

Tag: \_\_\_\_\_

## Adjustable Flow Control for Roof Drains

### ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.

Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

#### EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2" of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3" of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:  
[ 5 gpm (per inch of head) x 2 inches of head ] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.

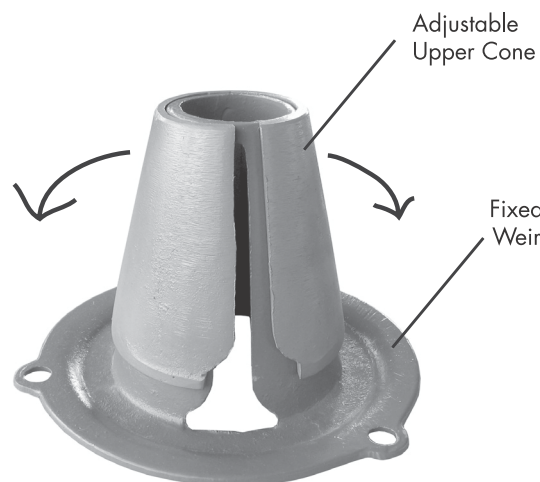
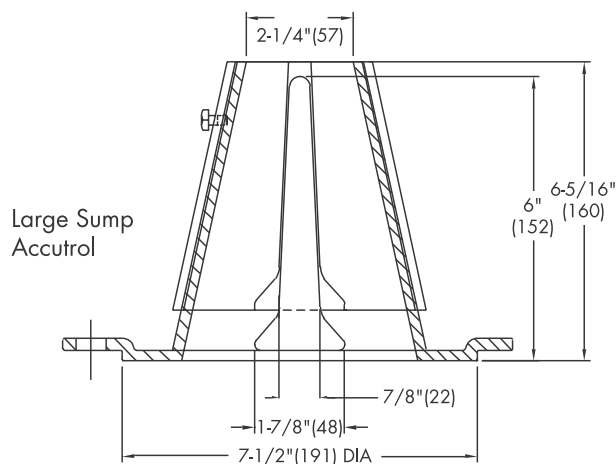


TABLE 1. Adjustable Accutrol Flow Rate Settings

| Weir Opening Exposed | 1"                             | 2" | 3"    | 4"   | 5"    | 6" |
|----------------------|--------------------------------|----|-------|------|-------|----|
|                      | Flow Rate (gallons per minute) |    |       |      |       |    |
| Fully Exposed        | 5                              | 10 | 15    | 20   | 25    | 30 |
| 3/4                  | 5                              | 10 | 13.75 | 17.5 | 21.25 | 25 |
| 1/2                  | 5                              | 10 | 12.5  | 15   | 17.5  | 20 |
| 1/4                  | 5                              | 10 | 11.25 | 12.5 | 13.75 | 15 |
| Closed               | 5                              | 5  | 5     | 5    | 5     | 5  |

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_

Job Location \_\_\_\_\_

Contractor's P.O. No. \_\_\_\_\_

Engineer \_\_\_\_\_

Representative \_\_\_\_\_

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com

Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca

Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com



A Watts Water Technologies Company

# Stormceptor®EF Sizing Report

Imbrium®Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/14/2025

| Province:                                         | Ontario                  | Project Name:                                                                                                                                                                                                                                                                                                                                                                               | 5923 Ottawa St. (Distillery and Warehouse) |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
|---------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|--------------------------|------|----|------|----|------|----|------|----|-------|----|-------|----|
| City:                                             | Ottawa                   | Project Number:                                                                                                                                                                                                                                                                                                                                                                             | COO-25-0415                                |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Nearest Rainfall Station:                         | OTTAWA CDA RCS           | Designer Name:                                                                                                                                                                                                                                                                                                                                                                              | Jessica Steffler                           |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Climate Station Id:                               | 6105978                  | Designer Company:                                                                                                                                                                                                                                                                                                                                                                           | Forterra Pipe & Precast                    |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Years of Rainfall Data:                           | 20                       | Designer Email:                                                                                                                                                                                                                                                                                                                                                                             | jessica.steffler@RinkerPipe.com            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Site Name:                                        | Phase 1                  | Designer Phone:                                                                                                                                                                                                                                                                                                                                                                             | 519-239-6958                               |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Drainage Area (ha):                               | 0.48                     | EOR Name:                                                                                                                                                                                                                                                                                                                                                                                   | Francis VALENTI                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Runoff Coefficient 'c':                           | 0.59                     | EOR Company:                                                                                                                                                                                                                                                                                                                                                                                | EGIS                                       |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Particle Size Distribution:                       | CA ETV                   | EOR Email:                                                                                                                                                                                                                                                                                                                                                                                  | Francis.VALENTI@egis-group.com             |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Target TSS Removal (%):                           | 60.0                     | EOR Phone:                                                                                                                                                                                                                                                                                                                                                                                  | 613-714-6895                               |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Required Water Quality Runoff Volume Capture (%): | 90.00                    | <div>Net Annual Sediment (TSS) Load Reduction Sizing Summary</div> <table> <tr> <th>Stormceptor Model</th> <th>TSS Removal Provided (%)</th> </tr> <tr> <td>EFO4</td> <td>60</td> </tr> <tr> <td>EFO5</td> <td>63</td> </tr> <tr> <td>EFO6</td> <td>65</td> </tr> <tr> <td>EFO8</td> <td>68</td> </tr> <tr> <td>EFO10</td> <td>69</td> </tr> <tr> <td>EFO12</td> <td>70</td> </tr> </table> |                                            | Stormceptor Model | TSS Removal Provided (%) | EFO4 | 60 | EFO5 | 63 | EFO6 | 65 | EFO8 | 68 | EFO10 | 69 | EFO12 | 70 |
| Stormceptor Model                                 | TSS Removal Provided (%) |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO4                                              | 60                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO5                                              | 63                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO6                                              | 65                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO8                                              | 68                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO10                                             | 69                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO12                                             | 70                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Water Quality Flow Rate (L/s):          | 9.14                     |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Oil / Fuel Spill Risk Site?                       | Yes                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Upstream Flow Control?                            | No                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Peak Conveyance (maximum) Flow Rate (L/s):        | 18.00                    |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Influent TSS Concentration (mg/L):                | 200                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Average Annual Sediment Load (kg/yr):   | 189                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Average Annual Sediment Volume (L/yr):  | 154                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |

Recommended Stormceptor EFO Model:

Estimated Net Annual Sediment (TSS) Load Reduction (%):

Water Quality Runoff Volume Capture (%):

EFO4

60

> 90



Stormceptor®EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► Stormceptor®EF and Stormceptor®EFO are the latest evolutions in the Stormceptor®oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

PERFORMANCE

► Stormceptor®EF and EFO remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The Canadian ETV PSD shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

| Particle Size (µm) | Percent Less Than | Particle Size Fraction (µm) | Percent |
|--------------------|-------------------|-----------------------------|---------|
| 1000               | 100               | 500-1000                    | 5       |
| 500                | 95                | 250-500                     | 5       |
| 250                | 90                | 150-250                     | 15      |
| 150                | 75                | 100-150                     | 15      |
| 100                | 60                | 75-100                      | 10      |
| 75                 | 50                | 50-75                       | 5       |
| 50                 | 45                | 20-50                       | 10      |
| 20                 | 35                | 8-20                        | 15      |
| 8                  | 20                | 5-8                         | 10      |
| 5                  | 10                | 2-5                         | 5       |
| 2                  | 5                 | <2                          | 5       |



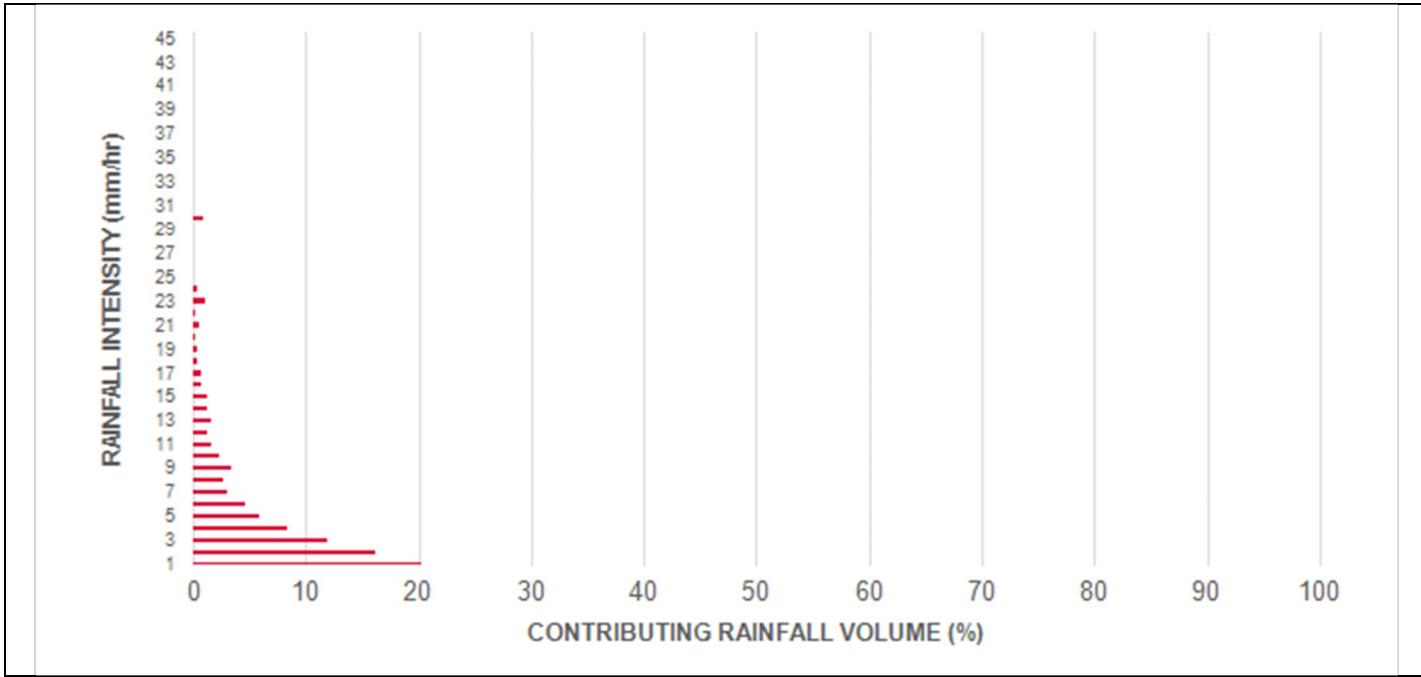
## Stormceptor®EF Sizing Report

| Rainfall Intensity (mm / hr)                         | Percent Rainfall Volume (%) | Cumulative Rainfall Volume (%) | Flow Rate (L/s) | Flow Rate (L/min) | Surface Loading Rate (L/min/ m²) | Removal Efficiency (%) | Incremental Removal (%) | Cumulative Removal (%) |
|------------------------------------------------------|-----------------------------|--------------------------------|-----------------|-------------------|----------------------------------|------------------------|-------------------------|------------------------|
| 0.50                                                 | 8.6                         | 8.6                            | 0.39            | 24.0              | 20.0                             | 70                     | 6.1                     | 6.1                    |
| 1.00                                                 | 20.3                        | 29.0                           | 0.79            | 47.0              | 39.0                             | 70                     | 14.3                    | 20.4                   |
| 2.00                                                 | 16.2                        | 45.2                           | 1.57            | 94.0              | 79.0                             | 66                     | 10.6                    | 31.0                   |
| 3.00                                                 | 12.0                        | 57.2                           | 2.36            | 142.0             | 118.0                            | 62                     | 7.4                     | 38.4                   |
| 4.00                                                 | 8.4                         | 65.6                           | 3.15            | 189.0             | 157.0                            | 58                     | 4.9                     | 43.3                   |
| 5.00                                                 | 5.9                         | 71.6                           | 3.94            | 236.0             | 197.0                            | 55                     | 3.3                     | 46.6                   |
| 6.00                                                 | 4.6                         | 76.2                           | 4.72            | 283.0             | 236.0                            | 53                     | 2.5                     | 49.0                   |
| 7.00                                                 | 3.1                         | 79.3                           | 5.51            | 331.0             | 276.0                            | 52                     | 1.6                     | 50.6                   |
| 8.00                                                 | 2.7                         | 82.0                           | 6.30            | 378.0             | 315.0                            | 51                     | 1.4                     | 52.0                   |
| 9.00                                                 | 3.3                         | 85.3                           | 7.09            | 425.0             | 354.0                            | 50                     | 1.7                     | 53.7                   |
| 10.00                                                | 2.3                         | 87.6                           | 7.87            | 472.0             | 394.0                            | 48                     | 1.1                     | 54.8                   |
| 11.00                                                | 1.6                         | 89.2                           | 8.66            | 520.0             | 433.0                            | 47                     | 0.7                     | 55.5                   |
| 12.00                                                | 1.3                         | 90.5                           | 9.45            | 567.0             | 472.0                            | 46                     | 0.6                     | 56.1                   |
| 13.00                                                | 1.7                         | 92.2                           | 10.23           | 614.0             | 512.0                            | 45                     | 0.8                     | 56.9                   |
| 14.00                                                | 1.2                         | 93.5                           | 11.02           | 661.0             | 551.0                            | 44                     | 0.5                     | 57.4                   |
| 15.00                                                | 1.2                         | 94.6                           | 11.81           | 709.0             | 590.0                            | 42                     | 0.5                     | 57.9                   |
| 16.00                                                | 0.7                         | 95.3                           | 12.60           | 756.0             | 630.0                            | 42                     | 0.3                     | 58.2                   |
| 17.00                                                | 0.7                         | 96.1                           | 13.38           | 803.0             | 669.0                            | 42                     | 0.3                     | 58.5                   |
| 18.00                                                | 0.4                         | 96.5                           | 14.17           | 850.0             | 709.0                            | 42                     | 0.2                     | 58.7                   |
| 19.00                                                | 0.4                         | 96.9                           | 14.96           | 898.0             | 748.0                            | 41                     | 0.2                     | 58.8                   |
| 20.00                                                | 0.2                         | 97.1                           | 15.75           | 945.0             | 787.0                            | 41                     | 0.1                     | 58.9                   |
| 21.00                                                | 0.5                         | 97.5                           | 16.53           | 992.0             | 827.0                            | 41                     | 0.2                     | 59.1                   |
| 22.00                                                | 0.2                         | 97.8                           | 17.32           | 1039.0            | 866.0                            | 41                     | 0.1                     | 59.2                   |
| 23.00                                                | 1.0                         | 98.8                           | 18.11           | 1086.0            | 905.0                            | 41                     | 0.4                     | 59.6                   |
| 24.00                                                | 0.3                         | 99.1                           | 18.90           | 1134.0            | 945.0                            | 40                     | 0.1                     | 59.7                   |
| 25.00                                                | 0.0                         | 99.1                           | 19.68           | 1181.0            | 984.0                            | 40                     | 0.0                     | 59.7                   |
| 30.00                                                | 0.9                         | 100.0                          | 23.62           | 1417.0            | 1181.0                           | 37                     | 0.3                     | 60.1                   |
| 35.00                                                | 0.0                         | 100.0                          | 27.56           | 1653.0            | 1378.0                           | 34                     | 0.0                     | 60.1                   |
| 40.00                                                | 0.0                         | 100.0                          | 31.49           | 1890.0            | 1575.0                           | 30                     | 0.0                     | 60.1                   |
| 45.00                                                | 0.0                         | 100.0                          | 35.43           | 2126.0            | 1771.0                           | 27                     | 0.0                     | 60.1                   |
| Estimated Net Annual Sediment (TSS) Load Reduction = |                             |                                |                 |                   |                                  |                        |                         | 60 %                   |

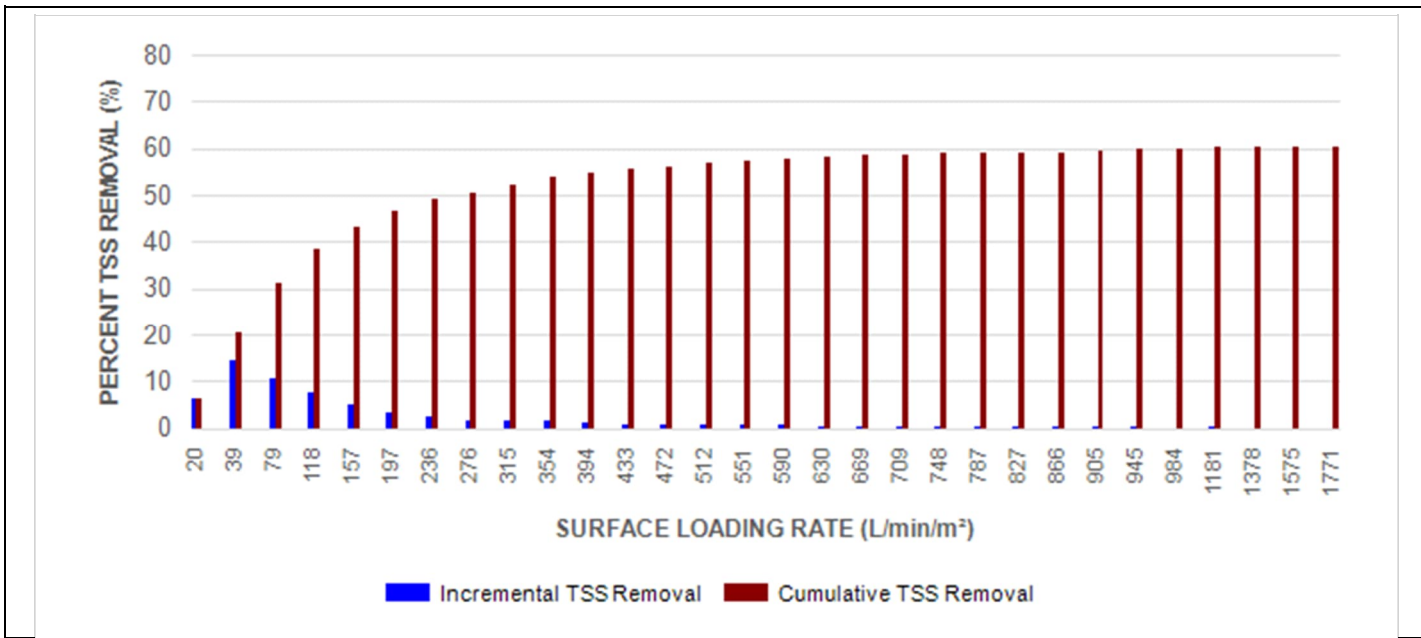
Climate Station ID: 6105978 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL  
FOR THE RECOMMENDED STORMCEPTOR® MODEL





## Stormceptor®EF Sizing Report

### Maximum Pipe Diameter / Peak Conveyance

| Stormceptor<br>EF / EFO | Model Diameter |      | Min Angle Inlet /<br>Outlet Pipes | Max Inlet Pipe<br>Diameter |      | Max Outlet Pipe<br>Diameter |      | Peak Conveyance<br>Flow Rate |       |
|-------------------------|----------------|------|-----------------------------------|----------------------------|------|-----------------------------|------|------------------------------|-------|
|                         | (m)            | (ft) |                                   | (mm)                       | (in) | (mm)                        | (in) | (L/s)                        | (cfs) |
| EF4 / EFO4              | 1.2            | 4    | 90                                | 609                        | 24   | 609                         | 24   | 425                          | 15    |
| EF5 / EFO5              | 1.5            | 5    | 90                                | 762                        | 30   | 762                         | 30   | 710                          | 25    |
| EF6 / EFO6              | 1.8            | 6    | 90                                | 914                        | 36   | 914                         | 36   | 990                          | 35    |
| EF8 / EFO8              | 2.4            | 8    | 90                                | 1219                       | 48   | 1219                        | 48   | 1700                         | 60    |
| EF10 / EFO10            | 3.0            | 10   | 90                                | 1828                       | 72   | 1828                        | 72   | 2830                         | 100   |
| EF12 / EFO12            | 3.6            | 12   | 90                                | 1828                       | 72   | 1828                        | 72   | 2830                         | 100   |

### SCOUR PREVENTION AND ONLINE CONFIGURATION

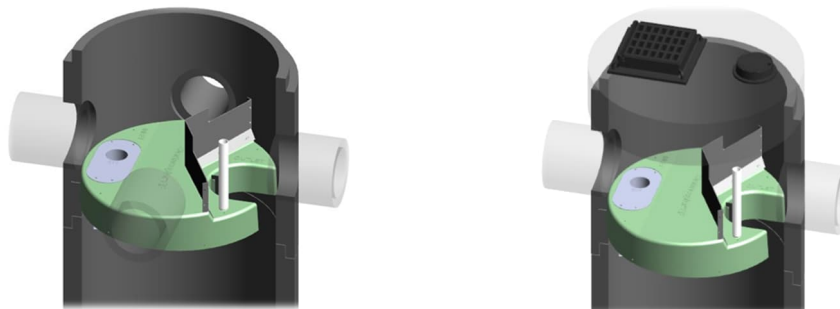
► Stormceptor®EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

### DESIGN FLEXIBILITY

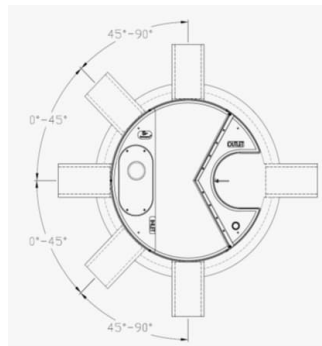
► Stormceptor®EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

### OIL CAPTURE AND RETENTION

► While Stormceptor®EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor®EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



## Stormceptor®EF Sizing Report



### INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

### HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

### Pollutant Capacity

| Stormceptor<br>EF / EFO | Model<br>Diameter |      | Depth (Outlet<br>Pipe Invert to<br>Sump Floor) |      | Oil Volume |       | Recommended<br>Sediment<br>Maintenance Depth * |      | Maximum<br>Sediment Volume * |       | Maximum<br>Sediment Mass ** |        |
|-------------------------|-------------------|------|------------------------------------------------|------|------------|-------|------------------------------------------------|------|------------------------------|-------|-----------------------------|--------|
|                         | (m)               | (ft) | (m)                                            | (ft) | (L)        | (Gal) | (mm)                                           | (in) | (L)                          | (ft³) | (kg)                        | (lb)   |
| EF4 / EFO4              | 1.2               | 4    | 1.52                                           | 5.0  | 265        | 70    | 203                                            | 8    | 1190                         | 42    | 1904                        | 5250   |
| EF5 / EFO5              | 1.5               | 5    | 1.62                                           | 5.3  | 420        | 111   | 305                                            | 10   | 2124                         | 75    | 2612                        | 5758   |
| EF6 / EFO6              | 1.8               | 6    | 1.93                                           | 6.3  | 610        | 160   | 305                                            | 12   | 3470                         | 123   | 5552                        | 15375  |
| EF8 / EFO8              | 2.4               | 8    | 2.59                                           | 8.5  | 1070       | 280   | 610                                            | 24   | 8780                         | 310   | 14048                       | 38750  |
| EF10 / EFO10            | 3.0               | 10   | 3.25                                           | 10.7 | 1670       | 440   | 610                                            | 24   | 17790                        | 628   | 28464                       | 78500  |
| EF12 / EFO12            | 3.6               | 12   | 3.89                                           | 12.8 | 2475       | 655   | 610                                            | 24   | 31220                        | 1103  | 49952                       | 137875 |

\* Increased sump depth may be added to increase sediment storage capacity

\*\* Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

| Feature                                                                 | Benefit                                           | Feature Appeals To                                  |
|-------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| Patent-pending enhanced flow treatment and scour prevention technology  | Superior, verified third-party performance        | Regulator, Specifying & Design Engineer             |
| Third-party verified light liquid capture and retention for EFO version | Proven performance for fuel/oil hotspot locations | Regulator, Specifying & Design Engineer, Site Owner |
| Functions as bend, junction or inlet structure                          | Design flexibility                                | Specifying & Design Engineer                        |
| Minimal drop between inlet and outlet                                   | Site installation ease                            | Contractor                                          |
| Large diameter outlet riser for inspection and maintenance              | Easy maintenance access from grade                | Maintenance Contractor & Site Owner                 |

### STANDARD STORMCEPTOR EF/ EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

### STANDARD STORMCEPTOR EF/ EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

## Stormceptor®EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results  
 Stormceptor®EFO

| SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL |
|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|
| 1                 | 70              | 660               | 42              | 1320              | 35              | 1980              | 24              |
| 30                | 70              | 690               | 42              | 1350              | 35              | 2010              | 24              |
| 60                | 67              | 720               | 41              | 1380              | 34              | 2040              | 23              |
| 90                | 63              | 750               | 41              | 1410              | 34              | 2070              | 23              |
| 120               | 61              | 780               | 41              | 1440              | 33              | 2100              | 23              |
| 150               | 58              | 810               | 41              | 1470              | 32              | 2130              | 22              |
| 180               | 56              | 840               | 41              | 1500              | 32              | 2160              | 22              |
| 210               | 54              | 870               | 41              | 1530              | 31              | 2190              | 22              |
| 240               | 53              | 900               | 41              | 1560              | 31              | 2220              | 21              |
| 270               | 52              | 930               | 40              | 1590              | 30              | 2250              | 21              |
| 300               | 51              | 960               | 40              | 1620              | 29              | 2280              | 21              |
| 330               | 50              | 990               | 40              | 1650              | 29              | 2310              | 21              |
| 360               | 49              | 1020              | 40              | 1680              | 28              | 2340              | 20              |
| 390               | 48              | 1050              | 39              | 1710              | 28              | 2370              | 20              |
| 420               | 47              | 1080              | 39              | 1740              | 27              | 2400              | 20              |
| 450               | 47              | 1110              | 38              | 1770              | 27              | 2430              | 20              |
| 480               | 46              | 1140              | 38              | 1800              | 26              | 2460              | 19              |
| 510               | 45              | 1170              | 37              | 1830              | 26              | 2490              | 19              |
| 540               | 44              | 1200              | 37              | 1860              | 26              | 2520              | 19              |
| 570               | 43              | 1230              | 37              | 1890              | 25              | 2550              | 19              |
| 600               | 42              | 1260              | 36              | 1920              | 25              | 2580              | 18              |
| 630               | 42              | 1290              | 36              | 1950              | 24              | 2600              | 26              |

## Stormceptor®EF Sizing Report

# STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

## PART 1 – GENERAL

### 1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

### 1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit Separators**

### 1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

## PART 2 – PRODUCTS

### 2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

|       |                                     |                                             |
|-------|-------------------------------------|---------------------------------------------|
| 2.1.1 | 4 ft (1219 mm) Diameter OGS Units:  | 1.19 m <sup>3</sup> sediment / 265 L oil    |
|       | 5 ft (1524 mm) Diameter OGS Units:  | 1.95 m <sup>3</sup> sediment / 420 L oil    |
|       | 6 ft (1829 mm) Diameter OGS Units:  | 3.48 m <sup>3</sup> sediment / 609 L oil    |
|       | 8 ft (2438 mm) Diameter OGS Units:  | 8.78 m <sup>3</sup> sediment / 1,071 L oil  |
|       | 10 ft (3048 mm) Diameter OGS Units: | 17.78 m <sup>3</sup> sediment / 1,673 L oil |
|       | 12 ft (3657 mm) Diameter OGS Units: | 31.23 m <sup>3</sup> sediment / 2,476 L oil |

## PART 3 – PERFORMANCE & DESIGN

### 3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

## Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

### 3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m<sup>2</sup> to 1400 L/min/m<sup>2</sup>, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m<sup>2</sup> and 1400 L/min/m<sup>2</sup> shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m<sup>2</sup> shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m<sup>2</sup>. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m<sup>2</sup>.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m<sup>2</sup> shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m<sup>2</sup>, and shall be calculated using a simple proportioning formula, with 1400 L/min/m<sup>2</sup> in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m<sup>2</sup>.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

### 3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m<sup>2</sup>.

### 3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.



**Stormceptor®EF Sizing Report**

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m<sup>2</sup> to 2600 L/min/m<sup>2</sup>) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

# Stormceptor®EF Sizing Report

Imbrium®Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/14/2025

| Province:                                         | Ontario                  | Project Name:                                                                                                                                                                                                                                                                                                                                                                               | 5923 Ottawa St. (Distillery and Warehouse) |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
|---------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|--------------------------|------|----|------|----|------|----|------|----|-------|----|-------|----|
| City:                                             | Ottawa                   | Project Number:                                                                                                                                                                                                                                                                                                                                                                             | COO-25-0415                                |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Nearest Rainfall Station:                         | OTTAWA CDA RCS           | Designer Name:                                                                                                                                                                                                                                                                                                                                                                              | Jessica Steffler                           |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Climate Station Id:                               | 6105978                  | Designer Company:                                                                                                                                                                                                                                                                                                                                                                           | Forterra Pipe & Precast                    |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Years of Rainfall Data:                           | 20                       | Designer Email:                                                                                                                                                                                                                                                                                                                                                                             | jessica.steffler@RinkerPipe.com            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Site Name:                                        | Phase 2                  | Designer Phone:                                                                                                                                                                                                                                                                                                                                                                             | 519-239-6958                               |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Drainage Area (ha):                               | 0.45                     | EOR Name:                                                                                                                                                                                                                                                                                                                                                                                   | Francis VALENTI                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Runoff Coefficient 'c':                           | 0.60                     | EOR Company:                                                                                                                                                                                                                                                                                                                                                                                | EGIS                                       |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Particle Size Distribution:                       | CA ETV                   | EOR Email:                                                                                                                                                                                                                                                                                                                                                                                  | Francis.VALENTI@egis-group.com             |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Target TSS Removal (%):                           | 60.0                     | EOR Phone:                                                                                                                                                                                                                                                                                                                                                                                  | 613-714-6895                               |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Required Water Quality Runoff Volume Capture (%): | 90.00                    | <div>Net Annual Sediment (TSS) Load Reduction Sizing Summary</div> <table> <tr> <th>Stormceptor Model</th> <th>TSS Removal Provided (%)</th> </tr> <tr> <td>EFO4</td> <td>60</td> </tr> <tr> <td>EFO5</td> <td>63</td> </tr> <tr> <td>EFO6</td> <td>66</td> </tr> <tr> <td>EFO8</td> <td>68</td> </tr> <tr> <td>EFO10</td> <td>69</td> </tr> <tr> <td>EFO12</td> <td>70</td> </tr> </table> |                                            | Stormceptor Model | TSS Removal Provided (%) | EFO4 | 60 | EFO5 | 63 | EFO6 | 66 | EFO8 | 68 | EFO10 | 69 | EFO12 | 70 |
| Stormceptor Model                                 | TSS Removal Provided (%) |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO4                                              | 60                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO5                                              | 63                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO6                                              | 66                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO8                                              | 68                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO10                                             | 69                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| EFO12                                             | 70                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Water Quality Flow Rate (L/s):          | 8.71                     |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Oil / Fuel Spill Risk Site?                       | Yes                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Upstream Flow Control?                            | No                       |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Peak Conveyance (maximum) Flow Rate (L/s):        | 18.00                    |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Influent TSS Concentration (mg/L):                | 200                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Average Annual Sediment Load (kg/yr):   | 184                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |
| Estimated Average Annual Sediment Volume (L/yr):  | 149                      |                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                   |                          |      |    |      |    |      |    |      |    |       |    |       |    |

Recommended Stormceptor EFO Model:

Estimated Net Annual Sediment (TSS) Load Reduction (%):

Water Quality Runoff Volume Capture (%):

EFO4

60

> 90



Stormceptor®EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► Stormceptor®EF and Stormceptor®EFO are the latest evolutions in the Stormceptor®oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

PERFORMANCE

► Stormceptor®EF and EFO remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The Canadian ETV PSD shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

| Particle Size (µm) | Percent Less Than | Particle Size Fraction (µm) | Percent |
|--------------------|-------------------|-----------------------------|---------|
| 1000               | 100               | 500-1000                    | 5       |
| 500                | 95                | 250-500                     | 5       |
| 250                | 90                | 150-250                     | 15      |
| 150                | 75                | 100-150                     | 15      |
| 100                | 60                | 75-100                      | 10      |
| 75                 | 50                | 50-75                       | 5       |
| 50                 | 45                | 20-50                       | 10      |
| 20                 | 35                | 8-20                        | 15      |
| 8                  | 20                | 5-8                         | 10      |
| 5                  | 10                | 2-5                         | 5       |
| 2                  | 5                 | <2                          | 5       |



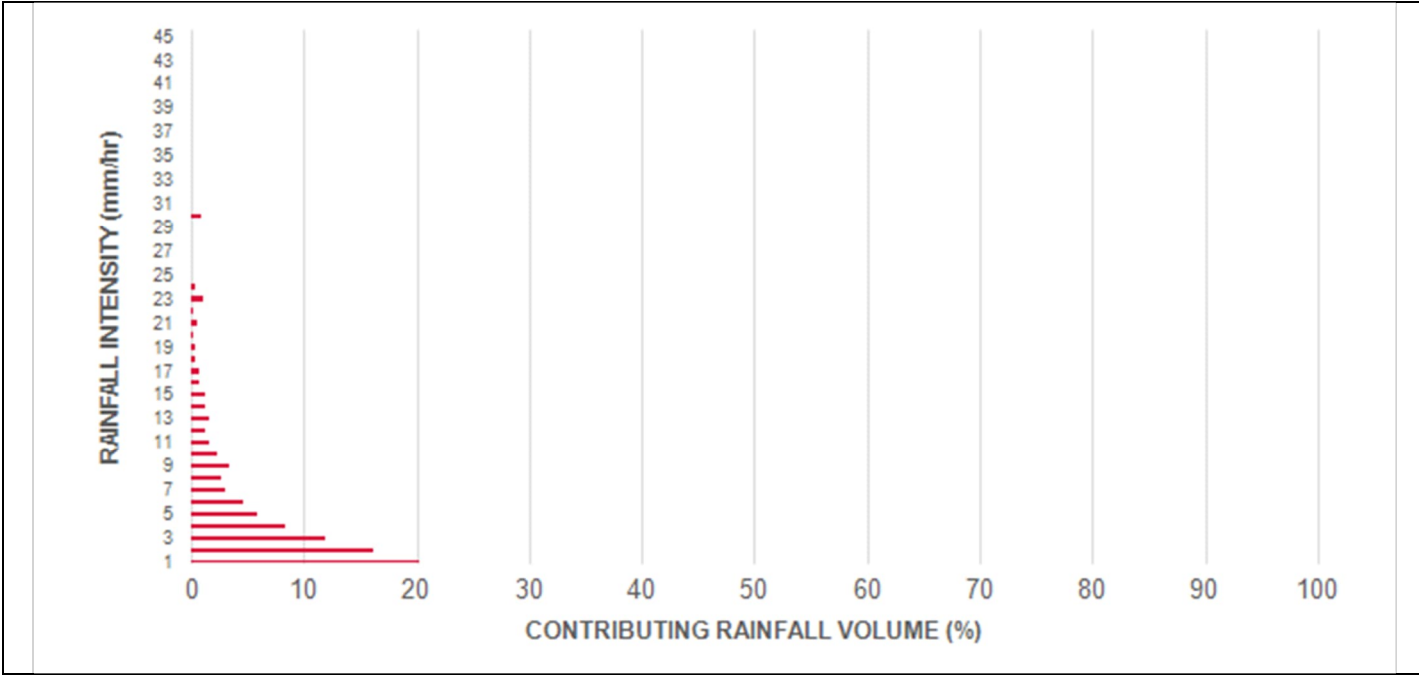
## Stormceptor®EF Sizing Report

| Rainfall Intensity (mm / hr)                         | Percent Rainfall Volume (%) | Cumulative Rainfall Volume (%) | Flow Rate (L/s) | Flow Rate (L/min) | Surface Loading Rate (L/min/ m²) | Removal Efficiency (%) | Incremental Removal (%) | Cumulative Removal (%) |
|------------------------------------------------------|-----------------------------|--------------------------------|-----------------|-------------------|----------------------------------|------------------------|-------------------------|------------------------|
| 0.50                                                 | 8.6                         | 8.6                            | 0.38            | 23.0              | 19.0                             | 70                     | 6.1                     | 6.1                    |
| 1.00                                                 | 20.3                        | 29.0                           | 0.75            | 45.0              | 38.0                             | 70                     | 14.3                    | 20.4                   |
| 2.00                                                 | 16.2                        | 45.2                           | 1.50            | 90.0              | 75.0                             | 66                     | 10.6                    | 31.0                   |
| 3.00                                                 | 12.0                        | 57.2                           | 2.25            | 135.0             | 113.0                            | 62                     | 7.4                     | 38.4                   |
| 4.00                                                 | 8.4                         | 65.6                           | 3.00            | 180.0             | 150.0                            | 58                     | 4.9                     | 43.3                   |
| 5.00                                                 | 5.9                         | 71.6                           | 3.75            | 225.0             | 188.0                            | 56                     | 3.3                     | 46.6                   |
| 6.00                                                 | 4.6                         | 76.2                           | 4.50            | 270.0             | 225.0                            | 53                     | 2.5                     | 49.1                   |
| 7.00                                                 | 3.1                         | 79.3                           | 5.25            | 315.0             | 263.0                            | 52                     | 1.6                     | 50.7                   |
| 8.00                                                 | 2.7                         | 82.0                           | 6.00            | 360.0             | 300.0                            | 51                     | 1.4                     | 52.1                   |
| 9.00                                                 | 3.3                         | 85.3                           | 6.76            | 405.0             | 338.0                            | 50                     | 1.7                     | 53.8                   |
| 10.00                                                | 2.3                         | 87.6                           | 7.51            | 450.0             | 375.0                            | 49                     | 1.1                     | 54.9                   |
| 11.00                                                | 1.6                         | 89.2                           | 8.26            | 495.0             | 413.0                            | 48                     | 0.7                     | 55.6                   |
| 12.00                                                | 1.3                         | 90.5                           | 9.01            | 540.0             | 450.0                            | 47                     | 0.6                     | 56.2                   |
| 13.00                                                | 1.7                         | 92.2                           | 9.76            | 585.0             | 488.0                            | 46                     | 0.8                     | 57.0                   |
| 14.00                                                | 1.2                         | 93.5                           | 10.51           | 631.0             | 525.0                            | 44                     | 0.5                     | 57.6                   |
| 15.00                                                | 1.2                         | 94.6                           | 11.26           | 676.0             | 563.0                            | 43                     | 0.5                     | 58.1                   |
| 16.00                                                | 0.7                         | 95.3                           | 12.01           | 721.0             | 600.0                            | 42                     | 0.3                     | 58.4                   |
| 17.00                                                | 0.7                         | 96.1                           | 12.76           | 766.0             | 638.0                            | 42                     | 0.3                     | 58.7                   |
| 18.00                                                | 0.4                         | 96.5                           | 13.51           | 811.0             | 676.0                            | 42                     | 0.2                     | 58.8                   |
| 19.00                                                | 0.4                         | 96.9                           | 14.26           | 856.0             | 713.0                            | 41                     | 0.2                     | 59.0                   |
| 20.00                                                | 0.2                         | 97.1                           | 15.01           | 901.0             | 751.0                            | 41                     | 0.1                     | 59.1                   |
| 21.00                                                | 0.5                         | 97.5                           | 15.76           | 946.0             | 788.0                            | 41                     | 0.2                     | 59.3                   |
| 22.00                                                | 0.2                         | 97.8                           | 16.51           | 991.0             | 826.0                            | 41                     | 0.1                     | 59.4                   |
| 23.00                                                | 1.0                         | 98.8                           | 17.26           | 1036.0            | 863.0                            | 41                     | 0.4                     | 59.8                   |
| 24.00                                                | 0.3                         | 99.1                           | 18.01           | 1081.0            | 901.0                            | 41                     | 0.1                     | 59.9                   |
| 25.00                                                | 0.0                         | 99.1                           | 18.77           | 1126.0            | 938.0                            | 40                     | 0.0                     | 59.9                   |
| 30.00                                                | 0.9                         | 100.0                          | 22.52           | 1351.0            | 1126.0                           | 38                     | 0.4                     | 60.3                   |
| 35.00                                                | 0.0                         | 100.0                          | 26.27           | 1576.0            | 1314.0                           | 35                     | 0.0                     | 60.3                   |
| 40.00                                                | 0.0                         | 100.0                          | 30.02           | 1801.0            | 1501.0                           | 32                     | 0.0                     | 60.3                   |
| 45.00                                                | 0.0                         | 100.0                          | 33.78           | 2027.0            | 1689.0                           | 28                     | 0.0                     | 60.3                   |
| Estimated Net Annual Sediment (TSS) Load Reduction = |                             |                                |                 |                   |                                  |                        |                         | 60 %                   |

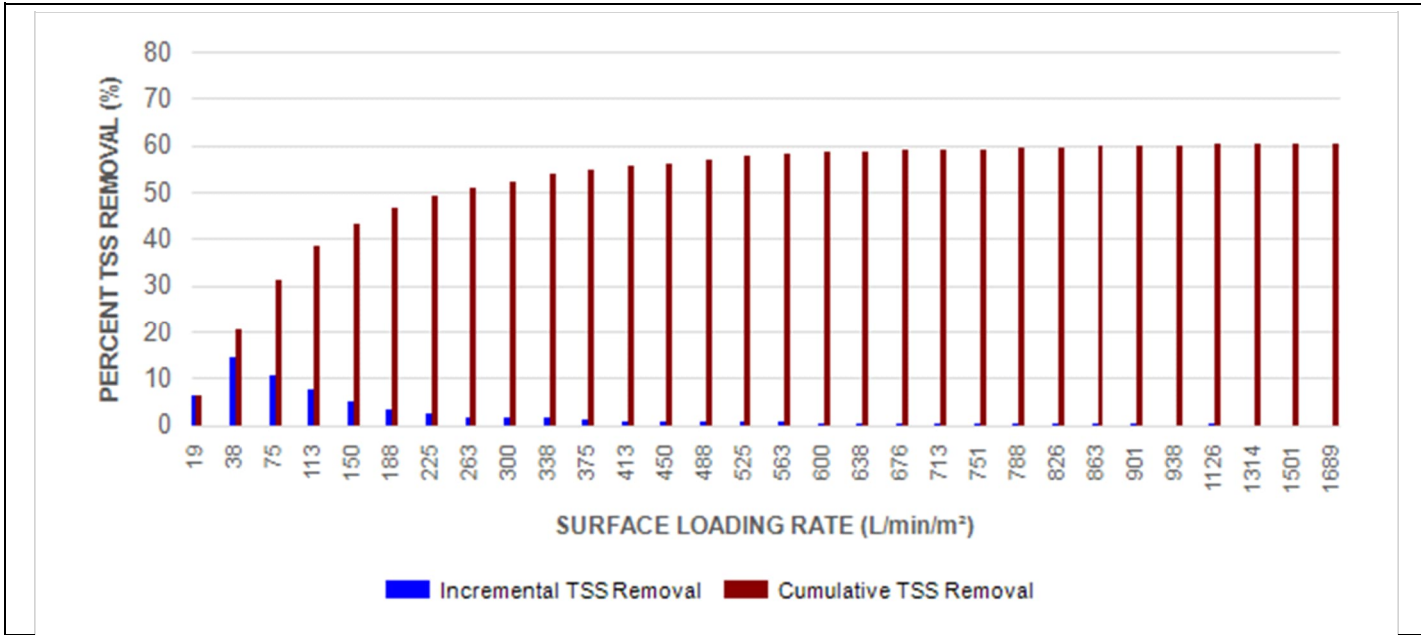
Climate Station ID: 6105978 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL  
FOR THE RECOMMENDED STORMCEPTOR® MODEL





## Stormceptor®EF Sizing Report

### Maximum Pipe Diameter / Peak Conveyance

| Stormceptor<br>EF / EFO | Model Diameter |      | Min Angle Inlet /<br>Outlet Pipes | Max Inlet Pipe<br>Diameter |      | Max Outlet Pipe<br>Diameter |      | Peak Conveyance<br>Flow Rate |       |
|-------------------------|----------------|------|-----------------------------------|----------------------------|------|-----------------------------|------|------------------------------|-------|
|                         | (m)            | (ft) |                                   | (mm)                       | (in) | (mm)                        | (in) | (L/s)                        | (cfs) |
| EF4 / EFO4              | 1.2            | 4    | 90                                | 609                        | 24   | 609                         | 24   | 425                          | 15    |
| EF5 / EFO5              | 1.5            | 5    | 90                                | 762                        | 30   | 762                         | 30   | 710                          | 25    |
| EF6 / EFO6              | 1.8            | 6    | 90                                | 914                        | 36   | 914                         | 36   | 990                          | 35    |
| EF8 / EFO8              | 2.4            | 8    | 90                                | 1219                       | 48   | 1219                        | 48   | 1700                         | 60    |
| EF10 / EFO10            | 3.0            | 10   | 90                                | 1828                       | 72   | 1828                        | 72   | 2830                         | 100   |
| EF12 / EFO12            | 3.6            | 12   | 90                                | 1828                       | 72   | 1828                        | 72   | 2830                         | 100   |

### SCOUR PREVENTION AND ONLINE CONFIGURATION

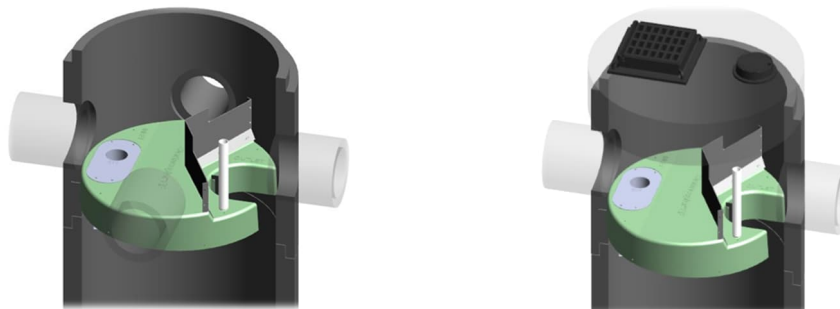
► Stormceptor®EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

### DESIGN FLEXIBILITY

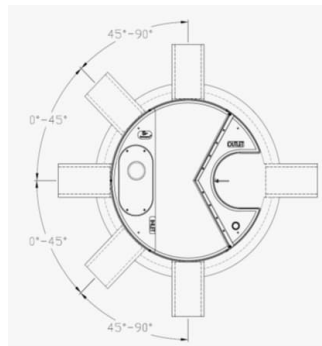
► Stormceptor®EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

### OIL CAPTURE AND RETENTION

► While Stormceptor®EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor®EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



## Stormceptor®EF Sizing Report



### INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

### HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

### Pollutant Capacity

| Stormceptor<br>EF / EFO | Model<br>Diameter |      | Depth (Outlet<br>Pipe Invert to<br>Sump Floor) |      | Oil Volume |       | Recommended<br>Sediment<br>Maintenance Depth * |      | Maximum<br>Sediment Volume * |       | Maximum<br>Sediment Mass ** |        |
|-------------------------|-------------------|------|------------------------------------------------|------|------------|-------|------------------------------------------------|------|------------------------------|-------|-----------------------------|--------|
|                         | (m)               | (ft) | (m)                                            | (ft) | (L)        | (Gal) | (mm)                                           | (in) | (L)                          | (ft³) | (kg)                        | (lb)   |
| EF4 / EFO4              | 1.2               | 4    | 1.52                                           | 5.0  | 265        | 70    | 203                                            | 8    | 1190                         | 42    | 1904                        | 5250   |
| EF5 / EFO5              | 1.5               | 5    | 1.62                                           | 5.3  | 420        | 111   | 305                                            | 10   | 2124                         | 75    | 2612                        | 5758   |
| EF6 / EFO6              | 1.8               | 6    | 1.93                                           | 6.3  | 610        | 160   | 305                                            | 12   | 3470                         | 123   | 5552                        | 15375  |
| EF8 / EFO8              | 2.4               | 8    | 2.59                                           | 8.5  | 1070       | 280   | 610                                            | 24   | 8780                         | 310   | 14048                       | 38750  |
| EF10 / EFO10            | 3.0               | 10   | 3.25                                           | 10.7 | 1670       | 440   | 610                                            | 24   | 17790                        | 628   | 28464                       | 78500  |
| EF12 / EFO12            | 3.6               | 12   | 3.89                                           | 12.8 | 2475       | 655   | 610                                            | 24   | 31220                        | 1103  | 49952                       | 137875 |

\* Increased sump depth may be added to increase sediment storage capacity

\*\* Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

| Feature                                                                 | Benefit                                           | Feature Appeals To                                  |
|-------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| Patent-pending enhanced flow treatment and scour prevention technology  | Superior, verified third-party performance        | Regulator, Specifying & Design Engineer             |
| Third-party verified light liquid capture and retention for EFO version | Proven performance for fuel/oil hotspot locations | Regulator, Specifying & Design Engineer, Site Owner |
| Functions as bend, junction or inlet structure                          | Design flexibility                                | Specifying & Design Engineer                        |
| Minimal drop between inlet and outlet                                   | Site installation ease                            | Contractor                                          |
| Large diameter outlet riser for inspection and maintenance              | Easy maintenance access from grade                | Maintenance Contractor & Site Owner                 |

### STANDARD STORMCEPTOR EF/ EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

### STANDARD STORMCEPTOR EF/ EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

## Stormceptor®EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results  
 Stormceptor®EFO

| SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL | SLR<br>(L/min/m²) | TSS%<br>REMOVAL |
|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|
| 1                 | 70              | 660               | 42              | 1320              | 35              | 1980              | 24              |
| 30                | 70              | 690               | 42              | 1350              | 35              | 2010              | 24              |
| 60                | 67              | 720               | 41              | 1380              | 34              | 2040              | 23              |
| 90                | 63              | 750               | 41              | 1410              | 34              | 2070              | 23              |
| 120               | 61              | 780               | 41              | 1440              | 33              | 2100              | 23              |
| 150               | 58              | 810               | 41              | 1470              | 32              | 2130              | 22              |
| 180               | 56              | 840               | 41              | 1500              | 32              | 2160              | 22              |
| 210               | 54              | 870               | 41              | 1530              | 31              | 2190              | 22              |
| 240               | 53              | 900               | 41              | 1560              | 31              | 2220              | 21              |
| 270               | 52              | 930               | 40              | 1590              | 30              | 2250              | 21              |
| 300               | 51              | 960               | 40              | 1620              | 29              | 2280              | 21              |
| 330               | 50              | 990               | 40              | 1650              | 29              | 2310              | 21              |
| 360               | 49              | 1020              | 40              | 1680              | 28              | 2340              | 20              |
| 390               | 48              | 1050              | 39              | 1710              | 28              | 2370              | 20              |
| 420               | 47              | 1080              | 39              | 1740              | 27              | 2400              | 20              |
| 450               | 47              | 1110              | 38              | 1770              | 27              | 2430              | 20              |
| 480               | 46              | 1140              | 38              | 1800              | 26              | 2460              | 19              |
| 510               | 45              | 1170              | 37              | 1830              | 26              | 2490              | 19              |
| 540               | 44              | 1200              | 37              | 1860              | 26              | 2520              | 19              |
| 570               | 43              | 1230              | 37              | 1890              | 25              | 2550              | 19              |
| 600               | 42              | 1260              | 36              | 1920              | 25              | 2580              | 18              |
| 630               | 42              | 1290              | 36              | 1950              | 24              | 2600              | 26              |

## Stormceptor®EF Sizing Report

# STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

## PART 1 – GENERAL

### 1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

### 1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit Separators**

### 1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

## PART 2 – PRODUCTS

### 2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

|       |                                     |                                             |
|-------|-------------------------------------|---------------------------------------------|
| 2.1.1 | 4 ft (1219 mm) Diameter OGS Units:  | 1.19 m <sup>3</sup> sediment / 265 L oil    |
|       | 5 ft (1524 mm) Diameter OGS Units:  | 1.95 m <sup>3</sup> sediment / 420 L oil    |
|       | 6 ft (1829 mm) Diameter OGS Units:  | 3.48 m <sup>3</sup> sediment / 609 L oil    |
|       | 8 ft (2438 mm) Diameter OGS Units:  | 8.78 m <sup>3</sup> sediment / 1,071 L oil  |
|       | 10 ft (3048 mm) Diameter OGS Units: | 17.78 m <sup>3</sup> sediment / 1,673 L oil |
|       | 12 ft (3657 mm) Diameter OGS Units: | 31.23 m <sup>3</sup> sediment / 2,476 L oil |

## PART 3 – PERFORMANCE & DESIGN

### 3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

## Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

### 3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m<sup>2</sup> to 1400 L/min/m<sup>2</sup>, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m<sup>2</sup> and 1400 L/min/m<sup>2</sup> shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m<sup>2</sup> shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m<sup>2</sup>. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m<sup>2</sup>.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m<sup>2</sup> shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m<sup>2</sup>, and shall be calculated using a simple proportioning formula, with 1400 L/min/m<sup>2</sup> in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m<sup>2</sup>.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

### 3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m<sup>2</sup>.

### 3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.



**Stormceptor®EF** Sizing Report

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m<sup>2</sup> to 2600 L/min/m<sup>2</sup>) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

September 11, 2025

Project Number: P2710(e01)

Stratford Foxrun  
6286 Prince of Wales Drive  
North Gower, ON  
K0A 2T0

**Attention: Joshua Laginski, P.Eng**

**Subject: Stratford Foxrun Development- 5923 Ottawa Street, Richmond  
Ditch Hydrologic and Hydraulic Analysis**

---

## RATIONALE FOR UPDATE

The following memo has been revised to address comments received from the City of Ottawa on July 3, 2025, titled “*Feedback Form – Completeness Review #1 Site Plan Control 5923 Ottawa Street*”. Updates in this memo include refinements to the site grading and stormwater management design, as well as the incorporation of additional calculations and supporting text for justification of selected model parameters, as requested by the city review comments provided. These updates ensure consistency with the latest design information and compliance with applicable City of Ottawa guidelines.

## OVERVIEW

Egis Group has commissioned JFSA Canada Inc. to develop detailed hydrologic and hydraulic models for the proposed Stratford Foxrun development. This development, located at 5923 Ottawa Street in Richmond, Ontario, will include local depressions within the site that will act as stormwater management controls to mitigate increases in peak flows resulting from the development. The site will outlet into an existing roadside ditch on Ottawa Street before proceeding east to Eagleson Road and then turning north towards the rail corridor before finally discharging into Marlborough Creek, which is a tributary of the Jock River.

This memo presents a downstream hydrologic and hydraulic analysis of the aforementioned roadside ditch, specifically quantifying its capacity from 5923 Ottawa Street to the Marlborough Creek. **Figure 1** illustrates the development's location and extent, as well as the road site ditch relative to its outlet at Marlborough Creek.

Figure 1: Site Boundary and Existing Watercourse



## HYDROLOGY

### Existing Conditions

#### Drainage Areas

Existing drainage areas for this study were delineated using a comprehensive Digital Terrain Model (DTM). This DTM was developed from two primary sources: LiDAR data, obtained from the LIO (Land Information Ontario) Digital Terrain Model and flown in 2019-2020, and a detailed topographic survey of the existing ditch and associated crossings completed by Egis in January 2025. This combined data was then imported into GIS software. Watershed delineation algorithms were subsequently applied to the DTM to automatically define the drainage areas. These automated delineations were manually reviewed against relevant previous studies and existing drainage delineations for accuracy and consistency. **Figure A1 in Attachment A** provides a visual overview of the existing drainage areas within the study area.

#### Land Use

Land use data has been taken from Land Information Ontario's (LIO) Land Use Data and then discretized based on the respective subcatchments. **Figure A2 in Attachment A** provides a visual overview of the respective land use data for each of the subcatchments within the study area.

#### Soil/Infiltration Data

Soil data within the study area has been taken from the Soil Survey Complex Data available on Land Information Ontario (LIO). **Figure A3 in Attachment A** provides a visual overview of the respective soil type data for each of the subcatchments within the study area. A full breakdown of the soil data for each drainage area has also been provided in **Table A1 in Attachment A**.

## Curve Number (CN)

Based on the underlying Land Use Type and Soil Classification at each location within a subcatchment, a Curve Number (CN) was calculated, based on applicable values outlined in Tables A2 and A3 in the SWMHYMO Manual. Each Curve Number was then weighted based on the total area within a given subcatchment to determine the weighted CN for that subcatchment. The CN values calculated were then converted to CN\*. Note that the traditional CN procedure assumes that Initial Abstraction (IA) = 0.2S. However, the traditional CN method is subject to errors because of this assumption, particularly for smaller rainfall events. Instead, it is recommended that a modified CN\* and a user-defined IA value be used for SWMHYMO modelling. Modified CN\* values have been shown to correlate well with measured flows and perform well in continuous SWMHYMO modelling (as discussed in the July 1989 INTERHYMO / OTTHYMO 89 Manual). The CN values derived were converted to CN\* based on the formula provided in the November 2002 Runoff Curve Number Method: Examination of the Initial Abstract Ratio paper, and applied to the hydrologic model.

$$CN^* = \frac{100}{1.879 \left[ \frac{100}{CN-1} \right]^{1.15} + 1}$$

**Table A1 in Attachment** provides a full summary of the CN/CN\* calculations for each of the predevelopment subcatchments.

## Time to Peak (tp)

For natural areas within the study area, the time to peak values for each of the subcatchments has been calculated based on existing topography. Flow paths have been discretized based on the topographic data using GIS tools, and the longest major flow path within each subcatchment has been identified; refer to Figure B6 in Attachment B for the flow paths discretized for each subcatchment. The upstream and downstream topographic elevations and flow lengths were identified for each subcatchment and used in the calculations. For these natural subcatchments, the Federal Aviation Administration (FAA) method was determined to be the most appropriate method to calculate the Time to Peak.

Other methods, such as the Uplands method, were also included in that analysis. The FAA method was selected for use in the final model because it produced longer time-to-peak (Tp) values for the same catchments, resulting in lower peak flows under pre-development conditions. These lower peak flows were then used to establish allowable release rates for the proposed stormwater management facilities.

This approach results in a more conservative design, as the SWM controls are sized to ensure post-development flows do not exceed these lower pre-development thresholds. While the Uplands method is preferred in the Sewer Design Guidelines (Appendix 5-D), the FAA method remains suitable for flat, rural catchments with longer overland flow paths, which characterizes the study area. Therefore, the FAA-based design applied in this analysis is more conservative and protective of downstream infrastructure.

Full details of these calculations have been provided in **Table A2 in Attachment A**, along with other time-to-peak values using alternative tp calculation methods.

## Existing SWMHYMO modelling

An existing conditions SWMHYMO model of the drainage areas was developed based on the pre-development drainage areas provided. To represent the existing undeveloped lands, CALIB NASHYDs have been used, with Initial Abstraction (IA)=4.67 mm, and Number of Linear Reservoirs (N)=3. Full input and summary files of the existing conditions model have been provided in Attachment A

## Channel Routing

To account for channel routing throughout the study area, LiDAR has been used to approximate the channel cross-section and associated flow parameters (length & slope). **Figure A4 in Attachment A** outlines the major flow paths within the study area, which have been used to account for channel routing and time to peak calculations within the subcatchments.

## Design & Historical Storms

The stormwater management analysis incorporates both standard design storms and historical storm events in accordance with the City of Ottawa's guidelines. The selected design storms include the 3-hour Chicago distribution and the 24-hour SCS distribution, which are consistent with standard practice for stormwater management design in the region.

The 3-hour Chicago storm is widely used for urban infrastructure analysis because it provides a balanced representation of peak intensity and total rainfall volume. This duration is sufficient to generate meaningful runoff volumes for sizing stormwater management controls while capturing peak intensities that challenge conveyance systems. Although shorter-duration storms (e.g., 1-hour 100-year) exhibit higher peak intensities, their lower total rainfall volume often results in less conservative storage sizing. Conversely, the 24-hour SCS storm is included to assess broader floodplain impacts and downstream conveyance performance.

In addition to these design storms, the following historical events were simulated as per City requirements: July 1, 1979, August 4, 1988, and August 8, 1996. These events provide additional validation of system performance under real-world conditions and help ensure resiliency of the proposed stormwater management system.

## Proposed Conditions

### Drainage Areas & Imperviousness

For the Stratford Foxrun development under proposed conditions, Egis provided JFSA with detailed design drawings that included drainage areas and associated imperviousness. The proposed development lot layout and the associated drainage areas have been provided in **Figure B1 of Attachment B**. To represent the proposed Stratford Foxrun development lands, DESIGN STANDHYDs have been used, with default parameters per the city of Ottawa Storm Sewer Design Guidelines.

### Onsite SWM Controls

Egis's design for the proposed development included detailed grading of localized depressions within the site that will act as onsite stormwater management controls, along with corresponding stage-storage tables. These stage-storage tables were directly incorporated into the hydrologic model. This integration allowed for the determination of appropriate outlet configurations for these facilities, as well as an accurate assessment of the storage volumes provided by the proposed depressions. Full detailed Stage/Storage/Outflow curves have been provided in **Tables B1 and B2 in Attachment B**. Based on this analysis, both sites will have a **75 mm** orifice at the bottom of the localized depression area and a **30cm** overflow weir at an elevation of **94.40m** and for extreme events.



## Results

### Onsite Controls Summary

**Table 2** provides a comprehensive overview of the maximum storage volumes achieved at each of these locations across various return periods, in addition to their associated peak outflows and maximum water levels.

**Table 1: Site Release Rates / Required Storage Volume / Ponding Depth/WSE**

| Event            | Site 1<br>(0.480 ha)                   |                                     |                    |              | Site 2<br>(0.447 ha)                   |                                     |                    |              |
|------------------|----------------------------------------|-------------------------------------|--------------------|--------------|----------------------------------------|-------------------------------------|--------------------|--------------|
|                  | Peak<br>Outflow<br>(m <sup>3</sup> /s) | Pond<br>Volume<br>(m <sup>3</sup> ) | Pond<br>WSE<br>(m) | Depth<br>(m) | Peak<br>Outflow<br>(m <sup>3</sup> /s) | Pond<br>Volume<br>(m <sup>3</sup> ) | Pond<br>WSE<br>(m) | Depth<br>(m) |
| 2YrCHI3Hr        | 0.033                                  | 34                                  | 94.113             | 0.273        | 0.031                                  | 38                                  | 94.058             | 0.348        |
| 5YrCHI3Hr        | 0.054                                  | 64                                  | 94.189             | 0.349        | 0.049                                  | 65                                  | 94.167             | 0.447        |
| 10YrCHI3Hr       | 0.072                                  | 85                                  | 94.231             | 0.391        | 0.064                                  | 84                                  | 94.220             | 0.490        |
| 25YrCHI3Hr       | 0.094                                  | 113                                 | 94.284             | 0.444        | 0.083                                  | 109                                 | 94.280             | 0.540        |
| 50YrCHI3Hr       | 0.109                                  | 134                                 | 94.323             | 0.483        | 0.096                                  | 129                                 | 94.323             | 0.573        |
| 100YrCHI3Hr      | 0.130                                  | 158                                 | 94.364             | 0.524        | 0.114                                  | 150                                 | 94.366             | 0.606        |
| 2YrSCS24Hr       | 0.036                                  | 43                                  | 94.139             | 0.299        | 0.034                                  | 45                                  | 94.091             | 0.321        |
| 5YrSCS24Hr       | 0.056                                  | 72                                  | 94.205             | 0.365        | 0.051                                  | 71                                  | 94.185             | 0.405        |
| 10YrSCS24Hr      | 0.070                                  | 91                                  | 94.244             | 0.404        | 0.064                                  | 89                                  | 94.232             | 0.442        |
| 25YrSCS24Hr      | 0.088                                  | 117                                 | 94.292             | 0.452        | 0.080                                  | 112                                 | 94.286             | 0.486        |
| 50YrSCS24Hr      | 0.101                                  | 136                                 | 94.327             | 0.487        | 0.090                                  | 130                                 | 94.325             | 0.515        |
| 100YrSCS24Hr     | 0.115                                  | 157                                 | 94.362             | 0.522        | 0.103                                  | 149                                 | 94.364             | 0.544        |
| July 1st, 1979   | 0.091                                  | 206                                 | 94.443             | 0.603        | 0.082                                  | 192                                 | 94.449             | 0.619        |
| August 4th, 1988 | 0.108                                  | 173                                 | 94.389             | 0.549        | 0.096                                  | 165                                 | 94.396             | 0.556        |
| August 8th, 1996 | 0.071                                  | 146                                 | 94.344             | 0.504        | 0.065                                  | 139                                 | 94.344             | 0.494        |
| 100YrCHI+20%     | 0.165                                  | 203                                 | 94.438             | 0.598        | 0.144                                  | 188                                 | 94.439             | 0.579        |

### Peak Flows at Key Locations

The model was run for both existing and proposed conditions, and peak flows were extracted from the key nodes within the watercourse (refer to **Figure A4** for locations). **Table 2** outlines the peak flows for various return periods at each node, covering both the 3-hour Chicago and 24-hour SCS storms for 2- to 100-year events, along with the stress test and historical events.

This analysis indicates minor increases in peak flows to the roadside ditch for lower return period events under post-development conditions (2YrCHI3Hr, 5YrCHI3Hr & 2YRSCS24Hr). However, for larger events (e.g., the 100-year storm), peak flows are equal to or less than those under existing conditions. For the lower return period events (2YrCHI3Hr, 5YrCHI3Hr & 2YRSCS24Hr) that exhibit slight increases in peak flows, the hydraulic modelling indicates that maximum velocities within the ditch remain below 1.5 m/s. This threshold aligns with the maximum permissible velocity for grassed roadside ditches without requiring bioengineering stabilization measures, as outlined in Section 2.3 of SD-9 Roadside Ditches (Conveyance Only) from the MTO Highway Drainage Design Standards. Therefore, it can be concluded that the modest increase in flow rates during smaller storm events will not result in adverse erosion within the grassed channel.

Additionally, both sites will utilize a **75 mm** orifice at the outlet to maximize the storage capacity of these depression areas; this is the smallest allowable outlet size per MECP SWM guidelines.

**Table 2: Pre and Post Development Peak Flow Summary**

| Event            | Node  | J1    |        | Node  | J2    |        | Node  | J3    |        | Node  | J4    |        |
|------------------|-------|-------|--------|-------|-------|--------|-------|-------|--------|-------|-------|--------|
|                  | Pre   | Post  | Diff   | Pre   | Post  | Diff   | Pre   | Post  | Diff   | Pre   | Post  | Diff   |
| Area (ha)        | 0.85  | 1.23  | 0.38   | 4.62  | 5     | 0.38   | 4.93  | 5.31  | 0.38   | 5.52  | 5.9   | 0.38   |
| 2YrCHI3Hr        | 0.015 | 0.019 | 0.004  | 0.057 | 0.062 | 0.005  | 0.061 | 0.066 | 0.005  | 0.067 | 0.072 | 0.005  |
| 5YrCHI3Hr        | 0.026 | 0.027 | 0.001  | 0.102 | 0.102 | 0.000  | 0.109 | 0.109 | 0.000  | 0.121 | 0.122 | 0.001  |
| 10YrCHI3Hr       | 0.035 | 0.032 | -0.003 | 0.136 | 0.132 | -0.004 | 0.145 | 0.141 | -0.004 | 0.162 | 0.159 | -0.003 |
| 25YrCHI3Hr       | 0.047 | 0.038 | -0.009 | 0.181 | 0.172 | -0.009 | 0.194 | 0.185 | -0.009 | 0.218 | 0.209 | -0.009 |
| 50YrCHI3Hr       | 0.057 | 0.043 | -0.014 | 0.219 | 0.205 | -0.014 | 0.234 | 0.220 | -0.014 | 0.263 | 0.249 | -0.014 |
| 100YrCHI3Hr      | 0.067 | 0.048 | -0.019 | 0.258 | 0.239 | -0.019 | 0.277 | 0.258 | -0.019 | 0.311 | 0.292 | -0.019 |
| 2YrSCS24Hr       | 0.024 | 0.024 | 0.000  | 0.090 | 0.091 | 0.001  | 0.096 | 0.097 | 0.001  | 0.107 | 0.108 | 0.001  |
| 5YrSCS24Hr       | 0.038 | 0.032 | -0.006 | 0.148 | 0.142 | -0.006 | 0.158 | 0.152 | -0.006 | 0.177 | 0.171 | -0.006 |
| 10YrSCS24Hr      | 0.049 | 0.037 | -0.012 | 0.189 | 0.178 | -0.011 | 0.202 | 0.191 | -0.011 | 0.227 | 0.216 | -0.011 |
| 25YrSCS24Hr      | 0.062 | 0.044 | -0.018 | 0.242 | 0.224 | -0.018 | 0.259 | 0.242 | -0.017 | 0.291 | 0.274 | -0.017 |
| 50YrSCS24Hr      | 0.073 | 0.049 | -0.024 | 0.284 | 0.260 | -0.024 | 0.305 | 0.281 | -0.024 | 0.343 | 0.320 | -0.023 |
| 100YrSCS24Hr     | 0.084 | 0.055 | -0.029 | 0.329 | 0.300 | -0.029 | 0.354 | 0.325 | -0.029 | 0.399 | 0.370 | -0.029 |
| July 1st, 1979   | 0.090 | 0.060 | -0.030 | 0.372 | 0.345 | -0.027 | 0.399 | 0.371 | -0.028 | 0.448 | 0.420 | -0.028 |
| August 4th, 1988 | 0.079 | 0.053 | -0.026 | 0.314 | 0.287 | -0.027 | 0.338 | 0.313 | -0.025 | 0.379 | 0.354 | -0.025 |
| August 8th, 1996 | 0.052 | 0.040 | -0.012 | 0.210 | 0.199 | -0.011 | 0.226 | 0.215 | -0.011 | 0.254 | 0.243 | -0.011 |
| 100YrCHI+20%     | 0.090 | 0.061 | -0.029 | 0.346 | 0.321 | -0.025 | 0.372 | 0.345 | -0.027 | 0.419 | 0.392 | -0.027 |

**Table 2: Pre and Post Development Peak Flow Summary**

| Event            | Node  | J5    |        | Node  | J6    |       | Node  | J7    |        | Node  | J8    |        |
|------------------|-------|-------|--------|-------|-------|-------|-------|-------|--------|-------|-------|--------|
|                  | Pre   | Post  | Diff   | Pre   | Post  | Diff  | Pre   | Post  | Diff   | Pre   | Post  | Diff   |
| Area (ha)        | 6.86  | 7.23  | 0.37   | 1.01  | 1.02  | 0.01  | 1.83  | 1.46  | -0.37  | 13.1  | 13.09 | -0.01  |
| 2YrCHI3Hr        | 0.080 | 0.086 | 0.006  | 0.016 | 0.021 | 0.005 | 0.019 | 0.018 | -0.001 | 0.141 | 0.146 | 0.005  |
| 5YrCHI3Hr        | 0.147 | 0.149 | 0.002  | 0.025 | 0.028 | 0.003 | 0.035 | 0.034 | -0.001 | 0.264 | 0.265 | 0.001  |
| 10YrCHI3Hr       | 0.197 | 0.196 | -0.001 | 0.034 | 0.034 | 0.000 | 0.047 | 0.047 | 0.000  | 0.361 | 0.357 | -0.004 |
| 25YrCHI3Hr       | 0.267 | 0.260 | -0.007 | 0.047 | 0.047 | 0.000 | 0.065 | 0.064 | -0.001 | 0.493 | 0.483 | -0.010 |
| 50YrCHI3Hr       | 0.323 | 0.312 | -0.011 | 0.057 | 0.057 | 0.000 | 0.079 | 0.078 | -0.001 | 0.602 | 0.586 | -0.016 |
| 100YrCHI3Hr      | 0.384 | 0.368 | -0.016 | 0.069 | 0.069 | 0.000 | 0.095 | 0.094 | -0.001 | 0.721 | 0.700 | -0.021 |
| 2YrSCS24Hr       | 0.128 | 0.130 | 0.002  | 0.023 | 0.023 | 0.000 | 0.032 | 0.031 | -0.001 | 0.233 | 0.234 | 0.001  |
| 5YrSCS24Hr       | 0.215 | 0.211 | -0.004 | 0.039 | 0.039 | 0.000 | 0.054 | 0.053 | -0.001 | 0.400 | 0.393 | -0.007 |
| 10YrSCS24Hr      | 0.277 | 0.268 | -0.009 | 0.051 | 0.051 | 0.000 | 0.070 | 0.069 | -0.001 | 0.517 | 0.505 | -0.012 |
| 25YrSCS24Hr      | 0.357 | 0.342 | -0.015 | 0.066 | 0.066 | 0.000 | 0.092 | 0.090 | -0.002 | 0.675 | 0.656 | -0.019 |
| 50YrSCS24Hr      | 0.421 | 0.400 | -0.021 | 0.079 | 0.079 | 0.000 | 0.110 | 0.107 | -0.003 | 0.800 | 0.776 | -0.024 |
| 100YrSCS24Hr     | 0.491 | 0.465 | -0.026 | 0.093 | 0.093 | 0.000 | 0.129 | 0.126 | -0.003 | 0.939 | 0.906 | -0.033 |
| July 1st, 1979   | 0.557 | 0.530 | -0.027 | 0.094 | 0.094 | 0.000 | 0.137 | 0.130 | -0.007 | 1.057 | 1.018 | -0.039 |
| August 4th, 1988 | 0.462 | 0.440 | -0.022 | 0.085 | 0.085 | 0.000 | 0.121 | 0.115 | -0.006 | 0.883 | 0.857 | -0.026 |
| August 8th, 1996 | 0.308 | 0.300 | -0.008 | 0.058 | 0.058 | 0.000 | 0.082 | 0.079 | -0.003 | 0.586 | 0.576 | -0.010 |
| 100YrCHI+20%     | 0.519 | 0.495 | -0.024 | 0.095 | 0.095 | 0.000 | 0.131 | 0.129 | -0.002 | 0.984 | 0.951 | -0.033 |

## HYDRAULICS

The detailed hydraulic analysis of the downstream study area was conducted using the US Army Corps of Engineers HEC-RAS software (version 6.6). The purpose of this hydraulic analysis is to assess the hydraulic impacts that the proposed Stratford Foxrun development may have on existing water levels for the applicable design storms.

### Model Development & Parameters

The primary method used to establish cross-sections involved detailed topographic surveying, typically conducted at approximately 50-meter intervals along the watercourse. These measurements were supplemented with LiDAR data in the floodplain to enhance spatial coverage and resolution. This close spacing is essential for accurately representing the hydraulic characteristics and flow conveyance capacity of the existing channel. The selected interval aligns with HEC-RAS best practices for open-channel flow modelling in rural systems, particularly where channel geometry and slope are relatively uniform. In general, cross-section spacing between 30 and 100 meters is considered appropriate for natural channels, unless abrupt changes in geometry, slope, or hydraulic controls are present.

To ensure the model captured localized hydraulic effects, additional cross-sections were inserted at key hydraulic structures (e.g., culverts and driveway crossings) and at locations where notable changes in channel geometry or slope occurred. This approach allowed for an accurate representation of hydraulic behaviour without introducing unnecessary complexity or instability into the model. In areas not explicitly surveyed, supplementary cross-sections were generated by sampling the merged LiDAR and topographic Digital Terrain Model (DTM). This ensured that all critical sections were included to accurately reflect channel hydraulics. The extent and location of all model cross-sections are illustrated in **Figure C1** of **Attachment C**.

Existing hydraulic infrastructure, such as culverts, on the respective watercourses, was incorporated into the model based on the details obtained from the topographic surveys. Consistent with HEC-RAS technical guidelines, ineffective flow areas and expansion-contraction coefficients were appropriately applied at these locations. Typical Manning's values of 0.035 and 0.05 were applied to the roadside ditch channel bottom and over banks, respectively.

A normal downstream boundary condition was applied for all events due to the substantial difference in drainage area between Marlborough Creek and the roadside ditch. The study area at the confluence with Marlborough Creek has a drainage area of **13.1 ha**, with a channel length of **1.034 km** and an average slope of **0.6%**, based on detailed modelling presented in this report. In contrast, Marlborough Creek at the same location has a drainage area of **437.4 ha**, a channel length of **5.120 km**, and an average slope of **0.26%**, as per the Ontario Watershed Information Tool. Using the velocity method outlined in Chapter 15 of the USDA's Hydrology National Engineering Handbook, the time to peak for the study area was calculated to be **1.2 hours**, while the time to peak for Marlborough Creek was estimated at **8.8 hours**. A full summary of these calculations is provided in **Table 3** below. Given the significant difference in time to peak between the two systems, it is evident that peak flows from the study area and Marlborough Creek cannot coincide. Therefore, the application of a normal downstream boundary condition is considered appropriate.

Table 3: Watercourse Time to Peak Calculations

| Parameter             | Units        | Study Area  | Malbrough Creek |
|-----------------------|--------------|-------------|-----------------|
| Area                  | (ha)         | 13.1        | 437.4           |
| Channel Length        | (m)          | 1034        | 5120            |
| Slope                 | (%)          | 0.60%       | 0.26%           |
| Flow Type             | -            | Short grass | Short grass     |
| Average Velocity      | (m/s)        | 0.165       | 0.108           |
| Time of Concentration | (secs)       | 6,275       | 47,262          |
| Time of Concentration | (hrs)        | 1.7         | 13.1            |
| <b>Time to Peak</b>   | <b>(hrs)</b> | <b>1.2</b>  | <b>8.8</b>      |

## Results

The pre- and post-development models were run for the full range of design storms (2- to 100-Year Events) to accurately establish the existing and proposed floodplain extents within the study area. **Figures C2 and C3** illustrate the flood extents for both existing and proposed conditions during the 24-hour SCS-type storms (the critical design storm). **Figure C4** provide a comparison between the 100-year floodplain under both existing and proposed conditions. From this figure, it is shown that the 100-year floodplain extents along the ditch are reduced under post-development conditions. This demonstrates that the proposed stormwater management solution is effective and that the proposed development will not worsen existing flood conditions along the ditch. **Attachment C** also includes pre- and post-development long- and cross-section plots, along with summary tables.

This analysis also revealed that flows in the roadside ditch overtop the banks during 5- to 10-year events (depending on the design storm). This is expected, as the typical level of service for driveway crossings is generally in this range. It's crucial to note that existing driveway crossings, not the channel itself, are constricting flows and causing them to overtop the bank. Upsizing several culverts along this stretch of roadside ditch would significantly reduce the floodplain in this area.

Along Eagleson Road, approximately halfway between the railway and the Ottawa Street intersection, flows will overtop the bank and spill west to the culvert under the railway. For a conservative design, the hydraulic modelling does not account for this spill, assuming all flows proceed to the next downstream cross-section. It's also important to emphasize that for all events (up to and including the 100-year event), water levels in the roadside ditch do not reach an elevation that would impede traffic on either Eagleson Road or Ottawa Street, as the flood extents do not touch the shoulder of the road. Furthermore, the maximum 100-year floodplain extents do not affect any nearby buildings, meaning the current and proposed flood extents pose no danger to existing structures.



## CONCLUSION

In summary, JFSA Canada Inc.'s hydrologic and hydraulic modelling confirms that the proposed Stratford Foxrun development's stormwater management plan effectively mitigates downstream impacts. The on-site localized depressions, with **75 mm** orifice outlets, will manage post-development runoff, ensuring peak flows for major storm events (up to 100-year) remain at or below pre-development levels.

The HEC-RAS analysis further demonstrates that the proposed SWM measures will lead to a reduction in the 100-year floodplain extent along the receiving roadside ditch. While existing culverts contribute to minor, more frequent overtopping, the development itself will not worsen these conditions or cause flooding that impedes traffic or endangers structures during major events. The findings indicate that the proposed SWM strategy for this site is sufficient and will not adversely impact downstream lands.

