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IRON VALLEY 2
5331 Fernbank Road

Site Servicing Report

Prepared for: Claridge Homes

IRON VALLEY 2
5331 Fernbank Road

OTTAWA, ONTARIO

Site Servicing Report

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

Submitted: June 2, 2021
Revised: November 5, 2021
Revised: February 17, 2022
Revised: November 14, 2025

Novatech File: 121011
Ref: R-2021-079

November 14, 2025

City of Ottawa
Planning and Infrastructure Approvals
110 Laurier Street West, 4th Floor
Ottawa, ON, K1P 1J1

Attention: **Abi Dieme**

Reference: **Iron Valley 2 - 5331 Fernbank Road**
Site Servicing Report
Our File No.: 121011

Please find enclosed for your review the revised Site Servicing Report including the hydraulic network analysis and stormwater management for the Iron Valley 2 (formerly Fernbank Zens) development at 5331 Fernbank Road. The site is bounded by Cope Drive to the north, the existing SOHO development to the east, Fernbank Road to the south and Terry Fox Drive to the west.

This report addresses the approach to site servicing (sanitary/storm/watermain) and to stormwater management for the subject property. Also, the included hydraulic analysis examines the proposed water distribution system as it relates to the existing infrastructure and future watermain distribution. This report demonstrates that the site servicing and stormwater management can be achieved and that the proposed water distribution system can provide adequate system pressures for servicing and fire protection purposes throughout the development.

This site has previously received Site Plan Approval. Due to the redesign of this development, this Site Servicing Report is submitted in support of the engineering detailed design for the Claridge Homes site plan application resubmission.

Trusting this report is adequate for your purposes. Should you have any questions, or require additional information pertaining to the enclosed report, please contact us.

Yours truly,

NOVATECH

Drew Blair, P. Eng.
Senior Project Manager

Cc Marc St. Pierre, Claridge Homes

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

DRAWINGS

1.0 INTRODUCTION

This Site Servicing Report was prepared as part of the engineering detailed design for the Iron Valley 2 (formerly Fernbank Zens) residential development at 5331 Fernbank Road (Subject Site).

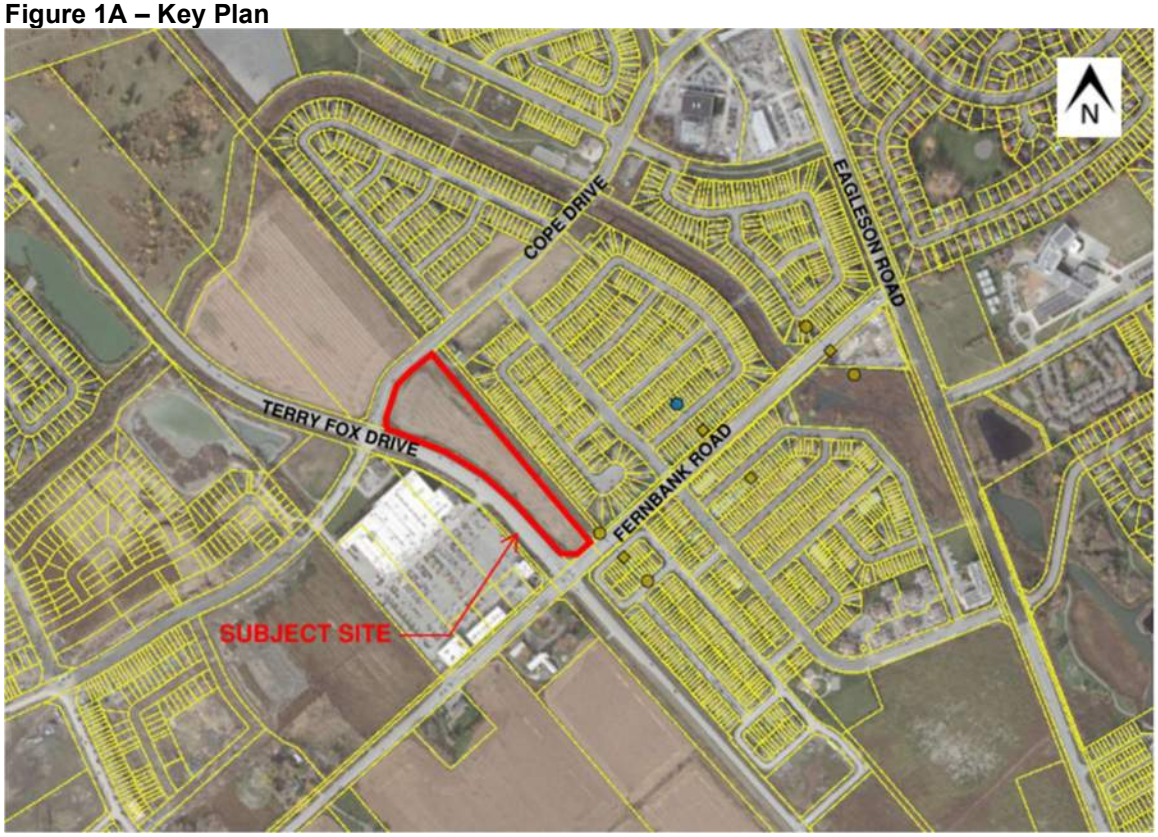
1.1 Site Description

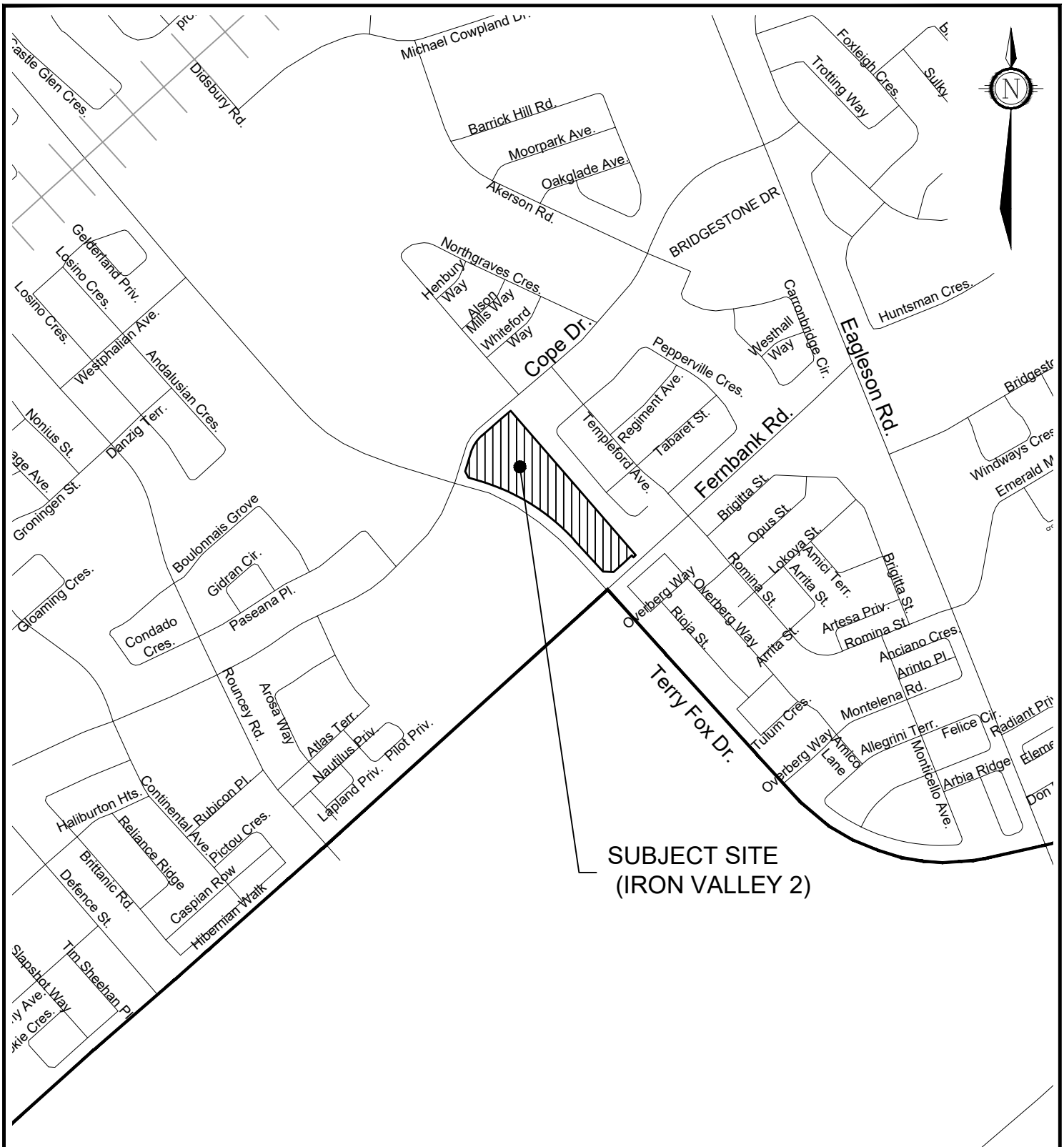
The proposed Iron Valley 2 development (**approximately 3.70 ha**) is owned by Claridge Homes and located within the City of Ottawa. The Subject Site is bounded by Cope Drive to the north, the existing SOHO development to the east, Fernbank Road to the south and Terry Fox Drive to the west as shown on **Figure 1A/1B** – Key Plan.

The legal description of the property is designated as Part of Lot 30 Concession 10, Goulbourn, Part 1 Plan 4R17373, Except Part 4, Plan 4R20112; Ottawa. Subject to an Easement in Favour of Hydro Ottawa Limited Over Parts 5,6, 7, 8 and 9 Plan 4R20112 as in OC455206. Road Allowance Between Lots 30 and 31 Concession 10, Goulbourn Lying Between Parts 3 and 4 on 4R17373 and Part 2 on Plan 4R20112, as Closed by N599928; Ottawa. Part of Lot 31, Concession 10, Goulbourn, Part 1 on Plan 4R19334 City of Ottawa.

The Subject Site is proposed to be developed as a residential development which will consist of 192 apartment units within 16 buildings (12 units per building), on-site parking and private local roadways with access from Cope Drive and Terry Fox Drive as shown on **Figure 2** – Site Plan. The existing lands are presently vacant but were previously occupied by farmland as shown on **Figure 3** – Existing Conditions.

Figure 1A – Key Plan





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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

KEY PLAN

SCALE N.T.S.

DATE	JOB	FIGURE
NOV 2025	121011	FIG-1B

SHT8X11.DWG - 216mmx279mm

EXISTING RESIDENTIAL LANDS

BLDG-A
BLDG-B
BLDG-C
BLDG-D
BLDG-E
BLDG-F
BLDG-G
BLDG-H
BLDG-J
BLDG-K
BLDG-L
BLDG-M
BLDG- N
BLDG-P
BLDG-Q
BLDG-R

CLARIDGE FERNBANK SITE

FERNBANK ROAD

TERRY FOX DRIVE

COPE DRIVE

Concrete Sidewalk

600mmøCSP
T/P=96.48
INV=95.96

600mmøCSP
T/P=96.43
INV=95.83

EXISTING COMMERCIAL LANDS

C:\Temp\AcPublish_28576\121011-FIG2.dwg, FIG2, Nov 10, 2025 - 2:04pm, mabdul

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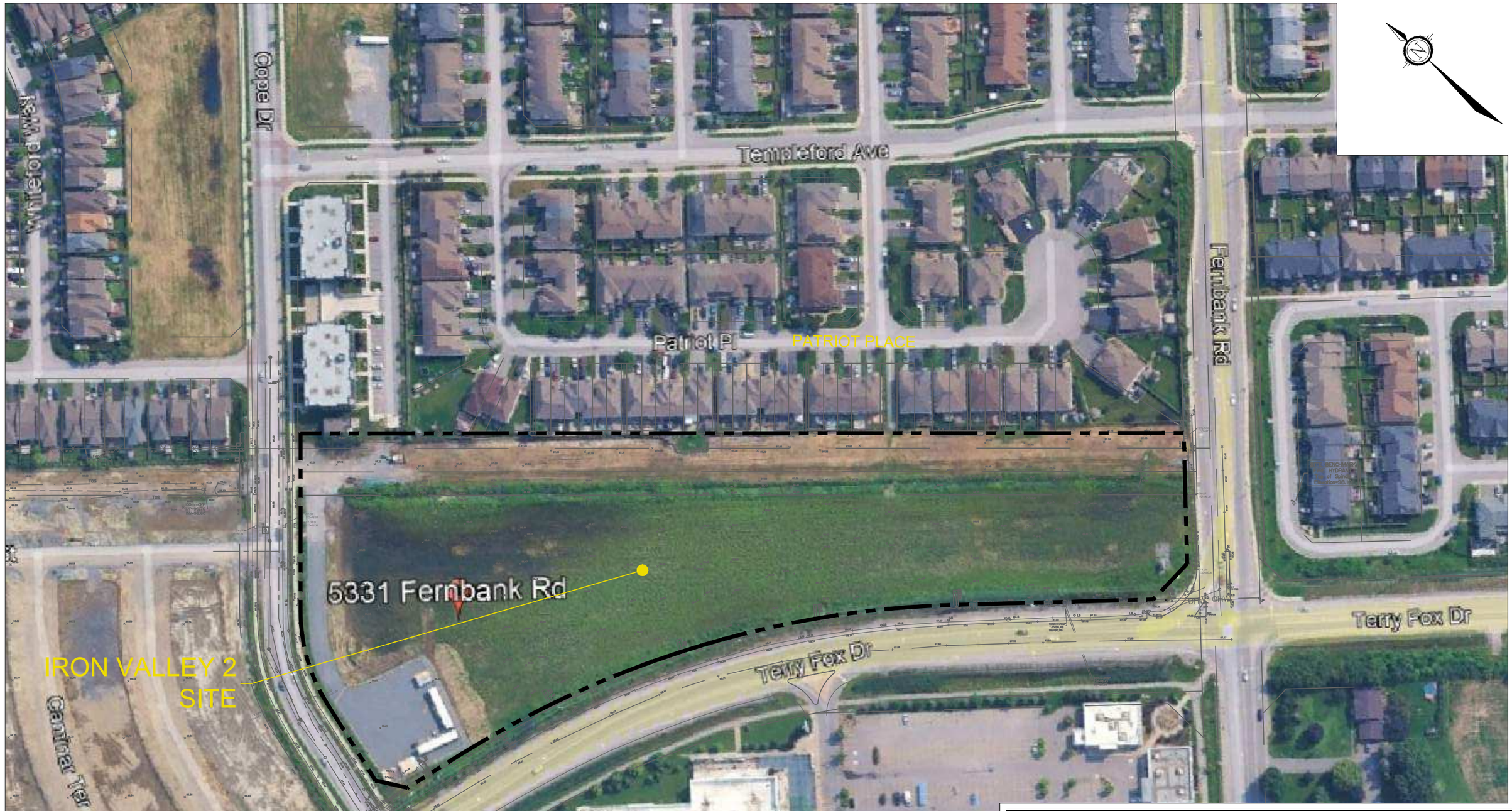
CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

SITE PLAN

SCALE 1 : 1000 (0 10 20 30 40)

DATE NOV 2025 | JOB 121011 | FIGURE FIG-2

SHT11X17.DWG - 279mmX432mm



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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

EXISTING CONDITIONS

SCALE			
N.T.S.			
DATE	JOB	FIGURE	
NOV 2025	121011	FIG-3	

SHT11X17.DWG - 279mmX432mm

C:\Temp\AcPublish_28576\121011-FIG3.dwg, FIG3, Oct 17, 2025 - 11:01am, aechlin

1.2 Planning Context

The subject property is designated General Urban Area in the City of Ottawa Official Plan. General Urban Areas are generally areas of commercial, industrial or medium and high-density residential housing. The proposed development conforms to these policies of the Official Plan.

The Subject Site is currently zoned *General Mixed Use – GM* and subject to Urban Exception number 2411 under the *City of Ottawa's Zoning By-law 2008-250.* The purpose of the *General Mixed Use – GM* is to:

1. *allow residential, commercial and institutional uses, or mixed-use development in the* ***General Urban Area*** *and in the Upper Town, Lowertown and Sandy Hill West Character Areas of the Central Area designations of the Official Plan;*
2. *limit commercial uses to individual occupancies or in groupings in well-defined areas such that they do not affect the development of the designated Traditional and Arterial Mainstreets as viable mixed-use areas;*
3. *permit uses that are often large and serve or draw from broader areas than the surrounding community and which may generate traffic, noise or other impacts provided the anticipated impacts are adequately mitigated or otherwise addressed; and*
4. *impose development standards that will ensure that the uses are compatible and complement surrounding land uses*.

The proposed development of a low-density apartment building is a permitted land use within the *General Mixed Use – GM* zone. The building has been designed to be compliant with the standards of the *General Mixed-Use Zone,* and the residential nature of the building is compatible with the surrounding properties.

1.3 Referenced Guidelines

This report has been prepared in accordance with the City of Ottawa Servicing Study Guidelines for Development Applications, the Water Distribution Design Guidelines (July 2010), the MOE Design Guidelines for Drinking-Water Systems (2008), the Ottawa Sewer Design Guidelines (October 2012) and all associated Technical Bulletins issued by the City of Ottawa.

1.4 Additional Reports

This Site Servicing Report provides information on the considerations and approach by which Novatech Engineering Consultants Ltd. has designed and evaluated the proposed servicing system for the Subject Site. This report should be read in conjunction with the following:

1) *Geotechnical Investigation – Proposed Residential Development, 5331 Fernbank Road, Ottawa, Ontario,* Paterson Group Inc., March 5, 2021. Report No. PG5683-1;

2) *Serviceability Report – Cavanaugh Construction Ltd. / Karam SOHO West – Rev 3, Stantec Consulting Ltd., October 31, 2007;*

3) *Cavanaugh Construction – Soho West (Phase 1 and 2), Kanata South, City of Ottawa Stormwater Management Report, Stantec Consulting Ltd. October 31, 2007;*

4) *Monahan Drain Constructed Wetlands – Updated Hydrologic and Hydraulic Analysis, City of Ottawa, J.F. Sabourin and Associates Inc (JFSA), March, 2019;*

5) *Servicing and Stormwater Management Brief - Van Gaal Lands 5331 Fernbank Road and 1039 Terry Fox Drive, Novatech Engineers, Planners & Landscape Architects, September 1, 2015;*

6) *Van Gaal Lands Claridge Developments — 1039 Terry Fox Drive and 5331 Fernbank Road – Site Serviceability and Stormwater Management Report, Novatech, October 2022.*

1.5 Consultations and Approvals

The Subject Site is located upstream of the approved Phase 1 of the Trailwest (formerly SOHO West) Subdivision. The SOHO West Serviceability Report, *SOHO West- Rev. 3, Serviceability Report, Prepared by Stantec, dated October 31st, 2007,* calculated sanitary and stormwater flows to outlet to Cope Drive from the land that makes up 5331 Fernbank Road.

The Ministry of the Environment (MOE) and the Rideau Valley Conservation Authority (RVCA) will be consulted regarding the proposed development.

2.0 PRE-DEVELOPMENT CONDITIONS

2.1 Site Description & Existing Conditions

The proposed Iron Valley 2 development is approximately 3.70 hectares, is currently undeveloped and comprised of former agricultural lands that are currently fallow. The northwest portion of the site has been developed for use as a site trailer and loading bay for the Subject Site. There is access to the site via Cope Drive to the north and Terry Fox Drive to the west. For more details see **Figure 3** – Existing Conditions Plan**.**

2.2 Existing Drainage

Under existing conditions, the site grading is relatively flat with sheet drainage to an existing ditch to the west along Terry Fox Drive and an existing ditch along the old Hazeldean Side Road on the east side of the parcel. These ditches eventually convey flows to the Monahan Municipal Drain to the north and east of the site.

2.3 Geotechnical Investigation

Paterson Group conducted a geotechnical review in support of the proposed residential development on the Claridge Homes Lands. The findings of this investigation are documented in their report titled *Geotechnical Investigation – Proposed Residential Development, 5331 Fernbank Road*.