Yours truly,  
**JFSA Canada Inc.**



Jonathon Burnett, B.Eng, P.Eng  
Water Resource Engineer



cc: J.F. Sabourin, M.Eng, P.Eng  
Director of Water Resources Projects

### Figures

Figure 1: Site Boundary and Existing Watercourse

### Tables

Table 1: Site Release Rates / Required Storage Volume / Ponding Depth

Table 2: Peak Flows at Key Locations

### Attachments

- Attachment A: Pre-Development Hydrology
- Attachment B: Post Development Hydrology
- Attachment C: Hydraulic Analysis



JFSA Canada Inc.  
52 Springbrook Drive,  
Ottawa, ON K2S 1B9  
T 613-836-3884 F 613-836-0332

[jfsa.com](http://jfsa.com)

# Attachment A

Pre-Development Hydrology





Legend

- Jock River Tributary
- Pre-dev. Subcatchments

Google Hybrid

EXT1

Subcatchment Name

3.212 ha

Subcatchment Area (ha)

SCALE:

1:3000

050100150 m

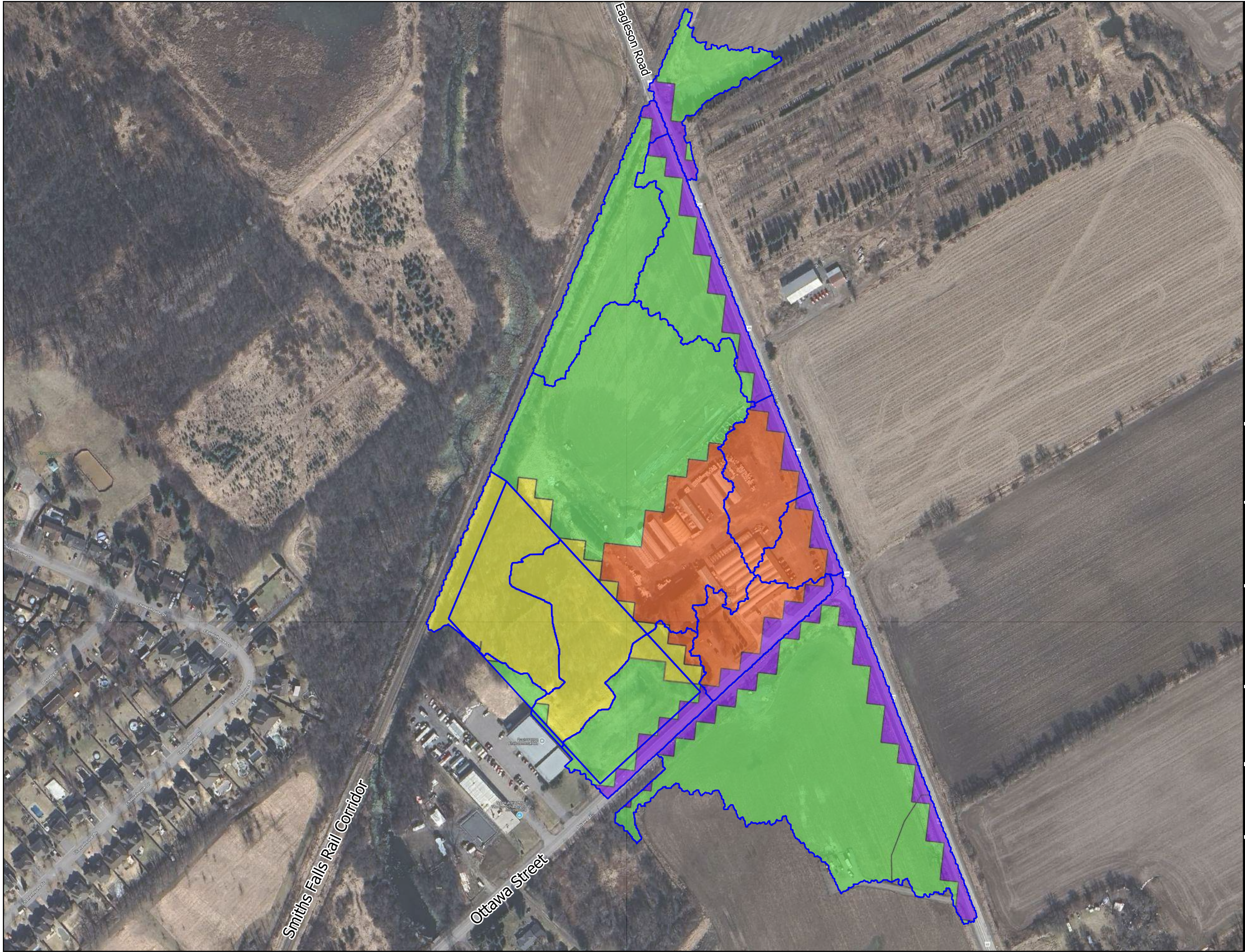


5923 Ottawa St – Richmond

Figure A1: Existing Drainage Areas

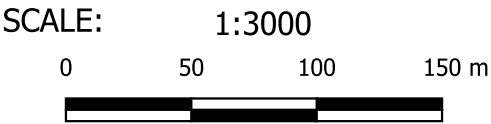
|         |            |
|---------|------------|
| PROJECT | P2710(e01) |
| DRAWN   | MM         |
| DATE    | 04-06-2025 |





**Legend**

-  Pre-dev. Subcatchments
-  CN
-  Built Up Area - Pervious
-  Transportation
-  Forest
-  Tilled
- Google Hybrid

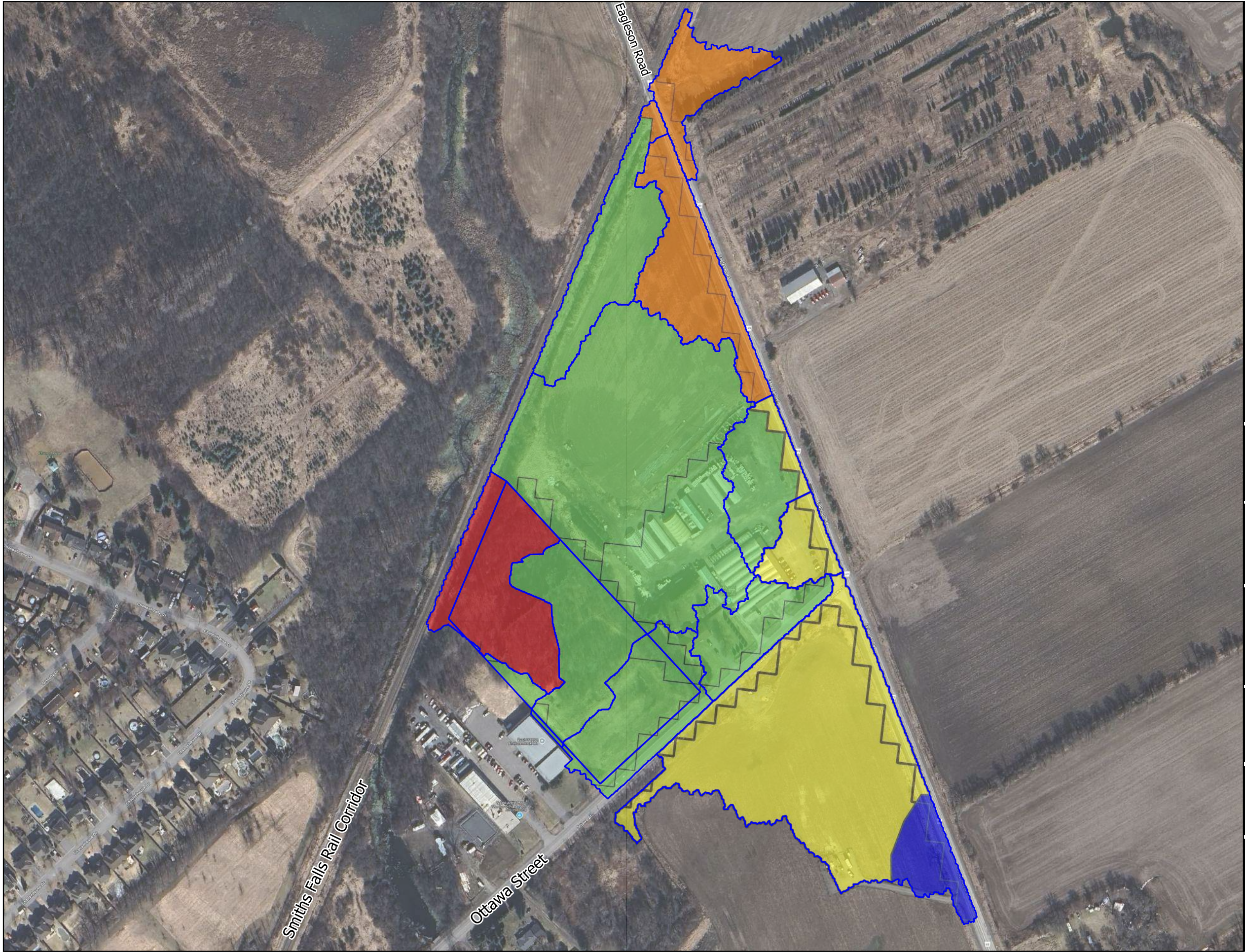


5923 Ottawa St – Richmond

Figure A2: Land Use Data

|         |            |
|---------|------------|
| PROJECT | P2710(e01) |
| DRAWN   | MM         |
| DATE    | 04-06-2025 |

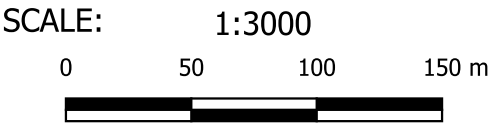




**Legend**

-  Pre-dev. Subcatchments
- Soil Name (Soil Type)
-  ERODED CHANNEL (D)
-  NORTH GOWER (D)
-  DALHOUSIE (D)
-  BRANDON (D)
-  GRENVILLE (B)

Google Hybrid

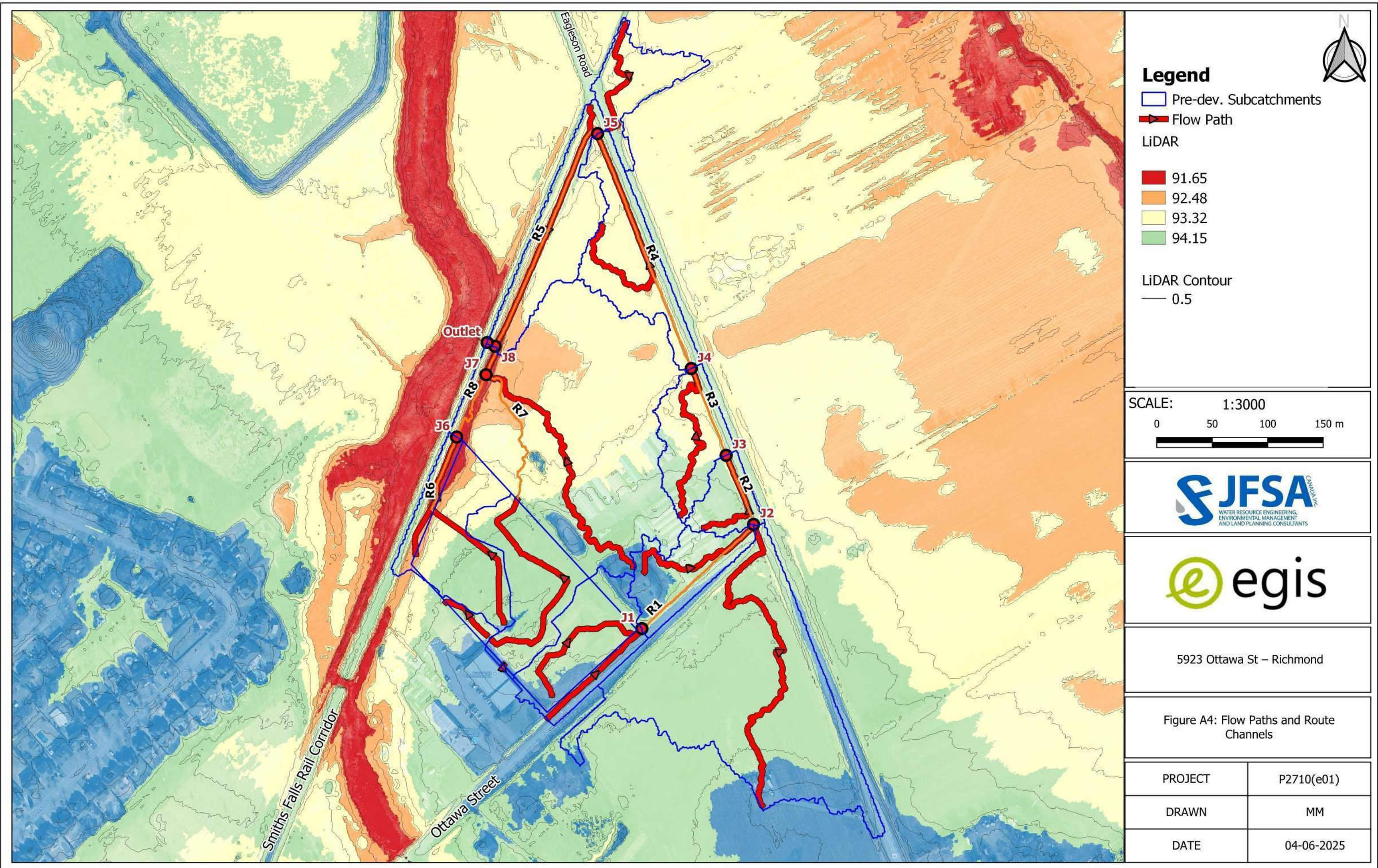


5923 Ottawa St – Richmond

Figure A3: Soil Type

|         |            |
|---------|------------|
| PROJECT | P2710(e01) |
| DRAWN   | MM         |
| DATE    | 04-06-2025 |







**Table A1: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN\*)**

| EXT1 ( 3.212 ha) |                |           |                |            |    |                |             |
|------------------|----------------|-----------|----------------|------------|----|----------------|-------------|
| Area (ha)        | Land Type      | Soil Name | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.107            | Transportation | GRENVILLE | Fair           | B          | 98 | 3.3%           | 3.3         |
| 0.229            | Tilled         | GRENVILLE | Fair           | B          | 69 | 7.1%           | 4.9         |
| 0.403            | Transportation | BRANDON   | Fair           | D          | 98 | 12.5%          | 12.3        |
| 2.472            | Tilled         | BRANDON   | Fair           | D          | 84 | 77.0%          | 64.6        |
|                  |                |           |                |            |    | <b>CN</b>      | <b>85</b>   |
|                  |                |           |                |            |    | <b>CN*</b>     | <b>80</b>   |

| EXT2 ( 0.285 ha) |                          |             |                |            |    |                |             |
|------------------|--------------------------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)        | Land Type                | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.04             | Built Up Area - Pervious | NORTH GOWER | Fair           | D          | 80 | 14.0%          | 11.2        |
| 0.051            | Tilled                   | NORTH GOWER | Fair           | D          | 84 | 17.9%          | 15.0        |
| 0.067            | Forest                   | NORTH GOWER | Fair           | D          | 79 | 23.5%          | 18.6        |
| 0.127            | Transportation           | NORTH GOWER | Fair           | D          | 98 | 44.6%          | 43.7        |
|                  |                          |             |                |            |    | <b>CN</b>      | <b>89</b>   |
|                  |                          |             |                |            |    | <b>CN*</b>     | <b>85</b>   |

| EXT3 ( 0.56 ha) |                          |             |                |            |    |                |             |
|-----------------|--------------------------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)       | Land Type                | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0               | Forest                   | NORTH GOWER | Fair           | D          | 79 | 0.0%           | 0.0         |
| 0.17            | Transportation           | NORTH GOWER | Fair           | D          | 98 | 30.4%          | 29.8        |
| 0.39            | Built Up Area - Pervious | NORTH GOWER | Fair           | D          | 80 | 69.6%          | 55.7        |
|                 |                          |             |                |            |    | <b>CN</b>      | <b>85</b>   |
|                 |                          |             |                |            |    | <b>CN*</b>     | <b>80</b>   |

| EXT4 ( 0.309 ha) |                          |           |                |            |    |                |             |
|------------------|--------------------------|-----------|----------------|------------|----|----------------|-------------|
| Area (ha)        | Land Type                | Soil Name | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.074            | Transportation           | BRANDON   | Fair           | D          | 98 | 23.9%          | 23.5        |
| 0.235            | Built Up Area - Pervious | BRANDON   | Fair           | D          | 80 | 76.1%          | 60.8        |
|                  |                          |           |                |            |    | <b>CN</b>      | <b>84</b>   |
|                  |                          |           |                |            |    | <b>CN*</b>     | <b>79</b>   |

| EXT5 ( 0.594 ha) |                          |             |                |            |    |                |             |
|------------------|--------------------------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)        | Land Type                | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.084            | Transportation           | BRANDON     | Fair           | D          | 98 | 14.1%          | 13.9        |
| 0.51             | Built Up Area - Pervious | NORTH GOWER | Fair           | D          | 80 | 85.9%          | 68.7        |
|                  |                          |             |                |            |    | <b>CN</b>      | <b>83</b>   |
|                  |                          |             |                |            |    | <b>CN*</b>     | <b>76</b>   |

**Table A1: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN\*)**

| EXT6 ( 0.864 ha) |                |           |           |            |    |           |          |
|------------------|----------------|-----------|-----------|------------|----|-----------|----------|
| Area<br>(ha)     | Land Type      | Soil      |           |            | CN | % of      | Weighted |
|                  |                | Soil Name | Condition | Soil Group |    | Catchment | CN       |
| 0.271            | Transportation | DALHOUSIE | Fair      | D          | 98 | 31.4%     | 30.7     |
| 0.593            | Tilled         | DALHOUSIE | Fair      | D          | 84 | 68.6%     | 57.7     |
|                  |                |           |           |            |    | CN        | 88       |
|                  |                |           |           |            |    | CN*       | 85       |

| EXT7 ( 0.47 ha) |                |           |           |            |    |           |          |
|-----------------|----------------|-----------|-----------|------------|----|-----------|----------|
| Area<br>(ha)    | Land Type      | Soil Name | Soil      |            | CN | % of      | Weighted |
|                 |                |           | Condition | Soil Group |    | Catchment | CN       |
| 0.097           | Transportation | DALHOUSIE | Fair      | D          | 98 | 20.6%     | 20.2     |
| 0.374           | Tilled         | DALHOUSIE | Fair      | D          | 84 | 79.6%     | 66.8     |
|                 |                |           |           |            |    | CN        | 87       |
|                 |                |           |           |            |    | CN*       | 83       |

| EXT8 ( 0.835 ha) |                |             |                   |            |    |                   |                |
|------------------|----------------|-------------|-------------------|------------|----|-------------------|----------------|
| Area<br>(ha)     | Land Type      | Soil Name   | Soil<br>Condition | Soil Group | CN | % of<br>Catchment | Weighted<br>CN |
| 0.036            | Transportation | DALHOUSIE   | Fair              | D          | 98 | 4.3%              | 4.2            |
| 0.798            | Tilled         | NORTH GOWER | Fair              | D          | 84 | 95.6%             | 80.3           |
|                  |                |             |                   |            |    | CN                | 85             |
|                  |                |             |                   |            |    | CN*               | 79             |
|                  |                |             |                   |            |    |                   |                |

| EXT9 ( 3.572 ha) |                          |             |           |            |    |            |           |
|------------------|--------------------------|-------------|-----------|------------|----|------------|-----------|
| Area<br>(ha)     | Land Type                | Soil Name   | Soil      |            | CN | % of       | Weighted  |
|                  |                          |             | Condition | Soil Group |    | Catchment  | CN        |
| 0.001            | Transportation           | NORTH GOWER | Fair      | D          | 98 | 0.0%       | 0.0       |
| 0.126            | Forest                   | NORTH GOWER | Fair      | D          | 79 | 3.5%       | 2.8       |
| 0.998            | Built Up Area - Pervious | NORTH GOWER | Fair      | D          | 80 | 27.9%      | 22.4      |
| 2.446            | Tilled                   | NORTH GOWER | Fair      | D          | 84 | 68.5%      | 57.5      |
|                  |                          |             |           |            |    | <b>CN</b>  | <b>83</b> |
|                  |                          |             |           |            |    | <b>CN*</b> | <b>76</b> |

| EXT9a ( 0.011 ha) |           |             |                |            |    |                   |                |
|-------------------|-----------|-------------|----------------|------------|----|-------------------|----------------|
| Area<br>(ha)      | Land Type | Soil Name   | Soil Condition | Soil Group | CN | % of<br>Catchment | Weighted<br>CN |
| 0.011             | Tilled    | NORTH GOWER | Fair           | D          | 84 | 100.0%            | 84.0           |
|                   |           |             |                |            |    | CN                | 84             |
|                   |           |             |                |            |    | CN*               | 78             |

| EXT10 ( 0.203 ha) |           |                |                |            |    |                   |                |
|-------------------|-----------|----------------|----------------|------------|----|-------------------|----------------|
| Area<br>(ha)      | Land Type | Soil Name      | Soil Condition | Soil Group | CN | % of<br>Catchment | Weighted<br>CN |
| 0.203             | Forest    | ERODED CHANNEL | Fair           | D          | 79 | 100.0%            | 79.0           |
|                   |           |                |                |            |    | CN                | 79             |
|                   |           |                |                |            |    | CN*               | 71             |

**Table A1: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN\*)**

| Pre10 ( 0.803 ha) |           |                |                |            |    |                |             |
|-------------------|-----------|----------------|----------------|------------|----|----------------|-------------|
| Area (ha)         | Land Type | Soil Name      | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.803             | Forest    | ERODED CHANNEL | Fair           | D          | 79 | 100.0%         | 79.0        |
|                   |           |                |                |            |    | <b>CN</b>      | <b>79</b>   |
|                   |           |                |                |            |    | <b>CN*</b>     | <b>71</b>   |

| Pre11 ( 0.069 ha) |           |             |                |            |    |                |             |
|-------------------|-----------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)         | Land Type | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.004             | Forest    | NORTH GOWER | Fair           | D          | 79 | 5.8%           | 4.6         |
| 0.065             | Tilled    | NORTH GOWER | Fair           | D          | 84 | 94.2%          | 79.1        |
|                   |           |             |                |            |    | <b>CN</b>      | <b>84</b>   |
|                   |           |             |                |            |    | <b>CN*</b>     | <b>78</b>   |

| Pre2 ( 0.565 ha) |                |             |                |            |    |                |             |
|------------------|----------------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)        | Land Type      | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0.017            | Transportation | NORTH GOWER | Fair           | D          | 98 | 3.0%           | 2.9         |
| 0.066            | Forest         | NORTH GOWER | Fair           | D          | 79 | 11.7%          | 9.2         |
| 0.483            | Tilled         | NORTH GOWER | Fair           | D          | 84 | 85.5%          | 71.8        |
|                  |                |             |                |            |    | <b>CN</b>      | <b>84</b>   |
|                  |                |             |                |            |    | <b>CN*</b>     | <b>78</b>   |

| Pre9 ( 0.83 ha) |                          |             |                |            |    |                |             |
|-----------------|--------------------------|-------------|----------------|------------|----|----------------|-------------|
| Area (ha)       | Land Type                | Soil Name   | Soil Condition | Soil Group | CN | % of Catchment | Weighted CN |
| 0               | Built Up Area - Pervious | NORTH GOWER | Fair           | D          | 80 | 0.0%           | 0.0         |
| 0.014           | Tilled                   | NORTH GOWER | Fair           | D          | 84 | 1.7%           | 1.4         |
| 0.815           | Forest                   | NORTH GOWER | Fair           | D          | 79 | 98.2%          | 77.6        |
|                 |                          |             |                |            |    | <b>CN</b>      | <b>79</b>   |
|                 |                          |             |                |            |    | <b>CN*</b>     | <b>71</b>   |



Table A2: Time to Peak Calculations

| Parameter                                              | Units  | EXT1  | EXT2  | EXT3  | EXT4  | EXT5  | EXT6  | EXT7  | EXT8  | EXT9  | EXT9a | EXT10 | Pre10 | Pre11 | Pre2  | Pre9  |
|--------------------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Area                                                   | ha     | 3.211 | 0.285 | 0.560 | 0.309 | 0.594 | 0.864 | 0.471 | 0.834 | 3.571 | 0.011 | 0.203 | 0.803 | 0.069 | 0.566 | 0.829 |
| CN                                                     | -      | 80    | 85    | 80    | 79    | 76    | 85    | 83    | 79    | 76    | 78    | 71    | 71    | 78    | 78    | 71    |
| Ptotal to calc C from CN, use 2 yr 24 hr Chicago storm | P(mm)  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  | 48.7  |
|                                                        | la(mm) | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
|                                                        | RV(mm) | 17.7  | 21.4  | 18.0  | 16.9  | 15.4  | 21.2  | 19.7  | 17.1  | 15.6  | 16.7  | 12.9  | 12.9  | 16.4  | 16.7  | 12.9  |
| C (From Chicago storm)                                 | -      | 0.363 | 0.439 | 0.370 | 0.348 | 0.317 | 0.436 | 0.404 | 0.351 | 0.319 | 0.342 | 0.265 | 0.265 | 0.337 | 0.342 | 0.265 |
| Length of Channel                                      | m      | 404   | 121   | 161   | 116   | 215   | 279   | 140   | 263   | 344   | 5     | 121   | 135   | 54    | 145   | 236   |
|                                                        | ft     | 1327  | 397   | 527   | 381   | 705   | 916   | 459   | 862   | 1128  | 15    | 398   | 443   | 176   | 475   | 776   |
| Elevation of Head Water                                | m      | 94.63 | 94.17 | 94.91 | 93.95 | 94.08 | 92.97 | 93.24 | 93.52 | 94.94 | 94.74 | 91.69 | 94.14 | 94.09 | 94.34 | 94.11 |
|                                                        | ft     | 310   | 309   | 311   | 308   | 309   | 305   | 306   | 307   | 311   | 311   | 301   | 309   | 309   | 310   | 309   |
| Elevation of Outlet                                    | m      | 92.98 | 93.57 | 93.00 | 92.69 | 92.44 | 91.96 | 92.11 | 90.43 | 90.46 | 94.55 | 91.11 | 91.71 | 93.58 | 93.80 | 93.20 |
|                                                        | ft     | 305   | 307   | 305   | 304   | 303   | 302   | 302   | 297   | 297   | 310   | 299   | 301   | 307   | 308   | 306   |
| Average Slope                                          | %      | 0.41% | 0.50% | 1.18% | 1.08% | 0.76% | 0.36% | 0.81% | 1.17% | 1.30% | 4.28% | 0.49% | 1.80% | 0.96% | 0.38% | 0.38% |
| Flow Type (Uplands)                                    | -      | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     | B     |
| <b>Kirpich</b>                                         |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time of Concentration                                  | mins   | 16    | 6     | 5     | 4     | 8     | 13    | 6     | 8     | 9     | 0     | 6     | 4     | 2     | 8     | 11    |
| Time to Peak                                           | min    | 11    | 4     | 4     | 3     | 5     | 9     | 4     | 5     | 6     | 0     | 4     | 3     | 2     | 5     | 7     |
| Time to Peak                                           | Hours  | 0.18  | 0.07  | 0.06  | 0.05  | 0.09  | 0.14  | 0.06  | 0.09  | 0.10  | 0.00  | 0.07  | 0.04  | 0.03  | 0.09  | 0.12  |
| <b>FAA (From Chicago storm)</b>                        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time of Concentration                                  | mins   | 65    | 30    | 29    | 26    | 41    | 51    | 29    | 37    | 43    | 3     | 38    | 26    | 18    | 41    | 58    |
| Time to Peak                                           | mins   | 43    | 20    | 19    | 17    | 27    | 34    | 19    | 25    | 29    | 2     | 25    | 17    | 12    | 27    | 38    |
| Time to Peak                                           | Hours  | 0.72  | 0.33  | 0.32  | 0.29  | 0.45  | 0.56  | 0.32  | 0.42  | 0.48  | 0.04  | 0.42  | 0.29  | 0.21  | 0.46  | 0.64  |
| <b>Barnsby Williams</b>                                |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time of Concentration                                  | mins   | 25    | 9     | 9     | 7     | 14    | 20    | 9     | 15    | 17    | 0     | 9     | 7     | 4     | 11    | 17    |
| Time to Peak                                           | mins   | 17    | 6     | 6     | 5     | 9     | 13    | 6     | 10    | 11    | 0     | 6     | 5     | 3     | 7     | 11    |
| Time to Peak                                           | Hours  | 0.28  | 0.10  | 0.11  | 0.08  | 0.15  | 0.22  | 0.10  | 0.17  | 0.18  | 0.00  | 0.10  | 0.08  | 0.05  | 0.12  | 0.19  |
| <b>SCS</b>                                             |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time of Concentration                                  | mins   | 63    | 18    | 17    | 15    | 31    | 42    | 17    | 27    | 34    | 1     | 28    | 16    | 9     | 30    | 54    |
| Time to Peak                                           | mins   | 42    | 12    | 12    | 10    | 21    | 28    | 12    | 18    | 23    | 0     | 19    | 11    | 6     | 20    | 36    |
| Time to Peak                                           | Hours  | 0.70  | 0.20  | 0.19  | 0.16  | 0.34  | 0.47  | 0.19  | 0.30  | 0.38  | 0.01  | 0.31  | 0.18  | 0.10  | 0.34  | 0.61  |
| <b>Uplands</b>                                         |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time of Concentration                                  | mins   | 69    | 19    | 16    | 12    | 27    | 50    | 17    | 26    | 33    | 0     | 19    | 11    | 6     | 26    | 41    |
| Time to Peak                                           | mins   | 46    | 12    | 11    | 8     | 18    | 34    | 11    | 18    | 22    | 0     | 13    | 7     | 4     | 17    | 28    |
| Time to Peak                                           | Hours  | 0.76  | 0.21  | 0.18  | 0.13  | 0.30  | 0.56  | 0.19  | 0.29  | 0.36  | 0.00  | 0.21  | 0.12  | 0.07  | 0.28  | 0.46  |
| <b>Selected Method: FAA (From Chicago storm)</b>       |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time to Peak                                           | min    | 43    | 20    | 19    | 17    | 27    | 34    | 19    | 25    | 29    | 2     | 25    | 17    | 12    | 27    | 38    |
| Time to Peak                                           | Hours  | 0.72  | 0.33  | 0.32  | 0.29  | 0.45  | 0.56  | 0.32  | 0.42  | 0.48  | 0.04  | 0.42  | 0.29  | 0.21  | 0.46  | 0.64  |
| Velocity                                               | m/s    | 0.16  | 0.10  | 0.14  | 0.11  | 0.13  | 0.14  | 0.12  | 0.18  | 0.20  | 0.04  | 0.08  | 0.13  | 0.07  | 0.09  | 0.10  |

```

1  20      Metric units / ID numbers OFF
2  *#*****
   *****
3  *#  SWMHYMO  / INPUT DATA FILE
4  *#*****
   *****
5  *#  Project Name   : [5923 Ottawa St]
6  *#  Project Number: [P2710(e01)]
7  *#  Date           : [2025 FEB 05]
8  *#  Modeller       : [MM]
9  *#  Company        : JFSA Canada Inc.
10 *#  License #      : 2549237
11 *#*****
   *****
12 *# Model developed to simulate runoff from subcatchments under pre development conditions
13 *#*****
   *****
14 *%  25 mm Storm based on 2-Year, 3-Hour Chicago Storm
15 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
16                [ "002YC3H.stm" ] <--storm filename, one per line for NSTORM time
17 *%-----|-----
18 READ STORM      STORM_FILENAME=[ "STORM.001" ]
19 *%-----|-----
20 *#*****
   *****
21 *#  EXT1
22 *#*****
   *****
23 CALIB NASHYD    NHYD=[ "EXT1" ], DT[1] (min), AREA=[3.211] (ha),
24                 DWF=[0] (cms), CN=[80],
25                 IA=[4.67] (mm), N=[3], TP[0.72] (hrs),
26                 RAINFALL[ , , -1]
27 *#*****
   *****
28 *#  EXT2
29 *#*****
   *****
30 CALIB NASHYD    NHYD=[ "EXT2" ], DT[1] (min), AREA=[0.285] (ha),
31                 DWF=[0] (cms), CN=[85],
32                 IA=[4.67] (mm), N=[3], TP[0.33] (hrs),
33                 RAINFALL[ , , -1]
34 *#*****
   *****
35 *#  EXT3
36 *#*****
   *****
37 CALIB NASHYD    NHYD=[ "EXT3" ], DT[1] (min), AREA=[0.560] (ha),
38                 DWF=[0] (cms), CN=[80],
39                 IA=[4.67] (mm), N=[3], TP[0.32] (hrs),
40                 RAINFALL[ , , -1]
41 *#*****
   *****
42 *#  EXT4
43 *#*****
   *****
44 CALIB NASHYD    NHYD=[ "EXT4" ], DT[1] (min), AREA=[0.309] (ha),
45                 DWF=[0] (cms), CN=[79],
46                 IA=[4.67] (mm), N=[3], TP[0.29] (hrs),
47                 RAINFALL[ , , -1]
48 *#*****
   *****
49 *#  EXT5
50 *#*****
   *****
51 CALIB NASHYD    NHYD=[ "EXT5" ], DT[1] (min), AREA=[0.594] (ha),
52                 DWF=[0] (cms), CN=[76],
53                 IA=[4.67] (mm), N=[3], TP[0.45] (hrs),
54                 RAINFALL[ , , -1]
55 *#*****

```

```

*****
56 *# EXT6
57 *#*****
*****
58 CALIB NASHYD      NHYD=["EXT6"], DT[1] (min), AREA=[0.864] (ha),
59                   DWF=[0] (cms), CN=[85],
60                   IA=[4.67] (mm), N=[3], TP[0.56] (hrs),
61                   RAINFALL[ , , -1]
62 *#*****
*****
63 *# EXT7
64 *#*****
*****
65 CALIB NASHYD      NHYD=["EXT7"], DT[1] (min), AREA=[0.471] (ha),
66                   DWF=[0] (cms), CN=[83],
67                   IA=[4.67] (mm), N=[3], TP[0.32] (hrs),
68                   RAINFALL[ , , -1]
69 *#*****
*****
70 *# EXT8
71 *#*****
*****
72 CALIB NASHYD      NHYD=["EXT8"], DT[1] (min), AREA=[0.834] (ha),
73                   DWF=[0] (cms), CN=[79],
74                   IA=[4.67] (mm), N=[3], TP[0.42] (hrs),
75                   RAINFALL[ , , -1]
76 *#*****
*****
77 *# EXT9
78 *#*****
*****
79 CALIB NASHYD      NHYD=["EXT9"], DT[1] (min), AREA=[3.571] (ha),
80                   DWF=[0] (cms), CN=[76],
81                   IA=[4.67] (mm), N=[3], TP[0.48] (hrs),
82                   RAINFALL[ , , -1]
83 *#*****
*****
84 *# EXT9a
85 *#*****
*****
86 CALIB NASHYD      NHYD=["EXT9a"], DT[1] (min), AREA=[0.011] (ha),
87                   DWF=[0] (cms), CN=[78],
88                   IA=[4.67] (mm), N=[3], TP[0.04] (hrs),
89                   RAINFALL[ , , -1]
90 *#*****
*****
91 *# EXT10
92 *#*****
*****
93 CALIB NASHYD      NHYD=["EXT10"], DT[1] (min), AREA=[0.203] (ha),
94                   DWF=[0] (cms), CN=[71],
95                   IA=[4.67] (mm), N=[3], TP[0.42] (hrs),
96                   RAINFALL[ , , -1]
97 *#*****
*****
98 *# Pre2
99 *#*****
*****
100 CALIB NASHYD      NHYD=["Pre2"], DT[1] (min), AREA=[0.566] (ha),
101                   DWF=[0] (cms), CN=[78],
102                   IA=[4.67] (mm), N=[3], TP[0.46] (hrs),
103                   RAINFALL[ , , -1]
104 *#*****
*****
105 *# Pre9
106 *#*****
*****
107 CALIB NASHYD      NHYD=["Pre9"], DT[1] (min), AREA=[0.829] (ha),
108                   DWF=[0] (cms), CN=[71],

```

```

109             IA=[4.67] (mm), N=[3], TP[0.64] (hrs),
110             RAINFALL[ , , -1]
111 *#*****
112 *# Pre10
113 *#*****
114 CALIB NASHYD      NHYD=["Pre10"], DT[1] (min), AREA=[0.803] (ha),
115                   DWF=[0] (cms), CN=[71],
116                   IA=[4.67] (mm), N=[3], TP[0.29] (hrs),
117                   RAINFALL[ , , -1]
118 *#*****
119 *# Pre11
120 *#*****
121 CALIB NASHYD      NHYD=["Pre11"], DT[1] (min), AREA=[0.069] (ha),
122                   DWF=[0] (cms), CN=[78],
123                   IA=[4.67] (mm), N=[3], TP[0.21] (hrs),
124                   RAINFALL[ , , -1]
125 *#*****
126 ADD HYD           NHYDsum=["J1"], NHYDs to add=["EXT2"+"Pre2"]
127 *%-----|-----|
128 * NOTE: Cross-section number 849.0434 is taken from HEC-RAS Model
129 ROUTE CHANNEL     NHYDout=["R1"], NHYDin=["J1"], RDT=[1] (min),
130                   CHLGTH=[143.151] (m), CHSLOPE=[0.394] (%), FPSLOPE=[0.394] (%),
131                   SECNUM=[849.0434], NSEG=[3],
132                   ( SEGROUGH, SEGDIST (m))=[0.08,18.95 -0.035,26.78 0.08,35.18] NSEG
133                   times
134                   ( DISTANCE (m), ELEVATION (m))=[0.48, 94.05]
135                   [3.19, 93.99]
136                   [6.85, 93.91]
137                   [10.48, 93.87]
138                   [17.45, 93.85]
139                   [18.95, 93.84]
140                   [20.36, 93.81]
141                   [22.3, 93.76]
142                   [22.53, 93.72]
143                   [23.98, 93.35]
144                   [24.35, 93.33]
145                   [24.65, 93.37]
146                   [25.04, 93.45]
147                   [26.04, 93.74]
148                   [26.44, 93.82]
149                   [26.78, 93.87]
150                   [29.14, 94.11]
151                   [33.98, 94.26]
152                   [35.18, 94.26]
153 *%-----|-----|
154 ADD HYD           NHYDsum=["J2"], NHYDs to add=["R1"+"EXT3"+"EXT1"]
155 *%-----|-----|
156 * NOTE: Cross-section number 737.5813 is taken from HEC-RAS Model
157 ROUTE CHANNEL     NHYDout=["R2"], NHYDin=["J2"], RDT=[1] (min),
158                   CHLGTH=[73.338] (m), CHSLOPE=[0.425] (%), FPSLOPE=[0.425] (%),
159                   SECNUM=[737.5813], NSEG=[3],
160                   ( SEGROUGH, SEGDIST (m))=[0.08,8.4 -0.035,16.42 0.08,22.6] NSEG
161                   times
162                   ( DISTANCE (m), ELEVATION (m))=[0, 93.52]
163                   [1.08, 93.5]
164                   [4.37, 93.48]
165                   [6.31, 93.45]
166                   [8.4, 93.38]
167                   [9.5, 93.31]
168                   [10.49, 93.23]
169                   [10.99, 93.18]
170                   [12.4, 92.94]
171                   [13.11, 92.84]
172                   [13.67, 92.92]

```



```

171                                     [16.42, 93.6]
172                                     [16.91, 93.65]
173                                     [17.97, 93.65]
174                                     [19, 93.83]
175                                     [19.51, 93.89]
176                                     [21.06, 93.94]
177                                     [22.6, 93.95]
178 *%-----|-----|
179 ADD HYD          NHYDsum=["J3"], NHYDs to add=["R2"+"EXT4"]
180 *%-----|-----|
181 * NOTE: Cross-section number 675.4097 is taken from HEC-RAS Model
182 ROUTE CHANNEL    NHYDout=["R3"], NHYDin=["J3"], RDT=[1] (min),
183                  CHLGTH=[92.08] (m), CHSLOPE=[0.274] (%), FPSLOPE=[0.274] (%),
184                  SECNUM=[675.4097], NSEG=[3],
185                  ( SEGROUGH, SEGDIST (m))=[0.08,31.64 -0.035,42.44 0.08,48.87] NSEG
186                  times
187                  ( DISTANCE (m), ELEVATION (m))=[30.59, 93.12]
188                  [31.64, 93.13]
189                  [34.35, 93.08]
190                  [35.18, 93.03]
191                  [37.78, 92.72]
192                  [38.25, 92.64]
193                  [38.7, 92.61]
194                  [39.74, 92.76]
195                  [42.44, 93.41]
196                  [42.89, 93.49]
197                  [43.97, 93.57]
198                  [44.92, 93.6]
199                  [46.07, 93.67]
200                  [48.87, 93.74]
201 *%-----|-----|
202 ADD HYD          NHYDsum=["J4"], NHYDs to add=["R3"+"EXT5"]
203 *%-----|-----|
204 * NOTE: Cross-section number 518.7506 is taken from HEC-RAS Model
205 ROUTE CHANNEL    NHYDout=["R4"], NHYDin=["J4"], RDT=[1] (min),
206                  CHLGTH=[251.495] (m), CHSLOPE=[0.19] (%), FPSLOPE=[0.19] (%),
207                  SECNUM=[518.7506], NSEG=[3],
208                  ( SEGROUGH, SEGDIST (m))=[0.08,51.48 -0.035,59.39 0.08,66.4] NSEG
209                  times
210                  ( DISTANCE (m), ELEVATION (m))=[0, 92.92]
211                  [4.26, 92.9]
212                  [48.31, 92.76]
213                  [51.48, 92.76]
214                  [53.64, 92.7]
215                  [55.33, 92.29]
216                  [55.44, 92.29]
217                  [56.43, 92.37]
218                  [56.97, 92.43]
219                  [59.39, 93.27]
220                  [59.74, 93.37]
221                  [60.8, 93.52]
222                  [63.31, 93.71]
223                  [66.4, 93.76]
224 *%-----|-----|
225 ADD HYD          NHYDsum=["J5"], NHYDs to add=["R4"+"EXT6"+"EXT7"]
226 *%-----|-----|
227 * NOTE: Cross-section number 275.0857 is taken from HEC-RAS Model
228 ROUTE CHANNEL    NHYDout=["R5"], NHYDin=["J5"], RDT=[1] (min),
229                  CHLGTH=[237.343] (m), CHSLOPE=[0.644] (%), FPSLOPE=[0.644] (%),
230                  SECNUM=[275.0857], NSEG=[3],
231                  ( SEGROUGH, SEGDIST (m))=[0.08,40.82 -0.035,53.64 0.08,57.93] NSEG
232                  times
233                  ( DISTANCE (m), ELEVATION (m))=[36.16, 92.63]
234                  [40.82, 92.97]
235                  [41.39, 92.9]
236                  [44.69, 91.72]
237                  [45.24, 91.58]
238                  [46.33, 91.43]
239                  [47.41, 91.64]

```

```

237                                     [47.87, 91.75]
238                                     [49.59, 92.2]
239                                     [50.99, 92.36]
240                                     [51.44, 92.48]
241                                     [53.18, 92.98]
242                                     [53.64, 93.15]
243                                     [55.92, 93.66]
244                                     [57.93, 93.68]
245 *%-----|-----
246 * NOTE: Cross-section number 124 is taken from HEC-RAS Model
247 ROUTE CHANNEL      NHYDout=["R6"], NHYDin=["Pre10"], RDT=[1] (min),
248                   CHLGTH=[77.414] (m), CHSLOPE=[0.776] (%), FPSLOPE=[0.776] (%),
249                   SECNUM=[124], NSEG=[3],
250                   ( SEGROUGH, SEGDIST (m))=[0.08,8.34 -0.035,31.31 0.08,84.97] NSEG
251                   times
252                   ( DISTANCE (m), ELEVATION (m))=[1.78, 93.73]
253                                     [4.51, 93.54]
254                                     [5.06, 93.31]
255                                     [7.25, 92.98]
256                                     [7.79, 92.77]
257                                     [8.34, 92.49]
258                                     [9.43, 91.93]
259                                     [9.68, 91.81]
260                                     [10.53, 91.27]
261                                     [12.64, 90.92]
262                                     [14.44, 90.9]
263                                     [16.54, 91.06]
264                                     [17.64, 91.06]
265                                     [30.22, 92.3]
266                                     [31.31, 92.45]
267                                     [33.5, 92.41]
268                                     [55.37, 93.11]
269                                     [57.01, 93.2]
270                                     [84.97, 93.43]
271 *%-----|-----
272 * NOTE: Cross-section number 74 is taken from HEC-RAS Model
273 ROUTE CHANNEL      NHYDout=["R7"], NHYDin=["Pre9"], RDT=[1] (min),
274                   CHLGTH=[159.151] (m), CHSLOPE=[1.576] (%), FPSLOPE=[1.576] (%),
275                   SECNUM=[74], NSEG=[3],
276                   ( SEGROUGH, SEGDIST (m))=[0.08,4.67 -0.035,81.24 0.08,82.88] NSEG
277                   times
278                   ( DISTANCE (m), ELEVATION (m))=[1.94, 93.64]
279                                     [4.67, 93.32]
280                                     [5.77, 93.15]
281                                     [7.41, 92.69]
282                                     [7.95, 92.37]
283                                     [9.36, 91.71]
284                                     [10.12, 91.22]
285                                     [10.49, 91.06]
286                                     [12.64, 90.89]
287                                     [16.16, 90.92]
288                                     [18.83, 91.66]
289                                     [19.59, 92.02]
290                                     [21.62, 92.39]
291                                     [24.87, 92.48]
292                                     [30.37, 92.55]
293                                     [34.37, 92.65]
294                                     [77.41, 92.82]
295                                     [80.6, 93.25]
296                                     [81.24, 93.48]
297                                     [82.88, 93.79]
298 *%-----|-----
299 ADD HYD             NHYDsum=["J6"], NHYDs to add=["R6"+"EXT10"]
300 *%-----|-----
301 * NOTE: Cross-section number 49 is taken from HEC-RAS Model
302 ROUTE CHANNEL      NHYDout=["R8"], NHYDin=["J6"], RDT=[1] (min),
303                   CHLGTH=[78.801] (m), CHSLOPE=[0.522] (%), FPSLOPE=[0.522] (%),
304                   SECNUM=[49], NSEG=[3],
305                   ( SEGROUGH, SEGDIST (m))=[0.08,8.71 -0.035,20.59 0.08,116.73] NSEG

```

```

304         times
305         ( DISTANCE (m), ELEVATION (m))=[0, 93.36]
306         [1.93, 93.63]
307         [4.61, 93.26]
308         [6.23, 93.1]
309         [8.19, 92.26]
310         [8.71, 91.84]
311         [9.86, 91.47]
312         [10.53, 91.04]
313         [13.84, 91]
314         [14.5, 91.11]
315         [16.97, 91.27]
316         [20.59, 91.76]
317         [23.3, 91.64]
318         [30.34, 91.85]
319         [35.29, 91.92]
320         [116.73, 92.96]
321 *%-----|-----
322 ADD HYD      NHYDsum=["J7"], NHYDs to add=["R8"+"R7"]
323 *%-----|-----
324 * NOTE: Cross-section number 7 is taken from HEC-RAS Model
325 ROUTE CHANNEL NHYDout=["R9"], NHYDin=["J7"], RDT=[1] (min),
326             CHLGTH=[29.445] (m), CHSLOPE=[0.887] (%), FPSLOPE=[0.887] (%),
327             SECNUM=[7], NSEG=[3],
328             ( SEGROUGH, SEGDIST (m))=[0.08,1.5 -0.035,22.44 0.08,100.08] NSEG
329             times
330             ( DISTANCE (m), ELEVATION (m))=[0, 93.4]
331             [1.5, 93.63]
332             [3.13, 93.62]
333             [4.76, 93.28]
334             [5.3, 93.25]
335             [6.52, 93.08]
336             [6.96, 92.95]
337             [10.57, 90.95]
338             [13.59, 90.67]
339             [15.83, 90.72]
340             [16.42, 90.85]
341             [18.66, 91.76]
342             [20.82, 91.86]
343             [22.44, 91.92]
344             [27.84, 91.98]
345             [30.15, 91.96]
346             [100.08, 92.61]
347 *%-----|-----
348 ADD HYD      NHYDsum=["J8"], NHYDs to add=["EXT9"+"R9"+"EXT8"+"R5"]
349 *%-----|-----
350 * Note: The pipe needs to be adjusted based on the Culvert-under-railway information
351 ROUTE PIPE    PTYPE=[1]circ, NHYDout=["Outlet"], RNUMBER=[1.0],
352             PDIAM=[525] (mm), PLNGTH=[8.407] (m), PROUGH=[0.013],
353             PSLOPE=[0.0001] (m/m),
354             NHYDin=["J8"], RDT=[1] (min)
355 *%-----|-----
356 *#####
357 *# STORMS
358 *#####
359 *% 2-Year, 3-Hour Chicago Storm
360 *START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[002]
361 *             ["002YC3H.stm"] <--storm filename, one per line for NSTORM time
362 *%-----|-----
363 *% 5-Year, 3-Hour Chicago Storm
364 *START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[005]
365 *             ["005YC3H.stm"] <--storm filename, one per line for NSTORM time
366 *%-----|-----
367 *% 10-Year, 3-Hour Chicago Storm
368 *START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[010]
369 *             ["010YC3H.stm"] <--storm filename, one per line for NSTORM time
370 *%-----|-----
371 *% 25-Year, 3-Hour Chicago Storm
372 *START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[025]

```

```

370      ["025YC3H.stm"] <--storm filename, one per line for NSTORM time
371  *%-----|-----|
372  *% 50-Year, 3-Hour Chicago Storm
373  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[050]
374      ["050YC3H.stm"] <--storm filename, one per line for NSTORM time
375  *%-----|-----|
376  *% 100-Year, 3-Hour Chicago Storm
377  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[099]
378      ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
379  *%-----|-----|
380  *% 2-Year, 24-Hour SCS Storm
381  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[102]
382      ["SC24002x.stm"] <--storm filename, one per line for NSTORM time
383  *%-----|-----|
384  *% 5-Year, 24-Hour SCS Storm
385  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[105]
386      ["SC24005x.stm"] <--storm filename, one per line for NSTORM time
387  *%-----|-----|
388  *% 10-Year, 24-Hour SCS Storm
389  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[110]
390      ["SC24010x.stm"] <--storm filename, one per line for NSTORM time
391  *%-----|-----|
392  *% 25-Year, 24-Hour SCS Storm
393  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[125]
394      ["SC24025x.stm"] <--storm filename, one per line for NSTORM time
395  *%-----|-----|
396  *% 50-Year, 24-Hour SCS Storm
397  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[150]
398      ["SC24050x.stm"] <--storm filename, one per line for NSTORM time
399  *%-----|-----|
400  *% 100-Year, 24-Hour SCS Storm
401  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[199]
402      ["SC24100x.stm"] <--storm filename, one per line for NSTORM time
403  *%-----|-----|
404  *% July 1st, 1979 Storm - Ottawa International Airport
405  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1979]
406      ["19790701.stm"] <--storm filename, one per line for NSTORM time
407  *%-----|-----|
408  *% August 4th, 1988 Storm - Ottawa International Airport
409  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1988]
410      ["19880804.stm"] <--storm filename, one per line for NSTORM time
411  *%-----|-----|
412  *% August 8th, 1996 Storm - Ottawa International Airport
413  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1996]
414      ["19960808.stm"] <--storm filename, one per line for NSTORM time
415  *%-----|-----|
416  *% 100-Year, 3-Hour Chicago Storm + 20%
417  START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[9999]
418      ["100YC3H+.STM"] <--storm filename, one per line for NSTORM time
419  *%-----|-----|
420  FINISH

```



```
00001 *****
00002 SSSSS W W M M H H Y Y M M O O 222 000 11 5555 *****
00003 S S S S W W M M H H Y Y M M O O 2 0 0 11 5
00004 S S S S W W M M H H Y Y M M O O 2 0 0 11 5 Ver 5.500
00005 SSSSS W W M M H H Y Y M M O O 222 0 0 11 555 FEB 2015
00006 S S S S W W M M H H Y Y M M O O 2 0 0 11 5
00007 SSSSS W W M M H H Y Y M M O O 2 0 0 11 5 *****
00008 *****
00009 StormWater Management Hydrologic Model 222 000 11 555 *****
00010 *****
00011 *****
00012 ***** SWHYNDY Ver 5.500 *****
00013 ***** A single event and continuous hydrologic simulation model *****
00014 ***** based on the principles of HYND and its successors *****
00015 ***** OTTHYND-S3 and OTTHYND-S9 *****
00016 *****
00017 ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00018 ***** Ottawa, Ontario: (613) 836-3884 *****
00019 ***** Gatineau, Quebec: (819) 243-6858 *****
00020 ***** E-Mail: ssmh@jfsa.com *****
00021 *****
00022 *****
00023 *****
00024 ***** Licensed user: JFSaInc. *****
00025 ***** SERIAL#:2549237 *****
00026 *****
00027 *****
00028 *****
00029 ***** PROGRAM ARRAY DIMENSIONS *****
00030 ***** Maximum value for ID numbers: 1 1 *****
00031 ***** Max. number of rainfall points: 105408 *****
00032 ***** Max. number of flow points: 105408 *****
00033 *****
00034 *****
00035 *****
00036 ***** S U M M A R Y O U T P U T *****
00037 *****
00038 ***** RUN DATE: 2025-09-10 TIME: 20:42:32 RUN COUNTER: 018129 *****
00039 *****
00040 ***** Input file: C:\Temp\Fox Run\20250205-PreDev\Ott_St-Pre_v04.dat *****
00041 ***** Output file: C:\Temp\Fox Run\20250205-PreDev\Ott_St-Pre_v04.out *****
00042 ***** Summary file: C:\Temp\Fox Run\20250205-PreDev\Ott_St-Pre_v04.sum *****
00043 ***** User comments: *****
00044 ***** 1. *****
00045 ***** 2. *****
00046 ***** 3. *****
00047 *****
00048 *****
00049 *****
00050 *****
00051 ***** SWHYNDY / INPUT DATA FILE *****
00052 *****
00053 ***** Project Name : [5923 Ottawa St] *****
00054 ***** Project Number: [P2710(e01)] *****
00055 ***** Date : [2025 FEB 05] *****
00056 ***** Modeler : [JFM] *****
00057 ***** Company : JFSa Canada Inc. *****
00058 ***** License # : 2549237 *****
00059 *****
00060 ***** Model developed to simulate runoff from subcatchments under pre development conditions *****
00061 *****
00062 ***** ** END OF RUN : 1 *****
00063 *****
00064 *****
00065 *****
00066 *****
00067 *****
00068 *****
00069 *****
00070 ***** RUN/COMMAND *****
00071 ***** R0002:C0001 *****
00072 ***** START *****
00073 ***** (TZERO = .00 hrs on 0) *****
00074 ***** (METOUT= 2 (1=Imperial, 2=metric output)) *****
00075 ***** (INSTORM= 1) *****
00076 ***** (NRUN = 0002) *****
00077 *****
00078 ***** SWHYNDY / INPUT DATA FILE *****
00079 *****
00080 ***** Project Name : [5923 Ottawa St] *****
00081 ***** Project Number: [P2710(e01)] *****
00082 ***** Date : [2025 FEB 05] *****
00083 ***** Modeler : [JFM] *****
00084 ***** Company : JFSa Canada Inc. *****
00085 ***** License # : 2549237 *****
00086 *****
00087 ***** Model developed to simulate runoff from subcatchments under pre development conditions *****
00088 *****
00089 ***** R0002:C0002 *****
00090 ***** HEAD STORM *****
00091 ***** Filename = STORM.001 *****
00092 ***** Comment = CHICAGO STORM 2 Year, 3 Hours *****
00093 ***** (SDT=10.0;SDUR= 3.00;PTOT= 11.86) *****
00094 *****
00095 ***** # EXT *****
00096 *****
00097 ***** R0002:C0003 *****
00098 ***** CALIB NASHYD 1.0 01:EXT1 3.21 .037 No.date 1:58 8.15 .256 .000 *****
00099 ***** [CN= 80.0; N= 3.00; Tpe = .72] *****
00100 *****
00101 ***** # EXT2 *****
00102 *****
00103 ***** R0002:C0004 *****
00104 ***** CALIB NASHYD 1.0 01:EXT2 .28 .007 No.date 1:25 10.26 .322 .000 *****
00105 ***** [CN= 85.0; N= 3.00; Tpe = .32] *****
00106 *****
00107 ***** # EXT3 *****
00108 *****
00109 ***** R0002:C0005 *****
00110 ***** CALIB NASHYD 1.0 01:EXT3 .83 .013 No.date 1:33 7.81 .245 .000 *****
00111 ***** [CN= 80.0; N= 3.00; Tpe = .32] *****
00112 *****
00113 ***** # EXT4 *****
00114 *****
00115 ***** R0002:C0006 *****
00116 ***** CALIB NASHYD 1.0 01:EXT4 .31 .006 No.date 1:22 7.80 .245 .000 *****
00117 ***** [CN= 79.0; N= 3.00; Tpe = .48] *****
00118 *****
00119 ***** # EXT5 *****
00120 *****
00121 ***** R0002:C0007 *****
00122 ***** CALIB NASHYD 1.0 01:EXT5 .59 .008 No.date 1:36 6.88 .216 .000 *****
00123 ***** [CN= 76.0; N= 3.00; Tpe = .45] *****
00124 *****
00125 ***** # EXT6 *****
00126 *****
00127 ***** R0002:C0008 *****
00128 ***** CALIB NASHYD 1.0 01:EXT6 .86 .015 No.date 1:44 10.27 .322 .000 *****
00129 ***** [CN= 85.0; N= 3.00; Tpe = .56] *****
00130 *****
00131 ***** # EXT7 *****
00132 *****
00133 ***** R0002:C0009 *****
00134 ***** CALIB NASHYD 1.0 01:EXT7 .47 .011 No.date 1:24 9.33 .293 .000 *****
00135 ***** [CN= 85.0; N= 3.00; Tpe = .32] *****
00136 *****
00137 ***** # EXT8 *****
00138 *****
00139 ***** R0002:C00010 *****
00140 ***** CALIB NASHYD 1.0 01:EXT8 .93 .013 No.date 1:33 7.81 .245 .000 *****
00141 ***** [CN= 79.0; N= 3.00; Tpe = .42] *****
00142 *****
00143 ***** # EXT9 *****
00144 *****
00145 ***** R0002:C00011 *****
00146 ***** CALIB NASHYD 1.0 01:EXT9 3.57 .045 No.date 1:38 6.88 .216 .000 *****
00147 ***** [CN= 76.0; N= 3.00; Tpe = .48] *****
00148 *****
00149 ***** # EXT9a *****
00150 *****
00151 ***** R0002:C00012 *****
00152 ***** CALIB NASHYD 1.0 01:EXT9a .01 .001 No.date 1:00 7.47 .234 .000 *****
00153 ***** [CN= 78.0; N= 3.00; Tpe = .04] *****
00154 *****
00155 ***** # EXT10 *****
00156 *****
00157 ***** R0002:C00013 *****
00158 ***** CALIB NASHYD 1.0 01:EXT10 .20 .002 No.date 1:34 5.64 .177 .000 *****
00159 ***** [CN= 71.0; N= 3.00; Tpe = .42] *****
00160 *****
00161 ***** # Pre2 *****
00162 *****
00163 ***** R0002:C00014 *****
00164 ***** CALIB NASHYD 1.0 01:Pre2 .57 .008 No.date 1:36 7.48 .235 .000 *****
00165 ***** [CN= 78.0; N= 3.00; Tpe = .48] *****
00166 *****
00167 ***** # Pre9 *****
00168 *****
00169 ***** R0002:C00015 *****
00170 ***** CALIB NASHYD 1.0 01:Pre9 .83 .007 No.date 1:52 5.65 .177 .000 *****
00171 ***** [CN= 71.0; N= 3.00; Tpe = .64] *****
00172 *****
00173 ***** # Pre10 *****
00174 *****
00175 ***** R0002:C00016 *****
00176 ***** CALIB NASHYD 1.0 01:Pre10 .80 .011 No.date 1:22 5.65 .177 .000 *****
00177 ***** [CN= 71.0; N= 3.00; Tpe = .64] *****
00178 *****
00179 ***** # Pre11 *****
00180 *****
00181 ***** R0002:C00017 *****
00182 ***** CALIB NASHYD 1.0 01:Pre11 .03 .013 No.date 1:36 12.13 .285 .000 *****
00183 ***** [CN= 78.0; N= 3.00; Tpe = .21] *****
00184 *****
00185 ***** R0002:C00018 *****
00186 ***** ADD HYD 1.0 02:EXT3 .28 .007 No.date 1:25 10.26 n/a .000 *****
00187 ***** [L/S/ft= 73.0 / 425 / 035] *****
00188 ***** SUM= 1.0 01:EXT3 .85 .015 No.date 1:30 8.41 n/a .000 *****
00189 ***** R0002:C00019 *****
00190 ***** ROUTE CHANNEL -> 1.0 02:EXT3 .85 .015 No.date 1:30 8.41 n/a .000 *****
00191 ***** [L/S/ft= 73.0 / 425 / 035] *****
00192 ***** SUM= 1.0 02:EXT3 .85 .015 No.date 1:30 8.41 n/a .000 *****
00193 ***** R0002:C00020 *****
00194 ***** ADD HYD 1.0 02:EXT3 .56 .011 No.date 1:24 8.15 n/a .000 *****
00195 ***** [L/S/ft= 73.0 / 425 / 035] *****
00196 ***** SUM= 1.0 02:EXT3 .56 .011 No.date 1:24 8.15 n/a .000 *****
00197 ***** R0002:C00021 *****
00198 ***** ROUTE CHANNEL -> 1.0 02:EXT3 .56 .011 No.date 1:24 8.15 n/a .000 *****
00199 ***** [L/S/ft= 73.0 / 425 / 035] *****
00200 ***** SUM= 1.0 02:EXT3 .56 .011 No.date 1:24 8.15 n/a .000 *****
00201 ***** R0002:C00022 *****
00202 ***** ADD HYD 1.0 02:EXT4 .31 .006 No.date 1:22 7.80 n/a .000 *****
00203 ***** [L/S/ft= 73.0 / 425 / 035] *****
00204 ***** SUM= 1.0 02:EXT4 .31 .006 No.date 1:22 7.80 n/a .000 *****
00205 ***** R0002:C00023 *****
00206 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .31 .006 No.date 1:22 7.80 n/a .000 *****
00207 ***** [L/S/ft= 73.0 / 425 / 035] *****
00208 ***** SUM= 1.0 02:EXT4 .31 .006 No.date 1:22 7.80 n/a .000 *****
00209 ***** R0002:C00024 *****
00210 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00211 ***** [L/S/ft= 73.0 / 425 / 035] *****
00212 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00213 ***** R0002:C00025 *****
00214 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00215 ***** [L/S/ft= 73.0 / 425 / 035] *****
00216 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00217 ***** R0002:C00026 *****
00218 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00219 ***** [L/S/ft= 73.0 / 425 / 035] *****
00220 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00221 ***** R0002:C00027 *****
00222 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00223 ***** [L/S/ft= 73.0 / 425 / 035] *****
00224 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00225 ***** R0002:C00028 *****
00226 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00227 ***** [L/S/ft= 73.0 / 425 / 035] *****
00228 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00229 ***** R0002:C00029 *****
00230 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00231 ***** [L/S/ft= 73.0 / 425 / 035] *****
00232 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00233 ***** R0002:C00030 *****
00234 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00235 ***** [L/S/ft= 73.0 / 425 / 035] *****
00236 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00237 ***** R0002:C00031 *****
00238 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00239 ***** [L/S/ft= 73.0 / 425 / 035] *****
00240 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00241 ***** R0002:C00032 *****
00242 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00243 ***** [L/S/ft= 73.0 / 425 / 035] *****
00244 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00245 ***** R0002:C00033 *****
00246 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00247 ***** [L/S/ft= 73.0 / 425 / 035] *****
00248 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00249 ***** R0002:C00034 *****
00250 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00251 ***** [L/S/ft= 73.0 / 425 / 035] *****
00252 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00253 ***** R0002:C00035 *****
00254 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00255 ***** [L/S/ft= 73.0 / 425 / 035] *****
00256 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00257 ***** R0002:C00036 *****
00258 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00259 ***** [L/S/ft= 73.0 / 425 / 035] *****
00260 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00261 ***** R0002:C00037 *****
00262 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00263 ***** [L/S/ft= 73.0 / 425 / 035] *****
00264 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00265 ***** R0002:C00038 *****
00266 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00267 ***** [L/S/ft= 73.0 / 425 / 035] *****
00268 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00269 ***** R0002:C00039 *****
00270 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00271 ***** [L/S/ft= 73.0 / 425 / 035] *****
00272 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00273 ***** R0002:C00040 *****
00274 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00275 ***** [L/S/ft= 73.0 / 425 / 035] *****
00276 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00277 ***** R0002:C00041 *****
00278 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00279 ***** [L/S/ft= 73.0 / 425 / 035] *****
00280 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00281 ***** R0002:C00042 *****
00282 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00283 ***** [L/S/ft= 73.0 / 425 / 035] *****
00284 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00285 ***** R0002:C00043 *****
00286 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00287 ***** [L/S/ft= 73.0 / 425 / 035] *****
00288 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00289 ***** R0002:C00044 *****
00290 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00291 ***** [L/S/ft= 73.0 / 425 / 035] *****
00292 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00293 ***** R0002:C00045 *****
00294 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00295 ***** [L/S/ft= 73.0 / 425 / 035] *****
00296 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00297 ***** R0002:C00046 *****
00298 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00299 ***** [L/S/ft= 73.0 / 425 / 035] *****
00300 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00301 ***** R0002:C00047 *****
00302 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00303 ***** [L/S/ft= 73.0 / 425 / 035] *****
00304 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00305 ***** R0002:C00048 *****
00306 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00307 ***** [L/S/ft= 73.0 / 425 / 035] *****
00308 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00309 ***** R0002:C00049 *****
00310 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00311 ***** [L/S/ft= 73.0 / 425 / 035] *****
00312 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00313 ***** R0002:C00050 *****
00314 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00315 ***** [L/S/ft= 73.0 / 425 / 035] *****
00316 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00317 ***** R0002:C00051 *****
00318 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00319 ***** [L/S/ft= 73.0 / 425 / 035] *****
00320 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00321 ***** R0002:C00052 *****
00322 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00323 ***** [L/S/ft= 73.0 / 425 / 035] *****
00324 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00325 ***** R0002:C00053 *****
00326 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00327 ***** [L/S/ft= 73.0 / 425 / 035] *****
00328 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00329 ***** R0002:C00054 *****
00330 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00331 ***** [L/S/ft= 73.0 / 425 / 035] *****
00332 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00333 ***** R0002:C00055 *****
00334 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00335 ***** [L/S/ft= 73.0 / 425 / 035] *****
00336 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00337 ***** R0002:C00056 *****
00338 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00339 ***** [L/S/ft= 73.0 / 425 / 035] *****
00340 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00341 ***** R0002:C00057 *****
00342 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00343 ***** [L/S/ft= 73.0 / 425 / 035] *****
00344 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00345 ***** R0002:C00058 *****
00346 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00347 ***** [L/S/ft= 73.0 / 425 / 035] *****
00348 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00349 ***** R0002:C00059 *****
00350 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00351 ***** [L/S/ft= 73.0 / 425 / 035] *****
00352 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00353 ***** R0002:C00060 *****
00354 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00355 ***** [L/S/ft= 73.0 / 425 / 035] *****
00356 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00357 ***** R0002:C00061 *****
00358 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00359 ***** [L/S/ft= 73.0 / 425 / 035] *****
00360 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00361 ***** R0002:C00062 *****
00362 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00363 ***** [L/S/ft= 73.0 / 425 / 035] *****
00364 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00365 ***** R0002:C00063 *****
00366 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00367 ***** [L/S/ft= 73.0 / 425 / 035] *****
00368 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00369 ***** R0002:C00064 *****
00370 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00371 ***** [L/S/ft= 73.0 / 425 / 035] *****
00372 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00373 ***** R0002:C00065 *****
00374 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00375 ***** [L/S/ft= 73.0 / 425 / 035] *****
00376 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00377 ***** R0002:C00066 *****
00378 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00379 ***** [L/S/ft= 73.0 / 425 / 035] *****
00380 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00381 ***** R0002:C00067 *****
00382 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00383 ***** [L/S/ft= 73.0 / 425 / 035] *****
00384 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00385 ***** R0002:C00068 *****
00386 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00387 ***** [L/S/ft= 73.0 / 425 / 035] *****
00388 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00389 ***** R0002:C00069 *****
00390 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00391 ***** [L/S/ft= 73.0 / 425 / 035] *****
00392 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00393 ***** R0002:C00070 *****
00394 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00395 ***** [L/S/ft= 73.0 / 425 / 035] *****
00396 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00397 ***** R0002:C00071 *****
00398 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00399 ***** [L/S/ft= 73.0 / 425 / 035] *****
00400 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00401 ***** R0002:C00072 *****
00402 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00403 ***** [L/S/ft= 73.0 / 425 / 035] *****
00404 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00405 ***** R0002:C00073 *****
00406 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00407 ***** [L/S/ft= 73.0 / 425 / 035] *****
00408 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00409 ***** R0002:C00074 *****
00410 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00411 ***** [L/S/ft= 73.0 / 425 / 035] *****
00412 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00413 ***** R0002:C00075 *****
00414 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00415 ***** [L/S/ft= 73.0 / 425 / 035] *****
00416 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00417 ***** R0002:C00076 *****
00418 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00419 ***** [L/S/ft= 73.0 / 425 / 035] *****
00420 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00421 ***** R0002:C00077 *****
00422 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00423 ***** [L/S/ft= 73.0 / 425 / 035] *****
00424 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00425 ***** R0002:C00078 *****
00426 ***** ADD HYD 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00427 ***** [L/S/ft= 73.0 / 425 / 035] *****
00428 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00429 ***** R0002:C00079 *****
00430 ***** ROUTE CHANNEL -> 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00431 ***** [L/S/ft= 73.0 / 425 / 035] *****
00432 ***** SUM= 1.0 02:EXT4 .52 .067 No.date 1:50 8.04 n/a .000 *****
00433 ***** R0002:C00080 *****
00434 ***** ADD HYD 
```

```
00361: *****
00362: # EXT3A
00363: *****
00364: R0005:C00012-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00365: CALIB NASHYD 1.0 01:EXT3A .01 .003 No_date 1:00 13.07 .307 .000
00366: [CN= 78.0: N= 3.00: Tpe = .04]
00367: *****
00368: # EXT10
00369: *****
00370: R0005:C00013-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00371: CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 1:32 10.11 .238 .000
00372: [CN= 71.0: N= 3.00: Tpe = .29]
00373: *****
00374: # Pre2
00375: *****
00376: R0005:C00014-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00377: CALIB NASHYD 1.0 01:Pre2 .57 .015 No_date 1:35 13.08 .308 .000
00378: [CN= 78.0: N= 3.00: Tpe = .46]
00379: *****
00380: # Pre3
00381: *****
00382: R0005:C00015-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00383: CALIB NASHYD 1.0 01:Pre3 .83 .013 No_date 1:50 10.11 .238 .000
00384: [CN= 71.0: N= 3.00: Tpe = .64]
00385: *****
00386: # Pre10
00387: *****
00388: R0005:C00016-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00389: CALIB NASHYD 1.0 01:Pre10 .80 .021 No_date 1:21 10.11 .238 .000
00390: [CN= 71.0: N= 3.00: Tpe = .29]
00391: *****
00392: # Pre11
00393: *****
00394: R0005:C00017-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00395: CALIB NASHYD 1.0 01:Pre11 .07 .003 No_date 1:14 13.07 .308 .000
00396: [CN= 78.0: N= 3.00: Tpe = .21]
00397: *****
00398: R0005:C00018-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00399: ADD HYD 1.0 02:EXT2 .28 .012 No_date 1:23 17.32 n/a .000
00400: SUM= 1.0 02:Pre2 .57 .015 No_date 1:35 13.08 n/a .000
00401: 1.0 01:J1 .85 .026 No_date 1:29 14.50 n/a .000
00402: R0005:C00019-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00403: ROUTE CHANNEL -> 1.0 02:J1 .85 .026 No_date 1:29 14.50 n/a .000
00404: [RDY=1.00] out<- 1.0 01:Pre1 .85 .025 No_date 1:36 14.50 n/a .000
00405: [L/S/n= 143././394/(.035)]
00406: (Vmax=.291:Dmax=.195)
00407: R0005:C00020-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00408: ADD HYD 1.0 02:R1 .85 .025 No_date 1:36 14.50 n/a .000
00409: SUM= 1.0 02:EXT3 .56 .020 No_date 1:23 14.13 n/a .000
00410: 1.0 01:EXT1 3.21 .016 No_date 1:35 14.13 n/a .000
00411: 1.0 01:J2 4.62 .102 No_date 1:43 14.20 n/a .000
00412: R0005:C00021-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00413: ROUTE CHANNEL -> 1.0 02:J2 4.62 .102 No_date 1:43 14.20 n/a .000
00414: [RDY=1.00] out<- 1.0 01:R2 4.62 .101 No_date 1:45 14.20 n/a .000
00415: [L/S/n= 71././425/(.035)]
00416: (Vmax=.412:Dmax=.195)
00417: R0005:C00022-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00418: ADD HYD 1.0 02:R2 4.62 .101 No_date 1:45 14.20 n/a .000
00419: SUM= 1.0 02:EXT4 .31 .011 No_date 1:21 13.59 n/a .000
00420: 1.0 01:EXT1 4.93 .109 No_date 1:43 14.16 n/a .000
00421: R0005:C00023-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00422: ROUTE CHANNEL -> 1.0 02:J3 4.93 .108 No_date 1:43 14.16 n/a .000
00423: [RDY=1.00] out<- 1.0 01:R3 4.93 .108 No_date 1:47 14.16 n/a .000
00424: [L/S/n= 92././274/(.035)]
00425: (Vmax=.337:Dmax=.195)
00426: R0005:C00024-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00427: ADD HYD 1.0 02:EXT5 4.93 .088 No_date 1:41 14.16 n/a .000
00428: SUM= 1.0 02:EXT3 .59 .014 No_date 1:34 12.13 n/a .000
00429: 1.0 01:J4 5.52 .121 No_date 1:45 13.94 n/a .000
00430: R0005:C00025-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00431: ROUTE CHANNEL -> 1.0 02:J4 5.52 .121 No_date 1:45 13.94 n/a .000
00432: [RDY=1.00] out<- 1.0 01:J4 5.52 .112 No_date 1:58 13.94 n/a .000
00433: [L/S/n= 251././190/(.035)]
00434: (Vmax=.323:Dmax=.221)
00435: R0005:C00026-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00436: ADD HYD 1.0 02:R4 5.52 .112 No_date 1:58 13.94 n/a .000
00437: SUM= 1.0 02:EXT7 4.47 .019 No_date 1:23 15.94 n/a .000
00438: 1.0 01:EXT1 6.86 .147 No_date 1:53 14.51 n/a .000
00439: R0005:C00027-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00440: ROUTE CHANNEL -> 1.0 02:J5 6.86 .147 No_date 1:53 14.51 n/a .000
00441: [RDY=1.00] out<- 1.0 01:R5 6.86 .144 No_date 2:00 14.51 n/a .000
00442: [L/S/n= 237././644/(.035)]
00443: (Vmax=.519:Dmax=.210)
00444: R0005:C00028-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00445: ROUTE CHANNEL -> 1.0 02:Pre10 .80 .021 No_date 1:21 10.11 n/a .000
00446: [RDY=1.00] out<- 1.0 01:Pre10 .80 .021 No_date 1:24 10.11 n/a .000
00447: [L/S/n= 77././776/(.035)]
00448: (Vmax=.492:Dmax=.015)
00449: R0005:C00029-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00450: ROUTE CHANNEL -> 1.0 02:Pre9 .83 .013 No_date 1:50 10.11 n/a .000
00451: [RDY=1.00] out<- 1.0 01:EXT7 4.83 .013 No_date 1:54 10.11 n/a .000
00452: [L/S/n= 159././1576/(.035)]
00453: (Vmax=.797:Dmax=.004)
00454: R0005:C00030-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00455: ADD HYD 1.0 02:R6 .80 .021 No_date 1:24 10.26 n/a .000
00456: SUM= 1.0 02:EXT10 1.01 .025 No_date 1:25 10.23 n/a .000
00457: 1.0 01:J6 1.01 .025 No_date 1:25 10.23 n/a .000
00458: R0005:C00031-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00459: ROUTE CHANNEL -> 1.0 02:J6 1.01 .025 No_date 1:25 10.23 n/a .000
00460: [RDY=1.00] out<- 1.0 01:R8 1.01 .025 No_date 1:28 10.23 n/a .000
00461: [L/S/n= 79././322/(.035)]
00462: (Vmax=.423:Dmax=.018)
00463: R0005:C00032-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00464: ADD HYD 1.0 02:R8 1.01 .025 No_date 1:28 10.23 n/a .000
00465: SUM= 1.0 02:R7 .83 .013 No_date 1:54 10.14 n/a .000
00466: 1.0 01:EXT7 1.83 .035 No_date 1:34 10.19 n/a .000
00467: R0005:C00033-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00468: ROUTE CHANNEL -> 1.0 02:J7 1.83 .035 No_date 1:34 10.19 n/a .000
00469: [RDY=1.00] out<- 1.0 01:R9 1.83 .035 No_date 1:34 10.19 n/a .000
00470: [L/S/n= 29././887/(.035)]
00471: (Vmax=.543:Dmax=.005)
00472: R0005:C00034-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00473: ADD HYD 1.0 02:EXT9 3.57 .083 No_date 1:36 12.13 n/a .000
00474: SUM= 1.0 02:R9 1.83 .035 No_date 1:34 10.20 n/a .000
00475: 1.0 01:EXT8 8.83 .024 No_date 1:31 13.59 n/a .000
00476: 1.0 01:EXT6 6.86 .146 No_date 2:00 14.51 n/a .000
00477: R0005:C00035-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00478: ROUTE CHANNEL -> 1.0 02:J8 13.10 .264 No_date 1:49 13.20 n/a .000
00479: SUM= 1.0 02:R8 1.01 .025 No_date 1:28 10.23 n/a .000
00480: ROUTE PIPE -> 1.0 02:R8 13.10 .264 No_date 1:49 13.20 n/a .000
00481: [RDY=1.00] out<- 1.0 01:Outlet 13.10 .264 No_date 1:49 13.20 n/a .000
00482: [L/S/n= 8././0161]
00483: (Vmax=.356:Dmax=.951)
00484: [Dln=.55:Dduse=.104]
00485: #####
00486: # STORMS
00487: #####
00488: ** END OF RUN : 9
00489:
00490:
00491:
00492:
00493:
00494:
00495: RUN:COMMAND#
00496: R001:C00001-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00497: START (TZERO=.00 hrs on 5)
00498: [METOUT= 2 (l=imperial, 2=metric output)]
00499: [INFORM= 1]
00500: [RUN= 0010]
00501:
00502:
00503:
00504: # JMWIND / INPUT DATA FILE
00505: *****
00506: # Project Name : [5923 Ottawa St]
00507: # Project Number: [P2711]
00508: # Date : [2025 FEB 05]
00509: # Modeller : [JW]
00510: # Company : JFSA Canada Inc.
00511: # License #: 2549237
00512:
00513: # Model developed to simulate runoff from subcatchments under pre development conditions
00514:
00515: R001:C00002-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00516: READ STORM#
00517: File=001
00518: Comment = CHICAGO STORM 10 Year, 3 Hours
00519: [RDY=1.00] out<- 3.00:PTOT= 49.50]
00520: *****
00521: # EXT1
00522: *****
00523: R001:C00003-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00524: CALIB NASHYD 1.0 01:EXT1 3.21 .088 No_date 1:54 18.55 .375 .000
00525: [CN= 80.0: N= 3.00: Tpe = .21]
00526: *****
00527: # EXT2
00528: *****
00529: R001:C00004-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00530: CALIB NASHYD 1.0 01:EXT2 .56 .027 No_date 1:23 18.55 .375 .000
00531: [CN= 85.0: N= 3.00: Tpe = .33]
00532: *****
00533: # EXT3
00534: *****
00535: R001:C00005-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00536: CALIB NASHYD 1.0 01:EXT3 .56 .027 No_date 1:23 18.55 .375 .000
00537: [CN= 80.0: N= 3.00: Tpe = .21]
00538: *****
00539: # EXT4
00540: *****
00541: R001:C00006-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00542: CALIB NASHYD 1.0 01:EXT4 .31 .013 No_date 1:20 17.89 .361 .000
00543: [CN= 79.0: N= 3.00: Tpe = .29]
00544: *****
00545: # EXT5
00546: *****
00547: R001:C00007-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00548: CALIB NASHYD 1.0 01:EXT5 .59 .019 No_date 1:33 16.07 .325 .000
00549: [CN= 78.0: N= 3.00: Tpe = .45]
00550: *****
00551: # EXT6
00552: *****
00553: R001:C00008-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00554: CALIB NASHYD 1.0 01:EXT6 .86 .035 No_date 1:41 22.42 .453 .000
00555: [CN= 83.0: N= 3.00: Tpe = .46]
00556: *****
00557: # EXT7
00558: *****
00559: R001:C00009-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00560: CALIB NASHYD 1.0 01:Pre2 .57 .020 No_date 1:34 17.26 .349 .000
00561: [CN= 83.0: N= 3.00: Tpe = .32]
00562: *****
00563: # EXT8
00564: *****
00565: R001:C00010-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00566: CALIB NASHYD 1.0 01:EXT8 .83 .032 No_date 1:31 17.89 .361 .000
00567: [CN= 79.0: N= 3.00: Tpe = .42]
00568: *****
00569: # EXT9
00570: *****
00571: R001:C00011-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00572: CALIB NASHYD 1.0 01:EXT9 3.57 .111 No_date 1:36 16.08 .325 .000
00573: [CN= 76.0: N= 3.00: Tpe = .48]
00574: *****
00575: # EXT9a
00576: *****
00577: R001:C00012-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00578: CALIB NASHYD 1.0 01:EXT9a .01 .001 No_date 1:00 17.25 .348 .000
00579: [CN= 78.0: N= 3.00: Tpe = .04]
00580: *****
00581: # EXT10
00582: *****
00583: R001:C00013-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00584: CALIB NASHYD 1.0 01:EXT10 .20 .006 No_date 1:31 13.53 .273 .000
00585: [CN= 71.0: N= 3.00: Tpe = .62]
00586: *****
00587: # Pre2
00588: *****
00589: R001:C00014-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00590: CALIB NASHYD 1.0 01:Pre2 .57 .020 No_date 1:34 17.26 .349 .000
00591: [CN= 78.0: N= 3.00: Tpe = .46]
00592: *****
00593: # Pre9
00594: *****
00595: R001:C00015-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00596: CALIB NASHYD 1.0 01:Pre9 .83 .018 No_date 1:49 13.53 .273 .000
00597: [CN= 71.0: N= 3.00: Tpe = .29]
00598: *****
00599: # Pre10
00600: *****
00601: R001:C00016-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00602: CALIB NASHYD 1.0 01:Pre10 .80 .029 No_date 1:21 13.53 .273 .000
00603: [CN= 71.0: N= 3.00: Tpe = .29]
00604: *****
00605: # Pre11
00606: *****
00607: R001:C00017-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00608: CALIB NASHYD 1.0 01:Pre11 .07 .004 No_date 1:14 17.25 .348 .000
00609: [CN= 78.0: N= 3.00: Tpe = .21]
00610: *****
00611: # EXT18
00612: *****
00613: ADD HYD 1.0 02:Pre2 .57 .020 No_date 1:34 17.26 n/a .000
00614: SUM= 1.0 01:J1 .85 .035 No_date 1:28 18.99 n/a .000
00615: R001:C00019-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00616: ROUTE CHANNEL -> 1.0 02:J1 .85 .035 No_date 1:28 18.99 n/a .000
00617: [L/S/n= 143././394/(.035)]
00618: (Vmax=.311:Dmax=.122)
00619: R001:C00020-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00620: ADD HYD 1.0 02:R1 .85 .033 No_date 1:35 18.99 n/a .000
00621: SUM= 1.0 02:EXT3 .56 .020 No_date 1:23 14.13 n/a .000
00622: 1.0 01:EXT1 3.21 .088 No_date 1:54 18.55 n/a .000
00623: 1.0 01:J2 4.62 .106 No_date 1:42 18.63 n/a .000
00624: R001:C00021-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00625: ROUTE CHANNEL -> 1.0 02:J2 4.62 .106 No_date 1:42 18.63 n/a .000
00626: [RDY=1.00] out<- 1.0 01:R2 4.62 .135 No_date 1:45 18.63 n/a .000
00627: [L/S/n= 73././425/(.035)]
00628: (Vmax=.444:Dmax=.219)
00629: R001:C00022-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00630: ADD HYD 1.0 02:R2 4.62 .135 No_date 1:45 18.63 n/a .000
00631: SUM= 1.0 02:EXT4 .31 .011 No_date 1:21 17.89 n/a .000
00632: 1.0 01:J3 4.93 .145 No_date 1:42 18.59 n/a .000
00633: R001:C00023-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00634: ROUTE CHANNEL -> 1.0 02:J3 4.93 .145 No_date 1:42 18.59 n/a .000
00635: [RDY=1.00] out<- 1.0 01:R3 4.93 .144 No_date 1:46 18.59 n/a .000
00636: [L/S/n= 92././274/(.035)]
00637: (Vmax=.364:Dmax=.227)
00638: R001:C00024-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00639: ADD HYD 1.0 02:R3 4.93 .144 No_date 1:46 18.59 n/a .000
00640: SUM= 1.0 02:EXT5 .59 .019 No_date 1:33 16.07 n/a .000
00641: 1.0 01:J4 5.52 .121 No_date 1:45 13.94 n/a .000
00642: R001:C00025-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00643: ROUTE CHANNEL -> 1.0 02:J4 5.52 .121 No_date 1:44 18.32 n/a .000
00644: [RDY=1.00] out<- 1.0 01:R4 5.52 .151 No_date 1:54 18.32 n/a .000
00645: [L/S/n= 251././190/(.035)]
00646: (Vmax=.352:Dmax=.005)
00647: R001:C00026-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00648: ADD HYD 1.0 02:R4 5.52 .151 No_date 1:56 18.32 n/a .000
00649: SUM= 1.0 02:EXT6 .86 .035 No_date 1:41 22.42 n/a .000
00650: 1.0 01:EXT7 4.47 .025 No_date 1:22 15.94 n/a .000
00651: 1.0 01:EXT9 6.86 .197 No_date 1:51 19.00 n/a .000
00652: R001:C00027-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00653: ROUTE CHANNEL -> 1.0 02:J5 6.86 .197 No_date 1:51 19.00 n/a .000
00654: [RDY=1.00] out<- 1.0 01:Pre10 .80 .029 No_date 1:21 13.53 n/a .000
00655: [L/S/n= 77././776/(.035)]
00656: (Vmax=.543:Dmax=.005)
00657: R001:C00028-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00658: ROUTE CHANNEL -> 1.0 02:Pre10 .80 .029 No_date 1:21 13.53 n/a .000
00659: [RDY=1.00] out<- 1.0 01:Pre10 .80 .029 No_date 1:24 13.53 n/a .000
00660: [L/S/n= 79././322/(.035)]
00661: (Vmax=.423:Dmax=.018)
00662: R001:C00029-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00663: ROUTE CHANNEL -> 1.0 02:Pre9 .83 .018 No_date 1:49 13.53 n/a .000
00664: [RDY=1.00] out<- 1.0 01:EXT7 4.83 .018 No_date 1:53 13.53 n/a .000
00665: [L/S/n= 159././1576/(.035)]
00666: (Vmax=.797:Dmax=.005)
00667: R001:C00030-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00668: ADD HYD 1.0 02:R6 .80 .021 No_date 1:24 10.26 n/a .000
00669: SUM= 1.0 02:EXT10 1.01 .025 No_date 1:25 10.23 n/a .000
00670: 1.0 01:J6 1.01 .025 No_date 1:25 10.23 n/a .000
00671: R001:C00031-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00672: ROUTE CHANNEL -> 1.0 02:J6 1.01 .025 No_date 1:25 10.23 n/a .000
00673: [RDY=1.00] out<- 1.0 01:R8 1.01 .034 No_date 1:24 13.66 n/a .000
00674: [L/S/n= 8././010/(.013)]
00675: (Vmax=.385:Dmax=.957)
00676: R001:C00032-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00677: ADD HYD 1.0 02:R8 1.01 .034 No_date 1:28 13.66 n/a .000
00678: SUM= 1.0 02:R7 .83 .018 No_date 1:53 13.55 n/a .000
00679: 1.0 01:EXT7 1.83 .047 No_date 1:33 13.61 n/a .000
00680: R001:C00033-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00681: ROUTE CHANNEL -> 1.0 02:J7 1.83 .047 No_date 1:33 13.61 n/a .000
00682: [RDY=1.00] out<- 1.0 01:R9 1.83 .047 No_date 1:34 13.61 n/a .000
00683: [L/S/n= 29././887/(.035)]
00684: (Vmax=.543:Dmax=.005)
00685: R001:C00034-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00686: ADD HYD 1.0 02:EXT9 3.57 .111 No_date 1:36 16.08 n/a .000
00687: SUM= 1.0 02:R9 1.83 .047 No_date 1:34 13.62 n/a .000
00688: 1.0 01:EXT8 8.83 .032 No_date 1:31 17.89 n/a .000
00689: 1.0 01:EXT6 6.86 .146 No_date 2:00 14.51 n/a .000
00690: R001:C00035-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00691: ROUTE PIPE -> 1.0 02:R8 13.10 .264 No_date 1:47 17.38 n/a .000
00692: [RDY=1.00] out<- 1.0 01:Outlet 13.10 .264 No_date 1:47 17.38 n/a .000
00693: [L/S/n= 8././010/(.013)]
00694: (Vmax=.385:Dmax=.957)
00695: [Dln=.53:Dduse=.171]
00696: #####
00697: # STORMS
00698: #####
00699: ** END OF RUN : 24
00700:
00701:
00702:
00703:
00704:
00705:
00706:
00707:
00708:
00709: RUN:COMMAND#
00710: R002:C00001-----DtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvM-R.C-----DNFcms
00711: START (TZERO=.00 hrs on 0)
00712: [METOUT= 2 (l=imperial, 2=metric output)]
00713: [INFORM= 1]
00714: [RUN= 0025]
00715:
00716:
00717: # JMWIND / INPUT DATA FILE
00718: *****
00719: # Project Name : [5923 Ottawa St]
00720: # Project Number: [P2711]
00721: *****
```