The field program for the current geotechnical investigation was carried out in February 2021. It consisted of advancing five (5) boreholes to a maximum depth of 6.7m below ground surface. Previous field investigations were completed by Paterson for the subject site in January 2018 and May 2006. A total of 9 boreholes were advanced to a maximum depth of 14.6 m during the previous investigations. The principal findings are summarized as follows:

- A surficial layer of topsoil of thickness from 0.19m to 0.36m for all boreholes except boreholes BH1-18, BH7-18 and BH8-18. These boreholes had a layer of fill of thickness 0.53m, 0.48m and 0.33m respectively consisting of crushed stone with silt and sand.
- An interbedded brown silty sand with stiff brown clayey silt to silty clay of thickness 1.2m to 3.7m was encountered below the topsoil.
- The brown silty sand with stiff brown clayey silt to silty clay layer is underlain with a deep deposit of firm grey silty clay with some sand of thickness 3.8m to 11.9m.
- Based on geological mapping, the bedrock in this area is part of the Gull River formation, which consists of interbedded limestone and dolomite with an overburden drift thickness ranging between 25 to 50 m.
- Groundwater inflow was observed in test pits. Based on these observations, the long-term groundwater level is expected to be between 1.5 to 2.5 m depth.

- Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Grain size distribution and hydrometer testing was also completed on selected soil samples.
- Based on the results of the Atterberg limit testing mentioned above, the plasticity index was found to be less than 40% in all the tested clay samples. In addition, based on the clay content found in the clay samples from the grain size distribution test results, moisture levels and consistency, the silty clay across the subject site is considered low to medium sensitivity clay and should not be designated as sensitive marine clays.
- The permissible grade raise recommendation for finished grading within 6 m of a building footprint is 1.5 m and the permissible grade raise restriction for finished grading along access lanes and parking lots is 2.0 m.
- Expanded Polystyrene (EPS) geofoam may be used for this site within the porches and garages if the proposed grade raise is greater than allowed.

The report provides engineering guidelines based on Paterson Group's interpretation of the borehole information and project requirements. Refer to the final Geotechnical Report dated March 5, 2021, by Paterson Group for complete details.

3.0 STORMWATER MANAGEMENT

The post-development storm sewer and stormwater management system has been designed in accordance with the Ottawa Sewer Design Guidelines and will adhere to previously established release rates for this area.

3.1 Background Information (Trailwest Subdivision / Monahan Drain Cell 1)

The Subject Site are tributary to the existing storm sewer on Cope Drive, which was designed by Stantec (2007) as part of Phase 1 of the Trailwest (formerly SOHO West) Subdivision. The Fernbank Zens Lands were included in the overall storm drainage design and is represented as subcatchment FUT-13B. Refer to Drawing OSD – Overall Storm Drainage Area Plan, SOHO – Kanata South (Rev. 7), Stantec (February 25, 2009), provided in **Appendix A**.

3.2 Stormwater Management Criteria

SOHO (Trailwest) Subdivision (Stantec, 2007)

As part of the overall storm drainage design for the SOHO Subdivision, storm runoff from the Zens Lands (catchment FUT13-B) was allocated to MH1013 on Cope Drive based on the following parameters:

Drainage Area Parameters

- Area ID = FUT-13B
- Drainage Area = 3.73 ha
- Runoff Coefficient = 0.65

The stormwater management model for the SOHO subdivision assigned the following stormwater management criteria to catchment FUT-13B:

- Minor system inlet rate = 317 L/s (85 L/s/ha x 3.73 ha)
- Major system storage = 60 m^3/ha
- 100-year Major system peak flow = 781 L/s

J.F Sabourin and Associates completed an updated hydrologic and hydraulic assessment of the Monahan Drain SWM Facility which provided an updated 100-year boundary condition of 95.05m at MH1013 in Cope Drive. Excerpts from these reports are provided in **Appendix A**.

3.3 Existing and Proposed Storm Infrastructure

The proposed development will be serviced by approximately 1,175m of storm sewers ranging from 250mm to 825mm in diameter. The minor system outlet is an existing 1200mm x 1800mm concrete box storm sewer at MH1013 on Cope Drive, which runs through the Trailwest Subdivision and conveys runoff to a Vortechnics hydrodynamic separator for water quality treatment before discharging to Cell 1 of the Monahan Drain. The proposed storm layout can be seen on **Figure 4** – Storm Alignment.

3.3.1 Minor System (Storm Sewers)

Storm servicing for the Iron Valley 2 development will be provided using a dual-drainage system. Runoff from frequent events will be conveyed by the proposed storm sewers (minor system), while flows from large storm events that exceed the capacity of the minor system will be stored on the surface in road sags and/or conveyed overland along defined overland flow routes (major system).

Storm Sewer Design Criteria

The following is the storm sewer design criteria based on the City of Ottawa Sewer Design Guidelines (Oct. 2012)]:

- Rational Method (Q) = 2.78CIA, where
    - Q = peak flow (L/s)
    - C = runoff coefficient
        - C = (0.70 * %Imp.) + 0.20
    - I = rainfall intensity for a 2-year return period (mm/hr)
        - $I_{2yr} = 732.951 / [(Tc(min) + 6.199)]^{0.810}$
    - A = site area (ha)
- Minimum Pipe Size = 250 mm; Minimum / Maximum Full Flow Velocity = 0.8 m/s / 3.0 m/s

The on-site storm sewers will be sized to convey the peak flows corresponding to a 2-year return period storm event. Refer to the storm sewer design sheets provided in **Appendix A**.

Inlet Control Devices

Inlet control devices (ICDs) will be used to restrict inflows to the minor system. ICDs will be sized to control minor system peak flows to the Cope Drive storm sewer to the allowable release rate of 317 L/s.

The uncontrolled flows directed overland have been accounted for as part of the major system design.

Hydraulic Grade Line

The storm sewers will be designed to ensure the hydraulic grade line (HGL) elevation for a 100-year storm event will provide a minimum 0.30 m clearance from the underside of footing (USF) elevation where the buildings are directly connected to the storm sewers.

3.3.2 Major System (Overland Flow)

Under post-development conditions, the majority of the site will be graded to provide an overland flow path to convey major system runoff towards Cope Drive. The uncontrolled areas have been

LEGEND

- SITE BOUNDARY
- PROPOSED STORM SEWER C/W FLOW DIRECTION
- EXISTING STORM SEWER C/W FLOW DIRECTION

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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

STORM ALIGNMENT

1 : 1500 (0, 15, 30, 45, 60)

NOV 2025	121011	FIG4-STM

graded to direct flows overland to either the adjacent Fernbank Road ROW or Terry Fox Drive ROW. Refer to the Grading Plans (Drawing 121011-GR1 and GR2).

Major System (Overland Flow) Criteria

Runoff from storms that exceed the minor system capacity are to be stored or conveyed overland within the right-of-way and/or defined drainage easements. The following overland flow criteria from the OSDG will be applied to the design:

- Ensure that major system flows have a maximum dynamic depth of 0.35 m (static ponding + dynamic flow) during the 100-year event.
- Ensure the product of velocity x depth does not exceed 0.60 during the 100-year event.

The major system will be evaluated using a hydraulic model to ensure that the maximum total flow depth (static + dynamic) will be restricted to 0.35 m during the 100-year storm event; and water levels will not touch the building envelope / lowest opening during the Stress Test event (100-year +20%).

3.4 Proposed Stormwater Management Strategy

Stormwater Quality Control

The existing Vortech unit immediately upstream the outlet to Cell 1 of the Monahan Drain Constructed Wetlands has been designed to provide an Enhanced level of water quality control for the contributing drainage area, including the Iron Valley 2 Site. The proposed site layout has a slightly smaller drainage area and the same coefficient than was used to size the Vortech unit, and as such will provide the required level of water quality treatment – refer to **Table 3.1**.

Table 3.1: Vortech Sizing Criteria (Iron Valley 2)

Design	Catchment ID	Parameters	Description
Stantec (2007)	**FUT-13B**	**3.73 ha, C = 0.65**	**Area to Cope Drive / Vortech Unit**
Novatech (2021)	**A1-A32**	**3.45 ha, C = 0.52**	**Area to Cope Drive / Vortech Unit**
	U1-U5	**0.26 ha, C = 0.34**	**Uncontrolled Areas**
	TOTAL	**3.71 ha, C = 0.51**	**Total Drainage Area (Controlled + Uncontrolled)**

Stormwater Quantity Control

Surface/Underground storage will be provided within the road sags/parking areas/oversized underground storage pipes, based on the minimum major system storage requirement of 60 m^3/ha taken from the downstream Trailwest (SOHO West) approved design by Stantec.

The Cope Drive storm sewer and Cell 1 of the Monahan Drain Constructed Wetlands have been designed to accommodate post-development runoff from the site based on a contributing drainage area of 3.73 ha and a runoff coefficient of C = 0.65. The proposed development has a total drainage area of 3.71 ha and a runoff coefficient of C = 0.51. Therefore, there will be no increase in runoff volume to the Monahan Drain from the 2007 Stantec design and the 2019 J.F Sabourin review.

3.4.1 Stormwater Management Model Development

The PCSWMM model has been developed to account for both minor and major system flows from the development and ensure no adverse impacts on the downstream watercourses and wetland areas. The results of the analysis were used to:

- Determine the total major and minor system runoff from the site;
- Size the ICDs for each inlet to the storm sewer system;
- Calculate the storm sewer hydraulic grade line for the 100-year storm event;
- Evaluate overland flow depths and ponding volumes during the 100-year event; and
- Ensure no ponding occurs during the 2-year storm event.

3.4.2 PCSWMM Model Parameters

Design Storms

The model includes the following design storms based on the City of Ottawa IDF data presented in the City of Ottawa Sewer Design Guidelines (October 2012). The 24-hour SCS storm distribution was provided by JFSA and was used for the analysis of the Monahan Drain.

- 3-hour Chicago Storm Distribution (10-minute time step)
- 24-hour SCS Storm Distribution from JFSA (12-minute time step)

The 3-hour Chicago storm distribution includes the 2-year, 5-year, 100-year, and 100-year (+20%) return periods while the 24-hour SCS storm distribution includes only the 100-year return period.

PCSWMM Model Schematics, Output Data and Modeling Files

PCSWMM model schematics and output data for the 100-year 3-hour Chicago and 100-year 24-hour SCS (JFSA) storm distributions are provided in **Appendix A**. The PCSWMM modeling files are provided electronically as part of the submission package.