Page 2

```
010811 [RDT= 1.00] out<- 1.0 01:R5 6.86 .318 No_date 1:52 29.83 n/a .000
010812 [L/S/n= 227./, .644/.035]
010813 (Vmax=.658;Dmax=.288)
010814 R0059:C00028-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010815 ROUTE CHANNEL -> 1.0 01:Pre10 80 .049 No_date 1:20 22.07 n/a .000
010816 [RDT= 1.00] out<- 1.0 01:R6 80 .048 No_date 1:23 22.07 n/a .000
010817 [L/S/n= 71./, .775/.035]
010818 (Vmax=.492;Dmax=.036)
010819 R0059:C00029-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010820 ROUTE CHANNEL -> 1.0 01:Pre9 83 .029 No_date 1:48 22.07 n/a .000
010821 [RDT= 1.00] out<- 1.0 01:R7 83 .029 No_date 1:51 22.07 n/a .000
010822 [L/S/n= 159./, .171/.035]
010823 (Vmax=.797;Dmax=.009)
010824 R0059:C00030-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010825 ADD HYD + 1.0 02:R6 80 .048 No_date 1:23 22.28 n/a .000
010826 [RDT= 1.00] out<- 1.0 02:EXT10 .20 .010 No_date 1:30 22.06 n/a .000
010827 SUM= 1.0 02:R7 83 .029 No_date 1:51 22.09 n/a .000
010828 R0059:C00031-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010829 ROUTE CHANNEL -> 1.0 02:R6 1.01 .057 No_date 1:24 22.24 n/a .000
010830 [RDT= 1.00] out<- 1.0 01:R8 1.01 .056 No_date 1:27 22.24 n/a .000
010831 [L/S/n= 79./, .522/.035]
010832 (Vmax=.423;Dmax=.042)
010833 R0059:C00032-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010834 ADD HYD + 1.0 02:R8 1.01 .056 No_date 1:27 22.24 n/a .000
010835 SUM= 1.0 02:R7 83 .029 No_date 1:51 22.09 n/a .000
010836 R0059:C00033-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010837 ROUTE CHANNEL -> 1.0 02:R7 1.83 .079 No_date 1:32 22.17 n/a .000
010838 [RDT= 1.00] out<- 1.0 02:R7 1.83 .079 No_date 1:32 22.17 n/a .000
010839 [L/S/n= 29./, .887/.035]
010840 (Vmax=.543;Dmax=.054)
010841 R0059:C00034-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010842 ADD HYD + 1.0 02:EXT9 3.57 .183 No_date 1:35 25.77 n/a .000
010843 [RDT= 1.00] out<- 1.0 02:R9 1.83 .079 No_date 1:33 22.18 n/a .000
010844 [L/S/n= 1.0 02:EXT8 83 .052 No_date 1:30 28.13 n/a .000
010845 SUM= 1.0 02:R5 6.86 .318 No_date 1:52 29.83 n/a .000
010846 [RDT= 1.00] out<- 1.0 02:R6 80 .048 No_date 1:24 27.56 n/a .000
010847 SUM= 1.0 02:R9 1.83 .079 No_date 1:32 22.17 n/a .000
010848 R0059:C00035-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010849 ROUTE PIPE -> 1.0 02:R8 13.10 .602 No_date 1:44 27.56 n/a .000
010850 [RDT= 1.00] out<- 1.0 02:R8 13.10 .602 No_date 1:44 27.56 n/a .000
010851 [L/S/n= 8./, .010/.035]
010852 (Vmax=.481;Dmax=.046)
010853 [Dln=.53;Dused=.141]
010854 *****
010855 # STORM
010856 *****
010857 # END OF RUN 1 98
010858 *****
010859 RUN# COMMAND#
010860 R0099:C00001-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010861 START
010862 [TZERO=.00 hrs on 0]
010863 [METOUT= 2 [1=Imperial, 2=metric output]]
010864 [METORM= 1]
010865 [INRUN=.0099]
010866 *****
010867 # SWHYMO / INPUT DATA FILE
010868 # Project Name : [5923 Ottawa St.]
010869 # Project Number : [92710 (e01)]
010870 # Date : [2020 FEB 05]
010871 # Modeler : [JFS]
010872 # Company : [JFS Canada Inc.]
010873 # License # : [2549237]
010874 # Model developed to simulate runoff from subcatchments under pre development conditions
010875 *****
010876 R0099:C00002-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010877 READ STORM
010878 Filename = STORM.001
010879 Comment = CHICAGO STORM 100 Year, 3 Hours
010880 [SDT=10.00;SDUR= 3.00;PTOT= 71.66]
010881 *****
010882 # EXT1
010883 *****
010884 R0099:C00003-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010885 CALIB NASHYD 1.0 01:EXT1 3.21 .167 No_date 1:52 34.39 .480 .000
010886 [CN= 80.0; N= 3.00; Tpe=.72]
010887 *****
010888 R0099:C00004-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010889 CALIB NASHYD 1.0 01:EXT2 .28 .031 No_date 1:22 40.14 .560 .000
010890 [CN= 85.0; N= 3.00; Tpe=.48]
010891 *****
010892 # EXT1
010893 *****
010894 R0099:C00005-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010895 CALIB NASHYD 1.0 01:EXT3 3.21 .167 No_date 1:52 34.39 .480 .000
010896 [CN= 80.0; N= 3.00; Tpe=.52]
010897 *****
010898 # EXT4
010899 *****
010900 R0099:C00006-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010901 CALIB NASHYD 1.0 01:EXT4 .31 .029 No_date 1:19 33.37 .466 .000
010902 [CN= 79.0; N= 3.00; Tpe=.48]
010903 *****
010904 # EXT1
010905 *****
010906 R0099:C00007-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010907 CALIB NASHYD 1.0 01:EXT5 .59 .038 No_date 1:32 30.49 .425 .000
010908 [CN= 76.0; N= 3.00; Tpe=.45]
010909 *****
010910 # EXT6
010911 *****
010912 R0099:C00008-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010913 CALIB NASHYD 1.0 01:EXT6 .86 .064 No_date 1:39 40.14 .560 .000
010914 [CN= 85.0; N= 3.00; Tpe=.56]
010915 *****
010916 # EXT7
010917 *****
010918 R0099:C00009-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010919 CALIB NASHYD 1.0 01:EXT7 .47 .048 No_date 1:21 37.71 .526 .000
010920 [CN= 85.0; N= 3.00; Tpe=.46]
010921 *****
010922 # EXT8
010923 *****
010924 R0099:C00010-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010925 CALIB NASHYD 1.0 01:EXT8 .83 .067 No_date 1:29 34.37 .466 .000
010926 [CN= 79.0; N= 3.00; Tpe=.42]
010927 *****
010928 # EXT9
010929 *****
010930 R0099:C00011-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010931 CALIB NASHYD 1.0 01:EXT9 3.57 .218 No_date 1:34 30.49 .425 .000
010932 [CN= 78.0; N= 3.00; Tpe=.48]
010933 *****
010934 # EXT5a
010935 *****
010936 R0099:C00012-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010937 CALIB NASHYD 1.0 01:EXT5a .01 .003 No_date 1:00 32.37 .452 .000
010938 [CN= 78.0; N= 3.00; Tpe=.04]
010939 *****
010940 # EXT10
010941 *****
010942 R0099:C00013-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010943 CALIB NASHYD 1.0 01:EXT10 .20 .012 No_date 1:30 26.28 .367 .000
010944 [CN= 71.0; N= 3.00; Tpe=.42]
010945 *****
010946 # Pre2
010947 *****
010948 R0099:C00014-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010949 CALIB NASHYD 1.0 01:Pre2 .57 .038 No_date 1:32 32.37 .452 .000
010950 [CN= 78.0; N= 3.00; Tpe=.46]
010951 *****
010952 # Pre9
010953 *****
010954 R0099:C00015-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010955 CALIB NASHYD 1.0 01:Pre9 83 .035 No_date 1:47 26.29 .367 .000
010956 [CN= 71.0; N= 3.00; Tpe=.64]
010957 *****
010958 # Pre10
010959 *****
010960 R0099:C00016-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010961 CALIB NASHYD 1.0 01:Pre10 80 .058 No_date 1:20 26.29 .367 .000
010962 [CN= 78.0; N= 3.00; Tpe=.48]
010963 *****
010964 # Pre11
010965 *****
010966 R0099:C00017-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010967 CALIB NASHYD 1.0 01:Pre11 .07 .008 No_date 1:13 32.37 .452 .000
010968 [CN= 78.0; N= 3.00; Tpe=.25]
010969 *****
010970 # EXT5b
010971 *****
010972 R0099:C00018-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010973 ADD HYD + 1.0 02:EXT2 .28 .031 No_date 1:22 40.14 n/a .000
010974 SUM= 1.0 02:R7 83 .029 No_date 1:51 22.09 n/a .000
010975 R0099:C00019-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010976 ROUTE CHANNEL -> 1.0 02:R8 85 .067 No_date 1:27 34.97 n/a .000
010977 [RDT= 1.00] out<- 1.0 01:R1 85 .064 No_date 1:33 34.97 n/a .000
010978 [L/S/n= 143./, .396/.035]
010979 (Vmax=.375;Dmax=.162)
010980 R0099:C00020-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
010981 ADD HYD + 1.0 02:R1 85 .064 No_date 1:33 34.97 n/a .000
```

```
012615 + 1.0 02:EXT3 .56 .052 No_date 1:21 34.39 n/a .000
012616 [L/S/n= 1.0 02:EXT1 3.21 .167 No_date 1:52 34.39 n/a .000
012617 SUM= 1.0 01:R2 4.62 .258 No_date 1:40 34.50 n/a .000
012618 R0099:C00021-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012619 ROUTE CHANNEL -> 1.0 02:R2 4.62 .258 No_date 1:40 34.50 n/a .000
012620 [RDT= 1.00] out<- 1.0 01:R2 4.62 .258 No_date 1:42 34.50 n/a .000
012621 [L/S/n= 73./, .283/.035]
012622 (Vmax=.526;Dmax=.284)
012623 R0099:C00022-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012624 ADD HYD + 1.0 02:R3 4.62 .258 No_date 1:42 34.50 n/a .000
012625 [RDT= 1.00] out<- 1.0 02:EXT4 .31 .029 No_date 1:19 33.37 n/a .000
012626 SUM= 1.0 01:R3 4.93 .277 No_date 1:39 34.43 n/a .000
012627 R0099:C00023-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012628 ROUTE CHANNEL -> 1.0 02:R3 4.93 .277 No_date 1:39 34.43 n/a .000
012629 [RDT= 1.00] out<- 1.0 02:EXT5 .59 .038 No_date 1:20 26.29 n/a .000
012630 [L/S/n= 92./, .274/.035]
012631 (Vmax=.431;Dmax=.000)
012632 R0099:C00024-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012633 ADD HYD + 1.0 02:R3 4.93 .275 No_date 1:42 34.43 n/a .000
012634 SUM= 1.0 02:EXT5 .59 .038 No_date 1:20 26.29 n/a .000
012635 [RDT= 1.00] out<- 1.0 01:R4 5.52 .311 No_date 1:40 34.01 n/a .000
012636 [L/S/n= 251./, .190/.035]
012637 (Vmax=.425;Dmax=.333)
012638 R0099:C00025-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012639 ROUTE CHANNEL -> 1.0 02:R4 5.52 .295 No_date 1:51 34.01 n/a .000
012640 [RDT= 1.00] out<- 1.0 02:EXT6 .86 .064 No_date 1:39 40.14 n/a .000
012641 [L/S/n= 1.0 02:EXT7 .47 .048 No_date 1:21 37.71 n/a .000
012642 SUM= 1.0 01:R5 6.86 .384 No_date 1:46 35.03 n/a .000
012643 R0099:C00026-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012644 ROUTE CHANNEL -> 1.0 02:R4 5.52 .295 No_date 1:51 34.01 n/a .000
012645 [RDT= 1.00] out<- 1.0 01:R6 8.0 .058 No_date 1:20 26.29 n/a .000
012646 [L/S/n= 1.0 01:R6 8.0 .058 No_date 1:23 26.29 n/a .000
012647 [RDT= 1.00] out<- 1.0 01:R6 8.0 .058 No_date 1:23 26.29 n/a .000
012648 (Vmax=.492;Dmax=.043)
012649 R0099:C00027-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012650 ROUTE CHANNEL -> 1.0 02:Pre9 83 .035 No_date 1:47 26.29 n/a .000
012651 [RDT= 1.00] out<- 1.0 01:R7 .83 .035 No_date 1:51 26.29 n/a .000
012652 [L/S/n= 159./, .157/.035]
012653 (Vmax=.797;Dmax=.011)
012654 R0099:C00028-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012655 ADD HYD + 1.0 02:R6 8.0 .058 No_date 1:23 26.52 n/a .000
012656 SUM= 1.0 02:EXT10 .20 .012 No_date 1:30 26.28 n/a .000
012657 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012658 ROUTE CHANNEL -> 1.0 02:R6 1.01 .068 No_date 1:27 26.48 n/a .000
012659 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012660 [L/S/n= 77./, .776/.035]
012661 (Vmax=.425;Dmax=.050)
012662 R0099:C00029-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012663 ROUTE CHANNEL -> 1.0 02:R6 1.01 .068 No_date 1:27 26.48 n/a .000
012664 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012665 [L/S/n= 237./, .644/.035]
012666 (Vmax=.699;Dmax=.310)
012667 R0099:C00030-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012668 ROUTE CHANNEL -> 1.0 02:Pre10 80 .058 No_date 1:20 26.29 n/a .000
012669 [RDT= 1.00] out<- 1.0 01:R6 8.0 .058 No_date 1:20 26.29 n/a .000
012670 [L/S/n= 1.0 01:R6 8.0 .058 No_date 1:23 26.29 n/a .000
012671 [RDT= 1.00] out<- 1.0 01:R6 8.0 .058 No_date 1:23 26.29 n/a .000
012672 (Vmax=.492;Dmax=.043)
012673 R0099:C00031-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012674 ROUTE CHANNEL -> 1.0 02:Pre9 83 .035 No_date 1:47 26.29 n/a .000
012675 [RDT= 1.00] out<- 1.0 01:R7 .83 .035 No_date 1:51 26.29 n/a .000
012676 [L/S/n= 159./, .157/.035]
012677 (Vmax=.797;Dmax=.011)
012678 R0099:C00032-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012679 ADD HYD + 1.0 02:R6 8.0 .058 No_date 1:23 26.52 n/a .000
012680 SUM= 1.0 02:EXT10 .20 .012 No_date 1:30 26.28 n/a .000
012681 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012682 ROUTE CHANNEL -> 1.0 02:R6 1.01 .068 No_date 1:27 26.48 n/a .000
012683 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012684 [L/S/n= 79./, .522/.035]
012685 (Vmax=.425;Dmax=.050)
012686 R0099:C00033-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012687 ADD HYD + 1.0 02:R7 8.0 .058 No_date 1:23 26.52 n/a .000
012688 SUM= 1.0 01:R7 8.0 .058 No_date 1:23 26.52 n/a .000
012689 [RDT= 1.00] out<- 1.0 02:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012690 [L/S/n= 8./, .010/.035]
012691 (Vmax=.458;Dmax=.240)
012692 [RDT= 1.00] out<- 1.0 01:R8 1.01 .068 No_date 1:27 26.48 n/a .000
012693 [L/S/n= 53;Dused=.151]
012694 *****
012695 # STORM
012696 *****
012697 # END OF RUN 1 98
012698 *****
012699 RUN# COMMAND#
012700 R1012:C00001-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012701 START
012702 [TZERO=.00 hrs on 0]
012703 [METOUT= 2 [1=Imperial, 2=metric output]]
012704 [METORM= 1]
012705 [INRUN=.0102]
012706 *****
012707 # SWHYMO / INPUT DATA FILE
012708 # Project Name : [5923 Ottawa St.]
012709 # Project Number : [92710 (e01)]
012710 # Date : [2020 FEB 05]
012711 # Modeler : [JFS]
012712 # Company : [JFS Canada Inc.]
012713 # License # : [2549237]
012714 # Model developed to simulate runoff from subcatchments under pre development conditions
012715 *****
012716 R1012:C00002-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012717 READ STORM
012718 Filename = STORM.001
012719 Comment = 2 Years ESC Type 2 Storm 24 Hours step 10 min, City of Ottawa
012720 [SDT=10.00;SDUR= 2.00;PTOT= 48.46]
012721 *****
012722 # EXT1
012723 *****
012724 R1012:C00003-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012725 CALIB NASHYD 1.0 01:EXT1 3.21 .058 No_date 12:42 17.87 .369 .000
012726 [CN= 80.0; N= 3.00; Tpe=.56]
012727 *****
012728 # EXT2
012729 *****
012730 R1012:C00004-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012731 CALIB NASHYD 1.0 01:EXT2 .28 .011 No_date 12:14 21.63 .446 .000
012732 [CN= 85.0; N= 3.00; Tpe=.33]
012733 *****
012734 # EXT3
012735 *****
012736 R1012:C00005-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012737 CALIB NASHYD 1.0 01:EXT3 .56 .018 No_date 12:13 17.87 .369 .000
012738 [CN= 80.0; N= 3.00; Tpe=.32]
012739 *****
012740 # EXT4
012741 *****
012742 R1012:C00006-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012743 CALIB NASHYD 1.0 01:EXT4 .31 .010 No_date 12:12 17.22 .355 .000
012744 [CN= 80.0; N= 3.00; Tpe=.56]
012745 *****
012746 # EXT5
012747 *****
012748 R1012:C00007-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012749 CALIB NASHYD 1.0 01:EXT5 .01 .001 No_date 12:00 16.59 .342 .000
012750 [CN= 78.0; N= 3.00; Tpe=.45]
012751 *****
012752 # EXT6
012753 *****
012754 R1012:C00008-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012755 CALIB NASHYD 1.0 01:EXT6 .86 .023 No_date 12:30 21.64 .446 .000
012756 [CN= 85.0; N= 3.00; Tpe=.56]
012757 *****
012758 # EXT7
012759 *****
012760 R1012:C00009-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012761 CALIB NASHYD 1.0 01:EXT7 .47 .017 No_date 12:13 20.01 .413 .000
012762 [CN= 83.0; N= 3.00; Tpe=.32]
012763 *****
012764 # EXT8
012765 *****
012766 R1012:C00010-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012767 CALIB NASHYD 1.0 01:EXT8 .83 .021 No_date 12:20 17.22 .355 .000
012768 [CN= 79.0; N= 3.00; Tpe=.42]
012769 *****
012770 # EXT9
012771 *****
012772 R1012:C00011-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012773 CALIB NASHYD 1.0 01:EXT9 3.57 .074 No_date 12:25 15.46 .319 .000
012774 [CN= 76.0; N= 3.00; Tpe=.04]
012775 *****
012776 # EXT10
012777 *****
012778 R1012:C00012-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012779 CALIB NASHYD 1.0 01:EXT9a .01 .001 No_date 12:00 16.59 .342 .000
012780 [CN= 78.0; N= 3.00; Tpe=.04]
012781 *****
012782 # EXT11
012783 *****
012784 R1012:C00013-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012785 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012786 [CN= 78.0; N= 3.00; Tpe=.04]
012787 *****
012788 # Pre2
012789 *****
012790 R1012:C00014-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012791 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012792 [CN= 78.0; N= 3.00; Tpe=.04]
012793 *****
012794 # Pre2
012795 *****
012796 R1012:C00015-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012797 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012798 [CN= 78.0; N= 3.00; Tpe=.04]
012799 *****
012800 # Pre2
012801 *****
012802 R1012:C00016-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012803 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012804 [CN= 78.0; N= 3.00; Tpe=.04]
012805 *****
012806 # Pre2
012807 *****
012808 R1012:C00017-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012809 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012810 [CN= 78.0; N= 3.00; Tpe=.04]
012811 *****
012812 # Pre2
012813 *****
012814 R1012:C00018-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012815 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012816 [CN= 78.0; N= 3.00; Tpe=.04]
012817 *****
012818 # Pre2
012819 *****
012820 R1012:C00019-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012821 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012822 [CN= 78.0; N= 3.00; Tpe=.04]
012823 *****
012824 # Pre2
012825 *****
012826 R1012:C00020-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012827 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012828 [CN= 78.0; N= 3.00; Tpe=.04]
012829 *****
012830 # Pre2
012831 *****
012832 R1012:C00021-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
012833 CALIB NASHYD 1.0 01:EXT10 .20 .004 No_date 12:20 12.99 .268 .000
012834 [CN= 78.0; N= 3.00; Tpe=.04]
012835 *****
012836 # Pre2
012837 *****
012838 R1012:C00022-----DtnIn
```



```
01441# R0102/C00014-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01442# CALIB NASHYD 1.0 01:Pre11 .07 .003 No_date 12:07 26.60 343 .000
01443# [CN= 78.0; N= 3.00; Tpe = .46]
01444# # Pre9
01445# *****
01446# *****
01447# R0102/C00015-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01448# CALIB NASHYD 1.0 01:Pre9 .83 .012 No_date 12:37 12.99 268 .000
01449# [CN= 71.0; N= 3.00; Tpe = .44]
01450# *****
01451# # Pre10
01452# *****
01453# R0102/C00016-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01454# CALIB NASHYD 1.0 01:Pre10 .80 .020 No_date 12:12 12.99 268 .000
01455# [CN= 71.0; N= 3.00; Tpe = .44]
01456# *****
01457# # Pre11
01458# *****
01459# R0102/C00017-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01460# CALIB NASHYD 1.0 01:Pre11 .07 .003 No_date 12:07 26.60 343 .000
01461# [CN= 78.0; N= 3.00; Tpe = .21]
01462# *****
01463# R0102/C00018-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01464# ADD HYD + 1.0 02:EXT2 .28 .011 No_date 12:14 21.63 n/a .000
01465# + 1.0 02:EXT2 .57 .013 No_date 12:23 16.61 n/a .000
01466# SUM= 1.0 01:21 .85 .024 No_date 12:18 18.29 n/a .000
01467# R0102/C00019-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01468# ROUTE CHANNEL -> 1.0 02:21 .85 .024 No_date 12:18 18.29 n/a .000
01469# [RDT= 1.00] out<- 1.0 01:R1 .85 .022 No_date 12:25 18.29 n/a .000
01470# [L/S/n= 143./ / .394/.035]
01471# (Vmax= .278;Dmax= .103)
01472# R0102/C00020-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01473# ADD HYD + 1.0 02:R1 .85 .022 No_date 12:25 18.29 n/a .000
01474# + 1.0 02:EXT3 .56 .018 No_date 12:13 17.87 n/a .000
01475# + 1.0 02:EXT3 .31 .021 No_date 12:42 17.87 n/a .000
01476# SUM= 1.0 01:22 4.62 .090 No_date 12:30 17.95 n/a .000
01477# R0102/C00021-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01478# ROUTE CHANNEL -> 1.0 02:22 4.62 .090 No_date 12:30 17.95 n/a .000
01479# [RDT= 1.00] out<- 1.0 01:R2 4.62 .090 No_date 12:33 17.95 n/a .000
01480# [L/S/n= 73./ / .425/.035]
01481# (Vmax= .398;Dmax= .186)
01482# R0102/C00022-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01483# ADD HYD + 1.0 02:R2 4.62 .090 No_date 12:33 17.95 n/a .000
01484# + 1.0 02:EXT4 .31 .010 No_date 12:12 17.22 n/a .000
01485# SUM= 4.93 .096 No_date 12:30 17.90 n/a .000
01486# R0102/C00023-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01487# ROUTE CHANNEL -> 1.0 02:23 4.93 .096 No_date 12:30 17.90 n/a .000
01488# [RDT= 1.00] out<- 1.0 01:R3 4.93 .095 No_date 12:35 17.90 n/a .000
01489# [L/S/n= 92./ / .274/.035]
01490# (Vmax= .324;Dmax= .146)
01491# R0102/C00024-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01492# ADD HYD + 1.0 02:EXT5 .59 .013 No_date 12:22 15.46 n/a .000
01493# + 1.0 02:EXT5 .52 .022 No_date 12:33 17.64 n/a .000
01494# SUM= 1.0 01:24 5.52 .107 No_date 12:33 17.64 n/a .000
01495# R0102/C00025-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01496# ROUTE CHANNEL -> 1.0 02:24 5.52 .107 No_date 12:33 17.64 n/a .000
01497# [RDT= 1.00] out<- 1.0 01:R4 5.52 .098 No_date 12:46 17.64 n/a .000
01498# [L/S/n= 251./ / .394/.035]
01499# (Vmax= .309;Dmax= .120)
01500# R0102/C00026-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01501# ADD HYD + 1.0 02:R4 5.52 .098 No_date 12:46 17.64 n/a .000
01502# + 1.0 02:EXT6 .20 .004 No_date 12:20 12.99 n/a .000
01503# + 1.0 02:EXT7 .47 .017 No_date 12:13 20.01 n/a .000
01504# SUM= 1.0 01:25 6.86 .128 No_date 12:40 18.31 n/a .000
01505# R0102/C00027-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01506# ROUTE CHANNEL -> 1.0 02:25 6.86 .128 No_date 12:40 18.31 n/a .000
01507# [RDT= 1.00] out<- 1.0 01:R5 6.86 .125 No_date 12:47 18.31 n/a .000
01508# [L/S/n= 237./ / .644/.035]
01509# (Vmax= .501;Dmax= .200)
01510# R0102/C00028-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01511# ROUTE CHANNEL -> 1.0 02:Pre10 .80 .020 No_date 12:12 12.99 n/a .000
01512# [RDT= 1.00] out<- 1.0 01:R6 3.80 .019 No_date 12:15 12.99 n/a .000
01513# [L/S/n= 77./ / .776/.035]
01514# (Vmax= .492;Dmax= .041)
01515# R0102/C00029-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01516# ROUTE CHANNEL -> 1.0 02:Pre9 .83 .012 No_date 12:37 12.99 n/a .000
01517# [RDT= 1.00] out<- 1.0 01:R7 4.83 .012 No_date 12:40 12.99 n/a .000
01518# [L/S/n= 159./ / .576/.035]
01519# (Vmax= .797;Dmax= .003)
01520# R0102/C00030-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01521# ADD HYD + 1.0 02:R6 .80 .019 No_date 12:15 13.03 n/a .000
01522# + 1.0 02:EXT10 .20 .004 No_date 12:20 12.99 n/a .000
01523# SUM= 1.0 01:26 1.01 .023 No_date 12:15 13.02 n/a .000
01524# R0102/C00031-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01525# ROUTE CHANNEL -> 1.0 02:26 1.01 .023 No_date 12:15 13.02 n/a .000
01526# [RDT= 1.00] out<- 1.0 01:R8 1.01 .023 No_date 12:19 13.02 n/a .000
01527# [L/S/n= 79./ / .321/.035]
01528# (Vmax= .423;Dmax= .017)
01529# R0102/C00032-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01530# ADD HYD + 1.0 02:R8 1.01 .023 No_date 12:19 13.02 n/a .000
01531# + 1.0 02:R7 .83 .011 No_date 12:40 13.00 n/a .000
01532# SUM= 1.0 01:27 1.83 .032 No_date 12:22 13.02 n/a .000
01533# R0102/C00033-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01534# ROUTE CHANNEL -> 1.0 02:27 1.83 .032 No_date 12:22 13.01 n/a .000
01535# [RDT= 1.00] out<- 1.0 01:R9 1.83 .032 No_date 12:23 13.01 n/a .000
01536# [L/S/n= 29./ / .887/.035]
01537# (Vmax= .543;Dmax= .004)
01538# R0102/C00034-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01539# ADD HYD + 1.0 02:EXT9 3.57 .074 No_date 12:25 15.46 n/a .000
01540# + 1.0 02:R9 1.83 .032 No_date 12:23 13.02 n/a .000
01541# + 1.0 02:EXT8 .83 .021 No_date 12:20 17.22 n/a .000
01542# SUM= 6.86 .129 No_date 12:47 18.31 n/a .000
01543# R0102/C00035-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01544# ROUTE PIPE -> 1.0 02:28 13.10 .223 No_date 12:35 16.72 n/a .000
01545# [RDT= 1.00] out<- 1.0 01:Outlet 13.10 .229 No_date 12:42 16.72 n/a .000
01546# [L/S/n= 77./ / .776/.035]
01547# (Vmax= .345;Dmax= .812)
01548# [Dtn= .55;Dmax= .99]
01549# *****
01550# *****
01551# # STORMS
01552# *****
01553# ** END OF RUN : 104
01554#
01555#
01556#
01557#
01558#
01559#
01560#
01561# RUN COMMANDS
01562# *****
01563# START = .00 hrs on 0
01564# [METOUT= 2 (1=imperial, 2=metric output)]
01565# [NFORM= 1]
01566# [NFORM= 1]
01567# [NFORM= 1]
01568# *****
01569# # SWHYND / INPUT DATA FILE
01570# *****
01571# # Project Name : [5923 Ottawa St]
01572# # Project Number: [P2710(001)]
01573# # Date : [2025 FEB 05]
01574# # Modifier : [NM]
01575# # Company : JFSA Canada Inc.
01576# # License # : 2549237
01577# *****
01578# # Model developed to simulate runoff from subcatchments under pre development conditions
01579# *****
01580# R0105/C00002-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01581# READ STORM File=STORM.001
01582# Comment = 5 years RCU Type 2 Storm 24 Hours step 10 min, City of Ottawa
01583# [SDT=10.00;SDUR= 24.00;PTOT= 64.11]
01584# *****
01585# # EXT1
01586# *****
01587# *****
01588# R0105/C00003-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01589# CALIB NASHYD 1.0 01:EXT1 3.21 .095 No_date 12:41 28.73 448 .000
01590# [CN= 80.0; N= 3.00; Tpe = .72]
01591# *****
01592# # EXT2
01593# *****
01594# R0105/C00004-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01595# CALIB NASHYD 1.0 01:EXT2 .59 .021 No_date 12:22 25.29 395 .000
01596# [CN= 85.0; N= 3.00; Tpe = .33]
01597# *****
01598# # EXT3
01599# *****
01600# R0105/C00005-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01601# CALIB NASHYD 1.0 01:EXT3 .56 .030 No_date 12:13 28.73 448 .000
01602# [CN= 80.0; N= 3.00; Tpe = .40]
01603# *****
01604# # EXT4
01605# *****
01606# R0105/C00006-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01607# CALIB NASHYD 1.0 01:EXT4 .31 .017 No_date 12:11 27.82 434 .000
01608# [CN= 79.0; N= 3.00; Tpe = .29]
01609# *****
01610# # EXT5
01611# *****
01612# R0105/C00007-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01613# CALIB NASHYD 1.0 01:EXT5 .59 .021 No_date 12:22 25.29 395 .000
01614# [CN= 76.0; N= 3.00; Tpe = .45]
01615# *****
01616# # EXT6
01617# *****
01618# R0105/C00008-----DtnIn-ID:INVD-----AREAh-QFEARcns-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
01619# CALIB NASHYD 1.0 01:EXT6 .86 .037 No_date 12:29 33.88 529 .000
01620# [CN= 85.0; N= 3.00; Tpe = .54]
01621# *****
01622# *****
01623# *****
01624# *****
01625# *****
01626# *****
01627# *****
01628# *****
01629# *****
01630# *****
01631# *****
01632# *****
01633# *****
01634# *****
01635# *****
01636# *****
01637# *****
01638# *****
01639# *****
01640# *****
01641# *****
01642# *****
01643# *****
01644# *****
01645# *****
01646# *****
01647# *****
01648# *****
01649# *****
01650# *****
01651# *****
01652# *****
01653# *****
01654# *****
01655# *****
01656# *****
01657# *****
01658# *****
01659# *****
01660# *****
01661# *****
01662# *****
01663# *****
01664# *****
01665# *****
01666# *****
01667# *****
01668# *****
01669# *****
01670# *****
01671# *****
01672# *****
01673# *****
01674# *****
01675# *****
01676# *****
01677# *****
01678# *****
01679# *****
01680# *****
01681# *****
01682# *****
01683# *****
01684# *****
01685# *****
01686# *****
01687# *****
01688# *****
01689# *****
01690# *****
01691# *****
01692# *****
01693# *****
01694# *****
01695# *****
01696# *****
01697# *****
01698# *****
01699# *****
01700# *****
01701# *****
01702# *****
01703# *****
01704# *****
01705# *****
01706# *****
01707# *****
01708# *****
01709# *****
01710# *****
01711# *****
01712# *****
01713# *****
01714# *****
01715# *****
01716# *****
01717# *****
01718# *****
01719# *****
01720# *****
01721# *****
01722# *****
01723# *****
01724# *****
01725# *****
01726# *****
01727# *****
01728# *****
01729# *****
01730# *****
01731# *****
01732# *****
01733# *****
01734# *****
01735# *****
01736# *****
01737# *****
01738# *****
01739# *****
01740# *****
01741# *****
01742# *****
01743# *****
01744# *****
01745# *****
01746# *****
01747# *****
01748# *****
01749# *****
01750# *****
01751# *****
01752# *****
01753# *****
01754# *****
01755# *****
01756# *****
01757# *****
01758# *****
01759# *****
01760# *****
01761# *****
01762# *****
01763# *****
01764# *****
01765# *****
01766# *****
01767# *****
01768# *****
01769# *****
01770# *****
01771# *****
01772# *****
01773# *****
01774# *****
01775# *****
01776# *****
01777# *****
01778# *****
01779# *****
01780# *****
01781# *****
01782# *****
01783# *****
01784# *****
01785# *****
01786# *****
01787# *****
01788# *****
01789# *****
01790# *****
01791# *****
01792# *****
01793# *****
01794# *****
01795# *****
01796# *****
01797# *****
01798# *****
01799# *****
01800# *****
```

JFSAinc.

[illegible]

```
025211 *****
025212 # Pre11-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025223 *****
025224 R1979:C0017-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025225 CALIB NASHYD 1.0 01:Pre11 .07 .010 No_date 12:06 59.96 .462 .000
025226 [CN= 78.0; N= 3.00; Tpe= .21]
025227 *****
025228 R1979:C0018-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025229 ADD HYD + 1.0 02:EXT2 .28 .037 No_date 12:13 70.91 n/a .000
025230 + 1.0 02:EXT1 3.21 .012 No_date 12:12 82.92 n/a .000
025231 SUM= 1.0 01:EXT .85 .084 No_date 12:17 63.63 n/a .000
025232 R1979:C0019-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025233 ROUTE CHANNEL -> 1.0 02:EXT1 .85 .084 No_date 12:17 63.63 n/a .000
025234 [RDT= 1.00] out<- 1.0 01:EXT1 .85 .081 No_date 12:22 63.63 n/a .000
025235 [L/S/n= 143./ .394/.035]
025236 [Vmax= .404;Dmax= .181]
025237 R1979:C0020-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025238 ADD HYD + 1.0 02:EXT1 .85 .081 No_date 12:22 63.63 n/a .000
025239 + 1.0 02:EXT3 .56 .066 No_date 12:13 62.92 n/a .000
025240 SUM= 1.0 01:EXT3 3.21 .012 No_date 12:12 82.92 n/a .000
025241 [CN= 78.0; N= 3.00; Tpe= .46]
025242 R1979:C0021-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025243 ROUTE CHANNEL -> 1.0 02:EXT2 4.62 .329 No_date 12:27 63.05 n/a .000
025244 [RDT= 1.00] out<- 1.0 01:EXT2 4.62 .329 No_date 12:29 63.05 n/a .000
025245 [L/S/n= 143./ .425/.035]
025246 [Vmax= .561;Dmax= .313]
025247 R1979:C0022-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025248 ADD HYD + 1.0 02:EXT2 4.62 .329 No_date 12:29 63.05 n/a .000
025249 + 1.0 02:EXT4 .31 .038 No_date 12:11 61.42 n/a .000
025250 SUM= 1.0 01:EXT3 4.93 .352 No_date 12:12 62.95 n/a .000
025251 R1979:C0023-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025252 ROUTE CHANNEL -> 1.0 02:EXT3 4.93 .354 No_date 12:27 62.95 n/a .000
025253 [RDT= 1.00] out<- 1.0 01:EXT3 4.93 .352 No_date 12:30 62.95 n/a .000
025254 [L/S/n= 92./ .274/.035]
025255 [Vmax= .459;Dmax= .323]
025256 R1979:C0024-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025257 ADD HYD + 1.0 02:EXT3 .59 .049 No_date 12:21 57.15 n/a .000
025258 + 1.0 02:EXT5 .52 .399 No_date 12:28 62.32 n/a .000
025259 SUM= 1.0 01:EXT4 5.52 .399 No_date 12:28 62.32 n/a .000
025260 R1979:C0025-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025261 ROUTE CHANNEL -> 1.0 01:EXT4 5.52 .399 No_date 12:28 62.32 n/a .000
025262 [RDT= 1.00] out<- 1.0 01:EXT4 5.52 .379 No_date 12:37 62.32 n/a .000
025263 [L/S/n= 251./ .190/.035]
025264 [Vmax= .456;Dmax= .372]
025265 R1979:C0026-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025266 ADD HYD + 1.0 02:EXT4 5.52 .379 No_date 12:37 62.32 n/a .000
025267 + 1.0 02:EXT6 .47 .060 No_date 12:12 67.60 n/a .000
025268 SUM= 1.0 01:EXT5 6.86 .491 No_date 12:33 63.77 n/a .000
025269 R1979:C0027-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025270 ROUTE CHANNEL -> 1.0 01:EXT5 6.86 .491 No_date 12:33 63.77 n/a .000
025271 [RDT= 1.00] out<- 1.0 01:EXT5 6.86 .485 No_date 12:38 63.77 n/a .000
025272 [L/S/n= 237./ .644/.035]
025273 [Vmax= .744;Dmax= .340]
025274 R1979:C0028-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025275 ROUTE CHANNEL -> 1.0 01:Pre10 .80 .080 No_date 12:11 50.61 n/a .000
025276 [RDT= 1.00] out<- 1.0 01:Pre10 .80 .078 No_date 12:14 50.61 n/a .000
025277 [L/S/n= 77./ .776/.035]
025278 [Vmax= .492;Dmax= .058]
025279 R1979:C0029-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025280 ROUTE CHANNEL -> 1.0 01:Pre9 .83 .047 No_date 12:35 50.61 n/a .000
025281 [RDT= 1.00] out<- 1.0 01:Pre9 .83 .047 No_date 12:38 50.61 n/a .000
025282 [L/S/n= 159./ .1576/.035]
025283 [Vmax= .797;Dmax= .014]
025284 R1979:C0030-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025285 ADD HYD + 1.0 02:EXT6 .80 .078 No_date 12:14 50.69 n/a .000
025286 + 1.0 02:EXT10 2.0 .016 No_date 12:19 50.61 n/a .000
025287 SUM= 1.0 01:EXT6 1.01 .093 No_date 12:14 50.67 n/a .000
025288 R1979:C0031-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025289 ROUTE CHANNEL -> 1.0 01:EXT6 1.01 .093 No_date 12:14 50.67 n/a .000
025290 [RDT= 1.00] out<- 1.0 01:EXT6 1.01 .091 No_date 12:18 50.67 n/a .000
025291 [L/S/n= 79./ .522/.035]
025292 [Vmax= .423;Dmax= .068]
025293 R1979:C0032-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025294 ADD HYD + 1.0 02:EXT8 .83 .047 No_date 12:38 50.63 n/a .000
025295 + 1.0 02:EXT7 .83 .129 No_date 12:21 50.65 n/a .000
025296 SUM= 1.0 01:EXT7 1.83 .129 No_date 12:22 50.65 n/a .000
025297 R1979:C0033-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025298 ROUTE CHANNEL -> 1.0 01:EXT7 1.83 .129 No_date 12:21 50.65 n/a .000
025299 [RDT= 1.00] out<- 1.0 01:EXT7 1.83 .129 No_date 12:22 50.65 n/a .000
025300 [L/S/n= 29./ .887/.035]
025301 [Vmax= .543;Dmax= .019]
025302 R1979:C0034-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025303 ADD HYD + 1.0 02:EXT9 3.57 .284 No_date 12:23 57.15 n/a .000
025304 + 1.0 02:EXT8 1.83 .129 No_date 12:22 50.66 n/a .000
025305 SUM= 1.0 02:EXT8 6.83 .079 No_date 12:19 61.43 n/a .000
025306 + 1.0 02:EXT9 6.86 .485 No_date 12:38 63.77 n/a .000
025307 SUM= 1.0 01:EXT8 13.10 .939 No_date 12:30 59.98 n/a .000
025308 R1979:C0035-----DtnIn-ID-INHYD-----AREAhA-QFEARcMs-TpeakDate_hh:mm-----RvM-R.C-----DWfCms
025309 ROUTE PIPE -> 1.0 01:Outlet 13.10 .939 No_date 12:30 59.98 n/a .000
025310 [RDT= 1.00] out<- 1.0 01:Outlet 13.10 .937 No_date 12:31 59.98 n/a .000
025311 [L/S/n= 79./ .522/.035]
025312 [Vmax= .489;Dmax= 1.369]
025313 [Dlsw= .553;Dused= 1.67]
025314 *****
025315 *****
025316 *****
025317 *****
025318 *****
025319 *****
025320 *****
025321 *****
025322 *****
025323 *****
025324 *****
025325 *****
025326 *****
025327 *****
025328 *****
025329 *****
025330 *****
025331 *****
025332 *****
025333 *****
025334 *****
025335 *****
025336 *****
025337 *****
025338 *****
025339 *****
025340 *****
025341 *****
025342 *****
025343 *****
025344 *****
025345 *****
025346 *****
025347 *****
025348 *****
025349 *****
025350 *****
025351 *****
025352 *****
025353 *****
025354 *****
025355 *****
025356 *****
025357 *****
025358 *****
025359 *****
025360 *****
025361 *****
025362 *****
025363 *****
025364 *****
025365 *****
025366 *****
025367 *****
025368 *****
025369 *****
025370 *****
025371 *****
025372 *****
025373 *****
025374 *****
025375 *****
025376 *****
025377 *****
025378 *****
025379 *****
025380 *****
025381 *****
025382 *****
025383 *****
025384 *****
025385 *****
025386 *****
025387 *****
025388 *****
025389 *****
025390 *****
025391 *****
025392 *****
025393 *****
025394 *****
025395 *****
025396 *****
025397 *****
025398 *****
025399 *****
025400 *****
025401 *****
025402 *****
025403 *****
025404 *****
025405 *****
025406 *****
025407 *****
025408 *****
025409 *****
025410 *****
025411 *****
025412 *****
025413 *****
025414 *****
025415 *****
025416 *****
025417 *****
025418 *****
025419 *****
025420 *****
025421 *****
025422 *****
025423 *****
025424 *****
025425 *****
025426 *****
025427 *****
025428 *****
025429 *****
025430 *****
025431 *****
025432 *****
025433 *****
025434 *****
025435 *****
025436 *****
025437 *****
025438 *****
025439 *****
025440 *****
025441 *****
025442 *****
025443 *****
025444 *****
025445 *****
025446 *****
025447 *****
025448 *****
025449 *****
025450 *****
025451 *****
025452 *****
025453 *****
025454 *****
025455 *****
025456 *****
025457 *****
025458 *****
025459 *****
025460 *****
025461 *****
025462 *****
025463 *****
025464 *****
025465 *****
025466 *****
025467 *****
025468 *****
025469 *****
025470 *****
025471 *****
025472 *****
025473 *****
025474 *****
025475 *****
025476 *****
025477 *****
025478 *****
025479 *****
025480 *****
025481 *****
025482 *****
025483 *****
025484 *****
025485 *****
025486 *****
025487 *****
025488 *****
025489 *****
025490 *****
025491 *****
025492 *****
025493 *****
025494 *****
025495 *****
025496 *****
025497 *****
025498 *****
025499 *****
025500 *****
025501 *****
025502 *****
025503 *****
025504 *****
025505 *****
025506 *****
025507 *****
025508 *****
025509 *****
025510 *****
025511 *****
025512 *****
025513 *****
025514 *****
025515 *****
025516 *****
025517 *****
025518 *****
025519 *****
025520 *****
025521 *****
025522 *****
025523 *****
025524 *****
025525 *****
025526 *****
025527 *****
025528 *****
025529 *****
025530 *****
025531 *****
025532 *****
025533 *****
025534 *****
025535 *****
025536 *****
025537 *****
025538 *****
025539 *****
025540 *****
025541 *****
025542 *****
025543 *****
025544 *****
025545 *****
025546 *****
025547 *****
025548 *****
025549 *****
025550 *****
025551 *****
025552 *****
025553 *****
025554 *****
025555 *****
025556 *****
025557 *****
025558 *****
025559 *****
025560 *****
025561 *****
025562 *****
025563 *****
025564 *****
025565 *****
025566 *****
025567 *****
025568 *****
025569 *****
025570 *****
025571 *****
025572 *****
025573 *****
025574 *****
025575 *****
025576 *****
025577 *****
025578 *****
025579 *****
025580 *****
025581 *****
025582 *****
025583 *****
025584 *****
025585 *****
025586 *****
025587 *****
025588 *****
025589 *****
025590 *****
025591 *****
025592 *****
025593 *****
025594 *****
025595 *****
025596 *****
025597 *****
025598 *****
025599 *****
025600 *****
025601 *****
025602 *****
025603 *****
025604 *****
025605 *****
025606 *****
025607 *****
025608 *****
025609 *****
025610 *****
025611 *****
025612 *****
025613 *****
025614 *****
025615 *****
025616 *****
025617 *****
025618 *****
025619 *****
025620 *****
025621 *****
025622 *****
025623 *****
025624 *****
025625 *****
025626 *****
025627 *****
025628 *****
025629 *****
025630 *****
025631 *****
025632 *****
025633 *****
025634 *****
025635 *****
025636 *****
025637 *****
025638 *****
025639 *****
025640 *****
025641 *****
025642 *****
025643 *****
025644 *****
025645 *****
025646 *****
025647 *****
025648 *****
025649 *****
025650 *****
025651 *****
025652 *****
025653 *****
025654 *****
025655 *****
025656 *****
025657 *****
025658 *****
025659 *****
025660 *****
025661 *****
025662 *****
025663 *****
025664 *****
025665 *****
025666 *****
025667 *****
025668 *****
025669 *****
025670 *****
025671 *****
025672 *****
025673 *****
025674 *****
025675 *****
025676 *****
025677 *****
025678 *****
025679 *****
025680 *****
025681 *****
025682 *****
025683 *****
025684 *****
025685 *****
025686 *****
025687 *****
025688 *****
025689 *****
025690 *****
025691 *****
025692 *****
025693 *****
025694 *****
025695 *****
025696 *****
025697 *****
025698 *****
025699 *****
025700 *****
```



JFSAinc.

```
03241) (Vmax=.543;Dmax=.056)-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03242) R1996:CO0010-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03243) ADD HYD + 1.0 02:EXT9 3.57 .177 No_date 3:36 32.07 n/a .000
03244) + 1.0 02:R9 1.83 .082 No_date 3:35 27.76 n/a .000
03245) + 1.0 02:EXT8 .83 .049 No_date 3:32 35.05 n/a .000
03246) + 1.0 02:R5 6.86 .302 No_date 3:50 36.76 n/a .000
03247) SUM= 13.10 .186 No_date 3:41 34.11 n/a .000
03248) R1996:CO0035-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03249) ROUTE PIPE -> 1.0 02:P8 13.10 .586 No_date 3:41 34.11 n/a .000
03250) * [RDT=1.00] out<- 1.0 01:Outlet 13.10 .586 No_date 3:42 34.11 n/a .000
03251) [L/S/n= 8./ .010/.033]
03252) (Vmax=.493;Dmax=.140)-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03253) (Dtn=.53;Dused=1.40)
03254) #####
03255) * STORMS
03256) #####
03257) *** END OF RUN : 1996
03258) #####
03259) #####
03260) #####
03261) #####
03262) #####
03263) #####
03264) #####
03265) RUN#:CONMAN#
03266) R9999:CO0001-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03267) START
03268) [TZERO = .00 hrs on 0]
03269) [MOUTP= 2 (1=Imperial, 2=metric output)]
03270) [METFORM= 1]
03271) [NRUN = 9999]
03272) #####
03273) * SWHYDRO / INPUT DATA FILE
03274) #####
03275) * Project Name : [5923 Ottawa St]
03276) * Project Number: [P2710(e01)]
03277) * Date : [2025 FEB 05]
03278) * Modeller : [NM]
03279) * Company : JFSA Canada Inc.
03280) * License # : 254327
03281) #####
03282) * Model developed to simulate runoff from subcatchments under pre development conditions
03283) #####
03284) R9999:CO0002-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03285) READ STORM
03286) Filename = STORM.001
03287) Comment = CHICAGO STORM 100 Year, 3 Hours *20k Stress Test
03288) [SDT=10.0;SDUR= 3.00;PTOT= 86.00]
03289) #####
03290) * EXT1
03291) #####
03292) R9999:CO0003-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03293) CALIB NASHYD 1.0 01:EXT1 3.21 .224 No_date 1:51 45.67 .531 .000
03294) [Cm= 80.0; N= 3.00; Tpe=.72]
03295) #####
03296) * EXT2
03297) #####
03298) R9999:CO0004-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03299) CALIB NASHYD 1.0 01:EXT2 .28 .041 No_date 1:21 52.43 .610 .000
03300) [Cm= 80.0; N= 3.00; Tpe=.31]
03301) #####
03302) * EXT3
03303) #####
03304) R9999:CO0005-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03305) CALIB NASHYD 1.0 01:EXT3 .86 .070 No_date 1:21 45.67 .531 .000
03306) [Cm= 80.0; N= 3.00; Tpe=.32]
03307) #####
03308) * EXT4
03309) #####
03310) R9999:CO0006-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03311) CALIB NASHYD 1.0 01:EXT4 .31 .040 No_date 1:19 44.44 .517 .000
03312) [Cm= 79.0; N= 3.00; Tpe=.29]
03313) #####
03314) * EXT5
03315) #####
03316) R9999:CO0007-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03317) CALIB NASHYD 1.0 01:EXT5 .59 .052 No_date 1:31 40.94 .476 .000
03318) [Cm= 76.0; N= 3.00; Tpe=.45]
03319) #####
03320) * EXT6
03321) #####
03322) R9999:CO0008-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03323) CALIB NASHYD 1.0 01:EXT6 .86 .085 No_date 1:38 52.43 .610 .000
03324) [Cm= 85.0; N= 3.00; Tpe=.56]
03325) #####
03326) * EXT7
03327) #####
03328) R9999:CO0009-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03329) CALIB NASHYD 1.0 01:EXT7 .47 .064 No_date 1:21 49.60 .577 .000
03330) [Cm= 83.0; N= 3.00; Tpe=.29]
03331) #####
03332) * EXT8
03333) #####
03334) R9999:CO0010-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03335) CALIB NASHYD 1.0 01:EXT8 .83 .083 No_date 1:29 44.44 .517 .000
03336) [Cm= 79.0; N= 3.00; Tpe=.42]
03337) #####
03338) * EXT9
03339) #####
03340) R9999:CO0011-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03341) CALIB NASHYD 1.0 01:EXT9 3.57 .297 No_date 1:34 40.95 .476 .000
03342) [Cm= 76.0; N= 3.00; Tpe=.48]
03343) #####
03344) * EXT9a
03345) #####
03346) R9999:CO0012-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03347) CALIB NASHYD 1.0 01:EXT9a .01 .004 No_date 1:00 43.23 .503 .000
03348) [Cm= 78.0; N= 3.00; Tpe=.04]
03349) #####
03350) * EXT10
03351) #####
03352) R9999:CO0013-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03353) CALIB NASHYD 1.0 01:EXT10 .20 .016 No_date 1:29 35.74 .416 .000
03354) [Cm= 71.0; N= 3.00; Tpe=.42]
03355) #####
03356) * Pre2
03357) #####
03358) R9999:CO0014-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03359) CALIB NASHYD 1.0 01:Pre2 .57 .051 No_date 1:32 43.24 .503 .000
03360) [Cm= 78.0; N= 3.00; Tpe=.29]
03361) #####
03362) * Pre0
03363) #####
03364) R9999:CO0015-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03365) CALIB NASHYD 1.0 01:Pre0 .83 .048 No_date 1:47 35.74 .416 .000
03366) [Cm= 71.0; N= 3.00; Tpe=.64]
03367) #####
03368) * Pre10
03369) #####
03370) R9999:CO0016-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03371) CALIB NASHYD 1.0 01:Pre10 .80 .081 No_date 1:19 35.74 .416 .000
03372) [Cm= 71.0; N= 3.00; Tpe=.21]
03373) #####
03374) * Pre11
03375) #####
03376) R9999:CO0017-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03377) CALIB NASHYD 1.0 01:Pre11 .07 .011 No_date 1:13 43.23 .503 .000
03378) [Cm= 78.0; N= 3.00; Tpe=.21]
03379) #####
03380) R9999:CO0018-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03381) ADD HYD + 1.0 02:EXT2 .28 .041 No_date 1:21 52.43 n/a .000
03382) + 1.0 02:Pre2 .57 .051 No_date 1:32 43.24 n/a .000
03383) SUM= 1.0 01:P1 .85 .090 No_date 1:26 46.32 n/a .000
03384) R9999:CO0019-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03385) ROUTE CHANNEL -> 1.0 02:P1 .85 .090 No_date 1:26 46.32 n/a .000
03386) [RDT=1.00] out<- 1.0 01:P1 .85 .087 No_date 1:32 46.32 n/a .000
03387) [L/S/n= 143./ .394/.035]
03388) (Vmax=.410;Dmax=.185)
03389) R9999:CO0020-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03390) ADD HYD + 1.0 02:P1 .85 .087 No_date 1:32 46.32 n/a .000
03391) + 1.0 02:EXT3 .56 .070 No_date 1:21 45.67 n/a .000
03392) + 1.0 02:EXT4 3.21 .224 No_date 1:51 45.67 n/a .000
03393) SUM= 1.0 01:P2 4.62 .346 No_date 1:39 45.79 n/a .000
03394) R9999:CO0021-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03395) ROUTE CHANNEL -> 1.0 02:P2 4.62 .346 No_date 1:39 45.79 n/a .000
03396) [RDT=1.00] out<- 1.0 01:P2 4.62 .346 No_date 1:40 45.79 n/a .000
03397) [L/S/n= 71./ .425/.035]
03398) (Vmax=.568;Dmax=.320)
03399) R9999:CO0022-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03400) ADD HYD + 1.0 02:P2 4.62 .346 No_date 1:40 45.79 n/a .000
03401) + 1.0 02:EXT4 .31 .040 No_date 1:19 44.44 n/a .000
03402) SUM= 1.0 01:P3 4.93 .372 No_date 1:38 45.70 n/a .000
03403) R9999:CO0023-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03404) ROUTE CHANNEL -> 1.0 02:P3 4.93 .372 No_date 1:38 45.70 n/a .000
03405) [RDT=1.00] out<- 1.0 01:P3 4.93 .369 No_date 1:40 45.70 n/a .000
03406) [L/S/n= 92./ .274/.035]
03407) (Vmax=.463;Dmax=.320)
03408) R9999:CO0024-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03409) ADD HYD + 1.0 02:P3 4.93 .369 No_date 1:40 45.70 n/a .000
03410) + 1.0 02:EXT5 .59 .052 No_date 1:31 40.94 n/a .000
03411) SUM= 1.0 01:P4 5.52 .419 No_date 1:39 45.19 n/a .000
03412) R9999:CO0025-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03413) ROUTE CHANNEL -> 1.0 02:P4 5.52 .419 No_date 1:39 45.19 n/a .000
03414) [RDT=1.00] out<- 1.0 01:P4 5.52 .399 No_date 1:48 45.19 n/a .000
03415) [L/S/n= 251./ .190/.035]
03416) (Vmax=.463;Dmax=.380)
03417) R9999:CO0026-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03418) ADD HYD + 1.0 02:P4 5.52 .399 No_date 1:48 45.19 n/a .000
03419) + 1.0 02:EXT6 .86 .085 No_date 1:38 52.43 n/a .000
03420) SUM= 1.0 02:EXT7 .47 .064 No_date 1:21 49.60 n/a .000
03421) SUM= 1.0 01:P5 6.86 .519 No_date 1:44 46.41 n/a .000
03422) R9999:CO0027-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03423) ROUTE CHANNEL -> 1.0 02:P5 6.86 .519 No_date 1:44 46.41 n/a .000
03424) [RDT=1.00] out<- 1.0 01:P5 6.86 .513 No_date 1:49 46.41 n/a .000
03425) [L/S/n= 237./ .544/.035]
03426) (Vmax=.757;Dmax=.348)
03427) R9999:CO0028-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03428) ROUTE CHANNEL -> 1.0 02:Pre10 .80 .081 No_date 1:19 35.74 n/a .000
03429) [RDT=1.00] out<- 1.0 01:P6 .80 .080 No_date 1:22 35.74 n/a .000
03430) [L/S/n= 71./ .776/.035]
03431) (Vmax=.492;Dmax=.059)
03432) R9999:CO0029-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03433) ROUTE CHANNEL -> 1.0 02:Pre9 .83 .048 No_date 1:47 35.74 n/a .000
03434) [RDT=1.00] out<- 1.0 01:P7 .83 .048 No_date 1:50 35.74 n/a .000
03435) [L/S/n= 159./ .1576/.035]
03436) (Vmax=.797;Dmax=.014)
03437) R9999:CO0030-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03438) ADD HYD + 1.0 02:P6 .80 .080 No_date 1:22 36.02 n/a .000
03439) + 1.0 02:EXT10 .20 .016 No_date 1:29 35.74 n/a .000
03440) SUM= 1.0 01:P6 1.83 .048 No_date 1:29 35.74 n/a .000
03441) R9999:CO0031-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03442) ROUTE CHANNEL -> 1.0 02:P6 1.01 .095 No_date 1:23 35.96 n/a .000
03443) [RDT=1.00] out<- 1.0 01:P8 1.01 .093 No_date 1:26 35.96 n/a .000
03444) [L/S/n= 79./ .522/.035]
03445) (Vmax=.423;Dmax=.070)
03446) R9999:CO0032-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03447) ADD HYD + 1.0 02:P8 1.01 .093 No_date 1:26 35.96 n/a .000
03448) + 1.0 02:P7 .83 .048 No_date 1:50 35.77 n/a .000
03449) SUM= 1.0 01:P7 1.83 .131 No_date 1:31 35.88 n/a .000
03450) R9999:CO0033-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03451) ROUTE CHANNEL -> 1.0 02:P7 1.83 .131 No_date 1:31 35.88 n/a .000
03452) [RDT=1.00] out<- 1.0 01:P9 1.83 .131 No_date 1:32 35.88 n/a .000
03453) [L/S/n= 28./ .887/.035]
03454) (Vmax=.543;Dmax=.089)
03455) R9999:CO0034-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03456) ADD HYD + 1.0 02:EXT9 3.57 .297 No_date 1:34 40.95 n/a .000
03457) + 1.0 02:P9 1.83 .131 No_date 1:32 35.89 n/a .000
03458) + 1.0 02:EXT8 .83 .083 No_date 1:29 44.44 n/a .000
03459) SUM= 1.0 02:P3 6.86 .513 No_date 1:49 46.41 n/a .000
03460) 13.10 .586 No_date 1:41 43.32 n/a .000
03461) R9999:CO0035-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03462) ROUTE PIPE -> 1.0 02:P8 13.10 .586 No_date 1:41 43.32 n/a .000
03463) * [RDT=1.00] out<- 1.0 01:Outlet 13.10 .583 No_date 1:42 43.32 n/a .000
03464) [L/S/n= 8./ .010/.033]
03465) (Vmax=.493;Dmax=1.394)
03466) (Dtn=.53;Dused=1.70)
03467) #####
03468) * STORMS
03469) #####
03470) R9999:CO0002-----DtnIn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfcm
03471) FINISH
03472) #####
03473) #####
03474) WARNINGS / ERRORS / NOTES
03475) #####
03476) R0002:CO0035 ROUTE PIPE ->
03477) *** WARNING: New pipe size used for routing.
03478) *** WARNING: New pipe size used for routing.
03479) *** WARNING: New pipe size used for routing.
03480) *** WARNING: New pipe size used for routing.
03481) *** WARNING: New pipe size used for routing.
03482) *** WARNING: New pipe size used for routing.
03483) *** WARNING: New pipe size used for routing.
03484) *** WARNING: New pipe size used for routing.
03485) *** WARNING: New pipe size used for routing.
03486) *** WARNING: New pipe size used for routing.
03487) *** WARNING: New pipe size used for routing.
03488) *** WARNING: New pipe size used for routing.
03489) *** WARNING: New pipe size used for routing.
03490) *** WARNING: New pipe size used for routing.
03491) *** WARNING: New pipe size used for routing.
03492) *** WARNING: New pipe size used for routing.
03493) Simulation ended on 2025-09-10 at 20:42:50
03494) #####
03495) #####
```

# Attachment B

Post-Development Hydrology





Legend

- Post-development Subcatchments
- Site Plan
- EXT1  
3.212 ha

Subcatchment Name
- Subcatchment Area (ha)

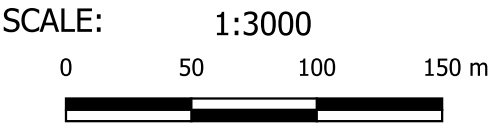




Table B1 - Site 1 - Stage/Storage/Outflow Curves

|                  |                   |                   |                      |                       | Quality Control 1      |                   | Overflow           |                   | Total             |                   |       |
|------------------|-------------------|-------------------|----------------------|-----------------------|------------------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------|
|                  |                   |                   |                      |                       | Vertical Orifice       |                   | Broad Crested Weir |                   |                   |                   |       |
|                  |                   |                   |                      |                       | Dia (m)                | 0.075             | L (m)              | 0.300             |                   |                   |       |
|                  |                   |                   |                      |                       | Area (m <sup>2</sup> ) | 0.006             | C <sub>w</sub>     | 1.580             |                   |                   |       |
|                  |                   |                   |                      |                       | Invert (m)             | 93.84             |                    |                   |                   |                   |       |
|                  |                   |                   |                      |                       | C <sub>v</sub>         | 0.61              | Invert (m)         | 94.40             |                   |                   |       |
|                  |                   |                   |                      |                       | Q @ D                  | 0.002             | n contr.           | 2                 |                   |                   |       |
| Elevation<br>(m) | Storage 1<br>(m³) | Storage 2<br>(m³) | Total Volume<br>(m³) | Demarcation<br>Points | Depth<br>(m)           | Outflow<br>(m³/s) | Depth<br>(m)       | Outflow<br>(m³/s) | Outflow<br>(m³/s) | Storage<br>(ha-m) |       |
| 93.84            |                   | 0.0               | 0.0                  | Pond Bottom           | 0.000                  | 0.000             | 0.000              | 0.000             | 0.000             | 0.000             |       |
| 93.85            |                   | 0.0               | 0.0                  |                       | 0.010                  | 0.000             | 0.000              | 0.000             | 0.000             | 0.000             | 0.000 |
| 93.86            |                   | 0.0               | 0.0                  |                       | 0.020                  | 0.001             | 0.000              | 0.000             | 0.001             | 0.000             | 0.000 |
| 93.87            |                   | 0.2               | 0.2                  |                       | 0.030                  | 0.001             | 0.000              | 0.000             | 0.001             | 0.000             | 0.000 |
| 93.88            |                   | 0.3               | 0.3                  |                       | 0.040                  | 0.001             | 0.000              | 0.000             | 0.001             | 0.000             | 0.000 |
| 93.89            |                   | 0.6               | 0.6                  |                       | 0.050                  | 0.002             | 0.000              | 0.000             | 0.002             | 0.000             | 0.000 |
| 93.90            |                   | 0.9               | 0.9                  |                       | 0.060                  | 0.002             | 0.000              | 0.000             | 0.002             | 0.000             | 0.000 |
| 93.91            |                   | 1.4               | 1.4                  |                       | 0.070                  | 0.002             | 0.000              | 0.000             | 0.002             | 0.000             | 0.000 |
| 93.92            |                   | 1.9               | 1.9                  |                       | 0.080                  | 0.002             | 0.000              | 0.000             | 0.002             | 0.000             | 0.000 |
| 93.93            |                   | 2.5               | 2.5                  |                       | 0.090                  | 0.003             | 0.000              | 0.000             | 0.003             | 0.000             | 0.000 |
| 93.94            |                   | 3.2               | 3.2                  |                       | 0.100                  | 0.003             | 0.000              | 0.000             | 0.003             | 0.000             | 0.000 |
| 93.95            |                   | 4.0               | 4.0                  |                       | 0.110                  | 0.003             | 0.000              | 0.000             | 0.003             | 0.000             | 0.000 |
| 93.96            |                   | 4.9               | 4.9                  |                       | 0.120                  | 0.003             | 0.000              | 0.000             | 0.003             | 0.000             | 0.000 |
| 93.97            |                   | 5.9               | 5.9                  |                       | 0.130                  | 0.004             | 0.000              | 0.000             | 0.004             | 0.001             | 0.001 |
| 93.98            |                   | 6.9               | 6.9                  |                       | 0.140                  | 0.004             | 0.000              | 0.000             | 0.004             | 0.001             | 0.001 |
| 93.99            |                   | 8.1               | 8.1                  |                       | 0.150                  | 0.004             | 0.000              | 0.000             | 0.004             | 0.001             | 0.001 |
| 94.00            |                   | 9.3               | 9.3                  |                       | 0.160                  | 0.004             | 0.000              | 0.000             | 0.004             | 0.001             | 0.001 |
| 94.01            | 0.00              | 10.6              | 10.6                 |                       | 0.170                  | 0.004             | 0.000              | 0.000             | 0.004             | 0.001             | 0.001 |
| 94.02            | 0.01              | 12.0              | 12.1                 |                       | 0.180                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.001             | 0.001 |
| 94.03            | 0.05              | 13.6              | 13.6                 |                       | 0.190                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.001             | 0.001 |
| 94.04            | 0.16              | 15.2              | 15.3                 |                       | 0.200                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.002             | 0.002 |
| 94.05            | 0.39              | 16.9              | 17.2                 |                       | 0.210                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.002             | 0.002 |
| 94.06            | 0.74              | 18.7              | 19.4                 |                       | 0.220                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.002             | 0.002 |
| 94.07            | 1.20              | 20.5              | 21.7                 |                       | 0.230                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.002             | 0.002 |
| 94.08            | 1.78              | 22.5              | 24.3                 |                       | 0.240                  | 0.005             | 0.000              | 0.000             | 0.005             | 0.002             | 0.002 |
| 94.09            | 2.46              | 24.6              | 27.1                 |                       | 0.250                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.003             | 0.003 |
| 94.10            | 3.24              | 26.8              | 30.1                 |                       | 0.260                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.003             | 0.003 |
| 94.11            | 4.12              | 29.1              | 33.2                 |                       | 0.270                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.003             | 0.003 |
| 94.12            | 4.61              | 31.5              | 36.1                 |                       | 0.280                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.004             | 0.004 |
| 94.13            | 5.63              | 34.0              | 39.7                 |                       | 0.290                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.004             | 0.004 |
| 94.14            | 6.85              | 36.6              | 43.5                 |                       | 0.300                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.004             | 0.004 |
| 94.15            | 8.19              | 39.3              | 47.5                 |                       | 0.310                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.005             | 0.005 |
| 94.16            | 9.66              | 42.0              | 51.7                 |                       | 0.320                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.005             | 0.005 |
| 94.17            | 11.17             | 44.8              | 56.0                 |                       | 0.330                  | 0.006             | 0.000              | 0.000             | 0.006             | 0.006             | 0.006 |
| 94.18            | 12.00             | 47.6              | 59.6                 |                       | 0.340                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.006             | 0.006 |
| 94.19            | 13.82             | 50.5              | 64.3                 |                       | 0.350                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.006             | 0.006 |
| 94.20            | 15.76             | 53.3              | 69.1                 |                       | 0.360                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.007             | 0.007 |
| 94.21            | 17.78             | 56.3              | 74.0                 |                       | 0.370                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.007             | 0.007 |
| 94.22            | 19.87             | 59.2              | 79.1                 |                       | 0.380                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.008             | 0.008 |
| 94.23            | 22.01             | 62.2              | 84.2                 |                       | 0.390                  | 0.007             | 0.000              | 0.000             | 0.007             | 0.008             | 0.008 |
| 94.24            | 24.17             | 65.1              | 89.3                 | 0.400                 | 0.007                  | 0.000             | 0.000              | 0.007             | 0.009             | 0.009             |       |
| 94.25            | 26.36             | 68.2              | 94.5                 | 0.410                 | 0.007                  | 0.000             | 0.000              | 0.007             | 0.009             | 0.009             |       |
| 94.26            | 28.57             | 71.2              | 99.8                 | 0.420                 | 0.007                  | 0.000             | 0.000              | 0.007             | 0.010             | 0.010             |       |
| 94.27            | 30.81             | 74.3              | 105.1                | 0.430                 | 0.007                  | 0.000             | 0.000              | 0.007             | 0.011             | 0.011             |       |
| 94.28            | 33.07             | 77.4              | 110.5                | 0.440                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.011             | 0.011             |       |
| 94.29            | 35.35             | 80.5              | 115.9                | 0.450                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.012             | 0.012             |       |
| 94.30            | 37.66             | 83.7              | 121.3                | 0.460                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.012             | 0.012             |       |
| 94.31            | 39.99             | 86.9              | 126.9                | 0.470                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.013             | 0.013             |       |
| 94.32            | 42.35             | 90.1              | 132.5                | 0.480                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.013             | 0.013             |       |
| 94.33            | 44.74             | 93.4              | 138.1                | 0.490                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.014             | 0.014             |       |
| 94.34            | 47.15             | 96.7              | 143.8                | 0.500                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.014             | 0.014             |       |
| 94.35            | 49.58             | 100.0             | 149.6                | 0.510                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.015             | 0.015             |       |
| 94.36            | 52.04             | 103.4             | 155.4                | 0.520                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.016             | 0.016             |       |
| 94.37            | 54.52             | 106.8             | 161.3                | 0.530                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.016             | 0.016             |       |
| 94.38            | 57.03             | 110.2             | 167.2                | 0.540                 | 0.008                  | 0.000             | 0.000              | 0.008             | 0.017             | 0.017             |       |
| 94.39            | 59.56             | 113.7             | 173.3                | 0.550                 | 0.009                  | 0.000             | 0.000              | 0.009             | 0.017             | 0.017             |       |
| 94.40            | 62.12             | 117.2             | 179.3                | Max100-Yr WSE*        | 0.560                  | 0.009             | 0.000              | 0.000             | 0.009             | 0.018             |       |
| 94.41            | 64.70             | 120.8             | 185.5                |                       | 0.570                  | 0.009             | 0.010              | 0.000             | 0.009             | 0.019             | 0.019 |
| 94.42            | 67.31             | 124.4             | 191.7                |                       | 0.580                  | 0.009             | 0.020              | 0.001             | 0.010             | 0.019             | 0.019 |
| 94.43            | 69.95             | 128.0             | 197.9                |                       | 0.590                  | 0.009             | 0.030              | 0.002             | 0.011             | 0.020             | 0.020 |
| 94.44            | 72.61             | 131.7             | 204.3                |                       | 0.600                  | 0.009             | 0.040              | 0.004             | 0.013             | 0.020             | 0.020 |
| 94.45            | 75.29             | 135.4             | 210.7                |                       | 0.610                  | 0.009             | 0.050              | 0.005             | 0.014             | 0.021             | 0.021 |
| 94.46            | 78.00             | 139.1             | 217.1                |                       | 0.620                  | 0.009             | 0.060              | 0.007             | 0.016             | 0.022             | 0.022 |
| 94.47            | 80.74             | 142.9             | 223.7                |                       | 0.630                  | 0.009             | 0.070              | 0.008             | 0.018             | 0.022             | 0.022 |
| 94.48            | 83.50             | 146.8             | 230.3                |                       | 0.640                  | 0.009             | 0.080              | 0.010             | 0.019             | 0.023             | 0.023 |
| 94.49            | 86.29             | 150.7             | 237.0                |                       | 0.650                  | 0.009             | 0.090              | 0.012             | 0.021             | 0.024             | 0.024 |
| 94.50            | 89.10             | 154.6             | 243.7                |                       | 0.660                  | 0.009             | 0.100              | 0.014             | 0.023             | 0.024             | 0.024 |
| 94.51            | 91.94             | 158.6             | 250.5                |                       | 0.670                  | 0.009             | 0.110              | 0.016             | 0.026             | 0.025             | 0.025 |
| 94.52            | 94.81             | 162.6             | 257.4                |                       | 0.680                  | 0.010             | 0.120              | 0.018             | 0.028             | 0.026             | 0.026 |
| 94.53            | 97.70             | 166.7             | 264.4                |                       | 0.690                  | 0.010             | 0.130              | 0.020             | 0.030             | 0.026             | 0.026 |
| 94.54            | 100.61            | 170.8             | 271.4                |                       | 0.700                  | 0.010             | 0.140              | 0.023             | 0.032             | 0.027             | 0.027 |
| 94.55            | 103.56            | 175.0             | 278.5                |                       | 0.710                  | 0.010             | 0.150              | 0.025             | 0.035             | 0.028             | 0.028 |
| 94.56            | 106.53            | 179.2             | 285.7                |                       | 0.720                  | 0.010             | 0.160              | 0.027             | 0.037             | 0.029             | 0.029 |
| 94.57            | 109.52            | 183.5             | 293.0                |                       | 0.730                  | 0.010             | 0.170              | 0.029             | 0.039             | 0.029             | 0.029 |
| 94.58            | 112.54            | 187.8             | 300.3                |                       | 0.740                  | 0.010             | 0.180              | 0.032             | 0.042             | 0.030             | 0.030 |
| 94.59            | 115.59            | 192.2             | 307.7                |                       | 0.750                  | 0.010             | 0.190              | 0.034             | 0.044             | 0.031             | 0.031 |
| 94.60            | 118.66            | 196.6             | 315.2                |                       | 0.760                  | 0.010             | 0.200              | 0.037             | 0.047             | 0.032             | 0.032 |
| 94.61            | 119.86            | 201.1             | 320.9                |                       | 0.770                  | 0.010             | 0.210              | 0.039             | 0.049             | 0.032             | 0.032 |
| 94.62            | 121.07            | 205.6             | 326.7                |                       | 0.780                  | 0.010             | 0.220              | 0.042             | 0.052             | 0.033             | 0.033 |
| 94.63            | 124.27            | 210.2             | 334.5                |                       | 0.790                  | 0.010             | 0.230              | 0.044             | 0.055             | 0.033             | 0.033 |
| 94.64            | 125.49            | 214.9             | 340.4                |                       | 0.800                  | 0.010             | 0.240              | 0.047             | 0.057             | 0.034             | 0.034 |
| 94.65            | 125.52            | 219.6             | 345.1                |                       | 0.810                  | 0.010             | 0.250              | 0.049             | 0.060             | 0.035             | 0.035 |
| 94.66            | 126.70            | 224.3             | 351.0                |                       | 0.820                  | 0.011             | 0.260              | 0.052             | 0.063             | 0.035             | 0.035 |
| 94.67            | 127.87            | 229.2             | 357.0                |                       | 0.830                  | 0.011             | 0.270              | 0.055             | 0.065             | 0.036             | 0.036 |
| 94.68            | 131.15            | 234.1             | 365.2                |                       | 0.840                  | 0.011             | 0.280              | 0.057             | 0.068             | 0.037             | 0.037 |
| 94.69            | 132.31            | 239.0             | 371.3                |                       | 0.850                  | 0.011             | 0.290              | 0.060             | 0.070             | 0.037             | 0.037 |
| 94.70            | 132.31            | 244.0             | 376.3                |                       | Pond Spill             | 0.860             | 0.011              | 0.300             | 0.062             | 0.073             | 0.038 |

\*Maximum allowable 100-year water level in the pond - not the simulated 100 year water level

Table B2 - Site 2 - Stage/Storage/Outflow Curves

|               |                             |                             |                                |                    | Quality Control 1      |                             | Emergency Overflow |                             |                             |                |
|---------------|-----------------------------|-----------------------------|--------------------------------|--------------------|------------------------|-----------------------------|--------------------|-----------------------------|-----------------------------|----------------|
|               |                             |                             |                                |                    | Vertical Orifice       |                             | Broad Crested Weir |                             |                             |                |
|               |                             |                             |                                |                    | Dia (m)                | 0.075                       | L (m)              | 0.300                       |                             |                |
|               |                             |                             |                                |                    | Area (m <sup>2</sup> ) | 0.006                       | C <sub>w</sub>     | 1.580                       |                             |                |
|               |                             |                             |                                |                    | Invert (m)             | 93.71                       |                    |                             |                             |                |
|               |                             |                             |                                |                    | C <sub>v</sub>         | 0.61                        | Invert (m)         | 94.40                       |                             |                |
|               |                             |                             |                                |                    | Q @ D                  | 0.002                       | n contr.           | 2                           | Total                       |                |
| Elevation (m) | Storage 3 (m <sup>3</sup> ) | Storage 4 (m <sup>3</sup> ) | Total Volume (m <sup>3</sup> ) | Demarcation Points | Depth (m)              | Outflow (m <sup>3</sup> /s) | Depth (m)          | Outflow (m <sup>3</sup> /s) | Outflow (m <sup>3</sup> /s) | Storage (ha-m) |
| 93.71         |                             | 0.0                         | 0.0                            | Pond Bottom        | 0.000                  | 0.000                       | 0.000              | 0.000                       | 0.000                       | 0.000          |
| 93.72         |                             | 0.0                         | 0.0                            |                    | 0.010                  | 0.000                       | 0.000              | 0.000                       | 0.000                       |                |
| 93.73         |                             | 0.0                         | 0.0                            |                    | 0.020                  | 0.001                       | 0.000              | 0.000                       | 0.001                       |                |
| 93.74         |                             | 0.1                         | 0.1                            |                    | 0.030                  | 0.001                       | 0.000              | 0.000                       | 0.001                       |                |
| 93.75         |                             | 0.3                         | 0.3                            |                    | 0.040                  | 0.001                       | 0.000              | 0.000                       | 0.001                       |                |
| 93.76         |                             | 0.6                         | 0.6                            |                    | 0.050                  | 0.002                       | 0.000              | 0.000                       | 0.002                       |                |
| 93.77         |                             | 1.0                         | 1.0                            |                    | 0.060                  | 0.002                       | 0.000              | 0.000                       | 0.002                       |                |
| 93.78         |                             | 1.6                         | 1.6                            |                    | 0.070                  | 0.002                       | 0.000              | 0.000                       | 0.002                       |                |
| 93.79         |                             | 2.3                         | 2.3                            |                    | 0.080                  | 0.002                       | 0.000              | 0.000                       | 0.002                       |                |
| 93.80         |                             | 3.2                         | 3.2                            |                    | 0.090                  | 0.003                       | 0.000              | 0.000                       | 0.003                       |                |
| 93.81         |                             | 4.3                         | 4.3                            |                    | 0.100                  | 0.003                       | 0.000              | 0.000                       | 0.003                       |                |
| 93.82         |                             | 5.4                         | 5.4                            |                    | 0.110                  | 0.003                       | 0.000              | 0.000                       | 0.003                       |                |
| 93.83         |                             | 6.5                         | 6.5                            |                    | 0.120                  | 0.003                       | 0.000              | 0.000                       | 0.003                       |                |
| 93.84         |                             | 7.7                         | 7.7                            |                    | 0.130                  | 0.004                       | 0.000              | 0.000                       | 0.004                       |                |
| 93.85         |                             | 8.9                         | 8.9                            |                    | 0.140                  | 0.004                       | 0.000              | 0.000                       | 0.004                       |                |
| 93.86         |                             | 10.2                        | 10.2                           |                    | 0.150                  | 0.004                       | 0.000              | 0.000                       | 0.004                       |                |
| 93.87         |                             | 11.4                        | 11.4                           |                    | 0.160                  | 0.004                       | 0.000              | 0.000                       | 0.004                       |                |
| 93.88         |                             | 12.7                        | 12.7                           |                    | 0.170                  | 0.004                       | 0.000              | 0.000                       | 0.004                       |                |
| 93.89         |                             | 13.9                        | 13.9                           |                    | 0.180                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.90         |                             | 15.2                        | 15.2                           |                    | 0.190                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.91         |                             | 16.5                        | 16.5                           |                    | 0.200                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.92         |                             | 17.8                        | 17.8                           |                    | 0.210                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.93         |                             | 19.1                        | 19.1                           |                    | 0.220                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.94         |                             | 20.5                        | 20.5                           |                    | 0.230                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.95         |                             | 21.8                        | 21.8                           |                    | 0.240                  | 0.005                       | 0.000              | 0.000                       | 0.005                       |                |
| 93.96         |                             | 23.2                        | 23.2                           |                    | 0.250                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 93.97         |                             | 24.6                        | 24.6                           |                    | 0.260                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 93.98         |                             | 26.0                        | 26.0                           |                    | 0.270                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 93.99         |                             | 27.4                        | 27.4                           |                    | 0.280                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.00         |                             | 28.9                        | 28.9                           |                    | 0.290                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.01         |                             | 30.4                        | 30.4                           |                    | 0.300                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.02         |                             | 31.8                        | 31.8                           |                    | 0.310                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.03         |                             | 33.4                        | 33.4                           |                    | 0.320                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.04         | 0.0                         | 34.9                        | 34.9                           |                    | 0.330                  | 0.006                       | 0.000              | 0.000                       | 0.006                       |                |
| 94.05         | 0.1                         | 36.4                        | 36.6                           |                    | 0.340                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.06         | 0.4                         | 38.0                        | 38.4                           |                    | 0.350                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.07         | 0.8                         | 39.6                        | 40.4                           |                    | 0.360                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.08         | 1.3                         | 41.2                        | 42.5                           |                    | 0.370                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.09         | 1.8                         | 42.9                        | 44.7                           |                    | 0.380                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.10         | 2.5                         | 44.5                        | 47.0                           |                    | 0.390                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.11         | 3.3                         | 46.2                        | 49.5                           |                    | 0.400                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.12         | 4.1                         | 48.0                        | 52.1                           |                    | 0.410                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.13         | 4.5                         | 49.7                        | 54.2                           |                    | 0.420                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.14         | 5.6                         | 51.5                        | 57.1                           |                    | 0.430                  | 0.007                       | 0.000              | 0.000                       | 0.007                       |                |
| 94.15         | 6.7                         | 53.3                        | 60.0                           |                    | 0.440                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.16         | 8.0                         | 55.1                        | 63.1                           |                    | 0.450                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.17         | 8.5                         | 57.0                        | 65.5                           |                    | 0.460                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.18         | 10.0                        | 58.9                        | 68.9                           |                    | 0.470                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.19         | 11.6                        | 60.8                        | 72.4                           |                    | 0.480                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.20         | 13.3                        | 62.7                        | 76.0                           |                    | 0.490                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.21         | 15.1                        | 64.7                        | 79.8                           |                    | 0.500                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.22         | 17.0                        | 66.7                        | 83.8                           |                    | 0.510                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.23         | 19.1                        | 68.8                        | 87.8                           |                    | 0.520                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.24         | 21.1                        | 70.9                        | 92.0                           |                    | 0.530                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.25         | 23.2                        | 73.0                        | 96.2                           |                    | 0.540                  | 0.008                       | 0.000              | 0.000                       | 0.008                       |                |
| 94.26         | 25.4                        | 75.1                        | 100.5                          |                    | 0.550                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.27         | 27.5                        | 77.3                        | 104.8                          |                    | 0.560                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.28         | 29.7                        | 79.5                        | 109.2                          |                    | 0.570                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.29         | 31.9                        | 81.8                        | 113.7                          |                    | 0.580                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.30         | 34.1                        | 84.1                        | 118.2                          |                    | 0.590                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.31         | 36.4                        | 86.4                        | 122.8                          |                    | 0.600                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.32         | 38.7                        | 88.7                        | 127.4                          |                    | 0.610                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.33         | 41.0                        | 91.1                        | 132.1                          |                    | 0.620                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.34         | 43.3                        | 93.6                        | 136.9                          |                    | 0.630                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.35         | 45.7                        | 96.1                        | 141.7                          |                    | 0.640                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.36         | 48.1                        | 98.6                        | 146.7                          |                    | 0.650                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.37         | 50.5                        | 101.2                       | 151.7                          |                    | 0.660                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.38         | 52.9                        | 103.8                       | 156.7                          |                    | 0.670                  | 0.009                       | 0.000              | 0.000                       | 0.009                       |                |
| 94.39         | 55.4                        | 106.5                       | 161.9                          |                    | 0.680                  | 0.010                       | 0.000              | 0.000                       | 0.010                       |                |
| 94.40         | 57.9                        | 109.2                       | 167.1                          | Max 100-Yr WSE*    | 0.690                  | 0.010                       | 0.000              | 0.000                       | 0.010                       | 0.017          |
| 94.41         | 60.4                        | 112.0                       | 172.4                          |                    | 0.700                  | 0.010                       | 0.010              | 0.000                       | 0.010                       |                |
| 94.42         | 62.9                        | 114.8                       | 177.7                          |                    | 0.710                  | 0.010                       | 0.020              | 0.001                       | 0.011                       |                |
| 94.43         | 65.5                        | 117.7                       | 183.2                          |                    | 0.720                  | 0.010                       | 0.030              | 0.002                       | 0.012                       |                |
| 94.44         | 68.1                        | 119.9                       | 188.0                          |                    | 0.730                  | 0.010                       | 0.040              | 0.004                       | 0.014                       |                |
| 94.45         | 70.7                        | 122.0                       | 192.7                          |                    | 0.740                  | 0.010                       | 0.050              | 0.005                       | 0.015                       |                |
| 94.46         | 73.4                        | 123.8                       | 197.2                          |                    | 0.750                  | 0.010                       | 0.060              | 0.007                       | 0.017                       |                |
| 94.47         | 76.1                        | 125.7                       | 201.8                          |                    | 0.760                  | 0.010                       | 0.070              | 0.008                       | 0.019                       |                |
| 94.48         | 78.8                        | 127.2                       | 206.0                          |                    | 0.770                  | 0.010                       | 0.080              | 0.010                       | 0.020                       |                |
| 94.49         | 81.5                        | 129.4                       | 210.9                          |                    | 0.780                  | 0.010                       | 0.090              | 0.012                       | 0.022                       |                |
| 94.50         | 84.3                        | 131.0                       | 215.2                          |                    | 0.790                  | 0.010                       | 0.100              | 0.014                       | 0.024                       |                |
| 94.51         | 87.1                        | 133.1                       | 220.2                          |                    | 0.800                  | 0.010                       | 0.110              | 0.016                       | 0.026                       |                |
| 94.52         | 89.9                        | 134.7                       | 224.6                          |                    | 0.810                  | 0.010                       | 0.120              | 0.018                       | 0.029                       |                |
| 94.53         | 92.7                        | 135.4                       | 228.1                          |                    | 0.820                  | 0.011                       | 0.130              | 0.020                       | 0.031                       |                |
| 94.53         | 92.7                        | 135.4                       | 228.1                          |                    | 0.820                  | 0.011                       | 0.130              | 0.020                       | 0.031                       |                |
| 94.54         | 95.6                        | 137.6                       | 233.2                          |                    | 0.830                  | 0.011                       | 0.140              | 0.023                       | 0.033                       |                |
| 94.55         | 98.5                        | 137.6                       | 236.1                          |                    | 0.840                  | 0.011                       | 0.150              | 0.025                       | 0.035                       |                |
| 94.55         | 98.5                        | 137.6                       | 236.1                          |                    | 0.840                  | 0.011                       | 0.150              | 0.025                       | 0.035                       |                |
| 94.56         | 101.4                       | 138.4                       | 239.9                          |                    | 0.850                  | 0.011                       | 0.160              | 0.027                       | 0.038                       |                |
| 94.57         | 104.4                       | 139.1                       | 243.5                          |                    | 0.860                  | 0.011                       | 0.170              | 0.029                       | 0.040                       |                |
| 94.57         | 104.4                       | 139.1                       | 243.5                          |                    | 0.860                  | 0.011                       | 0.170              | 0.029                       | 0.040                       |                |
| 94.58         | 107.4                       | 140.6                       | 248.0                          |                    | 0.870                  | 0.011                       | 0.180              | 0.032                       | 0.043                       |                |
| 94.59         | 110.4                       | 141.4                       | 251.8                          |                    | 0.880                  | 0.011                       | 0.190              | 0.034                       | 0.045                       |                |
| 94.60         | 113.4                       | 143.6                       | 257.1                          |                    | 0.890                  | 0.011                       | 0.200              | 0.037                       | 0.048                       |                |
| 94.61         | 114.6                       | 144.4                       | 259.1                          |                    | 0.900                  | 0.011                       | 0.210              | 0.039                       | 0.050                       |                |
| 94.62         | 115.8                       | 145.9                       | 261.7                          |                    | 0.910                  | 0.011                       | 0.220              | 0.042                       | 0.053                       |                |
| 94.63         | 119.0                       | 148.1                       | 267.1                          |                    | 0.920                  | 0.011                       | 0.230              | 0.044                       | 0.055                       |                |
| 94.64         | 120.2                       | 149.6                       | 269.8                          |                    | 0.930                  | 0.011                       | 0.240              | 0.047                       | 0.058                       |                |
| 94.65         | 120.2                       | 150.4                       | 270.6                          |                    | 0.940                  | 0.011                       | 0.250              | 0.049                       | 0.061                       |                |
| 94.66         | 121.4                       | 152.6                       | 274.1                          |                    | 0.950                  | 0.011                       | 0.260              | 0.052                       | 0.063                       |                |
| 94.67         | 122.6                       | 153.4                       | 276.0                          |                    | 0.960                  | 0.011                       | 0.270              | 0.055                       | 0.066                       |                |
| 94.68         | 125.8                       | 155.7                       | 281.5                          |                    | 0.970                  | 0.012                       | 0.280              | 0.057                       | 0.069                       |                |
| 94.69         | 127.0                       | 156.5                       | 283.5                          |                    | 0.980                  | 0.012                       | 0.290              | 0.060                       | 0.071                       |                |
| 94.70         | 127.0                       | 157.3                       | 284.3                          | Pond Spill         | 0.990                  | 0.012                       | 0.300              | 0.062                       | 0.074                       |                |

```

1  20      Metric units / ID numbers OFF
2  *#*****
   *****
3  *#  SWMHYMO  / INPUT DATA FILE
4  *#*****
   *****
5  *#  Project Name   : [5923 Ottawa St]
6  *#  Project Number: [P2710(e01)]
7  *#  Date           : [2025 April 28]
8  *#  Modeller       : [MM]
9  *#  Company        : JFSA Canada Inc.
10 *#  License #      : 2549237
11 *#*****
   *****
12 *# Model developed to simulate runoff from subcatchments under post development
   conditions
13 *#*****
   *****
14 *%  25 mm Storm based on 2-Year, 3-Hour Chicago Storm
15 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
16                ["002YC3H.stm"] <--storm filename, one per line for NSTORM time
17 *%-----|-----
18 READ STORM      STORM_FILENAME=["STORM.001"]
19 *%-----|-----
20 *#*****
   *****
21 *%-----|-----
22 DEFAULT VALUES ICASEdef=[1],  read values only
23                DEFVAL_FILENAME=["Ottawa.val"]
24 *%-----|-----
25 *#*****
   *****
26 *#  EXT1
27 *#*****
   *****
28 CALIB NASHYD    NHYD=["EXT1"], DT[1] (min), AREA=[3.211] (ha),
29                DWF=[0] (cms), CN=[80],
30                IA=[4.67] (mm), N=[3], TP[0.72] (hrs),
31                RAINFALL[ , , -1]
32 *#*****
   *****
33 *#  EXT2
34 *#*****
   *****
35 CALIB NASHYD    NHYD=["EXT2"], DT[1] (min), AREA=[0.285] (ha),
36                DWF=[0] (cms), CN=[85],
37                IA=[4.67] (mm), N=[3], TP[0.33] (hrs),
38                RAINFALL[ , , -1]
39 *#*****
   *****
40 *#  EXT3
41 *#*****
   *****
42 CALIB NASHYD    NHYD=["EXT3"], DT[1] (min), AREA=[0.560] (ha),
43                DWF=[0] (cms), CN=[80],
44                IA=[4.67] (mm), N=[3], TP[0.32] (hrs),
45                RAINFALL[ , , -1]
46 *#*****
   *****
47 *#  EXT4
48 *#*****
   *****
49 CALIB NASHYD    NHYD=["EXT4"], DT[1] (min), AREA=[0.309] (ha),
50                DWF=[0] (cms), CN=[79],
51                IA=[4.67] (mm), N=[3], TP[0.29] (hrs),
52                RAINFALL[ , , -1]
53 *#*****
   *****
54 *#  EXT5

```

```

55  *#*****
56  CALIB NASHYD      NHYD=["EXT5"], DT[1] (min), AREA=[0.594] (ha),
57                    DWF=[0] (cms), CN=[76],
58                    IA=[4.67] (mm), N=[3], TP[0.45] (hrs),
59                    RAINFALL[ , , -1]
60  *#*****
61  *# EXT6
62  *#*****
63  CALIB NASHYD      NHYD=["EXT6"], DT[1] (min), AREA=[0.864] (ha),
64                    DWF=[0] (cms), CN=[85],
65                    IA=[4.67] (mm), N=[3], TP[0.56] (hrs),
66                    RAINFALL[ , , -1]
67  *#*****
68  *# EXT7
69  *#*****
70  CALIB NASHYD      NHYD=["EXT7"], DT[1] (min), AREA=[0.471] (ha),
71                    DWF=[0] (cms), CN=[83],
72                    IA=[4.67] (mm), N=[3], TP[0.32] (hrs),
73                    RAINFALL[ , , -1]
74  *#*****
75  *# EXT8
76  *#*****
77  CALIB NASHYD      NHYD=["EXT8"], DT[1] (min), AREA=[0.834] (ha),
78                    DWF=[0] (cms), CN=[79],
79                    IA=[4.67] (mm), N=[3], TP[0.42] (hrs),
80                    RAINFALL[ , , -1]
81  *#*****
82  *# EXT9
83  *#*****
84  CALIB NASHYD      NHYD=["EXT9"], DT[1] (min), AREA=[3.571] (ha),
85                    DWF=[0] (cms), CN=[76],
86                    IA=[4.67] (mm), N=[3], TP[0.48] (hrs),
87                    RAINFALL[ , , -1]
88  *#*****
89  *# EXT9a
90  *#*****
91  CALIB NASHYD      NHYD=["EXT9a"], DT[1] (min), AREA=[0.011] (ha),
92                    DWF=[0] (cms), CN=[78],
93                    IA=[4.67] (mm), N=[3], TP[0.04] (hrs),
94                    RAINFALL[ , , -1]
95  *#*****
96  *# EXT10
97  *#*****
98  CALIB NASHYD      NHYD=["EXT10"], DT[1] (min), AREA=[0.203] (ha),
99                    DWF=[0] (cms), CN=[71],
100                   IA=[4.67] (mm), N=[3], TP[0.42] (hrs),
101                   RAINFALL[ , , -1]
102  *#*****
103  *# Pre2_1
104  *#*****
105  CALIB NASHYD      NHYD=["Pre2_1"], DT[1] (min), AREA=[0.013] (ha),
106                    DWF=[0] (cms), CN=[72],
107                    IA=[4.67] (mm), N=[3], TP[0.03] (hrs),
108                    RAINFALL[ , , -1]

```



```

109  *#*****
110  *# Pre2_2
111  *#*****
112  CALIB NASHYD      NHYD=["Pre2_2"], DT[1] (min), AREA=[0.002] (ha),
113                   DWF=[0] (cms), CN=[78],
114                   IA=[4.67] (mm), N=[3], TP[0.02] (hrs),
115                   RAINFALL[ , , -1]
116  *#*****
117  *# Pre9_1
118  *#*****
119  CALIB NASHYD      NHYD=["Pre9_1"], DT[1] (min), AREA=[0.437] (ha),
120                   DWF=[0] (cms), CN=[71],
121                   IA=[4.67] (mm), N=[3], TP[0.38] (hrs),
122                   RAINFALL[ , , -1]
123  *#*****
124  *# Pre9_2
125  *#*****
126  CALIB NASHYD      NHYD=["Pre9_2"], DT[1] (min), AREA=[0.014] (ha),
127                   DWF=[0] (cms), CN=[59],
128                   IA=[4.67] (mm), N=[3], TP[0.03] (hrs),
129                   RAINFALL[ , , -1]
130  *#*****
131  *# Pre10_1
132  *#*****
133  CALIB NASHYD      NHYD=["Pre10_1"], DT[1] (min), AREA=[0.799] (ha),
134                   DWF=[0] (cms), CN=[71],
135                   IA=[4.67] (mm), N=[3], TP[0.29] (hrs),
136                   RAINFALL[ , , -1]
137  *#*****
138  *# Pre11_1
139  *#*****
140  CALIB NASHYD      NHYD=["Pre11_1"], DT[1] (min), AREA=[0.067] (ha),
141                   DWF=[0] (cms), CN=[78],
142                   IA=[4.67] (mm), N=[3], TP[0.21] (hrs),
143                   RAINFALL[ , , -1]
144  *#*****
145  *# Site 1
146  *#*****
147  DESIGN STANDHYD   NHYD=["S1-B1"], DT=[1] (min), AREA=[0.415] (ha),
148                   XIMP=[0.34], TIMP=[0.44], DWF=[0] (cms),
149                   LOSS=[1], SLOPE=[1.0] (%), RAINFALL=[ , , -1] (mm/hr)
150  *#*****
151  *# Site 1 - Roof
152  *#*****
153  DESIGN STANDHYD   NHYD=["S1-Roof"], DT=[1] (min), AREA=[0.065] (ha),
154                   XIMP=[0.99], TIMP=[0.99], DWF=[0] (cms),
155                   LOSS=[1], SLOPE=[0.5] (%), RAINFALL=[ , , -1] (mm/hr)
156  *%-----|-----
157  * Rooftop Storage-Outflow Curve for site 1 Facility - From EGIS Report
158  ROUTE RESERVOIR   NHYDout=["S1-Roof-Out"], NHYDin=["S1-Roof"], RDT=[1] (min),
159                   TABLE of ( OUTFLOW-STORAGE ) values
160                   (cms) - (ha-m)
161                   [ 0 , 0 ]
162                   [ 0.0008 , 0.0007 ]

```

```

163         [ 0.001 , 0.001 ]
164         [ 0.0015 , 0.0015 ]
165         [ 0.0018 , 0.0017 ]
166         [ 0.0023 , 0.0022 ]
167         [ 0.0025 , 0.0024 ]
168         [ 0.0028 , 0.0027 ]
169         [ 0.003 , 0.0029 ]
170         [ 0.0033 , 0.0032 ]
171         [ 0.0038 , 0.0037 ]
172         [ 0.004 , 0.0039 ]
173         [ 0.0045 , 0.0044 ]
174         [ 0.0048 , 0.0046 ]
175         [ 0.0051 , 0.0049 ]
176         [ 0.0056 , 0.0054 ]
177         [ 0.0063 , 0.0061 ]
178         [ 0.0066 , 0.0064 ]
179         [ 0.0076 , 0.0073 ]
180         [ -1 , -1 ]
181         NHYDovf=[ "S1-Roof-Over" ],
182     *%-----|-----
183     ADD HYD          NHYDsum=[ "SITE1-IN" ], NHYDs to add=[ "S1-B1"+"S1-Roof-Out"+
184     "S1-Roof-Over" ]
185     *%-----|-----
186     * Pond for Site 1: Stage-Storage-Outflow
187     ROUTE RESERVOIR    NHYDout=[ "SITE1-Out" ], NHYDin=[ "SITE1-IN" ], RDT=[1] (min),
188                       TABLE of ( OUTFLOW-STORAGE ) values
189                           (cms) - (ha-m)
190                           [ 0.00000 , 0 ]
191                           [ 0.00154 , 0.00006 ]
192                           [ 0.00246 , 0.00019 ]
193                           [ 0.00321 , 0.0004 ]
194                           [ 0.00382 , 0.00069 ]
195                           [ 0.00435 , 0.00106 ]
196                           [ 0.00481 , 0.00153 ]
197                           [ 0.00524 , 0.00217 ]
198                           [ 0.00563 , 0.00301 ]
199                           [ 0.006 , 0.00397 ]
200                           [ 0.00634 , 0.00517 ]
201                           [ 0.00667 , 0.00643 ]
202                           [ 0.00699 , 0.00791 ]
203                           [ 0.00729 , 0.00945 ]
204                           [ 0.00757 , 0.01105 ]
205                           [ 0.00785 , 0.01269 ]
206                           [ 0.00812 , 0.01438 ]
207                           [ 0.00838 , 0.01613 ]
208                           [ 0.00863 , 0.01793 ]
209                           [ 0.01129 , 0.01979 ]
210                           [ 0.0158 , 0.02171 ]
211                           [ 0.02137 , 0.0237 ]
212                           [ 0.0277 , 0.02574 ]
213                           [ 0.03457 , 0.02785 ]
214                           [ 0.04186 , 0.03003 ]
215                           [ 0.04945 , 0.03209 ]
216                           [ 0.05724 , 0.03404 ]
217                           [ 0.06516 , 0.0357 ]
218                           [ 0.07313 , 0.03763 ]
219                           [ -1 , -1 ]
220         NHYDovf=[ "SITE1-Over" ],
221     *%-----|-----
222     *# Site 2
223     *# Site 2
224     DESIGN STANDHYD    NHYD=[ "S2-B3" ], DT=[1] (min), AREA=[0.354] (ha),
225                       XIMP=[0.31], TIMP=[0.41], DWF=[0] (cms),

```

```

226                LOSS=[1], SLOPE=[1.0] (%), RAINFALL=[ , , -1] (mm/hr)
227 *#*****
227 *****
228 *# Site 2 - Roof
229 *#*****
229 *****
230 DESIGN STANDHYD      NHYD=["S2-Roof"], DT=[1] (min), AREA=[0.093] (ha),
231                      XIMP=[0.99], TIMP=[0.99], DWF=[0] (cms),
232                      LOSS=[1], SLOPE=[0.5] (%), RAINFALL=[ , , -1] (mm/hr)
233 *#*****
233 *****
234 * Rooftop Storage-Outflow Curve for site 2 Facility - From EGIS Report
235 ROUTE RESERVOIR      NHYDout=["S2-Roof-Out"], NHYDin=["S2-Roof"], RDT=[1] (min),
236                      TABLE of ( OUTFLOW-STORAGE ) values
237                      (cms) - (ha-m)
238                      [ 0 , 0 ]
239                      [ 0.0007 , 0 ]
240                      [ 0.0015 , 0.0001 ]
241                      [ 0.003 , 0.0002 ]
242                      [ 0.0037 , 0.0004 ]
243                      [ 0.0048 , 0.0007 ]
244                      [ 0.0053 , 0.0008 ]
245                      [ 0.0065 , 0.0014 ]
246                      [ 0.0072 , 0.0018 ]
247                      [ 0.0081 , 0.0025 ]
248                      [ 0.0084 , 0.0029 ]
249                      [ 0.0092 , 0.0042 ]
250                      [ 0.0099 , 0.006 ]
251                      [ 0.0104 , 0.0075 ]
252                      [ 0.0106 , 0.0083 ]
253                      [ 0.0112 , 0.0109 ]
254                      [ 0.0143 , 0.0128 ]
255                      [ 0.0174 , 0.0138 ]
256                      [ 0.0253 , 0.0158 ]
257                      [ 0.0276 , 0.0164 ]
258                      [ -1 , -1 ]
259                      NHYDovf=["S2-Roof-Over"],
260 *%-----|-----
261 ADD HYD          NHYDsum=["SITE2-IN"], NHYDs to add=["S2-B3"+"S2-Roof-Out"+
261 "S2-Roof-Over"]
262 *%-----|-----
263 * Pond for Site 2: Stage-Storage-Outflow
264 ROUTE RESERVOIR      NHYDout=["SITE2-Out"], NHYDin=["SITE2-IN"], RDT=[1] (min),
265                      TABLE of ( OUTFLOW-STORAGE
266                      (cms) - (ha-m)
267                      [ 0 , 0 ]
268                      [ 0.0022 , 0.0002 ]
269                      [ 0.003 , 0.0004 ]
270                      [ 0.0036 , 0.0008 ]
271                      [ 0.0042 , 0.0011 ]
272                      [ 0.0047 , 0.0015 ]
273                      [ 0.0051 , 0.0019 ]
274                      [ 0.0055 , 0.0023 ]
275                      [ 0.0059 , 0.0027 ]
276                      [ 0.0062 , 0.0032 ]
277                      [ 0.0066 , 0.0037 ]
278                      [ 0.0069 , 0.0042 ]
279                      [ 0.0072 , 0.0049 ]
280                      [ 0.0075 , 0.0057 ]
281                      [ 0.0078 , 0.0065 ]
282                      [ 0.008 , 0.0076 ]
283                      [ 0.0083 , 0.0088 ]
284                      [ 0.0085 , 0.01 ]
285                      [ 0.0088 , 0.0114 ]
286                      [ 0.009 , 0.0127 ]
287                      [ 0.0093 , 0.0142 ]
288                      [ 0.0095 , 0.0157 ]
289                      [ 0.0102 , 0.0172 ]
290                      [ 0.0136 , 0.0188 ]

```

```

291 [ 0.0185 , 0.0202 ]
292 [ 0.0243 , 0.0215 ]
293 [ 0.0309 , 0.0228 ]
294 [ 0.0355 , 0.0236 ]
295 [ 0.0403 , 0.0244 ]
296 [ 0.0452 , 0.0252 ]
297 [ 0.0529 , 0.0262 ]
298 [ 0.0607 , 0.0271 ]
299 [ 0.0686 , 0.0282 ]
300 [ 0.074 , 0.0284 ]
301 [ 0.0766 , 0.0287 ]
302 [ 0.0793 , 0.0287 ]
303 [ 0.0819 , 0.0287 ]
304 [ 0.0819 , 0.0287 ]
305 [ 0.0846 , 0.0287 ]
306 [ 0.0872 , 0.0287 ]
307 [ 0.0898 , 0.0287 ]
308 [ 0.0924 , 0.0288 ]
309 [ 0.095 , 0.0288 ]
310 [ 0.0976 , 0.0288 ]
311 [ 0.1027 , 0.0288 ]
312 [ 0.1053 , 0.0288 ]
313 [ 0.1078 , 0.0288 ]
314 [ 0.1102 , 0.0288 ]
315 [ 0.1127 , 0.0288 ]
316 [ 0.1151 , 0.0289 ]
317 [ 0.1175 , 0.0289 ]
318 [ 0.1199 , 0.0289 ]
319 [ 0.1222 , 0.0289 ]
320 [ 0.129 , 0.0289 ]
321 [ 0.1355 , 0.0289 ]
322 [ 0.1417 , 0.0289 ]
323 [ 0.1474 , 0.0289 ]
324 [ 0.151 , 0.0289 ]
325 [ 0.156 , 0.0289 ]
326 [ -1 , -1 ]
327 NHYDovf=["SITE2-Over"],
328 *%-----|-----|
329 ADD HYD NHYDsum=["Site1"], NHYDs to add=["SITE1-Out"+"SITE1-Over"]
330 *%-----|-----|
331 ADD HYD NHYDsum=["Site2"], NHYDs to add=["SITE2-Out"+"SITE2-Over"]
332 *%-----|-----|
333 ADD HYD NHYDsum=["J1"], NHYDs to add=["EXT2"+"Pre2_1"+"Site1"+"Site2"]
334 *%-----|-----|
335 * NOTE: Cross-section number 849.0434 is taken from HEC-RAS Model
336 ROUTE CHANNEL NHYDout=["R1"], NHYDin=["J1"], RDT=[1](min),
337 CHLGTH=[143.151](m), CHSLOPE=[0.394](%), FPSLOPE=[0.394](%),
338 SECNUM=[849.0434], NSEG=[3],
339 ( SEGROUGH, SEGDIST (m))=[0.08,18.95 -0.035,26.78 0.08,35.18] NSEG
times
340 ( DISTANCE (m), ELEVATION (m))=[0.48, 94.05]
341 [3.19, 93.99]
342 [6.85, 93.91]
343 [10.48, 93.87]
344 [17.45, 93.85]
345 [18.95, 93.84]
346 [20.36, 93.81]
347 [22.3, 93.76]
348 [22.53, 93.72]
349 [23.98, 93.35]
350 [24.35, 93.33]
351 [24.65, 93.37]
352 [25.04, 93.45]
353 [26.04, 93.74]
354 [26.44, 93.82]
355 [26.78, 93.87]
356 [29.14, 94.11]
357 [33.98, 94.26]
358 [35.18, 94.26]

```



```

359 *%-----|-----|
360 ADD HYD      NHYDsum=["J2"], NHYDs to add=["R1"+"EXT3"+"EXT1"]
361 *%-----|-----|
362 * NOTE: Cross-section number 737.5813 is taken from HEC-RAS Model
363 ROUTE CHANNEL NHYDout=["R2"], NHYDin=["J2"], RDT=[1] (min),
364              CHLGTH=[73.338] (m), CHSLOPE=[0.425] (%), FPSLOPE=[0.425] (%),
365              SECNUM=[737.5813], NSEG=[3],
366              ( SEGROUGH, SEGDIST (m))=[0.08,8.4 -0.035,16.42 0.08,22.6] NSEG
              times
              ( DISTANCE (m), ELEVATION (m))=[0, 93.52]
              [1.08, 93.5]
              [4.37, 93.48]
              [6.31, 93.45]
              [8.4, 93.38]
              [9.5, 93.31]
              [10.49, 93.23]
              [10.99, 93.18]
              [12.4, 92.94]
              [13.11, 92.84]
              [13.67, 92.92]
              [16.42, 93.6]
              [16.91, 93.65]
              [17.97, 93.65]
              [19, 93.83]
              [19.51, 93.89]
              [21.06, 93.94]
              [22.6, 93.95]
385 *%-----|-----|
386 ADD HYD      NHYDsum=["J3"], NHYDs to add=["R2"+"EXT4"]
387 *%-----|-----|
388 * NOTE: Cross-section number 675.4097 is taken from HEC-RAS Model
389 ROUTE CHANNEL NHYDout=["R3"], NHYDin=["J3"], RDT=[1] (min),
390              CHLGTH=[92.08] (m), CHSLOPE=[0.274] (%), FPSLOPE=[0.274] (%),
391              SECNUM=[675.4097], NSEG=[3],
392              ( SEGROUGH, SEGDIST (m))=[0.08,31.64 -0.035,42.44 0.08,48.87] NSEG
              times
              ( DISTANCE (m), ELEVATION (m))=[30.59, 93.12]
              [31.64, 93.13]
              [34.35, 93.08]
              [35.18, 93.03]
              [37.78, 92.72]
              [38.25, 92.64]
              [38.7, 92.61]
              [39.74, 92.76]
              [42.44, 93.41]
              [42.89, 93.49]
              [43.97, 93.57]
              [44.92, 93.6]
              [46.07, 93.67]
              [48.87, 93.74]
407 *%-----|-----|
408 ADD HYD      NHYDsum=["J4"], NHYDs to add=["R3"+"EXT5"]
409 *%-----|-----|
410 * NOTE: Cross-section number 518.7506 is taken from HEC-RAS Model
411 ROUTE CHANNEL NHYDout=["R4"], NHYDin=["J4"], RDT=[1] (min),
412              CHLGTH=[251.495] (m), CHSLOPE=[0.19] (%), FPSLOPE=[0.19] (%),
413              SECNUM=[518.7506], NSEG=[3],
414              ( SEGROUGH, SEGDIST (m))=[0.08,51.48 -0.035,59.39 0.08,66.4] NSEG
              times
              ( DISTANCE (m), ELEVATION (m))=[0, 92.92]
              [4.26, 92.9]
              [48.31, 92.76]
              [51.48, 92.76]
              [53.64, 92.7]
              [55.33, 92.29]
              [55.44, 92.29]
              [56.43, 92.37]
              [56.97, 92.43]
              [59.39, 93.27]

```

```

425                                     [59.74, 93.37]
426                                     [60.8, 93.52]
427                                     [63.31, 93.71]
428                                     [66.4, 93.76]
429 *%-----|-----
430 ADD HYD                               NHYDsum=["J5"], NHYDs to add=["R4"+"EXT6"+"EXT7"]
431 *%-----|-----
432 * NOTE: Cross-section number 275.0857 is taken from HEC-RAS Model
433 ROUTE CHANNEL                       NHYDout=["R5"], NHYDin=["J5"], RDT=[1] (min),
434                                     CHLGTH=[237.343] (m), CHSLOPE=[0.644] (%), FPSLOPE=[0.644] (%),
435                                     SECNUM=[275.0857], NSEG=[3],
436                                     ( SEGROUGH, SEGDIST (m))=[0.08,40.82 -0.035,53.64 0.08,57.93] NSEG
437                                     times
438                                     ( DISTANCE (m), ELEVATION (m))=[36.16, 92.63]
439                                     [40.82, 92.97]
440                                     [41.39, 92.9]
441                                     [44.69, 91.72]
442                                     [45.24, 91.58]
443                                     [46.33, 91.43]
444                                     [47.41, 91.64]
445                                     [47.87, 91.75]
446                                     [49.59, 92.2]
447                                     [50.99, 92.36]
448                                     [51.44, 92.48]
449                                     [53.18, 92.98]
450                                     [53.64, 93.15]
451                                     [55.92, 93.66]
452                                     [57.93, 93.68]
453 *%-----|-----
454 ADD HYD                               NHYDsum=["Pre"], NHYDs to add=["Pre10_1"+"Pre9_2"+"Pre2_2"]
455 *%-----|-----
456 * NOTE: Cross-section number 124 is taken from HEC-RAS Model
457 ROUTE CHANNEL                       NHYDout=["R6"], NHYDin=["Pre"], RDT=[1] (min),
458                                     CHLGTH=[77.414] (m), CHSLOPE=[0.776] (%), FPSLOPE=[0.776] (%),
459                                     SECNUM=[124], NSEG=[3],
460                                     ( SEGROUGH, SEGDIST (m))=[0.08,8.34 -0.035,31.31 0.08,84.97] NSEG
461                                     times
462                                     ( DISTANCE (m), ELEVATION (m))=[1.78, 93.73]
463                                     [4.51, 93.54]
464                                     [5.06, 93.31]
465                                     [7.25, 92.98]
466                                     [7.79, 92.77]
467                                     [8.34, 92.49]
468                                     [9.43, 91.93]
469                                     [9.68, 91.81]
470                                     [10.53, 91.27]
471                                     [12.64, 90.92]
472                                     [14.44, 90.9]
473                                     [16.54, 91.06]
474                                     [17.64, 91.06]
475                                     [30.22, 92.3]
476                                     [31.31, 92.45]
477                                     [33.5, 92.41]
478                                     [55.37, 93.11]
479                                     [57.01, 93.2]
480                                     [84.97, 93.43]
481 *%-----|-----
482 * NOTE: Cross-section number 74 is taken from HEC-RAS Model
483 ROUTE CHANNEL                       NHYDout=["R7"], NHYDin=["Pre9_1"], RDT=[1] (min),
484                                     CHLGTH=[159.151] (m), CHSLOPE=[1.576] (%), FPSLOPE=[1.576] (%),
485                                     SECNUM=[74], NSEG=[3],
486                                     ( SEGROUGH, SEGDIST (m))=[0.08,4.67 -0.035,81.24 0.08,82.88] NSEG
487                                     times
488                                     ( DISTANCE (m), ELEVATION (m))=[1.94, 93.64]
489                                     [4.67, 93.32]
490                                     [5.77, 93.15]
491                                     [7.41, 92.69]
492                                     [7.95, 92.37]
493                                     [9.36, 91.71]

```

```

491                                     [10.12, 91.22]
492                                     [10.49, 91.06]
493                                     [12.64, 90.89]
494                                     [16.16, 90.92]
495                                     [18.83, 91.66]
496                                     [19.59, 92.02]
497                                     [21.62, 92.39]
498                                     [24.87, 92.48]
499                                     [30.37, 92.55]
500                                     [34.37, 92.65]
501                                     [77.41, 92.82]
502                                     [80.6, 93.25]
503                                     [81.24, 93.48]
504                                     [82.88, 93.79]
505 *%-----|-----|
506 ADD HYD      NHYDsum=["J6"], NHYDs to add=["R6"+"EXT10"]
507 *%-----|-----|
508 * NOTE: Cross-section number 49 is taken from HEC-RAS Model
509 ROUTE CHANNEL NHYDout=["R8"], NHYDin=["J6"], RDT=[1] (min),
510               CHLGTH=[78.801] (m), CHSLOPE=[0.522] (%), FPSLOPE=[0.522] (%),
511               SECNUM=[49], NSEG=[3],
512               ( SEGROUGH, SEGDIST (m))=[0.08,8.71 -0.035,20.59 0.08,116.73] NSEG
513               times
514               ( DISTANCE (m), ELEVATION (m))=[0, 93.36]
515               [1.93, 93.63]
516               [4.61, 93.26]
517               [6.23, 93.1]
518               [8.19, 92.26]
519               [8.71, 91.84]
520               [9.86, 91.47]
521               [10.53, 91.04]
522               [13.84, 91]
523               [14.5, 91.11]
524               [16.97, 91.27]
525               [20.59, 91.76]
526               [23.3, 91.64]
527               [30.34, 91.85]
528               [35.29, 91.92]
529               [116.73, 92.96]
530 *%-----|-----|
531 ADD HYD      NHYDsum=["J7"], NHYDs to add=["R8"+"R7"]
532 *%-----|-----|
533 * NOTE: Cross-section number 7 is taken from HEC-RAS Model
534 ROUTE CHANNEL NHYDout=["R9"], NHYDin=["J7"], RDT=[1] (min),
535               CHLGTH=[29.445] (m), CHSLOPE=[0.887] (%), FPSLOPE=[0.887] (%),
536               SECNUM=[7], NSEG=[3],
537               ( SEGROUGH, SEGDIST (m))=[0.08,1.5 -0.035,22.44 0.08,100.08] NSEG
538               times
539               ( DISTANCE (m), ELEVATION (m))=[0, 93.4]
540               [1.5, 93.63]
541               [3.13, 93.62]
542               [4.76, 93.28]
543               [5.3, 93.25]
544               [6.52, 93.08]
545               [6.96, 92.95]
546               [10.57, 90.95]
547               [13.59, 90.67]
548               [15.83, 90.72]
549               [16.42, 90.85]
550               [18.66, 91.76]
551               [20.82, 91.86]
552               [22.44, 91.92]
553               [27.84, 91.98]
554               [30.15, 91.96]
555               [100.08, 92.61]
556 *%-----|-----|
557 ADD HYD      NHYDsum=["J8"], NHYDs to add=["EXT9"+"R9"+"EXT8"+"R5"]
558 *%-----|-----|
559 * Note: The pipe needs to be adjusted based on the Culvert-under-railway information

```

```

558 ROUTE PIPE PTYPE=[1]circ, NHYDout=["Outlet"], RNUMBER=[1.0],
559 PDIAM=[525] (mm), PLNGTH=[8.407] (m), PROUGH=[0.013],
PSLOPE=[0.0001] (m/m),
560 NHYDin=["J8"], RDT=[1] (min)
561 *%-----|-----|
562 *#####|
563 *# STORMS
564 *#####|
565 *% 2-Year, 3-Hour Chicago Storm
566 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[002]
567 * ["002YC3H.stm"] <--storm filename, one per line for NSTORM time
568 *%-----|-----|
569 *% 5-Year, 3-Hour Chicago Storm
570 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[005]
571 * ["005YC3H.stm"] <--storm filename, one per line for NSTORM time
572 *%-----|-----|
573 *% 10-Year, 3-Hour Chicago Storm
574 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[010]
575 * ["010YC3H.stm"] <--storm filename, one per line for NSTORM time
576 *%-----|-----|
577 *% 25-Year, 3-Hour Chicago Storm
578 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[025]
579 * ["025YC3H.stm"] <--storm filename, one per line for NSTORM time
580 *%-----|-----|
581 *% 50-Year, 3-Hour Chicago Storm
582 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[050]
583 * ["050YC3H.stm"] <--storm filename, one per line for NSTORM time
584 *%-----|-----|
585 *% 100-Year, 3-Hour Chicago Storm
586 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[099]
587 * ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
588 *%-----|-----|
589 *% 2-Year, 24-Hour SCS Storm
590 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[102]
591 * ["SC24002x.stm"] <--storm filename, one per line for NSTORM time
592 *%-----|-----|
593 *% 5-Year, 24-Hour SCS Storm
594 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[105]
595 * ["SC24005x.stm"] <--storm filename, one per line for NSTORM time
596 *%-----|-----|
597 *% 10-Year, 24-Hour SCS Storm
598 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[110]
599 * ["SC24010x.stm"] <--storm filename, one per line for NSTORM time
600 *%-----|-----|
601 *% 25-Year, 24-Hour SCS Storm
602 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[125]
603 * ["SC24025x.stm"] <--storm filename, one per line for NSTORM time
604 *%-----|-----|
605 *% 50-Year, 24-Hour SCS Storm
606 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[150]
607 * ["SC24050x.stm"] <--storm filename, one per line for NSTORM time
608 *%-----|-----|
609 *% 100-Year, 24-Hour SCS Storm
610 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[199]
611 * ["SC24100x.stm"] <--storm filename, one per line for NSTORM time
612 *%-----|-----|
613 *% July 1st, 1979 Storm - Ottawa International Airport
614 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1979]
615 * ["19790701.stm"] <--storm filename, one per line for NSTORM time
616 *%-----|-----|
617 *% August 4th, 1988 Storm - Ottawa International Airport
618 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1988]
619 * ["19880804.stm"] <--storm filename, one per line for NSTORM time
620 *%-----|-----|
621 *% August 8th, 1996 Storm - Ottawa International Airport
622 *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1996]
623 * ["19960808.stm"] <--storm filename, one per line for NSTORM time
624 *%-----|-----|
625 *% 100-Year, 3-Hour Chicago Storm + 20%

```



```
626  START                                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[9999]
627                                     [ "100YC3H+.STM" ] <--storm filename, one per line for NSTORM time
628  *%-----|-----|
629  FINISH
```

```
00001 ===== SSSSS W W M M M H H Y Y M M M O O O 222 000 11 5555 =====
00002
00003 SSSSS W W M M M H H Y Y M M M O O O 222 000 11 5555 =====
00004 S W W M M M M H H Y Y M M M O O O 2 0 0 11 5
00005 SSSSS W W M M M H H Y Y M M M O O O 222 000 11 5555 Ver 5.500
00006 S W W M M M H H Y Y M M M O O O 222 0 0 11 555 FEB 2015
00007 SSSSS W W M M M H H Y Y M M M O O O 2 0 0 11 5
00008
00009 StormWater Management Hydrologic Model 222 000 11 555 =====
00010
00011 ***** SWHYMO Ver 5.500 *****
00012 ***** based on the principles of HYMO and its successors *****
00013 ***** OTTHYMO-SI and OTTHYMO-S9 *****
00014 *****
00015 ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00016 *****
00017 *****
00018 *****
00019 *****
00020 *****
00021 *****
00022 *****
00023 *****
00024 *****
00025 ***** SERIAL#:2549237 *****
00026 *****
00027 *****
00028 ***** PROGRAM ARRAY DIMENSIONS *****
00029 *****
00030 ***** Maximum value for ID numbers: 1 *****
00031 ***** Max. number of rainfall points: 105408 *****
00032 ***** Number of flow points: 105408 *****
00033 *****
00034 *****
00035 *****
00036 *****
00037 *****
00038 *****
00039 *****
00040 *****
00041 *****
00042 *****
00043 *****
00044 *****
00045 *****
00046 *****
00047 *****
00048 *****
00049 *****
00050 *****
00051 *****
00052 *****
00053 *****
00054 *****
00055 *****
00056 *****
00057 *****
00058 *****
00059 *****
00060 *****
00061 *****
00062 *****
00063 *****
00064 *****
00065 *****
00066 *****
00067 *****
00068 *****
00069 *****
00070 *****
00071 *****
00072 *****
00073 *****
00074 *****
00075 *****
00076 *****
00077 *****
00078 *****
00079 *****
00080 *****
00081 *****
00082 *****
00083 *****
00084 *****
00085 *****
00086 *****
00087 *****
00088 *****
00089 *****
00090 *****
00091 *****
00092 *****
00093 *****
00094 *****
00095 *****
00096 *****
00097 *****
00098 *****
00099 *****
00100 *****
00101 *****
00102 *****
00103 *****
00104 *****
00105 *****
00106 *****
00107 *****
00108 *****
00109 *****
00110 *****
00111 *****
00112 *****
00113 *****
00114 *****
00115 *****
00116 *****
00117 *****
00118 *****
00119 *****
00120 *****
00121 *****
00122 *****
00123 *****
00124 *****
00125 *****
00126 *****
00127 *****
00128 *****
00129 *****
00130 *****
00131 *****
00132 *****
00133 *****
00134 *****
00135 *****
00136 *****
00137 *****
00138 *****
00139 *****
00140 *****
00141 *****
00142 *****
00143 *****
00144 *****
00145 *****
00146 *****
00147 *****
00148 *****
00149 *****
00150 *****
00151 *****
00152 *****
00153 *****
00154 *****
00155 *****
00156 *****
00157 *****
00158 *****
00159 *****
00160 *****
00161 *****
00162 *****
00163 *****
00164 *****
00165 *****
00166 *****
00167 *****
00168 *****
00169 *****
00170 *****
00171 *****
00172 *****
00173 *****
00174 *****
00175 *****
00176 *****
00177 *****
00178 *****
00179 *****
00180 *****
00181 *****
00182 *****
00183 *****
00184 *****
00185 *****
00186 *****
00187 *****
00188 *****
00189 *****
00190 *****
00191 *****
00192 *****
00193 *****
00194 *****
00195 *****
00196 *****
00197 *****
00198 *****
00199 *****
00200 *****
00201 *****
00202 *****
00203 *****
00204 *****
00205 *****
00206 *****
00207 *****
00208 *****
00209 *****
00210 *****
00211 *****
00212 *****
00213 *****
00214 *****
00215 *****
00216 *****
00217 *****
00218 *****
00219 *****
00220 *****
00221 *****
00222 *****
00223 *****
00224 *****
00225 *****
00226 *****
00227 *****
00228 *****
00229 *****
00230 *****
00231 *****
00232 *****
00233 *****
00234 *****
00235 *****
00236 *****
00237 *****
00238 *****
00239 *****
00240 *****
00241 *****
00242 *****
00243 *****
00244 *****
00245 *****
00246 *****
00247 *****
00248 *****
00249 *****
00250 *****
00251 *****
00252 *****
00253 *****
00254 *****
00255 *****
00256 *****
00257 *****
00258 *****
00259 *****
00260 *****
00261 *****
00262 *****
00263 *****
00264 *****
00265 *****
00266 *****
00267 *****
00268 *****
00269 *****
00270 *****
00271 *****
00272 *****
00273 *****
00274 *****
00275 *****
00276 *****
00277 *****
00278 *****
00279 *****
00280 *****
00281 *****
00282 *****
00283 *****
00284 *****
00285 *****
00286 *****
00287 *****
00288 *****
00289 *****
00290 *****
00291 *****
00292 *****
00293 *****
00294 *****
00295 *****
00296 *****
00297 *****
00298 *****
00299 *****
00300 *****
00301 *****
00302 *****
00303 *****
00304 *****
00305 *****
00306 *****
00307 *****
00308 *****
00309 *****
00310 *****
00311 *****
00312 *****
00313 *****
00314 *****
00315 *****
00316 *****
00317 *****
00318 *****
00319 *****
00320 *****
00321 *****
00322 *****
00323 *****
00324 *****
00325 *****
00326 *****
00327 *****
00328 *****
00329 *****
00330 *****
00331 *****
00332 *****
00333 *****
00334 *****
00335 *****
00336 *****
00337 *****
00338 *****
00339 *****
00340 *****
00341 *****
00342 *****
00343 *****
00344 *****
00345 *****
00346 *****
00347 *****
00348 *****
00349 *****
00350 *****
00351 *****
00352 *****
00353 *****
00354 *****
00355 *****
00356 *****
00357 *****
00358 *****
00359 *****
00360 *****
```

Page 1

Page 2



---

*Page 3*

```
01441> CALIB NASHVD 1.0 01:EXT6 .86 .055 No_date 1:40 34.45 .532 .000
01442> [CN= 83.0: N= 3.00: Tpe= .42]
01443> *****
01444> # EXT7
01445> *****
01446> R0505/C00010-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01447> CALIB NASHVD 1.0 01:EXT8 .47 .041 No_date 1:21 32.24 .498 .000
01448> [CN= 83.0: N= 3.00: Tpe= .32]
01449> *****
01450> # EXT8
01451> *****
01452> R0505/C00011-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01453> CALIB NASHVD 1.0 01:EXT8 .83 .052 No_date 1:30 28.33 .437 .000
01454> [CN= 79.0: N= 3.00: Tpe= .42]
01455> *****
01456> # EXT9
01457> *****
01458> R0505/C00012-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01459> CALIB NASHVD 1.0 01:EXT9 3.57 .183 No_date 1:35 25.77 .398 .000
01460> [CN= 76.0: N= 3.00: Tpe= .42]
01461> *****
01462> # EXT9
01463> *****
01464> R0505/C00013-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01465> CALIB NASHVD 1.0 01:EXT8 .01 .002 No_date 1:00 27.43 .423 .000
01466> [CN= 78.0: N= 3.00: Tpe= .04]
01467> *****
01468> # EXT10
01469> *****
01470> R0505/C00014-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01471> CALIB NASHVD 1.0 01:EXT10 .20 .010 No_date 1:30 22.06 .340 .000
01472> [CN= 72.0: N= 3.00: Tpe= .03]
01473> *****
01474> # Pre2_1
01475> *****
01476> R0505/C00015-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01477> CALIB NASHVD 1.0 01:EXT10 .01 .002 No_date 1:00 22.75 .351 .000
01478> [CN= 72.0: N= 3.00: Tpe= .03]
01479> *****
01480> # Pre2_2
01481> *****
01482> R0505/C00016-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01483> CALIB NASHVD 1.0 01:Pre2_2 .00 .000 No_date 1:00 27.40 .423 .000
01484> [CN= 78.0: N= 3.00: Tpe= .02]
01485> *****
01486> # Pre2_1
01487> *****
01488> R0505/C00017-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01489> CALIB NASHVD 1.0 01:Pre2_1 .44 .022 No_date 1:27 22.07 .340 .000
01490> [CN= 71.0: N= 3.00: Tpe= .03]
01491> *****
01492> # Pre2_2
01493> *****
01494> R0505/C00018-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01495> CALIB NASHVD 1.0 01:Pre2_2 .01 .002 No_date 1:00 25.27 .236 .000
01496> [CN= 59.0: N= 3.00: Tpe= .03]
01497> *****
01498> # Pre2_1
01499> *****
01500> R0505/C00019-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01501> CALIB NASHVD 1.0 01:Pre2_1 .80 .048 No_date 1:20 22.07 .340 .000
01502> [CN= 72.0: N= 3.00: Tpe= .03]
01503> *****
01504> # Pre2_1
01505> *****
01506> R0505/C00020-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01507> CALIB NASHVD 1.0 01:Pre2_1 .07 .006 No_date 1:13 27.44 .423 .000
01508> [CN= 78.0: N= 3.00: Tpe= .21]
01509> *****
01510> # Site 1
01511> *****
01512> R0505/C00021-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01513> DESIGN STANDHYD 1.0 01:Site-1 .42 .107 No_date 1:00 40.11 .619 .000
01514> [XMP= 34.7Tpe= .44]
01515> [SLP= 1.00DT= 1.00]
01516> [LOSS= 1 : HORTONS]
01517> *****
01518> # Site 1 - Roof
01519> *****
01520> R0505/C00022-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01521> DESIGN STANDHYD 1.0 01:Site-Roof .06 .029 No_date 1:00 62.84 .970 .000
01522> [XMP= 99.7Tpe= .99]
01523> [SLP= .50DT= 1.00]
01524> [LOSS= 1 : HORTONS]
01525> *****
01526> R0505/C00023-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01527> ROUTE RESERVOIR -> 1.0 01:Site-Roof .06 .029 No_date 1:00 62.84 n/a .000
01528> overFlow <= 1.0 01:Site-Roof-Ov .00 .000 No_date 0:00 .00 n/a .000
01529> [MxTotDsed= 27578.02 m3, TotDVol= 0.000E+00 m3, No-Ovr= 0, TotDurOvr= 0 hrs]
01530> R0505/C00024-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01531> ADD HYD + 1.0 01:Site-Roof .42 .107 No_date 1:00 40.11 n/a .000
01532> SUM= 1.0 01:Site-Roof .00 .000 No_date 1:00 62.84 n/a .000
01533> + 1.0 01:Site-Roof-Ov .00 .000 No_date 0:00 .00 n/a .000
01534> SUM= 1.0 01:SITE1-IN .48 .109 No_date 1:00 43.19 n/a .000
01535> R0505/C00025-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01536> ROUTE RESERVOIR -> 1.0 01:SITE1-IN .48 .109 No_date 1:00 43.19 n/a .000
01537> overFlow <= 1.0 01:SITE1-Over .00 .000 No_date 0:00 .00 n/a .000
01538> SUM= 1.0 01:SITE1-Over .00 .000 No_date 0:00 .00 n/a .000
01539> [MxTotDsed= 11436.01 m3, TotDVol= 0.000E+00 m3, No-Ovr= 0, TotDurOvr= 0 hrs]
01540> *****
01541> # Site 2
01542> *****
01543> R0505/C00026-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01544> DESIGN STANDHYD 1.0 01:Site-2 .35 .088 No_date 1:00 38.93 .401 .000
01545> [XMP= 31.7Tpe= .41]
01546> [SLP= 1.00DT= 1.00]
01547> [LOSS= 1 : HORTONS]
01548> *****
01549> # Site 2 - Roof
01550> *****
01551> R0505/C00027-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01552> DESIGN STANDHYD 1.0 01:Site-Roof .09 .041 No_date 1:00 62.84 .970 .000
01553> [XMP= 99.7Tpe= .99]
01554> [SLP= .50DT= 1.00]
01555> [LOSS= 1 : HORTONS]
01556> *****
01557> R0505/C00028-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01558> ROUTE RESERVOIR -> 1.0 01:Site-Roof .09 .041 No_date 1:00 62.84 n/a .000
01559> overFlow <= 1.0 01:Site-Roof-Ov .00 .000 No_date 1:11 62.85 n/a .000
01560> SUM= 1.0 01:SITE1-IN .00 .000 No_date 0:00 .00 n/a .000
01561> [MxTotDsed= 26836.02 m3, TotDVol= 0.000E+00 m3, No-Ovr= 0, TotDurOvr= 0 hrs]
01562> R0505/C00029-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01563> ADD HYD + 1.0 01:Site-Roof .35 .088 No_date 1:00 38.93 n/a .000
01564> SUM= 1.0 01:SITE1-IN .09 .008 No_date 1:11 62.85 n/a .000
01565> + 1.0 01:SITE1-Over .00 .000 No_date 0:00 .00 n/a .000
01566> SUM= 1.0 01:SITE1-IN .45 .096 No_date 1:00 43.90 n/a .000
01567> R0505/C00030-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01568> ROUTE RESERVOIR -> 1.0 01:SITE1-IN .45 .096 No_date 1:00 43.90 n/a .000
01569> overFlow <= 1.0 01:SITE1-Over .00 .000 No_date 2:05 43.90 n/a .000
01570> SUM= 1.0 01:SITE1-Over .00 .000 No_date 0:00 .00 n/a .000
01571> [MxTotDsed= 12882.01 m3, TotDVol= 0.000E+00 m3, No-Ovr= 0, TotDurOvr= 0 hrs]
01572> R0505/C00031-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01573> ADD HYD + 1.0 01:SITE1-Over .48 .008 No_date 1:50 43.19 n/a .000
01574> SUM= 1.0 01:SITE1-Over .00 .000 No_date 0:00 .00 n/a .000
01575> + 1.0 01:SITE1-IN .48 .008 No_date 1:50 43.19 n/a .000
01576> R0505/C00032-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01577> ADD HYD + 1.0 01:SITE1-Over .45 .009 No_date 2:05 43.90 n/a .000
01578> SUM= 1.0 01:SITE2-IN .45 .009 No_date 1:50 43.90 n/a .000
01579> + 1.0 01:SITE2-Over .00 .000 No_date 0:00 .00 n/a .000
01580> R0505/C00033-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01581> ADD HYD + 1.0 01:EXT7 .28 .026 No_date 1:22 34.45 n/a .000
01582> SUM= 1.0 01:Pre2_1 .01 .002 No_date 1:00 22.75 n/a .000
01583> + 1.0 01:SITE1-IN .48 .008 No_date 1:50 43.19 n/a .000
01584> + 1.0 01:SITE2-IN .45 .009 No_date 2:05 43.90 n/a .000
01585> SUM= 1.0 01:21 .123 .043 No_date 1:22 41.20 n/a .000
01586> R0505/C00034-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01587> ROUTE CHANNEL -> 1.0 01:R1 1.23 .043 No_date 1:22 41.20 n/a .000
01588> [RDT= 1.00] out<= 1.0 01:R1 1.23 .041 No_date 1:29 41.20 n/a .000
01589> [L/S= 143 / .394 / .035]
01590> *****
01591> R0505/C00035-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01592> ADD HYD + 1.0 01:EXT7 1.23 .041 No_date 1:29 41.20 n/a .000
01593> SUM= 1.0 01:EXT7 3.21 .142 No_date 1:53 29.25 n/a .000
01594> + 1.0 01:EXT8 5.00 .205 No_date 1:41 32.18 n/a .000
01595> SUM= 1.0 01:EXT7 3.21 .142 No_date 1:53 29.25 n/a .000
01596> R0505/C00036-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01597> ROUTE CHANNEL -> 1.0 01:R2 5.00 .204 No_date 1:43 32.18 n/a .000
01598> [RDT= 1.00] out<= 1.0 01:R2 5.00 .204 No_date 1:43 32.18 n/a .000
01599> [L/S= 73 / .429 / .035]
01600> *****
01601> R0505/C00037-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01602> ADD HYD + 1.0 01:EXT7 3.21 .142 No_date 1:53 29.25 n/a .000
01603> SUM= 1.0 01:EXT7 3.21 .142 No_date 1:53 29.25 n/a .000
01604> + 1.0 01:EXT8 5.00 .205 No_date 1:41 32.18 n/a .000
01605> SUM= 1.0 01:EXT7 3.21 .142 No_date 1:53 29.25 n/a .000
01606> ROUTE CHANNEL -> 1.0 01:R3 5.31 .220 No_date 1:39 31.96 n/a .000
01607> [RDT= 1.00] out<= 1.0 01:R3 5.31 .220 No_date 1:39 31.96 n/a .000
01608> [L/S= 92 / .274 / .035]
01609> *****
01610> R0505/C00038-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01611> ADD HYD + 1.0 01:EXT7 5.31 .219 No_date 1:43 31.96 n/a .000
01612> SUM= 1.0 01:EXT7 5.31 .219 No_date 1:43 31.96 n/a .000
01613> + 1.0 01:EXT8 5.90 .249 No_date 1:41 31.33 n/a .000
01614> SUM= 1.0 01:EXT7 5.90 .249 No_date 1:41 31.33 n/a .000
01615> R0505/C00039-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01616> ROUTE CHANNEL -> 1.0 01:R4 5.90 .236 No_date 1:52 31.33 n/a .000
01617> [L/S= 100 / .394 / .035]
01618> [Vmax= .399; Dmax= .302]
01619> *****
01620> R0505/C00040-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01621> ADD HYD + 1.0 01:EXT8 5.90 .236 No_date 1:52 31.33 n/a .000
01622> SUM= 1.0 01:EXT8 5.90 .236 No_date 1:52 31.33 n/a .000
01623> + 1.0 01:EXT9 7.23 .312 No_date 1:46 31.76 n/a .000
01624> SUM= 1.0 01:EXT8 7.23 .312 No_date 1:46 31.76 n/a .000
01625> ROUTE CHANNEL -> 1.0 01:R5 7.23 .312 No_date 1:46 31.76 n/a .000
01626> [RDT= 1.00] out<= 1.0 01:R5 7.23 .308 No_date 1:53 31.76 n/a .000
01627> [L/S= 159 / .576 / .035]
01628> [Vmax= 421; Dmax= .283]
01629> R0505/C00041-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01630> ADD HYD + 1.0 01:Pre2_1 .44 .022 No_date 1:27 22.07 n/a .000
01631> SUM= 1.0 01:Pre2_2 .01 .002 No_date 1:00 25.27 n/a .000
01632> + 1.0 01:EXT10 .20 .010 No_date 1:30 22.06 n/a .000
01633> SUM= 1.0 01:Pre2_2 .01 .002 No_date 1:00 25.27 n/a .000
01634> R0505/C00042-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01635> ROUTE CHANNEL -> 1.0 01:Pre2_2 .01 .002 No_date 1:00 25.27 n/a .000
01636> [RDT= 1.00] out<= 1.0 01:R6 1.02 .057 No_date 1:24 22.23 n/a .000
01637> [L/S= 77 / .764 / .035]
01638> [Vmax= 492; Dmax= .036]
01639> R0505/C00043-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01640> ROUTE CHANNEL -> 1.0 01:Pre2_2 .44 .022 No_date 1:31 22.07 n/a .000
01641> [RDT= 1.00] out<= 1.0 01:R7 1.02 .057 No_date 1:24 22.23 n/a .000
01642> [L/S= 159 / .576 / .035]
01643> [Vmax= 797; Dmax= .007]
01644> R0505/C00044-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01645> ADD HYD + 1.0 01:EXT10 .20 .010 No_date 1:30 22.06 n/a .000
01646> SUM= 1.0 01:EXT10 .20 .010 No_date 1:30 22.06 n/a .000
01647> + 1.0 01:EXT11 .13 .009 No_date 1:24 22.23 n/a .000
01648> R0505/C00045-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01649> ROUTE CHANNEL -> 1.0 01:EXT11 .13 .009 No_date 1:24 22.23 n/a .000
01650> [RDT= 1.00] out<= 1.0 01:R8 1.02 .057 No_date 1:24 22.23 n/a .000
01651> [L/S= 79 / .522 / .035]
01652> [Vmax= 421; Dmax= .042]
01653> R0505/C00046-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01654> ADD HYD + 1.0 01:EXT8 1.02 .057 No_date 1:27 22.39 n/a .000
01655> SUM= 1.0 01:EXT8 .83 .032 No_date 1:50 27.40 n/a .000
01656> + 1.0 01:EXT9 7.23 .312 No_date 1:46 31.76 n/a .000
01657> SUM= 1.0 01:EXT8 7.23 .312 No_date 1:46 31.76 n/a .000
01658> ROUTE CHANNEL -> 1.0 01:EXT9 7.23 .312 No_date 1:46 31.76 n/a .000
01659> [RDT= 1.00] out<= 1.0 01:R9 1.46 .078 No_date 1:28 22.42 n/a .000
01660> [L/S= 23 / .887 / .035]
01661> [Vmax= 543; Dmax= .053]
01662> R0505/C00047-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01663> ADD HYD + 1.0 01:EXT9 3.57 .183 No_date 1:35 25.77 n/a .000
01664> SUM= 1.0 01:EXT9 1.46 .078 No_date 1:29 22.52 n/a .000
01665> + 1.0 01:EXT10 .20 .010 No_date 1:30 22.06 n/a .000
01666> SUM= 1.0 01:EXT9 1.46 .078 No_date 1:29 22.52 n/a .000
01667> + 1.0 01:EXT11 .13 .009 No_date 1:24 22.23 n/a .000
01668> R0505/C00048-----DtnIn-ID:INVD-----AREAh-QFEARCs-TpeaDate_hh:mm-----RvM-R.C-----DWfMcs
01669> ROUTE PIPE -> 1.0 01:R10 13.09 .586 No_date 1:42 28.88 n/a .000
01670> [RDT= 1.00] out<= 1.0 01:Outlet 13.09 .585 No_date 1:42 28.88 n/a .000
01671> [L/S= 8 / .010 / .013]
01672> [Vmax= 421; Dmax= .042]
01673> [Dine .53; Dsed= 1.40]
01674> *****
01675> *****
01676> *****
01677> *****
01678> *****
01679> *****
01680> *****
01681> *****
01682> *****
01683> *****
01684> *****
01685> *****
01686> *****
01687> *****
01688> *****
01689> *****
01690> *****
01691> *****
01692> *****
01693> *****
01694> *****
01695> *****
01696> *****
01697> *****
01698> *****
01699> *****
01700> *****
01701> *****
01702> *****
01703> *****
01704> *****
01705> *****
01706> *****
01707> *****
01708> *****
01709> *****
01710> *****
01711> *****
01712> *****
01713> *****
01714> *****
01715> *****
01716> *****
01717> *****
01718> *****
01719> *****
01720> *****
01721> *****
01722> *****
01723> *****
01724> *****
01725> *****
01726> *****
01727> *****
01728> *****
01729> *****
01730> *****
01731> *****
01732> *****
01733> *****
01734> *****
01735> *****
01736> *****
01737> *****
01738> *****
01739> *****
01740> *****
01741> *****
01742> *****
01743> *****
01744> *****
01745> *****
01746> *****
01747> *****
01748> *****
01749> *****
01750> *****
01751> *****
01752> *****
01753> *****
01754> *****
01755> *****
01756> *****
01757> *****
01758> *****
01759> *****
01760> *****
01761> *****
01762> *****
01763> *****
01764> *****
01765> *****
01766> *****
01767> *****
01768> *****
01769> *****
01770> *****
01771> *****
01772> *****
01773> *****
01774> *****
01775> *****
01776> *****
01777> *****
01778> *****
01779> *****
01780> *****
01781> *****
01782> *****
01783> *****
01784> *****
01785> *****
01786> *****
01787> *****
01788> *****
01789> *****
01790> *****
01791> *****
01792> *****
01793> *****
01794> *****
01795> *****
01796> *****
01797> *****
01798> *****
01799> *****
01800> *****
```

```
01801> [CN= 72.0; N= 3.00; Tpe= .03]
01802> *****
01803> # Pre2_2
01804> *****
01805> R0099/C00016-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01806> * CALIB NASHYD 1.0 01:Pre2_2 .00 .001 No_date 1:00 32.36 .451 .000
01807> [CN= 76.0; N= 3.00; Tpe= .03]
01808> *****
01809> # Pre1_1
01810> *****
01811> R0099/C00017-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01812> * CALIB NASHYD 1.0 01:Pre1_1 .44 .027 No_date 1:27 26.29 .367 .000
01813> [CN= 71.0; N= 3.00; Tpe= .38]
01814> *****
01815> # Pre2_2
01816> *****
01817> R0099/C00018-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01818> * CALIB NASHYD 1.0 01:Pre2_2 .01 .002 No_date 1:00 18.43 .257 .000
01819> [CN= 59.0; N= 3.00; Tpe= .03]
01820> *****
01821> # Pre1_1
01822> *****
01823> R0099/C00019-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01824> * CALIB NASHYD 1.0 01:Pre1_1 .80 .058 No_date 1:20 26.29 .367 .000
01825> [CN= 71.0; N= 3.00; Tpe= .03]
01826> *****
01827> # Pre1_1
01828> *****
01829> R0099/C00020-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01830> * CALIB NASHYD 1.0 01:Pre1_1 .07 .008 No_date 1:13 32.37 .452 .000
01831> [CN= 78.0; N= 3.00; Tpe= .21]
01832> *****
01833> # Site 1
01834> *****
01835> R0099/C00021-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01836> * DESIGN STANHYD 1.0 01:Site1 .42 .127 No_date 1:00 46.20 .645 .000
01837> [XIMP= .91; TIMP= .44]
01838> [SLP= 1.0; DUT= 1.0]
01839> [LOSS= 1; HORTONS= 1]
01840> *****
01841> # Site 1 - Roof
01842> *****
01843> R0099/C00022-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01844> * DESIGN STANHYD 1.0 01:Site1-Roof .06 .032 No_date 1:00 69.68 .972 .000
01845> [XIMP= .91; TIMP= .99]
01846> [SLP= .50; DUT= 1.0]
01847> [LOSS= 1; HORTONS= 1]
01848> R0099/C00023-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01849> * ROUTE RESERVOIR -> 1.0 01:Site1-Roof .06 .032 No_date 1:00 69.68 n/a .000
01850> * out 1.0 01:Site1-Roof .06 .032 No_date 1:30 69.68 n/a .000
01851> * overflow 1.0 01:Site1-Roof .06 .000 No_date 0:00 .00 n/a .000
01852> [Mktotdase= .3248E-02 n3, TotdovVol= .0000E+00 n3, M-ovr= 0, TotdovRst= 0 hrs]
01853> R0099/C00024-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01854> * ADD HYD 1.0 01:Site1-R1 .42 .127 No_date 1:00 46.20 n/a .000
01855> * 1.0 01:Site1-Roof .06 .032 No_date 1:30 69.68 n/a .000
01856> * 1.0 01:Site1-Roof .06 .000 No_date 0:00 .00 n/a .000
01857> * SUM= 1.0 01:Site1-R1 .48 .130 No_date 1:00 49.38 n/a .000
01858> R0099/C00025-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01859> * ROUTE RESERVOIR -> 1.0 01:Site1-IN .48 .130 No_date 1:00 49.38 n/a .000
01860> * out 1.0 01:Site1-Out .48 .130 No_date 1:30 49.38 n/a .000
01861> * overflow 1.0 01:Site1-Over .00 .000 No_date 0:00 .00 n/a .000
01862> [Mktotdase= .3248E-02 n3, TotdovVol= .0000E+00 n3, M-ovr= 0, TotdovRst= 0 hrs]
01863> *****
01864> # Site 2
01865> *****
01866> R0099/C00026-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01867> * DESIGN STANHYD 1.0 01:Site2-R3 .35 .105 No_date 1:00 44.99 .628 .000
01868> [XIMP= .31; TIMP= .41]
01869> [SLP= 1.0; DUT= 1.0]
01870> [LOSS= 1; HORTONS= 1]
01871> *****
01872> # Site 2 - Roof
01873> *****
01874> R0099/C00027-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01875> * DESIGN STANHYD 1.0 01:Site2-Roof .09 .046 No_date 1:00 69.68 .972 .000
01876> [XIMP= .99; TIMP= .99]
01877> [SLP= .50; DUT= 1.0]
01878> [LOSS= 1; HORTONS= 1]
01879> *****
01880> R0099/C00028-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01881> * ROUTE RESERVOIR -> 1.0 01:Site2-Roof .09 .046 No_date 1:00 69.68 n/a .000
01882> * out 1.0 01:Site2-Roof .09 .046 No_date 1:30 69.68 n/a .000
01883> * overflow 1.0 01:Site2-Roof .09 .000 No_date 0:00 .00 n/a .000
01884> [Mktotdase= .3248E-02 n3, TotdovVol= .0000E+00 n3, M-ovr= 0, TotdovRst= 0 hrs]
01885> R0099/C00029-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01886> * ADD HYD 1.0 01:Site2-R3 .35 .105 No_date 1:00 44.99 n/a .000
01887> * 1.0 01:Site2-Roof .09 .046 No_date 1:30 69.68 n/a .000
01888> * 1.0 01:Site2-Roof .09 .000 No_date 0:00 .00 n/a .000
01889> * SUM= 1.0 01:Site2-IN .45 .114 No_date 1:00 50.13 n/a .000
01890> R0099/C00030-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01891> * ROUTE RESERVOIR -> 1.0 01:Site2-IN .45 .114 No_date 1:00 50.13 n/a .000
01892> * out 1.0 01:Site2-Out .45 .114 No_date 1:30 50.13 n/a .000
01893> * overflow 1.0 01:Site2-Over .00 .000 No_date 0:00 .00 n/a .000
01894> [Mktotdase= .1499E-01 n3, TotdovVol= .0000E+00 n3, M-ovr= 0, TotdovRst= 0 hrs]
01895> R0099/C00031-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01896> * ADD HYD 1.0 01:Site2-Out .48 .008 No_date 1:51 49.38 n/a .000
01897> * 1.0 01:Site2-Over .48 .008 No_date 1:51 49.38 n/a .000
01898> * SUM= 1.0 01:Site2-IN .48 .008 No_date 1:51 49.38 n/a .000
01899> R0099/C00032-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01900> * ADD HYD 1.0 01:Site2-Over .00 .000 No_date 0:00 .00 n/a .000
01901> * 1.0 01:Site2-Over .00 .000 No_date 0:00 .00 n/a .000
01902> * SUM= 1.0 01:Site2-IN .45 .114 No_date 1:00 50.13 n/a .000
01903> R0099/C00033-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01904> * ADD HYD 1.0 01:Site2-R3 .28 .031 No_date 1:22 40.14 n/a .000
01905> * 1.0 01:Site2-Roof .09 .046 No_date 1:30 69.68 n/a .000
01906> * 1.0 01:Site2-Roof .09 .000 No_date 0:00 .00 n/a .000
01907> * SUM= 1.0 01:Site2-IN .45 .114 No_date 1:00 50.13 n/a .000
01908> R0099/C00034-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01909> * ROUTE CHANNEL -> 1.0 01:Site1 1.23 .048 No_date 1:28 47.27 n/a .000
01910> * [RDT= 1.0; out= 1.0 01:Site1 1.23 .047 No_date 1:28 47.27 n/a .000]
01911> [L/S= 143 / 423]
01912> [Vmax= .344; Dmax= .141]
01913> *****
01914> R0099/C00035-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01915> * ADD HYD 1.0 01:Site1 1.23 .047 No_date 1:28 47.27 n/a .000
01916> * 1.0 01:Site2-R3 .28 .031 No_date 1:22 40.14 n/a .000
01917> * 1.0 01:Site2-Roof .09 .046 No_date 1:30 69.68 n/a .000
01918> * SUM= 1.0 01:Site2 .50 .029 No_date 1:41 37.55 n/a .000
01919> R0099/C00036-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01920> * ROUTE CHANNEL -> 1.0 01:Site2 5.00 .239 No_date 1:42 37.55 n/a .000
01921> * [RDT= 1.0; out= 1.0 01:Site2 5.00 .239 No_date 1:42 37.55 n/a .000]
01922> [L/S= 237 / 423]
01923> [Vmax= .517; Dmax= .276]
01924> R0099/C00037-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01925> * ADD HYD 1.0 01:Site2 5.00 .239 No_date 1:42 37.55 n/a .000
01926> * 1.0 01:Site2-R3 .28 .031 No_date 1:22 40.14 n/a .000
01927> * SUM= 1.0 01:Site2 5.31 .029 No_date 1:19 33.37 n/a .000
01928> R0099/C00038-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01929> * ROUTE CHANNEL -> 1.0 01:Site2 5.31 .258 No_date 1:39 37.31 n/a .000
01930> * [RDT= 1.0; out= 1.0 01:Site2 5.31 .258 No_date 1:39 37.31 n/a .000]
01931> [L/S= 92 / 274]
01932> [Vmax= .423; Dmax= .285]
01933> R0099/C00039-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01934> * ADD HYD 1.0 01:Site2 5.31 .256 No_date 1:42 37.31 n/a .000
01935> * 1.0 01:Site2-R3 .28 .031 No_date 1:22 40.14 n/a .000
01936> * SUM= 1.0 01:Site2 5.90 .292 No_date 1:40 36.62 n/a .000
01937> R0099/C00040-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01938> * ROUTE CHANNEL -> 1.0 01:Site2 5.90 .292 No_date 1:40 36.62 n/a .000
01939> * [RDT= 1.0; out= 1.0 01:Site2 5.90 .278 No_date 1:51 36.62 n/a .000]
01940> [L/S= 251 / 190]
01941> [Vmax= .418; Dmax= .241]
01942> R0099/C00041-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01943> * ADD HYD 1.0 01:Site2 5.90 .278 No_date 1:51 36.62 n/a .000
01944> * 1.0 01:Site2-R3 .28 .031 No_date 1:22 40.14 n/a .000
01945> * 1.0 01:Site2-Roof .09 .046 No_date 1:30 69.68 n/a .000
01946> * SUM= 1.0 01:Site2 7.23 .368 No_date 1:45 37.31 n/a .000
01947> R0099/C00042-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01948> * ROUTE CHANNEL -> 1.0 01:Site2 7.23 .368 No_date 1:45 37.31 n/a .000
01949> * [RDT= 1.0; out= 1.0 01:Site2 7.23 .364 No_date 1:50 37.31 n/a .000]
01950> [L/S= 237 / 644]
01951> [Vmax= .689; Dmax= .305]
01952> R0099/C00043-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01953> * ADD HYD 1.0 01:Site2-R1 .80 .058 No_date 1:20 26.29 n/a .000
01954> * 1.0 01:Site2-R2 .01 .002 No_date 1:00 18.43 n/a .000
01955> * 1.0 01:Site2-R3 .00 .001 No_date 1:00 32.36 n/a .000
01956> * SUM= 1.0 01:Site2 .81 .059 No_date 1:20 26.27 n/a .000
01957> R0099/C00044-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01958> * ROUTE CHANNEL -> 1.0 01:Site2 .81 .059 No_date 1:20 26.27 n/a .000
01959> * [RDT= 1.0; out= 1.0 01:Site2 .81 .058 No_date 1:22 26.27 n/a .000]
01960> [L/S= 71 / 776]
01961> [Vmax= .492; Dmax= .483]
01962> R0099/C00045-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01963> * ROUTE CHANNEL -> 1.0 01:Site2-R1 .44 .027 No_date 1:27 26.29 n/a .000
01964> * [RDT= 1.0; out= 1.0 01:Site2 .44 .026 No_date 1:30 26.29 n/a .000]
01965> [L/S= 159 / 175]
01966> [Vmax= .797; Dmax= .088]
01967> R0099/C00046-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01968> * ADD HYD 1.0 01:Site2 .81 .058 No_date 1:22 26.30 n/a .000
01969> * 1.0 01:Site2-R1 .00 .012 No_date 1:20 26.28 n/a .000
01970> * SUM= 1.0 01:Site2 1.02 .069 No_date 1:23 26.46 n/a .000
01971> R0099/C00047-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01972> * ROUTE CHANNEL -> 1.0 01:Site2 1.02 .068 No_date 1:23 26.46 n/a .000
01973> * [RDT= 1.0; out= 1.0 01:Site2 1.02 .068 No_date 1:27 26.46 n/a .000]
01974> [L/S= 79 / 522]
01975> [Vmax= .423; Dmax= .285]
01976> R0099/C00048-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
01977> * ADD HYD 1.0 01:Site2 .44 .032 No_date 1:51 36.73 n/a .000
01978> * 1.0 01:Site2-R1 .00 .012 No_date 1:20 26.28 n/a .000
01979> * SUM= 1.0 01:Site2 1.44 .032 No_date 1:28 26.46 n/a .000
01980> R0099/C00049-----DtnIn-ID-INHYD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfCms
```

Page 6

***JFSAinc.***



```
028811 [L/S/n= 143./,394/,035]
02882 (Vmax= 316.0max= 129)
02883 R0110:C00035 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02884 ADD HYD + 1.0 02:01 1.23 .036 No_date 12:21 43.37 n/a .000
02885 + 1.0 02:EXT3 1.23 .036 No_date 12:13 36.46 n/a .000
02886 + 1.0 02:EXT1 3.21 .121 No_date 12:40 36.46 n/a .000
02887 + 1.0 01:EXT4 5.31 .191 No_date 12:19 38.15 n/a .000
02888 R0110:C00036 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02889 ROUTE CHANNEL -> 1.0 02:12 5.00 .178 No_date 12:29 38.15 n/a .000
02890 ROUTE 1.001 out-> 1.0 01:02 5.00 .177 No_date 12:31 38.15 n/a .000
02891 [L/S/n= 73./,425/,035]
02892 (Vmax= 478.0max= )
02893 R0110:C00037 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02894 ADD HYD + 1.0 02:02 5.00 .177 No_date 12:31 38.15 n/a .000
02895 + 1.0 02:EXT3 5.31 .191 No_date 12:13 37.99 n/a .000
02896 + 1.0 01:EXT4 5.31 .191 No_date 12:19 37.99 n/a .000
02897 R0110:C00038 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02898 ROUTE CHANNEL -> 1.0 02:23 5.31 .191 No_date 12:28 37.99 n/a .000
02899 ROUTE 1.001 out-> 1.0 01:03 5.31 .190 No_date 12:31 37.99 n/a .000
02900 [L/S/n= 92./,274/,035]
02901 (Vmax= 391.0max= 253)
02902 R0110:C00039 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02903 ADD HYD + 1.0 02:03 5.31 .190 No_date 12:31 37.99 n/a .000
02904 + 1.0 02:EXT3 5.31 .190 No_date 12:22 32.39 n/a .000
02905 SUM= 1.0 01:EXT4 5.90 .216 No_date 12:13 37.99 n/a .000
02906 R0110:C00040 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02907 ROUTE CHANNEL -> 1.0 02:14 5.90 .216 No_date 12:30 37.43 n/a .000
02908 ROUTE 1.001 out-> 1.0 01:04 5.90 .204 No_date 12:40 37.43 n/a .000
02909 [L/S/n= 251./,190/,035]
02910 (Vmax= 384.0max= 284)
02911 R0110:C00041 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02912 ADD HYD + 1.0 02:04 5.90 .204 No_date 12:40 37.43 n/a .000
02913 + 1.0 02:EXT6 .86 .046 No_date 12:29 42.40 n/a .000
02914 + 1.0 02:EXT7 .47 .035 No_date 12:13 39.90 n/a .000
02915 SUM= 1.0 01:EXT4 7.23 .268 No_date 12:13 38.18 n/a .000
02916 R0110:C00042 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02917 ROUTE CHANNEL -> 1.0 02:15 7.23 .268 No_date 12:15 38.18 n/a .000
02918 ROUTE 1.001 out-> 1.0 01:05 7.23 .264 No_date 12:41 38.18 n/a .000
02919 [L/S/n= 237./,644/,035]
02920 (Vmax= 623.0max= 457)
02921 R0110:C00043 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02922 ADD HYD + 1.0 02:05 5.90 .043 No_date 12:11 28.00 n/a .000
02923 + 1.0 02:Pre0_2 .01 .001 No_date 12:00 19.72 n/a .000
02924 + 1.0 02:Pre0_2 .01 .001 No_date 12:00 34.35 n/a .000
02925 SUM= 1.0 01:Pre0_2 .81 .043 No_date 12:11 27.87 n/a .000
02926 R0110:C00044 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02927 ROUTE CHANNEL -> 1.0 02:15 7.23 .268 No_date 12:15 38.18 n/a .000
02928 ROUTE 1.001 out-> 1.0 01:06 .81 .043 No_date 12:14 27.87 n/a .000
02929 [L/S/n= 77./,774/,035]
02930 (Vmax= 492.0max= 391)
02931 R0110:C00045 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02932 ROUTE CHANNEL -> 1.0 02:06 5.90 .020 No_date 12:11 28.00 n/a .000
02933 ROUTE 1.001 out-> 1.0 01:07 .44 .019 No_date 12:21 28.00 n/a .000
02934 [L/S/n= 159./,1,574/,035]
02935 (Vmax= 791.0max= )
02936 R0110:C00046 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02937 ADD HYD + 1.0 02:EXT10 1.20 .008 No_date 12:20 27.99 n/a .000
02938 + 1.0 02:EXT10 1.20 .008 No_date 12:15 27.94 n/a .000
02939 SUM= 1.0 02:EXT6 1.02 .051 No_date 12:15 27.94 n/a .000
02940 R0110:C00047 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02941 ROUTE CHANNEL -> 1.0 02:16 1.02 .051 No_date 12:15 27.94 n/a .000
02942 ROUTE 1.001 out-> 1.0 01:08 1.02 .050 No_date 12:18 27.94 n/a .000
02943 [L/S/n= 79./,522/,035]
02944 (Vmax= 423.0max= 337)
02945 R0110:C00048 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02946 ADD HYD + 1.0 02:08 1.02 .050 No_date 12:18 27.97 n/a .000
02947 + 1.0 02:EXT6 1.02 .051 No_date 12:11 27.97 n/a .000
02948 SUM= 1.0 01:EXT7 1.46 .069 No_date 12:19 28.00 n/a .000
02949 R0110:C00049 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02950 ROUTE CHANNEL -> 1.0 02:17 1.46 .069 No_date 12:19 28.00 n/a .000
02951 ROUTE 1.001 out-> 1.0 01:09 1.46 .069 No_date 12:20 28.00 n/a .000
02952 [L/S/n= 29./,883/,035]
02953 (Vmax= 543.0max= 447)
02954 R0110:C00050 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02955 ADD HYD + 1.0 02:09 1.46 .069 No_date 12:20 28.02 n/a .000
02956 + 1.0 02:EXT6 1.46 .069 No_date 12:19 28.00 n/a .000
02957 SUM= 1.0 02:EXT5 7.23 .264 No_date 12:41 38.18 n/a .000
02958 + 1.0 02:EXT6 13.09 .505 No_date 12:30 35.30 n/a .000
02959 R0110:C00051 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
02960 ROUTE PIPE -> 1.0 02:18 13.09 .505 No_date 12:30 35.30 n/a .000
02961 ROUTE 1.001 out-> 1.0 01:07 13.09 .505 No_date 12:32 35.30 n/a .000
02962 [L/S/n= 8./,010/,035]
02963 (Vmax= 419.0max= 1.085)
02964 Dtn= 01:00outlet
02965 # STORM
02966 #####
02967 ** END OF RUN : 124
02970
02971
02972
02973
02974
02975
02976
02977 RUN COMMANDS
02978 R0110:C00001
02979 START
02980 [TSD= 0.0 hrs on 0]
02981 [METOUT= 2 (1=imperial,2=metric output)]
02982 [NITD= 1]
02983 [NRUN = 0125 ]
02984
02985 # SWHYD / INPUT DATA FILE
02986 #####
02987 # Project Name : (5921 Oct 1991)
02988 # Project Number: (P2710(601))
02989 # Date : (2025 April 28)
02990 # Modeler : (JW)
02991 # Company : (JFSa Canada Inc.)
02992 # License #: (25422)
02993
02994 # Model developed to simulate runoff from subcatchments under post development conditions
02995 R0110:C00002
02996 READ STORM
02997 File name = STORM.001
02998 Comment = 25 years SCS Type 2 Storm 24 hours step 10 min, City of Ottawa
02999 [SEP=10.00 SECS, 24.00 HOURS, 86.40]
03000
03001 #####
03002 R0110:C00003
03003 DEFAULT VALUES
03004 File name = C:\Temp\20250910-PostDev\Ottawa.val
03005 [COURSE = 1 (read point data)]
03006 FileTitle File comment: [Parameters for City of Ottawa Projects]
03007
03008 Horton's infiltration equation parameters:
03009 [Fw 76.20 mm/hr] [Fw(1.320 mm/hr)] [DCAVC 4.14 hr] [r= .00 mm]
03010 Parameters for FERM/OS surfaces in STANDNO:
03011 [IAGex 4.67 mm] [IAG=40.00 mm] [DMP= 230]
03012 Parameters for DWERS/OSD surfaces in STANDNO:
03013 [IAGex 1.57 mm] [CAI= 1.50] [DMP= .013]
03014 Parameters used in NURD:
03015 [Iw 4.67 mm] [R= 3.00]
03016 Average monthly Pan Evaporation data in (mm)
03017 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03018 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
03019 Average monthly Potential Evapotranspiration in (mm)
03020 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03021 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
03022
03023 # EXT1
03024
03025 R0110:C00004 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03026 CALIB NASHYD 1.0 01:EXT1 3.21 .155 No_date 12:40 46.39 .534 .000
03027 [CN= 80.0; N= 3.00; Tpe= .32]
03028
03029 # EXT2
03030
03031 R0110:C00005 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03032 CALIB NASHYD 1.0 01:EXT2 .28 .028 No_date 12:13 53.21 .612 .000
03033 [CN= 85.0; N= 3.00; Tpe= .33]
03034
03035 # EXT3
03036 #####
03037 R0110:C00006 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03038 CALIB NASHYD 1.0 01:EXT3 .56 .048 No_date 12:13 46.39 .534 .000
03039 [CN= 80.0; N= 3.00; Tpe= .32]
03040
03041 # EXT4
03042 #####
03043 R0110:C00007 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03044 CALIB NASHYD 1.0 01:EXT4 .31 .028 No_date 12:11 45.14 .520 .000
03045 [CN= 79.0; N= 3.00; Tpe= .45]
03046 #####
03047 # EXT5
03048 #####
03049 R0110:C00008 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03050 CALIB NASHYD 1.0 01:EXT5 .86 .058 No_date 12:28 53.21 .612 .000
03051 [CN= 85.0; N= 3.00; Tpe= .45]
03052 #####
03053 # EXT6
03054 #####
03055 R0110:C00009 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03056 CALIB NASHYD 1.0 01:EXT6 .86 .058 No_date 12:28 53.21 .612 .000
03057 [CN= 85.0; N= 3.00; Tpe= .45]
03058 #####
03059 # EXT7
03060 #####
03061 R0110:C00010 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03062 CALIB NASHYD 1.0 01:EXT7 .86 .058 No_date 12:28 53.21 .612 .000
03063 [CN= 85.0; N= 3.00; Tpe= .45]
03064 #####
03065 # EXT8
03066 #####
03067 R0110:C00011 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03068 CALIB NASHYD 1.0 01:EXT8 .83 .058 No_date 12:19 45.14 .520 .000
03069 [CN= 79.0; N= 3.00; Tpe= .42]
03070 #####
03071 # EXT9
03072 #####
03073 R0110:C00012 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03074 CALIB NASHYD 1.0 01:EXT9 3.57 .205 No_date 12:23 41.62 .479 .000
03075 [CN= 76.0; N= 3.00; Tpe= .48]
03076 #####
03077 # EXT10
03078 #####
03079 R0110:C00013 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03080 CALIB NASHYD 1.0 01:EXT10 .20 .011 No_date 12:20 36.34 .418 .000
03081 [CN= 78.0; N= 3.00; Tpe= .04]
03082 #####
03083 # EXT11
03084 #####
03085 R0110:C00014 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03086 CALIB NASHYD 1.0 01:EXT11 .20 .011 No_date 12:20 36.34 .418 .000
03087 [CN= 72.0; N= 3.00; Tpe= .42]
03088 #####
03089 # Pre0_1
03090 #####
03091 R0110:C00015 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03092 CALIB NASHYD 1.0 01:Pre0_1 .01 .002 No_date 12:00 37.34 .430 .000
03093 [CN= 72.0; N= 3.00; Tpe= .03]
03094 #####
03095 # Pre0_2
03096 #####
03097 R0110:C00016 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03098 CALIB NASHYD 1.0 01:Pre0_2 .00 .000 No_date 12:00 43.92 .506 .000
03099 [CN= 78.0; N= 3.00; Tpe= .02]
03100 #####
03101 # Pre0_3
03102 #####
03103 R0110:C00017 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03104 CALIB NASHYD 1.0 01:Pre0_3 .44 .026 No_date 12:17 36.35 .418 .000
03105 [CN= 71.0; N= 3.00; Tpe= .48]
03106 #####
03107 # Pre0_4
03108 #####
03109 R0110:C00018 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03110 CALIB NASHYD 1.0 01:Pre0_4 .00 .000 No_date 12:00 43.92 .506 .000
03111 [CN= 78.0; N= 3.00; Tpe= .02]
03112 #####
03113 # Pre0_5
03114 #####
03115 R0110:C00019 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03116 CALIB NASHYD 1.0 01:Pre0_5 .80 .057 No_date 12:11 36.35 .418 .000
03117 [CN= 72.0; N= 3.00; Tpe= .42]
03118 #####
03119 # Pre0_6
03120 #####
03121 R0110:C00020 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03122 CALIB NASHYD 1.0 01:Pre0_6 .07 .007 No_date 12:06 43.93 .506 .000
03123 [CN= 78.0; N= 3.00; Tpe= .21]
03124 #####
03125 # Site 1
03126 #####
03127 R0110:C00021 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03128 DESIGN STANDARD 1.0 01:01-R1 .42 .086 No_date 12:00 47.13 .542 .000
03129 [XMP= 34.74Tpe= 44]
03130 [SLP= 0.010Tpe= 1.00]
03131 [LOSS= 1 : HORTONS]
03132 [LOSS= 1 : HORTONS]
03133 # Site 1 - Roof
03134 #####
03135 R0110:C00022 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03136 DESIGN STANDARD 1.0 01:01-Roof .06 .019 No_date 12:00 84.69 .975 .000
03137 [XMP= 34.74Tpe= 99]
03138 [SLP= .500Tpe= 1.00]
03139 [LOSS= 1 : HORTONS]
03140 R0110:C00023 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03141 ROUTE RESERVOIR -> 1.0 01:01-Roof .06 .019 No_date 12:00 84.69 n/a .000
03142 [XMP= 34.74Tpe= 99]
03143 [SLP= .500Tpe= 1.00]
03144 [LOSS= 1 : HORTONS]
03145 R0110:C00024 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03146 ADD HYD + 1.0 01:01-R1 .42 .086 No_date 12:00 47.14 n/a .000
03147 + 1.0 01:01-Roof .06 .019 No_date 12:00 84.69 n/a .000
03148 + 1.0 01:01-Roof .06 .019 No_date 12:00 84.69 n/a .000
03149 SUM= 1.0 01:01:R1-IN .48 .088 No_date 12:00 52.22 n/a .000
03150 R0110:C00025 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03151 ROUTE RESERVOIR -> 1.0 01:01:R1-IN .48 .088 No_date 12:00 52.22 n/a .000
03152 + 1.0 01:01:R1-Out .48 .088 No_date 12:00 52.22 n/a .000
03153 + 1.0 01:01:R1-Out .48 .088 No_date 12:00 52.22 n/a .000
03154 [XMP= 34.74Tpe= 99]
03155 [SLP= .500Tpe= 1.00]
03156 [LOSS= 1 : HORTONS]
03157 # Site 2
03158 #####
03159 R0110:C00026 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03160 DESIGN STANDARD 1.0 01:02-R3 .35 .072 No_date 12:00 45.30 .521 .000
03161 [XMP= 34.74Tpe= 41]
03162 [SLP= 0.010Tpe= 1.00]
03163 [LOSS= 1 : HORTONS]
03164 # Site 2 - Roof
03165 #####
03166 R0110:C00027 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03167 DESIGN STANDARD 1.0 01:02-Roof .09 .027 No_date 12:00 84.69 .975 .000
03168 [XMP= 99.74Tpe= 99]
03169 [SLP= .500Tpe= 1.00]
03170 [LOSS= 1 : HORTONS]
03171 #####
03172 R0110:C00028 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03173 ROUTE RESERVOIR -> 1.0 01:02-Roof .09 .027 No_date 12:00 84.69 n/a .000
03174 + 1.0 01:02-Roof-Out .09 .027 No_date 12:00 84.69 n/a .000
03175 + 1.0 01:02-Roof-Out .09 .027 No_date 12:00 84.69 n/a .000
03176 [XMP= 99.74Tpe= 99]
03177 [SLP= .500Tpe= 1.00]
03178 [LOSS= 1 : HORTONS]
03179 ADD HYD + 1.0 01:02-R3 .35 .072 No_date 12:00 45.30 n/a .000
03180 + 1.0 01:02-Roof-Out .09 .027 No_date 12:00 84.69 n/a .000
03181 + 1.0 01:02-Roof-Out .09 .027 No_date 12:00 84.69 n/a .000
03182 SUM= 1.0 01:01:R1-IN .45 .080 No_date 12:00 53.50 n/a .000
03183 ROUTE RESERVOIR -> 1.0 01:01:R1-IN .45 .080 No_date 12:00 53.50 n/a .000
03184 + 1.0 01:01:R1-Out .45 .080 No_date 12:00 53.50 n/a .000
03185 + 1.0 01:01:R1-Out .45 .080 No_date 12:00 53.50 n/a .000
03186 [XMP= 99.74Tpe= 99]
03187 [SLP= .500Tpe= 1.00]
03188 [LOSS= 1 : HORTONS]
03189 ADD HYD + 1.0 01:01:R1-Out .48 .088 No_date 12:19 52.22 n/a .000
03190 + 1.0 01:01:R1-Out .48 .088 No_date 12:19 52.22 n/a .000
03191 R0110:C00032 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03192 ADD HYD + 1.0 01:01:R1-Out .45 .080 No_date 12:48 53.50 n/a .000
03193 + 1.0 01:01:R1-Out .45 .080 No_date 12:48 53.50 n/a .000
03194 SUM= 1.0 01:01:R1-Out .45 .080 No_date 12:48 53.50 n/a .000
03195 R0110:C00033 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03196 ADD HYD + 1.0 01:EXT2 .28 .028 No_date 12:13 53.21 .612 .000
03197 + 1.0 02:Pre0_3 .01 .002 No_date 12:00 37.34 .430 .000
03198 + 1.0 02:Pre0_3 .01 .002 No_date 12:00 37.34 .430 .000
03199 + 1.0 02:Pre0_3 .01 .002 No_date 12:00 37.34 .430 .000
03200 SUM= 1.23 .044 No_date 12:14 52.76 n/a .000
03201 R0110:C00034 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03202 ROUTE CHANNEL -> 1.0 02:01 1.23 .044 No_date 12:14 52.76 n/a .000
03203 [RD= 1.00] out-> 1.0 01:01 1.23 .044 No_date 12:19 52.76 n/a .000
03204 [L/S/n= 143./,394/,035]
03205 (Vmax= 331.0max= 139)
03206 R0110:C00035 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03207 ADD HYD + 1.0 02:EXT3 .56 .048 No_date 12:13 46.39 n/a .000
03208 + 1.0 02:EXT3 3.21 .155 No_date 12:40 46.39 n/a .000
03209 SUM= 1.0 02:EXT1 5.90 .216 No_date 12:29 47.95 n/a .000
03210 R0110:C00036 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03211 ROUTE CHANNEL -> 1.0 02:12 5.90 .216 No_date 12:29 47.95 n/a .000
03212 ROUTE 1.001 out-> 1.0 01:02 5.90 .223 No_date 12:31 47.95 n/a .000
03213 [RD= 1.00] out-> 1.0 01:02 5.90 .223 No_date 12:31 47.95 n/a .000
03214 [L/S/n= 73./,425/,035]
03215 (Vmax= 509.0max= 269)
03216 R0110:C00037 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03217 ADD HYD + 1.0 02:EXT4 .31 .028 No_date 12:11 45.14 n/a .000
03218 + 1.0 02:EXT4 3.21 .155 No_date 12:40 46.39 n/a .000
03219 SUM= 1.0 01:EXT3 7.23 .268 No_date 12:19 28.00 n/a .000
03220 R0110:C00038 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03221 ROUTE CHANNEL -> 1.0 02:13 7.23 .268 No_date 12:19 28.00 n/a .000
03222 ROUTE 1.001 out-> 1.0 01:03 7.23 .264 No_date 12:41 38.18 n/a .000
03223 [L/S/n= 92./,274/,035]
03224 (Vmax= 411.0max= 278)
03225 R0110:C00039 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03226 ADD HYD + 1.0 02:03 5.31 .190 No_date 12:30 37.43 n/a .000
03227 + 1.0 02:EXT3 5.31 .190 No_date 12:22 32.39 n/a .000
03228 SUM= 1.0 01:EXT4 5.90 .216 No_date 12:29 47.95 n/a .000
03229 R0110:C00040 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03230 ROUTE CHANNEL -> 1.0 02:14 5.90 .216 No_date 12:29 47.95 n/a .000
03231 ROUTE 1.001 out-> 1.0 01:04 5.90 .259 No_date 12:39 47.16 n/a .000
03232 [L/S/n= 251./,190/,035]
03233 (Vmax= 411.0max= 315)
03234 R0110:C00041 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03235 ADD HYD + 1.0 02:EXT6 .86 .058 No_date 12:28 53.21 .612 .000
03236 + 1.0 02:EXT6 1.46 .069 No_date 12:19 28.00 n/a .000
03237 SUM= 1.0 01:EXT5 7.23 .268 No_date 12:19 28.00 n/a .000
03238 R0110:C00042 -----Dtn-ID-INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----Rvnm-R.C-----DWfms
03239 ROUTE CHANNEL -> 1.0 02:15 7.23 .268 No_date 12:15 38.18 n/a .000
03240 ROUTE 1.001 out-> 1.0 01:05 7.23 .264 No_date 12:41 38.18 n/a .000
```

JFSAinc.

```
036011 ADD HYD + 1.0 02:EXT9 3.57 .242 No_date 12:23 49.04 n/a .000
036022 + 1.0 02:EXT9 1.46 .107 No_date 12:19 43.15 n/a .000
036033 + 1.0 02:EXT8 .83 .068 No_date 12:19 52.94 n/a .000
036044 + 1.0 02:EXT8 .23 .396 No_date 12:38 55.95 n/a .000
036055 SUM= 1.0 01:EXT8 13.09 .776 No_date 12:28 52.45 n/a .000
036066 R0199:C0001-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036077 ROUTE RESERVOIR -> 1.0 01:EXT8 13.09 .776 No_date 12:28 52.45 n/a .000
036088 * (RDT=1.00) out<- 1.0 01:Outlet 13.09 .775 No_date 12:30 52.45 n/a .000
036099 [L/S/m= 87./0107/033]
036100 (Wmax= 483/0max= 1.35)
036111 Dtlm= 53/0max= 1.55)
036122 *****
036133 * STORMS
036144 *****
036155 ** END OF RUN : 198
036166 *****
036177 *****
036188 *****
036199 *****
036200 *****
036211 *****
036222 *****
036233 RUN:COMMAND#
036244 R0199:C0001-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036255 START
036266 (TZERO = .00 hrs on 0)
036277 (METOUT = 2 [Imperial, 2metric output])
036288 (INSTORM= 1)
036299 (NRUN = 019)
036300 *****
036311 # SWHYMO / INPUT DATA FILE
036322 *****
036333 # Project Name : [5923 Ottawa St]
036344 # Project Number: [2025 April 28]
036355 # Date : [2025 April 28]
036366 # Modeller : [JFS]
036377 # Company : JFS Canada Inc.
036388 # License # : 2549237
036399 *****
036400 # Model developed to simulate runoff from subcatchments under post development conditions
036411 *****
036422 R0199:C0002-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036433 READ STORM
036444 Filename = STORM.001
036455 Comments = 100 Year SCS Type 2 Storm 24 Hours step 10 min, City of Ottawa
036466 (SDT=10.00;SDUR= 24.00;PDT= 106.73)
036477 *****
036488 R0199:C0003-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036499 DEFAULT VALUES
036500 Filename = C:\Temp\20250910-PostDev\Ottawa.val
036511 ICAREV = 1 (read and print data)
036522 FileTitle File comment: [Parameters for City of Ottawa Projects]
036533 *****
036544 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
036555 Parameters for INFILTRATION equation parameters:
036566 [Fw= 76.20 mm/hr] [Fw1= 20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
036577 [Iapex= 4.67 mm] [Iap=40.00 n/s] [DWT= .250]
036588 Parameters for IMPERVIOUS surfaces in STANDARD:
036599 [Iapex= 1.57 mm] [CWI= 1.50] [DWT= .03]
036600 Parameters used in NALM:
036611 [Iaw= 4.67 mm] [N= 3.00]
036622 Average monthly Pan Evaporation data in (mm)
036633 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
036644 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
036655 Average monthly Potential Evapotranspiration in (mm)
036666 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
036677 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
036688 *****
036699 # EXTS
036700 *****
036711 R0199:C0004-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036722 CALIB NASHYD 1.0 01:EXT4 3.21 .212 No_date 12:39 62.92 .589 .000
036733 [Cw= 80.0; N= 3.00; Tpe= .72]
036744 # EXTS
036755 *****
036766 *****
036777 R0199:C0005-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036788 CALIB NASHYD 1.0 01:EXT2 .28 .037 No_date 12:13 70.91 .664 .000
036799 [Cw= 85.0; N= 3.00; Tpe= .33]
036800 *****
036811 # EXTS
036822 *****
036833 R0199:C0006-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036844 CALIB NASHYD 1.0 01:EXT3 .56 .066 No_date 12:13 62.92 .589 .000
036855 [Cw= 78.0; N= 3.00; Tpe= .04]
036866 *****
036877 # EXTS
036888 *****
036899 R0199:C0007-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036900 CALIB NASHYD 1.0 01:EXT4 .31 .031 .084 No_date 12:13 50.61 .474 .000
036911 [Cw= 79.0; N= 3.00; Tpe= .29]
036922 *****
036933 R0199:C0008-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
036944 CALIB NASHYD 1.0 01:EXT5 .59 .049 No_date 12:21 57.15 .535 .000
036955 [Cw= 78.0; N= 3.00; Tpe= .04]
036966 *****
036977 # EXTS
036988 *****
036999 R0199:C0009-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037000 CALIB NASHYD 1.0 01:EXT4 .86 .078 No_date 12:28 70.92 .664 .000
037011 [Cw= 85.0; N= 3.00; Tpe= .56]
037022 *****
037033 *****
037044 # EXTS
037055 *****
037066 *****
037077 R0199:C0001-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037088 CALIB NASHYD 1.0 01:EXT7 .47 .060 No_date 12:12 67.60 .633 .000
037099 [Cw= 81.0; N= 3.00; Tpe= .32]
037100 *****
037111 # EXTS
037122 *****
037133 R0199:C0001-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037144 CALIB NASHYD 1.0 01:EXT8 .83 .079 No_date 12:19 61.42 .576 .000
037155 [Cw= 78.0; N= 3.00; Tpe= .02]
037166 *****
037177 # EXTS
037188 *****
037199 R0199:C0002-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037200 CALIB NASHYD 1.0 01:EXT8 3.05 .084 No_date 12:17 57.15 .535 .000
037211 [Cw= 76.0; N= 3.00; Tpe= .48]
037222 *****
037233 R0199:C0003-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037244 CALIB NASHYD 1.0 01:EXT9a .01 .003 No_date 12:00 59.96 .562 .000
037255 [Cw= 78.0; N= 3.00; Tpe= .04]
037266 *****
037277 *****
037288 *****
037299 *****
037300 *****
037311 R0199:C0004-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037322 CALIB NASHYD 1.0 01:EXT10 .20 .016 No_date 12:19 50.61 .474 .000
037333 [Cw= 71.0; N= 3.00; Tpe= .42]
037344 *****
037355 # Pre2_1
037366 *****
037377 R0199:C0005-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037388 CALIB NASHYD 1.0 01:Pre2_1 .01 .003 No_date 12:00 51.86 .486 .000
037399 [Cw= 72.0; N= 3.00; Tpe= .03]
037400 *****
037411 # Pre2_2
037422 *****
037433 R0199:C0006-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037444 CALIB NASHYD 1.0 01:Pre2_2 .00 .001 No_date 12:00 59.95 .562 .000
037455 [Cw= 78.0; N= 3.00; Tpe= .02]
037466 *****
037477 # Pre2_3
037488 *****
037499 R0199:C0007-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037500 CALIB NASHYD 1.0 01:Pre2_3 3.44 .084 No_date 12:17 50.61 .474 .000
037511 [Cw= 71.0; N= 3.00; Tpe= .38]
037522 *****
037533 R0199:C0008-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037544 CALIB NASHYD 1.0 01:Pre2_2 .01 .002 No_date 12:00 37.39 .350 .000
037555 [Cw= 59.0; N= 3.00; Tpe= .04]
037566 *****
037577 *****
037588 *****
037599 *****
037600 *****
037611 R0199:C0009-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037622 CALIB NASHYD 1.0 01:Pre2_1 .80 .079 No_date 12:11 50.61 .474 .000
037633 [Cw= 71.0; N= 3.00; Tpe= .29]
037644 *****
037655 # Pre1_1
037666 *****
037677 R0199:C0002-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037688 CALIB NASHYD 1.0 01:Pre1_1 .07 .010 No_date 12:06 59.96 .562 .000
037699 [Cw= 78.0; N= 3.00; Tpe= .21]
037700 *****
037711 # Site 1
037722 *****
037733 R0199:C0001-----Dtlm-ID:INVD-----AREAh-QFEARcms-TpeakDate_hh:mm-----Rvwm-R.C-----DWfms
037744 DESIGN STANDARDY 1.0 01:Site-B1 .42 .112 No_date 12:00 60.12 .563 .000
037755 [Cw= 59.0; N= 3.00; Tpe= .44]
037766 [SLP=1.00;DT= 1.00]
037777 [L/S/m= 181./0107/033]
037788 *****
037799 # Site 1 - Roof
037800 *****
037811 *****
037822 *****
037833 *****
037844 *****
037855 *****
037866 *****
037877 *****
037888 *****
037899 *****
037900 *****
037911 *****
037922 *****
037933 *****
037944 *****
037955 *****
037966 *****
037977 *****
037988 *****
037999 *****
038000 *****
038011 *****
038022 *****
038033 *****
038044 *****
038055 *****
038066 *****
038077 *****
038088 *****
038099 *****
038100 *****
038111 *****
038122 *****
038133 *****
038144 *****
038155 *****
038166 *****
038177 *****
038188 *****
038199 *****
038200 *****
038211 *****
038222 *****
038233 *****
038244 *****
038255 *****
038266 *****
038277 *****
038288 *****
038299 *****
038300 *****
038311 *****
038322 *****
038333 *****
038344 *****
038355 *****
038366 *****
038377 *****
038388 *****
038399 *****
038400 *****
038411 *****
038422 *****
038433 *****
038444 *****
038455 *****
038466 *****
038477 *****
038488 *****
038499 *****
038500 *****
038511 *****
038522 *****
038533 *****
038544 *****
038555 *****
038566 *****
038577 *****
038588 *****
038599 *****
038600 *****
038611 *****
038622 *****
038633 *****
038644 *****
038655 *****
038666 *****
038677 *****
038688 *****
038699 *****
038700 *****
038711 *****
038722 *****
038733 *****
038744 *****
038755 *****
038766 *****
038777 *****
038788 *****
038799 *****
038800 *****
038811 *****
038822 *****
038833 *****
038844 *****
038855 *****
038866 *****
038877 *****
038888 *****
038899 *****
038900 *****
038911 *****
038922 *****
038933 *****
038944 *****
038955 *****
038966 *****
038977 *****
038988 *****
038999 *****
039000 *****
039011 *****
039022 *****
039033 *****
039044 *****
039055 *****
039066 *****
039077 *****
039088 *****
039099 *****
039100 *****
039111 *****
039122 *****
039133 *****
039144 *****
039155 *****
039166 *****
039177 *****
039188 *****
039199 *****
039200 *****
039211 *****
039222 *****
039233 *****
039244 *****
039255 *****
039266 *****
039277 *****
039288 *****
039299 *****
039300 *****
039311 *****
039322 *****
039333 *****
039344 *****
039355 *****
039366 *****
039377 *****
039388 *****
039399 *****
039400 *****
039411 *****
039422 *****
039433 *****
039444 *****
039455 *****
039466 *****
039477 *****
039488 *****
039499 *****
039500 *****
039511 *****
039522 *****
039533 *****
039544 *****
039555 *****
039566 *****
039577 *****
039588 *****
039599 *****
039600 *****
```

```
03961 # License # : 2549237
03962 *****
03963 # Model developed to simulate runoff from subcatchments under post development conditions
03964 *****
03965 R1979:C00002-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
03966 READ STORM
03967 FileNm= STORM.001
03968 Comment = July 1st, 1979 Storm (3H) - Ottawa International Airport step 5 min
03969 [SDT= 5.00;SDRM= 3.00;PTOT= 83.99]
03970 *****
03971 R1979:C00003-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
03972 DEFAULT VALUES
03973 FileNm= C:\Temp\20250910-PostDev\Ottawa_val
03974 ICAERD= 1 (read and print data)
03975 FileTitle= File comment: [Parameters for City of Ottawa Projects]
03976 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARDYD COM
03977 Horton's infiltration equation parameters:
03978 [Fw= 76.20 mm/hr] [Fw=13.20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
03979 Parameters for PERVIOUS surfaces in STANDYD:
03980 [Iape= 4.67 mm] [LGP=40.00 n] [MNP= .250]
03981 Parameters for IMPVIOUS surfaces in STANDYD:
03982 [Iape= 1.57 mm] [Cfil= 1.50] [DNI= .013]
03983 Parameters used in NASHYD:
03984 [Iaw= 4.67 mm] [N= 3.00]
03985 Average monthly Pan Evaporation data in (mm)
03986 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03987 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
03988 Average monthly Potential Evapotranspiration in (mm)
03989 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03990 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
03991 *****
03992 # EXT1
03993 *****
03994 R1979:C00004-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
03995 CALIB NASHYD 1.0 01:EXT1 3.21 .040 No_date 2:16 44.05 .524 .000
03996 [Cm= 80.0; N= 3.00; Tpe= .72]
03997 *****
03998 # EXT2
03999 *****
04000 R1979:C00005-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04001 CALIB NASHYD 1.0 01:EXT2 .28 .039 No_date 1:50 50.68 .603 .000
04002 [Cm= 80.0; N= 3.00; Tpe= .72]
04003 *****
04004 # EXT3
04005 *****
04006 R1979:C00006-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04007 CALIB NASHYD 1.0 01:EXT3 .56 .067 No_date 1:50 44.05 .524 .000
04008 [Cm= 80.0; N= 3.00; Tpe= .32]
04009 *****
04010 # EXT4
04011 *****
04012 R1979:C00007-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04013 CALIB NASHYD 1.0 01:EXT4 .31 .038 No_date 1:48 42.84 .510 .000
04014 [Cm= 79.0; N= 3.00; Tpe= .29]
04015 *****
04016 # EXT5
04017 *****
04018 R1979:C00008-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04019 CALIB NASHYD 1.0 01:EXT5 .59 .054 No_date 2:01 39.44 .470 .000
04020 [Cm= 76.0; N= 3.00; Tpe= .04]
04021 *****
04022 # EXT6
04023 *****
04024 R1979:C00009-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04025 CALIB NASHYD 1.0 01:EXT6 .86 .088 No_date 2:06 50.48 .603 .000
04026 [Cm= 85.0; N= 3.00; Tpe= .56]
04027 *****
04028 # EXT7
04029 *****
04030 R1979:C00010-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04031 CALIB NASHYD 1.0 01:EXT7 .47 .061 No_date 1:49 47.90 .570 .000
04032 [Cm= 82.0; N= 3.00; Tpe= .04]
04033 *****
04034 # EXT8
04035 *****
04036 R1979:C00011-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04037 CALIB NASHYD 1.0 01:EXT8 .83 .085 No_date 1:58 42.85 .510 .000
04038 [Cm= 79.0; N= 3.00; Tpe= .42]
04039 *****
04040 # EXT9
04041 *****
04042 R1979:C00012-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04043 CALIB NASHYD 1.0 01:EXT9 3.57 .311 No_date 2:03 39.44 .470 .000
04044 [Cm= 76.0; N= 3.00; Tpe= .48]
04045 *****
04046 # EXT10
04047 *****
04048 R1979:C00013-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04049 CALIB NASHYD 1.0 01:EXT10 .01 .002 No_date 1:30 41.67 .496 .000
04050 [Cm= 76.0; N= 3.00; Tpe= .04]
04051 *****
04052 # EXT10
04053 *****
04054 R1979:C00014-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04055 CALIB NASHYD 1.0 01:EXT10 .20 .017 No_date 1:59 34.37 .409 .000
04056 [Cm= 71.0; N= 3.00; Tpe= .42]
04057 *****
04058 # Pre2_1
04059 *****
04060 R1979:C00015-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04061 CALIB NASHYD 1.0 01:Pre2_1 .01 .002 No_date 1:30 35.32 .421 .000
04062 [Cm= 76.0; N= 3.00; Tpe= .04]
04063 *****
04064 # Pre2_2
04065 *****
04066 R1979:C00016-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04067 CALIB NASHYD 1.0 01:Pre2_2 .00 .000 No_date 1:30 41.63 .496 .000
04068 [Cm= 78.0; N= 3.00; Tpe= .02]
04069 *****
04070 # Pre3_1
04071 *****
04072 R1979:C00017-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04073 CALIB NASHYD 1.0 01:Pre3_1 .44 .038 No_date 1:55 34.37 .409 .000
04074 [Cm= 71.0; N= 3.00; Tpe= .38]
04075 *****
04076 # Pre3_2
04077 *****
04078 R1979:C00018-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04079 CALIB NASHYD 1.0 01:Pre3_2 .01 .002 No_date 1:30 24.59 .293 .000
04080 [Cm= 59.0; N= 3.00; Tpe= .04]
04081 *****
04082 # Pre10_1
04083 *****
04084 R1979:C00019-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04085 CALIB NASHYD 1.0 01:Pre10_1 .00 .078 No_date 1:48 34.37 .409 .000
04086 [Cm= 71.0; N= 3.00; Tpe= .29]
04087 *****
04088 # Pre11_1
04089 *****
04090 R1979:C00020-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04091 CALIB NASHYD 1.0 01:Pre11_1 .07 .009 No_date 1:43 41.67 .496 .000
04092 [Cm= 76.0; N= 3.00; Tpe= .21]
04093 *****
04094 # Site 1
04095 *****
04096 R1979:C00021-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04097 DESIGN STANDYD 1.0 01:Site1-81 .42 .088 No_date 1:30 59.24 .709 .000
04098 [XMP= 34.71MP= 44]
04099 [SLP= 50.0DT= 1.00]
04100 *****
04101 # Site 1 - Horton
04102 *****
04103 *****
04104 R1979:C00022-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04105 DESIGN STANDYD 1.0 01:Site1-81 .06 .019 No_date 1:30 82.00 .976 .000
04106 [XMP= 99.71MP= 99]
04107 [SLP= 50.0DT= 1.00]
04108 *****
04109 # Site 1 - Horton
04110 *****
04111 *****
04112 *****
04113 *****
04114 R1979:C00023-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04115 ROUTE RESERVOIR -> 1.0 01:Site1-81 .06 .004 No_date 2:01 82.00 n/a .000
04116 overflow out <= 1.0 01:Site1-Roof-Ou .09 .009 No_date 1:43 82.00 n/a .000
04117 [MktotSed= .3896E-02 m3, TotDurVol= .0000E+00 m3, N-Ovrf= 0, TotDurOvrf= 0 hrs]
04118 SUM= 1.0 01:SITE1-IN 48 .094 No_date 1:30 62.32 n/a .000
04119 R1979:C00024-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04120 ROUTE RESERVOIR -> 1.0 01:SITE1-IN .09 .012 No_date 1:30 82.00 n/a .000
04121 out <= 1.0 01:SITE1-Out 48 .013 No_date 2:14 62.32 n/a .000
04122 overflow out <= 1.0 01:SITE1-Over 48 .013 No_date 2:14 62.32 n/a .000
04123 [MktotSed= .2061E-01 m3, TotDurVol= .0000E+00 m3, N-Ovrf= 0, TotDurOvrf= 0 hrs]
04124 *****
04125 # Site 2
04126 *****
04127 R1979:C00025-----DtnIn-ID:INVDY-----AREAh-QFEARCs-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
04128 DESIGN STANDYD 1.0 01:Site2-83 .35 .073 No_date 1:30 58.02 .691 .000
04129 [XMP= 31.71MP= 41]
04130 [SLP= 50.0DT= 1.00]
04131 *****
04132 # Site 2 - Roof
04133 *****
04134 *****
04135 *****
04136 *****
04137 *****
04138 *****
04139 *****
04140 *****
04141 *****
04142 *****
04143 *****
04144 *****
04145 *****
04146 *****
04147 *****
04148 *****
04149 *****
04150 *****
04151 *****
04152 *****
04153 *****
04154 *****
04155 *****
04156 *****
04157 *****
04158 *****
04159 *****
04160 *****
04161 *****
04162 *****
04163 *****
04164 *****
04165 *****
04166 *****
04167 *****
04168 *****
04169 *****
04170 *****
04171 *****
04172 *****
04173 *****
04174 *****
04175 *****
04176 *****
04177 *****
04178 *****
04179 *****
04180 *****
04181 *****
04182 *****
04183 *****
04184 *****
04185 *****
04186 *****
04187 *****
04188 *****
04189 *****
04190 *****
04191 *****
04192 *****
04193 *****
04194 *****
04195 *****
04196 *****
04197 *****
04198 *****
04199 *****
04200 *****
04201 *****
04202 *****
04203 *****
04204 *****
04205 *****
04206 *****
04207 *****
04208 *****
04209 *****
04210 *****
04211 *****
04212 *****
04213 *****
04214 *****
04215 *****
04216 *****
04217 *****
04218 *****
04219 *****
04220 *****
04221 *****
04222 *****
04223 *****
04224 *****
04225 *****
04226 *****
04227 *****
04228 *****
04229 *****
04230 *****
04231 *****
04232 *****
04233 *****
04234 *****
04235 *****
04236 *****
04237 *****
04238 *****
04239 *****
04240 *****
04241 *****
04242 *****
04243 *****
04244 *****
04245 *****
04246 *****
04247 *****
04248 *****
04249 *****
04250 *****
04251 *****
04252 *****
04253 *****
04254 *****
04255 *****
04256 *****
04257 *****
04258 *****
04259 *****
04260 *****
04261 *****
04262 *****
04263 *****
04264 *****
04265 *****
04266 *****
04267 *****
04268 *****
04269 *****
04270 *****
04271 *****
04272 *****
04273 *****
04274 *****
04275 *****
04276 *****
04277 *****
04278 *****
04279 *****
04280 *****
04281 *****
04282 *****
04283 *****
04284 *****
04285 *****
04286 *****
04287 *****
04288 *****
04289 *****
04290 *****
04291 *****
04292 *****
04293 *****
04294 *****
04295 *****
04296 *****
04297 *****
04298 *****
04299 *****
04300 *****
04301 *****
04302 *****
04303 *****
04304 *****
04305 *****
04306 *****
04307 *****
04308 *****
04309 *****
04310 *****
04311 *****
04312 *****
04313 *****
04314 *****
04315 *****
04316 *****
04317 *****
04318 *****
04319 *****
04320 *****
```

JFSAinc.