Subcatchment Areas / Runoff Coefficients

- For modeling purposes, the site has been divided into subcatchments based on the drainage areas tributary to each inlet of the proposed storm sewer system. The catchment areas are shown on the Storm Drainage Area Plans (**121011-STM**). Refer to the Grading Plans (**121011-GR1 and GR2**) and the General Plan of Services (**121011-GP1 and GP2**) for the location of high points and low points, and the storm sewer layout, respectively.
- The weighted runoff coefficients and percent impervious values are provided in **Appendix A**. As per the City of Ottawa Sewer Design Guidelines (October 2012), the percent impervious values are based on the following equation:

  % Imp. = (C – 0.20) / 0.7

The hydrologic parameters for each subcatchment were developed based on the Grading Plans and the Storm Drainage Area Plans. An overview of the drainage area parameters is provided in **Table 3.2.**

Table 3.2: Hydrologic Model Parameters

Area ID	Catchment Area (ha)	Runoff Coeff. (C)	Percent Imperv. (%)	No Depression (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
Controlled Areas							
A01	0.04	0.52	45.7	63	12	34	3.7
A02	0.14	0.72	74.3	42	20	72	1.9
A03	0.12	0.56	51.4	100	20	61	3.0
A04	0.12	0.80	85.7	38	17	70	2.3
A05	0.08	0.78	82.9	44	12	66	3.7
A06	0.22	0.83	90.0	36	16	139	2.6
A07	0.08	0.52	45.7	0	17	48	1.2
A08	0.16	0.49	41.4	40	19	83	1.9
A09	0.08	0.40	29	44	12	65	3.7
A10	0.1	0.66	66	46	12	87	2.0
A11	0.16	0.34	20	40	20	82	2.0
A12	0.11	0.59	56	0	11	100	1.0
A13	0.03	0.51	44	0	22	14	2.5
A14	0.04	0.34	20	0	7	55	2.5
A15	0.14	0.61	59	28	21	68	2.5
A16	0.05	0.64	63	100	10	51	2.5
A17	0.21	0.51	44	34	31	67	2.5
A18	0.24	0.29	13	28	19	124	2.1
A19	0.08	0.64	63	40	12	67	3.5
A20	0.09	0.62	60	100	16	56	3.0
A21	0.06	0.67	67	100	8	76	3.0
A22	0.09	0.20	0	40	16	56	3.5
A23	0.21	0.56	51	25	24	89	2.3
A24	0.09	0.25	7	0	10	86	0.5
A25	0.15	0.59	56	42	18	82	2.2
A26	0.08	0.62	60	40	17	46	3.7
A27	0.05	0.51	44	100	13	38	3.5
A28	0.12	0.24	6	20	16	77	2.5
A29	0.09	0.23	4	100	12	72	3.0
A30	0.08	0.48	40	0	16	51	1.9
A31	0.05	0.63	61	100	13	38	3.4
A32	0.09	0.61	59	50	8	108	0.5
TOTAL	**3.55**	**0.52**	**45.8**				
Uncontrolled Areas							
U1	0.05	0.20	0	0	2	212	15.0
U2	0.03	0.20	0	0	6	47	5.0
U3	0.05	0.20	0	0	3	172	15.0
U4	0.13	0.48	40	77	15	85	3.7
TOTAL	**0.26**	**0.34**	**20**				

Depression Storage

- The default values for depression storage (1.57mm impervious / 4.67 mm pervious) have been applied to all catchments.
- The 'zero impervious' parameter (areas with no depression storage) for all catchments is based off the percent of roof top areas to total impervious area.

Subarea Routing

- Subarea routing for all catchments draining to Cope Drive is set to 'Outlet'.

Minor System Conduits (Bend / Exit Losses)

- The minor system network was created in Civil3D and imported into PCSWMM.
- The following exit losses have been inputted into the model. They represent the loss coefficient based on the bend angle, as per the Appendix 6-B in the City of Ottawa Sewer Design Guidelines (October 2012).

Bend Angle	Loss Coefficient
0	0.00
15	0.09
30	0.21
45	0.39
60	0.64
75	0.96
90	1.32

Downstream Boundary Condition (Minor System)

- The storm sewer outlet for the Fernbank Zens Lands is the existing maintenance hole (MH1013) on Cope Drive.
- The boundary condition for the storm outlet was set at the 100-year HGL elevation of the outgoing sewer (95.05m). This is based on the Sensitivity Analysis completed by JFSA. It represents an ultimate buildout condition of the vacant lands within the watershed. The boundary condition correspondence has been provided in **Appendix E**.

3.5 Minor System

Runoff from the site will be captured by the proposed on-site storm sewer network and attenuated by ICDs. Storage will be provided with a combination of underground storage (i.e. pipes / structures) and surface storage.

Inflows to the storm sewer were modeled based on the characteristics of each inlet. All the catchbasins in the roadways and parking areas are located at low points. Inflows to the storm sewer are based on the ICD specified for the inlet and the maximum depth of ponding. ICDs have been sized to limit the outlet peak flows to the allowable release rate of 317 L/s. Details are outlined as follows in **Table 3.3**. ICD information is indicated on the General Plan of Services (drawing **121011-GP1** and **GP2**).

Table 3.3: Inlet Control Devices and Design Flows

Structure ID	ICD Size & Inlet Rate					
	ICD Type	T/G (m)	Orifice Invert (m)	Max HGL (100-yr) (m)	100-year Head on Orifice (m)	100-year Orifice Peak Flow* (L/s)
CBMH1	Tempest LMF Vortex 45	96.74	94.77	97.04	2.25	2.76
CBMH2	83mm	96.84	94.86	97.12	2.22	20.80
CBMH3	83mm	97.10	94.98	97.34	2.32	21.89
CBMH4	Tempest LMF Vortex 80	97.31	95.12	97.61	2.45	7.72
CBMH5	Tempest LMF Vortex 40	97.38	95.29	97.61	2.30	2.13
CBMH8	Tempest LMF Vortex 70	96.92	94.85	97.11	2.23	6.58
CBMH10	83mm	96.86	94.85	97.16	2.27	21.10
CBMH11	83mm	97.08	94.90	97.31	2.37	21.76
CBMH13	83mm	97.23	94.91	97.41	2.46	22.07
CBMH14	Tempest LMF Vortex 40	97.23	95.09	97.41	2.30	2.13
CBMH15	Tempest LMF Vortex 45	97.50	95.35	97.69	2.32	2.81
CICB1	83mm	97.14	95.42	97.14	1.68	18.94
CICB2	83mm	97.59	96.04	97.66	1.58	18.35
RYE7	94mm	97.14	95.03	97.35	2.27	27.98
RYT13	83mm	97.17	95.59	97.31	1.68	18.92
RYT14	83mm	97.29	95.72	97.43	1.67	18.90
RYT15	83mm	97.48	95.91	97.60	1.65	18.76

**PCSWMM model results for a 3-hour Chicago storm distribution.*

3.5.1 Hydraulic Grade Line (PCSWMM)

The Hydraulic Grade Line (HGL) within the storm sewer system was evaluated using the fixed HGL of 95.05 at MH 1013 on Cope Drive during the 100-year storm event. This HGL elevation surcharges the storm sewer on Cope Drive by 0.24m (obvert elevation = 94.81m).

The results of the analysis were used to ensure that a minimum freeboard of 0.30m is provided between the 100-year hydraulic gradeline (HGL) and the designed underside of footing (USF) elevations for all buildings where they are directly connected to the storm sewer. The HGL analysis confirms that all buildings will have at least 0.30m of freeboard between the modeled hydraulic gradeline and the USF elevation. The HGL elevations for a 20% increase (rainfall intensity and total precipitation) in the 100-year storm were also reviewed to ensure that the modeled HGL is below the USF.

Table 3.4 provides a summary of the 100-year HGL elevation at each storm manhole downstream of the buildings storm connections within the proposed development. The 100-year+20% HGL elevations have been provided in **Appendix A**. **Table 3.5** summarizes the 100-year HGL elevation at the storm manholes that are upstream of the building storm connections. The HGLs in these manholes are above the design USF due to downstream flow controls. Since these manholes are upstream of storm connections to the buildings, the high HGLs are acceptable.

Table 3.4: 100-Year Hydraulic Gradeline Elevations (Downstream of Buildings)

Manhole ID	MH Obvert Elevation (m)	T/G Elevation (m)	HGL Elevation 100yr-3hr (m)	HGL Elevation 100yr+20% (m)	Design USF (m)	Clearance 100-yr (m)
MH100	94.93	96.96	95.06	95.06	95.38	0.32
MH102	94.96	97.02	95.07	95.08	95.38	0.31
MH104	94.98	97.03	95.08	95.09	95.38	0.30
MH106	95.06	97.13	95.11	95.11	95.45	0.34
MH108	95.13	97.28	95.13	95.14	95.61	0.48
MH110	95.18	97.36	95.14	95.16	95.61	0.47
MH112	95.32	97.49	95.15	95.15	95.84	0.69
MH114	95.47	97.55	95.22	95.22	95.97	0.75
MH116	95.50	97.61	95.22	95.22	95.73	0.51
MH118	95.53	97.67	95.23	95.23	95.73	0.50
MH200	95.07	97.14	95.15	95.20	95.45	0.30

Table 3.5: 100-Year Hydraulic Gradeline Elevations (Upstream of Buildings)

Manhole ID	MH Obvert Elevation (m)	T/G Elevation (m)	HGL Elevation 100yr-3hr (m)	HGL Elevation 100yr+20% (m)	100-Year Surcharge (m)	100-Year Clearance from T/G (m)
MH202	95.48	97.38	97.13	97.18	1.65	0.25
MH204	95.23	97.12	97.16	97.22	1.93	-0.04
MH206	95.73	97.76	97.69	97.69	1.96	0.07

3.5.2 Major System

The major system network was evaluated using the PCSWMM model to ensure that the overland flow depths and velocities conform to City standards. A summary of ponding depths at each inlet for the 2-year, 5-year, 100-year and 100-year (+20%) events are provided in **Appendix A**. The maximum static and dynamic ponding depths within the roadways are less than 0.35m during all events and the product of depth x velocity will be less than 0.60.

The underground and surface storage provided upstream of each ICD are represented in the model using a combination of storage curves and oversized storm sewers (**Appendix A**), which use a depth vs area relationship to represent the corresponding storage volumes at a given elevation. The underground parking area sewer pipes have been oversized in some areas to provide the required storage. They are installed at minimum slope however are accessible at either end for cleaning and maintenance purposes.

Table 3.6 provides a summary of the maximum static and 100-year ponding elevation at each catchbasin manhole within the proposed development.

Table 3.6: Overland Flow Results (100-year Event)

Structure	T/G	Max. Static Ponding (Spill Depth)		100-yr Event (3hr)			
		Elev.	Depth	Elev.	Depth	Cascading	Cascade Depth (m)
	(m)	(m)	(m)	(m)	(m)	Flow?	
CBMH1	96.74	97.06	0.32	97.04	0.30	N	0.00
CBMH2	96.84	97.27	0.13	97.10	0.26	Y	0.13
CBMH3	97.10	97.20	0.34	97.34	0.24	N	0.00
CBMH4	97.31	97.25	0.17	97.50	0.19	Y	0.02
CBMH5	97.38	97.66	0.11	97.61	0.23	Y	0.12
CBMH7	96.78	97.37	0.14	95.14	0.00	N	0.00
CBMH8	96.92	97.34	0.11	97.12	0.20	Y	0.09
CBMH9	97.14	97.75	0.25	97.19	0.05	N	0.00
CBMH10	96.86	97.14	0.30	97.16	0.30	N	0.00
CBMH11	97.08	97.38	0.28	97.31	0.23	N	0.00
CBMH12	97.55	97.59	0.28	97.31	0.00	N	0.00
CBMH13	97.23	97.68	0.30	97.41	0.18	N	0.00
CBMH14	97.23	97.08	0.30	97.41	0.18	N	0.00
CBMH15	97.50	97.16	0.24	97.69	0.19	N	0.00
CICB1	96.99	97.11	0.12	97.14	0.15	Y	0.03
CICB2	97.44	97.64	0.20	97.66	0.22	Y	0.02

The model results demonstrate that each storage area provides sufficient underground storage to ensure no surface ponding during the 2-year design event (the 2-year HGL elevation at each structure does not exceed the corresponding top of grate elevation).

An expanded table of the ponding depths at low points in the roadway and landscaped areas (including the stress-test event) is provided in **Appendix A**. Based on these results, the proposed storm drainage system will not experience any adverse flooding even with a 20% increase to the 100-year event.

3.5.3 Peak Flows (PCSWMM)

Table 3.7 provides a summary of the minor and major system flows from the Fernbank Zens Lands to Cope Drive, Fernbank Road ROW and Terry Fox Drive ROW for all storm events up to and including the 100-year.

Table 3.7: Summary of Peak Flows (PCSWMM)

Outfall	Allowable Release Rate	2-year Peak Flow	5-year Peak Flow	100-year Peak Flow[(2)] (L/s)		Description
				3-hour Chicago	24-hour SCS	
		(L/s)	(L/s)			
Minor System	317 L/s	144	209	317	300	To Cope Drive MH1013
Major System	781 L/s	12	23	56	42	Flow to Cope Drive (OF4, HP-CB01)
		3	19	30	24	Flow to Fernbank ROW (OF3)
		1	4	42	31	Flow to Terry Fox ROW (OF1, OF2)
TOTAL	**1,098 L/s**	**160**	**255**	**445**	**397**	

[(2)] PCSWMM model results; fixed outfall at 95.05m (100-year HGL elevation at MH 1013 on Cope Drive).

The 100-year minor system peak flow to Cope Drive is controlled to the allowable release rate of 317 L/s for both the 3-hour Chicago and 24-hour SCS distributions.

The major system peak flows are significantly less than the allowable rate of 781 L/s. The PCSWMM model is based on the grading design, which provides significantly more than the required 60m^3/ha of major system storage.

4.0 SANITARY SEWER SYSTEM

4.1 Background Information

The Subject Site is located upstream of Phase 1 of the Trailwest (formerly SOHO West) Subdivision. The SOHO West Serviceability Report, *SOHO West- Rev. 3, Serviceability Report, Prepared by Stantec, dated October 31st, 2007,* calculated sanitary flows to outlet to Cope Drive from the lands that make up 1039 Terry Fox Drive and 5331 Fernbank Road, which includes the Subject Site and lands north of the Monahan Drain and lands south of Cope Drive. Sanitary flows in this report were calculated to be 45.95L/s to outlet to the sanitary sewers on Cope Drive, which ultimately outlet to the Hazeldean Pump Station. Refer to **Appendix B** for excerpts.

In 2015, a rezoning application was submitted for the lands located at 5331 Fernbank Road & 1039 Terry Fox Drive. The land north of the Monahan Drain was rezoned from IP4 to IP to allow for the development of office buildings. The Subject Site was rezoned from IP4 to R3X [2410]-h to allow for residential development. And lastly, the land south of Cope Drive to Fernbank Road was rezoned from IP4 to IP with exceptions to all for commercial development. The exceptions would allow for retail store and retail food store to be permitted as secondary uses. As part of the submission a servicing and stormwater report was included titled, *Van Gaal Lands: 5331 Fernbank Road and 1039 Terry Fox Drive, Ottawa, ON, Servicing & Stormwater Management Brief, completed by Novatech, Ref. No.: R-2015-123, dated September 1, 2015.* The 2015 report comprised of two separate outlets for the sanitary flow from 1039 Terry Fox Drive and 5331 Fernbank Road.

The Subject Site and the lands south of Cope Drive outlet to the sanitary sewers on Cope Drive. A sanitary flow of 16.23L/s was calculated for the Cope Drive sanitary sewers.

The business park outlets to the existing 900mm dia. sanitary sewer along Hazeldean Side Road due to its proximity to the Hazeldean Pump Station. A sanitary flow of 25.81L/s was calculated to outlet to the Hazeldean Side Road sewer.

The total sanitary flows to the Hazeldean Pump Station were calculated to be 42.04L/s.

4.2 Existing Sanitary Sewer System

Currently, there is an existing 525mm dia. sanitary trunk sewer along Cope Drive and a 200mm dia. sanitary sewer along Northgraves Crescent to the northeast. The sanitary trunk sewer along Cope Drive currently services the existing commercial plaza located at 5357 Fernbank Road and the existing Trailwest community. The Cope Drive trunk sewer ultimately outlets to the Hazeldean Pump Station via the sanitary pipe system in the Trailwest subdivision. Through pre-consultation with the City of Ottawa for the Van Gaal lands (north of Cope Drive), the underside of footing elevations (USFs) shall be a minimum of 95.30m, which is the emergency overflow elevation at the Pump Station. These conditions should apply to the Subject Site as both developments outlet to the existing Cope Drive sanitary sewer at the same location. Please refer the **Appendix B** for correspondence regarding the minimum USF restrictions for the Subject Site.

4.3 Proposed Sanitary Sewer Outlet

It is proposed that sanitary flows from the Subject Site will outlet directly to the 525mm dia. sanitary trunk sewer along Cope Drive. The proposed outlet is consistent with the approved SOHO West Serviceability Report (Stantec, October 2007) and the approved Servicing & Stormwater Management Report (Novatech, September 2015) as part of the rezoning application for the Van Gaal Lands. Refer to Section 1.3 for report details.

The Subject Site will be serviced by a gravity sanitary sewer system, utilizing 200mm dia. sanitary pipes. Refer to **Figure 5** – Sanitary Alignment for details of the proposed sanitary sewer system.

4.4 Design Criteria

The proposed sanitary sewer system has been designed based on criteria established by the City of Ottawa in the following documents:

- Section 4.0 of the City of Ottawa Sewer Design Guidelines (October 2012).
- Technical Bulletins issued by the City of Ottawa regarding new sanitary design parameters. Design parameters listed in these technical bulletins supersede values from the City of Ottawa Sewer Design Guidelines (2012).

The resulting design parameters are summarized as follows:

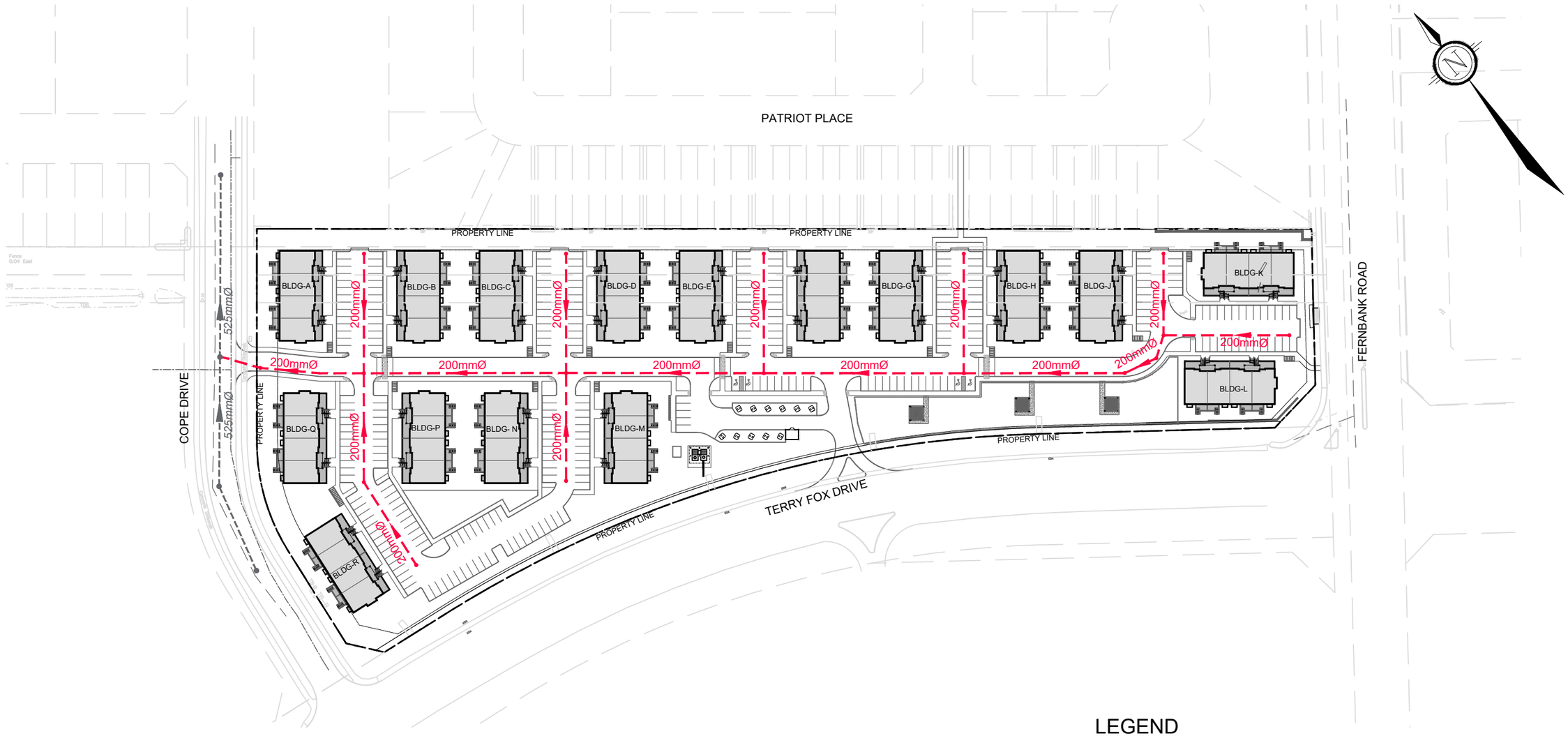
Population Flow = 280 L/capita/day
Infiltration = 0.33 L/s/ha
Apartment = 2.1 persons per unit
Maximum Residential Peak Factor = 4.0
Harmon Correction Factor = 0.8
Industrial/Commercial/Institutional Peak Factor
= 1.0, if area is <20% of total contributing area
= 1.5, if area is >20% of total contributing area
Industrial Peaking Factor: As per Appendix 4-B of the City of Ottawa Sewer Design Guidelines
Minimum velocity = 0.6m/s
Manning's n = 0.013

4.5 Proposed Sanitary Sewer System

The calculated peak sanitary design flow for the development is 5.68 L/s. For detailed calculations, refer to the Sanitary Sewer Design Sheet located in **Appendix B** and the Sanitary Drainage Area Plan (**121011-SAN**) located in **Appendix F** for sanitary drainage area details.