Page 13

Page 14

# Attachment C

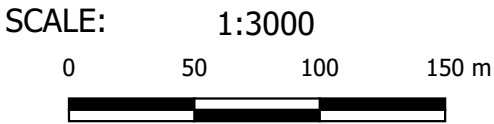
## Hydraulic Analysis





**Legend**

-  Site Boundary
-  Jock River Tributary
-  Centerline
-  HEC-RAS XS



5923 Ottawa St – Richmond

Figure C1: HEC-RAS Cross Sections

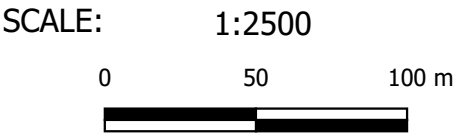
|         |              |
|---------|--------------|
| PROJECT | P2710(e01)   |
| DRAWN   | MM           |
| DATE    | 10 Sept 2025 |





**Legend**

- Site Boundary
- Pre-Development Flood Extents
  - 2YrSCS24Hr
  - 5YrSCS24Hr
  - 10YrSCS24Hr
  - 25YrSCS24Hr
  - 50YrSCS24Hr
  - 100YrSCS24Hr
- Spill Line

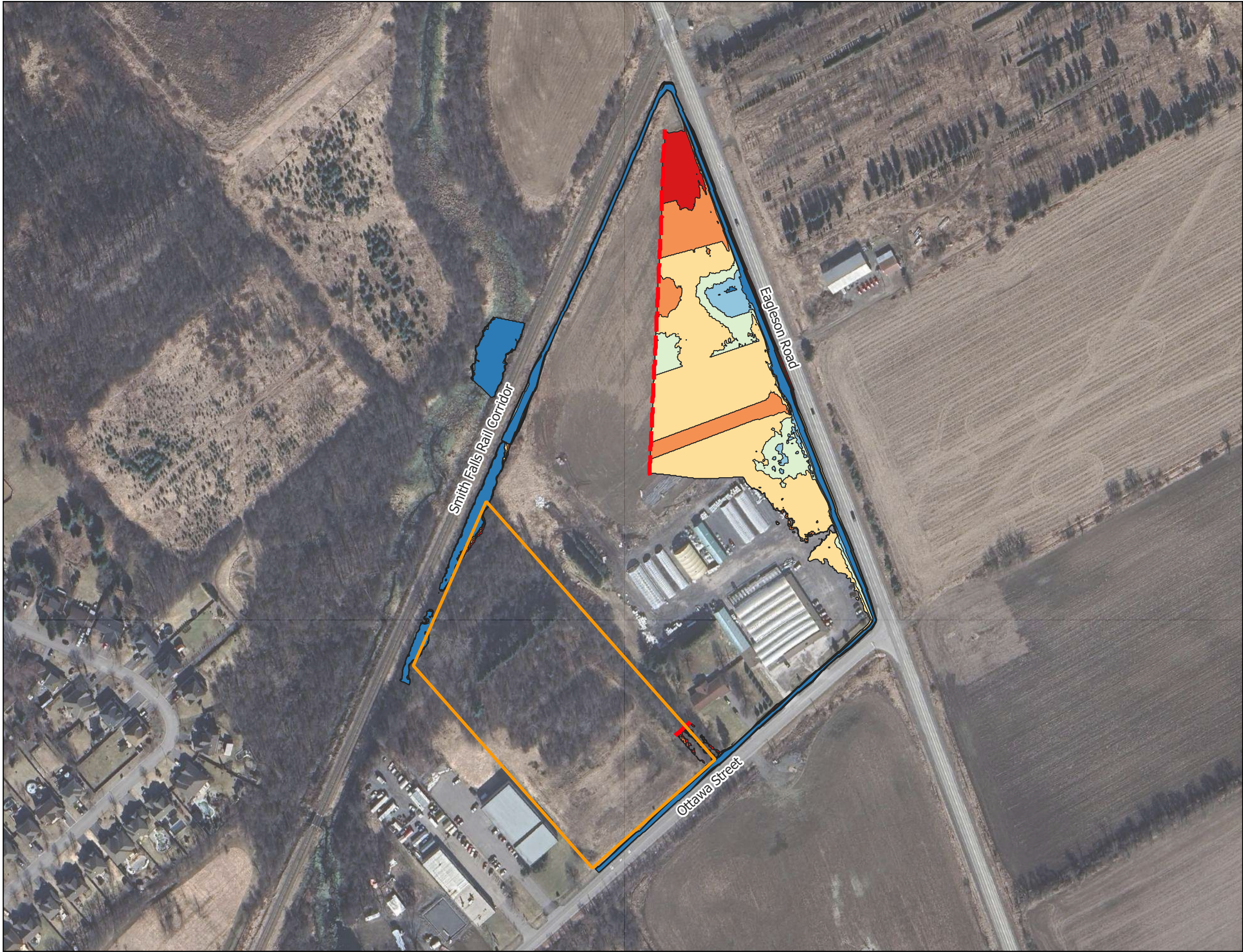


5923 Ottawa St - Richmond

Figure C2: Pre-Development Flood Extents

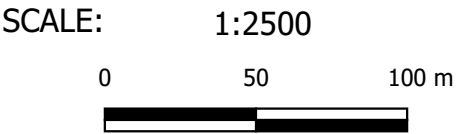
|         |             |
|---------|-------------|
| PROJECT | P2719(e01)  |
| DRAWN   | BT          |
| DATE    | 5 June 2025 |





**Legend**

- Site Boundary
- Post-Development Flood Extents
  - 2YrSCS24Hr
  - 5YrSCS24Hr
  - 10YrSCS24Hr
  - 25YrSCS24Hr
  - 50YrSCS24Hr
  - 100YrSCS24Hr
- Spill Line

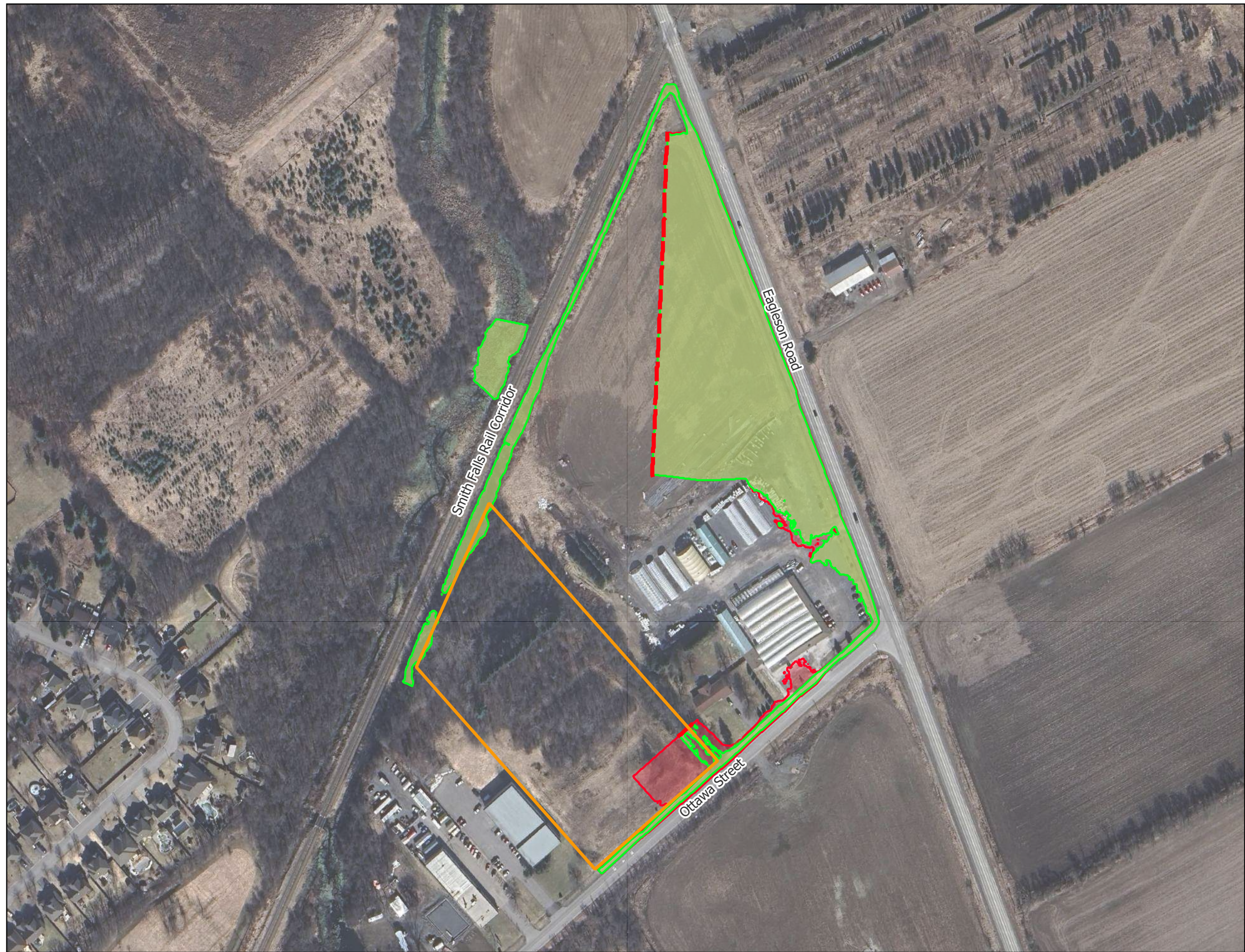


5923 Ottawa St - Richmond

Figure C3: Post-Development Flood Extents

|         |              |
|---------|--------------|
| PROJECT | P2719(e01)   |
| DRAWN   | BT           |
| DATE    | 10 Sept 2025 |





### Legend

- Site Boundary
- Spill Line
- Pre-Development 100yr
- Post-Dev 100yr

SCALE: 1:2500

0 50 100 m

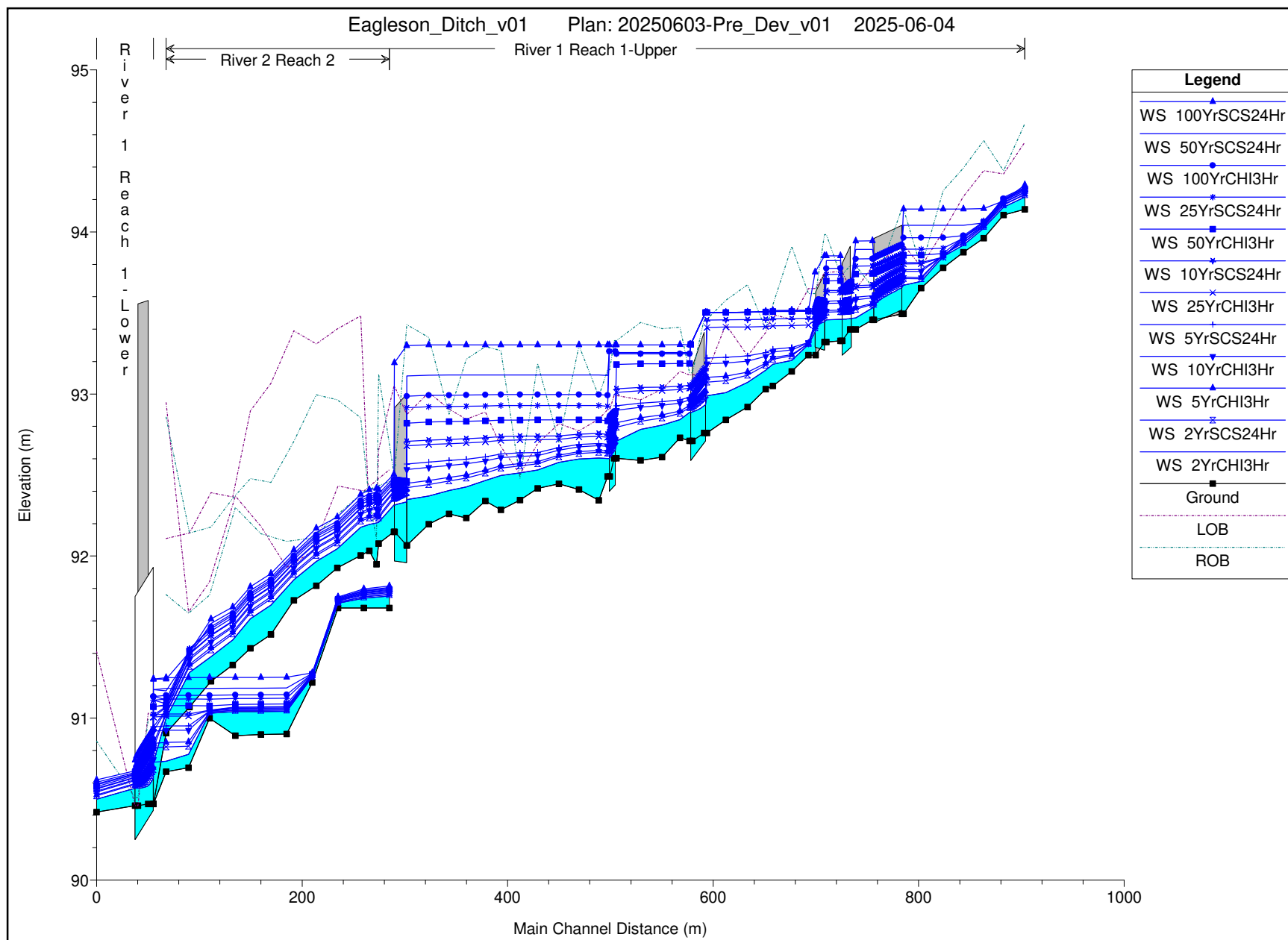


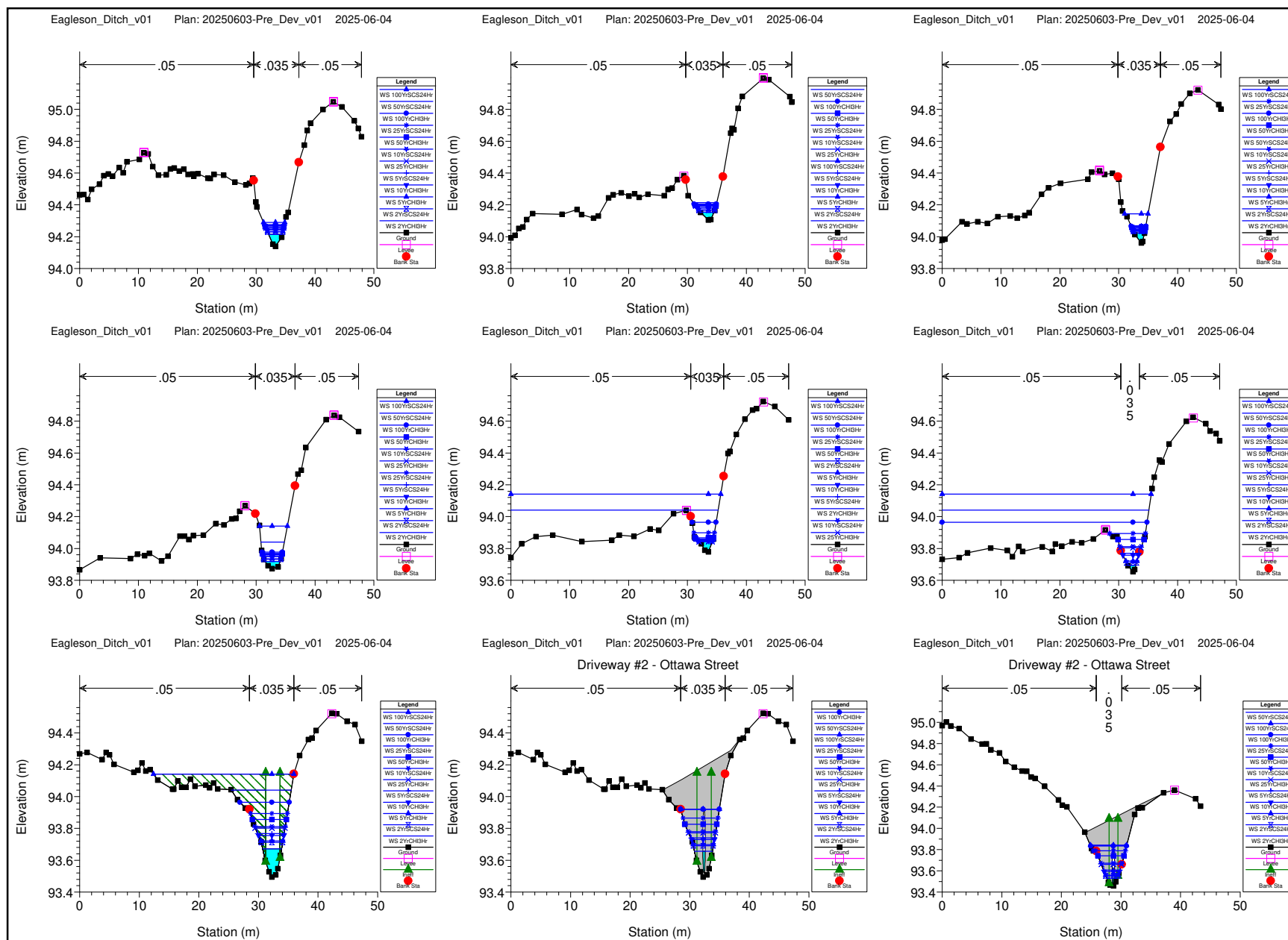
5923 Ottawa St - Richmond

Figure C4: 100-yr Floodplain Extents Comparison

|         |              |
|---------|--------------|
| PROJECT | P2719(e01)   |
| DRAWN   | BT           |
| DATE    | 10 Sept 2025 |



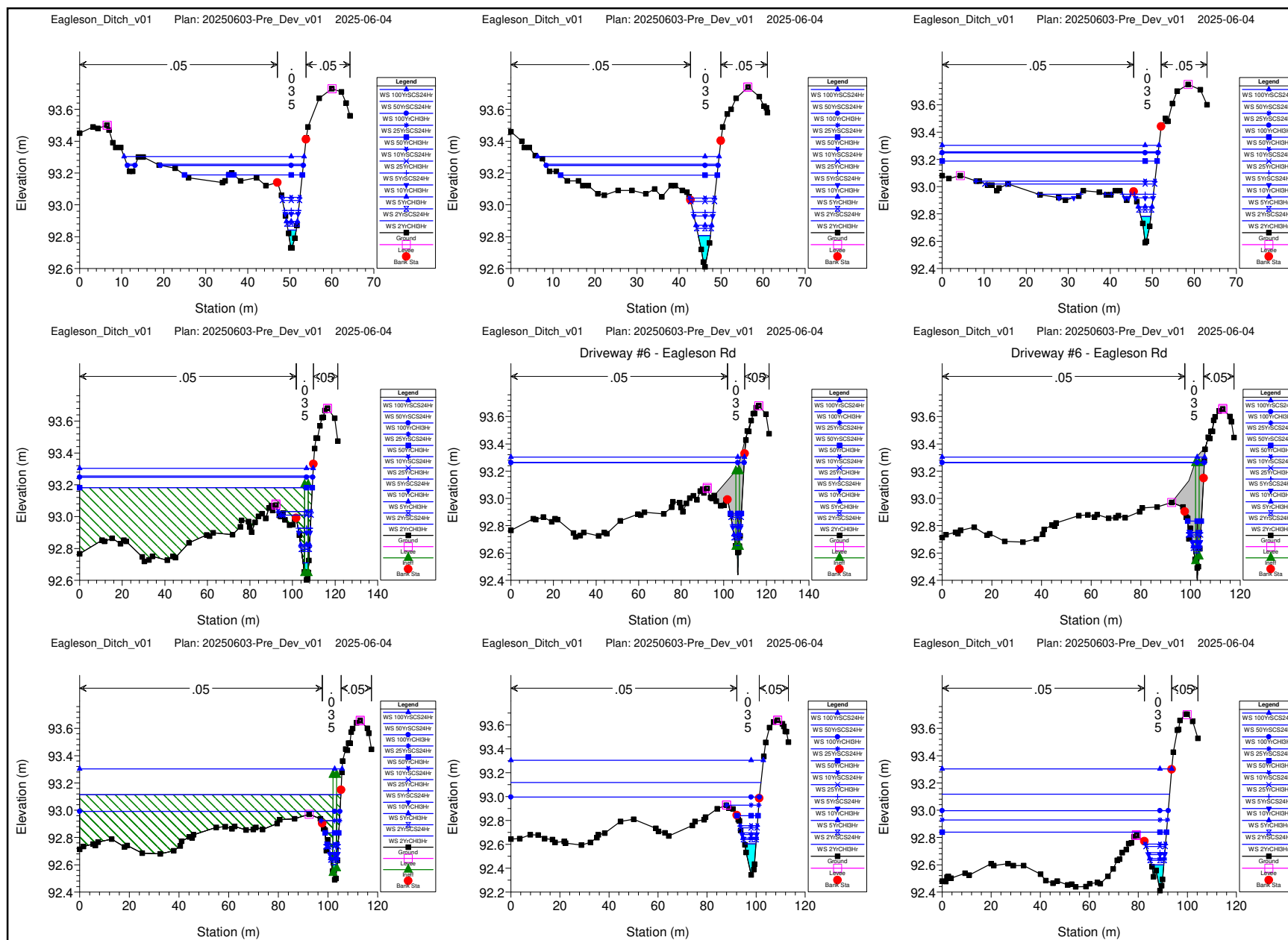














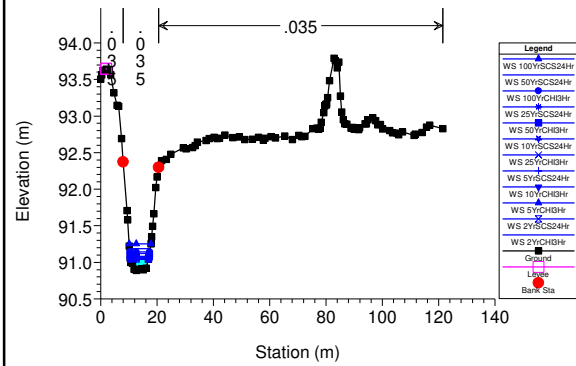




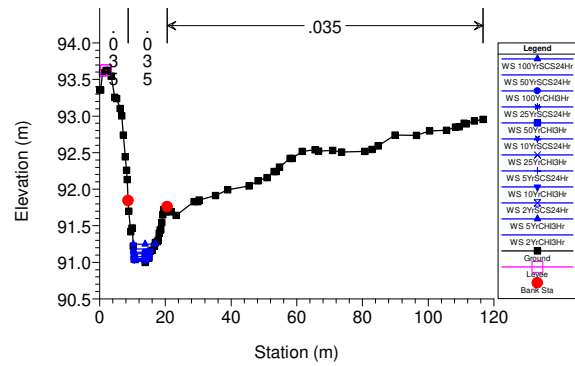




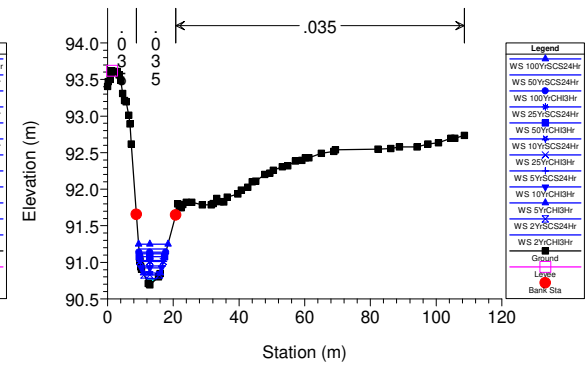
Eagleson\_Ditch\_v01 Plan: 20250603-Pre\_Dev\_v01 2025-06-04



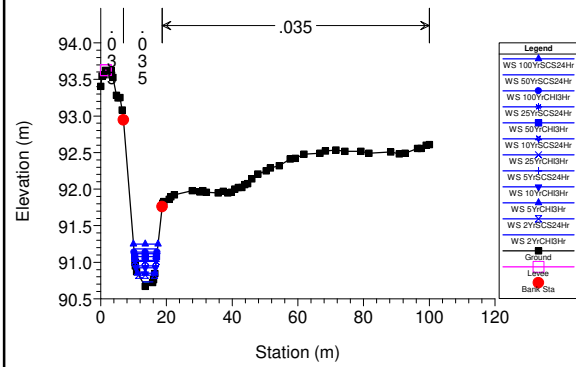
Eagleson\_Ditch\_v01 Plan: 20250603-Pre\_Dev\_v01 2025-06-04



Eagleson\_Ditch\_v01 Plan: 20250603-Pre\_Dev\_v01 2025-06-04



Eagleson\_Ditch\_v01 Plan: 20250603-Pre\_Dev\_v01 2025-06-04





| River   | Reach   | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 2 | Reach 2 | 224       | 2YrCHI3Hr    | 0.02              | 91.68            | 91.75            | 91.71            | 91.75            | 0.000626            | 0.08              | 0.20              | 5.09             | 0.13         |
| River 2 | Reach 2 | 224       | 5YrCHI3Hr    | 0.03              | 91.68            | 91.76            | 91.72            | 91.76            | 0.000730            | 0.10              | 0.26              | 5.99             | 0.15         |
| River 2 | Reach 2 | 224       | 10YrCHI3Hr   | 0.03              | 91.68            | 91.77            | 91.72            | 91.77            | 0.000742            | 0.11              | 0.32              | 6.48             | 0.15         |
| River 2 | Reach 2 | 224       | 25YrCHI3Hr   | 0.05              | 91.68            | 91.78            | 91.73            | 91.79            | 0.000756            | 0.12              | 0.39              | 6.61             | 0.16         |
| River 2 | Reach 2 | 224       | 50YrCHI3Hr   | 0.06              | 91.68            | 91.79            | 91.73            | 91.79            | 0.000763            | 0.13              | 0.44              | 6.71             | 0.16         |
| River 2 | Reach 2 | 224       | 100YrCHI3Hr  | 0.07              | 91.68            | 91.80            | 91.74            | 91.80            | 0.000773            | 0.14              | 0.50              | 6.81             | 0.16         |
| River 2 | Reach 2 | 224       | 2YrSCS24Hr   | 0.02              | 91.68            | 91.76            | 91.72            | 91.76            | 0.000717            | 0.09              | 0.25              | 5.79             | 0.14         |
| River 2 | Reach 2 | 224       | 5YrSCS24Hr   | 0.04              | 91.68            | 91.78            | 91.73            | 91.78            | 0.000753            | 0.11              | 0.35              | 6.53             | 0.15         |
| River 2 | Reach 2 | 224       | 10YrSCS24Hr  | 0.05              | 91.68            | 91.79            | 91.73            | 91.79            | 0.000757            | 0.12              | 0.41              | 6.65             | 0.16         |
| River 2 | Reach 2 | 224       | 25YrSCS24Hr  | 0.07              | 91.68            | 91.80            | 91.74            | 91.80            | 0.000769            | 0.14              | 0.48              | 6.78             | 0.16         |
| River 2 | Reach 2 | 224       | 50YrSCS24Hr  | 0.08              | 91.68            | 91.81            | 91.74            | 91.81            | 0.000794            | 0.15              | 0.54              | 6.88             | 0.17         |
| River 2 | Reach 2 | 224       | 100YrSCS24Hr | 0.09              | 91.68            | 91.81            | 91.75            | 91.82            | 0.000800            | 0.16              | 0.60              | 6.99             | 0.17         |
| River 2 | Reach 2 | 199       | 2YrCHI3Hr    | 0.02              | 91.68            | 91.74            | 91.71            | 91.74            | 0.000450            | 0.07              | 0.24              | 6.76             | 0.11         |
| River 2 | Reach 2 | 199       | 5YrCHI3Hr    | 0.03              | 91.68            | 91.75            | 91.71            | 91.75            | 0.000479            | 0.08              | 0.31              | 6.96             | 0.12         |
| River 2 | Reach 2 | 199       | 10YrCHI3Hr   | 0.03              | 91.68            | 91.76            | 91.71            | 91.76            | 0.000481            | 0.09              | 0.38              | 7.14             | 0.12         |
| River 2 | Reach 2 | 199       | 25YrCHI3Hr   | 0.05              | 91.68            | 91.77            | 91.72            | 91.77            | 0.000549            | 0.10              | 0.45              | 7.32             | 0.13         |
| River 2 | Reach 2 | 199       | 50YrCHI3Hr   | 0.06              | 91.68            | 91.78            | 91.72            | 91.78            | 0.000569            | 0.11              | 0.50              | 7.42             | 0.14         |
| River 2 | Reach 2 | 199       | 100YrCHI3Hr  | 0.07              | 91.68            | 91.78            | 91.73            | 91.78            | 0.000591            | 0.12              | 0.56              | 7.51             | 0.14         |
| River 2 | Reach 2 | 199       | 2YrSCS24Hr   | 0.02              | 91.68            | 91.75            | 91.71            | 91.75            | 0.000474            | 0.08              | 0.30              | 6.91             | 0.12         |
| River 2 | Reach 2 | 199       | 5YrSCS24Hr   | 0.04              | 91.68            | 91.76            | 91.72            | 91.76            | 0.000522            | 0.10              | 0.41              | 7.20             | 0.13         |
| River 2 | Reach 2 | 199       | 10YrSCS24Hr  | 0.05              | 91.68            | 91.77            | 91.72            | 91.77            | 0.000558            | 0.11              | 0.47              | 7.37             | 0.14         |
| River 2 | Reach 2 | 199       | 25YrSCS24Hr  | 0.07              | 91.68            | 91.78            | 91.72            | 91.78            | 0.000582            | 0.12              | 0.55              | 7.49             | 0.14         |
| River 2 | Reach 2 | 199       | 50YrSCS24Hr  | 0.08              | 91.68            | 91.79            | 91.73            | 91.79            | 0.000628            | 0.13              | 0.60              | 7.57             | 0.15         |
| River 2 | Reach 2 | 199       | 100YrSCS24Hr | 0.09              | 91.68            | 91.80            | 91.73            | 91.80            | 0.000634            | 0.14              | 0.66              | 7.67             | 0.15         |
| River 2 | Reach 2 | 174       | 2YrCHI3Hr    | 0.02              | 91.68            | 91.71            | 91.70            | 91.71            | 0.009341            | 0.22              | 0.07              | 3.33             | 0.47         |
| River 2 | Reach 2 | 174       | 5YrCHI3Hr    | 0.03              | 91.68            | 91.71            | 91.70            | 91.72            | 0.010728            | 0.27              | 0.09              | 3.51             | 0.52         |
| River 2 | Reach 2 | 174       | 10YrCHI3Hr   | 0.03              | 91.68            | 91.72            | 91.71            | 91.73            | 0.009147            | 0.28              | 0.12              | 3.68             | 0.49         |
| River 2 | Reach 2 | 174       | 25YrCHI3Hr   | 0.05              | 91.68            | 91.73            | 91.72            | 91.73            | 0.010482            | 0.33              | 0.14              | 3.80             | 0.54         |
| River 2 | Reach 2 | 174       | 50YrCHI3Hr   | 0.06              | 91.68            | 91.73            | 91.72            | 91.74            | 0.010789            | 0.35              | 0.16              | 3.90             | 0.56         |
| River 2 | Reach 2 | 174       | 100YrCHI3Hr  | 0.07              | 91.68            | 91.74            | 91.72            | 91.75            | 0.011338            | 0.38              | 0.18              | 3.99             | 0.58         |
| River 2 | Reach 2 | 174       | 2YrSCS24Hr   | 0.02              | 91.68            | 91.71            | 91.70            | 91.72            | 0.009099            | 0.24              | 0.09              | 3.51             | 0.48         |
| River 2 | Reach 2 | 174       | 5YrSCS24Hr   | 0.04              | 91.68            | 91.73            | 91.71            | 91.73            | 0.009102            | 0.29              | 0.13              | 3.75             | 0.50         |
| River 2 | Reach 2 | 174       | 10YrSCS24Hr  | 0.05              | 91.68            | 91.73            | 91.72            | 91.74            | 0.010830            | 0.34              | 0.15              | 3.84             | 0.55         |
| River 2 | Reach 2 | 174       | 25YrSCS24Hr  | 0.07              | 91.68            | 91.74            | 91.72            | 91.74            | 0.010024            | 0.36              | 0.18              | 4.01             | 0.55         |
| River 2 | Reach 2 | 174       | 50YrSCS24Hr  | 0.08              | 91.68            | 91.74            | 91.73            | 91.75            | 0.010794            | 0.40              | 0.20              | 4.08             | 0.57         |
| River 2 | Reach 2 | 174       | 100YrSCS24Hr | 0.09              | 91.68            | 91.75            | 91.73            | 91.76            | 0.010716            | 0.42              | 0.22              | 4.15             | 0.58         |
| River 2 | Reach 2 | 149       | 2YrCHI3Hr    | 0.02              | 91.22            | 91.25            | 91.25            | 91.26            | 0.049600            | 0.35              | 0.05              | 3.45             | 0.99         |
| River 2 | Reach 2 | 149       | 5YrCHI3Hr    | 0.03              | 91.22            | 91.26            | 91.26            | 91.27            | 0.037267            | 0.35              | 0.07              | 4.39             | 0.89         |
| River 2 | Reach 2 | 149       | 10YrCHI3Hr   | 0.03              | 91.22            | 91.26            | 91.26            | 91.27            | 0.052915            | 0.44              | 0.08              | 4.47             | 1.07         |
| River 2 | Reach 2 | 149       | 25YrCHI3Hr   | 0.05              | 91.22            | 91.27            | 91.27            | 91.28            | 0.039832            | 0.45              | 0.10              | 4.68             | 0.97         |
| River 2 | Reach 2 | 149       | 50YrCHI3Hr   | 0.06              | 91.22            | 91.27            | 91.27            | 91.28            | 0.037244            | 0.47              | 0.12              | 4.80             | 0.95         |
| River 2 | Reach 2 | 149       | 100YrCHI3Hr  | 0.07              | 91.22            | 91.27            | 91.27            | 91.29            | 0.034157            | 0.49              | 0.14              | 4.94             | 0.93         |
| River 2 | Reach 2 | 149       | 2YrSCS24Hr   | 0.02              | 91.22            | 91.26            | 91.26            | 91.26            | 0.052399            | 0.39              | 0.06              | 3.96             | 1.03         |
| River 2 | Reach 2 | 149       | 5YrSCS24Hr   | 0.04              | 91.22            | 91.26            | 91.26            | 91.27            | 0.052134            | 0.46              | 0.08              | 4.53             | 1.07         |
| River 2 | Reach 2 | 149       | 10YrSCS24Hr  | 0.05              | 91.22            | 91.27            | 91.27            | 91.28            | 0.037535            | 0.46              | 0.11              | 4.74             | 0.95         |
| River 2 | Reach 2 | 149       | 25YrSCS24Hr  | 0.07              | 91.22            | 91.27            | 91.27            | 91.29            | 0.044620            | 0.53              | 0.13              | 4.83             | 1.05         |
| River 2 | Reach 2 | 149       | 50YrSCS24Hr  | 0.08              | 91.22            | 91.28            | 91.28            | 91.29            | 0.037650            | 0.53              | 0.15              | 5.00             | 0.98         |
| River 2 | Reach 2 | 149       | 100YrSCS24Hr | 0.09              | 91.22            | 91.28            | 91.28            | 91.30            | 0.038788            | 0.57              | 0.16              | 5.05             | 1.01         |
| River 2 | Reach 2 | 124       | 2YrCHI3Hr    | 0.02              | 90.90            | 91.04            | 90.93            | 91.04            | 0.000032            | 0.03              | 0.48              | 5.07             | 0.03         |
| River 2 | Reach 2 | 124       | 5YrCHI3Hr    | 0.03              | 90.90            | 91.05            | 90.93            | 91.05            | 0.000060            | 0.05              | 0.53              | 5.26             | 0.05         |
| River 2 | Reach 2 | 124       | 10YrCHI3Hr   | 0.03              | 90.90            | 91.06            | 90.94            | 91.06            | 0.000112            | 0.06              | 0.57              | 6.50             | 0.06         |
| River 2 | Reach 2 | 124       | 25YrCHI3Hr   | 0.05              | 90.90            | 91.07            | 90.95            | 91.07            | 0.000154            | 0.07              | 0.64              | 6.76             | 0.08         |
| River 2 | Reach 2 | 124       | 50YrCHI3Hr   | 0.06              | 90.90            | 91.09            | 90.95            | 91.09            | 0.000135            | 0.07              | 0.76              | 7.17             | 0.07         |
| River 2 | Reach 2 | 124       | 100YrCHI3Hr  | 0.07              | 90.90            | 91.14            | 90.95            | 91.14            | 0.000050            | 0.06              | 1.21              | 8.10             | 0.05         |
| River 2 | Reach 2 | 124       | 2YrSCS24Hr   | 0.02              | 90.90            | 91.05            | 90.93            | 91.05            | 0.000054            | 0.04              | 0.51              | 5.22             | 0.05         |
| River 2 | Reach 2 | 124       | 5YrSCS24Hr   | 0.04              | 90.90            | 91.06            | 90.94            | 91.06            | 0.000129            | 0.07              | 0.60              | 6.60             | 0.07         |
| River 2 | Reach 2 | 124       | 10YrSCS24Hr  | 0.05              | 90.90            | 91.07            | 90.95            | 91.07            | 0.000166            | 0.08              | 0.66              | 6.83             | 0.08         |
| River 2 | Reach 2 | 124       | 25YrSCS24Hr  | 0.07              | 90.90            | 91.12            | 90.95            | 91.12            | 0.000074            | 0.06              | 1.04              | 7.89             | 0.06         |
| River 2 | Reach 2 | 124       | 50YrSCS24Hr  | 0.08              | 90.90            | 91.19            | 90.96            | 91.19            | 0.000031            | 0.05              | 1.55              | 8.50             | 0.04         |
| River 2 | Reach 2 | 124       | 100YrSCS24Hr | 0.09              | 90.90            | 91.25            | 90.96            | 91.25            | 0.000017            | 0.04              | 2.15              | 9.67             | 0.03         |
| River 2 | Reach 2 | 99        | 2YrCHI3Hr    | 0.02              | 90.90            | 91.04            | 90.92            | 91.04            | 0.000010            | 0.02              | 0.80              | 7.44             | 0.02         |
| River 2 | Reach 2 | 99        | 5YrCHI3Hr    | 0.03              | 90.90            | 91.05            | 90.92            | 91.05            | 0.000018            | 0.03              | 0.87              | 7.51             | 0.03         |
| River 2 | Reach 2 | 99        | 10YrCHI3Hr   | 0.03              | 90.90            | 91.06            | 90.93            | 91.06            | 0.000027            | 0.04              | 0.93              | 7.57             | 0.03         |
| River 2 | Reach 2 | 99        | 25YrCHI3Hr   | 0.05              | 90.90            | 91.07            | 90.93            | 91.07            | 0.000041            | 0.05              | 1.00              | 7.64             | 0.04         |
| River 2 | Reach 2 | 99        | 50YrCHI3Hr   | 0.06              | 90.90            | 91.09            | 90.94            | 91.09            | 0.000040            | 0.05              | 1.14              | 7.79             | 0.04         |
| River 2 | Reach 2 | 99        | 100YrCHI3Hr  | 0.07              | 90.90            | 91.14            | 90.94            | 91.14            | 0.000020            | 0.04              | 1.61              | 8.25             | 0.03         |
| River 2 | Reach 2 | 99        | 2YrSCS24Hr   | 0.02              | 90.90            | 91.05            | 90.92            | 91.05            | 0.000016            | 0.03              | 0.86              | 7.49             | 0.03         |
| River 2 | Reach 2 | 99        | 5YrSCS24Hr   | 0.04              | 90.90            | 91.06            | 90.93            | 91.06            | 0.000032            | 0.04              | 0.96              | 7.60             | 0.04         |
| River 2 | Reach 2 | 99        | 10YrSCS24Hr  | 0.05              | 90.90            | 91.07            | 90.94            | 91.07            | 0.000045            | 0.05              | 1.02              | 7.67             | 0.04         |
| River 2 | Reach 2 | 99        | 25YrSCS24Hr  | 0.07              | 90.90            | 91.12            | 90.94            | 91.12            | 0.000026            | 0.05              | 1.43              | 8.07             | 0.03         |
| River 2 | Reach 2 | 99        | 50YrSCS24Hr  | 0.08              | 90.90            | 91.19            | 90.94            | 91.19            | 0.000014            | 0.04              | 1.96              | 8.55             | 0.03         |
| River 2 | Reach 2 | 99        | 100YrSCS24Hr | 0.09              | 90.90            | 91.25            | 90.95            | 91.25            | 0.000009            | 0.04              | 2.54              | 9.03             | 0.02         |
| River 2 | Reach 2 | 74        | 2YrCHI3Hr    | 0.02              | 90.89            | 91.04            | 90.91            | 91.04            | 0.000011            | 0.02              | 0.72              | 6.36             | 0.02         |
| River 2 | Reach 2 | 74        | 5YrCHI3Hr    | 0.03              | 90.89            | 91.05            | 90.92            | 91.05            | 0.000021            | 0.03              | 0.78              | 6.44             | 0.03         |
| River 2 | Reach 2 | 74        | 10YrCHI3Hr   | 0.03              | 90.89            | 91.06            | 90.92            | 91.06            | 0.000033            | 0.04              | 0.83              | 6.50             | 0.04         |
| River 2 | Reach 2 | 74        | 25YrCHI3Hr   | 0.05              | 90.89            | 91.07            | 90.93            | 91.07            | 0.000050            | 0.05              | 0.89              | 6.57             | 0.05         |
| River 2 | Reach 2 | 74        | 50YrCHI3Hr   | 0.06              | 90.89            | 91.08            | 90.93            | 91.08            | 0.000049            | 0.06              | 1.01              | 6.70             | 0.05         |
| River 2 | Reach 2 | 74        | 100YrCHI3Hr  | 0.07              | 90.89            | 91.14            | 90.93            | 91.14            | 0.000025            | 0.05              | 1.42              | 7.09             | 0.03         |
| River 2 | Reach 2 | 74        | 2YrSCS24Hr   | 0.02              | 90.89            | 91.05            | 90.92            | 91.05            | 0.000019            | 0.03              | 0.77              | 6.42             | 0.03         |
| River 2 | Reach 2 | 74        | 5YrSCS24Hr   | 0.04              | 90.89            | 91.06            | 90.92            | 91.06            | 0.000039            | 0.05              | 0.85              | 6.53             | 0.04         |
| River 2 | Reach 2 | 74        | 10YrSCS24Hr  | 0.05              | 90.89            | 91.07            | 90.93            | 91.07            | 0.000055            | 0.06              | 0.91              | 6.59             | 0.05         |
| River 2 | Reach 2 | 74        | 25YrSCS24Hr  | 0.07              | 90.89            | 91.12            | 90.93            | 91.12            | 0.000033            | 0.05              | 1.26              | 6.96             | 0.04         |
| River 2 | Reach 2 | 74        | 50YrSCS24Hr  | 0.08              | 90.89            | 91.18            | 90.93            | 91.18            | 0.000018            | 0.05              | 1.72              | 7.34             | 0.03         |
| River 2 | Reach 2 | 74        | 100YrSCS24Hr | 0.09              | 90.89            | 91.25            | 90.94            | 91.25            | 0.000012            | 0.04              | 2.22              | 7.71             | 0.03         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 2 | Reach 2       | 49        | 2YrCHI3Hr    | 0.02              | 91.00            | 91.03            | 91.03            | 91.04            | 0.048683            | 0.40              | 0.04              | 2.56             | 1.01         |
| River 2 | Reach 2       | 49        | 5YrCHI3Hr    | 0.03              | 91.00            | 91.04            | 91.04            | 91.05            | 0.045843            | 0.43              | 0.06              | 3.06             | 1.01         |
| River 2 | Reach 2       | 49        | 10YrCHI3Hr   | 0.03              | 91.00            | 91.04            | 91.04            | 91.05            | 0.036151            | 0.43              | 0.08              | 3.50             | 0.92         |
| River 2 | Reach 2       | 49        | 25YrCHI3Hr   | 0.05              | 91.00            | 91.05            | 91.05            | 91.06            | 0.042954            | 0.52              | 0.09              | 3.52             | 1.03         |
| River 2 | Reach 2       | 49        | 50YrCHI3Hr   | 0.06              | 91.00            | 91.08            | 91.05            | 91.08            | 0.005537            | 0.28              | 0.20              | 4.07             | 0.41         |
| River 2 | Reach 2       | 49        | 100YrCHI3Hr  | 0.07              | 91.00            | 91.14            | 91.05            | 91.14            | 0.000508            | 0.14              | 0.50              | 4.96             | 0.14         |
| River 2 | Reach 2       | 49        | 2YrSCS24Hr   | 0.02              | 91.00            | 91.04            | 91.04            | 91.04            | 0.038802            | 0.40              | 0.06              | 3.06             | 0.93         |
| River 2 | Reach 2       | 49        | 5YrSCS24Hr   | 0.04              | 91.00            | 91.04            | 91.04            | 91.06            | 0.043713            | 0.48              | 0.08              | 3.50             | 1.02         |
| River 2 | Reach 2       | 49        | 10YrSCS24Hr  | 0.05              | 91.00            | 91.05            | 91.05            | 91.06            | 0.037160            | 0.51              | 0.10              | 3.53             | 0.97         |
| River 2 | Reach 2       | 49        | 25YrSCS24Hr  | 0.07              | 91.00            | 91.12            | 91.05            | 91.12            | 0.001066            | 0.17              | 0.38              | 4.82             | 0.19         |
| River 2 | Reach 2       | 49        | 50YrSCS24Hr  | 0.08              | 91.00            | 91.18            | 91.06            | 91.18            | 0.000237            | 0.11              | 0.73              | 5.93             | 0.10         |
| River 2 | Reach 2       | 49        | 100YrSCS24Hr | 0.09              | 91.00            | 91.25            | 91.06            | 91.25            | 0.000083            | 0.08              | 1.15              | 6.63             | 0.06         |
| River 2 | Reach 2       | 28        | 2YrCHI3Hr    | 0.02              | 90.69            | 90.78            | 90.74            | 90.78            | 0.001301            | 0.13              | 0.15              | 3.26             | 0.20         |
| River 2 | Reach 2       | 28        | 5YrCHI3Hr    | 0.03              | 90.69            | 90.85            | 90.75            | 90.85            | 0.000163            | 0.07              | 0.47              | 5.17             | 0.08         |
| River 2 | Reach 2       | 28        | 10YrCHI3Hr   | 0.05              | 90.69            | 90.93            | 90.75            | 90.93            | 0.000046            | 0.05              | 0.89              | 6.29             | 0.04         |
| River 2 | Reach 2       | 28        | 25YrCHI3Hr   | 0.06              | 90.69            | 91.01            | 90.76            | 91.01            | 0.000019            | 0.04              | 1.48              | 7.14             | 0.03         |
| River 2 | Reach 2       | 28        | 50YrCHI3Hr   | 0.08              | 90.69            | 91.08            | 90.77            | 91.08            | 0.000012            | 0.04              | 1.96              | 7.68             | 0.03         |
| River 2 | Reach 2       | 28        | 100YrCHI3Hr  | 0.09              | 90.69            | 91.14            | 90.78            | 91.14            | 0.000009            | 0.04              | 2.47              | 8.16             | 0.02         |
| River 2 | Reach 2       | 28        | 2YrSCS24Hr   | 0.03              | 90.69            | 90.83            | 90.74            | 90.83            | 0.000330            | 0.09              | 0.35              | 4.66             | 0.11         |
| River 2 | Reach 2       | 28        | 5YrSCS24Hr   | 0.05              | 90.69            | 90.95            | 90.76            | 90.95            | 0.000036            | 0.05              | 1.07              | 6.57             | 0.04         |
| River 2 | Reach 2       | 28        | 10YrSCS24Hr  | 0.07              | 90.69            | 91.03            | 90.76            | 91.03            | 0.000019            | 0.04              | 1.58              | 7.26             | 0.03         |
| River 2 | Reach 2       | 28        | 25YrSCS24Hr  | 0.09              | 90.69            | 91.12            | 90.78            | 91.12            | 0.000011            | 0.04              | 2.28              | 7.99             | 0.02         |
| River 2 | Reach 2       | 28        | 50YrSCS24Hr  | 0.11              | 90.69            | 91.18            | 90.78            | 91.18            | 0.000008            | 0.04              | 2.82              | 8.48             | 0.02         |
| River 2 | Reach 2       | 28        | 100YrSCS24Hr | 0.13              | 90.69            | 91.25            | 90.79            | 91.25            | 0.000007            | 0.04              | 3.40              | 8.98             | 0.02         |
| River 2 | Reach 2       | 7         | 2YrCHI3Hr    | 0.02              | 90.67            | 90.73            | 90.71            | 90.74            | 0.003117            | 0.17              | 0.11              | 3.14             | 0.29         |
| River 2 | Reach 2       | 7         | 5YrCHI3Hr    | 0.03              | 90.67            | 90.85            | 90.72            | 90.85            | 0.000075            | 0.06              | 0.60              | 5.18             | 0.05         |
| River 2 | Reach 2       | 7         | 10YrCHI3Hr   | 0.05              | 90.67            | 90.92            | 90.73            | 90.92            | 0.000028            | 0.05              | 1.02              | 5.92             | 0.04         |
| River 2 | Reach 2       | 7         | 25YrCHI3Hr   | 0.06              | 90.67            | 91.01            | 90.73            | 91.01            | 0.000014            | 0.04              | 1.56              | 6.43             | 0.03         |
| River 2 | Reach 2       | 7         | 50YrCHI3Hr   | 0.08              | 90.67            | 91.08            | 90.74            | 91.08            | 0.000010            | 0.04              | 1.99              | 6.71             | 0.02         |
| River 2 | Reach 2       | 7         | 100YrCHI3Hr  | 0.09              | 90.67            | 91.14            | 90.74            | 91.14            | 0.000008            | 0.04              | 2.42              | 6.98             | 0.02         |
| River 2 | Reach 2       | 7         | 2YrSCS24Hr   | 0.03              | 90.67            | 90.82            | 90.72            | 90.82            | 0.000130            | 0.07              | 0.46              | 4.72             | 0.07         |
| River 2 | Reach 2       | 7         | 5YrSCS24Hr   | 0.05              | 90.67            | 90.95            | 90.73            | 90.95            | 0.000023            | 0.05              | 1.18              | 6.12             | 0.03         |
| River 2 | Reach 2       | 7         | 10YrSCS24Hr  | 0.07              | 90.67            | 91.03            | 90.73            | 91.03            | 0.000014            | 0.04              | 1.65              | 6.49             | 0.03         |
| River 2 | Reach 2       | 7         | 25YrSCS24Hr  | 0.09              | 90.67            | 91.12            | 90.74            | 91.12            | 0.000009            | 0.04              | 2.26              | 6.88             | 0.02         |
| River 2 | Reach 2       | 7         | 50YrSCS24Hr  | 0.11              | 90.67            | 91.18            | 90.75            | 91.18            | 0.000007            | 0.04              | 2.72              | 7.15             | 0.02         |
| River 2 | Reach 2       | 7         | 100YrSCS24Hr | 0.13              | 90.67            | 91.25            | 90.75            | 91.25            | 0.000006            | 0.04              | 3.21              | 7.44             | 0.02         |
| River 1 | Reach 1-Upper | 908       | 2YrCHI3Hr    | 0.02              | 94.14            | 94.22            | 94.18            | 94.22            | 0.001587            | 0.14              | 0.10              | 2.34             | 0.22         |
| River 1 | Reach 1-Upper | 908       | 5YrCHI3Hr    | 0.03              | 94.14            | 94.23            | 94.19            | 94.23            | 0.001806            | 0.18              | 0.15              | 2.64             | 0.24         |
| River 1 | Reach 1-Upper | 908       | 10YrCHI3Hr   | 0.03              | 94.14            | 94.24            | 94.20            | 94.24            | 0.002004            | 0.20              | 0.17              | 2.81             | 0.26         |
| River 1 | Reach 1-Upper | 908       | 25YrCHI3Hr   | 0.05              | 94.14            | 94.25            | 94.20            | 94.26            | 0.002189            | 0.22              | 0.21              | 3.02             | 0.27         |
| River 1 | Reach 1-Upper | 908       | 50YrCHI3Hr   | 0.06              | 94.14            | 94.26            | 94.21            | 94.27            | 0.002278            | 0.24              | 0.24              | 3.18             | 0.28         |
| River 1 | Reach 1-Upper | 908       | 100YrCHI3Hr  | 0.07              | 94.14            | 94.27            | 94.21            | 94.27            | 0.002320            | 0.25              | 0.26              | 3.32             | 0.29         |
| River 1 | Reach 1-Upper | 908       | 2YrSCS24Hr   | 0.02              | 94.14            | 94.23            | 94.19            | 94.23            | 0.001752            | 0.17              | 0.14              | 2.59             | 0.23         |
| River 1 | Reach 1-Upper | 908       | 5YrSCS24Hr   | 0.04              | 94.14            | 94.25            | 94.20            | 94.25            | 0.002058            | 0.21              | 0.18              | 2.87             | 0.26         |
| River 1 | Reach 1-Upper | 908       | 10YrSCS24Hr  | 0.05              | 94.14            | 94.26            | 94.20            | 94.26            | 0.002199            | 0.23              | 0.22              | 3.05             | 0.27         |
| River 1 | Reach 1-Upper | 908       | 25YrSCS24Hr  | 0.06              | 94.14            | 94.27            | 94.21            | 94.27            | 0.002241            | 0.25              | 0.25              | 3.26             | 0.28         |
| River 1 | Reach 1-Upper | 908       | 50YrSCS24Hr  | 0.07              | 94.14            | 94.28            | 94.22            | 94.28            | 0.002406            | 0.26              | 0.28              | 3.39             | 0.29         |
| River 1 | Reach 1-Upper | 908       | 100YrSCS24Hr | 0.08              | 94.14            | 94.29            | 94.22            | 94.29            | 0.002029            | 0.26              | 0.33              | 3.64             | 0.27         |
| River 1 | Reach 1-Upper | 887       | 2YrCHI3Hr    | 0.02              | 94.10            | 94.15            | 94.14            | 94.16            | 0.007507            | 0.23              | 0.07              | 2.30             | 0.44         |
| River 1 | Reach 1-Upper | 887       | 5YrCHI3Hr    | 0.03              | 94.10            | 94.17            | 94.15            | 94.17            | 0.005953            | 0.25              | 0.10              | 2.78             | 0.41         |
| River 1 | Reach 1-Upper | 887       | 10YrCHI3Hr   | 0.03              | 94.10            | 94.18            | 94.15            | 94.18            | 0.005054            | 0.26              | 0.14              | 3.08             | 0.39         |
| River 1 | Reach 1-Upper | 887       | 25YrCHI3Hr   | 0.05              | 94.10            | 94.19            | 94.16            | 94.20            | 0.004392            | 0.26              | 0.18              | 3.42             | 0.37         |
| River 1 | Reach 1-Upper | 887       | 50YrCHI3Hr   | 0.06              | 94.10            | 94.20            | 94.17            | 94.20            | 0.004802            | 0.29              | 0.20              | 3.57             | 0.39         |
| River 1 | Reach 1-Upper | 887       | 100YrCHI3Hr  | 0.07              | 94.10            | 94.21            | 94.17            | 94.21            | 0.004705            | 0.30              | 0.22              | 3.76             | 0.39         |
| River 1 | Reach 1-Upper | 887       | 2YrSCS24Hr   | 0.02              | 94.10            | 94.17            | 94.15            | 94.17            | 0.006295            | 0.25              | 0.10              | 2.71             | 0.42         |
| River 1 | Reach 1-Upper | 887       | 5YrSCS24Hr   | 0.04              | 94.10            | 94.18            | 94.15            | 94.19            | 0.004885            | 0.26              | 0.15              | 3.16             | 0.38         |
| River 1 | Reach 1-Upper | 887       | 10YrSCS24Hr  | 0.05              | 94.10            | 94.19            | 94.16            | 94.20            | 0.004587            | 0.27              | 0.18              | 3.44             | 0.38         |
| River 1 | Reach 1-Upper | 887       | 25YrSCS24Hr  | 0.06              | 94.10            | 94.20            | 94.17            | 94.20            | 0.005786            | 0.31              | 0.20              | 3.56             | 0.43         |
| River 1 | Reach 1-Upper | 887       | 50YrSCS24Hr  | 0.07              | 94.10            | 94.21            | 94.17            | 94.22            | 0.003925            | 0.29              | 0.25              | 3.98             | 0.36         |
| River 1 | Reach 1-Upper | 887       | 100YrSCS24Hr | 0.08              | 94.10            | 94.19            | 94.18            | 94.20            | 0.014690            | 0.48              | 0.18              | 3.39             | 0.67         |
| River 1 | Reach 1-Upper | 868       | 2YrCHI3Hr    | 0.02              | 93.96            | 94.02            | 94.01            | 94.03            | 0.006049            | 0.24              | 0.06              | 1.78             | 0.41         |
| River 1 | Reach 1-Upper | 868       | 5YrCHI3Hr    | 0.03              | 93.96            | 94.04            | 94.01            | 94.04            | 0.007801            | 0.31              | 0.08              | 1.98             | 0.48         |
| River 1 | Reach 1-Upper | 868       | 10YrCHI3Hr   | 0.03              | 93.96            | 94.04            | 94.02            | 94.05            | 0.010621            | 0.37              | 0.09              | 2.05             | 0.56         |
| River 1 | Reach 1-Upper | 868       | 25YrCHI3Hr   | 0.05              | 93.96            | 94.05            | 94.03            | 94.06            | 0.013422            | 0.44              | 0.11              | 2.15             | 0.64         |
| River 1 | Reach 1-Upper | 868       | 50YrCHI3Hr   | 0.06              | 93.96            | 94.06            | 94.04            | 94.07            | 0.010577            | 0.43              | 0.13              | 2.35             | 0.58         |
| River 1 | Reach 1-Upper | 868       | 100YrCHI3Hr  | 0.07              | 93.96            | 94.06            | 94.04            | 94.07            | 0.010976            | 0.46              | 0.15              | 2.45             | 0.60         |
| River 1 | Reach 1-Upper | 868       | 2YrSCS24Hr   | 0.02              | 93.96            | 94.03            | 94.01            | 94.04            | 0.007224            | 0.29              | 0.08              | 1.96             | 0.46         |
| River 1 | Reach 1-Upper | 868       | 5YrSCS24Hr   | 0.04              | 93.96            | 94.04            | 94.02            | 94.05            | 0.011359            | 0.39              | 0.10              | 2.08             | 0.58         |
| River 1 | Reach 1-Upper | 868       | 10YrSCS24Hr  | 0.05              | 93.96            | 94.05            | 94.03            | 94.06            | 0.012976            | 0.44              | 0.11              | 2.19             | 0.63         |
| River 1 | Reach 1-Upper | 868       | 25YrSCS24Hr  | 0.06              | 93.96            | 94.07            | 94.04            | 94.08            | 0.007363            | 0.39              | 0.16              | 2.55             | 0.49         |
| River 1 | Reach 1-Upper | 868       | 50YrSCS24Hr  | 0.07              | 93.96            | 94.06            | 94.05            | 94.07            | 0.019525            | 0.57              | 0.13              | 2.31             | 0.78         |
| River 1 | Reach 1-Upper | 868       | 100YrSCS24Hr | 0.08              | 93.96            | 94.14            | 94.05            | 94.15            | 0.001168            | 0.21              | 0.40              | 3.98             | 0.21         |
| River 1 | Reach 1-Upper | 848       | 2YrCHI3Hr    | 0.02              | 93.87            | 93.92            | 93.90            | 93.92            | 0.004686            | 0.19              | 0.08              | 2.57             | 0.35         |
| River 1 | Reach 1-Upper | 848       | 5YrCHI3Hr    | 0.03              | 93.87            | 93.93            | 93.91            | 93.94            | 0.003787            | 0.21              | 0.12              | 2.98             | 0.33         |
| River 1 | Reach 1-Upper | 848       | 10YrCHI3Hr   | 0.03              | 93.87            | 93.95            | 93.92            | 93.95            | 0.002708            | 0.21              | 0.17              | 3.15             | 0.29         |
| River 1 | Reach 1-Upper | 848       | 25YrCHI3Hr   | 0.05              | 93.87            | 93.97            | 93.92            | 93.97            | 0.002043            | 0.21              | 0.22              | 3.34             | 0.26         |
| River 1 | Reach 1-Upper | 848       | 50YrCHI3Hr   | 0.06              | 93.87            | 93.97            | 93.93            | 93.97            | 0.002676            | 0.25              | 0.23              | 3.37             | 0.30         |
| River 1 | Reach 1-Upper | 848       | 100YrCHI3Hr  | 0.07              | 93.87            | 93.98            | 93.93            | 93.98            | 0.002517            | 0.26              | 0.26              | 3.47             | 0.30         |
| River 1 | Reach 1-Upper | 848       | 2YrSCS24Hr   | 0.02              | 93.87            | 93.93            | 93.91            | 93.93            | 0.004188            | 0.21              | 0.11              | 2.93             | 0.34         |
| River 1 | Reach 1-Upper | 848       | 5YrSCS24Hr   | 0.04              | 93.87            | 93.95            | 93.92            | 93.96            | 0.002536            | 0.21              | 0.18              | 3.19             | 0.28         |
| River 1 | Reach 1-Upper | 848       | 10YrSCS24Hr  | 0.05              | 93.87            | 93.97            | 93.92            | 93.97            | 0.002100            | 0.22              | 0.23              | 3.35             | 0.27         |
| River 1 | Reach 1-Upper | 848       | 25YrSCS24Hr  | 0.06              | 93.87            | 93.96            | 93.93            | 93.97            | 0.004423            | 0.30              | 0.21              | 3.29             | 0.38         |
| River 1 | Reach 1-Upper | 848       | 50YrSCS24Hr  | 0.07              | 93.87            | 94.04            | 93.93            | 94.04            | 0.000430            | 0.15              | 0.50              | 3.98             | 0.13         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 848       | 100YrSCS24Hr | 0.08              | 93.87            | 94.14            | 93.94            | 94.14            | 0.000088            | 0.09              | 0.94              | 4.75             | 0.06         |
| River 1 | Reach 1-Upper | 828       | 2YrCHI3Hr    | 0.02              | 93.78            | 93.85            | 93.82            | 93.85            | 0.002687            | 0.16              | 0.09              | 2.47             | 0.27         |
| River 1 | Reach 1-Upper | 828       | 5YrCHI3Hr    | 0.03              | 93.78            | 93.86            | 93.83            | 93.86            | 0.004045            | 0.22              | 0.12              | 2.90             | 0.34         |
| River 1 | Reach 1-Upper | 828       | 10YrCHI3Hr   | 0.03              | 93.78            | 93.85            | 93.83            | 93.86            | 0.010289            | 0.33              | 0.10              | 2.68             | 0.54         |
| River 1 | Reach 1-Upper | 828       | 25YrCHI3Hr   | 0.05              | 93.78            | 93.84            | 93.84            | 93.86            | 0.040257            | 0.61              | 0.08              | 2.23             | 1.04         |
| River 1 | Reach 1-Upper | 828       | 50YrCHI3Hr   | 0.06              | 93.78            | 93.87            | 93.85            | 93.87            | 0.011893            | 0.40              | 0.14              | 3.16             | 0.59         |
| River 1 | Reach 1-Upper | 828       | 100YrCHI3Hr  | 0.07              | 93.78            | 93.96            | 93.85            | 93.97            | 0.000365            | 0.13              | 0.50              | 4.07             | 0.12         |
| River 1 | Reach 1-Upper | 828       | 2YrSCS24Hr   | 0.02              | 93.78            | 93.86            | 93.82            | 93.86            | 0.003210            | 0.19              | 0.12              | 2.95             | 0.30         |
| River 1 | Reach 1-Upper | 828       | 5YrSCS24Hr   | 0.04              | 93.78            | 93.85            | 93.84            | 93.86            | 0.014294            | 0.39              | 0.10              | 2.58             | 0.63         |
| River 1 | Reach 1-Upper | 828       | 10YrSCS24Hr  | 0.05              | 93.78            | 93.84            | 93.84            | 93.86            | 0.036015            | 0.59              | 0.08              | 2.34             | 0.99         |
| River 1 | Reach 1-Upper | 828       | 25YrSCS24Hr  | 0.06              | 93.78            | 93.90            | 93.85            | 93.90            | 0.002459            | 0.25              | 0.25              | 3.50             | 0.29         |
| River 1 | Reach 1-Upper | 828       | 50YrSCS24Hr  | 0.07              | 93.78            | 94.04            | 93.86            | 94.04            | 0.000005            | 0.02              | 5.50              | 35.21            | 0.01         |
| River 1 | Reach 1-Upper | 828       | 100YrSCS24Hr | 0.08              | 93.78            | 94.14            | 93.86            | 94.14            | 0.000001            | 0.01              | 9.06              | 35.66            | 0.01         |
| River 1 | Reach 1-Upper | 807       | 2YrCHI3Hr    | 0.02              | 93.65            | 93.70            | 93.70            | 93.71            | 0.039865            | 0.46              | 0.03              | 1.40             | 0.97         |
| River 1 | Reach 1-Upper | 807       | 5YrCHI3Hr    | 0.03              | 93.65            | 93.72            | 93.71            | 93.73            | 0.011679            | 0.35              | 0.07              | 1.90             | 0.57         |
| River 1 | Reach 1-Upper | 807       | 10YrCHI3Hr   | 0.03              | 93.65            | 93.76            | 93.71            | 93.76            | 0.002625            | 0.22              | 0.16              | 2.63             | 0.29         |
| River 1 | Reach 1-Upper | 807       | 25YrCHI3Hr   | 0.05              | 93.65            | 93.80            | 93.72            | 93.80            | 0.000718            | 0.16              | 0.30              | 3.53             | 0.16         |
| River 1 | Reach 1-Upper | 807       | 50YrCHI3Hr   | 0.06              | 93.65            | 93.86            | 93.73            | 93.86            | 0.000227            | 0.12              | 0.51              | 4.43             | 0.10         |
| River 1 | Reach 1-Upper | 807       | 100YrCHI3Hr  | 0.07              | 93.65            | 93.96            | 93.73            | 93.96            | 0.000003            | 0.02              | 5.71              | 34.82            | 0.01         |
| River 1 | Reach 1-Upper | 807       | 2YrSCS24Hr   | 0.02              | 93.65            | 93.71            | 93.70            | 93.72            | 0.021814            | 0.43              | 0.06              | 1.70             | 0.76         |
| River 1 | Reach 1-Upper | 807       | 5YrSCS24Hr   | 0.04              | 93.65            | 93.77            | 93.71            | 93.77            | 0.001862            | 0.20              | 0.19              | 2.86             | 0.25         |
| River 1 | Reach 1-Upper | 807       | 10YrSCS24Hr  | 0.05              | 93.65            | 93.81            | 93.72            | 93.81            | 0.000588            | 0.15              | 0.33              | 3.67             | 0.15         |
| River 1 | Reach 1-Upper | 807       | 25YrSCS24Hr  | 0.06              | 93.65            | 93.89            | 93.73            | 93.89            | 0.000119            | 0.10              | 0.70              | 6.11             | 0.07         |
| River 1 | Reach 1-Upper | 807       | 50YrSCS24Hr  | 0.07              | 93.65            | 94.04            | 93.74            | 94.04            | 0.000001            | 0.01              | 8.37              | 35.13            | 0.01         |
| River 1 | Reach 1-Upper | 807       | 100YrSCS24Hr | 0.08              | 93.65            | 94.14            | 93.74            | 94.14            | 0.000000            | 0.01              | 11.92             | 35.53            | 0.01         |
| River 1 | Reach 1-Upper | 789       | 2YrCHI3Hr    | 0.02              | 93.49            | 93.67            | 93.53            | 93.67            | 0.000035            | 0.04              | 0.33              | 3.14             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 5YrCHI3Hr    | 0.03              | 93.49            | 93.72            | 93.54            | 93.72            | 0.000038            | 0.06              | 0.45              | 3.66             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 10YrCHI3Hr   | 0.03              | 93.49            | 93.76            | 93.55            | 93.76            | 0.000039            | 0.07              | 0.54              | 4.24             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 25YrCHI3Hr   | 0.05              | 93.49            | 93.80            | 93.56            | 93.80            | 0.000037            | 0.07              | 0.65              | 4.99             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 50YrCHI3Hr   | 0.06              | 93.49            | 93.86            | 93.57            | 93.86            | 0.000030            | 0.07              | 0.78              | 5.73             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 100YrCHI3Hr  | 0.07              | 93.49            | 93.96            | 93.57            | 93.96            | 0.000016            | 0.06              | 1.04              | 8.28             | 0.03         |
| River 1 | Reach 1-Upper | 789       | 2YrSCS24Hr   | 0.02              | 93.49            | 93.71            | 93.54            | 93.71            | 0.000038            | 0.06              | 0.43              | 3.55             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 5YrSCS24Hr   | 0.04              | 93.49            | 93.77            | 93.55            | 93.77            | 0.000038            | 0.07              | 0.56              | 4.42             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 10YrSCS24Hr  | 0.05              | 93.49            | 93.81            | 93.56            | 93.81            | 0.000037            | 0.07              | 0.67              | 5.12             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 25YrSCS24Hr  | 0.06              | 93.49            | 93.89            | 93.57            | 93.89            | 0.000025            | 0.07              | 0.87              | 6.17             | 0.04         |
| River 1 | Reach 1-Upper | 789       | 50YrSCS24Hr  | 0.07              | 93.49            | 94.04            | 93.57            | 94.04            | 0.000011            | 0.06              | 1.22              | 10.07            | 0.03         |
| River 1 | Reach 1-Upper | 789       | 100YrSCS24Hr | 0.08              | 93.49            | 94.14            | 93.58            | 94.14            | 0.000008            | 0.06              | 1.46              | 23.56            | 0.02         |
| River 1 | Reach 1-Upper | 764       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 759       | 2YrCHI3Hr    | 0.02              | 93.46            | 93.53            | 93.50            | 93.53            | 0.002563            | 0.21              | 0.07              | 1.74             | 0.28         |
| River 1 | Reach 1-Upper | 759       | 5YrCHI3Hr    | 0.03              | 93.46            | 93.56            | 93.51            | 93.56            | 0.002115            | 0.23              | 0.11              | 2.11             | 0.27         |
| River 1 | Reach 1-Upper | 759       | 10YrCHI3Hr   | 0.03              | 93.46            | 93.59            | 93.52            | 93.60            | 0.001088            | 0.21              | 0.16              | 2.56             | 0.21         |
| River 1 | Reach 1-Upper | 759       | 25YrCHI3Hr   | 0.05              | 93.46            | 93.66            | 93.53            | 93.66            | 0.000396            | 0.18              | 0.26              | 3.40             | 0.14         |
| River 1 | Reach 1-Upper | 759       | 50YrCHI3Hr   | 0.06              | 93.46            | 93.74            | 93.54            | 93.74            | 0.000161            | 0.15              | 0.39              | 4.37             | 0.09         |
| River 1 | Reach 1-Upper | 759       | 100YrCHI3Hr  | 0.07              | 93.46            | 93.83            | 93.54            | 93.84            | 0.000081            | 0.13              | 0.53              | 6.02             | 0.07         |
| River 1 | Reach 1-Upper | 759       | 2YrSCS24Hr   | 0.02              | 93.46            | 93.55            | 93.51            | 93.56            | 0.002355            | 0.23              | 0.10              | 2.03             | 0.28         |
| River 1 | Reach 1-Upper | 759       | 5YrSCS24Hr   | 0.04              | 93.46            | 93.61            | 93.52            | 93.61            | 0.000864            | 0.21              | 0.18              | 2.73             | 0.19         |
| River 1 | Reach 1-Upper | 759       | 10YrSCS24Hr  | 0.05              | 93.46            | 93.67            | 93.53            | 93.67            | 0.000343            | 0.17              | 0.28              | 3.54             | 0.13         |
| River 1 | Reach 1-Upper | 759       | 25YrSCS24Hr  | 0.06              | 93.46            | 93.79            | 93.54            | 93.79            | 0.000109            | 0.14              | 0.46              | 4.99             | 0.08         |
| River 1 | Reach 1-Upper | 759       | 50YrSCS24Hr  | 0.07              | 93.46            | 93.89            | 93.54            | 93.89            | 0.000058            | 0.12              | 0.61              | 6.73             | 0.06         |
| River 1 | Reach 1-Upper | 759       | 100YrSCS24Hr | 0.08              | 93.46            | 93.95            | 93.55            | 93.95            | 0.000051            | 0.12              | 0.69              | 7.38             | 0.06         |
| River 1 | Reach 1-Upper | 743       | 2YrCHI3Hr    | 0.02              | 93.40            | 93.47            | 93.45            | 93.47            | 0.006174            | 0.30              | 0.05              | 1.27             | 0.43         |
| River 1 | Reach 1-Upper | 743       | 5YrCHI3Hr    | 0.03              | 93.40            | 93.53            | 93.46            | 93.54            | 0.001159            | 0.20              | 0.13              | 1.95             | 0.21         |
| River 1 | Reach 1-Upper | 743       | 10YrCHI3Hr   | 0.03              | 93.40            | 93.58            | 93.47            | 93.58            | 0.000560            | 0.19              | 0.19              | 2.40             | 0.16         |
| River 1 | Reach 1-Upper | 743       | 25YrCHI3Hr   | 0.05              | 93.40            | 93.66            | 93.48            | 93.66            | 0.000255            | 0.16              | 0.29              | 3.39             | 0.11         |
| River 1 | Reach 1-Upper | 743       | 50YrCHI3Hr   | 0.06              | 93.40            | 93.74            | 93.49            | 93.74            | 0.000125            | 0.14              | 0.40              | 5.00             | 0.08         |
| River 1 | Reach 1-Upper | 743       | 100YrCHI3Hr  | 0.07              | 93.40            | 93.83            | 93.50            | 93.83            | 0.000071            | 0.13              | 0.52              | 7.13             | 0.07         |
| River 1 | Reach 1-Upper | 743       | 2YrSCS24Hr   | 0.02              | 93.40            | 93.52            | 93.46            | 93.52            | 0.001463            | 0.21              | 0.11              | 1.84             | 0.23         |
| River 1 | Reach 1-Upper | 743       | 5YrSCS24Hr   | 0.04              | 93.40            | 93.60            | 93.47            | 93.60            | 0.000466            | 0.18              | 0.21              | 2.59             | 0.14         |
| River 1 | Reach 1-Upper | 743       | 10YrSCS24Hr  | 0.05              | 93.40            | 93.67            | 93.48            | 93.67            | 0.000228            | 0.16              | 0.30              | 3.72             | 0.11         |
| River 1 | Reach 1-Upper | 743       | 25YrSCS24Hr  | 0.06              | 93.40            | 93.79            | 93.49            | 93.79            | 0.000091            | 0.14              | 0.46              | 6.17             | 0.07         |
| River 1 | Reach 1-Upper | 743       | 50YrSCS24Hr  | 0.07              | 93.40            | 93.89            | 93.50            | 93.89            | 0.000054            | 0.12              | 0.59              | 7.75             | 0.06         |
| River 1 | Reach 1-Upper | 743       | 100YrSCS24Hr | 0.08              | 93.40            | 93.94            | 93.51            | 93.95            | 0.000049            | 0.13              | 0.66              | 9.45             | 0.06         |
| River 1 | Reach 1-Upper | 733       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 728       | 2YrCHI3Hr    | 0.02              | 93.33            | 93.46            | 93.38            | 93.46            | 0.000507            | 0.12              | 0.12              | 1.51             | 0.14         |
| River 1 | Reach 1-Upper | 728       | 5YrCHI3Hr    | 0.03              | 93.33            | 93.52            | 93.40            | 93.52            | 0.000283            | 0.13              | 0.20              | 1.94             | 0.11         |
| River 1 | Reach 1-Upper | 728       | 10YrCHI3Hr   | 0.03              | 93.33            | 93.56            | 93.41            | 93.56            | 0.000213            | 0.13              | 0.26              | 2.26             | 0.10         |
| River 1 | Reach 1-Upper | 728       | 25YrCHI3Hr   | 0.05              | 93.33            | 93.63            | 93.42            | 93.63            | 0.000137            | 0.13              | 0.36              | 2.78             | 0.08         |
| River 1 | Reach 1-Upper | 728       | 50YrCHI3Hr   | 0.06              | 93.33            | 93.70            | 93.43            | 93.70            | 0.000088            | 0.13              | 0.45              | 3.31             | 0.07         |
| River 1 | Reach 1-Upper | 728       | 100YrCHI3Hr  | 0.07              | 93.33            | 93.78            | 93.43            | 93.78            | 0.000060            | 0.12              | 0.56              | 4.21             | 0.06         |
| River 1 | Reach 1-Upper | 728       | 2YrSCS24Hr   | 0.02              | 93.33            | 93.51            | 93.39            | 93.51            | 0.000306            | 0.13              | 0.19              | 1.87             | 0.11         |
| River 1 | Reach 1-Upper | 728       | 5YrSCS24Hr   | 0.04              | 93.33            | 93.58            | 93.41            | 93.58            | 0.000196            | 0.14              | 0.28              | 2.37             | 0.10         |
| River 1 | Reach 1-Upper | 728       | 10YrSCS24Hr  | 0.05              | 93.33            | 93.64            | 93.42            | 93.64            | 0.000129            | 0.13              | 0.37              | 2.86             | 0.08         |
| River 1 | Reach 1-Upper | 728       | 25YrSCS24Hr  | 0.06              | 93.33            | 93.74            | 93.43            | 93.74            | 0.000071            | 0.12              | 0.51              | 3.65             | 0.06         |
| River 1 | Reach 1-Upper | 728       | 50YrSCS24Hr  | 0.07              | 93.33            | 93.82            | 93.44            | 93.82            | 0.000049            | 0.12              | 0.63              | 6.17             | 0.06         |
| River 1 | Reach 1-Upper | 728       | 100YrSCS24Hr | 0.08              | 93.33            | 93.85            | 93.45            | 93.85            | 0.000053            | 0.13              | 0.67              | 10.91            | 0.06         |
| River 1 | Reach 1-Upper | 715       | 2YrCHI3Hr    | 0.02              | 93.32            | 93.46            | 93.36            | 93.46            | 0.000165            | 0.09              | 0.17              | 2.22             | 0.08         |
| River 1 | Reach 1-Upper | 715       | 5YrCHI3Hr    | 0.03              | 93.32            | 93.52            | 93.37            | 93.52            | 0.000134            | 0.10              | 0.25              | 2.80             | 0.08         |
| River 1 | Reach 1-Upper | 715       | 10YrCHI3Hr   | 0.03              | 93.32            | 93.56            | 93.38            | 93.56            | 0.000117            | 0.11              | 0.31              | 3.23             | 0.08         |
| River 1 | Reach 1-Upper | 715       | 25YrCHI3Hr   | 0.05              | 93.32            | 93.63            | 93.39            | 93.63            | 0.000086            | 0.12              | 0.41              | 3.92             | 0.07         |
| River 1 | Reach 1-Upper | 715       | 50YrCHI3Hr   | 0.06              | 93.32            | 93.70            | 93.39            | 93.70            | 0.000061            | 0.11              | 0.51              | 4.63             | 0.06         |
| River 1 | Reach 1-Upper | 715       | 100YrCHI3Hr  | 0.07              | 93.32            | 93.77            | 93.40            | 93.78            | 0.000044            | 0.11              | 0.61              | 9.10             | 0.05         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 715       | 2YrSCS24Hr   | 0.02              | 93.32            | 93.51            | 93.36            | 93.51            | 0.000138            | 0.10              | 0.24              | 2.70             | 0.08         |
| River 1 | Reach 1-Upper | 715       | 5YrSCS24Hr   | 0.04              | 93.32            | 93.57            | 93.38            | 93.57            | 0.000112            | 0.11              | 0.33              | 3.38             | 0.08         |
| River 1 | Reach 1-Upper | 715       | 10YrSCS24Hr  | 0.05              | 93.32            | 93.64            | 93.39            | 93.64            | 0.000083            | 0.12              | 0.42              | 4.03             | 0.07         |
| River 1 | Reach 1-Upper | 715       | 25YrSCS24Hr  | 0.06              | 93.32            | 93.74            | 93.40            | 93.74            | 0.000051            | 0.11              | 0.56              | 5.03             | 0.06         |
| River 1 | Reach 1-Upper | 715       | 50YrSCS24Hr  | 0.07              | 93.32            | 93.82            | 93.40            | 93.82            | 0.000037            | 0.11              | 0.68              | 14.68            | 0.05         |
| River 1 | Reach 1-Upper | 715       | 100YrSCS24Hr | 0.08              | 93.32            | 93.85            | 93.41            | 93.85            | 0.000010            | 0.04              | 2.56              | 20.21            | 0.02         |
| River 1 | Reach 1-Upper | 705       | Culvert      |                   |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 698       | 2YrCHI3Hr    | 0.02              | 93.24            | 93.31            | 93.29            | 93.31            | 0.009120            | 0.33              | 0.05              | 1.10             | 0.51         |
| River 1 | Reach 1-Upper | 698       | 5YrCHI3Hr    | 0.03              | 93.24            | 93.31            | 93.30            | 93.32            | 0.019233            | 0.50              | 0.05              | 1.16             | 0.75         |
| River 1 | Reach 1-Upper | 698       | 10YrCHI3Hr   | 0.03              | 93.24            | 93.31            | 93.31            | 93.33            | 0.027628            | 0.62              | 0.06              | 1.19             | 0.91         |
| River 1 | Reach 1-Upper | 698       | 25YrCHI3Hr   | 0.05              | 93.24            | 93.42            | 93.32            | 93.43            | 0.000867            | 0.20              | 0.23              | 2.01             | 0.19         |
| River 1 | Reach 1-Upper | 698       | 50YrCHI3Hr   | 0.06              | 93.24            | 93.51            | 93.33            | 93.51            | 0.000225            | 0.14              | 0.41              | 2.80             | 0.10         |
| River 1 | Reach 1-Upper | 698       | 100YrCHI3Hr  | 0.07              | 93.24            | 93.51            | 93.34            | 93.51            | 0.000299            | 0.16              | 0.42              | 2.61             | 0.12         |
| River 1 | Reach 1-Upper | 698       | 2YrSCS24Hr   | 0.02              | 93.24            | 93.31            | 93.30            | 93.32            | 0.015768            | 0.45              | 0.05              | 1.16             | 0.68         |
| River 1 | Reach 1-Upper | 698       | 5YrSCS24Hr   | 0.04              | 93.24            | 93.32            | 93.31            | 93.34            | 0.027115            | 0.63              | 0.06              | 1.22             | 0.90         |
| River 1 | Reach 1-Upper | 698       | 10YrSCS24Hr  | 0.05              | 93.24            | 93.47            | 93.32            | 93.47            | 0.000368            | 0.15              | 0.32              | 2.29             | 0.13         |
| River 1 | Reach 1-Upper | 698       | 25YrSCS24Hr  | 0.06              | 93.24            | 93.51            | 93.33            | 93.51            | 0.000261            | 0.15              | 0.41              | 2.61             | 0.11         |
| River 1 | Reach 1-Upper | 698       | 50YrSCS24Hr  | 0.07              | 93.24            | 93.51            | 93.34            | 93.52            | 0.000345            | 0.17              | 0.42              | 2.63             | 0.13         |
| River 1 | Reach 1-Upper | 698       | 100YrSCS24Hr | 0.08              | 93.24            | 93.52            | 93.35            | 93.52            | 0.000432            | 0.20              | 0.43              | 2.65             | 0.14         |
| River 1 | Reach 1-Upper | 681       | 2YrCHI3Hr    | 0.02              | 93.14            | 93.21            | 93.18            | 93.21            | 0.004396            | 0.23              | 0.07              | 1.57             | 0.36         |
| River 1 | Reach 1-Upper | 681       | 5YrCHI3Hr    | 0.03              | 93.14            | 93.24            | 93.19            | 93.24            | 0.001938            | 0.21              | 0.12              | 1.83             | 0.26         |
| River 1 | Reach 1-Upper | 681       | 10YrCHI3Hr   | 0.03              | 93.14            | 93.27            | 93.20            | 93.27            | 0.001159            | 0.19              | 0.18              | 2.04             | 0.21         |
| River 1 | Reach 1-Upper | 681       | 25YrCHI3Hr   | 0.05              | 93.14            | 93.42            | 93.21            | 93.42            | 0.000083            | 0.08              | 0.57              | 3.09             | 0.06         |
| River 1 | Reach 1-Upper | 681       | 50YrCHI3Hr   | 0.06              | 93.14            | 93.51            | 93.22            | 93.51            | 0.000037            | 0.07              | 0.87              | 4.07             | 0.04         |
| River 1 | Reach 1-Upper | 681       | 100YrCHI3Hr  | 0.07              | 93.14            | 93.51            | 93.22            | 93.51            | 0.000050            | 0.08              | 0.88              | 4.10             | 0.05         |
| River 1 | Reach 1-Upper | 681       | 2YrSCS24Hr   | 0.02              | 93.14            | 93.23            | 93.19            | 93.24            | 0.002334            | 0.22              | 0.11              | 1.78             | 0.28         |
| River 1 | Reach 1-Upper | 681       | 5YrSCS24Hr   | 0.04              | 93.14            | 93.29            | 93.20            | 93.29            | 0.000854            | 0.18              | 0.21              | 2.14             | 0.18         |
| River 1 | Reach 1-Upper | 681       | 10YrSCS24Hr  | 0.05              | 93.14            | 93.46            | 93.21            | 93.46            | 0.000050            | 0.07              | 0.70              | 3.45             | 0.05         |
| River 1 | Reach 1-Upper | 681       | 25YrSCS24Hr  | 0.06              | 93.14            | 93.51            | 93.22            | 93.51            | 0.000043            | 0.07              | 0.88              | 4.08             | 0.05         |
| River 1 | Reach 1-Upper | 681       | 50YrSCS24Hr  | 0.07              | 93.14            | 93.51            | 93.23            | 93.51            | 0.000058            | 0.08              | 0.89              | 4.12             | 0.05         |
| River 1 | Reach 1-Upper | 681       | 100YrSCS24Hr | 0.08              | 93.14            | 93.52            | 93.23            | 93.52            | 0.000073            | 0.09              | 0.90              | 4.16             | 0.06         |
| River 1 | Reach 1-Upper | 663       | 2YrCHI3Hr    | 0.02              | 93.05            | 93.18            |                  | 93.18            | 0.000677            | 0.14              | 0.11              | 1.31             | 0.15         |
| River 1 | Reach 1-Upper | 663       | 5YrCHI3Hr    | 0.03              | 93.05            | 93.22            |                  | 93.23            | 0.000607            | 0.15              | 0.17              | 1.60             | 0.15         |
| River 1 | Reach 1-Upper | 663       | 10YrCHI3Hr   | 0.03              | 93.05            | 93.26            |                  | 93.26            | 0.000492            | 0.15              | 0.23              | 1.84             | 0.14         |
| River 1 | Reach 1-Upper | 663       | 25YrCHI3Hr   | 0.05              | 93.05            | 93.42            |                  | 93.42            | 0.000064            | 0.07              | 0.63              | 3.25             | 0.05         |
| River 1 | Reach 1-Upper | 663       | 50YrCHI3Hr   | 0.06              | 93.05            | 93.51            |                  | 93.51            | 0.000032            | 0.06              | 0.96              | 4.42             | 0.04         |
| River 1 | Reach 1-Upper | 663       | 100YrCHI3Hr  | 0.07              | 93.05            | 93.51            |                  | 93.51            | 0.000043            | 0.07              | 0.97              | 4.46             | 0.05         |
| River 1 | Reach 1-Upper | 663       | 2YrSCS24Hr   | 0.02              | 93.05            | 93.21            |                  | 93.22            | 0.000676            | 0.16              | 0.15              | 1.53             | 0.16         |
| River 1 | Reach 1-Upper | 663       | 5YrSCS24Hr   | 0.04              | 93.05            | 93.28            |                  | 93.28            | 0.000393            | 0.14              | 0.26              | 1.97             | 0.13         |
| River 1 | Reach 1-Upper | 663       | 10YrSCS24Hr  | 0.05              | 93.05            | 93.46            |                  | 93.46            | 0.000042            | 0.06              | 0.78              | 3.77             | 0.04         |
| River 1 | Reach 1-Upper | 663       | 25YrSCS24Hr  | 0.06              | 93.05            | 93.51            |                  | 93.51            | 0.000037            | 0.06              | 0.96              | 4.44             | 0.04         |
| River 1 | Reach 1-Upper | 663       | 50YrSCS24Hr  | 0.07              | 93.05            | 93.51            |                  | 93.51            | 0.000050            | 0.08              | 0.97              | 4.48             | 0.05         |
| River 1 | Reach 1-Upper | 663       | 100YrSCS24Hr | 0.08              | 93.05            | 93.51            |                  | 93.52            | 0.000064            | 0.09              | 0.99              | 4.53             | 0.06         |
| River 1 | Reach 1-Upper | 656       | 2YrCHI3Hr    | 0.06              | 93.03            | 93.15            | 93.12            | 93.16            | 0.008107            | 0.46              | 0.12              | 1.65             | 0.53         |
| River 1 | Reach 1-Upper | 656       | 5YrCHI3Hr    | 0.10              | 93.03            | 93.19            | 93.14            | 93.20            | 0.006746            | 0.51              | 0.20              | 1.91             | 0.51         |
| River 1 | Reach 1-Upper | 656       | 10YrCHI3Hr   | 0.14              | 93.03            | 93.23            | 93.16            | 93.24            | 0.004212            | 0.48              | 0.29              | 2.15             | 0.42         |
| River 1 | Reach 1-Upper | 656       | 25YrCHI3Hr   | 0.18              | 93.03            | 93.42            | 93.18            | 93.42            | 0.000424            | 0.23              | 0.79              | 3.69             | 0.15         |
| River 1 | Reach 1-Upper | 656       | 50YrCHI3Hr   | 0.22              | 93.03            | 93.51            | 93.20            | 93.51            | 0.000220            | 0.20              | 1.16              | 4.65             | 0.11         |
| River 1 | Reach 1-Upper | 656       | 100YrCHI3Hr  | 0.26              | 93.03            | 93.51            | 93.21            | 93.51            | 0.000302            | 0.24              | 1.17              | 4.66             | 0.13         |
| River 1 | Reach 1-Upper | 656       | 2YrSCS24Hr   | 0.09              | 93.03            | 93.18            | 93.14            | 93.19            | 0.007190            | 0.50              | 0.18              | 1.85             | 0.52         |
| River 1 | Reach 1-Upper | 656       | 5YrSCS24Hr   | 0.15              | 93.03            | 93.26            | 93.17            | 93.27            | 0.003060            | 0.44              | 0.34              | 2.29             | 0.36         |
| River 1 | Reach 1-Upper | 656       | 10YrSCS24Hr  | 0.19              | 93.03            | 93.46            | 93.18            | 93.46            | 0.000269            | 0.21              | 0.96              | 4.20             | 0.12         |
| River 1 | Reach 1-Upper | 656       | 25YrSCS24Hr  | 0.24              | 93.03            | 93.51            | 93.20            | 93.51            | 0.000267            | 0.23              | 1.17              | 4.65             | 0.12         |
| River 1 | Reach 1-Upper | 656       | 50YrSCS24Hr  | 0.28              | 93.03            | 93.51            | 93.22            | 93.51            | 0.000363            | 0.26              | 1.17              | 4.66             | 0.14         |
| River 1 | Reach 1-Upper | 656       | 100YrSCS24Hr | 0.33              | 93.03            | 93.51            | 93.23            | 93.51            | 0.000481            | 0.30              | 1.18              | 4.68             | 0.16         |
| River 1 | Reach 1-Upper | 638       | 2YrCHI3Hr    | 0.06              | 92.92            | 93.07            | 93.00            | 93.08            | 0.002802            | 0.32              | 0.18              | 1.81             | 0.32         |
| River 1 | Reach 1-Upper | 638       | 5YrCHI3Hr    | 0.10              | 92.92            | 93.14            | 93.04            | 93.14            | 0.001935            | 0.33              | 0.31              | 2.24             | 0.28         |
| River 1 | Reach 1-Upper | 638       | 10YrCHI3Hr   | 0.14              | 92.92            | 93.20            | 93.05            | 93.21            | 0.001072            | 0.29              | 0.48              | 2.76             | 0.22         |
| River 1 | Reach 1-Upper | 638       | 25YrCHI3Hr   | 0.18              | 92.92            | 93.41            | 93.07            | 93.42            | 0.000128            | 0.15              | 1.31              | 5.26             | 0.08         |
| River 1 | Reach 1-Upper | 638       | 50YrCHI3Hr   | 0.22              | 92.92            | 93.50            | 93.09            | 93.51            | 0.000082            | 0.14              | 1.86              | 6.83             | 0.07         |
| River 1 | Reach 1-Upper | 638       | 100YrCHI3Hr  | 0.26              | 92.92            | 93.50            | 93.10            | 93.51            | 0.000114            | 0.16              | 1.86              | 6.84             | 0.08         |
| River 1 | Reach 1-Upper | 638       | 2YrSCS24Hr   | 0.09              | 92.92            | 93.12            | 93.03            | 93.12            | 0.002288            | 0.34              | 0.27              | 2.11             | 0.30         |
| River 1 | Reach 1-Upper | 638       | 5YrSCS24Hr   | 0.15              | 92.92            | 93.24            | 93.06            | 93.24            | 0.000804            | 0.26              | 0.57              | 3.07             | 0.19         |
| River 1 | Reach 1-Upper | 638       | 10YrSCS24Hr  | 0.19              | 92.92            | 93.46            | 93.08            | 93.46            | 0.000092            | 0.14              | 1.57              | 6.15             | 0.07         |
| River 1 | Reach 1-Upper | 638       | 25YrSCS24Hr  | 0.24              | 92.92            | 93.50            | 93.10            | 93.51            | 0.000100            | 0.15              | 1.86              | 6.83             | 0.08         |
| River 1 | Reach 1-Upper | 638       | 50YrSCS24Hr  | 0.28              | 92.92            | 93.50            | 93.11            | 93.51            | 0.000137            | 0.18              | 1.87              | 6.84             | 0.09         |
| River 1 | Reach 1-Upper | 638       | 100YrSCS24Hr | 0.33              | 92.92            | 93.51            | 93.13            | 93.51            | 0.000184            | 0.20              | 1.87              | 6.85             | 0.10         |
| River 1 | Reach 1-Upper | 617       | 2YrCHI3Hr    | 0.06              | 92.84            | 93.01            | 92.95            | 93.01            | 0.003253            | 0.32              | 0.18              | 1.96             | 0.34         |
| River 1 | Reach 1-Upper | 617       | 5YrCHI3Hr    | 0.10              | 92.84            | 93.11            | 92.98            | 93.11            | 0.000952            | 0.24              | 0.43              | 2.97             | 0.20         |
| River 1 | Reach 1-Upper | 617       | 10YrCHI3Hr   | 0.14              | 92.84            | 93.19            | 93.00            | 93.19            | 0.000453            | 0.19              | 0.70              | 3.82             | 0.14         |
| River 1 | Reach 1-Upper | 617       | 25YrCHI3Hr   | 0.18              | 92.84            | 93.41            | 93.01            | 93.41            | 0.000070            | 0.09              | 1.97              | 8.09             | 0.06         |
| River 1 | Reach 1-Upper | 617       | 50YrCHI3Hr   | 0.22              | 92.84            | 93.50            | 93.03            | 93.50            | 0.000037            | 0.08              | 2.93              | 15.17            | 0.05         |
| River 1 | Reach 1-Upper | 617       | 100YrCHI3Hr  | 0.26              | 92.84            | 93.50            | 93.04            | 93.50            | 0.000051            | 0.09              | 2.93              | 15.17            | 0.05         |
| River 1 | Reach 1-Upper | 617       | 2YrSCS24Hr   | 0.09              | 92.84            | 93.08            | 92.97            | 93.09            | 0.001277            | 0.26              | 0.35              | 2.70             | 0.23         |
| River 1 | Reach 1-Upper | 617       | 5YrSCS24Hr   | 0.15              | 92.84            | 93.23            | 93.00            | 93.23            | 0.000340            | 0.18              | 0.84              | 4.32             | 0.13         |
| River 1 | Reach 1-Upper | 617       | 10YrSCS24Hr  | 0.19              | 92.84            | 93.46            | 93.02            | 93.46            | 0.000046            | 0.08              | 2.37              | 10.22            | 0.05         |
| River 1 | Reach 1-Upper | 617       | 25YrSCS24Hr  | 0.24              | 92.84            | 93.50            | 93.04            | 93.50            | 0.000045            | 0.09              | 2.93              | 15.17            | 0.05         |
| River 1 | Reach 1-Upper | 617       | 50YrSCS24Hr  | 0.28              | 92.84            | 93.50            | 93.05            | 93.50            | 0.000062            | 0.10              | 2.93              | 15.17            | 0.06         |
| River 1 | Reach 1-Upper | 617       | 100YrSCS24Hr | 0.33              | 92.84            | 93.50            | 93.06            | 93.50            | 0.000083            | 0.12              | 2.93              | 15.18            | 0.07         |
| River 1 | Reach 1-Upper | 598       | 2YrCHI3Hr    | 0.06              | 92.76            | 92.99            | 92.86            | 92.99            | 0.000555            | 0.18              | 0.33              | 2.52             | 0.15         |
| River 1 | Reach 1-Upper | 598       | 5YrCHI3Hr    | 0.11              | 92.76            | 93.10            | 92.89            | 93.10            | 0.000269            | 0.18              | 0.61              | 3.40             | 0.12         |
| River 1 | Reach 1-Upper | 598       | 10YrCHI3Hr   | 0.15              | 92.76            | 93.19            | 92.91            | 93.19            | 0.000175            | 0.18              | 0.82              | 5.45             | 0.10         |



HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 598       | 25YrCHI3Hr   | 0.19              | 92.76            | 93.41            | 92.93            | 93.41            | 0.000054            | 0.14              | 1.39              | 9.84             | 0.06         |
| River 1 | Reach 1-Upper | 598       | 50YrCHI3Hr   | 0.23              | 92.76            | 93.50            | 92.94            | 93.50            | 0.000020            | 0.08              | 4.94              | 31.21            | 0.04         |
| River 1 | Reach 1-Upper | 598       | 100YrCHI3Hr  | 0.28              | 92.76            | 93.50            | 92.96            | 93.50            | 0.000028            | 0.09              | 4.93              | 31.21            | 0.04         |
| River 1 | Reach 1-Upper | 598       | 2YrSCS24Hr   | 0.10              | 92.76            | 93.07            | 92.88            | 93.07            | 0.000322            | 0.18              | 0.53              | 3.17             | 0.12         |
| River 1 | Reach 1-Upper | 598       | 5YrSCS24Hr   | 0.16              | 92.76            | 93.22            | 92.91            | 93.22            | 0.000147            | 0.17              | 0.91              | 6.16             | 0.09         |
| River 1 | Reach 1-Upper | 598       | 10YrSCS24Hr  | 0.20              | 92.76            | 93.46            | 92.93            | 93.46            | 0.000045            | 0.13              | 1.50              | 22.56            | 0.06         |
| River 1 | Reach 1-Upper | 598       | 25YrSCS24Hr  | 0.26              | 92.76            | 93.50            | 92.95            | 93.50            | 0.000025            | 0.09              | 4.94              | 31.21            | 0.04         |
| River 1 | Reach 1-Upper | 598       | 50YrSCS24Hr  | 0.30              | 92.76            | 93.50            | 92.96            | 93.50            | 0.000034            | 0.10              | 4.93              | 31.21            | 0.05         |
| River 1 | Reach 1-Upper | 598       | 100YrSCS24Hr | 0.35              | 92.76            | 93.50            | 92.98            | 93.50            | 0.000046            | 0.12              | 4.93              | 31.21            | 0.05         |
| River 1 | Reach 1-Upper | 589       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 581       | 2YrCHI3Hr    | 0.06              | 92.71            | 92.89            | 92.81            | 92.89            | 0.002032            | 0.27              | 0.23              | 2.59             | 0.28         |
| River 1 | Reach 1-Upper | 581       | 5YrCHI3Hr    | 0.11              | 92.71            | 92.93            | 92.84            | 92.93            | 0.001970            | 0.33              | 0.33              | 3.40             | 0.29         |
| River 1 | Reach 1-Upper | 581       | 10YrCHI3Hr   | 0.15              | 92.71            | 92.96            | 92.86            | 92.97            | 0.001571            | 0.34              | 0.42              | 4.10             | 0.27         |
| River 1 | Reach 1-Upper | 581       | 25YrCHI3Hr   | 0.19              | 92.71            | 93.04            | 92.88            | 93.04            | 0.000858            | 0.32              | 0.60              | 5.44             | 0.21         |
| River 1 | Reach 1-Upper | 581       | 50YrCHI3Hr   | 0.23              | 92.71            | 93.19            | 92.89            | 93.19            | 0.000244            | 0.24              | 0.98              | 9.64             | 0.12         |
| River 1 | Reach 1-Upper | 581       | 100YrCHI3Hr  | 0.28              | 92.71            | 93.25            | 92.90            | 93.25            | 0.000213            | 0.24              | 1.13              | 30.32            | 0.12         |
| River 1 | Reach 1-Upper | 581       | 2YrSCS24Hr   | 0.10              | 92.71            | 92.92            | 92.83            | 92.92            | 0.002062            | 0.32              | 0.30              | 3.18             | 0.29         |
| River 1 | Reach 1-Upper | 581       | 5YrSCS24Hr   | 0.16              | 92.71            | 92.98            | 92.86            | 92.99            | 0.001381            | 0.34              | 0.46              | 4.41             | 0.25         |
| River 1 | Reach 1-Upper | 581       | 10YrSCS24Hr  | 0.20              | 92.71            | 93.05            | 92.88            | 93.06            | 0.000735            | 0.31              | 0.65              | 5.75             | 0.20         |
| River 1 | Reach 1-Upper | 581       | 25YrSCS24Hr  | 0.26              | 92.71            | 93.25            | 92.90            | 93.25            | 0.000187            | 0.23              | 1.13              | 30.32            | 0.11         |
| River 1 | Reach 1-Upper | 581       | 50YrSCS24Hr  | 0.30              | 92.71            | 93.26            | 92.91            | 93.26            | 0.000245            | 0.26              | 1.15              | 30.62            | 0.12         |
| River 1 | Reach 1-Upper | 581       | 100YrSCS24Hr | 0.35              | 92.71            | 93.30            | 92.92            | 93.30            | 0.000057            | 0.11              | 4.83              | 35.67            | 0.06         |
| River 1 | Reach 1-Upper | 572       | 2YrCHI3Hr    | 0.06              | 92.73            | 92.84            | 92.82            | 92.85            | 0.009130            | 0.45              | 0.13              | 1.96             | 0.55         |
| River 1 | Reach 1-Upper | 572       | 5YrCHI3Hr    | 0.11              | 92.73            | 92.90            | 92.84            | 92.90            | 0.004896            | 0.43              | 0.26              | 2.58             | 0.43         |
| River 1 | Reach 1-Upper | 572       | 10YrCHI3Hr   | 0.15              | 92.73            | 92.94            | 92.86            | 92.95            | 0.002649            | 0.37              | 0.39              | 3.10             | 0.33         |
| River 1 | Reach 1-Upper | 572       | 25YrCHI3Hr   | 0.19              | 92.73            | 93.03            | 92.88            | 93.03            | 0.001021            | 0.28              | 0.70              | 4.09             | 0.22         |
| River 1 | Reach 1-Upper | 572       | 50YrCHI3Hr   | 0.23              | 92.73            | 93.19            | 92.89            | 93.19            | 0.000155            | 0.14              | 2.22              | 26.73            | 0.09         |
| River 1 | Reach 1-Upper | 572       | 100YrCHI3Hr  | 0.28              | 92.73            | 93.25            | 92.90            | 93.25            | 0.000074            | 0.11              | 4.09              | 35.89            | 0.06         |
| River 1 | Reach 1-Upper | 572       | 2YrSCS24Hr   | 0.10              | 92.73            | 92.88            | 92.84            | 92.89            | 0.005898            | 0.44              | 0.22              | 2.42             | 0.47         |
| River 1 | Reach 1-Upper | 572       | 5YrSCS24Hr   | 0.16              | 92.73            | 92.96            | 92.86            | 92.97            | 0.002084            | 0.34              | 0.46              | 3.34             | 0.30         |
| River 1 | Reach 1-Upper | 572       | 10YrSCS24Hr  | 0.20              | 92.73            | 93.05            | 92.88            | 93.05            | 0.000824            | 0.26              | 0.78              | 4.31             | 0.20         |
| River 1 | Reach 1-Upper | 572       | 25YrSCS24Hr  | 0.26              | 92.73            | 93.25            | 92.90            | 93.25            | 0.000065            | 0.10              | 4.09              | 35.88            | 0.06         |
| River 1 | Reach 1-Upper | 572       | 50YrSCS24Hr  | 0.30              | 92.73            | 93.26            | 92.91            | 93.26            | 0.000079            | 0.12              | 4.37              | 36.88            | 0.07         |
| River 1 | Reach 1-Upper | 572       | 100YrSCS24Hr | 0.35              | 92.73            | 93.30            | 92.92            | 93.30            | 0.000050            | 0.10              | 6.26              | 42.85            | 0.05         |
| River 1 | Reach 1-Upper | 555       | 2YrCHI3Hr    | 0.06              | 92.61            | 92.81            | 92.71            | 92.81            | 0.000983            | 0.20              | 0.31              | 2.93             | 0.20         |
| River 1 | Reach 1-Upper | 555       | 5YrCHI3Hr    | 0.11              | 92.61            | 92.87            | 92.74            | 92.87            | 0.000748            | 0.21              | 0.52              | 3.73             | 0.18         |
| River 1 | Reach 1-Upper | 555       | 10YrCHI3Hr   | 0.15              | 92.61            | 92.93            | 92.75            | 92.93            | 0.000479            | 0.19              | 0.76              | 4.46             | 0.15         |
| River 1 | Reach 1-Upper | 555       | 25YrCHI3Hr   | 0.19              | 92.61            | 93.02            | 92.77            | 93.02            | 0.000238            | 0.16              | 1.22              | 5.62             | 0.11         |
| River 1 | Reach 1-Upper | 555       | 50YrCHI3Hr   | 0.23              | 92.61            | 93.19            | 92.78            | 93.19            | 0.000031            | 0.08              | 4.98              | 37.27            | 0.04         |
| River 1 | Reach 1-Upper | 555       | 100YrCHI3Hr  | 0.28              | 92.61            | 93.25            | 92.80            | 93.25            | 0.000018            | 0.06              | 7.39              | 40.94            | 0.03         |
| River 1 | Reach 1-Upper | 555       | 2YrSCS24Hr   | 0.10              | 92.61            | 92.85            | 92.73            | 92.85            | 0.000851            | 0.21              | 0.45              | 3.50             | 0.19         |
| River 1 | Reach 1-Upper | 555       | 5YrSCS24Hr   | 0.16              | 92.61            | 92.95            | 92.76            | 92.95            | 0.000402            | 0.18              | 0.87              | 4.75             | 0.14         |
| River 1 | Reach 1-Upper | 555       | 10YrSCS24Hr  | 0.20              | 92.61            | 93.04            | 92.77            | 93.04            | 0.000197            | 0.15              | 1.34              | 5.96             | 0.10         |
| River 1 | Reach 1-Upper | 555       | 25YrSCS24Hr  | 0.26              | 92.61            | 93.25            | 92.79            | 93.25            | 0.000016            | 0.06              | 7.39              | 40.94            | 0.03         |
| River 1 | Reach 1-Upper | 555       | 50YrSCS24Hr  | 0.30              | 92.61            | 93.26            | 92.81            | 93.26            | 0.000020            | 0.07              | 7.70              | 41.13            | 0.03         |
| River 1 | Reach 1-Upper | 555       | 100YrSCS24Hr | 0.35              | 92.61            | 93.30            | 92.82            | 93.30            | 0.000015            | 0.06              | 9.71              | 43.21            | 0.03         |
| River 1 | Reach 1-Upper | 534       | 2YrCHI3Hr    | 0.06              | 92.59            | 92.78            | 92.69            | 92.78            | 0.001540            | 0.24              | 0.25              | 2.41             | 0.24         |
| River 1 | Reach 1-Upper | 534       | 5YrCHI3Hr    | 0.11              | 92.59            | 92.85            | 92.72            | 92.86            | 0.001007            | 0.24              | 0.46              | 3.30             | 0.21         |
| River 1 | Reach 1-Upper | 534       | 10YrCHI3Hr   | 0.15              | 92.59            | 92.92            | 92.74            | 92.92            | 0.000570            | 0.21              | 0.74              | 8.51             | 0.16         |
| River 1 | Reach 1-Upper | 534       | 25YrCHI3Hr   | 0.19              | 92.59            | 93.02            | 92.76            | 93.02            | 0.000095            | 0.11              | 3.36              | 40.28            | 0.07         |
| River 1 | Reach 1-Upper | 534       | 50YrCHI3Hr   | 0.23              | 92.59            | 93.19            | 92.78            | 93.19            | 0.000006            | 0.04              | 11.46             | 51.16            | 0.02         |
| River 1 | Reach 1-Upper | 534       | 100YrCHI3Hr  | 0.28              | 92.59            | 93.25            | 92.79            | 93.25            | 0.000004            | 0.03              | 14.61             | 51.39            | 0.02         |
| River 1 | Reach 1-Upper | 534       | 2YrSCS24Hr   | 0.10              | 92.59            | 92.83            | 92.71            | 92.83            | 0.001214            | 0.25              | 0.39              | 3.03             | 0.22         |
| River 1 | Reach 1-Upper | 534       | 5YrSCS24Hr   | 0.16              | 92.59            | 92.94            | 92.75            | 92.95            | 0.000422            | 0.19              | 1.07              | 17.97            | 0.14         |
| River 1 | Reach 1-Upper | 534       | 10YrSCS24Hr  | 0.20              | 92.59            | 93.04            | 92.76            | 93.04            | 0.000064            | 0.09              | 4.23              | 42.61            | 0.06         |
| River 1 | Reach 1-Upper | 534       | 25YrSCS24Hr  | 0.26              | 92.59            | 93.25            | 92.78            | 93.25            | 0.000003            | 0.03              | 14.61             | 51.39            | 0.01         |
| River 1 | Reach 1-Upper | 534       | 50YrSCS24Hr  | 0.30              | 92.59            | 93.26            | 92.80            | 93.26            | 0.000004            | 0.03              | 14.99             | 51.42            | 0.02         |
| River 1 | Reach 1-Upper | 534       | 100YrSCS24Hr | 0.35              | 92.59            | 93.30            | 92.81            | 93.30            | 0.000004            | 0.03              | 17.46             | 51.60            | 0.02         |
| River 1 | Reach 1-Upper | 510       | 2YrCHI3Hr    | 0.06              | 92.60            | 92.71            | 92.67            | 92.72            | 0.005825            | 0.43              | 0.14              | 2.60             | 0.46         |
| River 1 | Reach 1-Upper | 510       | 5YrCHI3Hr    | 0.11              | 92.60            | 92.82            | 92.70            | 92.83            | 0.001169            | 0.34              | 0.32              | 4.18             | 0.24         |
| River 1 | Reach 1-Upper | 510       | 10YrCHI3Hr   | 0.15              | 92.60            | 92.90            | 92.72            | 92.90            | 0.000712            | 0.32              | 0.45              | 5.29             | 0.20         |
| River 1 | Reach 1-Upper | 510       | 25YrCHI3Hr   | 0.19              | 92.60            | 93.01            | 92.73            | 93.01            | 0.000421            | 0.31              | 0.62              | 14.09            | 0.16         |
| River 1 | Reach 1-Upper | 510       | 50YrCHI3Hr   | 0.23              | 92.60            | 93.18            | 92.75            | 93.19            | 0.000180            | 0.26              | 0.90              | 109.29           | 0.11         |
| River 1 | Reach 1-Upper | 510       | 100YrCHI3Hr  | 0.28              | 92.60            | 93.25            | 92.77            | 93.25            | 0.000000            | 0.01              | 42.37             | 109.53           | 0.00         |
| River 1 | Reach 1-Upper | 510       | 2YrSCS24Hr   | 0.10              | 92.60            | 92.79            | 92.69            | 92.80            | 0.001503            | 0.34              | 0.28              | 3.79             | 0.26         |
| River 1 | Reach 1-Upper | 510       | 5YrSCS24Hr   | 0.16              | 92.60            | 92.93            | 92.72            | 92.93            | 0.000617            | 0.32              | 0.49              | 5.78             | 0.19         |
| River 1 | Reach 1-Upper | 510       | 10YrSCS24Hr  | 0.20              | 92.60            | 93.03            | 92.74            | 93.04            | 0.000378            | 0.31              | 0.66              | 15.54            | 0.15         |
| River 1 | Reach 1-Upper | 510       | 25YrSCS24Hr  | 0.26              | 92.60            | 93.25            | 92.76            | 93.25            | 0.000000            | 0.01              | 42.37             | 109.53           | 0.00         |
| River 1 | Reach 1-Upper | 510       | 50YrSCS24Hr  | 0.30              | 92.60            | 93.26            | 92.78            | 93.26            | 0.000000            | 0.01              | 43.19             | 109.55           | 0.01         |
| River 1 | Reach 1-Upper | 510       | 100YrSCS24Hr | 0.35              | 92.60            | 93.30            | 92.79            | 93.30            | 0.000000            | 0.01              | 48.45             | 109.72           | 0.00         |
| River 1 | Reach 1-Upper | 505       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 502       | 2YrCHI3Hr    | 0.07              | 92.49            | 92.60            | 92.57            | 92.61            | 0.007956            | 0.50              | 0.13              | 2.20             | 0.54         |
| River 1 | Reach 1-Upper | 502       | 5YrCHI3Hr    | 0.12              | 92.49            | 92.65            | 92.60            | 92.67            | 0.006462            | 0.60              | 0.20              | 2.74             | 0.52         |
| River 1 | Reach 1-Upper | 502       | 10YrCHI3Hr   | 0.16              | 92.49            | 92.68            | 92.62            | 92.70            | 0.006042            | 0.66              | 0.25              | 3.06             | 0.52         |
| River 1 | Reach 1-Upper | 502       | 25YrCHI3Hr   | 0.22              | 92.49            | 92.73            | 92.64            | 92.76            | 0.004047            | 0.66              | 0.33              | 4.01             | 0.45         |
| River 1 | Reach 1-Upper | 502       | 50YrCHI3Hr   | 0.26              | 92.49            | 92.83            | 92.66            | 92.85            | 0.001665            | 0.54              | 0.48              | 5.45             | 0.31         |
| River 1 | Reach 1-Upper | 502       | 100YrCHI3Hr  | 0.31              | 92.49            | 92.99            | 92.68            | 93.00            | 0.000619            | 0.43              | 0.72              | 104.79           | 0.20         |
| River 1 | Reach 1-Upper | 502       | 2YrSCS24Hr   | 0.11              | 92.49            | 92.64            | 92.59            | 92.65            | 0.006729            | 0.58              | 0.19              | 2.62             | 0.53         |
| River 1 | Reach 1-Upper | 502       | 5YrSCS24Hr   | 0.18              | 92.49            | 92.69            | 92.63            | 92.71            | 0.005546            | 0.67              | 0.27              | 3.21             | 0.51         |
| River 1 | Reach 1-Upper | 502       | 10YrSCS24Hr  | 0.23              | 92.49            | 92.75            | 92.65            | 92.77            | 0.003381            | 0.64              | 0.36              | 4.41             | 0.42         |
| River 1 | Reach 1-Upper | 502       | 25YrSCS24Hr  | 0.29              | 92.49            | 92.92            | 92.67            | 92.94            | 0.000902            | 0.47              | 0.62              | 7.34             | 0.24         |
| River 1 | Reach 1-Upper | 502       | 50YrSCS24Hr  | 0.34              | 92.49            | 93.11            | 92.69            | 93.12            | 0.000353            | 0.38              | 0.90              | 105.15           | 0.16         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 502       | 100YrSCS24Hr | 0.40              | 92.49            | 93.30            | 92.71            | 93.30            | 0.000000            | 0.01              | 51.89             | 105.65           | 0.00         |
| River 1 | Reach 1-Upper | 493       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.60            | 92.42            | 92.60            | 0.000124            | 0.09              | 0.72              | 4.59             | 0.07         |
| River 1 | Reach 1-Upper | 493       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.65            | 92.45            | 92.65            | 0.000198            | 0.13              | 0.96              | 5.44             | 0.10         |
| River 1 | Reach 1-Upper | 493       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.68            | 92.46            | 92.68            | 0.000233            | 0.14              | 1.13              | 5.98             | 0.10         |
| River 1 | Reach 1-Upper | 493       | 25YrCHI3Hr   | 0.22              | 92.34            | 92.74            | 92.48            | 92.74            | 0.000196            | 0.14              | 1.51              | 6.84             | 0.10         |
| River 1 | Reach 1-Upper | 493       | 50YrCHI3Hr   | 0.26              | 92.34            | 92.84            | 92.49            | 92.84            | 0.000098            | 0.12              | 2.27              | 8.59             | 0.07         |
| River 1 | Reach 1-Upper | 493       | 100YrCHI3Hr  | 0.31              | 92.34            | 93.00            | 92.50            | 93.00            | 0.000001            | 0.02              | 28.79             | 101.37           | 0.01         |
| River 1 | Reach 1-Upper | 493       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.64            | 92.44            | 92.64            | 0.000183            | 0.12              | 0.90              | 5.23             | 0.09         |
| River 1 | Reach 1-Upper | 493       | 5YrSCS24Hr   | 0.18              | 92.34            | 92.70            | 92.46            | 92.70            | 0.000231            | 0.15              | 1.22              | 6.23             | 0.11         |
| River 1 | Reach 1-Upper | 493       | 10YrSCS24Hr  | 0.23              | 92.34            | 92.76            | 92.48            | 92.76            | 0.000169            | 0.14              | 1.63              | 7.02             | 0.09         |
| River 1 | Reach 1-Upper | 493       | 25YrSCS24Hr  | 0.29              | 92.34            | 92.93            | 92.50            | 92.93            | 0.000047            | 0.09              | 3.20              | 13.20            | 0.05         |
| River 1 | Reach 1-Upper | 493       | 50YrSCS24Hr  | 0.34              | 92.34            | 93.12            | 92.51            | 93.12            | 0.000001            | 0.01              | 41.12             | 102.01           | 0.01         |
| River 1 | Reach 1-Upper | 493       | 100YrSCS24Hr | 0.40              | 92.34            | 93.30            | 92.52            | 93.30            | 0.000000            | 0.01              | 60.16             | 102.98           | 0.00         |
| River 1 | Reach 1-Upper | 474       | 2YrCHI3Hr    | 0.07              | 92.41            | 92.60            | 92.50            | 92.60            | 0.000594            | 0.14              | 0.47              | 4.97             | 0.15         |
| River 1 | Reach 1-Upper | 474       | 5YrCHI3Hr    | 0.12              | 92.41            | 92.64            | 92.53            | 92.65            | 0.000595            | 0.17              | 0.72              | 5.95             | 0.16         |
| River 1 | Reach 1-Upper | 474       | 10YrCHI3Hr   | 0.16              | 92.41            | 92.67            | 92.54            | 92.68            | 0.000563            | 0.18              | 0.90              | 6.59             | 0.15         |
| River 1 | Reach 1-Upper | 474       | 25YrCHI3Hr   | 0.22              | 92.41            | 92.73            | 92.56            | 92.74            | 0.000352            | 0.16              | 1.33              | 7.87             | 0.13         |
| River 1 | Reach 1-Upper | 474       | 50YrCHI3Hr   | 0.26              | 92.41            | 92.84            | 92.57            | 92.84            | 0.000001            | 0.01              | 25.75             | 91.49            | 0.01         |
| River 1 | Reach 1-Upper | 474       | 100YrCHI3Hr  | 0.31              | 92.41            | 93.00            | 92.58            | 93.00            | 0.000000            | 0.01              | 40.12             | 92.20            | 0.01         |
| River 1 | Reach 1-Upper | 474       | 2YrSCS24Hr   | 0.11              | 92.41            | 92.63            | 92.52            | 92.63            | 0.000605            | 0.16              | 0.65              | 5.71             | 0.16         |
| River 1 | Reach 1-Upper | 474       | 5YrSCS24Hr   | 0.18              | 92.41            | 92.69            | 92.55            | 92.69            | 0.000512            | 0.18              | 1.00              | 6.89             | 0.15         |
| River 1 | Reach 1-Upper | 474       | 10YrSCS24Hr  | 0.23              | 92.41            | 92.75            | 92.56            | 92.75            | 0.000285            | 0.15              | 1.49              | 8.28             | 0.12         |
| River 1 | Reach 1-Upper | 474       | 25YrSCS24Hr  | 0.29              | 92.41            | 92.93            | 92.57            | 92.93            | 0.000001            | 0.01              | 33.86             | 91.89            | 0.01         |
| River 1 | Reach 1-Upper | 474       | 50YrSCS24Hr  | 0.34              | 92.41            | 93.12            | 92.58            | 93.12            | 0.000000            | 0.01              | 51.33             | 92.74            | 0.00         |
| River 1 | Reach 1-Upper | 474       | 100YrSCS24Hr | 0.40              | 92.41            | 93.30            | 92.59            | 93.30            | 0.000000            | 0.01              | 68.65             | 93.59            | 0.00         |
| River 1 | Reach 1-Upper | 454       | 2YrCHI3Hr    | 0.07              | 92.44            | 92.58            | 92.50            | 92.58            | 0.001576            | 0.24              | 0.28              | 2.85             | 0.24         |
| River 1 | Reach 1-Upper | 454       | 5YrCHI3Hr    | 0.12              | 92.44            | 92.62            | 92.53            | 92.63            | 0.001689            | 0.29              | 0.41              | 3.31             | 0.26         |
| River 1 | Reach 1-Upper | 454       | 10YrCHI3Hr   | 0.16              | 92.44            | 92.65            | 92.55            | 92.66            | 0.001595            | 0.31              | 0.52              | 3.64             | 0.26         |
| River 1 | Reach 1-Upper | 454       | 25YrCHI3Hr   | 0.22              | 92.44            | 92.72            | 92.56            | 92.72            | 0.000913            | 0.28              | 0.79              | 4.34             | 0.21         |
| River 1 | Reach 1-Upper | 454       | 50YrCHI3Hr   | 0.26              | 92.44            | 92.84            | 92.57            | 92.84            | 0.000012            | 0.04              | 12.27             | 82.88            | 0.03         |
| River 1 | Reach 1-Upper | 454       | 100YrCHI3Hr  | 0.31              | 92.44            | 93.00            | 92.59            | 93.00            | 0.000002            | 0.02              | 25.28             | 83.36            | 0.01         |
| River 1 | Reach 1-Upper | 454       | 2YrSCS24Hr   | 0.11              | 92.44            | 92.61            | 92.52            | 92.62            | 0.001709            | 0.28              | 0.38              | 3.19             | 0.26         |
| River 1 | Reach 1-Upper | 454       | 5YrSCS24Hr   | 0.18              | 92.44            | 92.67            | 92.55            | 92.67            | 0.001416            | 0.30              | 0.58              | 3.81             | 0.25         |
| River 1 | Reach 1-Upper | 454       | 10YrSCS24Hr  | 0.23              | 92.44            | 92.74            | 92.56            | 92.74            | 0.000715            | 0.26              | 0.88              | 4.56             | 0.18         |
| River 1 | Reach 1-Upper | 454       | 25YrSCS24Hr  | 0.29              | 92.44            | 92.93            | 92.58            | 92.93            | 0.000003            | 0.03              | 19.62             | 83.15            | 0.01         |
| River 1 | Reach 1-Upper | 454       | 50YrSCS24Hr  | 0.34              | 92.44            | 93.12            | 92.60            | 93.12            | 0.000001            | 0.02              | 35.41             | 83.72            | 0.01         |
| River 1 | Reach 1-Upper | 454       | 100YrSCS24Hr | 0.40              | 92.44            | 93.30            | 92.61            | 93.30            | 0.000000            | 0.01              | 51.02             | 84.29            | 0.00         |
| River 1 | Reach 1-Upper | 434       | 2YrCHI3Hr    | 0.07              | 92.42            | 92.53            | 92.49            | 92.54            | 0.003245            | 0.30              | 0.23              | 2.89             | 0.34         |
| River 1 | Reach 1-Upper | 434       | 5YrCHI3Hr    | 0.12              | 92.42            | 92.58            | 92.51            | 92.59            | 0.002201            | 0.32              | 0.38              | 3.34             | 0.30         |
| River 1 | Reach 1-Upper | 434       | 10YrCHI3Hr   | 0.16              | 92.42            | 92.62            | 92.52            | 92.62            | 0.001702            | 0.32              | 0.51              | 3.67             | 0.27         |
| River 1 | Reach 1-Upper | 434       | 25YrCHI3Hr   | 0.22              | 92.42            | 92.72            | 92.54            | 92.72            | 0.000099            | 0.09              | 4.19              | 44.55            | 0.07         |
| River 1 | Reach 1-Upper | 434       | 50YrCHI3Hr   | 0.26              | 92.42            | 92.84            | 92.55            | 92.84            | 0.000011            | 0.04              | 12.14             | 73.98            | 0.02         |
| River 1 | Reach 1-Upper | 434       | 100YrCHI3Hr  | 0.31              | 92.42            | 93.00            | 92.56            | 93.00            | 0.000002            | 0.02              | 23.78             | 74.52            | 0.01         |
| River 1 | Reach 1-Upper | 434       | 2YrSCS24Hr   | 0.11              | 92.42            | 92.57            | 92.50            | 92.57            | 0.002433            | 0.31              | 0.34              | 3.22             | 0.31         |
| River 1 | Reach 1-Upper | 434       | 5YrSCS24Hr   | 0.18              | 92.42            | 92.64            | 92.53            | 92.64            | 0.001593            | 0.30              | 0.59              | 4.31             | 0.26         |
| River 1 | Reach 1-Upper | 434       | 10YrSCS24Hr  | 0.23              | 92.42            | 92.74            | 92.54            | 92.74            | 0.000062            | 0.08              | 5.30              | 52.04            | 0.05         |
| River 1 | Reach 1-Upper | 434       | 25YrSCS24Hr  | 0.29              | 92.42            | 92.93            | 92.55            | 92.93            | 0.000003            | 0.03              | 18.72             | 74.29            | 0.01         |
| River 1 | Reach 1-Upper | 434       | 50YrSCS24Hr  | 0.34              | 92.42            | 93.12            | 92.57            | 93.12            | 0.000001            | 0.02              | 32.84             | 74.94            | 0.01         |
| River 1 | Reach 1-Upper | 434       | 100YrSCS24Hr | 0.40              | 92.42            | 93.30            | 92.58            | 93.30            | 0.000000            | 0.01              | 46.84             | 75.66            | 0.00         |
| River 1 | Reach 1-Upper | 416       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.51            | 92.42            | 92.51            | 0.000622            | 0.15              | 0.44              | 4.70             | 0.15         |
| River 1 | Reach 1-Upper | 416       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.57            | 92.45            | 92.57            | 0.000424            | 0.17              | 0.75              | 5.83             | 0.14         |
| River 1 | Reach 1-Upper | 416       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.62            | 92.46            | 92.62            | 0.000159            | 0.12              | 2.27              | 28.78            | 0.09         |
| River 1 | Reach 1-Upper | 416       | 25YrCHI3Hr   | 0.22              | 92.34            | 92.72            | 92.48            | 92.72            | 0.000031            | 0.07              | 5.56              | 35.85            | 0.04         |
| River 1 | Reach 1-Upper | 416       | 50YrCHI3Hr   | 0.26              | 92.34            | 92.84            | 92.48            | 92.84            | 0.000008            | 0.05              | 10.70             | 48.52            | 0.02         |
| River 1 | Reach 1-Upper | 416       | 100YrCHI3Hr  | 0.31              | 92.34            | 93.00            | 92.49            | 93.00            | 0.000002            | 0.03              | 20.27             | 66.96            | 0.01         |
| River 1 | Reach 1-Upper | 416       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.56            | 92.44            | 92.56            | 0.000463            | 0.17              | 0.67              | 5.55             | 0.14         |
| River 1 | Reach 1-Upper | 416       | 5YrSCS24Hr   | 0.18              | 92.34            | 92.64            | 92.47            | 92.64            | 0.000108            | 0.11              | 2.88              | 30.23            | 0.07         |
| River 1 | Reach 1-Upper | 416       | 10YrSCS24Hr  | 0.23              | 92.34            | 92.74            | 92.48            | 92.74            | 0.000024            | 0.07              | 6.41              | 39.28            | 0.04         |
| River 1 | Reach 1-Upper | 416       | 25YrSCS24Hr  | 0.29              | 92.34            | 92.93            | 92.49            | 92.93            | 0.000004            | 0.04              | 15.73             | 65.04            | 0.02         |
| River 1 | Reach 1-Upper | 416       | 50YrSCS24Hr  | 0.34              | 92.34            | 93.12            | 92.50            | 93.12            | 0.000001            | 0.02              | 28.42             | 67.40            | 0.01         |
| River 1 | Reach 1-Upper | 416       | 100YrSCS24Hr | 0.40              | 92.34            | 93.30            | 92.51            | 93.30            | 0.000000            | 0.02              | 41.01             | 68.07            | 0.01         |
| River 1 | Reach 1-Upper | 398       | 2YrCHI3Hr    | 0.07              | 92.28            | 92.50            | 92.40            | 92.50            | 0.000933            | 0.21              | 0.31              | 2.50             | 0.19         |
| River 1 | Reach 1-Upper | 398       | 5YrCHI3Hr    | 0.12              | 92.28            | 92.56            | 92.42            | 92.56            | 0.000915            | 0.26              | 0.47              | 2.86             | 0.20         |
| River 1 | Reach 1-Upper | 398       | 10YrCHI3Hr   | 0.16              | 92.28            | 92.61            | 92.44            | 92.61            | 0.000752            | 0.26              | 0.62              | 3.16             | 0.19         |
| River 1 | Reach 1-Upper | 398       | 25YrCHI3Hr   | 0.22              | 92.28            | 92.71            | 92.46            | 92.72            | 0.000355            | 0.22              | 1.01              | 4.66             | 0.14         |
| River 1 | Reach 1-Upper | 398       | 50YrCHI3Hr   | 0.26              | 92.28            | 92.84            | 92.47            | 92.84            | 0.000076            | 0.12              | 4.26              | 46.30            | 0.07         |
| River 1 | Reach 1-Upper | 398       | 100YrCHI3Hr  | 0.31              | 92.28            | 93.00            | 92.49            | 93.00            | 0.000008            | 0.05              | 12.80             | 58.61            | 0.02         |
| River 1 | Reach 1-Upper | 398       | 2YrSCS24Hr   | 0.11              | 92.28            | 92.54            | 92.42            | 92.55            | 0.000935            | 0.25              | 0.43              | 2.77             | 0.20         |
| River 1 | Reach 1-Upper | 398       | 5YrSCS24Hr   | 0.18              | 92.28            | 92.63            | 92.44            | 92.63            | 0.000660            | 0.26              | 0.69              | 3.29             | 0.18         |
| River 1 | Reach 1-Upper | 398       | 10YrSCS24Hr  | 0.23              | 92.28            | 92.74            | 92.46            | 92.74            | 0.000295            | 0.21              | 1.13              | 5.59             | 0.12         |
| River 1 | Reach 1-Upper | 398       | 25YrSCS24Hr  | 0.29              | 92.28            | 92.93            | 92.48            | 92.93            | 0.000020            | 0.07              | 8.81              | 58.42            | 0.03         |
| River 1 | Reach 1-Upper | 398       | 50YrSCS24Hr  | 0.34              | 92.28            | 93.12            | 92.50            | 93.12            | 0.000003            | 0.03              | 19.93             | 58.96            | 0.01         |
| River 1 | Reach 1-Upper | 398       | 100YrSCS24Hr | 0.40              | 92.28            | 93.30            | 92.51            | 93.30            | 0.000001            | 0.02              | 30.94             | 59.51            | 0.01         |
| River 1 | Reach 1-Upper | 383       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.47            | 92.42            | 92.47            | 0.004536            | 0.39              | 0.17              | 1.90             | 0.41         |
| River 1 | Reach 1-Upper | 383       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.53            | 92.45            | 92.54            | 0.002876            | 0.39              | 0.31              | 2.30             | 0.34         |
| River 1 | Reach 1-Upper | 383       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.59            | 92.47            | 92.59            | 0.001737            | 0.36              | 0.45              | 2.62             | 0.28         |
| River 1 | Reach 1-Upper | 383       | 25YrCHI3Hr   | 0.22              | 92.34            | 92.70            | 92.49            | 92.71            | 0.000630            | 0.27              | 0.80              | 3.29             | 0.18         |
| River 1 | Reach 1-Upper | 383       | 50YrCHI3Hr   | 0.26              | 92.34            | 92.83            | 92.50            | 92.84            | 0.000255            | 0.21              | 1.27              | 4.01             | 0.12         |
| River 1 | Reach 1-Upper | 383       | 100YrCHI3Hr  | 0.31              | 92.34            | 92.99            | 92.52            | 93.00            | 0.000100            | 0.16              | 2.02              | 5.50             | 0.08         |
| River 1 | Reach 1-Upper | 383       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.51            | 92.44            | 92.52            | 0.003262            | 0.40              | 0.27              | 2.21             | 0.36         |
| River 1 | Reach 1-Upper | 383       | 5YrSCS24Hr   | 0.18              | 92.34            | 92.61            | 92.47            | 92.62            | 0.001389            | 0.34              | 0.52              | 2.77             | 0.25         |
| River 1 | Reach 1-Upper | 383       | 10YrSCS24Hr  | 0.23              | 92.34            | 92.73            | 92.49            | 92.73            | 0.000520            | 0.26              | 0.88              | 3.42             | 0.16         |
| River 1 | Reach 1-Upper | 383       | 25YrSCS24Hr  | 0.29              | 92.34            | 92.93            | 92.51            | 92.93            | 0.000147            | 0.18              | 1.66              | 4.73             | 0.09         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 383       | 50YrSCS24Hr  | 0.34              | 92.34            | 93.12            | 92.53            | 93.12            | 0.000005            | 0.04              | 15.00             | 51.87            | 0.02         |
| River 1 | Reach 1-Upper | 383       | 100YrSCS24Hr | 0.40              | 92.34            | 93.30            | 92.54            | 93.30            | 0.000002            | 0.03              | 24.70             | 52.43            | 0.01         |
| River 1 | Reach 1-Upper | 364       | 2YrCHI3Hr    | 0.07              | 92.23            | 92.43            | 92.33            | 92.43            | 0.001355            | 0.26              | 0.26              | 2.01             | 0.23         |
| River 1 | Reach 1-Upper | 364       | 5YrCHI3Hr    | 0.12              | 92.23            | 92.50            | 92.36            | 92.50            | 0.001099            | 0.29              | 0.42              | 2.37             | 0.22         |
| River 1 | Reach 1-Upper | 364       | 10YrCHI3Hr   | 0.16              | 92.23            | 92.57            | 92.38            | 92.57            | 0.000740            | 0.27              | 0.59              | 2.71             | 0.19         |
| River 1 | Reach 1-Upper | 364       | 25YrCHI3Hr   | 0.22              | 92.23            | 92.70            | 92.40            | 92.70            | 0.000331            | 0.22              | 0.98              | 3.34             | 0.13         |
| River 1 | Reach 1-Upper | 364       | 50YrCHI3Hr   | 0.26              | 92.23            | 92.83            | 92.42            | 92.83            | 0.000166            | 0.18              | 1.48              | 4.20             | 0.10         |
| River 1 | Reach 1-Upper | 364       | 100YrCHI3Hr  | 0.31              | 92.23            | 92.99            | 92.43            | 92.99            | 0.000050            | 0.12              | 4.53              | 43.93            | 0.06         |
| River 1 | Reach 1-Upper | 364       | 2YrSCS24Hr   | 0.11              | 92.23            | 92.48            | 92.35            | 92.48            | 0.001197            | 0.29              | 0.37              | 2.27             | 0.23         |
| River 1 | Reach 1-Upper | 364       | 5YrSCS24Hr   | 0.18              | 92.23            | 92.60            | 92.39            | 92.60            | 0.000621            | 0.26              | 0.67              | 2.85             | 0.17         |
| River 1 | Reach 1-Upper | 364       | 10YrSCS24Hr  | 0.23              | 92.23            | 92.72            | 92.41            | 92.73            | 0.000283            | 0.21              | 1.07              | 3.47             | 0.12         |
| River 1 | Reach 1-Upper | 364       | 25YrSCS24Hr  | 0.29              | 92.23            | 92.92            | 92.43            | 92.93            | 0.000099            | 0.15              | 1.93              | 5.59             | 0.08         |
| River 1 | Reach 1-Upper | 364       | 50YrSCS24Hr  | 0.34              | 92.23            | 93.12            | 92.44            | 93.12            | 0.000012            | 0.07              | 9.97              | 44.25            | 0.03         |
| River 1 | Reach 1-Upper | 364       | 100YrSCS24Hr | 0.40              | 92.23            | 93.30            | 92.46            | 93.30            | 0.000003            | 0.04              | 18.26             | 45.01            | 0.01         |
| River 1 | Reach 1-Upper | 347       | 2YrCHI3Hr    | 0.07              | 92.26            | 92.40            | 92.33            | 92.41            | 0.001382            | 0.24              | 0.27              | 2.45             | 0.23         |
| River 1 | Reach 1-Upper | 347       | 5YrCHI3Hr    | 0.12              | 92.26            | 92.49            | 92.35            | 92.49            | 0.000808            | 0.25              | 0.49              | 2.80             | 0.19         |
| River 1 | Reach 1-Upper | 347       | 10YrCHI3Hr   | 0.16              | 92.26            | 92.56            | 92.36            | 92.56            | 0.000488            | 0.23              | 0.71              | 3.12             | 0.15         |
| River 1 | Reach 1-Upper | 347       | 25YrCHI3Hr   | 0.22              | 92.26            | 92.69            | 92.38            | 92.70            | 0.000213            | 0.19              | 1.16              | 3.69             | 0.11         |
| River 1 | Reach 1-Upper | 347       | 50YrCHI3Hr   | 0.26              | 92.26            | 92.83            | 92.40            | 92.83            | 0.000107            | 0.15              | 1.71              | 4.28             | 0.08         |
| River 1 | Reach 1-Upper | 347       | 100YrCHI3Hr  | 0.31              | 92.26            | 92.99            | 92.41            | 92.99            | 0.000050            | 0.13              | 2.54              | 7.35             | 0.06         |
| River 1 | Reach 1-Upper | 347       | 2YrSCS24Hr   | 0.11              | 92.26            | 92.46            | 92.34            | 92.47            | 0.000932            | 0.25              | 0.43              | 2.71             | 0.20         |
| River 1 | Reach 1-Upper | 347       | 5YrSCS24Hr   | 0.18              | 92.26            | 92.59            | 92.37            | 92.59            | 0.000403            | 0.22              | 0.80              | 3.25             | 0.14         |
| River 1 | Reach 1-Upper | 347       | 10YrSCS24Hr  | 0.23              | 92.26            | 92.72            | 92.39            | 92.72            | 0.000183            | 0.18              | 1.26              | 3.81             | 0.10         |
| River 1 | Reach 1-Upper | 347       | 25YrSCS24Hr  | 0.29              | 92.26            | 92.92            | 92.41            | 92.92            | 0.000071            | 0.14              | 2.13              | 5.02             | 0.07         |
| River 1 | Reach 1-Upper | 347       | 50YrSCS24Hr  | 0.34              | 92.26            | 93.12            | 92.42            | 93.12            | 0.000020            | 0.09              | 6.30              | 37.59            | 0.04         |
| River 1 | Reach 1-Upper | 347       | 100YrSCS24Hr | 0.40              | 92.26            | 93.30            | 92.43            | 93.30            | 0.000005            | 0.06              | 13.35             | 38.07            | 0.02         |
| River 1 | Reach 1-Upper | 328       | 2YrCHI3Hr    | 0.07              | 92.20            | 92.37            | 92.28            | 92.38            | 0.001873            | 0.30              | 0.22              | 1.82             | 0.27         |
| River 1 | Reach 1-Upper | 328       | 5YrCHI3Hr    | 0.12              | 92.20            | 92.47            | 92.32            | 92.47            | 0.001020            | 0.29              | 0.42              | 2.24             | 0.21         |
| River 1 | Reach 1-Upper | 328       | 10YrCHI3Hr   | 0.16              | 92.20            | 92.55            | 92.34            | 92.55            | 0.000618            | 0.26              | 0.61              | 2.58             | 0.17         |
| River 1 | Reach 1-Upper | 328       | 25YrCHI3Hr   | 0.22              | 92.20            | 92.69            | 92.36            | 92.69            | 0.000277            | 0.21              | 1.02              | 3.16             | 0.12         |
| River 1 | Reach 1-Upper | 328       | 50YrCHI3Hr   | 0.26              | 92.20            | 92.83            | 92.38            | 92.83            | 0.000152            | 0.17              | 1.51              | 4.11             | 0.09         |
| River 1 | Reach 1-Upper | 328       | 100YrCHI3Hr  | 0.31              | 92.20            | 92.99            | 92.40            | 92.99            | 0.000074            | 0.14              | 2.26              | 5.12             | 0.07         |
| River 1 | Reach 1-Upper | 328       | 2YrSCS24Hr   | 0.11              | 92.20            | 92.44            | 92.31            | 92.45            | 0.001182            | 0.29              | 0.36              | 2.14             | 0.23         |
| River 1 | Reach 1-Upper | 328       | 5YrSCS24Hr   | 0.18              | 92.20            | 92.58            | 92.34            | 92.58            | 0.000513            | 0.25              | 0.70              | 2.71             | 0.16         |
| River 1 | Reach 1-Upper | 328       | 10YrSCS24Hr  | 0.23              | 92.20            | 92.72            | 92.36            | 92.72            | 0.000240            | 0.21              | 1.11              | 3.28             | 0.11         |
| River 1 | Reach 1-Upper | 328       | 25YrSCS24Hr  | 0.29              | 92.20            | 92.92            | 92.39            | 92.92            | 0.000098            | 0.15              | 1.92              | 4.61             | 0.07         |
| River 1 | Reach 1-Upper | 328       | 50YrSCS24Hr  | 0.34              | 92.20            | 93.12            | 92.40            | 93.12            | 0.000035            | 0.11              | 4.57              | 29.52            | 0.05         |
| River 1 | Reach 1-Upper | 328       | 100YrSCS24Hr | 0.40              | 92.20            | 93.30            | 92.42            | 93.30            | 0.000009            | 0.06              | 10.13             | 29.96            | 0.02         |
| River 1 | Reach 1-Upper | 306       | 2YrCHI3Hr    | 0.07              | 92.07            | 92.35            | 92.18            | 92.35            | 0.000722            | 0.25              | 0.27              | 1.49             | 0.18         |
| River 1 | Reach 1-Upper | 306       | 5YrCHI3Hr    | 0.12              | 92.07            | 92.45            | 92.23            | 92.45            | 0.000689            | 0.30              | 0.40              | 1.84             | 0.18         |
| River 1 | Reach 1-Upper | 306       | 10YrCHI3Hr   | 0.16              | 92.07            | 92.53            | 92.25            | 92.54            | 0.000559            | 0.31              | 0.52              | 2.13             | 0.17         |
| River 1 | Reach 1-Upper | 306       | 25YrCHI3Hr   | 0.22              | 92.07            | 92.68            | 92.28            | 92.68            | 0.000321            | 0.29              | 0.74              | 2.69             | 0.13         |
| River 1 | Reach 1-Upper | 306       | 50YrCHI3Hr   | 0.26              | 92.07            | 92.82            | 92.30            | 92.82            | 0.000203            | 0.28              | 0.95              | 3.29             | 0.11         |
| River 1 | Reach 1-Upper | 306       | 100YrCHI3Hr  | 0.31              | 92.07            | 92.99            | 92.32            | 92.99            | 0.000131            | 0.26              | 1.20              | 4.54             | 0.09         |
| River 1 | Reach 1-Upper | 306       | 2YrSCS24Hr   | 0.11              | 92.07            | 92.42            | 92.21            | 92.43            | 0.000712            | 0.29              | 0.37              | 1.75             | 0.18         |
| River 1 | Reach 1-Upper | 306       | 5YrSCS24Hr   | 0.18              | 92.07            | 92.57            | 92.26            | 92.57            | 0.000497            | 0.31              | 0.58              | 2.25             | 0.16         |
| River 1 | Reach 1-Upper | 306       | 10YrSCS24Hr  | 0.23              | 92.07            | 92.71            | 92.28            | 92.71            | 0.000290            | 0.29              | 0.79              | 2.81             | 0.13         |
| River 1 | Reach 1-Upper | 306       | 25YrSCS24Hr  | 0.29              | 92.07            | 92.91            | 92.31            | 92.92            | 0.000156            | 0.27              | 1.10              | 3.90             | 0.10         |
| River 1 | Reach 1-Upper | 306       | 50YrSCS24Hr  | 0.34              | 92.07            | 93.11            | 92.33            | 93.11            | 0.000098            | 0.25              | 1.39              | 20.53            | 0.08         |
| River 1 | Reach 1-Upper | 306       | 100YrSCS24Hr | 0.40              | 92.07            | 93.30            | 92.36            | 93.30            | 0.000072            | 0.24              | 1.67              | 20.98            | 0.07         |
| River 1 | Reach 1-Upper | 300       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Upper | 294       | 2YrCHI3Hr    | 0.07              | 92.15            | 92.32            | 92.23            | 92.32            | 0.001567            | 0.31              | 0.22              | 2.08             | 0.26         |
| River 1 | Reach 1-Upper | 294       | 5YrCHI3Hr    | 0.12              | 92.15            | 92.37            | 92.26            | 92.38            | 0.001840            | 0.41              | 0.29              | 2.34             | 0.30         |
| River 1 | Reach 1-Upper | 294       | 10YrCHI3Hr   | 0.16              | 92.15            | 92.39            | 92.28            | 92.41            | 0.002165            | 0.49              | 0.33              | 2.48             | 0.33         |
| River 1 | Reach 1-Upper | 294       | 25YrCHI3Hr   | 0.22              | 92.15            | 92.42            | 92.30            | 92.44            | 0.002528            | 0.57              | 0.38              | 2.64             | 0.36         |
| River 1 | Reach 1-Upper | 294       | 50YrCHI3Hr   | 0.26              | 92.15            | 92.45            | 92.32            | 92.47            | 0.002769            | 0.63              | 0.41              | 2.76             | 0.38         |
| River 1 | Reach 1-Upper | 294       | 100YrCHI3Hr  | 0.31              | 92.15            | 92.47            | 92.33            | 92.49            | 0.002956            | 0.69              | 0.45              | 2.87             | 0.40         |
| River 1 | Reach 1-Upper | 294       | 2YrSCS24Hr   | 0.11              | 92.15            | 92.36            | 92.25            | 92.36            | 0.001762            | 0.39              | 0.28              | 2.28             | 0.29         |
| River 1 | Reach 1-Upper | 294       | 5YrSCS24Hr   | 0.18              | 92.15            | 92.40            | 92.28            | 92.41            | 0.002296            | 0.51              | 0.35              | 2.52             | 0.34         |
| River 1 | Reach 1-Upper | 294       | 10YrSCS24Hr  | 0.23              | 92.15            | 92.43            | 92.30            | 92.45            | 0.002610            | 0.59              | 0.39              | 2.66             | 0.37         |
| River 1 | Reach 1-Upper | 294       | 25YrSCS24Hr  | 0.29              | 92.15            | 92.46            | 92.33            | 92.48            | 0.002895            | 0.67              | 0.43              | 2.82             | 0.40         |
| River 1 | Reach 1-Upper | 294       | 50YrSCS24Hr  | 0.34              | 92.15            | 92.48            | 92.35            | 92.51            | 0.003128            | 0.73              | 0.47              | 2.94             | 0.42         |
| River 1 | Reach 1-Upper | 294       | 100YrSCS24Hr | 0.40              | 92.15            | 92.50            | 92.36            | 92.54            | 0.003396            | 0.80              | 0.50              | 3.05             | 0.44         |
| River 1 | Reach 1-Upper | 279       | 2YrCHI3Hr    | 0.08              | 92.08            | 92.21            | 92.21            | 92.24            | 0.029991            | 0.80              | 0.10              | 1.51             | 0.99         |
| River 1 | Reach 1-Upper | 279       | 5YrCHI3Hr    | 0.15              | 92.08            | 92.25            | 92.24            | 92.29            | 0.026320            | 0.91              | 0.16              | 1.84             | 0.98         |
| River 1 | Reach 1-Upper | 279       | 10YrCHI3Hr   | 0.20              | 92.08            | 92.28            |                  | 92.32            | 0.017826            | 0.87              | 0.23              | 2.04             | 0.83         |
| River 1 | Reach 1-Upper | 279       | 25YrCHI3Hr   | 0.27              | 92.08            | 92.32            |                  | 92.36            | 0.013314            | 0.86              | 0.31              | 2.27             | 0.74         |
| River 1 | Reach 1-Upper | 279       | 50YrCHI3Hr   | 0.32              | 92.08            | 92.34            |                  | 92.38            | 0.011695            | 0.87              | 0.37              | 2.42             | 0.71         |
| River 1 | Reach 1-Upper | 279       | 100YrCHI3Hr  | 0.38              | 92.08            | 92.37            |                  | 92.41            | 0.010643            | 0.88              | 0.43              | 2.57             | 0.69         |
| River 1 | Reach 1-Upper | 279       | 2YrSCS24Hr   | 0.13              | 92.08            | 92.23            | 92.23            | 92.28            | 0.029039            | 0.90              | 0.14              | 1.75             | 1.01         |
| River 1 | Reach 1-Upper | 279       | 5YrSCS24Hr   | 0.22              | 92.08            | 92.29            |                  | 92.33            | 0.015917            | 0.86              | 0.25              | 2.10             | 0.80         |
| River 1 | Reach 1-Upper | 279       | 10YrSCS24Hr  | 0.28              | 92.08            | 92.32            |                  | 92.36            | 0.012955            | 0.86              | 0.32              | 2.30             | 0.74         |
| River 1 | Reach 1-Upper | 279       | 25YrSCS24Hr  | 0.36              | 92.08            | 92.36            |                  | 92.40            | 0.011055            | 0.88              | 0.41              | 2.51             | 0.70         |
| River 1 | Reach 1-Upper | 279       | 50YrSCS24Hr  | 0.42              | 92.08            | 92.38            |                  | 92.42            | 0.010063            | 0.89              | 0.47              | 2.66             | 0.67         |
| River 1 | Reach 1-Upper | 279       | 100YrSCS24Hr | 0.49              | 92.08            | 92.41            |                  | 92.45            | 0.009502            | 0.91              | 0.54              | 2.81             | 0.66         |
| River 1 | Reach 1-Upper | 277       | 2YrCHI3Hr    | 0.08              | 91.95            | 92.20            |                  | 92.21            | 0.000695            | 0.21              | 0.39              | 2.70             | 0.17         |
| River 1 | Reach 1-Upper | 277       | 5YrCHI3Hr    | 0.15              | 91.95            | 92.26            |                  | 92.26            | 0.000856            | 0.28              | 0.54              | 3.02             | 0.20         |
| River 1 | Reach 1-Upper | 277       | 10YrCHI3Hr   | 0.20              | 91.95            | 92.29            |                  | 92.30            | 0.000927            | 0.32              | 0.64              | 3.19             | 0.21         |
| River 1 | Reach 1-Upper | 277       | 25YrCHI3Hr   | 0.27              | 91.95            | 92.33            |                  | 92.33            | 0.001006            | 0.37              | 0.76              | 3.41             | 0.23         |
| River 1 | Reach 1-Upper | 277       | 50YrCHI3Hr   | 0.32              | 91.95            | 92.35            |                  | 92.36            | 0.001068            | 0.41              | 0.85              | 3.55             | 0.24         |
| River 1 | Reach 1-Upper | 277       | 100YrCHI3Hr  | 0.38              | 91.95            | 92.38            |                  | 92.39            | 0.001131            | 0.44              | 0.95              | 3.69             | 0.25         |
| River 1 | Reach 1-Upper | 277       | 2YrSCS24Hr   | 0.13              | 91.95            | 92.25            |                  | 92.25            | 0.000826            | 0.26              | 0.50              | 2.94             | 0.20         |

HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 277       | 5YrSCS24Hr   | 0.22              | 91.95            | 92.30            |                  | 92.31            | 0.000941            | 0.33              | 0.68              | 3.25             | 0.22         |
| River 1 | Reach 1-Upper | 277       | 10YrSCS24Hr  | 0.28              | 91.95            | 92.33            |                  | 92.34            | 0.001018            | 0.38              | 0.78              | 3.43             | 0.23         |
| River 1 | Reach 1-Upper | 277       | 25YrSCS24Hr  | 0.36              | 91.95            | 92.37            |                  | 92.38            | 0.001104            | 0.43              | 0.91              | 3.63             | 0.25         |
| River 1 | Reach 1-Upper | 277       | 50YrSCS24Hr  | 0.42              | 91.95            | 92.39            |                  | 92.40            | 0.001159            | 0.46              | 1.00              | 3.77             | 0.26         |
| River 1 | Reach 1-Upper | 277       | 100YrSCS24Hr | 0.49              | 91.95            | 92.42            |                  | 92.43            | 0.001229            | 0.50              | 1.09              | 3.91             | 0.27         |
| River 1 | Reach 1-Upper | 270       | 2YrCHI3Hr    | 0.08              | 92.03            | 92.20            |                  | 92.20            | 0.001692            | 0.27              | 0.29              | 2.60             | 0.26         |
| River 1 | Reach 1-Upper | 270       | 5YrCHI3Hr    | 0.15              | 92.03            | 92.25            |                  | 92.25            | 0.001753            | 0.33              | 0.45              | 3.07             | 0.27         |
| River 1 | Reach 1-Upper | 270       | 10YrCHI3Hr   | 0.20              | 92.03            | 92.28            |                  | 92.29            | 0.001743            | 0.36              | 0.55              | 3.36             | 0.28         |
| River 1 | Reach 1-Upper | 270       | 25YrCHI3Hr   | 0.27              | 92.03            | 92.32            |                  | 92.33            | 0.001732            | 0.40              | 0.68              | 3.72             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 50YrCHI3Hr   | 0.32              | 92.03            | 92.34            |                  | 92.35            | 0.001721            | 0.42              | 0.78              | 4.13             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 100YrCHI3Hr  | 0.38              | 92.03            | 92.37            |                  | 92.38            | 0.001663            | 0.45              | 0.90              | 5.00             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 2YrSCS24Hr   | 0.13              | 92.03            | 92.24            |                  | 92.24            | 0.001760            | 0.32              | 0.40              | 2.95             | 0.27         |
| River 1 | Reach 1-Upper | 270       | 5YrSCS24Hr   | 0.22              | 92.03            | 92.29            |                  | 92.30            | 0.001717            | 0.37              | 0.58              | 3.47             | 0.28         |
| River 1 | Reach 1-Upper | 270       | 10YrSCS24Hr  | 0.28              | 92.03            | 92.32            |                  | 92.33            | 0.001734            | 0.40              | 0.70              | 3.76             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 25YrSCS24Hr  | 0.36              | 92.03            | 92.36            |                  | 92.37            | 0.001687            | 0.44              | 0.84              | 4.62             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 50YrSCS24Hr  | 0.42              | 92.03            | 92.38            |                  | 92.39            | 0.001617            | 0.46              | 0.97              | 5.51             | 0.29         |
| River 1 | Reach 1-Upper | 270       | 100YrSCS24Hr | 0.49              | 92.03            | 92.41            |                  | 92.42            | 0.001578            | 0.48              | 1.11              | 5.76             | 0.29         |
| River 1 | Reach 1-Upper | 261       | 2YrCHI3Hr    | 0.08              | 92.00            | 92.18            | 92.10            | 92.18            | 0.002216            | 0.32              | 0.25              | 2.09             | 0.30         |
| River 1 | Reach 1-Upper | 261       | 5YrCHI3Hr    | 0.15              | 92.00            | 92.23            | 92.13            | 92.24            | 0.002543            | 0.41              | 0.36              | 2.34             | 0.33         |
| River 1 | Reach 1-Upper | 261       | 10YrCHI3Hr   | 0.20              | 92.00            | 92.26            | 92.15            | 92.27            | 0.002719            | 0.46              | 0.43              | 2.48             | 0.35         |
| River 1 | Reach 1-Upper | 261       | 25YrCHI3Hr   | 0.27              | 92.00            | 92.29            | 92.18            | 92.31            | 0.002882            | 0.51              | 0.52              | 2.66             | 0.37         |
| River 1 | Reach 1-Upper | 261       | 50YrCHI3Hr   | 0.32              | 92.00            | 92.32            | 92.19            | 92.33            | 0.003012            | 0.55              | 0.59              | 2.78             | 0.38         |
| River 1 | Reach 1-Upper | 261       | 100YrCHI3Hr  | 0.38              | 92.00            | 92.34            | 92.21            | 92.36            | 0.003124            | 0.58              | 0.66              | 2.90             | 0.39         |
| River 1 | Reach 1-Upper | 261       | 2YrSCS24Hr   | 0.13              | 92.00            | 92.22            | 92.12            | 92.22            | 0.002466            | 0.39              | 0.33              | 2.27             | 0.32         |
| River 1 | Reach 1-Upper | 261       | 5YrSCS24Hr   | 0.22              | 92.00            | 92.27            | 92.16            | 92.28            | 0.002719            | 0.47              | 0.46              | 2.53             | 0.35         |
| River 1 | Reach 1-Upper | 261       | 10YrSCS24Hr  | 0.28              | 92.00            | 92.30            | 92.18            | 92.31            | 0.002908            | 0.52              | 0.54              | 2.68             | 0.37         |
| River 1 | Reach 1-Upper | 261       | 25YrSCS24Hr  | 0.36              | 92.00            | 92.33            | 92.20            | 92.35            | 0.003077            | 0.57              | 0.63              | 2.84             | 0.38         |
| River 1 | Reach 1-Upper | 261       | 50YrSCS24Hr  | 0.42              | 92.00            | 92.36            | 92.22            | 92.38            | 0.003155            | 0.60              | 0.70              | 2.97             | 0.39         |
| River 1 | Reach 1-Upper | 261       | 100YrSCS24Hr | 0.49              | 92.00            | 92.38            | 92.24            | 92.40            | 0.003314            | 0.63              | 0.77              | 3.10             | 0.41         |
| River 1 | Reach 1-Upper | 239       | 2YrCHI3Hr    | 0.08              | 91.93            | 92.05            | 92.03            | 92.07            | 0.018146            | 0.68              | 0.12              | 1.54             | 0.79         |
| River 1 | Reach 1-Upper | 239       | 5YrCHI3Hr    | 0.15              | 91.93            | 92.09            | 92.07            | 92.12            | 0.014163            | 0.75              | 0.20              | 1.88             | 0.73         |
| River 1 | Reach 1-Upper | 239       | 10YrCHI3Hr   | 0.20              | 91.93            | 92.12            | 92.09            | 92.15            | 0.012598            | 0.78              | 0.25              | 2.06             | 0.71         |
| River 1 | Reach 1-Upper | 239       | 25YrCHI3Hr   | 0.27              | 91.93            | 92.15            | 92.12            | 92.19            | 0.011181            | 0.82              | 0.33              | 2.23             | 0.69         |
| River 1 | Reach 1-Upper | 239       | 50YrCHI3Hr   | 0.32              | 91.93            | 92.18            | 92.13            | 92.21            | 0.010479            | 0.85              | 0.38              | 2.36             | 0.68         |
| River 1 | Reach 1-Upper | 239       | 100YrCHI3Hr  | 0.38              | 91.93            | 92.20            | 92.15            | 92.24            | 0.009912            | 0.88              | 0.44              | 2.49             | 0.67         |
| River 1 | Reach 1-Upper | 239       | 2YrSCS24Hr   | 0.13              | 91.93            | 92.08            | 92.06            | 92.11            | 0.014943            | 0.73              | 0.18              | 1.79             | 0.75         |
| River 1 | Reach 1-Upper | 239       | 5YrSCS24Hr   | 0.22              | 91.93            | 92.13            | 92.10            | 92.16            | 0.012137            | 0.79              | 0.27              | 2.10             | 0.70         |
| River 1 | Reach 1-Upper | 239       | 10YrSCS24Hr  | 0.28              | 91.93            | 92.16            | 92.12            | 92.19            | 0.011036            | 0.83              | 0.34              | 2.26             | 0.68         |
| River 1 | Reach 1-Upper | 239       | 25YrSCS24Hr  | 0.36              | 91.93            | 92.19            | 92.14            | 92.23            | 0.010147            | 0.86              | 0.41              | 2.43             | 0.67         |
| River 1 | Reach 1-Upper | 239       | 50YrSCS24Hr  | 0.42              | 91.93            | 92.22            | 92.16            | 92.26            | 0.009585            | 0.89              | 0.47              | 2.56             | 0.66         |
| River 1 | Reach 1-Upper | 239       | 100YrSCS24Hr | 0.49              | 91.93            | 92.24            | 92.18            | 92.28            | 0.009080            | 0.91              | 0.54              | 2.69             | 0.65         |
| River 1 | Reach 1-Upper | 218       | 2YrCHI3Hr    | 0.08              | 91.82            | 91.97            | 91.89            | 91.97            | 0.002000            | 0.29              | 0.27              | 2.48             | 0.28         |
| River 1 | Reach 1-Upper | 218       | 5YrCHI3Hr    | 0.15              | 91.82            | 92.02            | 91.92            | 92.02            | 0.002151            | 0.37              | 0.40              | 2.72             | 0.30         |
| River 1 | Reach 1-Upper | 218       | 10YrCHI3Hr   | 0.20              | 91.82            | 92.05            | 91.94            | 92.05            | 0.002198            | 0.40              | 0.49              | 2.86             | 0.31         |
| River 1 | Reach 1-Upper | 218       | 25YrCHI3Hr   | 0.27              | 91.82            | 92.08            | 91.96            | 92.09            | 0.002327            | 0.45              | 0.59              | 3.03             | 0.33         |
| River 1 | Reach 1-Upper | 218       | 50YrCHI3Hr   | 0.32              | 91.82            | 92.11            | 91.98            | 92.12            | 0.002390            | 0.49              | 0.67              | 3.15             | 0.34         |
| River 1 | Reach 1-Upper | 218       | 100YrCHI3Hr  | 0.38              | 91.82            | 92.13            | 91.99            | 92.14            | 0.002438            | 0.52              | 0.75              | 3.27             | 0.34         |
| River 1 | Reach 1-Upper | 218       | 2YrSCS24Hr   | 0.13              | 91.82            | 92.00            | 91.92            | 92.01            | 0.002117            | 0.35              | 0.37              | 2.66             | 0.30         |
| River 1 | Reach 1-Upper | 218       | 5YrSCS24Hr   | 0.22              | 91.82            | 92.06            | 91.95            | 92.06            | 0.002238            | 0.42              | 0.51              | 2.91             | 0.32         |
| River 1 | Reach 1-Upper | 218       | 10YrSCS24Hr  | 0.28              | 91.82            | 92.09            | 91.96            | 92.10            | 0.002340            | 0.46              | 0.60              | 3.05             | 0.33         |
| River 1 | Reach 1-Upper | 218       | 25YrSCS24Hr  | 0.36              | 91.82            | 92.12            | 91.98            | 92.13            | 0.002418            | 0.50              | 0.71              | 3.22             | 0.34         |
| River 1 | Reach 1-Upper | 218       | 50YrSCS24Hr  | 0.42              | 91.82            | 92.14            | 92.00            | 92.16            | 0.002473            | 0.53              | 0.79              | 3.36             | 0.35         |
| River 1 | Reach 1-Upper | 218       | 100YrSCS24Hr | 0.49              | 91.82            | 92.17            | 92.02            | 92.19            | 0.002504            | 0.56              | 0.88              | 3.53             | 0.35         |
| River 1 | Reach 1-Upper | 197       | 2YrCHI3Hr    | 0.08              | 91.73            | 91.85            | 91.84            | 91.87            | 0.016181            | 0.66              | 0.12              | 1.55             | 0.75         |
| River 1 | Reach 1-Upper | 197       | 5YrCHI3Hr    | 0.15              | 91.73            | 91.90            | 91.87            | 91.93            | 0.013293            | 0.73              | 0.20              | 1.87             | 0.72         |
| River 1 | Reach 1-Upper | 197       | 10YrCHI3Hr   | 0.20              | 91.73            | 91.93            | 91.89            | 91.96            | 0.012335            | 0.78              | 0.25              | 2.02             | 0.71         |
| River 1 | Reach 1-Upper | 197       | 25YrCHI3Hr   | 0.27              | 91.73            | 91.96            | 91.92            | 91.99            | 0.011527            | 0.84              | 0.32              | 2.18             | 0.70         |
| River 1 | Reach 1-Upper | 197       | 50YrCHI3Hr   | 0.32              | 91.73            | 91.98            | 91.94            | 92.02            | 0.010809            | 0.87              | 0.37              | 2.29             | 0.69         |
| River 1 | Reach 1-Upper | 197       | 100YrCHI3Hr  | 0.38              | 91.73            | 92.00            | 91.96            | 92.04            | 0.010540            | 0.91              | 0.42              | 2.39             | 0.68         |
| River 1 | Reach 1-Upper | 197       | 2YrSCS24Hr   | 0.13              | 91.73            | 91.89            | 91.87            | 91.91            | 0.013973            | 0.71              | 0.18              | 1.81             | 0.72         |
| River 1 | Reach 1-Upper | 197       | 5YrSCS24Hr   | 0.22              | 91.73            | 91.93            | 91.90            | 91.97            | 0.012083            | 0.80              | 0.27              | 2.06             | 0.70         |
| River 1 | Reach 1-Upper | 197       | 10YrSCS24Hr  | 0.28              | 91.73            | 91.96            | 91.92            | 92.00            | 0.011418            | 0.84              | 0.33              | 2.20             | 0.70         |
| River 1 | Reach 1-Upper | 197       | 25YrSCS24Hr  | 0.36              | 91.73            | 91.99            | 91.95            | 92.03            | 0.010650            | 0.89              | 0.40              | 2.34             | 0.69         |
| River 1 | Reach 1-Upper | 197       | 50YrSCS24Hr  | 0.42              | 91.73            | 92.02            | 91.97            | 92.06            | 0.010407            | 0.93              | 0.45              | 2.44             | 0.69         |
| River 1 | Reach 1-Upper | 197       | 100YrSCS24Hr | 0.49              | 91.73            | 92.04            | 91.99            | 92.08            | 0.010221            | 0.96              | 0.51              | 2.55             | 0.69         |
| River 1 | Reach 1-Upper | 174       | 2YrCHI3Hr    | 0.08              | 91.52            | 91.70            | 91.63            | 91.71            | 0.004212            | 0.41              | 0.19              | 1.80             | 0.40         |
| River 1 | Reach 1-Upper | 174       | 5YrCHI3Hr    | 0.15              | 91.52            | 91.75            | 91.67            | 91.76            | 0.004464            | 0.50              | 0.30              | 2.17             | 0.43         |
| River 1 | Reach 1-Upper | 174       | 10YrCHI3Hr   | 0.20              | 91.52            | 91.78            | 91.69            | 91.79            | 0.004633            | 0.55              | 0.36              | 2.31             | 0.45         |
| River 1 | Reach 1-Upper | 174       | 25YrCHI3Hr   | 0.27              | 91.52            | 91.81            | 91.72            | 91.83            | 0.004788            | 0.61              | 0.44              | 2.47             | 0.46         |
| River 1 | Reach 1-Upper | 174       | 50YrCHI3Hr   | 0.32              | 91.52            | 91.83            | 91.74            | 91.85            | 0.004947            | 0.65              | 0.50              | 2.58             | 0.48         |
| River 1 | Reach 1-Upper | 174       | 100YrCHI3Hr  | 0.38              | 91.52            | 91.85            | 91.76            | 91.88            | 0.005078            | 0.69              | 0.56              | 2.69             | 0.49         |
| River 1 | Reach 1-Upper | 174       | 2YrSCS24Hr   | 0.13              | 91.52            | 91.74            | 91.66            | 91.75            | 0.004366            | 0.47              | 0.27              | 2.08             | 0.42         |
| River 1 | Reach 1-Upper | 174       | 5YrSCS24Hr   | 0.22              | 91.52            | 91.78            | 91.70            | 91.80            | 0.004685            | 0.57              | 0.38              | 2.35             | 0.45         |
| River 1 | Reach 1-Upper | 174       | 10YrSCS24Hr  | 0.28              | 91.52            | 91.81            | 91.73            | 91.83            | 0.004821            | 0.62              | 0.45              | 2.49             | 0.46         |
| River 1 | Reach 1-Upper | 174       | 25YrSCS24Hr  | 0.36              | 91.52            | 91.84            | 91.75            | 91.87            | 0.005024            | 0.67              | 0.53              | 2.65             | 0.48         |
| River 1 | Reach 1-Upper | 174       | 50YrSCS24Hr  | 0.42              | 91.52            | 91.87            | 91.77            | 91.89            | 0.005141            | 0.71              | 0.59              | 2.76             | 0.49         |
| River 1 | Reach 1-Upper | 174       | 100YrSCS24Hr | 0.49              | 91.52            | 91.89            | 91.79            | 91.92            | 0.005179            | 0.75              | 0.66              | 2.87             | 0.50         |
| River 1 | Reach 1-Upper | 154       | 2YrCHI3Hr    | 0.08              | 91.43            | 91.61            | 91.56            | 91.62            | 0.004328            | 0.39              | 0.21              | 2.16             | 0.40         |
| River 1 | Reach 1-Upper | 154       | 5YrCHI3Hr    | 0.15              | 91.43            | 91.66            | 91.59            | 91.67            | 0.004181            | 0.46              | 0.32              | 2.60             | 0.41         |
| River 1 | Reach 1-Upper | 154       | 10YrCHI3Hr   | 0.20              | 91.43            | 91.69            | 91.61            | 91.70            | 0.004190            | 0.49              | 0.40              | 2.83             | 0.42         |
| River 1 | Reach 1-Upper | 154       | 25YrCHI3Hr   | 0.27              | 91.43            | 91.72            | 91.64            | 91.74            | 0.004087            | 0.53              | 0.50              | 3.11             | 0.42         |
| River 1 | Reach 1-Upper | 154       | 50YrCHI3Hr   | 0.32              | 91.43            | 91.75            | 91.65            | 91.76            | 0.003985            | 0.56              | 0.58              | 3.28             | 0.43         |
| River 1 | Reach 1-Upper | 154       | 100YrCHI3Hr  | 0.38              | 91.43            | 91.77            | 91.67            | 91.79            | 0.003882            | 0.58              | 0.66              | 3.44             | 0.43         |