Allowable sanitary flows from the Subject Site were previously calculated in the Stantec Serviceability Report (October 2007) and the approved Novatech Servicing & Stormwater Management Report (September 2015) as part of the rezoning application for the Van Gaal Lands. As previously noted, sanitary flows from the lands north of the Monahan Drain will be directed to an existing 900mm diameter sanitary sewer on Hazeldean Side Road with the remaining two parcels outletting to the Cope Drive trunk sewer.

As a result, the proposed sanitary flows directed to the Cope Drive trunk sewer will be significantly less than previously calculated.



LEGEND

- SITE BOUNDARY
- PROPOSED SANITARY SEWER C/W FLOW DIRECTION
- EXISTING SANITARY SEWER C/W FLOW DIRECTION

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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

SANITARY ALIGNMENT

1 : 1500 (0, 15, 30, 45, 60)

NOV 2025 | 121011 | FIG5-SAN

SHT11X17.DWG - 279mmX432mm

C:\Temp\AcPublish_28576\20210513-121011-FIGS4-5.dwg, FIGS-SAN, Oct 17, 2025 - 11:30am, aechlin

Outlet to Cope Drive Sewers

A comparison of the proposed sanitary flows outletting to the existing Cope Drive sanitary trunk sewer and the allowable sanitary flows outlined in previous serviceability reports are summarized in **Table 4.1**.

Table 4.1: Proposed and Allowable Sanitary Flows Summary

Development Condition	Population	Area (ha)	Peak Flow (L/s)	Peak Ext. + Park Flow (L/s)	Peak Design Flow (L/s)
Proposed Sanitary Flows					
Claridge Residential Site North of Cope Dr. (Van Gaal Lands)	502	8.14	5.49	1.88	7.38
Subject Site	403	3.67	4.46	1.22	5.68
Total Flow (Proposed)					**13.06**
Allowable Sanitary Flows					
Stantec Serviceability Report (October 2007)	2811	23.14	39.47*	6.48	45.95
Novatech Approved Serviceability Report (rezoning)* (September 2015)		11.87	12.91	3.32	**16.23**

**Based on Table 4.1 of the rezoning report, Van Gaal Lands: 5331 Fernbank Road and 1039 Terry Fox Drive, Ottawa, ON, Servicing & Stormwater Management Brief, completed by Novatech, Ref. No.: R-2015-123, dated September 1, 2015.*

The total proposed sanitary flow from the subject site and the residential area north of Cope Drive (Van Gaal Lands) is 13.06 L/s, which represents a 71% decrease in sanitary flows compared to the calculated flows in the Stantec Serviceability Report (45.95 L/s) and a 19% decrease in sanitary flows compared to the calculated flows from the approved Novatech rezoning Servicing and Stormwater Management report (16.23L/s). This indicates there will be adequate capacity in the existing Cope Drive sanitary sewers to accommodate the proposed development.

For sanitary design sheets, drainage plans and design parameters from the Stantec Serviceability Report (October 2007), refer to excerpts located in **Appendix B**. For excerpts from the approved Novatech rezoning Servicing and Stormwater Management Report (September 2015), refer to **Appendix B**.

5.0 WATER SUPPLY SYSTEM

5.1 Proposed Watermain Distribution Network

As part of the detail design process, the City of Ottawa requires a hydraulic network analysis of the proposed water distribution system within the Iron Valley 2 development to confirm adequate watermain pressure is available to service the development under all operating conditions.

It is proposed to service the Subject Site utilizing a combination of 200mm and 100mm dia. watermains. Two (2) connections will be made to the existing 300mm dia. watermain within Cope Drive to establish a looped system. The first connection will be made to the existing 300mm dia. watermain within Cope Drive approximately 35m southwest of Northgraves Crescent; the second connection, approximately 75m southwest of Northgraves Crescent.

The proposed buildings will be serviced internally with 38mm dia. water services. Each 38mm dia. waterline will service three (3) apartment units with four (4) services per building.

Figure 6 – Water Network Plan highlights the proposed works and connection points. To account for the recently installed Van Gaal Lands watermain network, new watermain boundary conditions have recently been provided by the City of Ottawa and are included in **Appendix C**.

5.2 Design Criteria

The proposed watermain distribution network has been designed in accordance with design criteria listed in the City of Ottawa Water Distribution Guidelines (July 2010) and the MOE Design Guidelines for Drinking-Water Systems (2008). The following design criteria is used to analyze the proposed watermain distribution network:

Residential (Based on MOE Design Guidelines for Developments < 500 Population)

Residential Demand:	280L per person per day
Apartments/Zen Units:	2.1 persons per unit
Maximum Daily Demand:	3.0 x Average Daily Demand
Peak Hour Demand:	4.5 x Average Daily Demand
Fire Flow Demand:	Fire Underwriters Survey
Maximum Fire Demand:	267.0 L/s, per the Fire Underwriter's Survey for Public Fire Protection. Refer to **Appendix C** for FUS calculation sheets.

System Pressures

Maximum (System):	690 kPa (100 psi), per City of Ottawa Water Distribution Guidelines
Maximum (Service):	550 kPa (80 psi), per Ontario Plumbing Code. pressure reducing valves are to be installed if service pressures exceed 80 psi
Minimum:	275 kPa (40 psi), except during fire flow condition
Minimum (fire):	140 kPa (20 psi)

The City of Ottawa Water Distribution Guidelines indicates the maximum pressure to be 690 kPa (100 psi) for unoccupied areas.

Friction Factors

Size	C-Factor
Less than 200mm	100
200mm-300mm	110

Operating Conditions for Hydraulic Analysis

Average Daily Demand; Maximum Daily Demand plus Fire Flow; and Peak Hour Demand.

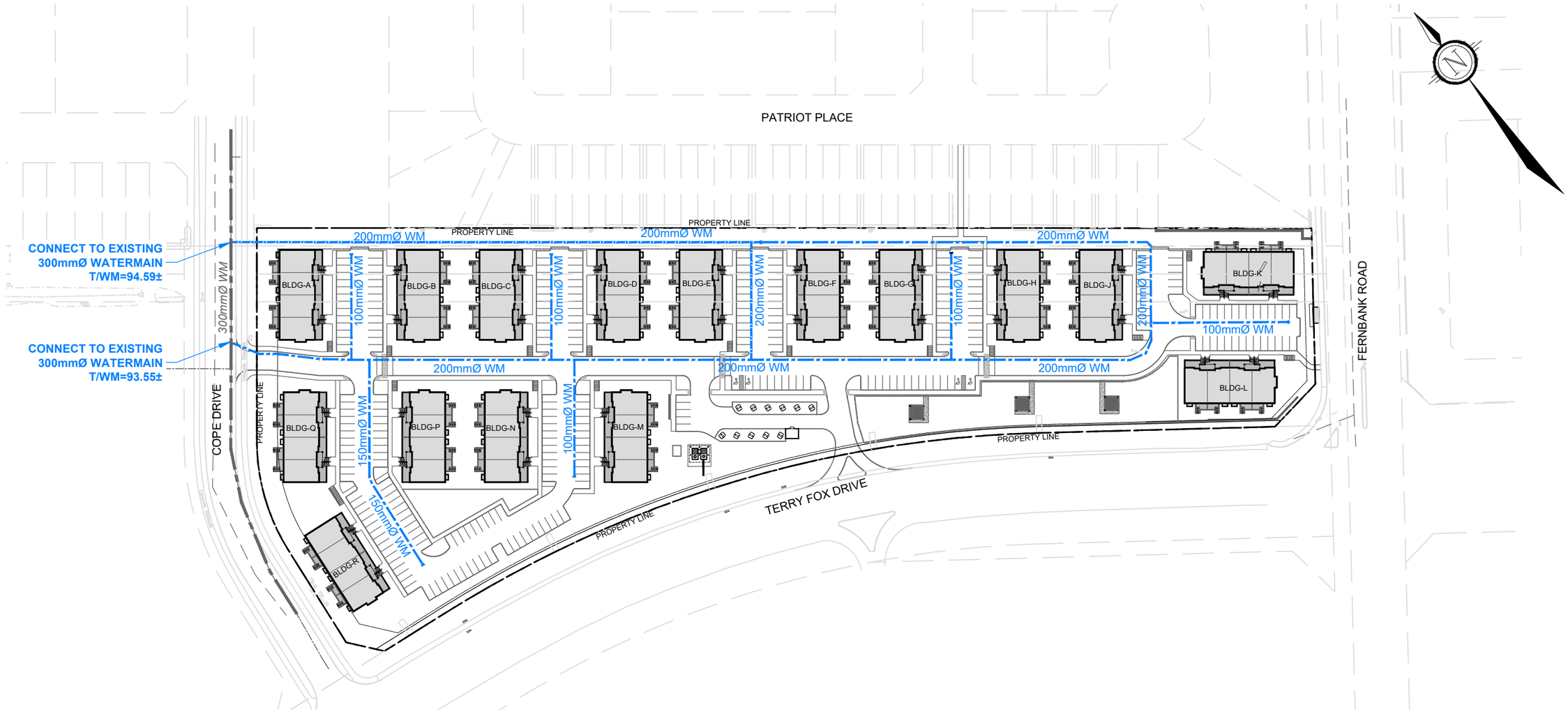
5.3 Hydraulic Analysis

The hydraulic modelling program "EPANET" was used for the purpose of analyzing the performance of the proposed watermain network under various operating conditions.