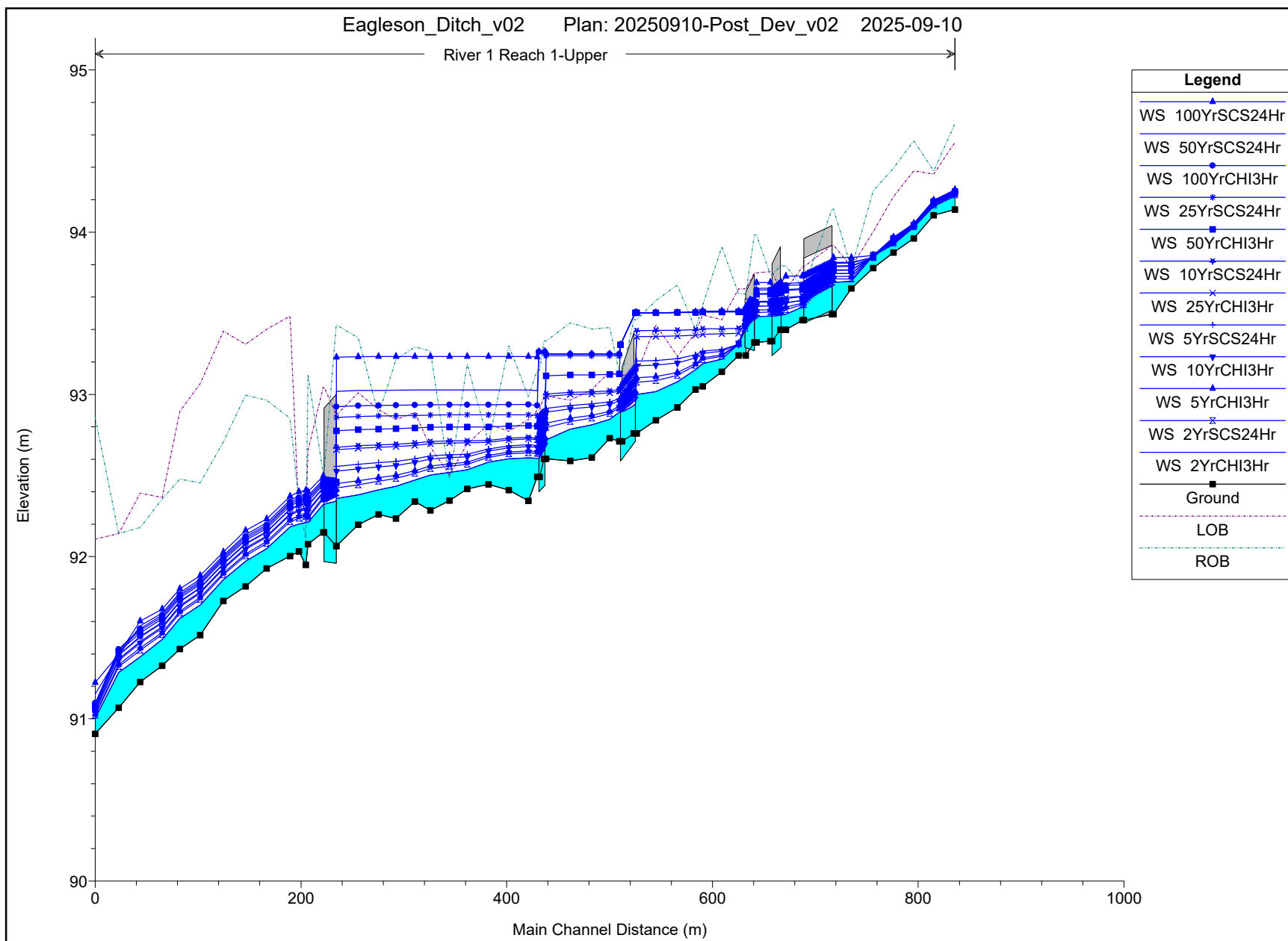


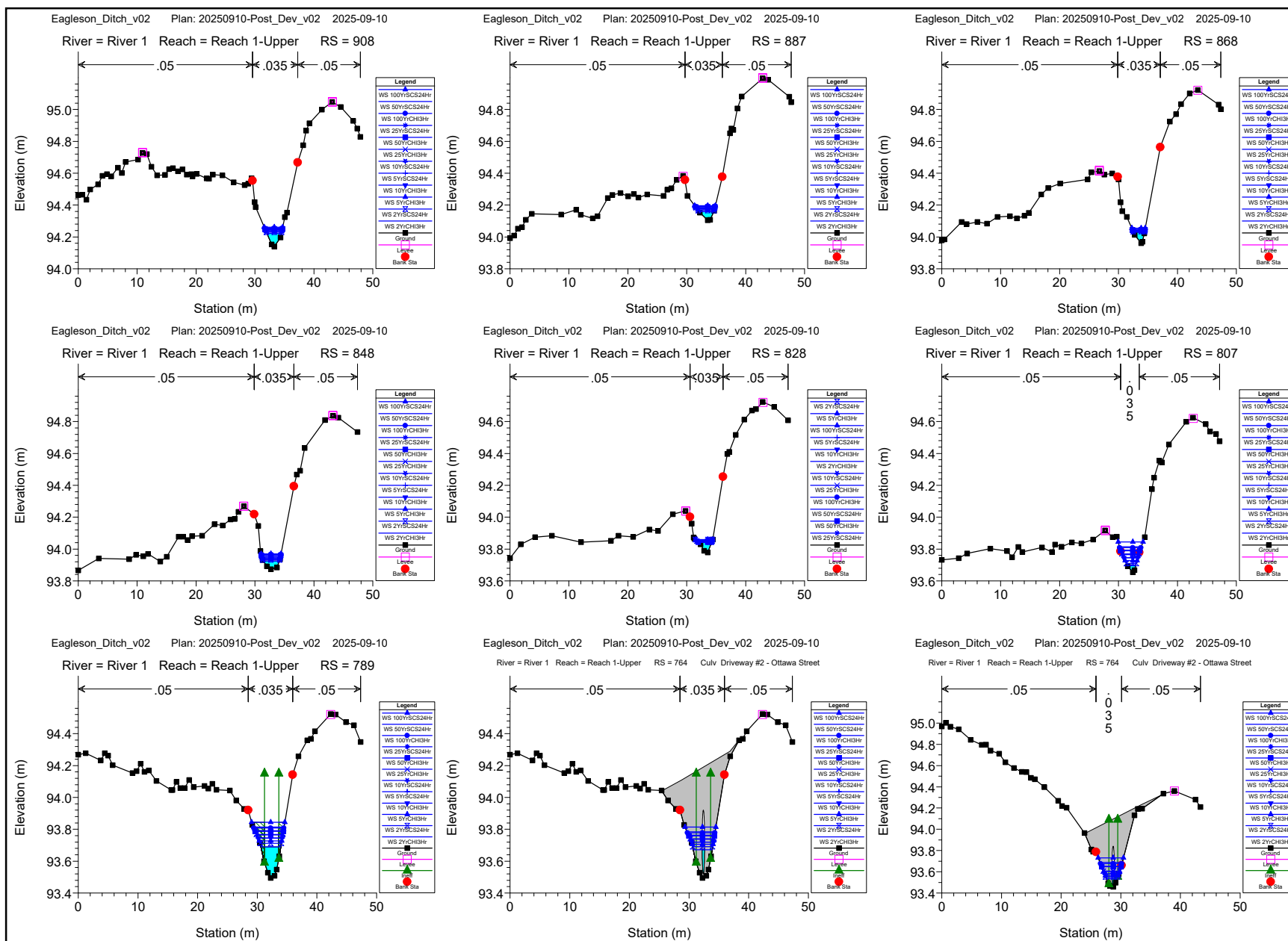
HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Upper | 154       | 2YrSCS24Hr   | 0.13              | 91.43            | 91.65            | 91.58            | 91.66            | 0.004251            | 0.44              | 0.29              | 2.49             | 0.41         |
| River 1 | Reach 1-Upper | 154       | 5YrSCS24Hr   | 0.22              | 91.43            | 91.70            | 91.62            | 91.71            | 0.004167            | 0.51              | 0.43              | 2.91             | 0.42         |
| River 1 | Reach 1-Upper | 154       | 10YrSCS24Hr  | 0.28              | 91.43            | 91.73            | 91.64            | 91.74            | 0.004071            | 0.54              | 0.51              | 3.14             | 0.43         |
| River 1 | Reach 1-Upper | 154       | 25YrSCS24Hr  | 0.36              | 91.43            | 91.76            | 91.66            | 91.78            | 0.003925            | 0.57              | 0.62              | 3.37             | 0.43         |
| River 1 | Reach 1-Upper | 154       | 50YrSCS24Hr  | 0.42              | 91.43            | 91.79            | 91.68            | 91.80            | 0.003830            | 0.60              | 0.71              | 3.53             | 0.43         |
| River 1 | Reach 1-Upper | 154       | 100YrSCS24Hr | 0.49              | 91.43            | 91.81            | 91.70            | 91.83            | 0.003747            | 0.62              | 0.79              | 3.69             | 0.43         |
| River 1 | Reach 1-Upper | 137       | 2YrCHI3Hr    | 0.08              | 91.33            | 91.48            | 91.46            | 91.50            | 0.012189            | 0.63              | 0.13              | 1.39             | 0.66         |
| River 1 | Reach 1-Upper | 137       | 5YrCHI3Hr    | 0.15              | 91.33            | 91.53            | 91.50            | 91.56            | 0.011338            | 0.73              | 0.20              | 1.65             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 10YrCHI3Hr   | 0.20              | 91.33            | 91.56            | 91.52            | 91.59            | 0.011017            | 0.79              | 0.25              | 1.80             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 25YrCHI3Hr   | 0.27              | 91.33            | 91.60            | 91.55            | 91.63            | 0.010550            | 0.84              | 0.32              | 1.99             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 50YrCHI3Hr   | 0.32              | 91.33            | 91.62            | 91.57            | 91.66            | 0.010206            | 0.88              | 0.37              | 2.12             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 100YrCHI3Hr  | 0.38              | 91.33            | 91.65            | 91.59            | 91.69            | 0.009820            | 0.90              | 0.42              | 2.25             | 0.66         |
| River 1 | Reach 1-Upper | 137       | 2YrSCS24Hr   | 0.13              | 91.33            | 91.52            | 91.49            | 91.54            | 0.011464            | 0.71              | 0.18              | 1.58             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 5YrSCS24Hr   | 0.22              | 91.33            | 91.57            | 91.53            | 91.60            | 0.010898            | 0.80              | 0.27              | 1.85             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 10YrSCS24Hr  | 0.28              | 91.33            | 91.60            | 91.55            | 91.64            | 0.010487            | 0.85              | 0.33              | 2.01             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 25YrSCS24Hr  | 0.36              | 91.33            | 91.63            | 91.58            | 91.68            | 0.009938            | 0.89              | 0.40              | 2.20             | 0.67         |
| River 1 | Reach 1-Upper | 137       | 50YrSCS24Hr  | 0.42              | 91.33            | 91.66            | 91.60            | 91.70            | 0.009574            | 0.92              | 0.46              | 2.33             | 0.66         |
| River 1 | Reach 1-Upper | 137       | 100YrSCS24Hr | 0.49              | 91.33            | 91.69            | 91.62            | 91.73            | 0.009283            | 0.95              | 0.52              | 2.46             | 0.66         |
| River 1 | Reach 1-Upper | 116       | 2YrCHI3Hr    | 0.08              | 91.23            | 91.38            | 91.32            | 91.39            | 0.003082            | 0.36              | 0.22              | 2.06             | 0.35         |
| River 1 | Reach 1-Upper | 116       | 5YrCHI3Hr    | 0.15              | 91.23            | 91.43            | 91.35            | 91.44            | 0.002930            | 0.42              | 0.35              | 2.36             | 0.35         |
| River 1 | Reach 1-Upper | 116       | 10YrCHI3Hr   | 0.20              | 91.23            | 91.47            | 91.37            | 91.48            | 0.002864            | 0.46              | 0.43              | 2.55             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 25YrCHI3Hr   | 0.27              | 91.23            | 91.51            | 91.39            | 91.52            | 0.002818            | 0.50              | 0.54              | 2.77             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 50YrCHI3Hr   | 0.32              | 91.23            | 91.54            | 91.41            | 91.55            | 0.002807            | 0.52              | 0.62              | 2.92             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 100YrCHI3Hr  | 0.38              | 91.23            | 91.56            | 91.42            | 91.58            | 0.002814            | 0.55              | 0.70              | 3.06             | 0.37         |
| River 1 | Reach 1-Upper | 116       | 2YrSCS24Hr   | 0.13              | 91.23            | 91.42            | 91.34            | 91.43            | 0.002964            | 0.41              | 0.31              | 2.29             | 0.35         |
| River 1 | Reach 1-Upper | 116       | 5YrSCS24Hr   | 0.22              | 91.23            | 91.48            | 91.37            | 91.49            | 0.002843            | 0.47              | 0.46              | 2.61             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 10YrSCS24Hr  | 0.28              | 91.23            | 91.51            | 91.39            | 91.53            | 0.002817            | 0.50              | 0.55              | 2.79             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 25YrSCS24Hr  | 0.36              | 91.23            | 91.55            | 91.42            | 91.57            | 0.002792            | 0.54              | 0.66              | 3.00             | 0.37         |
| River 1 | Reach 1-Upper | 116       | 50YrSCS24Hr  | 0.42              | 91.23            | 91.58            | 91.43            | 91.60            | 0.002600            | 0.55              | 0.76              | 3.16             | 0.36         |
| River 1 | Reach 1-Upper | 116       | 100YrSCS24Hr | 0.49              | 91.23            | 91.61            | 91.45            | 91.63            | 0.002607            | 0.58              | 0.85              | 3.28             | 0.36         |
| River 1 | Reach 1-Upper | 95        | 2YrCHI3Hr    | 0.08              | 91.07            | 91.28            | 91.23            | 91.29            | 0.006001            | 0.51              | 0.16              | 1.35             | 0.48         |
| River 1 | Reach 1-Upper | 95        | 5YrCHI3Hr    | 0.15              | 91.07            | 91.33            | 91.27            | 91.35            | 0.006981            | 0.63              | 0.23              | 1.60             | 0.53         |
| River 1 | Reach 1-Upper | 95        | 10YrCHI3Hr   | 0.20              | 91.07            | 91.36            | 91.30            | 91.39            | 0.007514            | 0.71              | 0.28              | 1.73             | 0.56         |
| River 1 | Reach 1-Upper | 95        | 25YrCHI3Hr   | 0.27              | 91.07            | 91.39            | 91.33            | 91.43            | 0.008051            | 0.78              | 0.34              | 1.89             | 0.59         |
| River 1 | Reach 1-Upper | 95        | 50YrCHI3Hr   | 0.32              | 91.07            | 91.42            | 91.35            | 91.45            | 0.008531            | 0.84              | 0.38              | 1.99             | 0.61         |
| River 1 | Reach 1-Upper | 95        | 100YrCHI3Hr  | 0.38              | 91.07            | 91.42            | 91.37            | 91.47            | 0.011364            | 0.98              | 0.39              | 2.01             | 0.71         |
| River 1 | Reach 1-Upper | 95        | 2YrSCS24Hr   | 0.13              | 91.07            | 91.32            | 91.26            | 91.34            | 0.006833            | 0.61              | 0.21              | 1.53             | 0.52         |
| River 1 | Reach 1-Upper | 95        | 5YrSCS24Hr   | 0.22              | 91.07            | 91.37            | 91.30            | 91.40            | 0.007484            | 0.72              | 0.30              | 1.78             | 0.56         |
| River 1 | Reach 1-Upper | 95        | 10YrSCS24Hr  | 0.28              | 91.07            | 91.40            | 91.33            | 91.43            | 0.008260            | 0.80              | 0.35              | 1.90             | 0.60         |
| River 1 | Reach 1-Upper | 95        | 25YrSCS24Hr  | 0.36              | 91.07            | 91.43            | 91.36            | 91.47            | 0.008800            | 0.87              | 0.41              | 2.08             | 0.63         |
| River 1 | Reach 1-Upper | 95        | 50YrSCS24Hr  | 0.42              | 91.07            | 91.39            | 91.38            | 91.47            | 0.022828            | 1.30              | 0.32              | 1.85             | 0.99         |
| River 1 | Reach 1-Upper | 95        | 100YrSCS24Hr | 0.49              | 91.07            | 91.41            | 91.41            | 91.50            | 0.022422            | 1.34              | 0.37              | 1.95             | 0.99         |
| River 1 | Reach 1-Upper | 72        | 2YrCHI3Hr    | 0.08              | 90.91            | 91.00            | 91.00            | 91.03            | 0.030836            | 0.74              | 0.11              | 1.93             | 0.99         |
| River 1 | Reach 1-Upper | 72        | 5YrCHI3Hr    | 0.15              | 90.91            | 91.03            | 91.03            | 91.07            | 0.028202            | 0.84              | 0.18              | 2.40             | 0.99         |
| River 1 | Reach 1-Upper | 72        | 10YrCHI3Hr   | 0.20              | 90.91            | 91.05            | 91.05            | 91.09            | 0.027394            | 0.90              | 0.22              | 2.63             | 0.99         |
| River 1 | Reach 1-Upper | 72        | 25YrCHI3Hr   | 0.27              | 90.91            | 91.07            | 91.07            | 91.12            | 0.026901            | 0.98              | 0.27              | 2.82             | 1.01         |
| River 1 | Reach 1-Upper | 72        | 50YrCHI3Hr   | 0.32              | 90.91            | 91.08            | 91.08            | 91.14            | 0.025605            | 1.02              | 0.32              | 2.96             | 1.00         |
| River 1 | Reach 1-Upper | 72        | 100YrCHI3Hr  | 0.38              | 90.91            | 91.11            | 91.10            | 91.16            | 0.016324            | 0.92              | 0.42              | 3.23             | 0.82         |
| River 1 | Reach 1-Upper | 72        | 2YrSCS24Hr   | 0.13              | 90.91            | 91.02            | 91.02            | 91.06            | 0.027869            | 0.80              | 0.16              | 2.30             | 0.97         |
| River 1 | Reach 1-Upper | 72        | 5YrSCS24Hr   | 0.22              | 90.91            | 91.05            | 91.05            | 91.10            | 0.028793            | 0.94              | 0.23              | 2.67             | 1.02         |
| River 1 | Reach 1-Upper | 72        | 10YrSCS24Hr  | 0.28              | 90.91            | 91.07            | 91.07            | 91.12            | 0.025957            | 0.98              | 0.28              | 2.86             | 0.99         |
| River 1 | Reach 1-Upper | 72        | 25YrSCS24Hr  | 0.36              | 90.91            | 91.09            | 91.09            | 91.15            | 0.025859            | 1.06              | 0.34              | 3.02             | 1.01         |
| River 1 | Reach 1-Upper | 72        | 50YrSCS24Hr  | 0.42              | 90.91            | 91.17            | 91.11            | 91.19            | 0.006772            | 0.70              | 0.60              | 3.69             | 0.55         |
| River 1 | Reach 1-Upper | 72        | 100YrSCS24Hr | 0.49              | 90.91            | 91.24            | 91.12            | 91.26            | 0.002972            | 0.55              | 0.89              | 4.14             | 0.38         |
| River 1 | Reach 1-Lower | 56        | 2YrCHI3Hr    | 0.14              | 90.47            | 90.73            | 90.57            | 90.73            | 0.000365            | 0.19              | 0.73              | 10.09            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 5YrCHI3Hr    | 0.26              | 90.47            | 90.84            | 90.60            | 90.85            | 0.000293            | 0.23              | 1.14              | 14.27            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 10YrCHI3Hr   | 0.36              | 90.47            | 90.92            | 90.62            | 90.92            | 0.000277            | 0.26              | 1.40              | 17.00            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 25YrCHI3Hr   | 0.49              | 90.47            | 91.01            | 90.64            | 91.01            | 0.000267            | 0.29              | 1.71              | 19.79            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 50YrCHI3Hr   | 0.60              | 90.47            | 91.07            | 90.66            | 91.08            | 0.000264            | 0.31              | 1.93              | 20.02            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 100YrCHI3Hr  | 0.72              | 90.47            | 91.13            | 90.68            | 91.14            | 0.000264            | 0.34              | 2.15              | 20.02            | 0.14         |
| River 1 | Reach 1-Lower | 56        | 2YrSCS24Hr   | 0.23              | 90.47            | 90.82            | 90.59            | 90.82            | 0.000307            | 0.22              | 1.05              | 13.08            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 5YrSCS24Hr   | 0.40              | 90.47            | 90.95            | 90.63            | 90.95            | 0.000273            | 0.27              | 1.50              | 18.26            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 10YrSCS24Hr  | 0.52              | 90.47            | 91.02            | 90.65            | 91.02            | 0.000269            | 0.29              | 1.75              | 19.92            | 0.13         |
| River 1 | Reach 1-Lower | 56        | 25YrSCS24Hr  | 0.68              | 90.47            | 91.11            | 90.67            | 91.12            | 0.000263            | 0.33              | 2.07              | 20.02            | 0.14         |
| River 1 | Reach 1-Lower | 56        | 50YrSCS24Hr  | 0.80              | 90.47            | 91.17            | 90.70            | 91.18            | 0.000261            | 0.35              | 2.30              | 20.02            | 0.14         |
| River 1 | Reach 1-Lower | 56        | 100YrSCS24Hr | 0.94              | 90.47            | 91.24            | 90.71            | 91.25            | 0.000262            | 0.37              | 2.53              | 20.02            | 0.14         |
| River 1 | Reach 1-Lower | 50        |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| River 1 | Reach 1-Lower | 38        | 2YrCHI3Hr    | 0.14              | 90.46            | 90.57            | 90.53            | 90.58            | 0.004969            | 0.42              | 0.33              | 30.00            | 0.43         |
| River 1 | Reach 1-Lower | 38        | 5YrCHI3Hr    | 0.26              | 90.46            | 90.60            | 90.55            | 90.62            | 0.006999            | 0.60              | 0.44              | 34.38            | 0.54         |
| River 1 | Reach 1-Lower | 38        | 10YrCHI3Hr   | 0.36              | 90.46            | 90.61            | 90.57            | 90.64            | 0.008612            | 0.72              | 0.50              | 35.69            | 0.61         |
| River 1 | Reach 1-Lower | 38        | 25YrCHI3Hr   | 0.49              | 90.46            | 90.63            | 90.60            | 90.67            | 0.010692            | 0.87              | 0.56              | 36.54            | 0.70         |
| River 1 | Reach 1-Lower | 38        | 50YrCHI3Hr   | 0.60              | 90.46            | 90.64            | 90.62            | 90.69            | 0.012409            | 0.99              | 0.61              | 36.97            | 0.76         |
| River 1 | Reach 1-Lower | 38        | 100YrCHI3Hr  | 0.72              | 90.46            | 90.66            | 90.64            | 90.72            | 0.014104            | 1.11              | 0.65              | 37.73            | 0.82         |
| River 1 | Reach 1-Lower | 38        | 2YrSCS24Hr   | 0.23              | 90.46            | 90.59            | 90.55            | 90.61            | 0.006395            | 0.56              | 0.42              | 33.55            | 0.51         |
| River 1 | Reach 1-Lower | 38        | 5YrSCS24Hr   | 0.40              | 90.46            | 90.62            | 90.58            | 90.65            | 0.009230            | 0.77              | 0.52              | 36.26            | 0.64         |
| River 1 | Reach 1-Lower | 38        | 10YrSCS24Hr  | 0.52              | 90.46            | 90.64            | 90.60            | 90.68            | 0.011069            | 0.90              | 0.57              | 36.60            | 0.71         |
| River 1 | Reach 1-Lower | 38        | 25YrSCS24Hr  | 0.68              | 90.46            | 90.65            | 90.63            | 90.71            | 0.013373            | 1.06              | 0.64              | 37.45            | 0.79         |
| River 1 | Reach 1-Lower | 38        | 50YrSCS24Hr  | 0.80              | 90.46            | 90.66            | 90.64            | 90.74            | 0.015442            | 1.19              | 0.68              | 38.06            | 0.86         |
| River 1 | Reach 1-Lower | 38        | 100YrSCS24Hr | 0.94              | 90.46            | 90.67            | 90.66            | 90.76            | 0.018005            | 1.32              | 0.71              | 38.54            | 0.94         |
| River 1 | Reach 1-Lower | 0         | 2YrCHI3Hr    | 0.14              | 90.42            | 90.50            | 90.46            | 90.50            | 0.001001            | 0.13              | 1.06              | 18.74            | 0.18         |
| River 1 | Reach 1-Lower | 0         | 5YrCHI3Hr    | 0.26              | 90.42            | 90.53            | 90.47            | 90.53            | 0.001000            | 0.17              | 1.59              | 20.04            | 0.19         |
| River 1 | Reach 1-Lower | 0         | 10YrCHI3Hr   | 0.36              | 90.42            | 90.54            | 90.48            | 90.55            | 0.001000            | 0.19              | 1.92              | 20.29            | 0.19         |

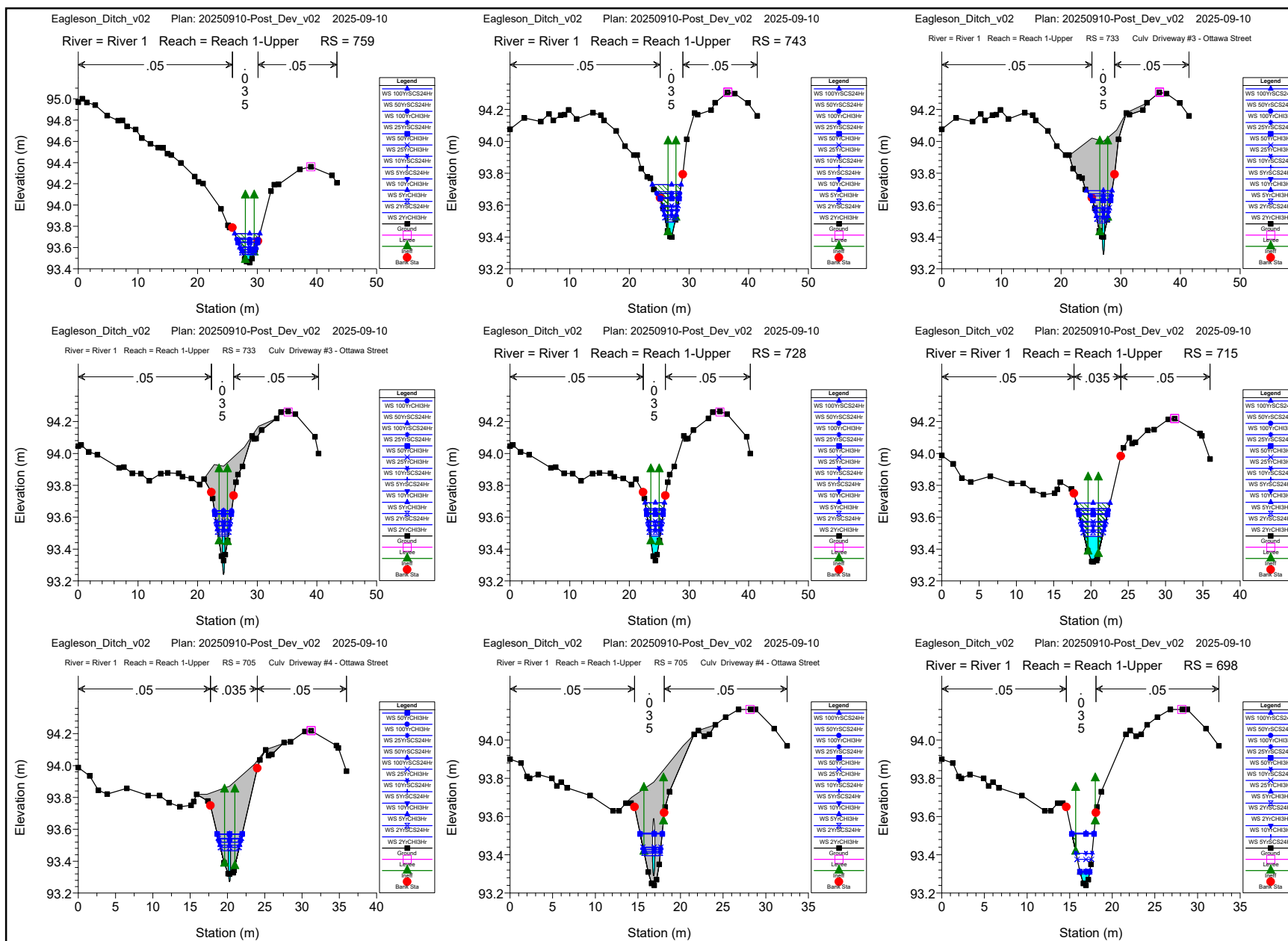
HEC-RAS Plan: 20250603-Pre\_Dev\_v01 (Continued)

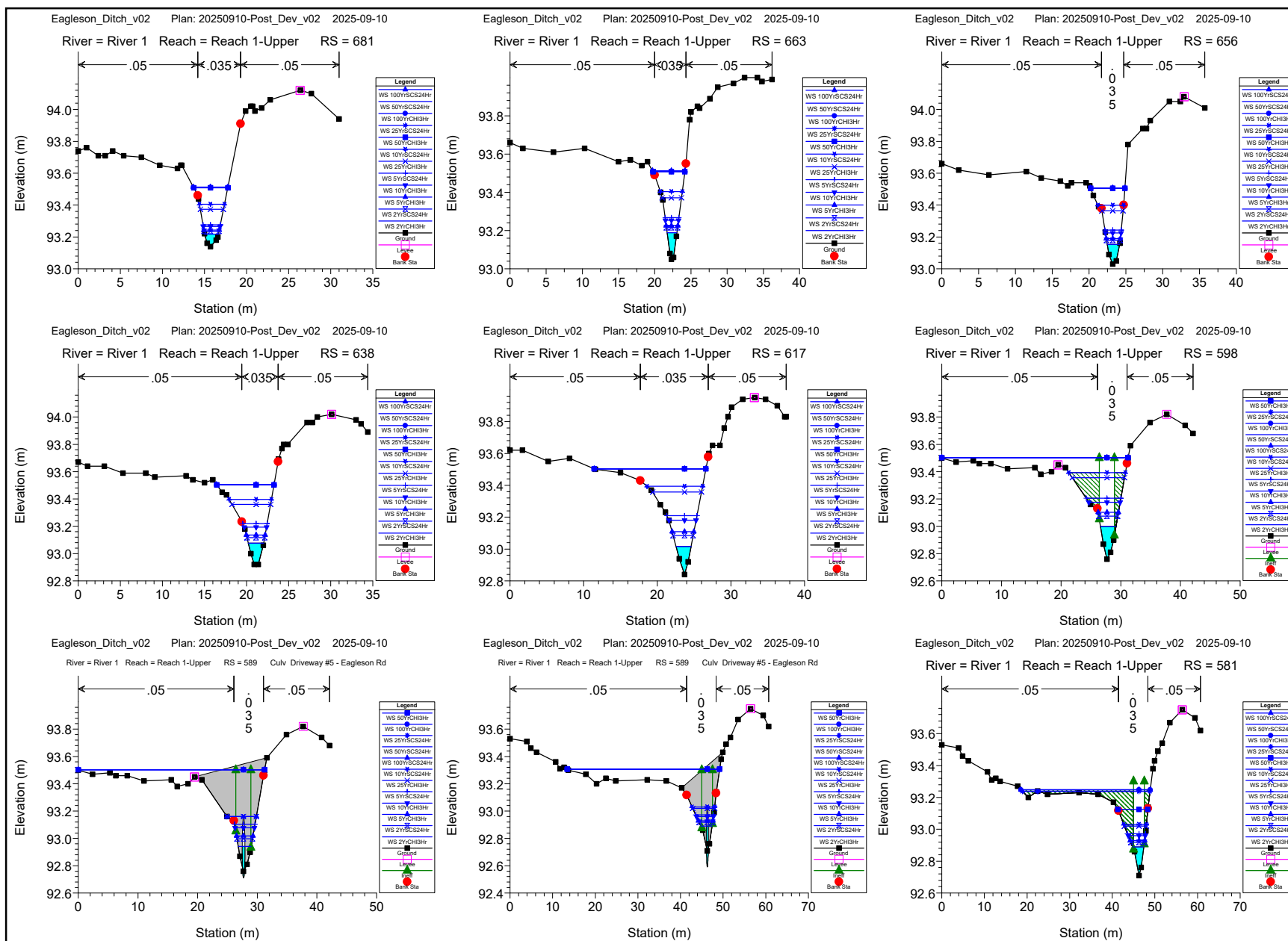
| River   | Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| River 1 | Reach 1-Lower | 0         | 25YrCHI3Hr   | 0.49              | 90.42            | 90.56            | 90.49            | 90.57            | 0.001001            | 0.21              | 2.33              | 20.58            | 0.20         |
| River 1 | Reach 1-Lower | 0         | 50YrCHI3Hr   | 0.60              | 90.42            | 90.58            | 90.49            | 90.58            | 0.001000            | 0.23              | 2.64              | 20.80            | 0.20         |
| River 1 | Reach 1-Lower | 0         | 100YrCHI3Hr  | 0.72              | 90.42            | 90.59            | 90.50            | 90.60            | 0.001000            | 0.24              | 2.98              | 21.46            | 0.21         |
| River 1 | Reach 1-Lower | 0         | 2YrSCS24Hr   | 0.23              | 90.42            | 90.52            | 90.46            | 90.52            | 0.001000            | 0.16              | 1.47              | 19.96            | 0.19         |
| River 1 | Reach 1-Lower | 0         | 5YrSCS24Hr   | 0.40              | 90.42            | 90.55            | 90.48            | 90.55            | 0.001001            | 0.20              | 2.05              | 20.38            | 0.20         |
| River 1 | Reach 1-Lower | 0         | 10YrSCS24Hr  | 0.52              | 90.42            | 90.57            | 90.48            | 90.57            | 0.001001            | 0.22              | 2.40              | 20.63            | 0.20         |
| River 1 | Reach 1-Lower | 0         | 25YrSCS24Hr  | 0.68              | 90.42            | 90.59            | 90.49            | 90.59            | 0.001000            | 0.24              | 2.85              | 21.31            | 0.21         |
| River 1 | Reach 1-Lower | 0         | 50YrSCS24Hr  | 0.80              | 90.42            | 90.60            | 90.50            | 90.61            | 0.001001            | 0.25              | 3.18              | 21.58            | 0.21         |
| River 1 | Reach 1-Lower | 0         | 100YrSCS24Hr | 0.94              | 90.42            | 90.62            | 90.51            | 90.62            | 0.001000            | 0.27              | 3.51              | 21.78            | 0.21         |

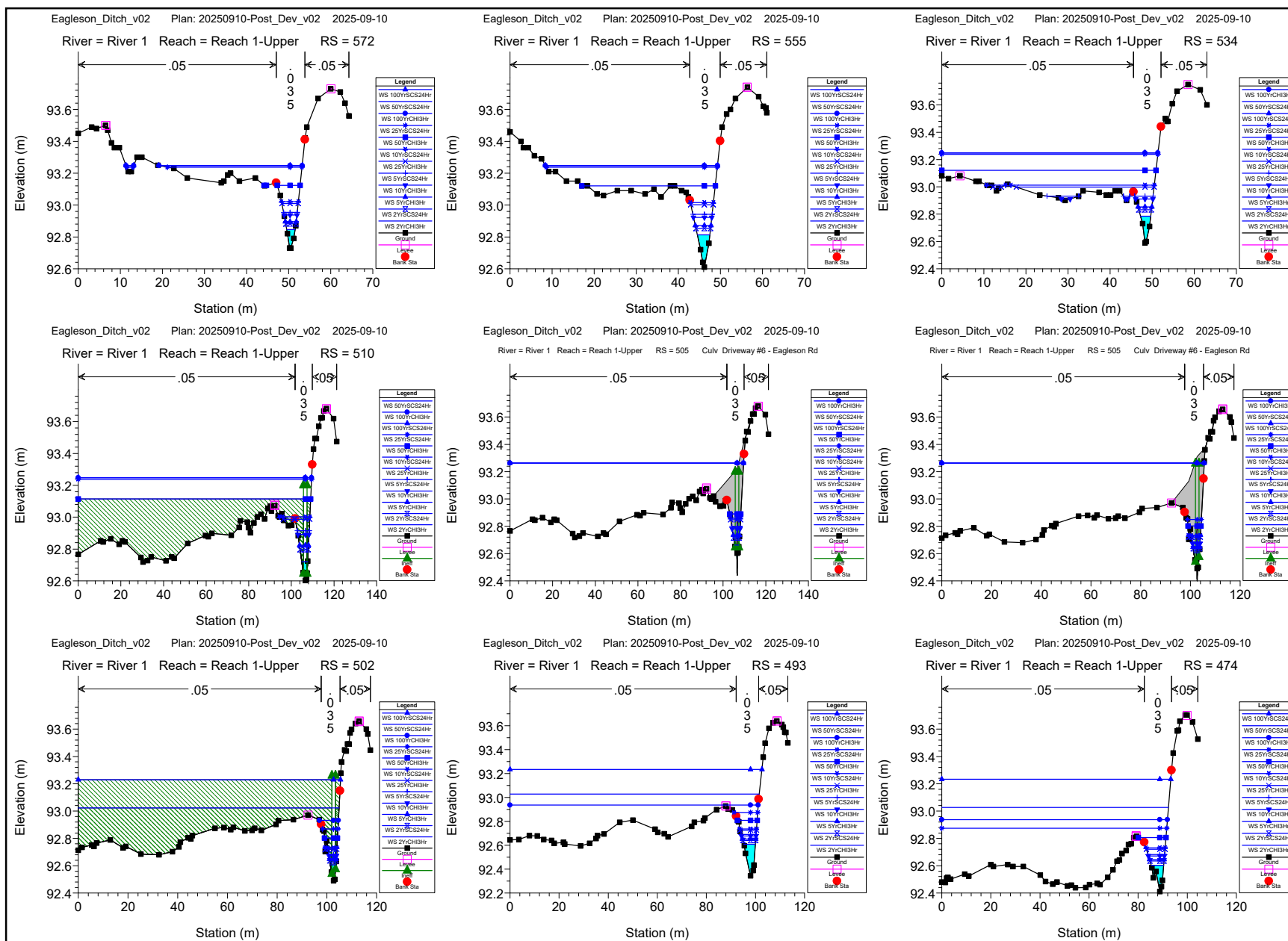


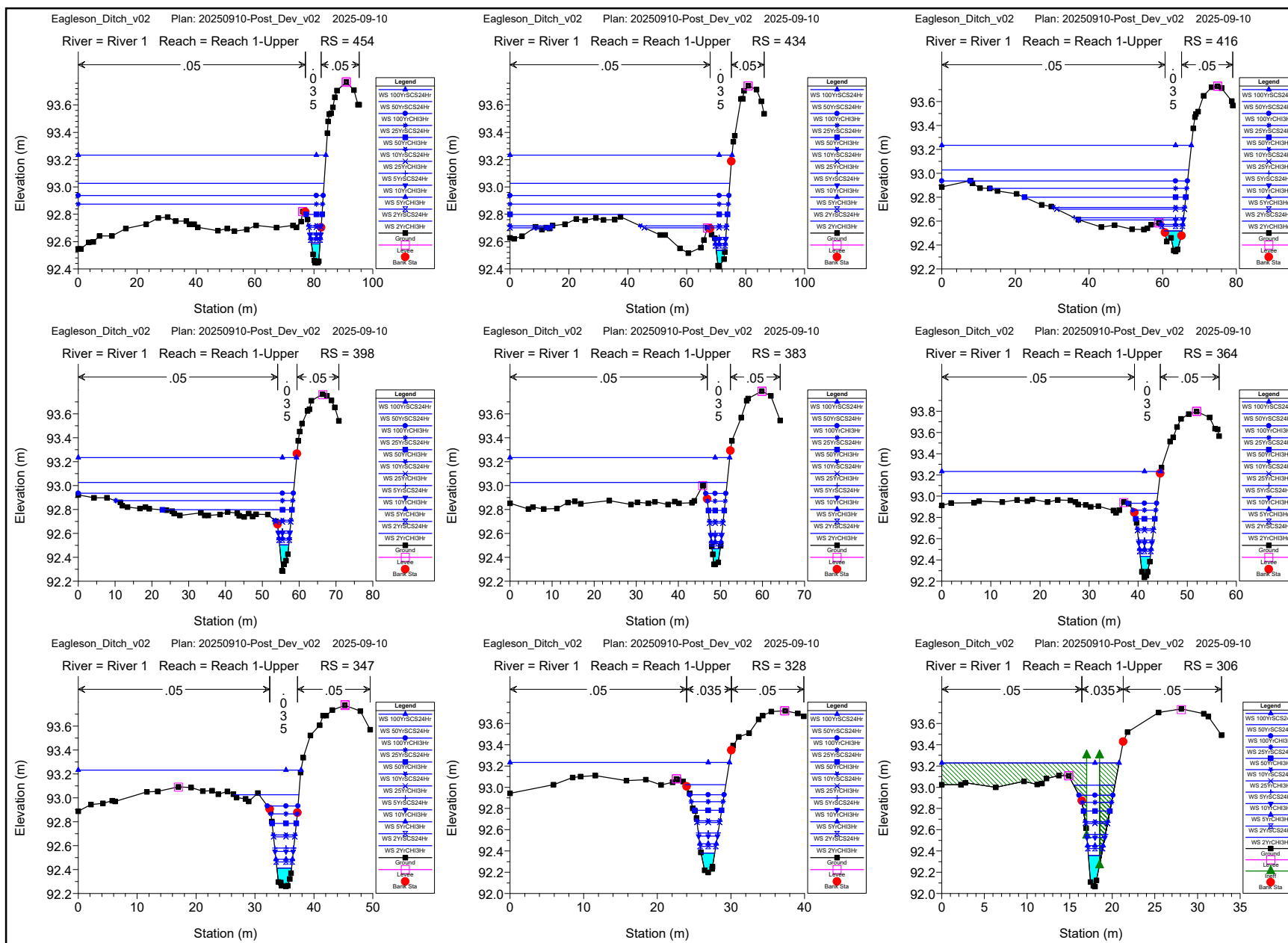






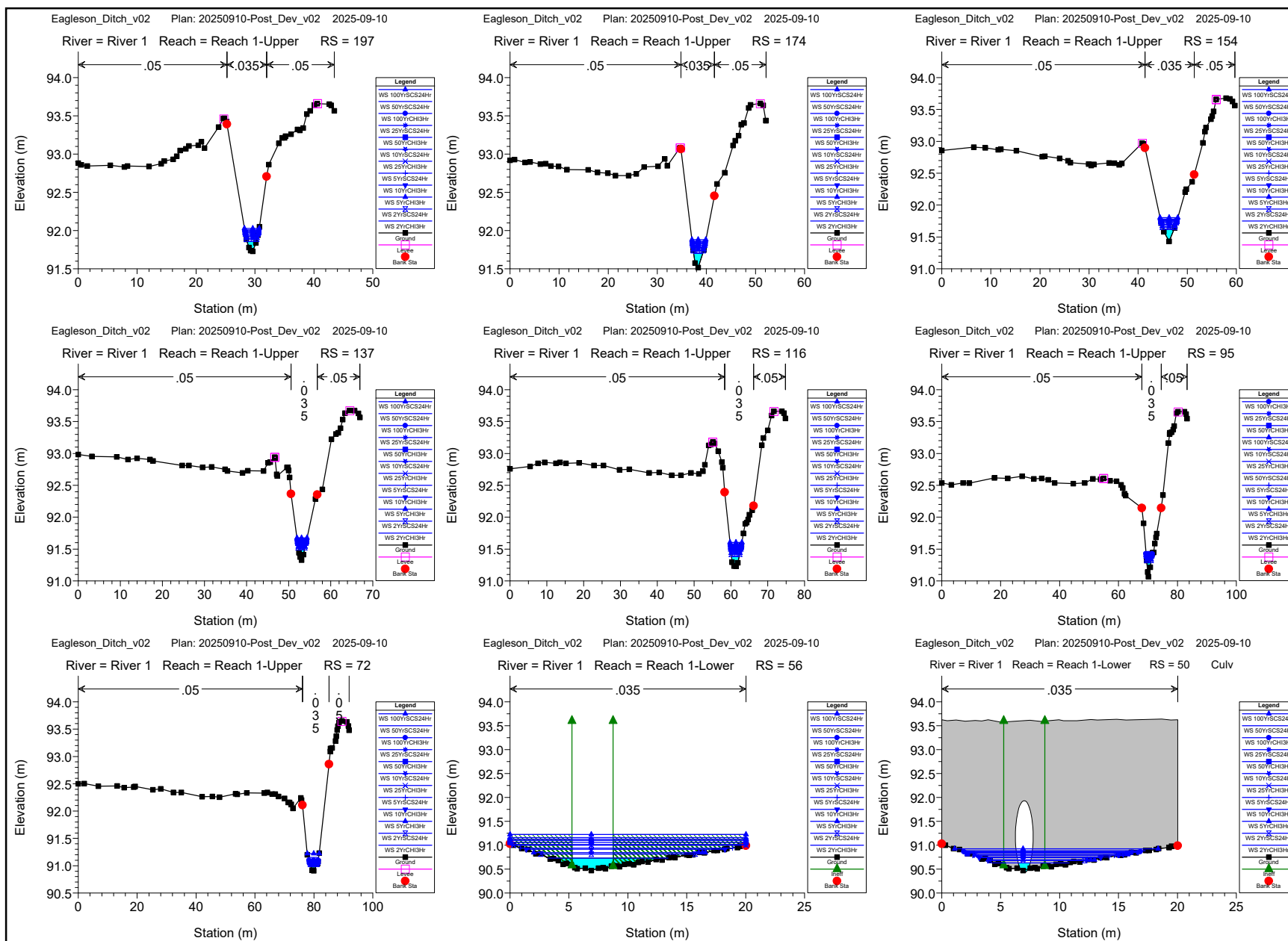


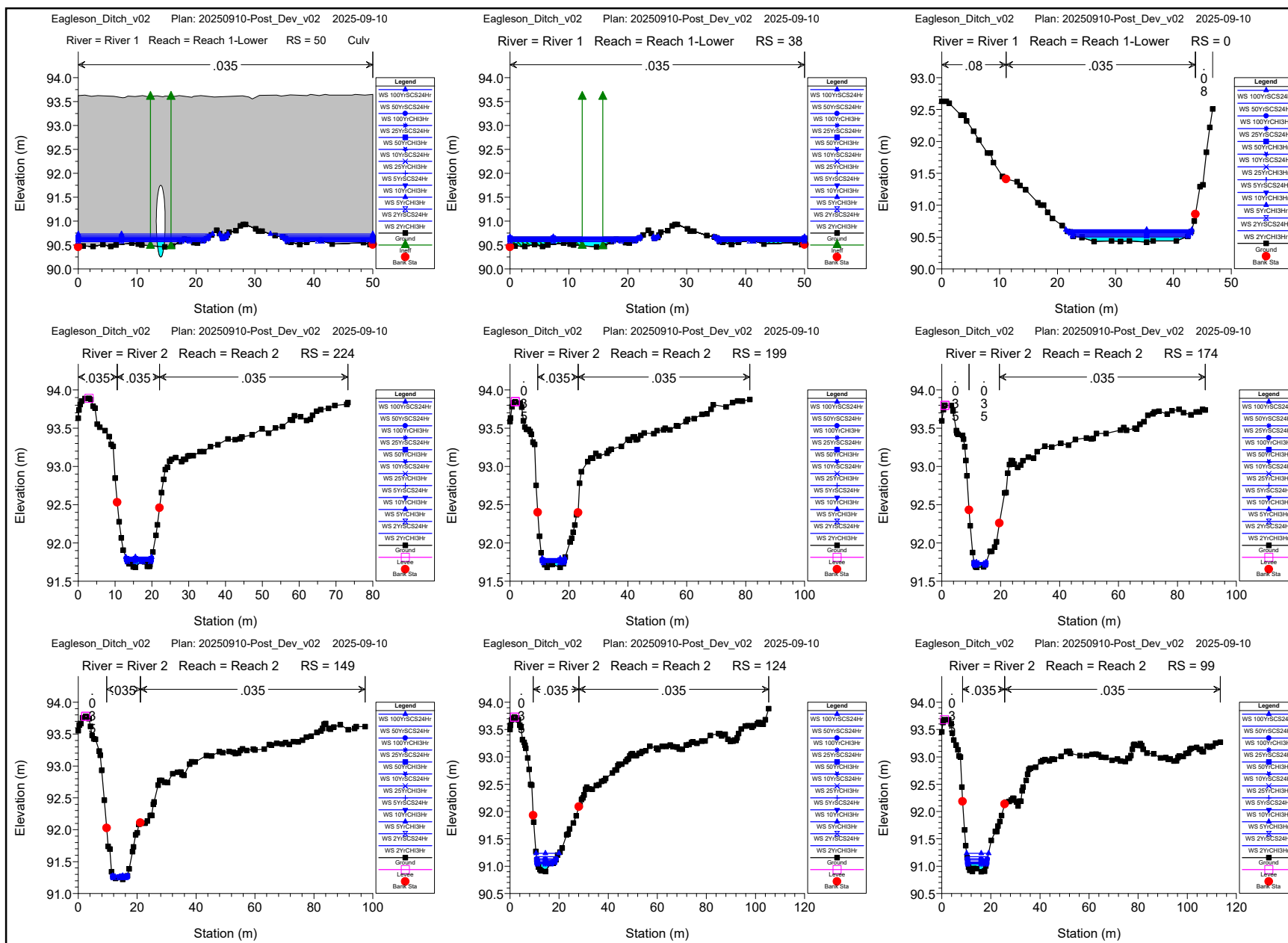




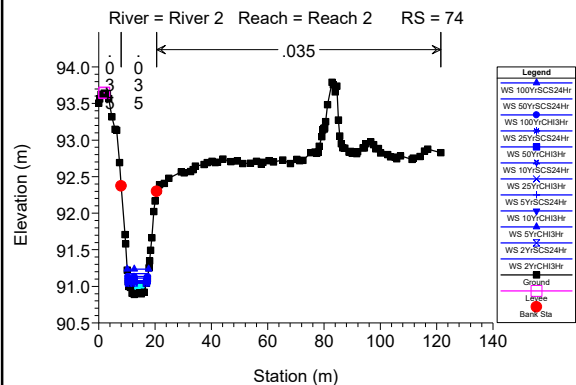




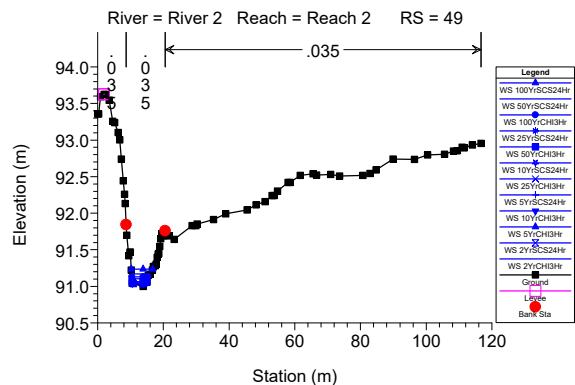




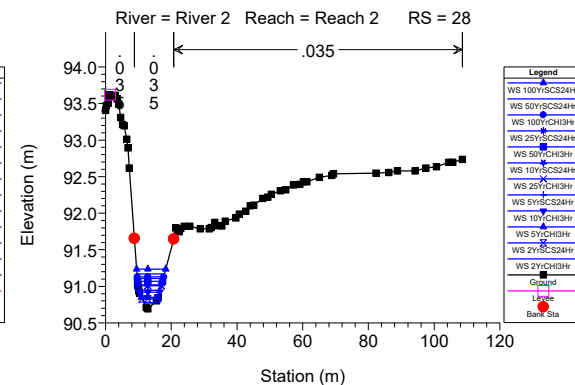
Eagleson\_Ditch\_v02 Plan: 20250910-Post\_Dev\_v02 2025-09-10



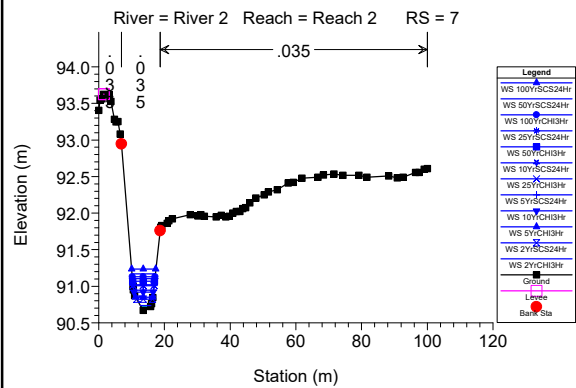
Eagleson\_Ditch\_v02 Plan: 20250910-Post\_Dev\_v02 2025-09-10



Eagleson\_Ditch\_v02 Plan: 20250910-Post\_Dev\_v02 2025-09-10



Eagleson\_Ditch\_v02 Plan: 20250910-Post\_Dev\_v02 2025-09-10





HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 908       | 2YrCHI3Hr    | 0.02              | 94.14            | 94.22            | 94.18            | 94.22            | 0.001632            | 0.16              | 0.12              | 2.47             | 0.22         |
| Reach 1-Upper | 908       | 5YrCHI3Hr    | 0.03              | 94.14            | 94.23            | 94.19            | 94.23            | 0.001834            | 0.18              | 0.15              | 2.66             | 0.24         |
| Reach 1-Upper | 908       | 10YrCHI3Hr   | 0.03              | 94.14            | 94.24            | 94.19            | 94.24            | 0.001946            | 0.19              | 0.17              | 2.76             | 0.25         |
| Reach 1-Upper | 908       | 25YrCHI3Hr   | 0.04              | 94.14            | 94.25            | 94.20            | 94.25            | 0.002058            | 0.21              | 0.18              | 2.87             | 0.26         |
| Reach 1-Upper | 908       | 50YrCHI3Hr   | 0.04              | 94.14            | 94.25            | 94.20            | 94.25            | 0.002138            | 0.22              | 0.20              | 2.95             | 0.27         |
| Reach 1-Upper | 908       | 100YrCHI3Hr  | 0.05              | 94.14            | 94.26            | 94.20            | 94.26            | 0.002189            | 0.23              | 0.21              | 3.04             | 0.27         |
| Reach 1-Upper | 908       | 2YrSCS24Hr   | 0.02              | 94.14            | 94.23            | 94.19            | 94.23            | 0.001752            | 0.17              | 0.14              | 2.59             | 0.23         |
| Reach 1-Upper | 908       | 5YrSCS24Hr   | 0.03              | 94.14            | 94.24            | 94.19            | 94.24            | 0.001946            | 0.19              | 0.17              | 2.76             | 0.25         |
| Reach 1-Upper | 908       | 10YrSCS24Hr  | 0.04              | 94.14            | 94.24            | 94.20            | 94.25            | 0.002043            | 0.20              | 0.18              | 2.85             | 0.26         |
| Reach 1-Upper | 908       | 25YrSCS24Hr  | 0.04              | 94.14            | 94.25            | 94.20            | 94.25            | 0.002153            | 0.22              | 0.20              | 2.97             | 0.27         |
| Reach 1-Upper | 908       | 50YrSCS24Hr  | 0.05              | 94.14            | 94.26            | 94.20            | 94.26            | 0.002199            | 0.23              | 0.22              | 3.05             | 0.27         |
| Reach 1-Upper | 908       | 100YrSCS24Hr | 0.06              | 94.14            | 94.26            | 94.21            | 94.26            | 0.002259            | 0.24              | 0.23              | 3.15             | 0.28         |
| Reach 1-Upper | 887       | 2YrCHI3Hr    | 0.02              | 94.10            | 94.16            | 94.14            | 94.16            | 0.007210            | 0.24              | 0.08              | 2.48             | 0.44         |
| Reach 1-Upper | 887       | 5YrCHI3Hr    | 0.03              | 94.10            | 94.17            | 94.15            | 94.17            | 0.005770            | 0.25              | 0.11              | 2.82             | 0.40         |
| Reach 1-Upper | 887       | 10YrCHI3Hr   | 0.03              | 94.10            | 94.18            | 94.15            | 94.18            | 0.005292            | 0.25              | 0.13              | 2.98             | 0.39         |
| Reach 1-Upper | 887       | 25YrCHI3Hr   | 0.04              | 94.10            | 94.18            | 94.15            | 94.19            | 0.004885            | 0.26              | 0.15              | 3.16             | 0.38         |
| Reach 1-Upper | 887       | 50YrCHI3Hr   | 0.04              | 94.10            | 94.19            | 94.16            | 94.19            | 0.004480            | 0.26              | 0.17              | 3.32             | 0.37         |
| Reach 1-Upper | 887       | 100YrCHI3Hr  | 0.05              | 94.10            | 94.19            | 94.16            | 94.20            | 0.004579            | 0.27              | 0.18              | 3.42             | 0.38         |
| Reach 1-Upper | 887       | 2YrSCS24Hr   | 0.02              | 94.10            | 94.17            | 94.15            | 94.17            | 0.006295            | 0.25              | 0.10              | 2.71             | 0.42         |
| Reach 1-Upper | 887       | 5YrSCS24Hr   | 0.03              | 94.10            | 94.18            | 94.15            | 94.18            | 0.005292            | 0.25              | 0.13              | 2.98             | 0.39         |
| Reach 1-Upper | 887       | 10YrSCS24Hr  | 0.04              | 94.10            | 94.18            | 94.15            | 94.19            | 0.004912            | 0.26              | 0.14              | 3.14             | 0.38         |
| Reach 1-Upper | 887       | 25YrSCS24Hr  | 0.04              | 94.10            | 94.19            | 94.16            | 94.19            | 0.004434            | 0.26              | 0.17              | 3.35             | 0.37         |
| Reach 1-Upper | 887       | 50YrSCS24Hr  | 0.05              | 94.10            | 94.19            | 94.16            | 94.20            | 0.004587            | 0.27              | 0.18              | 3.44             | 0.38         |
| Reach 1-Upper | 887       | 100YrSCS24Hr | 0.06              | 94.10            | 94.20            | 94.16            | 94.20            | 0.004863            | 0.29              | 0.19              | 3.53             | 0.39         |
| Reach 1-Upper | 868       | 2YrCHI3Hr    | 0.02              | 93.96            | 94.03            | 94.01            | 94.03            | 0.006094            | 0.26              | 0.07              | 1.89             | 0.41         |
| Reach 1-Upper | 868       | 5YrCHI3Hr    | 0.03              | 93.96            | 94.04            | 94.02            | 94.04            | 0.008117            | 0.32              | 0.09              | 1.99             | 0.49         |
| Reach 1-Upper | 868       | 10YrCHI3Hr   | 0.03              | 93.96            | 94.04            | 94.02            | 94.04            | 0.009697            | 0.35              | 0.09              | 2.03             | 0.53         |
| Reach 1-Upper | 868       | 25YrCHI3Hr   | 0.04              | 93.96            | 94.04            | 94.02            | 94.05            | 0.011359            | 0.39              | 0.10              | 2.08             | 0.58         |
| Reach 1-Upper | 868       | 50YrCHI3Hr   | 0.04              | 93.96            | 94.04            | 94.03            | 94.05            | 0.012637            | 0.42              | 0.10              | 2.12             | 0.62         |
| Reach 1-Upper | 868       | 100YrCHI3Hr  | 0.05              | 93.96            | 94.05            | 94.03            | 94.06            | 0.013009            | 0.44              | 0.11              | 2.18             | 0.63         |
| Reach 1-Upper | 868       | 2YrSCS24Hr   | 0.02              | 93.96            | 94.03            | 94.01            | 94.04            | 0.007224            | 0.29              | 0.08              | 1.96             | 0.46         |
| Reach 1-Upper | 868       | 5YrSCS24Hr   | 0.03              | 93.96            | 94.04            | 94.02            | 94.04            | 0.009697            | 0.35              | 0.09              | 2.03             | 0.53         |
| Reach 1-Upper | 868       | 10YrSCS24Hr  | 0.04              | 93.96            | 94.04            | 94.02            | 94.05            | 0.011232            | 0.39              | 0.10              | 2.07             | 0.58         |
| Reach 1-Upper | 868       | 25YrSCS24Hr  | 0.04              | 93.96            | 94.04            | 94.03            | 94.05            | 0.013016            | 0.43              | 0.10              | 2.13             | 0.63         |
| Reach 1-Upper | 868       | 50YrSCS24Hr  | 0.05              | 93.96            | 94.05            | 94.03            | 94.06            | 0.012976            | 0.44              | 0.11              | 2.19             | 0.63         |
| Reach 1-Upper | 868       | 100YrSCS24Hr | 0.06              | 93.96            | 94.05            | 94.04            | 94.06            | 0.011619            | 0.44              | 0.12              | 2.30             | 0.60         |
| Reach 1-Upper | 848       | 2YrCHI3Hr    | 0.02              | 93.87            | 93.92            | 93.90            | 93.93            | 0.004549            | 0.20              | 0.09              | 2.73             | 0.35         |
| Reach 1-Upper | 848       | 5YrCHI3Hr    | 0.03              | 93.87            | 93.94            | 93.91            | 93.94            | 0.003629            | 0.21              | 0.13              | 3.01             | 0.32         |
| Reach 1-Upper | 848       | 10YrCHI3Hr   | 0.03              | 93.87            | 93.94            | 93.91            | 93.95            | 0.002995            | 0.21              | 0.15              | 3.10             | 0.30         |
| Reach 1-Upper | 848       | 25YrCHI3Hr   | 0.04              | 93.87            | 93.95            | 93.92            | 93.96            | 0.002536            | 0.21              | 0.18              | 3.19             | 0.28         |
| Reach 1-Upper | 848       | 50YrCHI3Hr   | 0.04              | 93.87            | 93.96            | 93.92            | 93.96            | 0.002177            | 0.21              | 0.21              | 3.28             | 0.27         |
| Reach 1-Upper | 848       | 100YrCHI3Hr  | 0.05              | 93.87            | 93.97            | 93.92            | 93.97            | 0.002108            | 0.22              | 0.22              | 3.34             | 0.27         |
| Reach 1-Upper | 848       | 2YrSCS24Hr   | 0.02              | 93.87            | 93.93            | 93.91            | 93.93            | 0.004188            | 0.21              | 0.11              | 2.93             | 0.34         |
| Reach 1-Upper | 848       | 5YrSCS24Hr   | 0.03              | 93.87            | 93.94            | 93.91            | 93.95            | 0.002995            | 0.21              | 0.15              | 3.10             | 0.30         |
| Reach 1-Upper | 848       | 10YrSCS24Hr  | 0.04              | 93.87            | 93.95            | 93.92            | 93.95            | 0.002574            | 0.21              | 0.18              | 3.18             | 0.29         |
| Reach 1-Upper | 848       | 25YrSCS24Hr  | 0.04              | 93.87            | 93.96            | 93.92            | 93.96            | 0.002104            | 0.21              | 0.21              | 3.30             | 0.26         |
| Reach 1-Upper | 848       | 50YrSCS24Hr  | 0.05              | 93.87            | 93.97            | 93.92            | 93.97            | 0.002100            | 0.22              | 0.23              | 3.35             | 0.27         |
| Reach 1-Upper | 848       | 100YrSCS24Hr | 0.06              | 93.87            | 93.97            | 93.92            | 93.97            | 0.002380            | 0.23              | 0.23              | 3.38             | 0.28         |
| Reach 1-Upper | 828       | 2YrCHI3Hr    | 0.02              | 93.78            | 93.86            | 93.82            | 93.86            | 0.002644            | 0.17              | 0.11              | 2.77             | 0.27         |
| Reach 1-Upper | 828       | 5YrCHI3Hr    | 0.03              | 93.78            | 93.86            | 93.83            | 93.86            | 0.004666            | 0.23              | 0.12              | 2.86             | 0.37         |
| Reach 1-Upper | 828       | 10YrCHI3Hr   | 0.03              | 93.78            | 93.86            | 93.83            | 93.86            | 0.007085            | 0.28              | 0.11              | 2.81             | 0.45         |
| Reach 1-Upper | 828       | 25YrCHI3Hr   | 0.04              | 93.78            | 93.85            | 93.84            | 93.86            | 0.014294            | 0.39              | 0.10              | 2.58             | 0.63         |
| Reach 1-Upper | 828       | 50YrCHI3Hr   | 0.04              | 93.78            | 93.84            | 93.84            | 93.86            | 0.029914            | 0.53              | 0.08              | 2.30             | 0.90         |
| Reach 1-Upper | 828       | 100YrCHI3Hr  | 0.05              | 93.78            | 93.84            | 93.84            | 93.86            | 0.034267            | 0.57              | 0.08              | 2.34             | 0.97         |
| Reach 1-Upper | 828       | 2YrSCS24Hr   | 0.02              | 93.78            | 93.86            | 93.82            | 93.86            | 0.003210            | 0.19              | 0.12              | 2.95             | 0.30         |
| Reach 1-Upper | 828       | 5YrSCS24Hr   | 0.03              | 93.78            | 93.86            | 93.83            | 93.86            | 0.007085            | 0.28              | 0.11              | 2.81             | 0.45         |
| Reach 1-Upper | 828       | 10YrSCS24Hr  | 0.04              | 93.78            | 93.85            | 93.84            | 93.86            | 0.012962            | 0.37              | 0.10              | 2.61             | 0.60         |
| Reach 1-Upper | 828       | 25YrSCS24Hr  | 0.04              | 93.78            | 93.84            | 93.84            | 93.86            | 0.035615            | 0.57              | 0.08              | 2.22             | 0.98         |
| Reach 1-Upper | 828       | 50YrSCS24Hr  | 0.05              | 93.78            | 93.84            | 93.84            | 93.86            | 0.036015            | 0.59              | 0.08              | 2.34             | 0.99         |
| Reach 1-Upper | 828       | 100YrSCS24Hr | 0.06              | 93.78            | 93.86            | 93.85            | 93.87            | 0.020193            | 0.48              | 0.11              | 2.83             | 0.76         |
| Reach 1-Upper | 807       | 2YrCHI3Hr    | 0.02              | 93.65            | 93.70            | 93.70            | 93.71            | 0.044163            | 0.52              | 0.04              | 1.46             | 1.04         |
| Reach 1-Upper | 807       | 5YrCHI3Hr    | 0.03              | 93.65            | 93.73            | 93.71            | 93.73            | 0.007733            | 0.31              | 0.09              | 2.04             | 0.47         |
| Reach 1-Upper | 807       | 10YrCHI3Hr   | 0.03              | 93.65            | 93.75            | 93.71            | 93.75            | 0.003849            | 0.25              | 0.13              | 2.40             | 0.35         |
| Reach 1-Upper | 807       | 25YrCHI3Hr   | 0.04              | 93.65            | 93.77            | 93.71            | 93.77            | 0.001862            | 0.20              | 0.19              | 2.86             | 0.25         |
| Reach 1-Upper | 807       | 50YrCHI3Hr   | 0.04              | 93.65            | 93.79            | 93.72            | 93.79            | 0.001072            | 0.17              | 0.25              | 3.27             | 0.20         |
| Reach 1-Upper | 807       | 100YrCHI3Hr  | 0.05              | 93.65            | 93.81            | 93.72            | 93.81            | 0.000618            | 0.15              | 0.32              | 3.62             | 0.15         |
| Reach 1-Upper | 807       | 2YrSCS24Hr   | 0.02              | 93.65            | 93.71            | 93.70            | 93.72            | 0.021814            | 0.43              | 0.06              | 1.70             | 0.76         |
| Reach 1-Upper | 807       | 5YrSCS24Hr   | 0.03              | 93.65            | 93.75            | 93.71            | 93.75            | 0.003849            | 0.25              | 0.13              | 2.40             | 0.35         |
| Reach 1-Upper | 807       | 10YrSCS24Hr  | 0.04              | 93.65            | 93.77            | 93.71            | 93.77            | 0.002057            | 0.21              | 0.18              | 2.79             | 0.26         |
| Reach 1-Upper | 807       | 25YrSCS24Hr  | 0.04              | 93.65            | 93.79            | 93.72            | 93.79            | 0.000946            | 0.17              | 0.26              | 3.34             | 0.18         |
| Reach 1-Upper | 807       | 50YrSCS24Hr  | 0.05              | 93.65            | 93.81            | 93.72            | 93.82            | 0.000538            | 0.15              | 0.34              | 3.71             | 0.14         |
| Reach 1-Upper | 807       | 100YrSCS24Hr | 0.06              | 93.65            | 93.84            | 93.73            | 93.85            | 0.000286            | 0.13              | 0.46              | 4.22             | 0.11         |
| Reach 1-Upper | 789       | 2YrCHI3Hr    | 0.02              | 93.49            | 93.69            | 93.53            | 93.69            | 0.000037            | 0.05              | 0.38              | 3.33             | 0.04         |
| Reach 1-Upper | 789       | 5YrCHI3Hr    | 0.03              | 93.49            | 93.73            | 93.54            | 93.73            | 0.000036            | 0.06              | 0.47              | 3.77             | 0.04         |
| Reach 1-Upper | 789       | 10YrCHI3Hr   | 0.03              | 93.49            | 93.74            | 93.55            | 93.74            | 0.000038            | 0.06              | 0.51              | 4.05             | 0.04         |
| Reach 1-Upper | 789       | 25YrCHI3Hr   | 0.04              | 93.49            | 93.77            | 93.55            | 93.77            | 0.000038            | 0.07              | 0.56              | 4.42             | 0.04         |
| Reach 1-Upper | 789       | 50YrCHI3Hr   | 0.04              | 93.49            | 93.79            | 93.55            | 93.79            | 0.000038            | 0.07              | 0.61              | 4.75             | 0.04         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 789       | 100YrCHI3Hr  | 0.05              | 93.49            | 93.81            | 93.56            | 93.81            | 0.000036            | 0.07              | 0.66              | 5.08             | 0.04         |
| Reach 1-Upper | 789       | 2YrSCS24Hr   | 0.02              | 93.49            | 93.71            | 93.54            | 93.71            | 0.000038            | 0.06              | 0.43              | 3.55             | 0.04         |
| Reach 1-Upper | 789       | 5YrSCS24Hr   | 0.03              | 93.49            | 93.74            | 93.55            | 93.74            | 0.000038            | 0.06              | 0.51              | 4.05             | 0.04         |
| Reach 1-Upper | 789       | 10YrSCS24Hr  | 0.04              | 93.49            | 93.76            | 93.55            | 93.76            | 0.000038            | 0.07              | 0.56              | 4.37             | 0.04         |
| Reach 1-Upper | 789       | 25YrSCS24Hr  | 0.04              | 93.49            | 93.79            | 93.56            | 93.79            | 0.000037            | 0.07              | 0.62              | 4.81             | 0.04         |
| Reach 1-Upper | 789       | 50YrSCS24Hr  | 0.05              | 93.49            | 93.81            | 93.56            | 93.81            | 0.000035            | 0.07              | 0.67              | 5.17             | 0.04         |
| Reach 1-Upper | 789       | 100YrSCS24Hr | 0.06              | 93.49            | 93.84            | 93.56            | 93.84            | 0.000032            | 0.07              | 0.75              | 5.59             | 0.04         |
| Reach 1-Upper | 764       | Culvert      |                   |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 759       | 2YrCHI3Hr    | 0.02              | 93.46            | 93.54            | 93.50            | 93.54            | 0.002883            | 0.23              | 0.08              | 1.83             | 0.30         |
| Reach 1-Upper | 759       | 5YrCHI3Hr    | 0.03              | 93.46            | 93.56            | 93.51            | 93.56            | 0.001988            | 0.23              | 0.12              | 2.15             | 0.26         |
| Reach 1-Upper | 759       | 10YrCHI3Hr   | 0.03              | 93.46            | 93.58            | 93.51            | 93.58            | 0.001375            | 0.22              | 0.14              | 2.40             | 0.23         |
| Reach 1-Upper | 759       | 25YrCHI3Hr   | 0.04              | 93.46            | 93.61            | 93.52            | 93.61            | 0.000864            | 0.21              | 0.18              | 2.73             | 0.19         |
| Reach 1-Upper | 759       | 50YrCHI3Hr   | 0.04              | 93.46            | 93.65            | 93.52            | 93.65            | 0.000433            | 0.18              | 0.24              | 3.23             | 0.14         |
| Reach 1-Upper | 759       | 100YrCHI3Hr  | 0.05              | 93.46            | 93.68            | 93.53            | 93.68            | 0.000309            | 0.17              | 0.29              | 3.59             | 0.12         |
| Reach 1-Upper | 759       | 2YrSCS24Hr   | 0.02              | 93.46            | 93.55            | 93.51            | 93.56            | 0.002355            | 0.23              | 0.10              | 2.03             | 0.28         |
| Reach 1-Upper | 759       | 5YrSCS24Hr   | 0.03              | 93.46            | 93.58            | 93.51            | 93.58            | 0.001375            | 0.22              | 0.14              | 2.40             | 0.23         |
| Reach 1-Upper | 759       | 10YrSCS24Hr  | 0.04              | 93.46            | 93.60            | 93.52            | 93.60            | 0.000932            | 0.21              | 0.18              | 2.67             | 0.19         |
| Reach 1-Upper | 759       | 25YrSCS24Hr  | 0.04              | 93.46            | 93.65            | 93.52            | 93.65            | 0.000408            | 0.17              | 0.25              | 3.29             | 0.14         |
| Reach 1-Upper | 759       | 50YrSCS24Hr  | 0.05              | 93.46            | 93.69            | 93.53            | 93.69            | 0.000262            | 0.16              | 0.31              | 3.73             | 0.11         |
| Reach 1-Upper | 759       | 100YrSCS24Hr | 0.06              | 93.46            | 93.73            | 93.53            | 93.73            | 0.000176            | 0.15              | 0.37              | 4.23             | 0.10         |
| Reach 1-Upper | 743       | 2YrCHI3Hr    | 0.02              | 93.40            | 93.49            | 93.45            | 93.50            | 0.002754            | 0.25              | 0.08              | 1.55             | 0.30         |
| Reach 1-Upper | 743       | 5YrCHI3Hr    | 0.03              | 93.40            | 93.54            | 93.46            | 93.54            | 0.001046            | 0.20              | 0.13              | 2.00             | 0.20         |
| Reach 1-Upper | 743       | 10YrCHI3Hr   | 0.03              | 93.40            | 93.57            | 93.47            | 93.57            | 0.000686            | 0.19              | 0.17              | 2.25             | 0.17         |
| Reach 1-Upper | 743       | 25YrCHI3Hr   | 0.04              | 93.40            | 93.60            | 93.47            | 93.60            | 0.000466            | 0.18              | 0.21              | 2.59             | 0.14         |
| Reach 1-Upper | 743       | 50YrCHI3Hr   | 0.04              | 93.40            | 93.64            | 93.48            | 93.64            | 0.000265            | 0.16              | 0.27              | 3.11             | 0.11         |
| Reach 1-Upper | 743       | 100YrCHI3Hr  | 0.05              | 93.40            | 93.67            | 93.48            | 93.67            | 0.000207            | 0.16              | 0.31              | 3.83             | 0.10         |
| Reach 1-Upper | 743       | 2YrSCS24Hr   | 0.02              | 93.40            | 93.52            | 93.46            | 93.52            | 0.001463            | 0.21              | 0.11              | 1.84             | 0.23         |
| Reach 1-Upper | 743       | 5YrSCS24Hr   | 0.03              | 93.40            | 93.57            | 93.47            | 93.57            | 0.000686            | 0.19              | 0.17              | 2.25             | 0.17         |
| Reach 1-Upper | 743       | 10YrSCS24Hr  | 0.04              | 93.40            | 93.59            | 93.47            | 93.59            | 0.000495            | 0.18              | 0.20              | 2.53             | 0.15         |
| Reach 1-Upper | 743       | 25YrSCS24Hr  | 0.04              | 93.40            | 93.65            | 93.48            | 93.65            | 0.000254            | 0.16              | 0.27              | 3.18             | 0.11         |
| Reach 1-Upper | 743       | 50YrSCS24Hr  | 0.05              | 93.40            | 93.68            | 93.48            | 93.69            | 0.000181            | 0.15              | 0.32              | 4.15             | 0.10         |
| Reach 1-Upper | 743       | 100YrSCS24Hr | 0.06              | 93.40            | 93.73            | 93.49            | 93.73            | 0.000134            | 0.14              | 0.38              | 4.85             | 0.09         |
| Reach 1-Upper | 733       | Culvert      |                   |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 728       | 2YrCHI3Hr    | 0.02              | 93.33            | 93.48            | 93.39            | 93.48            | 0.000387            | 0.13              | 0.15              | 1.68             | 0.12         |
| Reach 1-Upper | 728       | 5YrCHI3Hr    | 0.03              | 93.33            | 93.52            | 93.40            | 93.52            | 0.000273            | 0.13              | 0.21              | 1.98             | 0.11         |
| Reach 1-Upper | 728       | 10YrCHI3Hr   | 0.03              | 93.33            | 93.55            | 93.40            | 93.55            | 0.000233            | 0.13              | 0.24              | 2.16             | 0.10         |
| Reach 1-Upper | 728       | 25YrCHI3Hr   | 0.04              | 93.33            | 93.58            | 93.41            | 93.58            | 0.000196            | 0.14              | 0.28              | 2.37             | 0.10         |
| Reach 1-Upper | 728       | 50YrCHI3Hr   | 0.04              | 93.33            | 93.62            | 93.41            | 93.62            | 0.000131            | 0.13              | 0.34              | 2.70             | 0.08         |
| Reach 1-Upper | 728       | 100YrCHI3Hr  | 0.05              | 93.33            | 93.64            | 93.42            | 93.64            | 0.000117            | 0.13              | 0.38              | 2.90             | 0.08         |
| Reach 1-Upper | 728       | 2YrSCS24Hr   | 0.02              | 93.33            | 93.51            | 93.39            | 93.51            | 0.000306            | 0.13              | 0.19              | 1.87             | 0.11         |
| Reach 1-Upper | 728       | 5YrSCS24Hr   | 0.03              | 93.33            | 93.55            | 93.40            | 93.55            | 0.000233            | 0.13              | 0.24              | 2.16             | 0.10         |
| Reach 1-Upper | 728       | 10YrSCS24Hr  | 0.04              | 93.33            | 93.57            | 93.41            | 93.57            | 0.000202            | 0.14              | 0.27              | 2.34             | 0.10         |
| Reach 1-Upper | 728       | 25YrSCS24Hr  | 0.04              | 93.33            | 93.62            | 93.41            | 93.62            | 0.000128            | 0.13              | 0.35              | 2.74             | 0.08         |
| Reach 1-Upper | 728       | 50YrSCS24Hr  | 0.05              | 93.33            | 93.66            | 93.42            | 93.66            | 0.000106            | 0.12              | 0.39              | 2.98             | 0.08         |
| Reach 1-Upper | 728       | 100YrSCS24Hr | 0.06              | 93.33            | 93.69            | 93.42            | 93.69            | 0.000091            | 0.12              | 0.44              | 3.24             | 0.07         |
| Reach 1-Upper | 715       | 2YrCHI3Hr    | 0.02              | 93.32            | 93.48            | 93.36            | 93.48            | 0.000151            | 0.10              | 0.20              | 2.44             | 0.08         |
| Reach 1-Upper | 715       | 5YrCHI3Hr    | 0.03              | 93.32            | 93.52            | 93.37            | 93.52            | 0.000132            | 0.11              | 0.26              | 2.85             | 0.08         |
| Reach 1-Upper | 715       | 10YrCHI3Hr   | 0.03              | 93.32            | 93.54            | 93.37            | 93.54            | 0.000123            | 0.11              | 0.29              | 3.09             | 0.08         |
| Reach 1-Upper | 715       | 25YrCHI3Hr   | 0.04              | 93.32            | 93.57            | 93.38            | 93.57            | 0.000112            | 0.11              | 0.33              | 3.38             | 0.08         |
| Reach 1-Upper | 715       | 50YrCHI3Hr   | 0.04              | 93.32            | 93.62            | 93.38            | 93.62            | 0.000081            | 0.11              | 0.39              | 3.82             | 0.07         |
| Reach 1-Upper | 715       | 100YrCHI3Hr  | 0.05              | 93.32            | 93.64            | 93.39            | 93.64            | 0.000075            | 0.11              | 0.43              | 4.07             | 0.06         |
| Reach 1-Upper | 715       | 2YrSCS24Hr   | 0.02              | 93.32            | 93.51            | 93.36            | 93.51            | 0.000138            | 0.10              | 0.24              | 2.70             | 0.08         |
| Reach 1-Upper | 715       | 5YrSCS24Hr   | 0.03              | 93.32            | 93.54            | 93.37            | 93.54            | 0.000123            | 0.11              | 0.29              | 3.09             | 0.08         |
| Reach 1-Upper | 715       | 10YrSCS24Hr  | 0.04              | 93.32            | 93.57            | 93.38            | 93.57            | 0.000114            | 0.11              | 0.32              | 3.33             | 0.08         |
| Reach 1-Upper | 715       | 25YrSCS24Hr  | 0.04              | 93.32            | 93.62            | 93.39            | 93.62            | 0.000080            | 0.11              | 0.40              | 3.86             | 0.07         |
| Reach 1-Upper | 715       | 50YrSCS24Hr  | 0.05              | 93.32            | 93.65            | 93.39            | 93.65            | 0.000070            | 0.11              | 0.44              | 4.19             | 0.06         |
| Reach 1-Upper | 715       | 100YrSCS24Hr | 0.06              | 93.32            | 93.69            | 93.39            | 93.69            | 0.000062            | 0.11              | 0.49              | 4.53             | 0.06         |
| Reach 1-Upper | 705       | Culvert      |                   |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 698       | 2YrCHI3Hr    | 0.02              | 93.24            | 93.31            | 93.29            | 93.32            | 0.010647            | 0.37              | 0.05              | 1.15             | 0.56         |
| Reach 1-Upper | 698       | 5YrCHI3Hr    | 0.03              | 93.24            | 93.31            | 93.30            | 93.33            | 0.018452            | 0.50              | 0.05              | 1.17             | 0.74         |
| Reach 1-Upper | 698       | 10YrCHI3Hr   | 0.03              | 93.24            | 93.31            | 93.31            | 93.33            | 0.030771            | 0.62              | 0.05              | 1.15             | 0.95         |
| Reach 1-Upper | 698       | 25YrCHI3Hr   | 0.04              | 93.24            | 93.38            | 93.31            | 93.38            | 0.002195            | 0.26              | 0.15              | 1.67             | 0.28         |
| Reach 1-Upper | 698       | 50YrCHI3Hr   | 0.04              | 93.24            | 93.51            | 93.32            | 93.51            | 0.000131            | 0.11              | 0.41              | 2.59             | 0.08         |
| Reach 1-Upper | 698       | 100YrCHI3Hr  | 0.05              | 93.24            | 93.51            | 93.32            | 93.51            | 0.000158            | 0.12              | 0.41              | 2.60             | 0.09         |
| Reach 1-Upper | 698       | 2YrSCS24Hr   | 0.02              | 93.24            | 93.31            | 93.30            | 93.32            | 0.016098            | 0.46              | 0.05              | 1.16             | 0.69         |
| Reach 1-Upper | 698       | 5YrSCS24Hr   | 0.03              | 93.24            | 93.31            | 93.31            | 93.33            | 0.033358            | 0.64              | 0.05              | 1.14             | 0.98         |
| Reach 1-Upper | 698       | 10YrSCS24Hr  | 0.04              | 93.24            | 93.41            | 93.31            | 93.41            | 0.000855            | 0.18              | 0.20              | 1.88             | 0.18         |
| Reach 1-Upper | 698       | 25YrSCS24Hr  | 0.04              | 93.24            | 93.51            | 93.32            | 93.51            | 0.000135            | 0.11              | 0.41              | 2.59             | 0.08         |
| Reach 1-Upper | 698       | 50YrSCS24Hr  | 0.05              | 93.24            | 93.51            | 93.32            | 93.51            | 0.000162            | 0.12              | 0.41              | 2.61             | 0.09         |
| Reach 1-Upper | 698       | 100YrSCS24Hr | 0.06              | 93.24            | 93.51            | 93.33            | 93.52            | 0.000196            | 0.13              | 0.42              | 2.63             | 0.10         |
| Reach 1-Upper | 681       | 2YrCHI3Hr    | 0.02              | 93.14            | 93.22            | 93.19            | 93.22            | 0.003726            | 0.23              | 0.08              | 1.65             | 0.34         |
| Reach 1-Upper | 681       | 5YrCHI3Hr    | 0.03              | 93.14            | 93.24            | 93.20            | 93.25            | 0.001985            | 0.21              | 0.13              | 1.84             | 0.26         |
| Reach 1-Upper | 681       | 10YrCHI3Hr   | 0.03              | 93.14            | 93.27            | 93.20            | 93.27            | 0.001166            | 0.19              | 0.17              | 2.00             | 0.21         |
| Reach 1-Upper | 681       | 25YrCHI3Hr   | 0.04              | 93.14            | 93.37            | 93.20            | 93.37            | 0.000122            | 0.09              | 0.42              | 2.74             | 0.07         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 681       | 50YrCHI3Hr   | 0.04              | 93.14            | 93.51            | 93.21            | 93.51            | 0.000021            | 0.05              | 0.87              | 4.05             | 0.03         |
| Reach 1-Upper | 681       | 100YrCHI3Hr  | 0.05              | 93.14            | 93.51            | 93.21            | 93.51            | 0.000026            | 0.06              | 0.88              | 4.08             | 0.04         |
| Reach 1-Upper | 681       | 2YrSCS24Hr   | 0.02              | 93.14            | 93.24            | 93.19            | 93.24            | 0.002292            | 0.21              | 0.11              | 1.78             | 0.27         |
| Reach 1-Upper | 681       | 5YrSCS24Hr   | 0.03              | 93.14            | 93.28            | 93.20            | 93.28            | 0.000837            | 0.17              | 0.19              | 2.07             | 0.18         |
| Reach 1-Upper | 681       | 10YrSCS24Hr  | 0.04              | 93.14            | 93.41            | 93.20            | 93.41            | 0.000067            | 0.07              | 0.52              | 2.97             | 0.05         |
| Reach 1-Upper | 681       | 25YrSCS24Hr  | 0.04              | 93.14            | 93.51            | 93.21            | 93.51            | 0.000022            | 0.05              | 0.87              | 4.07             | 0.03         |
| Reach 1-Upper | 681       | 50YrSCS24Hr  | 0.05              | 93.14            | 93.51            | 93.21            | 93.51            | 0.000027            | 0.06              | 0.88              | 4.09             | 0.04         |
| Reach 1-Upper | 681       | 100YrSCS24Hr | 0.06              | 93.14            | 93.51            | 93.22            | 93.51            | 0.000033            | 0.06              | 0.89              | 4.13             | 0.04         |
| Reach 1-Upper | 663       | 2YrCHI3Hr    | 0.02              | 93.05            | 93.19            |                  | 93.19            | 0.000887            | 0.16              | 0.12              | 1.35             | 0.18         |
| Reach 1-Upper | 663       | 5YrCHI3Hr    | 0.03              | 93.05            | 93.22            |                  | 93.23            | 0.000652            | 0.16              | 0.17              | 1.60             | 0.16         |
| Reach 1-Upper | 663       | 10YrCHI3Hr   | 0.03              | 93.05            | 93.25            |                  | 93.25            | 0.000460            | 0.15              | 0.22              | 1.80             | 0.13         |
| Reach 1-Upper | 663       | 25YrCHI3Hr   | 0.04              | 93.05            | 93.37            |                  | 93.37            | 0.000079            | 0.08              | 0.48              | 2.67             | 0.06         |
| Reach 1-Upper | 663       | 50YrCHI3Hr   | 0.04              | 93.05            | 93.51            |                  | 93.51            | 0.000018            | 0.05              | 0.96              | 4.41             | 0.03         |
| Reach 1-Upper | 663       | 100YrCHI3Hr  | 0.05              | 93.05            | 93.51            |                  | 93.51            | 0.000022            | 0.05              | 0.96              | 4.44             | 0.03         |
| Reach 1-Upper | 663       | 2YrSCS24Hr   | 0.02              | 93.05            | 93.22            |                  | 93.22            | 0.000662            | 0.16              | 0.15              | 1.54             | 0.16         |
| Reach 1-Upper | 663       | 5YrSCS24Hr   | 0.03              | 93.05            | 93.27            |                  | 93.27            | 0.000342            | 0.13              | 0.24              | 1.90             | 0.12         |
| Reach 1-Upper | 663       | 10YrSCS24Hr  | 0.04              | 93.05            | 93.40            |                  | 93.40            | 0.000049            | 0.06              | 0.57              | 3.04             | 0.05         |
| Reach 1-Upper | 663       | 25YrSCS24Hr  | 0.04              | 93.05            | 93.51            |                  | 93.51            | 0.000019            | 0.05              | 0.96              | 4.42             | 0.03         |
| Reach 1-Upper | 663       | 50YrSCS24Hr  | 0.05              | 93.05            | 93.51            |                  | 93.51            | 0.000023            | 0.05              | 0.97              | 4.46             | 0.03         |
| Reach 1-Upper | 663       | 100YrSCS24Hr | 0.06              | 93.05            | 93.51            |                  | 93.51            | 0.000028            | 0.06              | 0.98              | 4.50             | 0.04         |
| Reach 1-Upper | 656       | 2YrCHI3Hr    | 0.06              | 93.03            | 93.15            | 93.12            | 93.16            | 0.007897            | 0.46              | 0.13              | 1.69             | 0.53         |
| Reach 1-Upper | 656       | 5YrCHI3Hr    | 0.10              | 93.03            | 93.19            | 93.14            | 93.20            | 0.006746            | 0.51              | 0.20              | 1.91             | 0.51         |
| Reach 1-Upper | 656       | 10YrCHI3Hr   | 0.13              | 93.03            | 93.23            | 93.16            | 93.24            | 0.004563            | 0.48              | 0.27              | 2.12             | 0.43         |
| Reach 1-Upper | 656       | 25YrCHI3Hr   | 0.17              | 93.03            | 93.36            | 93.18            | 93.37            | 0.000762            | 0.28              | 0.62              | 2.87             | 0.19         |
| Reach 1-Upper | 656       | 50YrCHI3Hr   | 0.20              | 93.03            | 93.51            | 93.19            | 93.51            | 0.000191            | 0.19              | 1.16              | 4.64             | 0.10         |
| Reach 1-Upper | 656       | 100YrCHI3Hr  | 0.24              | 93.03            | 93.51            | 93.20            | 93.51            | 0.000260            | 0.22              | 1.17              | 4.65             | 0.12         |
| Reach 1-Upper | 656       | 2YrSCS24Hr   | 0.09              | 93.03            | 93.18            | 93.14            | 93.19            | 0.007161            | 0.50              | 0.18              | 1.86             | 0.52         |
| Reach 1-Upper | 656       | 5YrSCS24Hr   | 0.14              | 93.03            | 93.24            | 93.17            | 93.25            | 0.003570            | 0.45              | 0.31              | 2.22             | 0.39         |
| Reach 1-Upper | 656       | 10YrSCS24Hr  | 0.18              | 93.03            | 93.40            | 93.18            | 93.40            | 0.000513            | 0.24              | 0.73              | 3.49             | 0.16         |
| Reach 1-Upper | 656       | 25YrSCS24Hr  | 0.22              | 93.03            | 93.51            | 93.20            | 93.51            | 0.000228            | 0.21              | 1.16              | 4.65             | 0.11         |
| Reach 1-Upper | 656       | 50YrSCS24Hr  | 0.26              | 93.03            | 93.51            | 93.21            | 93.51            | 0.000307            | 0.24              | 1.17              | 4.66             | 0.13         |
| Reach 1-Upper | 656       | 100YrSCS24Hr | 0.30              | 93.03            | 93.51            | 93.22            | 93.51            | 0.000401            | 0.28              | 1.17              | 4.67             | 0.15         |
| Reach 1-Upper | 638       | 2YrCHI3Hr    | 0.06              | 92.92            | 93.08            | 93.01            | 93.08            | 0.002811            | 0.33              | 0.19              | 1.85             | 0.33         |
| Reach 1-Upper | 638       | 5YrCHI3Hr    | 0.10              | 92.92            | 93.14            | 93.04            | 93.14            | 0.001935            | 0.33              | 0.31              | 2.24             | 0.28         |
| Reach 1-Upper | 638       | 10YrCHI3Hr   | 0.13              | 92.92            | 93.19            | 93.05            | 93.20            | 0.001151            | 0.29              | 0.45              | 2.68             | 0.23         |
| Reach 1-Upper | 638       | 25YrCHI3Hr   | 0.17              | 92.92            | 93.36            | 93.07            | 93.36            | 0.000204            | 0.17              | 1.05              | 4.59             | 0.10         |
| Reach 1-Upper | 638       | 50YrCHI3Hr   | 0.20              | 92.92            | 93.50            | 93.08            | 93.50            | 0.000071            | 0.13              | 1.86              | 6.83             | 0.06         |
| Reach 1-Upper | 638       | 100YrCHI3Hr  | 0.24              | 92.92            | 93.50            | 93.10            | 93.51            | 0.000098            | 0.15              | 1.86              | 6.83             | 0.08         |
| Reach 1-Upper | 638       | 2YrSCS24Hr   | 0.09              | 92.92            | 93.12            | 93.03            | 93.12            | 0.002263            | 0.34              | 0.27              | 2.12             | 0.30         |
| Reach 1-Upper | 638       | 5YrSCS24Hr   | 0.14              | 92.92            | 93.22            | 93.06            | 93.22            | 0.000920            | 0.27              | 0.52              | 2.92             | 0.20         |
| Reach 1-Upper | 638       | 10YrSCS24Hr  | 0.18              | 92.92            | 93.40            | 93.07            | 93.40            | 0.000146            | 0.16              | 1.22              | 5.04             | 0.09         |
| Reach 1-Upper | 638       | 25YrSCS24Hr  | 0.22              | 92.92            | 93.50            | 93.09            | 93.51            | 0.000085            | 0.14              | 1.86              | 6.83             | 0.07         |
| Reach 1-Upper | 638       | 50YrSCS24Hr  | 0.26              | 92.92            | 93.50            | 93.10            | 93.51            | 0.000115            | 0.16              | 1.86              | 6.84             | 0.08         |
| Reach 1-Upper | 638       | 100YrSCS24Hr | 0.30              | 92.92            | 93.50            | 93.12            | 93.51            | 0.000152            | 0.18              | 1.87              | 6.84             | 0.09         |
| Reach 1-Upper | 617       | 2YrCHI3Hr    | 0.06              | 92.84            | 93.02            | 92.95            | 93.02            | 0.002976            | 0.32              | 0.19              | 2.05             | 0.33         |
| Reach 1-Upper | 617       | 5YrCHI3Hr    | 0.10              | 92.84            | 93.11            | 92.98            | 93.11            | 0.000952            | 0.24              | 0.43              | 2.97             | 0.20         |
| Reach 1-Upper | 617       | 10YrCHI3Hr   | 0.13              | 92.84            | 93.18            | 92.99            | 93.18            | 0.000487            | 0.20              | 0.66              | 3.68             | 0.15         |
| Reach 1-Upper | 617       | 25YrCHI3Hr   | 0.17              | 92.84            | 93.36            | 93.01            | 93.36            | 0.000104            | 0.11              | 1.56              | 6.63             | 0.07         |
| Reach 1-Upper | 617       | 50YrCHI3Hr   | 0.20              | 92.84            | 93.50            | 93.02            | 93.50            | 0.000032            | 0.07              | 2.93              | 15.16            | 0.04         |
| Reach 1-Upper | 617       | 100YrCHI3Hr  | 0.24              | 92.84            | 93.50            | 93.04            | 93.50            | 0.000044            | 0.09              | 2.93              | 15.17            | 0.05         |
| Reach 1-Upper | 617       | 2YrSCS24Hr   | 0.09              | 92.84            | 93.08            | 92.97            | 93.09            | 0.001249            | 0.26              | 0.35              | 2.72             | 0.23         |
| Reach 1-Upper | 617       | 5YrSCS24Hr   | 0.14              | 92.84            | 93.21            | 93.00            | 93.21            | 0.000388            | 0.18              | 0.77              | 4.08             | 0.13         |
| Reach 1-Upper | 617       | 10YrSCS24Hr  | 0.18              | 92.84            | 93.39            | 93.01            | 93.39            | 0.000078            | 0.10              | 1.82              | 7.56             | 0.06         |
| Reach 1-Upper | 617       | 25YrSCS24Hr  | 0.22              | 92.84            | 93.50            | 93.03            | 93.50            | 0.000038            | 0.08              | 2.93              | 15.17            | 0.05         |
| Reach 1-Upper | 617       | 50YrSCS24Hr  | 0.26              | 92.84            | 93.50            | 93.04            | 93.50            | 0.000052            | 0.09              | 2.93              | 15.17            | 0.05         |
| Reach 1-Upper | 617       | 100YrSCS24Hr | 0.30              | 92.84            | 93.50            | 93.06            | 93.50            | 0.000069            | 0.11              | 2.93              | 15.18            | 0.06         |
| Reach 1-Upper | 598       | 2YrCHI3Hr    | 0.06              | 92.76            | 93.00            | 92.86            | 93.00            | 0.000514            | 0.18              | 0.36              | 2.60             | 0.15         |
| Reach 1-Upper | 598       | 5YrCHI3Hr    | 0.11              | 92.76            | 93.10            | 92.89            | 93.10            | 0.000269            | 0.18              | 0.61              | 3.40             | 0.12         |
| Reach 1-Upper | 598       | 10YrCHI3Hr   | 0.14              | 92.76            | 93.18            | 92.91            | 93.18            | 0.000184            | 0.18              | 0.80              | 5.26             | 0.10         |
| Reach 1-Upper | 598       | 25YrCHI3Hr   | 0.19              | 92.76            | 93.36            | 92.92            | 93.36            | 0.000070            | 0.15              | 1.25              | 8.76             | 0.07         |
| Reach 1-Upper | 598       | 50YrCHI3Hr   | 0.22              | 92.76            | 93.50            | 92.94            | 93.50            | 0.000018            | 0.07              | 4.94              | 31.21            | 0.03         |
| Reach 1-Upper | 598       | 100YrCHI3Hr  | 0.26              | 92.76            | 93.50            | 92.95            | 93.50            | 0.000024            | 0.09              | 4.94              | 31.21            | 0.04         |
| Reach 1-Upper | 598       | 2YrSCS24Hr   | 0.10              | 92.76            | 93.07            | 92.88            | 93.08            | 0.000317            | 0.18              | 0.54              | 3.19             | 0.12         |
| Reach 1-Upper | 598       | 5YrSCS24Hr   | 0.15              | 92.76            | 93.20            | 92.91            | 93.21            | 0.000160            | 0.17              | 0.87              | 5.82             | 0.10         |
| Reach 1-Upper | 598       | 10YrSCS24Hr  | 0.19              | 92.76            | 93.39            | 92.93            | 93.39            | 0.000059            | 0.14              | 1.34              | 9.49             | 0.06         |
| Reach 1-Upper | 598       | 25YrSCS24Hr  | 0.24              | 92.76            | 93.50            | 92.94            | 93.50            | 0.000021            | 0.08              | 4.94              | 31.21            | 0.04         |
| Reach 1-Upper | 598       | 50YrSCS24Hr  | 0.28              | 92.76            | 93.50            | 92.96            | 93.50            | 0.000029            | 0.09              | 4.93              | 31.21            | 0.04         |
| Reach 1-Upper | 598       | 100YrSCS24Hr | 0.33              | 92.76            | 93.50            | 92.97            | 93.50            | 0.000039            | 0.11              | 4.93              | 31.21            | 0.05         |
| Reach 1-Upper | 589       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 581       | 2YrCHI3Hr    | 0.06              | 92.71            | 92.89            | 92.81            | 92.89            | 0.002034            | 0.27              | 0.24              | 2.66             | 0.28         |
| Reach 1-Upper | 581       | 5YrCHI3Hr    | 0.11              | 92.71            | 92.93            | 92.84            | 92.93            | 0.001970            | 0.33              | 0.33              | 3.40             | 0.29         |
| Reach 1-Upper | 581       | 10YrCHI3Hr   | 0.14              | 92.71            | 92.96            | 92.86            | 92.97            | 0.001627            | 0.34              | 0.41              | 4.01             | 0.27         |
| Reach 1-Upper | 581       | 25YrCHI3Hr   | 0.19              | 92.71            | 93.02            | 92.88            | 93.03            | 0.000990            | 0.33              | 0.56              | 5.14             | 0.22         |
| Reach 1-Upper | 581       | 50YrCHI3Hr   | 0.22              | 92.71            | 93.13            | 92.89            | 93.13            | 0.000386            | 0.27              | 0.83              | 7.07             | 0.15         |
| Reach 1-Upper | 581       | 100YrCHI3Hr  | 0.26              | 92.71            | 93.25            | 92.90            | 93.25            | 0.000184            | 0.23              | 1.13              | 30.32            | 0.11         |
| Reach 1-Upper | 581       | 2YrSCS24Hr   | 0.10              | 92.71            | 92.92            | 92.84            | 92.92            | 0.002055            | 0.32              | 0.31              | 3.20             | 0.29         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 581       | 5YrSCS24Hr   | 0.15              | 92.71            | 92.97            | 92.86            | 92.98            | 0.001468            | 0.34              | 0.44              | 4.26             | 0.26         |
| Reach 1-Upper | 581       | 10YrSCS24Hr  | 0.19              | 92.71            | 93.03            | 92.88            | 93.04            | 0.000901            | 0.32              | 0.59              | 5.33             | 0.21         |
| Reach 1-Upper | 581       | 25YrSCS24Hr  | 0.24              | 92.71            | 93.24            | 92.89            | 93.24            | 0.000175            | 0.22              | 1.11              | 29.51            | 0.10         |
| Reach 1-Upper | 581       | 50YrSCS24Hr  | 0.28              | 92.71            | 93.25            | 92.90            | 93.25            | 0.000220            | 0.25              | 1.13              | 30.33            | 0.12         |
| Reach 1-Upper | 581       | 100YrSCS24Hr | 0.33              | 92.71            | 93.25            | 92.91            | 93.25            | 0.000294            | 0.29              | 1.13              | 30.33            | 0.14         |
| Reach 1-Upper | 572       | 2YrCHI3Hr    | 0.06              | 92.73            | 92.85            | 92.82            | 92.86            | 0.008674            | 0.45              | 0.14              | 2.02             | 0.54         |
| Reach 1-Upper | 572       | 5YrCHI3Hr    | 0.11              | 92.73            | 92.90            | 92.84            | 92.90            | 0.004896            | 0.43              | 0.26              | 2.58             | 0.43         |
| Reach 1-Upper | 572       | 10YrCHI3Hr   | 0.14              | 92.73            | 92.94            | 92.86            | 92.94            | 0.002847            | 0.38              | 0.38              | 3.03             | 0.34         |
| Reach 1-Upper | 572       | 25YrCHI3Hr   | 0.19              | 92.73            | 93.01            | 92.87            | 93.01            | 0.001251            | 0.30              | 0.62              | 3.87             | 0.24         |
| Reach 1-Upper | 572       | 50YrCHI3Hr   | 0.22              | 92.73            | 93.12            | 92.88            | 93.12            | 0.000367            | 0.19              | 1.14              | 5.93             | 0.13         |
| Reach 1-Upper | 572       | 100YrCHI3Hr  | 0.26              | 92.73            | 93.25            | 92.90            | 93.25            | 0.000064            | 0.10              | 4.09              | 35.88            | 0.06         |
| Reach 1-Upper | 572       | 2YrSCS24Hr   | 0.10              | 92.73            | 92.88            | 92.84            | 92.89            | 0.005817            | 0.44              | 0.22              | 2.44             | 0.46         |
| Reach 1-Upper | 572       | 5YrSCS24Hr   | 0.15              | 92.73            | 92.95            | 92.86            | 92.96            | 0.002326            | 0.36              | 0.43              | 3.23             | 0.31         |
| Reach 1-Upper | 572       | 10YrSCS24Hr  | 0.19              | 92.73            | 93.02            | 92.88            | 93.03            | 0.001095            | 0.28              | 0.67              | 4.01             | 0.22         |
| Reach 1-Upper | 572       | 25YrSCS24Hr  | 0.24              | 92.73            | 93.24            | 92.89            | 93.24            | 0.000067            | 0.10              | 3.72              | 33.49            | 0.06         |
| Reach 1-Upper | 572       | 50YrSCS24Hr  | 0.28              | 92.73            | 93.25            | 92.90            | 93.25            | 0.000076            | 0.11              | 4.10              | 35.90            | 0.06         |
| Reach 1-Upper | 572       | 100YrSCS24Hr | 0.33              | 92.73            | 93.25            | 92.92            | 93.25            | 0.000102            | 0.13              | 4.10              | 35.94            | 0.07         |
| Reach 1-Upper | 555       | 2YrCHI3Hr    | 0.06              | 92.61            | 92.81            | 92.71            | 92.81            | 0.000982            | 0.20              | 0.32              | 2.99             | 0.20         |
| Reach 1-Upper | 555       | 5YrCHI3Hr    | 0.11              | 92.61            | 92.87            | 92.74            | 92.87            | 0.000748            | 0.21              | 0.52              | 3.73             | 0.18         |
| Reach 1-Upper | 555       | 10YrCHI3Hr   | 0.14              | 92.61            | 92.92            | 92.75            | 92.92            | 0.000505            | 0.19              | 0.73              | 4.38             | 0.15         |
| Reach 1-Upper | 555       | 25YrCHI3Hr   | 0.19              | 92.61            | 93.00            | 92.77            | 93.00            | 0.000277            | 0.17              | 1.12              | 5.37             | 0.12         |
| Reach 1-Upper | 555       | 50YrCHI3Hr   | 0.22              | 92.61            | 93.12            | 92.78            | 93.12            | 0.000080            | 0.11              | 2.69              | 31.73            | 0.07         |
| Reach 1-Upper | 555       | 100YrCHI3Hr  | 0.26              | 92.61            | 93.25            | 92.79            | 93.25            | 0.000015            | 0.06              | 7.39              | 40.94            | 0.03         |
| Reach 1-Upper | 555       | 2YrSCS24Hr   | 0.10              | 92.61            | 92.85            | 92.73            | 92.86            | 0.000843            | 0.21              | 0.46              | 3.51             | 0.19         |
| Reach 1-Upper | 555       | 5YrSCS24Hr   | 0.15              | 92.61            | 92.94            | 92.76            | 92.94            | 0.000435            | 0.19              | 0.82              | 4.62             | 0.14         |
| Reach 1-Upper | 555       | 10YrSCS24Hr  | 0.19              | 92.61            | 93.02            | 92.77            | 93.02            | 0.000251            | 0.16              | 1.19              | 5.53             | 0.11         |
| Reach 1-Upper | 555       | 25YrSCS24Hr  | 0.24              | 92.61            | 93.24            | 92.79            | 93.24            | 0.000016            | 0.06              | 6.96              | 40.67            | 0.03         |
| Reach 1-Upper | 555       | 50YrSCS24Hr  | 0.28              | 92.61            | 93.25            | 92.80            | 93.25            | 0.000018            | 0.07              | 7.39              | 40.94            | 0.03         |
| Reach 1-Upper | 555       | 100YrSCS24Hr | 0.33              | 92.61            | 93.25            | 92.81            | 93.25            | 0.000025            | 0.08              | 7.39              | 40.94            | 0.04         |
| Reach 1-Upper | 534       | 2YrCHI3Hr    | 0.06              | 92.59            | 92.79            | 92.69            | 92.79            | 0.001542            | 0.25              | 0.26              | 2.47             | 0.24         |
| Reach 1-Upper | 534       | 5YrCHI3Hr    | 0.11              | 92.59            | 92.85            | 92.72            | 92.86            | 0.001007            | 0.24              | 0.46              | 3.30             | 0.21         |
| Reach 1-Upper | 534       | 10YrCHI3Hr   | 0.14              | 92.59            | 92.91            | 92.74            | 92.91            | 0.000612            | 0.21              | 0.68              | 6.64             | 0.17         |
| Reach 1-Upper | 534       | 25YrCHI3Hr   | 0.19              | 92.59            | 93.00            | 92.76            | 93.00            | 0.000148            | 0.12              | 2.58              | 34.75            | 0.09         |
| Reach 1-Upper | 534       | 50YrCHI3Hr   | 0.22              | 92.59            | 93.12            | 92.77            | 93.12            | 0.000015            | 0.05              | 8.09              | 50.92            | 0.03         |
| Reach 1-Upper | 534       | 100YrCHI3Hr  | 0.26              | 92.59            | 93.25            | 92.78            | 93.25            | 0.000003            | 0.03              | 14.61             | 51.39            | 0.01         |
| Reach 1-Upper | 534       | 2YrSCS24Hr   | 0.10              | 92.59            | 92.83            | 92.71            | 92.84            | 0.001197            | 0.25              | 0.39              | 3.05             | 0.22         |
| Reach 1-Upper | 534       | 5YrSCS24Hr   | 0.15              | 92.59            | 92.93            | 92.74            | 92.93            | 0.000491            | 0.20              | 0.89              | 13.42            | 0.15         |
| Reach 1-Upper | 534       | 10YrSCS24Hr  | 0.19              | 92.59            | 93.01            | 92.76            | 93.01            | 0.000110            | 0.11              | 3.08              | 38.60            | 0.07         |
| Reach 1-Upper | 534       | 25YrSCS24Hr  | 0.24              | 92.59            | 93.24            | 92.78            | 93.24            | 0.000003            | 0.03              | 14.06             | 51.35            | 0.01         |
| Reach 1-Upper | 534       | 50YrSCS24Hr  | 0.28              | 92.59            | 93.25            | 92.79            | 93.25            | 0.000004            | 0.03              | 14.61             | 51.39            | 0.02         |
| Reach 1-Upper | 534       | 100YrSCS24Hr | 0.33              | 92.59            | 93.25            | 92.80            | 93.25            | 0.000005            | 0.04              | 14.61             | 51.39            | 0.02         |
| Reach 1-Upper | 510       | 2YrCHI3Hr    | 0.06              | 92.60            | 92.72            | 92.68            | 92.73            | 0.004446            | 0.41              | 0.16              | 2.77             | 0.41         |
| Reach 1-Upper | 510       | 5YrCHI3Hr    | 0.11              | 92.60            | 92.82            | 92.70            | 92.83            | 0.001169            | 0.34              | 0.32              | 4.18             | 0.24         |
| Reach 1-Upper | 510       | 10YrCHI3Hr   | 0.14              | 92.60            | 92.89            | 92.71            | 92.90            | 0.000746            | 0.33              | 0.43              | 5.14             | 0.20         |
| Reach 1-Upper | 510       | 25YrCHI3Hr   | 0.19              | 92.60            | 92.99            | 92.73            | 92.99            | 0.000465            | 0.32              | 0.59              | 11.84            | 0.17         |
| Reach 1-Upper | 510       | 50YrCHI3Hr   | 0.22              | 92.60            | 93.11            | 92.75            | 93.12            | 0.000243            | 0.28              | 0.79              | 109.05           | 0.13         |
| Reach 1-Upper | 510       | 100YrCHI3Hr  | 0.26              | 92.60            | 93.25            | 92.76            | 93.25            | 0.000000            | 0.01              | 42.37             | 109.53           | 0.00         |
| Reach 1-Upper | 510       | 2YrSCS24Hr   | 0.10              | 92.60            | 92.80            | 92.69            | 92.80            | 0.001471            | 0.34              | 0.28              | 3.82             | 0.26         |
| Reach 1-Upper | 510       | 5YrSCS24Hr   | 0.15              | 92.60            | 92.91            | 92.72            | 92.92            | 0.000658            | 0.32              | 0.47              | 5.55             | 0.19         |
| Reach 1-Upper | 510       | 10YrSCS24Hr  | 0.19              | 92.60            | 93.00            | 92.73            | 93.01            | 0.000435            | 0.31              | 0.61              | 13.01            | 0.16         |
| Reach 1-Upper | 510       | 25YrSCS24Hr  | 0.24              | 92.60            | 93.24            | 92.75            | 93.24            | 0.000000            | 0.01              | 41.20             | 109.49           | 0.00         |
| Reach 1-Upper | 510       | 50YrSCS24Hr  | 0.28              | 92.60            | 93.25            | 92.77            | 93.25            | 0.000000            | 0.01              | 42.37             | 109.53           | 0.00         |
| Reach 1-Upper | 510       | 100YrSCS24Hr | 0.33              | 92.60            | 93.25            | 92.78            | 93.25            | 0.000000            | 0.01              | 42.37             | 109.53           | 0.01         |
| Reach 1-Upper | 505       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 502       | 2YrCHI3Hr    | 0.07              | 92.49            | 92.61            | 92.57            | 92.62            | 0.007737            | 0.51              | 0.14              | 2.26             | 0.54         |
| Reach 1-Upper | 502       | 5YrCHI3Hr    | 0.12              | 92.49            | 92.65            | 92.60            | 92.67            | 0.006529            | 0.60              | 0.20              | 2.74             | 0.53         |
| Reach 1-Upper | 502       | 10YrCHI3Hr   | 0.16              | 92.49            | 92.67            | 92.62            | 92.70            | 0.006103            | 0.66              | 0.24              | 3.03             | 0.52         |
| Reach 1-Upper | 502       | 25YrCHI3Hr   | 0.21              | 92.49            | 92.72            | 92.64            | 92.74            | 0.004564            | 0.67              | 0.31              | 3.72             | 0.47         |
| Reach 1-Upper | 502       | 50YrCHI3Hr   | 0.25              | 92.49            | 92.80            | 92.65            | 92.82            | 0.002112            | 0.57              | 0.43              | 5.24             | 0.34         |
| Reach 1-Upper | 502       | 100YrCHI3Hr  | 0.29              | 92.49            | 92.93            | 92.67            | 92.94            | 0.000855            | 0.47              | 0.63              | 7.55             | 0.23         |
| Reach 1-Upper | 502       | 2YrSCS24Hr   | 0.11              | 92.49            | 92.64            | 92.59            | 92.65            | 0.006707            | 0.58              | 0.19              | 2.62             | 0.53         |
| Reach 1-Upper | 502       | 5YrSCS24Hr   | 0.17              | 92.49            | 92.68            | 92.62            | 92.71            | 0.005738            | 0.66              | 0.26              | 3.15             | 0.51         |
| Reach 1-Upper | 502       | 10YrSCS24Hr  | 0.22              | 92.49            | 92.73            | 92.64            | 92.75            | 0.004158            | 0.66              | 0.33              | 3.95             | 0.45         |
| Reach 1-Upper | 502       | 25YrSCS24Hr  | 0.27              | 92.49            | 92.87            | 92.66            | 92.88            | 0.001286            | 0.51              | 0.53              | 6.24             | 0.27         |
| Reach 1-Upper | 502       | 50YrSCS24Hr  | 0.32              | 92.49            | 93.02            | 92.68            | 93.03            | 0.000528            | 0.42              | 0.76              | 104.88           | 0.19         |
| Reach 1-Upper | 502       | 100YrSCS24Hr | 0.37              | 92.49            | 93.23            | 92.70            | 93.24            | 0.000228            | 0.34              | 1.08              | 105.45           | 0.13         |
| Reach 1-Upper | 493       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.61            | 92.42            | 92.61            | 0.000133            | 0.10              | 0.75              | 4.68             | 0.08         |
| Reach 1-Upper | 493       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.65            | 92.45            | 92.65            | 0.000201            | 0.13              | 0.96              | 5.45             | 0.10         |
| Reach 1-Upper | 493       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.68            | 92.46            | 92.68            | 0.000231            | 0.14              | 1.12              | 5.93             | 0.10         |
| Reach 1-Upper | 493       | 25YrCHI3Hr   | 0.21              | 92.34            | 92.73            | 92.47            | 92.73            | 0.000214            | 0.15              | 1.42              | 6.71             | 0.10         |
| Reach 1-Upper | 493       | 50YrCHI3Hr   | 0.25              | 92.34            | 92.81            | 92.49            | 92.81            | 0.000122            | 0.12              | 2.01              | 8.05             | 0.08         |
| Reach 1-Upper | 493       | 100YrCHI3Hr  | 0.29              | 92.34            | 92.94            | 92.50            | 92.94            | 0.000003            | 0.02              | 22.75             | 101.14           | 0.01         |
| Reach 1-Upper | 493       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.64            | 92.44            | 92.64            | 0.000184            | 0.12              | 0.90              | 5.25             | 0.09         |
| Reach 1-Upper | 493       | 5YrSCS24Hr   | 0.17              | 92.34            | 92.69            | 92.46            | 92.69            | 0.000232            | 0.14              | 1.18              | 6.13             | 0.11         |
| Reach 1-Upper | 493       | 10YrSCS24Hr  | 0.22              | 92.34            | 92.74            | 92.48            | 92.74            | 0.000200            | 0.15              | 1.49              | 6.81             | 0.10         |
| Reach 1-Upper | 493       | 25YrSCS24Hr  | 0.27              | 92.34            | 92.87            | 92.49            | 92.87            | 0.000073            | 0.11              | 2.58              | 9.70             | 0.06         |



HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 493       | 50YrSCS24Hr  | 0.32              | 92.34            | 93.03            | 92.50            | 93.03            | 0.000001            | 0.02              | 31.90             | 101.53           | 0.01         |
| Reach 1-Upper | 493       | 100YrSCS24Hr | 0.37              | 92.34            | 93.23            | 92.52            | 93.23            | 0.000000            | 0.01              | 52.95             | 102.61           | 0.00         |
| Reach 1-Upper | 474       | 2YrCHI3Hr    | 0.07              | 92.41            | 92.60            | 92.50            | 92.60            | 0.000597            | 0.15              | 0.49              | 5.07             | 0.15         |
| Reach 1-Upper | 474       | 5YrCHI3Hr    | 0.12              | 92.41            | 92.64            | 92.53            | 92.65            | 0.000602            | 0.17              | 0.72              | 5.95             | 0.16         |
| Reach 1-Upper | 474       | 10YrCHI3Hr   | 0.16              | 92.41            | 92.67            | 92.54            | 92.67            | 0.000570            | 0.18              | 0.88              | 6.52             | 0.16         |
| Reach 1-Upper | 474       | 25YrCHI3Hr   | 0.21              | 92.41            | 92.72            | 92.55            | 92.72            | 0.000404            | 0.17              | 1.23              | 7.58             | 0.13         |
| Reach 1-Upper | 474       | 50YrCHI3Hr   | 0.25              | 92.41            | 92.81            | 92.56            | 92.81            | 0.000152            | 0.13              | 1.98              | 11.32            | 0.09         |
| Reach 1-Upper | 474       | 100YrCHI3Hr  | 0.29              | 92.41            | 92.94            | 92.57            | 92.94            | 0.000001            | 0.01              | 34.63             | 91.93            | 0.01         |
| Reach 1-Upper | 474       | 2YrSCS24Hr   | 0.11              | 92.41            | 92.63            | 92.52            | 92.64            | 0.000604            | 0.16              | 0.66              | 5.73             | 0.16         |
| Reach 1-Upper | 474       | 5YrSCS24Hr   | 0.17              | 92.41            | 92.68            | 92.54            | 92.68            | 0.000532            | 0.18              | 0.96              | 6.77             | 0.15         |
| Reach 1-Upper | 474       | 10YrSCS24Hr  | 0.22              | 92.41            | 92.73            | 92.56            | 92.73            | 0.000363            | 0.16              | 1.31              | 7.81             | 0.13         |
| Reach 1-Upper | 474       | 25YrSCS24Hr  | 0.27              | 92.41            | 92.87            | 92.57            | 92.87            | 0.000001            | 0.01              | 28.89             | 91.64            | 0.01         |
| Reach 1-Upper | 474       | 50YrSCS24Hr  | 0.32              | 92.41            | 93.03            | 92.58            | 93.03            | 0.000000            | 0.01              | 42.95             | 92.33            | 0.00         |
| Reach 1-Upper | 474       | 100YrSCS24Hr | 0.37              | 92.41            | 93.23            | 92.59            | 93.23            | 0.000000            | 0.01              | 62.09             | 93.27            | 0.00         |
| Reach 1-Upper | 454       | 2YrCHI3Hr    | 0.07              | 92.44            | 92.58            | 92.51            | 92.59            | 0.001604            | 0.25              | 0.29              | 2.89             | 0.25         |
| Reach 1-Upper | 454       | 5YrCHI3Hr    | 0.12              | 92.44            | 92.62            | 92.53            | 92.63            | 0.001687            | 0.29              | 0.42              | 3.32             | 0.26         |
| Reach 1-Upper | 454       | 10YrCHI3Hr   | 0.16              | 92.44            | 92.65            | 92.54            | 92.66            | 0.001616            | 0.31              | 0.51              | 3.60             | 0.26         |
| Reach 1-Upper | 454       | 25YrCHI3Hr   | 0.21              | 92.44            | 92.70            | 92.56            | 92.71            | 0.001084            | 0.29              | 0.72              | 4.18             | 0.22         |
| Reach 1-Upper | 454       | 50YrCHI3Hr   | 0.25              | 92.44            | 92.80            | 92.57            | 92.80            | 0.000421            | 0.22              | 1.17              | 5.42             | 0.14         |
| Reach 1-Upper | 454       | 100YrCHI3Hr  | 0.29              | 92.44            | 92.94            | 92.58            | 92.94            | 0.000003            | 0.02              | 20.32             | 83.17            | 0.01         |
| Reach 1-Upper | 454       | 2YrSCS24Hr   | 0.11              | 92.44            | 92.61            | 92.52            | 92.62            | 0.001708            | 0.28              | 0.38              | 3.20             | 0.26         |
| Reach 1-Upper | 454       | 5YrSCS24Hr   | 0.17              | 92.44            | 92.66            | 92.55            | 92.67            | 0.001485            | 0.31              | 0.56              | 3.74             | 0.25         |
| Reach 1-Upper | 454       | 10YrSCS24Hr  | 0.22              | 92.44            | 92.72            | 92.56            | 92.72            | 0.000949            | 0.28              | 0.77              | 4.30             | 0.21         |
| Reach 1-Upper | 454       | 25YrSCS24Hr  | 0.27              | 92.44            | 92.87            | 92.58            | 92.87            | 0.000007            | 0.03              | 15.12             | 82.99            | 0.02         |
| Reach 1-Upper | 454       | 50YrSCS24Hr  | 0.32              | 92.44            | 93.03            | 92.59            | 93.03            | 0.000001            | 0.02              | 27.84             | 83.45            | 0.01         |
| Reach 1-Upper | 454       | 100YrSCS24Hr | 0.37              | 92.44            | 93.23            | 92.60            | 93.23            | 0.000000            | 0.01              | 45.11             | 84.07            | 0.01         |
| Reach 1-Upper | 434       | 2YrCHI3Hr    | 0.07              | 92.42            | 92.54            | 92.49            | 92.54            | 0.003131            | 0.30              | 0.24              | 2.93             | 0.33         |
| Reach 1-Upper | 434       | 5YrCHI3Hr    | 0.12              | 92.42            | 92.58            | 92.51            | 92.59            | 0.002184            | 0.32              | 0.39              | 3.35             | 0.30         |
| Reach 1-Upper | 434       | 10YrCHI3Hr   | 0.16              | 92.42            | 92.61            | 92.52            | 92.62            | 0.001764            | 0.32              | 0.50              | 3.63             | 0.27         |
| Reach 1-Upper | 434       | 25YrCHI3Hr   | 0.21              | 92.42            | 92.70            | 92.53            | 92.70            | 0.000136            | 0.10              | 3.47              | 39.92            | 0.08         |
| Reach 1-Upper | 434       | 50YrCHI3Hr   | 0.25              | 92.42            | 92.80            | 92.55            | 92.80            | 0.000022            | 0.05              | 9.17              | 73.84            | 0.03         |
| Reach 1-Upper | 434       | 100YrCHI3Hr  | 0.29              | 92.42            | 92.94            | 92.56            | 92.94            | 0.000003            | 0.03              | 19.34             | 74.32            | 0.01         |
| Reach 1-Upper | 434       | 2YrSCS24Hr   | 0.11              | 92.42            | 92.57            | 92.50            | 92.57            | 0.002416            | 0.31              | 0.34              | 3.23             | 0.31         |
| Reach 1-Upper | 434       | 5YrSCS24Hr   | 0.17              | 92.42            | 92.63            | 92.52            | 92.64            | 0.001606            | 0.31              | 0.56              | 4.00             | 0.26         |
| Reach 1-Upper | 434       | 10YrSCS24Hr  | 0.22              | 92.42            | 92.71            | 92.54            | 92.71            | 0.000108            | 0.09              | 4.02              | 43.59            | 0.07         |
| Reach 1-Upper | 434       | 25YrSCS24Hr  | 0.27              | 92.42            | 92.87            | 92.55            | 92.87            | 0.000006            | 0.03              | 14.69             | 74.10            | 0.02         |
| Reach 1-Upper | 434       | 50YrSCS24Hr  | 0.32              | 92.42            | 93.03            | 92.56            | 93.03            | 0.000001            | 0.02              | 26.07             | 74.63            | 0.01         |
| Reach 1-Upper | 434       | 100YrSCS24Hr | 0.37              | 92.42            | 93.23            | 92.57            | 93.23            | 0.000000            | 0.01              | 41.53             | 75.37            | 0.01         |
| Reach 1-Upper | 416       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.52            | 92.42            | 92.52            | 0.000594            | 0.15              | 0.47              | 4.81             | 0.15         |
| Reach 1-Upper | 416       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.57            | 92.45            | 92.57            | 0.000421            | 0.17              | 0.75              | 5.85             | 0.14         |
| Reach 1-Upper | 416       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.61            | 92.46            | 92.61            | 0.000173            | 0.13              | 2.14              | 28.43            | 0.09         |
| Reach 1-Upper | 416       | 25YrCHI3Hr   | 0.21              | 92.34            | 92.70            | 92.47            | 92.70            | 0.000038            | 0.08              | 4.95              | 34.66            | 0.05         |
| Reach 1-Upper | 416       | 50YrCHI3Hr   | 0.25              | 92.34            | 92.80            | 92.48            | 92.80            | 0.000012            | 0.05              | 8.86              | 43.80            | 0.03         |
| Reach 1-Upper | 416       | 100YrCHI3Hr  | 0.29              | 92.34            | 92.94            | 92.49            | 92.94            | 0.000004            | 0.04              | 16.28             | 66.50            | 0.02         |
| Reach 1-Upper | 416       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.56            | 92.44            | 92.56            | 0.000460            | 0.17              | 0.67              | 5.57             | 0.14         |
| Reach 1-Upper | 416       | 5YrSCS24Hr   | 0.17              | 92.34            | 92.63            | 92.46            | 92.63            | 0.000124            | 0.11              | 2.65              | 29.68            | 0.08         |
| Reach 1-Upper | 416       | 10YrSCS24Hr  | 0.22              | 92.34            | 92.71            | 92.47            | 92.71            | 0.000032            | 0.07              | 5.42              | 35.57            | 0.04         |
| Reach 1-Upper | 416       | 25YrSCS24Hr  | 0.27              | 92.34            | 92.87            | 92.49            | 92.87            | 0.000006            | 0.04              | 12.48             | 53.40            | 0.02         |
| Reach 1-Upper | 416       | 50YrSCS24Hr  | 0.32              | 92.34            | 93.03            | 92.49            | 93.03            | 0.000002            | 0.03              | 22.33             | 67.07            | 0.01         |
| Reach 1-Upper | 416       | 100YrSCS24Hr | 0.37              | 92.34            | 93.23            | 92.50            | 93.23            | 0.000001            | 0.02              | 36.24             | 67.81            | 0.01         |
| Reach 1-Upper | 398       | 2YrCHI3Hr    | 0.07              | 92.28            | 92.50            | 92.40            | 92.51            | 0.000938            | 0.22              | 0.33              | 2.54             | 0.20         |
| Reach 1-Upper | 398       | 5YrCHI3Hr    | 0.12              | 92.28            | 92.56            | 92.42            | 92.56            | 0.000913            | 0.26              | 0.48              | 2.86             | 0.20         |
| Reach 1-Upper | 398       | 10YrCHI3Hr   | 0.16              | 92.28            | 92.60            | 92.44            | 92.61            | 0.000768            | 0.26              | 0.61              | 3.13             | 0.19         |
| Reach 1-Upper | 398       | 25YrCHI3Hr   | 0.21              | 92.28            | 92.70            | 92.46            | 92.70            | 0.000401            | 0.23              | 0.93              | 4.03             | 0.14         |
| Reach 1-Upper | 398       | 50YrCHI3Hr   | 0.25              | 92.28            | 92.80            | 92.47            | 92.80            | 0.000150            | 0.16              | 2.51              | 35.14            | 0.09         |
| Reach 1-Upper | 398       | 100YrCHI3Hr  | 0.29              | 92.28            | 92.94            | 92.48            | 92.94            | 0.000018            | 0.07              | 9.30              | 58.44            | 0.03         |
| Reach 1-Upper | 398       | 2YrSCS24Hr   | 0.11              | 92.28            | 92.54            | 92.42            | 92.55            | 0.000934            | 0.25              | 0.43              | 2.78             | 0.20         |
| Reach 1-Upper | 398       | 5YrSCS24Hr   | 0.17              | 92.28            | 92.62            | 92.44            | 92.62            | 0.000689            | 0.26              | 0.67              | 3.24             | 0.18         |
| Reach 1-Upper | 398       | 10YrSCS24Hr  | 0.22              | 92.28            | 92.71            | 92.46            | 92.71            | 0.000365            | 0.22              | 0.99              | 4.50             | 0.14         |
| Reach 1-Upper | 398       | 25YrSCS24Hr  | 0.27              | 92.28            | 92.87            | 92.48            | 92.87            | 0.000042            | 0.10              | 5.90              | 48.09            | 0.05         |
| Reach 1-Upper | 398       | 50YrSCS24Hr  | 0.32              | 92.28            | 93.03            | 92.49            | 93.03            | 0.000006            | 0.04              | 14.60             | 58.70            | 0.02         |
| Reach 1-Upper | 398       | 100YrSCS24Hr | 0.37              | 92.28            | 93.23            | 92.50            | 93.23            | 0.000001            | 0.02              | 26.77             | 59.29            | 0.01         |
| Reach 1-Upper | 383       | 2YrCHI3Hr    | 0.07              | 92.34            | 92.47            | 92.42            | 92.48            | 0.004360            | 0.39              | 0.19              | 1.94             | 0.40         |
| Reach 1-Upper | 383       | 5YrCHI3Hr    | 0.12              | 92.34            | 92.53            | 92.45            | 92.54            | 0.002848            | 0.39              | 0.31              | 2.30             | 0.34         |
| Reach 1-Upper | 383       | 10YrCHI3Hr   | 0.16              | 92.34            | 92.58            | 92.46            | 92.59            | 0.001812            | 0.36              | 0.43              | 2.59             | 0.28         |
| Reach 1-Upper | 383       | 25YrCHI3Hr   | 0.21              | 92.34            | 92.69            | 92.48            | 92.69            | 0.000720            | 0.28              | 0.74              | 3.18             | 0.19         |
| Reach 1-Upper | 383       | 50YrCHI3Hr   | 0.25              | 92.34            | 92.79            | 92.50            | 92.80            | 0.000334            | 0.22              | 1.11              | 3.78             | 0.13         |
| Reach 1-Upper | 383       | 100YrCHI3Hr  | 0.29              | 92.34            | 92.93            | 92.51            | 92.94            | 0.000138            | 0.17              | 1.71              | 4.83             | 0.09         |
| Reach 1-Upper | 383       | 2YrSCS24Hr   | 0.11              | 92.34            | 92.51            | 92.44            | 92.52            | 0.003235            | 0.40              | 0.27              | 2.21             | 0.36         |
| Reach 1-Upper | 383       | 5YrSCS24Hr   | 0.17              | 92.34            | 92.60            | 92.47            | 92.61            | 0.001493            | 0.35              | 0.49              | 2.71             | 0.26         |
| Reach 1-Upper | 383       | 10YrSCS24Hr  | 0.22              | 92.34            | 92.70            | 92.49            | 92.70            | 0.000650            | 0.28              | 0.78              | 3.26             | 0.18         |
| Reach 1-Upper | 383       | 25YrSCS24Hr  | 0.27              | 92.34            | 92.87            | 92.51            | 92.87            | 0.000205            | 0.19              | 1.42              | 4.21             | 0.11         |
| Reach 1-Upper | 383       | 50YrSCS24Hr  | 0.32              | 92.34            | 93.03            | 92.52            | 93.03            | 0.000014            | 0.06              | 10.30             | 51.61            | 0.03         |
| Reach 1-Upper | 383       | 100YrSCS24Hr | 0.37              | 92.34            | 93.23            | 92.53            | 93.23            | 0.000002            | 0.03              | 21.02             | 52.21            | 0.01         |
| Reach 1-Upper | 364       | 2YrCHI3Hr    | 0.07              | 92.23            | 92.43            | 92.33            | 92.44            | 0.001347            | 0.27              | 0.27              | 2.04             | 0.23         |
| Reach 1-Upper | 364       | 5YrCHI3Hr    | 0.12              | 92.23            | 92.50            | 92.36            | 92.51            | 0.001091            | 0.29              | 0.42              | 2.38             | 0.22         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 364       | 10YrCHI3Hr   | 0.16              | 92.23            | 92.56            | 92.38            | 92.57            | 0.000763            | 0.28              | 0.57              | 2.68             | 0.19         |
| Reach 1-Upper | 364       | 25YrCHI3Hr   | 0.21              | 92.23            | 92.68            | 92.40            | 92.68            | 0.000366            | 0.23              | 0.92              | 3.24             | 0.14         |
| Reach 1-Upper | 364       | 50YrCHI3Hr   | 0.25              | 92.23            | 92.79            | 92.41            | 92.79            | 0.000203            | 0.19              | 1.31              | 3.88             | 0.11         |
| Reach 1-Upper | 364       | 100YrCHI3Hr  | 0.29              | 92.23            | 92.93            | 92.43            | 92.93            | 0.000094            | 0.15              | 1.98              | 5.87             | 0.07         |
| Reach 1-Upper | 364       | 2YrSCS24Hr   | 0.11              | 92.23            | 92.48            | 92.35            | 92.49            | 0.001191            | 0.29              | 0.37              | 2.28             | 0.23         |
| Reach 1-Upper | 364       | 5YrSCS24Hr   | 0.17              | 92.23            | 92.59            | 92.38            | 92.59            | 0.000655            | 0.27              | 0.64              | 2.80             | 0.18         |
| Reach 1-Upper | 364       | 10YrSCS24Hr  | 0.22              | 92.23            | 92.69            | 92.40            | 92.70            | 0.000339            | 0.22              | 0.97              | 3.32             | 0.13         |
| Reach 1-Upper | 364       | 25YrSCS24Hr  | 0.27              | 92.23            | 92.87            | 92.42            | 92.87            | 0.000135            | 0.17              | 1.64              | 4.67             | 0.09         |
| Reach 1-Upper | 364       | 50YrSCS24Hr  | 0.32              | 92.23            | 93.03            | 92.44            | 93.03            | 0.000033            | 0.10              | 5.95              | 44.01            | 0.05         |
| Reach 1-Upper | 364       | 100YrSCS24Hr | 0.37              | 92.23            | 93.23            | 92.45            | 93.23            | 0.000005            | 0.04              | 15.12             | 44.59            | 0.02         |
| Reach 1-Upper | 347       | 2YrCHI3Hr    | 0.07              | 92.26            | 92.41            | 92.33            | 92.41            | 0.001311            | 0.25              | 0.29              | 2.48             | 0.23         |
| Reach 1-Upper | 347       | 5YrCHI3Hr    | 0.12              | 92.26            | 92.49            | 92.35            | 92.49            | 0.000799            | 0.25              | 0.49              | 2.81             | 0.19         |
| Reach 1-Upper | 347       | 10YrCHI3Hr   | 0.16              | 92.26            | 92.55            | 92.36            | 92.56            | 0.000505            | 0.23              | 0.69              | 3.09             | 0.16         |
| Reach 1-Upper | 347       | 25YrCHI3Hr   | 0.21              | 92.26            | 92.67            | 92.38            | 92.68            | 0.000235            | 0.19              | 1.09              | 3.61             | 0.11         |
| Reach 1-Upper | 347       | 50YrCHI3Hr   | 0.25              | 92.26            | 92.79            | 92.39            | 92.79            | 0.000131            | 0.16              | 1.52              | 4.09             | 0.09         |
| Reach 1-Upper | 347       | 100YrCHI3Hr  | 0.29              | 92.26            | 92.93            | 92.41            | 92.93            | 0.000067            | 0.13              | 2.17              | 5.17             | 0.06         |
| Reach 1-Upper | 347       | 2YrSCS24Hr   | 0.11              | 92.26            | 92.46            | 92.34            | 92.47            | 0.000924            | 0.25              | 0.43              | 2.71             | 0.20         |
| Reach 1-Upper | 347       | 5YrSCS24Hr   | 0.17              | 92.26            | 92.58            | 92.37            | 92.58            | 0.000426            | 0.22              | 0.77              | 3.20             | 0.14         |
| Reach 1-Upper | 347       | 10YrSCS24Hr  | 0.22              | 92.26            | 92.69            | 92.38            | 92.69            | 0.000218            | 0.19              | 1.15              | 3.67             | 0.11         |
| Reach 1-Upper | 347       | 25YrSCS24Hr  | 0.27              | 92.26            | 92.87            | 92.40            | 92.87            | 0.000091            | 0.15              | 1.87              | 4.46             | 0.07         |
| Reach 1-Upper | 347       | 50YrSCS24Hr  | 0.32              | 92.26            | 93.03            | 92.41            | 93.03            | 0.000042            | 0.12              | 2.84              | 10.46            | 0.05         |
| Reach 1-Upper | 347       | 100YrSCS24Hr | 0.37              | 92.26            | 93.23            | 92.43            | 93.23            | 0.000008            | 0.06              | 10.68             | 37.82            | 0.02         |
| Reach 1-Upper | 328       | 2YrCHI3Hr    | 0.07              | 92.20            | 92.38            | 92.29            | 92.38            | 0.001752            | 0.30              | 0.24              | 1.87             | 0.27         |
| Reach 1-Upper | 328       | 5YrCHI3Hr    | 0.12              | 92.20            | 92.47            | 92.32            | 92.47            | 0.001008            | 0.29              | 0.42              | 2.25             | 0.21         |
| Reach 1-Upper | 328       | 10YrCHI3Hr   | 0.16              | 92.20            | 92.54            | 92.33            | 92.54            | 0.000638            | 0.26              | 0.60              | 2.55             | 0.17         |
| Reach 1-Upper | 328       | 25YrCHI3Hr   | 0.21              | 92.20            | 92.67            | 92.36            | 92.67            | 0.000304            | 0.22              | 0.95              | 3.08             | 0.13         |
| Reach 1-Upper | 328       | 50YrCHI3Hr   | 0.25              | 92.20            | 92.78            | 92.37            | 92.78            | 0.000178            | 0.19              | 1.34              | 3.69             | 0.10         |
| Reach 1-Upper | 328       | 100YrCHI3Hr  | 0.29              | 92.20            | 92.93            | 92.39            | 92.93            | 0.000093            | 0.15              | 1.96              | 4.66             | 0.07         |
| Reach 1-Upper | 328       | 2YrSCS24Hr   | 0.11              | 92.20            | 92.44            | 92.31            | 92.45            | 0.001172            | 0.29              | 0.37              | 2.14             | 0.23         |
| Reach 1-Upper | 328       | 5YrSCS24Hr   | 0.17              | 92.20            | 92.57            | 92.34            | 92.57            | 0.000541            | 0.26              | 0.67              | 2.67             | 0.16         |
| Reach 1-Upper | 328       | 10YrSCS24Hr  | 0.22              | 92.20            | 92.68            | 92.36            | 92.69            | 0.000283            | 0.22              | 1.00              | 3.14             | 0.12         |
| Reach 1-Upper | 328       | 25YrSCS24Hr  | 0.27              | 92.20            | 92.86            | 92.38            | 92.87            | 0.000127            | 0.16              | 1.67              | 4.31             | 0.08         |
| Reach 1-Upper | 328       | 50YrSCS24Hr  | 0.32              | 92.20            | 93.02            | 92.40            | 93.02            | 0.000064            | 0.13              | 2.44              | 5.46             | 0.06         |
| Reach 1-Upper | 328       | 100YrSCS24Hr | 0.37              | 92.20            | 93.23            | 92.41            | 93.23            | 0.000014            | 0.07              | 8.02              | 29.79            | 0.03         |
| Reach 1-Upper | 306       | 2YrCHI3Hr    | 0.07              | 92.07            | 92.36            | 92.19            | 92.36            | 0.000723            | 0.26              | 0.28              | 1.53             | 0.18         |
| Reach 1-Upper | 306       | 5YrCHI3Hr    | 0.12              | 92.07            | 92.45            | 92.22            | 92.45            | 0.000687            | 0.30              | 0.40              | 1.84             | 0.18         |
| Reach 1-Upper | 306       | 10YrCHI3Hr   | 0.16              | 92.07            | 92.53            | 92.25            | 92.53            | 0.000564            | 0.31              | 0.51              | 2.11             | 0.17         |
| Reach 1-Upper | 306       | 25YrCHI3Hr   | 0.21              | 92.07            | 92.66            | 92.27            | 92.66            | 0.000340            | 0.29              | 0.71              | 2.60             | 0.14         |
| Reach 1-Upper | 306       | 50YrCHI3Hr   | 0.25              | 92.07            | 92.78            | 92.29            | 92.78            | 0.000232            | 0.28              | 0.89              | 3.10             | 0.12         |
| Reach 1-Upper | 306       | 100YrCHI3Hr  | 0.29              | 92.07            | 92.92            | 92.31            | 92.93            | 0.000151            | 0.26              | 1.11              | 3.98             | 0.10         |
| Reach 1-Upper | 306       | 2YrSCS24Hr   | 0.11              | 92.07            | 92.42            | 92.22            | 92.43            | 0.000711            | 0.29              | 0.37              | 1.75             | 0.18         |
| Reach 1-Upper | 306       | 5YrSCS24Hr   | 0.17              | 92.07            | 92.56            | 92.26            | 92.56            | 0.000514            | 0.31              | 0.56              | 2.21             | 0.16         |
| Reach 1-Upper | 306       | 10YrSCS24Hr  | 0.22              | 92.07            | 92.67            | 92.28            | 92.68            | 0.000325            | 0.29              | 0.74              | 2.67             | 0.13         |
| Reach 1-Upper | 306       | 25YrSCS24Hr  | 0.27              | 92.07            | 92.86            | 92.31            | 92.86            | 0.000182            | 0.27              | 1.01              | 3.45             | 0.11         |
| Reach 1-Upper | 306       | 50YrSCS24Hr  | 0.32              | 92.07            | 93.02            | 92.32            | 93.02            | 0.000121            | 0.25              | 1.25              | 4.84             | 0.09         |
| Reach 1-Upper | 306       | 100YrSCS24Hr | 0.37              | 92.07            | 93.23            | 92.34            | 93.23            | 0.000077            | 0.24              | 1.57              | 20.82            | 0.07         |
| Reach 1-Upper | 300       |              | Culvert           |                  |                  |                  |                  |                     |                   |                   |                  |              |
| Reach 1-Upper | 294       | 2YrCHI3Hr    | 0.07              | 92.15            | 92.32            | 92.23            | 92.33            | 0.001574            | 0.32              | 0.23              | 2.11             | 0.26         |
| Reach 1-Upper | 294       | 5YrCHI3Hr    | 0.12              | 92.15            | 92.37            | 92.26            | 92.38            | 0.001843            | 0.41              | 0.30              | 2.35             | 0.30         |
| Reach 1-Upper | 294       | 10YrCHI3Hr   | 0.16              | 92.15            | 92.39            | 92.27            | 92.40            | 0.002090            | 0.48              | 0.33              | 2.47             | 0.32         |
| Reach 1-Upper | 294       | 25YrCHI3Hr   | 0.21              | 92.15            | 92.42            | 92.30            | 92.44            | 0.002418            | 0.56              | 0.38              | 2.62             | 0.35         |
| Reach 1-Upper | 294       | 50YrCHI3Hr   | 0.25              | 92.15            | 92.44            | 92.31            | 92.46            | 0.002632            | 0.61              | 0.41              | 2.73             | 0.37         |
| Reach 1-Upper | 294       | 100YrCHI3Hr  | 0.29              | 92.15            | 92.46            | 92.33            | 92.49            | 0.002788            | 0.66              | 0.44              | 2.84             | 0.39         |
| Reach 1-Upper | 294       | 2YrSCS24Hr   | 0.11              | 92.15            | 92.36            | 92.25            | 92.36            | 0.001772            | 0.39              | 0.28              | 2.29             | 0.29         |
| Reach 1-Upper | 294       | 5YrSCS24Hr   | 0.17              | 92.15            | 92.40            | 92.28            | 92.41            | 0.002190            | 0.50              | 0.34              | 2.51             | 0.33         |
| Reach 1-Upper | 294       | 10YrSCS24Hr  | 0.22              | 92.15            | 92.42            | 92.30            | 92.44            | 0.002481            | 0.57              | 0.38              | 2.64             | 0.36         |
| Reach 1-Upper | 294       | 25YrSCS24Hr  | 0.27              | 92.15            | 92.45            | 92.32            | 92.48            | 0.002750            | 0.64              | 0.43              | 2.79             | 0.39         |
| Reach 1-Upper | 294       | 50YrSCS24Hr  | 0.32              | 92.15            | 92.48            | 92.34            | 92.50            | 0.002924            | 0.70              | 0.46              | 2.90             | 0.40         |
| Reach 1-Upper | 294       | 100YrSCS24Hr | 0.37              | 92.15            | 92.50            | 92.35            | 92.53            | 0.003160            | 0.76              | 0.49              | 3.01             | 0.42         |
| Reach 1-Upper | 279       | 2YrCHI3Hr    | 0.09              | 92.08            | 92.21            | 92.21            | 92.25            | 0.030968            | 0.83              | 0.10              | 1.54             | 1.01         |
| Reach 1-Upper | 279       | 5YrCHI3Hr    | 0.15              | 92.08            | 92.25            | 92.24            | 92.29            | 0.025757            | 0.90              | 0.16              | 1.85             | 0.97         |
| Reach 1-Upper | 279       | 10YrCHI3Hr   | 0.20              | 92.08            | 92.28            |                  | 92.32            | 0.017921            | 0.87              | 0.23              | 2.03             | 0.83         |
| Reach 1-Upper | 279       | 25YrCHI3Hr   | 0.26              | 92.08            | 92.31            |                  | 92.35            | 0.013590            | 0.86              | 0.30              | 2.25             | 0.75         |
| Reach 1-Upper | 279       | 50YrCHI3Hr   | 0.31              | 92.08            | 92.34            |                  | 92.38            | 0.011935            | 0.87              | 0.36              | 2.40             | 0.71         |
| Reach 1-Upper | 279       | 100YrCHI3Hr  | 0.37              | 92.08            | 92.36            |                  | 92.40            | 0.010878            | 0.88              | 0.42              | 2.54             | 0.69         |
| Reach 1-Upper | 279       | 2YrSCS24Hr   | 0.13              | 92.08            | 92.24            | 92.24            | 92.28            | 0.028026            | 0.89              | 0.15              | 1.77             | 1.00         |
| Reach 1-Upper | 279       | 5YrSCS24Hr   | 0.21              | 92.08            | 92.29            |                  | 92.33            | 0.016973            | 0.87              | 0.24              | 2.08             | 0.82         |
| Reach 1-Upper | 279       | 10YrSCS24Hr  | 0.27              | 92.08            | 92.32            |                  | 92.36            | 0.013275            | 0.86              | 0.31              | 2.27             | 0.74         |
| Reach 1-Upper | 279       | 25YrSCS24Hr  | 0.34              | 92.08            | 92.35            |                  | 92.39            | 0.011320            | 0.87              | 0.39              | 2.47             | 0.70         |
| Reach 1-Upper | 279       | 50YrSCS24Hr  | 0.40              | 92.08            | 92.38            |                  | 92.42            | 0.010426            | 0.89              | 0.45              | 2.61             | 0.68         |
| Reach 1-Upper | 279       | 100YrSCS24Hr | 0.47              | 92.08            | 92.40            |                  | 92.44            | 0.009682            | 0.90              | 0.52              | 2.76             | 0.67         |
| Reach 1-Upper | 277       | 2YrCHI3Hr    | 0.09              | 91.95            | 92.21            |                  | 92.21            | 0.000715            | 0.22              | 0.40              | 2.73             | 0.18         |
| Reach 1-Upper | 277       | 5YrCHI3Hr    | 0.15              | 91.95            | 92.26            |                  | 92.26            | 0.000859            | 0.28              | 0.55              | 3.02             | 0.20         |
| Reach 1-Upper | 277       | 10YrCHI3Hr   | 0.20              | 91.95            | 92.29            |                  | 92.29            | 0.000926            | 0.32              | 0.64              | 3.19             | 0.21         |
| Reach 1-Upper | 277       | 25YrCHI3Hr   | 0.26              | 91.95            | 92.32            |                  | 92.33            | 0.000998            | 0.37              | 0.75              | 3.39             | 0.23         |
| Reach 1-Upper | 277       | 50YrCHI3Hr   | 0.31              | 91.95            | 92.35            |                  | 92.36            | 0.001055            | 0.40              | 0.84              | 3.52             | 0.24         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 277       | 100YrCHI3Hr  | 0.37              | 91.95            | 92.37            |                  | 92.38            | 0.001115            | 0.43              | 0.92              | 3.65             | 0.25         |
| Reach 1-Upper | 277       | 2YrSCS24Hr   | 0.13              | 91.95            | 92.25            |                  | 92.25            | 0.000829            | 0.26              | 0.51              | 2.95             | 0.20         |
| Reach 1-Upper | 277       | 5YrSCS24Hr   | 0.21              | 91.95            | 92.30            |                  | 92.30            | 0.000956            | 0.33              | 0.66              | 3.23             | 0.22         |
| Reach 1-Upper | 277       | 10YrSCS24Hr  | 0.27              | 91.95            | 92.33            |                  | 92.34            | 0.001007            | 0.37              | 0.77              | 3.41             | 0.23         |
| Reach 1-Upper | 277       | 25YrSCS24Hr  | 0.34              | 91.95            | 92.36            |                  | 92.37            | 0.001088            | 0.42              | 0.88              | 3.60             | 0.24         |
| Reach 1-Upper | 277       | 50YrSCS24Hr  | 0.40              | 91.95            | 92.39            |                  | 92.40            | 0.001147            | 0.45              | 0.97              | 3.73             | 0.25         |
| Reach 1-Upper | 277       | 100YrSCS24Hr | 0.47              | 91.95            | 92.41            |                  | 92.42            | 0.001203            | 0.48              | 1.06              | 3.86             | 0.26         |
| Reach 1-Upper | 270       | 2YrCHI3Hr    | 0.09              | 92.03            | 92.20            |                  | 92.20            | 0.001702            | 0.28              | 0.31              | 2.65             | 0.26         |
| Reach 1-Upper | 270       | 5YrCHI3Hr    | 0.15              | 92.03            | 92.25            |                  | 92.26            | 0.001752            | 0.33              | 0.45              | 3.08             | 0.28         |
| Reach 1-Upper | 270       | 10YrCHI3Hr   | 0.20              | 92.03            | 92.28            |                  | 92.29            | 0.001743            | 0.36              | 0.54              | 3.36             | 0.28         |
| Reach 1-Upper | 270       | 25YrCHI3Hr   | 0.26              | 92.03            | 92.31            |                  | 92.32            | 0.001731            | 0.40              | 0.67              | 3.69             | 0.29         |
| Reach 1-Upper | 270       | 50YrCHI3Hr   | 0.31              | 92.03            | 92.34            |                  | 92.35            | 0.001733            | 0.42              | 0.76              | 3.96             | 0.29         |
| Reach 1-Upper | 270       | 100YrCHI3Hr  | 0.37              | 92.03            | 92.36            |                  | 92.37            | 0.001677            | 0.44              | 0.86              | 4.77             | 0.29         |
| Reach 1-Upper | 270       | 2YrSCS24Hr   | 0.13              | 92.03            | 92.24            |                  | 92.24            | 0.001762            | 0.32              | 0.41              | 2.96             | 0.27         |
| Reach 1-Upper | 270       | 5YrSCS24Hr   | 0.21              | 92.03            | 92.29            |                  | 92.29            | 0.001769            | 0.37              | 0.57              | 3.43             | 0.28         |
| Reach 1-Upper | 270       | 10YrSCS24Hr  | 0.27              | 92.03            | 92.32            |                  | 92.33            | 0.001732            | 0.40              | 0.68              | 3.72             | 0.29         |
| Reach 1-Upper | 270       | 25YrSCS24Hr  | 0.34              | 92.03            | 92.35            |                  | 92.36            | 0.001702            | 0.43              | 0.81              | 4.41             | 0.29         |
| Reach 1-Upper | 270       | 50YrSCS24Hr  | 0.40              | 92.03            | 92.38            |                  | 92.39            | 0.001650            | 0.45              | 0.93              | 5.21             | 0.29         |
| Reach 1-Upper | 270       | 100YrSCS24Hr | 0.47              | 92.03            | 92.40            |                  | 92.41            | 0.001589            | 0.48              | 1.06              | 5.67             | 0.29         |
| Reach 1-Upper | 261       | 2YrCHI3Hr    | 0.09              | 92.00            | 92.18            | 92.10            | 92.19            | 0.002251            | 0.33              | 0.26              | 2.11             | 0.30         |
| Reach 1-Upper | 261       | 5YrCHI3Hr    | 0.15              | 92.00            | 92.23            | 92.13            | 92.24            | 0.002551            | 0.41              | 0.36              | 2.34             | 0.33         |
| Reach 1-Upper | 261       | 10YrCHI3Hr   | 0.20              | 92.00            | 92.26            | 92.15            | 92.27            | 0.002717            | 0.45              | 0.43              | 2.48             | 0.35         |
| Reach 1-Upper | 261       | 25YrCHI3Hr   | 0.26              | 92.00            | 92.29            | 92.17            | 92.30            | 0.002863            | 0.50              | 0.52              | 2.64             | 0.36         |
| Reach 1-Upper | 261       | 50YrCHI3Hr   | 0.31              | 92.00            | 92.31            | 92.19            | 92.33            | 0.002989            | 0.54              | 0.58              | 2.75             | 0.38         |
| Reach 1-Upper | 261       | 100YrCHI3Hr  | 0.37              | 92.00            | 92.34            | 92.21            | 92.35            | 0.003096            | 0.57              | 0.64              | 2.86             | 0.39         |
| Reach 1-Upper | 261       | 2YrSCS24Hr   | 0.13              | 92.00            | 92.22            | 92.12            | 92.22            | 0.002475            | 0.39              | 0.33              | 2.28             | 0.32         |
| Reach 1-Upper | 261       | 5YrSCS24Hr   | 0.21              | 92.00            | 92.26            | 92.16            | 92.28            | 0.002821            | 0.47              | 0.45              | 2.51             | 0.36         |
| Reach 1-Upper | 261       | 10YrSCS24Hr  | 0.27              | 92.00            | 92.29            | 92.18            | 92.31            | 0.002885            | 0.51              | 0.53              | 2.66             | 0.37         |
| Reach 1-Upper | 261       | 25YrSCS24Hr  | 0.34              | 92.00            | 92.33            | 92.20            | 92.34            | 0.003049            | 0.56              | 0.61              | 2.81             | 0.38         |
| Reach 1-Upper | 261       | 50YrSCS24Hr  | 0.40              | 92.00            | 92.36            | 92.22            | 92.37            | 0.003150            | 0.59              | 0.68              | 2.92             | 0.39         |
| Reach 1-Upper | 261       | 100YrSCS24Hr | 0.47              | 92.00            | 92.37            | 92.23            | 92.39            | 0.003253            | 0.62              | 0.75              | 3.06             | 0.40         |
| Reach 1-Upper | 239       | 2YrCHI3Hr    | 0.09              | 91.93            | 92.05            | 92.04            | 92.07            | 0.017641            | 0.69              | 0.12              | 1.58             | 0.78         |
| Reach 1-Upper | 239       | 5YrCHI3Hr    | 0.15              | 91.93            | 92.09            | 92.07            | 92.12            | 0.014089            | 0.75              | 0.20              | 1.89             | 0.73         |
| Reach 1-Upper | 239       | 10YrCHI3Hr   | 0.20              | 91.93            | 92.12            | 92.09            | 92.15            | 0.012625            | 0.78              | 0.25              | 2.05             | 0.71         |
| Reach 1-Upper | 239       | 25YrCHI3Hr   | 0.26              | 91.93            | 92.15            | 92.11            | 92.18            | 0.011287            | 0.82              | 0.32              | 2.22             | 0.69         |
| Reach 1-Upper | 239       | 50YrCHI3Hr   | 0.31              | 91.93            | 92.17            | 92.13            | 92.21            | 0.010600            | 0.84              | 0.37              | 2.34             | 0.68         |
| Reach 1-Upper | 239       | 100YrCHI3Hr  | 0.37              | 91.93            | 92.20            | 92.15            | 92.23            | 0.010052            | 0.87              | 0.42              | 2.45             | 0.67         |
| Reach 1-Upper | 239       | 2YrSCS24Hr   | 0.13              | 91.93            | 92.08            | 92.06            | 92.11            | 0.014856            | 0.73              | 0.18              | 1.80             | 0.74         |
| Reach 1-Upper | 239       | 5YrSCS24Hr   | 0.21              | 91.93            | 92.13            | 92.10            | 92.16            | 0.012234            | 0.79              | 0.27              | 2.09             | 0.70         |
| Reach 1-Upper | 239       | 10YrSCS24Hr  | 0.27              | 91.93            | 92.15            | 92.12            | 92.19            | 0.011165            | 0.82              | 0.33              | 2.24             | 0.69         |
| Reach 1-Upper | 239       | 25YrSCS24Hr  | 0.34              | 91.93            | 92.19            | 92.14            | 92.22            | 0.010287            | 0.86              | 0.40              | 2.40             | 0.67         |
| Reach 1-Upper | 239       | 50YrSCS24Hr  | 0.40              | 91.93            | 92.21            | 92.16            | 92.25            | 0.009763            | 0.88              | 0.45              | 2.52             | 0.66         |
| Reach 1-Upper | 239       | 100YrSCS24Hr | 0.47              | 91.93            | 92.23            | 92.17            | 92.27            | 0.009233            | 0.90              | 0.52              | 2.64             | 0.65         |
| Reach 1-Upper | 218       | 2YrCHI3Hr    | 0.09              | 91.82            | 91.97            | 91.90            | 91.98            | 0.002011            | 0.30              | 0.29              | 2.50             | 0.28         |
| Reach 1-Upper | 218       | 5YrCHI3Hr    | 0.15              | 91.82            | 92.02            | 91.92            | 92.02            | 0.002154            | 0.37              | 0.41              | 2.72             | 0.30         |
| Reach 1-Upper | 218       | 10YrCHI3Hr   | 0.20              | 91.82            | 92.05            | 91.94            | 92.05            | 0.002195            | 0.40              | 0.49              | 2.86             | 0.31         |
| Reach 1-Upper | 218       | 25YrCHI3Hr   | 0.26              | 91.82            | 92.08            | 91.96            | 92.09            | 0.002317            | 0.45              | 0.58              | 3.01             | 0.33         |
| Reach 1-Upper | 218       | 50YrCHI3Hr   | 0.31              | 91.82            | 92.10            | 91.97            | 92.11            | 0.002380            | 0.48              | 0.65              | 3.13             | 0.34         |
| Reach 1-Upper | 218       | 100YrCHI3Hr  | 0.37              | 91.82            | 92.12            | 91.99            | 92.14            | 0.002427            | 0.51              | 0.72              | 3.24             | 0.34         |
| Reach 1-Upper | 218       | 2YrSCS24Hr   | 0.13              | 91.82            | 92.00            | 91.92            | 92.01            | 0.002121            | 0.35              | 0.37              | 2.66             | 0.30         |
| Reach 1-Upper | 218       | 5YrSCS24Hr   | 0.21              | 91.82            | 92.05            | 91.94            | 92.06            | 0.002229            | 0.42              | 0.51              | 2.90             | 0.32         |
| Reach 1-Upper | 218       | 10YrSCS24Hr  | 0.27              | 91.82            | 92.08            | 91.96            | 92.09            | 0.002328            | 0.45              | 0.59              | 3.03             | 0.33         |
| Reach 1-Upper | 218       | 25YrSCS24Hr  | 0.34              | 91.82            | 92.11            | 91.98            | 92.13            | 0.002406            | 0.50              | 0.69              | 3.19             | 0.34         |
| Reach 1-Upper | 218       | 50YrSCS24Hr  | 0.40              | 91.82            | 92.14            | 92.00            | 92.15            | 0.002454            | 0.52              | 0.77              | 3.31             | 0.35         |
| Reach 1-Upper | 218       | 100YrSCS24Hr | 0.47              | 91.82            | 92.16            | 92.01            | 92.18            | 0.002479            | 0.55              | 0.85              | 3.47             | 0.35         |
| Reach 1-Upper | 197       | 2YrCHI3Hr    | 0.09              | 91.73            | 91.86            | 91.84            | 91.88            | 0.015766            | 0.67              | 0.13              | 1.59             | 0.75         |
| Reach 1-Upper | 197       | 5YrCHI3Hr    | 0.15              | 91.73            | 91.90            | 91.87            | 91.93            | 0.013264            | 0.74              | 0.20              | 1.88             | 0.72         |
| Reach 1-Upper | 197       | 10YrCHI3Hr   | 0.20              | 91.73            | 91.92            | 91.89            | 91.96            | 0.012348            | 0.78              | 0.25              | 2.01             | 0.71         |
| Reach 1-Upper | 197       | 25YrCHI3Hr   | 0.26              | 91.73            | 91.95            | 91.92            | 91.99            | 0.011605            | 0.83              | 0.31              | 2.16             | 0.70         |
| Reach 1-Upper | 197       | 50YrCHI3Hr   | 0.31              | 91.73            | 91.98            | 91.94            | 92.01            | 0.010864            | 0.86              | 0.36              | 2.27             | 0.69         |
| Reach 1-Upper | 197       | 100YrCHI3Hr  | 0.37              | 91.73            | 92.00            | 91.95            | 92.04            | 0.010606            | 0.90              | 0.41              | 2.36             | 0.69         |
| Reach 1-Upper | 197       | 2YrSCS24Hr   | 0.13              | 91.73            | 91.89            | 91.87            | 91.91            | 0.013909            | 0.72              | 0.18              | 1.81             | 0.72         |
| Reach 1-Upper | 197       | 5YrSCS24Hr   | 0.21              | 91.73            | 91.93            | 91.90            | 91.96            | 0.012137            | 0.79              | 0.27              | 2.05             | 0.70         |
| Reach 1-Upper | 197       | 10YrSCS24Hr  | 0.27              | 91.73            | 91.96            | 91.92            | 91.99            | 0.011514            | 0.84              | 0.32              | 2.18             | 0.70         |
| Reach 1-Upper | 197       | 25YrSCS24Hr  | 0.34              | 91.73            | 91.99            | 91.95            | 92.03            | 0.010714            | 0.88              | 0.39              | 2.32             | 0.69         |
| Reach 1-Upper | 197       | 50YrSCS24Hr  | 0.40              | 91.73            | 92.01            | 91.96            | 92.05            | 0.010482            | 0.92              | 0.44              | 2.41             | 0.69         |
| Reach 1-Upper | 197       | 100YrSCS24Hr | 0.47              | 91.73            | 92.03            | 91.98            | 92.08            | 0.010295            | 0.95              | 0.49              | 2.51             | 0.69         |
| Reach 1-Upper | 174       | 2YrCHI3Hr    | 0.09              | 91.52            | 91.70            | 91.64            | 91.71            | 0.004240            | 0.42              | 0.20              | 1.84             | 0.40         |
| Reach 1-Upper | 174       | 5YrCHI3Hr    | 0.15              | 91.52            | 91.75            | 91.67            | 91.76            | 0.004464            | 0.50              | 0.30              | 2.18             | 0.43         |
| Reach 1-Upper | 174       | 10YrCHI3Hr   | 0.20              | 91.52            | 91.78            | 91.70            | 91.79            | 0.004630            | 0.55              | 0.36              | 2.30             | 0.45         |
| Reach 1-Upper | 174       | 25YrCHI3Hr   | 0.26              | 91.52            | 91.81            | 91.72            | 91.82            | 0.004764            | 0.60              | 0.43              | 2.46             | 0.46         |
| Reach 1-Upper | 174       | 50YrCHI3Hr   | 0.31              | 91.52            | 91.83            | 91.74            | 91.85            | 0.004920            | 0.64              | 0.48              | 2.56             | 0.47         |
| Reach 1-Upper | 174       | 100YrCHI3Hr  | 0.37              | 91.52            | 91.85            | 91.76            | 91.87            | 0.005045            | 0.68              | 0.54              | 2.67             | 0.48         |
| Reach 1-Upper | 174       | 2YrSCS24Hr   | 0.13              | 91.52            | 91.74            | 91.67            | 91.75            | 0.004376            | 0.48              | 0.27              | 2.09             | 0.42         |
| Reach 1-Upper | 174       | 5YrSCS24Hr   | 0.21              | 91.52            | 91.78            | 91.70            | 91.80            | 0.004673            | 0.56              | 0.37              | 2.34             | 0.45         |
| Reach 1-Upper | 174       | 10YrSCS24Hr  | 0.27              | 91.52            | 91.81            | 91.72            | 91.83            | 0.004791            | 0.61              | 0.44              | 2.47             | 0.46         |
| Reach 1-Upper | 174       | 25YrSCS24Hr  | 0.34              | 91.52            | 91.84            | 91.75            | 91.86            | 0.004993            | 0.67              | 0.51              | 2.62             | 0.48         |

HEC-RAS Plan: 20250910-Post\_Dev\_v02 River: River 1 Reach: Reach 1-Upper (Continued)

| Reach         | River Sta | Profile      | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|-----------|--------------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Reach 1-Upper | 174       | 50YrSCS24Hr  | 0.40              | 91.52            | 91.86            | 91.77            | 91.89            | 0.005106            | 0.70              | 0.57              | 2.72             | 0.49         |
| Reach 1-Upper | 174       | 100YrSCS24Hr | 0.47              | 91.52            | 91.88            | 91.78            | 91.91            | 0.005150            | 0.73              | 0.63              | 2.83             | 0.50         |
| Reach 1-Upper | 154       | 2YrCHI3Hr    | 0.09              | 91.43            | 91.62            | 91.56            | 91.63            | 0.004316            | 0.40              | 0.22              | 2.21             | 0.40         |
| Reach 1-Upper | 154       | 5YrCHI3Hr    | 0.15              | 91.43            | 91.66            | 91.59            | 91.67            | 0.004196            | 0.46              | 0.33              | 2.61             | 0.41         |
| Reach 1-Upper | 154       | 10YrCHI3Hr   | 0.20              | 91.43            | 91.69            | 91.61            | 91.70            | 0.004192            | 0.49              | 0.40              | 2.83             | 0.42         |
| Reach 1-Upper | 154       | 25YrCHI3Hr   | 0.26              | 91.43            | 91.72            | 91.63            | 91.74            | 0.004098            | 0.53              | 0.49              | 3.08             | 0.42         |
| Reach 1-Upper | 154       | 50YrCHI3Hr   | 0.31              | 91.43            | 91.74            | 91.65            | 91.76            | 0.004007            | 0.55              | 0.56              | 3.25             | 0.43         |
| Reach 1-Upper | 154       | 100YrCHI3Hr  | 0.37              | 91.43            | 91.77            | 91.67            | 91.78            | 0.003907            | 0.58              | 0.64              | 3.40             | 0.43         |
| Reach 1-Upper | 154       | 2YrSCS24Hr   | 0.13              | 91.43            | 91.65            | 91.58            | 91.66            | 0.004250            | 0.44              | 0.29              | 2.50             | 0.41         |
| Reach 1-Upper | 154       | 5YrSCS24Hr   | 0.21              | 91.43            | 91.70            | 91.62            | 91.71            | 0.004172            | 0.50              | 0.42              | 2.89             | 0.42         |
| Reach 1-Upper | 154       | 10YrSCS24Hr  | 0.27              | 91.43            | 91.72            | 91.64            | 91.74            | 0.004085            | 0.53              | 0.50              | 3.11             | 0.42         |
| Reach 1-Upper | 154       | 25YrSCS24Hr  | 0.34              | 91.43            | 91.76            | 91.66            | 91.77            | 0.003951            | 0.57              | 0.60              | 3.33             | 0.43         |
| Reach 1-Upper | 154       | 50YrSCS24Hr  | 0.40              | 91.43            | 91.78            | 91.67            | 91.80            | 0.003859            | 0.59              | 0.68              | 3.48             | 0.43         |
| Reach 1-Upper | 154       | 100YrSCS24Hr | 0.47              | 91.43            | 91.80            | 91.69            | 91.82            | 0.003775            | 0.61              | 0.76              | 3.63             | 0.43         |
| Reach 1-Upper | 137       | 2YrCHI3Hr    | 0.09              | 91.33            | 91.49            | 91.46            | 91.51            | 0.011391            | 0.63              | 0.14              | 1.43             | 0.65         |
| Reach 1-Upper | 137       | 5YrCHI3Hr    | 0.15              | 91.33            | 91.53            | 91.50            | 91.56            | 0.011329            | 0.73              | 0.20              | 1.66             | 0.67         |
| Reach 1-Upper | 137       | 10YrCHI3Hr   | 0.20              | 91.33            | 91.56            | 91.52            | 91.59            | 0.011021            | 0.78              | 0.25              | 1.80             | 0.67         |
| Reach 1-Upper | 137       | 25YrCHI3Hr   | 0.26              | 91.33            | 91.59            | 91.55            | 91.63            | 0.010598            | 0.84              | 0.31              | 1.97             | 0.67         |
| Reach 1-Upper | 137       | 50YrCHI3Hr   | 0.31              | 91.33            | 91.62            | 91.57            | 91.65            | 0.010270            | 0.87              | 0.36              | 2.09             | 0.67         |
| Reach 1-Upper | 137       | 100YrCHI3Hr  | 0.37              | 91.33            | 91.64            | 91.58            | 91.68            | 0.009883            | 0.90              | 0.41              | 2.22             | 0.67         |
| Reach 1-Upper | 137       | 2YrSCS24Hr   | 0.13              | 91.33            | 91.52            | 91.49            | 91.55            | 0.011458            | 0.71              | 0.18              | 1.59             | 0.67         |
| Reach 1-Upper | 137       | 5YrSCS24Hr   | 0.21              | 91.33            | 91.57            | 91.53            | 91.60            | 0.010925            | 0.80              | 0.26              | 1.84             | 0.67         |
| Reach 1-Upper | 137       | 10YrSCS24Hr  | 0.27              | 91.33            | 91.60            | 91.55            | 91.63            | 0.010544            | 0.84              | 0.32              | 1.99             | 0.67         |
| Reach 1-Upper | 137       | 25YrSCS24Hr  | 0.34              | 91.33            | 91.63            | 91.58            | 91.67            | 0.010099            | 0.89              | 0.39              | 2.16             | 0.67         |
| Reach 1-Upper | 137       | 50YrSCS24Hr  | 0.40              | 91.33            | 91.65            | 91.60            | 91.69            | 0.009709            | 0.91              | 0.44              | 2.29             | 0.66         |
| Reach 1-Upper | 137       | 100YrSCS24Hr | 0.47              | 91.33            | 91.68            | 91.61            | 91.72            | 0.009370            | 0.93              | 0.50              | 2.42             | 0.66         |
| Reach 1-Upper | 116       | 2YrCHI3Hr    | 0.09              | 91.23            | 91.38            | 91.32            | 91.39            | 0.003211            | 0.37              | 0.23              | 2.08             | 0.35         |
| Reach 1-Upper | 116       | 5YrCHI3Hr    | 0.15              | 91.23            | 91.44            | 91.35            | 91.44            | 0.002924            | 0.42              | 0.35              | 2.37             | 0.35         |
| Reach 1-Upper | 116       | 10YrCHI3Hr   | 0.20              | 91.23            | 91.47            | 91.37            | 91.48            | 0.002866            | 0.46              | 0.43              | 2.54             | 0.36         |
| Reach 1-Upper | 116       | 25YrCHI3Hr   | 0.26              | 91.23            | 91.50            | 91.39            | 91.52            | 0.002818            | 0.49              | 0.53              | 2.75             | 0.36         |
| Reach 1-Upper | 116       | 50YrCHI3Hr   | 0.31              | 91.23            | 91.53            | 91.41            | 91.54            | 0.002810            | 0.52              | 0.60              | 2.89             | 0.36         |
| Reach 1-Upper | 116       | 100YrCHI3Hr  | 0.37              | 91.23            | 91.56            | 91.42            | 91.57            | 0.002804            | 0.54              | 0.68              | 3.03             | 0.37         |
| Reach 1-Upper | 116       | 2YrSCS24Hr   | 0.13              | 91.23            | 91.42            | 91.34            | 91.43            | 0.002958            | 0.41              | 0.32              | 2.29             | 0.35         |
| Reach 1-Upper | 116       | 5YrSCS24Hr   | 0.21              | 91.23            | 91.48            | 91.37            | 91.49            | 0.002849            | 0.47              | 0.45              | 2.59             | 0.36         |
| Reach 1-Upper | 116       | 10YrSCS24Hr  | 0.27              | 91.23            | 91.51            | 91.39            | 91.52            | 0.002820            | 0.50              | 0.54              | 2.77             | 0.36         |
| Reach 1-Upper | 116       | 25YrSCS24Hr  | 0.34              | 91.23            | 91.54            | 91.41            | 91.56            | 0.002805            | 0.53              | 0.64              | 2.96             | 0.37         |
| Reach 1-Upper | 116       | 50YrSCS24Hr  | 0.40              | 91.23            | 91.57            | 91.43            | 91.59            | 0.002678            | 0.55              | 0.73              | 3.11             | 0.36         |
| Reach 1-Upper | 116       | 100YrSCS24Hr | 0.47              | 91.23            | 91.60            | 91.45            | 91.62            | 0.002583            | 0.57              | 0.82              | 3.24             | 0.36         |
| Reach 1-Upper | 95        | 2YrCHI3Hr    | 0.09              | 91.07            | 91.29            | 91.23            | 91.30            | 0.006154            | 0.52              | 0.16              | 1.38             | 0.48         |
| Reach 1-Upper | 95        | 5YrCHI3Hr    | 0.15              | 91.07            | 91.33            | 91.27            | 91.35            | 0.006882            | 0.63              | 0.24              | 1.61             | 0.53         |
| Reach 1-Upper | 95        | 10YrCHI3Hr   | 0.20              | 91.07            | 91.36            | 91.30            | 91.39            | 0.007544            | 0.71              | 0.28              | 1.73             | 0.56         |
| Reach 1-Upper | 95        | 25YrCHI3Hr   | 0.26              | 91.07            | 91.39            | 91.33            | 91.42            | 0.007915            | 0.77              | 0.34              | 1.88             | 0.58         |
| Reach 1-Upper | 95        | 50YrCHI3Hr   | 0.31              | 91.07            | 91.41            | 91.35            | 91.45            | 0.008499            | 0.83              | 0.37              | 1.97             | 0.61         |
| Reach 1-Upper | 95        | 100YrCHI3Hr  | 0.37              | 91.07            | 91.43            | 91.37            | 91.47            | 0.009495            | 0.90              | 0.41              | 2.07             | 0.65         |
| Reach 1-Upper | 95        | 2YrSCS24Hr   | 0.13              | 91.07            | 91.32            | 91.26            | 91.34            | 0.006702            | 0.60              | 0.21              | 1.55             | 0.52         |
| Reach 1-Upper | 95        | 5YrSCS24Hr   | 0.21              | 91.07            | 91.37            | 91.30            | 91.39            | 0.007595            | 0.72              | 0.29              | 1.76             | 0.57         |
| Reach 1-Upper | 95        | 10YrSCS24Hr  | 0.27              | 91.07            | 91.39            | 91.33            | 91.43            | 0.008212            | 0.79              | 0.34              | 1.88             | 0.60         |
| Reach 1-Upper | 95        | 25YrSCS24Hr  | 0.34              | 91.07            | 91.42            | 91.36            | 91.46            | 0.008586            | 0.86              | 0.40              | 2.03             | 0.62         |
| Reach 1-Upper | 95        | 50YrSCS24Hr  | 0.40              | 91.07            | 91.39            | 91.38            | 91.46            | 0.019163            | 1.20              | 0.33              | 1.87             | 0.91         |
| Reach 1-Upper | 95        | 100YrSCS24Hr | 0.47              | 91.07            | 91.40            | 91.40            | 91.49            | 0.023191            | 1.34              | 0.35              | 1.90             | 1.00         |
| Reach 1-Upper | 72        | 2YrCHI3Hr    | 0.09              | 90.91            | 91.00            | 91.00            | 91.03            | 0.030446            | 0.75              | 0.12              | 1.98             | 0.99         |
| Reach 1-Upper | 72        | 5YrCHI3Hr    | 0.15              | 90.91            | 91.03            | 91.03            | 91.07            | 0.029306            | 0.85              | 0.18              | 2.40             | 1.01         |
| Reach 1-Upper | 72        | 10YrCHI3Hr   | 0.20              | 90.91            | 91.05            | 91.05            | 91.09            | 0.027108            | 0.89              | 0.22              | 2.63             | 0.99         |
| Reach 1-Upper | 72        | 25YrCHI3Hr   | 0.26              | 90.91            | 91.06            | 91.06            | 91.11            | 0.027545            | 0.98              | 0.27              | 2.80             | 1.02         |
| Reach 1-Upper | 72        | 50YrCHI3Hr   | 0.31              | 90.91            | 91.08            | 91.08            | 91.13            | 0.025861            | 1.01              | 0.31              | 2.94             | 1.00         |
| Reach 1-Upper | 72        | 100YrCHI3Hr  | 0.37              | 90.91            | 91.10            | 91.09            | 91.15            | 0.022250            | 1.01              | 0.36              | 3.09             | 0.95         |
| Reach 1-Upper | 72        | 2YrSCS24Hr   | 0.13              | 90.91            | 91.02            | 91.02            | 91.06            | 0.029339            | 0.82              | 0.16              | 2.29             | 1.00         |
| Reach 1-Upper | 72        | 5YrSCS24Hr   | 0.21              | 90.91            | 91.05            | 91.05            | 91.09            | 0.027610            | 0.92              | 0.23              | 2.67             | 1.00         |
| Reach 1-Upper | 72        | 10YrSCS24Hr  | 0.27              | 90.91            | 91.07            | 91.07            | 91.12            | 0.025875            | 0.97              | 0.28              | 2.84             | 0.99         |
| Reach 1-Upper | 72        | 25YrSCS24Hr  | 0.34              | 90.91            | 91.09            | 91.09            | 91.14            | 0.025973            | 1.05              | 0.33              | 2.99             | 1.01         |
| Reach 1-Upper | 72        | 50YrSCS24Hr  | 0.40              | 90.91            | 91.15            | 91.10            | 91.18            | 0.008061            | 0.73              | 0.55              | 3.56             | 0.59         |
| Reach 1-Upper | 72        | 100YrSCS24Hr | 0.47              | 90.91            | 91.22            | 91.11            | 91.24            | 0.003417            | 0.57              | 0.82              | 4.07             | 0.40         |

## APPENDIX H CITY OF OTTAWA DESIGN CHECKLIST



## 4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

### 4.1 General Content

| Criteria                                                                                                                                                                                                                                                                                                        | Location (if applicable)                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <input type="checkbox"/> Executive Summary (for larger reports only).                                                                                                                                                                                                                                           | N/A                                                                       |
| <input type="checkbox"/> Date and revision number of the report.                                                                                                                                                                                                                                                | On Cover                                                                  |
| <input type="checkbox"/> Location map and plan showing municipal address, boundary, and layout of proposed development.                                                                                                                                                                                         | Appendix A                                                                |
| <input type="checkbox"/> Plan showing the site and location of all existing services.                                                                                                                                                                                                                           | Site Servicing Plan (C102)                                                |
| <input type="checkbox"/> Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.                                                                      | 1.1 Purpose<br>1.2 Site Description<br>6.0 Proposed Stormwater Management |
| <input type="checkbox"/> Summary of pre-consultation meetings with City and other approval agencies.                                                                                                                                                                                                            | Appendix B                                                                |
| <input type="checkbox"/> Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria. | 1.1 Purpose<br>1.2 Site Description<br>6.0 Proposed Stormwater Management |
| <input type="checkbox"/> Statement of objectives and servicing criteria.                                                                                                                                                                                                                                        | 3.0 Pre-Consultation Summary                                              |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Identification of existing and proposed infrastructure available in the immediate area.                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/ A                                                     |
| <input type="checkbox"/> Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).                                                                                                                                                                                                                                                                                                               | Ste Grading Plan (C101)                                  |
| <input type="checkbox"/> Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.                                                                                                                                  | Ste Grading Plan (C101)                                  |
| <input type="checkbox"/> Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.                                                                                                                                                                                                                                                                                                                                 | N/ A                                                     |
| <input type="checkbox"/> Proposed phasing of the development, if applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/ A                                                     |
| <input type="checkbox"/> Reference to geotechnical studies and recommendations concerning servicing.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Section 2.0 Background Studies, Standards and References |
| <input type="checkbox"/> All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> <li>○ Metric scale</li> <li>○ North arrow (including construction North)</li> <li>○ Key plan</li> <li>○ Name and contact information of applicant and property owner</li> <li>○ Property limits including bearings and dimensions</li> <li>○ Existing and proposed structures and parking areas</li> <li>○ Easements, road widening and rights-of-way</li> <li>○ Adjacent street names</li> </ul> | Ste Grading Plan (C101)                                  |

## 4.2 Development Servicing Report: Water

| Criteria                                                                                                                                                                                                                                                                                                                          | Location (if applicable)                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Confirm consistency with Master Servicing Study, if available                                                                                                                                                                                                                                            | N/ A                                             |
| <input type="checkbox"/> Availability of public infrastructure to service proposed development                                                                                                                                                                                                                                    | N/ A                                             |
| <input type="checkbox"/> Identification of system constraints                                                                                                                                                                                                                                                                     | N/ A                                             |
| <input type="checkbox"/> Identify boundary conditions                                                                                                                                                                                                                                                                             | Appendix C                                       |
| <input type="checkbox"/> Confirmation of adequate domestic supply and pressure                                                                                                                                                                                                                                                    | N/ A                                             |
| <input type="checkbox"/> Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.                                                                                        | Appendix C                                       |
| <input type="checkbox"/> Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.                                                                                                                                                    | N/ A                                             |
| <input type="checkbox"/> Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design                                                                                                                                               | N/ A                                             |
| <input type="checkbox"/> Address reliability requirements such as appropriate location of shut-off valves                                                                                                                                                                                                                         | N/ A                                             |
| <input type="checkbox"/> Check on the necessity of a pressure zone boundary modification.                                                                                                                                                                                                                                         | N/ A                                             |
| <input type="checkbox"/> Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range | Appendix C, Section 4.2 Proposed Water Servicing |

|                                                                                                                                                                                                                                                                                                                       |                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <input type="checkbox"/> Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions. | Site Servicing Plan (C101) |
| <input type="checkbox"/> Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.                                             | N/A                        |
| <input type="checkbox"/> Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.                                                                                                                                                                                                | Appendix C                 |
| <input type="checkbox"/> Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.                                                                                                                                                            | N/A                        |

#### 4.3 Development Servicing Report: Wastewater

| Criteria                                                                                                                                                                                                                                                                                               | Location (if applicable)                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure). | N/A                                     |
| <input type="checkbox"/> Confirm consistency with Master Servicing Study and/or justifications for deviations.                                                                                                                                                                                         | N/A                                     |
| <input type="checkbox"/> Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.                                                       | N/A                                     |
| <input type="checkbox"/> Description of existing sanitary sewer available for discharge of wastewater from proposed development.                                                                                                                                                                       | Section 5.2 Proposed Sanitary Servicing |

|                                                                                                                                                                                                                                                                                                                                                 |                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)                                                                                           | Section 5.2 Proposed Sanitary Servicing |
| <input type="checkbox"/> Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.                                                                                                                                                                 | N/ A                                    |
| <input type="checkbox"/> Description of proposed sewer network including sewers, pumping stations, and forcemains.                                                                                                                                                                                                                              | Section 5.2 Proposed Sanitary Servicing |
| <input type="checkbox"/> Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality). | N/ A                                    |
| <input type="checkbox"/> Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.                                                                                                                                                                         | N/ A                                    |
| <input type="checkbox"/> Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.                                                                                                                                                                                                                       | N/ A                                    |
| <input type="checkbox"/> Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.                                                                                                                                               | N/ A                                    |
| <input type="checkbox"/> Special considerations such as contamination, corrosive environment etc.                                                                                                                                                                                                                                               | N/ A                                    |



#### 4.4 Development Servicing Report: Stormwater Checklist

| Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Location (if applicable)                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <input type="checkbox"/> Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)                                                                                                                                                                                                                                                                          | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> Analysis of available capacity in existing public infrastructure.                                                                                                                                                                                                                                                                                                                                                                        | N/A                                                                            |
| <input type="checkbox"/> A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.                                                                                                                                                                                                                                                                                             | Pre & Post-Development Plans                                                   |
| <input type="checkbox"/> Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5-year event (dependent on the receiving sewer design) to 100-year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects. | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.                                                                                                                                                                                                                                                                        | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> Description of the stormwater management concept with facility locations and descriptions with references and supporting information.                                                                                                                                                                                                                                                                                                    | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> Set-back from private sewage disposal systems.                                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                            |
| <input type="checkbox"/> Watercourse and hazard lands setbacks.                                                                                                                                                                                                                                                                                                                                                                                                   | N/A                                                                            |
| <input type="checkbox"/> Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.                                                                                                                                                                                                                                                                                      | N/A                                                                            |
| <input type="checkbox"/> Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.                                                                                                                                                                                                                                                                                                                                           | N/A                                                                            |
| <input type="checkbox"/> Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).                                                                                                                                                                                                                                                                         | Appendix G                                                                     |

|                                                                                                                                                                                                                             |                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <input type="checkbox"/> Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.            | Site Grading Plan (C101)                                                       |
| <input type="checkbox"/> Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions. | Appendix G, Section 7.0 Proposed Stormwater Management                         |
| <input type="checkbox"/> Any proposed diversion of drainage catchment areas from one outlet to another.                                                                                                                     | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.                                                                   | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.         | N/ A                                                                           |
| <input type="checkbox"/> Identification of potential impacts to receiving watercourses                                                                                                                                      | N/ A                                                                           |
| <input type="checkbox"/> Identification of municipal drains and related approval requirements.                                                                                                                              | N/ A                                                                           |
| <input type="checkbox"/> Descriptions of how the conveyance and storage capacity will be achieved for the development.                                                                                                      | Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management |
| <input type="checkbox"/> 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.                                 | Site Grading Plan (C101)                                                       |
| <input type="checkbox"/> Inclusion of hydraulic analysis including hydraulic grade line elevations.                                                                                                                         | N/ A                                                                           |

|                                                                                                                                                                                                                                                                                                                                                                        |                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <input type="checkbox"/> Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.                                                                                                                                                                                                | Section 8.0 Sediment & Erosion Control |
| <input type="checkbox"/> Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions. | N/A                                    |
| <input type="checkbox"/> Identification of fill constraints related to floodplain and geotechnical investigation.                                                                                                                                                                                                                                                      | N/A                                    |

#### 4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

| Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Location (if applicable) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <input type="checkbox"/> Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act. | N/A                      |
| <input type="checkbox"/> Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.                                                                                                                                                                                                                                                                                                                                                                                                                                                | N/A                      |
| <input type="checkbox"/> Changes to Municipal Drains.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | N/A                      |
| <input type="checkbox"/> Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)                                                                                                                                                                                                                                                                                                                                                                                              | N/A                      |

## 4.6 Conclusion Checklist

| Criteria                                                                                                                                                                                               | Location (if applicable)                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Clearly stated conclusions and recommendations                                                                                                                                | Section 9.0 Summary<br>Section 10.0 Recommendations |
| <input type="checkbox"/> Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency. | All are stamped                                     |
| <input type="checkbox"/> All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario                                                                      | All are stamped                                     |