Table 5.1 summarizes the demands under the various combined operating conditions for the Subject Site. Refer to **Appendix C** for water demands listed by node and operating condition.

Table 5.1: Hydraulic Model Demand – Iron Valley 2

Description	Demand
Population	404 persons
Average Daily Flow	1.31 L/s
Max. Daily Flow (MD)	3.93 L/s
Peak Hour Flow (PH)	5.89 L/s
Maximum Fire Flow (FF)	266.67 L/s



LEGEND

- SITE BOUNDARY
- PROPOSED WATERMAIN
- EXISTING WATERMAIN

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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

WATER NETWORK PLAN

1 : 1500 (0, 15, 30, 45, 60)

NOV 2025 | 121011 | FIG6-WM

A hydraulic analysis of the proposed watermain distribution network was conducted for the Iron Valley 2 development to confirm the proposed watermain layout can provide adequate system pressures to service the development under all operating conditions. The analysis results highlight maximum system pressures as a result of average daily flow, minimum system pressures as a result of maximum daily demand plus fire flow (MD+FF) and the peak hour demand (PH) operating condition. Refer to **Appendix C** for detailed hydraulic calculations and the associated hydraulic analysis node network. **Table 5.2** summarizes results from the hydraulic analysis under each operating condition.

Table 5.2: Hydraulic Model Results – Iron Valley 2

Operating Condition	Minimum Operating Pressure
Max Daily Demand + Fire Flow	**Watermain**
MD = 3.93 L/s FF= 266.67 L/s (at N3)	275.07 kPa 39.90 psi (at N3)
MD = 3.93 L/s FF= 266.67 L/s (at N4)	204.44 kPa 29.65 psi (at N4)
MD = 3.93 L/s FF= 266.67 L/s (at N5)	158.33 kPa 22.96 psi (at N5)
MD = 3.93 L/s FF= 266.67 L/s (at N6)	138.81 kPa 20.13 psi (at N18)
Peak Hour Demand	
PH = 5.89 L/s	568.88 kPa 82.51 psi (at N6)
Average Daily Demand	
Maximum High Pressure = Node N11	641.57 kPa 93.05 psi
Maximum Water Age = Node N4	2.9 hours

The results indicate that acceptable minimum system pressures will exist throughout the proposed distribution system under all design conditions.

The proposed water distribution system was checked for high pressures during average daily demand operating condition. The hydraulic analysis results indicate that pressures above 550 kPa (80 psi) exist within the site, up to a maximum of 641.57 kPa (93.05 psi). Therefore, pressure reducing valves will be required for all units.

5.4 Fire Flow Demands

The hydraulic analysis of the water distribution network demonstrated that the system has sufficient capacity to provide the required fire flows based on the Fire Underwriters Survey (FUS) calculations. The actual functionality of the system is limited by the available flow rate from each Hydrant. Existing and proposed hydrants are Class AA and the maximum available flow rate at each hydrant is 5,700 L/min. A further evaluation was conducted as per Technical Bulletin ISTB-2018-02 Appendix I: Guideline on Coordination of Hydrant Placement with Required Fire Flow. The results are summarized in **Table 5.3**, refer to **Figure 7** - Fire Hydrant Coverage Plan for more details.

PATRIOT PLACE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

COPE DRIVE

FERNBANK ROAD

TERRY FOX DRIVE

PROPERTY LINE

Fence
0.04 East

TOS

100mmCPP
T/P=96.70
INV=96.60

Centre Street CD

BLDG-A
R.F.F. = 15,000 L/MIN

BLDG-B
R.F.F.= 16,000 L/MIN

BLDG-C
R.F.F. = 14,000 L/MIN

BLDG-D
R.F.F.= 15,000 L/MIN

BLDG-E
R.F.F.= 15,000 L/MIN

BLDG-F
R.F.F.= 14,000 L/MIN

BLDG-G
R.F.F.= 14,000 L/MIN

BLDG-H
R.F.F.= 13,000 L/MIN

BLDG-J
R.F.F.= 14,000 L/MIN

BLDG-K
R.F.F.=12,000 L/MIN

BLDG-L
R.F.F.=13,000L/MIN

BLDG-O
R.F.F.= 14,000 L/MIN

BLDG-P
R.F.F.= 12,000 L/MIN

BLDG-N
R.F.F. = 13,000 L/MIN

BLDG-M
R.F.F.= 13,000 L/MIN

BLDG-R
R.F.F.= 14,000 L/MIN

H1 H2 H3 H4 H5

H1 H2 H3

LEGEND

- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- R.F.F. REQUIRED FIRE FLOW
- 75m COVERAGE RADIUS
- 150m COVERAGE RADIUS
- H2 PROPOSED HYDRANT
- H1 EXISTING HYDRANT

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Website www.novatech-eng.com

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

FIRE HYDRANT COVERAGE PLAN

SCALE 1 : 1500 (0 15 30 45 60)
DATE NOV 2025
JOB 121011
FIGURE FIG-7

SHT11X17.DWG - 279mmX432mm

C:\Temp\AcPublish_15836\20251016-121011-FIG7-HYDCOV.dwg, FIG 7, Nov 17, 2025 - 9:30am, aechlin

Table 5.3: Fire Flow Results

Building	Fire Flow Demand (L/min)	Fire Hydrants within 75m	Fire Hydrants within 150m	*Available Fire Flow (L/min)
A	13,000	Existing Hydrant 1 Existing Hydrant 3 Hydrant 1	Existing Hydrant 2 Hydrant 2	24,700
B	16,000	Existing Hydrant 1 Existing Hydrant 3 Hydrant 1	Existing Hydrant 2 Hydrant 2	24,700
C	16,000	Hydrant 1 Hydrant 2	Existing Hydrant 1 Existing Hydrant 3 Hydrant 3	22,800
D	16,000	Hydrant 1 Hydrant 2	Existing Hydrant 1 Existing Hydrant 3 Hydrant 3	22,800
E	13,000	Hydrant 1 Hydrant 2 Hydrant 3	Hydrant 4 Hydrant 5	24,700
F	13,000	Hydrant 2 Hydrant 3	Hydrant 1 Hydrant 4 Hydrant 5	22,800
G	13,000	Hydrant 2 Hydrant 3 Hydrant 4	Hydrant 1 Hydrant 5	24,700
H	13,000	Hydrant 3 Hydrant 4 Hydrant 5	Hydrant 2	20,900
J	13,000	Hydrant 3 Hydrant 4 Hydrant 5	Hydrant 2	20,900
K	12,000	Hydrant 4 Hydrant 5	Hydrant 3	15,200
L	12,000	Hydrant 4 Hydrant 5	Hydrant 3	15,200
M	12,000	Hydrant 1 Hydrant 2	Existing Hydrant 1 Existing Hydrant 2 Hydrant 3	22,800
N	13,000	Hydrant 1 Hydrant 2	Existing Hydrant 1 Existing Hydrant 2 Existing Hydrant 3	22,800
P	13,000	Existing Hydrant 1 Existing Hydrant 2 Hydrant 1	Existing Hydrant 3 Hydrant 2	24,700
Q	13,000	Existing Hydrant 1 Existing Hydrant 2 Hydrant 1	Existing Hydrant 3	20,900
R	13,000	Existing Hydrant 1 Existing Hydrant 2	Existing Hydrant 3 Hydrant 1	19,000

* Existing and proposed hydrants are Class AA and the maximum available flow rate at each hydrant is 5,700 L/min.

The proposed water distribution system and the number of proposed hydrants satisfy the requirements for available flow based on Technical Bulletin ISTB-2018-02 Appendix I: Guideline on Coordination of Hydrant Placement with Required Fire Flow.

6.0 ROADWAYS

6.1 Roadway Characteristics

The Iron Valley 2 development will have a roadway width of 6.7m throughout with parking areas provided within the development limits.

6.2 Traffic

An analysis of the effect from the proposed Fernbank Zens development on the existing traffic patterns has been performed and detailed in the report*, Proposed Residential Development, 5331 Fernbank Road, Transportation Impact Assessment, completed by Novatech, Ref. No.: R-2020-053, dated November 2025;* and is submitted under a separate cover. Please refer to this report for more details.

6.3 Pedestrian Facilities

There are 1.8m wide existing concrete sidewalks along Cope Drive and Fernbank Road and 1.8m wide pathways are proposed within the development. Pathway connections are provided through the development between Cope Drive and Fernbank Road and east to Patriot Place in the existing SOHO development.

6.4 Noise

The analysis of the roadway traffic along Terry Fox Drive, Fernbank Road and Cope Drive indicates that the City of Ottawa's criteria for residential noise will be exceeded, primarily for units in close proximity to the noise sources. Attenuation measures are required, and they may include the installation of central air conditioning, forced air ventilation, specified window and wall assemblies and/or a notice may be placed on title with regards to the noise levels to be expected. The detailed results are included in the Detailed Noise Control Study and is submitted under a separate cover. Refer to Fernbank *Zens, 5331 Fernbank Road, Detailed Noise Control Study, dated November 14, 2025, by Novatech, Report No.: R-2021-074* for more details.

7.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987).

Typical erosion and sediment control measures recommended include, but are not limited to, the use of silt fences around perimeter of site (OPSD 219.110), filter fabric or inserts under catch basin/maintenance hole lids, heavy duty silt fence barrier (OPSD 219.130), straw bale check dams (OPSD 219.180), rock check dams (219.210 or OPSD 219.211), riprap (OPSS 511), mud mats, silt bags for dewatering operations, topsoil and sod to disturbed areas and natural grassed waterways. Dewatering and sediment control techniques will be developed for the individual situations based on the above guidelines and utilizing typical measures to ensure erosion and sediment control is controlled in an acceptable manner and there is no negative impact to adjacent lands, water bodies or water treatment/conveyance facilities.

It will be the responsibility of the Contractor to submit a detailed construction schedule and appropriate staging, dewatering and erosion and sediment control plans to the Contract Administrator for review and approval prior to the commencement of work. A copy of the City of Ottawa Special Provision F-1004 is included in the **Appendix D** which will become part of any contract, and which outlines the contractual requirements which includes preparation of a detailed erosion and sediment control plan.

General

- All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.
- A qualified inspector should conduct daily visits during construction to ensure that the contractor is working in accordance with the design drawings and that mitigation measures are being implemented as specified.
    - A light duty silt fence barrier is to be installed in the locations shown on the Erosion and Sediment Control Plan.
    - Straw bale barriers are to be installed in drainage ditches.
    - Filter cloth is to be placed under the grates of all proposed and existing catchbasins and structures.
    - After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.
- The contractor shall ensure that proper dust control is provided with the application of water (and if required, calcium chloride) during dry periods.
- The contractor shall immediately report to the engineer or inspector any accidental discharges of sediment material into any ditch or sewer system. Appropriate response measures shall be carried out by the contractor without delay.
- The contractor acknowledges that failure to implement erosion and sediment control measures may result in penalties imposed by any applicable regulatory agency.

8.0 UTILITIES

The Iron Valley 2 development will be serviced by hydro, phone, gas and cable, which will be constructed in a four-party trench, as per the City and utility standard right-of-way cross-sections. Canada Post will service the site with community mailboxes. Site lighting will be provided along roadways and walkways as per City standards.

9.0 PHASING

Servicing of the Iron Valley 2 development will be constructed in one phase.

10.0 DEVIATIONS FROM SEWER DESIGN GUIDELINES

The cover over the proposed storm sewers in certain instances is less than the standard outlined in the City of Ottawa Sewer Design Guidelines (October 2012) as some of the proposed storm sewers have been oversized for underground stormwater management. Due to the grade raise restrictions for the Subject Site, if the site grading was raised to meet the minimum storm sewer cover over these few oversized storm sewers, there would be a corresponding large increase in the development cost with the use of lightweight fill over the entire site. The installation of insulation will be required where minimum cover over storm sewers cannot be achieved.

11.0 CONCLUSIONS

- Storm servicing for the development will be provided using a dual drainage system: minor system flows (up to the 2-year event) will be conveyed by storm sewers or stored underground, while major system flows will be stored at low points in the roadways and parking areas. Flows that exceed the storage provided will be conveyed overland along defined overland flow routes to either Cope Drive, Fernbank Road or Terry Fox Drive.
- Water quality control for the proposed development will be provided by the existing approved Vortechnics units located at the outfall to Cell 1 of the Monahan Drain Constructed Wetlands.
- Peak flows leaving the site will be less than the allowable release rate for both the minor and major systems and will therefore have no adverse impact on the existing development downstream.
- A minimum clearance of 0.30m will be provided between the 100-year hydraulic grade line (HGL) and the designed underside of footing elevations where the buildings are directly connected to the storm sewers.
- Sanitary servicing for the Iron Valley 2 development will be provided by a gravity sanitary sewer system which will utilize 200mm dia. sanitary pipes within the development. Sanitary flows from the Subject Site will outlet to the existing 525mm dia. sanitary trunk sewer along Cope Drive.
- Water servicing for the Iron Valley 2 development will be provided by two (2) connections to the existing 300mm dia. watermain within Cope Drive establishing a looped system. The proposed water distribution network provides adequate operating pressures utilizing a combination of 38mm, 100mm, and 200mm dia. watermains and private fire hydrants within the Subject Site.
- Local private roadways will be 6.7m in width throughout the site with parking areas situated within the development limits. Internal pathways will be provided for pedestrian access within and through the development connecting to existing sidewalks along Cope Drive and Fernbank Road.
- Noise attenuation measures (noise wall) are not required on the site for the outdoor amenity areas. Building façade analysis was completed and the corresponding building requirements are outlined in the Detailed Noise Control Study submitted under separate cover.
- Erosion and sediment control measures (i.e. filter fabric, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established. Erosion and sediment control measures associated with construction are to be implemented as outlined in Section 7.0.
- The Iron Valley 2 development will be serviced by hydro, phone, gas and cable, which will be constructed in a three-party trench, as per the City of Ottawa and utility standard right-of-way cross-sections. Canada Post will service the Subject Site with community mailboxes. Site lighting will be provided along roadways and pathways as per City of Ottawa standards.

It is recommended that the City of Ottawa approve the findings of this Site Servicing Report in support of the engineering detail design for Site Plan Approval of the Iron Valley 2 (formerly Fernbank Zens) development at 5331 Fernbank Road.

NOVATECH

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Appendix A
STORM SEWER DESIGN

IRON VALLEY 2
5331 Fernbank
Claridge Homes
Project No.: 121011

STORM SEWER DESIGN SHEET
IRON VALLEY 2
5331 FERNBANK
FLOW RATES BASED ON RATIONAL METHOD

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)			FLOW							TOTAL FLOW	SEWER DATA								
Street	Catchment ID	From MH	To MH	Area (ha)	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
	A1	206	CBMH 15	0.04	0.40	0.02	0.044	0.044	10.00	76.81			3.4	23.1	0.254	250	PVC	0.47	17.1	42.5	0.84	0.34	54%
						0.00	0.000	0.000	10.00														
						0.00	0.000	0.000	10.00														
	A2			0.14	0.66	0.09	0.257	0.301	10.00	76.81			23.1										
						0.00	0.000	0.000	10.00														
						0.00	0.000	0.000	10.00														
		CBMH 15	118	0.00	0.00	0.00	0.000	0.301	10.34	75.52			22.8	22.8	0.305	300	PVC	0.37	32.2	61.3	0.84	0.64	37%
						0.00	0.000	0.000	10.34														
						0.00	0.000	0.000	10.34														
									10.98														
	A3	CBMH 5	118	0.12	0.34	0.04	0.113	0.113	10.00	76.81			8.7	23.8	0.305	300	PVC	0.34	17.6	58.8	0.81	0.36	41%
						0.00	0.000	0.000	10.00														
						0.00	0.000	0.000	10.00														
	A4			0.12	0.59	0.07	0.197	0.310	10.00	76.81			23.8										
						0.00	0.000	0.000	10.00														
						0.00	0.000	0.000	10.00														
									10.36														
		118	116			0.00	0.000	0.612	10.98	73.24			44.8	44.8	0.381	375	PVC	0.34	8.9	106.6	0.93	0.16	42%
						0.00	0.000	0.000	10.98														
						0.00	0.000	0.000	10.98														
		116	114			0.00	0.000	0.612	11.14	72.70			44.5	44.5	0.381	375	PVC	0.25	12.0	91.4	0.80	0.25	49%
						0.00	0.000	0.000	11.14														
						0.00	0.000	0.000	11.14														
	A5	114	112	0.08	0.51	0.04	0.113	0.725	11.39	71.86			52.1	62.7	0.381	375	PVC	0.26	58.7	93.2	0.82	1.20	67%
						0.00	0.000	0.000	11.39														
						0.00	0.000	0.000	11.39														
	A32			0.09	0.59	0.05	0.148	0.873	11.39	71.86			62.7										
						0.00	0.000	0.000	11.39														
						0.00	0.000	0.000	11.39														
									12.58														
	A8	CHMH 4	112	0.16	0.64	0.10	0.285	0.285	10.00	76.81			21.9	21.9	0.305	300	PVC	0.38	26.6	62.1	0.85	0.52	35%
						0.00	0.000	0.000	10.00														
						0.00	0.000	0.000	10.00														
									10.52														
	A6	112	110	0.22	0.24	0.05	0.147	1.304	12.58	68.13			88.8	105.8	0.533	525	Conc	0.19	72.1	195.4	0.87	1.37	54%
						0.00	0.000	0.000	12.58														
						0.00	0.000	0.000	12.58														
	A7			0.08	0.61	0.05	0.136	1.440	12.58	68.13			98.1										
						0.00	0.000	0.000	12.58														
						0.00	0.000	0.000	12.58														
	A9			0.08	0.51	0.04	0.113	1.553	12.58	68.13			105.8										
						0.00	0.000	0.000	12.58														
						0.00	0.000	0.000	12.58														
									13.96														

IRON VALLEY 2
5331 Fernbank
Claridge Homes
Project No.: 121011

STORM SEWER DESIGN SHEET
IRON VALLEY 2
5331 FERNBANK
FLOW RATES BASED ON RATIONAL METHOD

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)			FLOW							TOTAL FLOW	SEWER DATA							
Street	Catchment ID	From MH	To MH	Area (ha)	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
	A10	CBMH 3	110	0.10	0.29	0.03	0.081	0.081	10.00	76.81			6.2	28.1	0.305	300	PVC	0.38	26.6	62.1	0.85	0.52	45%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A11			0.16	0.64	0.10	0.285	0.365	10.00	76.81			28.1									
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
									10.00													
	A12	CBMH 13	110	0.11	0.62	0.07	0.190	0.190	10.00	76.81			14.6	14.6	0.305	300	PVC	0.43	7.0	66.1	0.91	0.13	22%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
									10.13													
		110	108			0.00	0.000	2.108	13.96	64.34			135.6	135.6	0.533	525	Conc	0.23	21.5	215.0	0.96	0.37	63%
						0.00	0.000	0.000	13.96													
						0.00	0.000	0.000	13.96													
									14.33													
	A14	CBMH 12	CBMH 11	0.04	0.20	0.01	0.022	0.022	10.00	76.81			1.7	6.0	0.254	250	PVC	0.52	38.6	44.7	0.88	0.73	13%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A13			0.03	0.67	0.02	0.056	0.078	10.00	76.81			6.0									
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A15	CBMH 11	108	0.14	0.56	0.08	0.218	0.296	10.73	74.11			21.9	21.9	0.305	300	PVC	0.35	19.3	59.6	0.82	0.39	37%
						0.00	0.000	0.000	10.73													
						0.00	0.000	0.000	10.73													
									11.12													
	A19	108	106	0.08	0.51	0.04	0.113	2.518	14.33	63.40			159.6	159.6	0.610	600	Conc	0.14	50.6	239.5	0.82	1.03	67%
						0.00	0.000	0.000	14.33													
						0.00	0.000	0.000	14.33													
									15.36													
	A20	CBMH 2	106	0.09	0.24	0.02	0.060	0.060	10.00	76.81			4.6	36.4	0.305	300	PVC	0.38	26.6	62.1	0.85	0.52	59%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A18			0.24	0.62	0.15	0.414	0.474	10.00	76.81			36.4									
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
									10.52													
	A27	CBMH 9	204	0.05	0.27	0.01	0.038	0.038	10.00	76.81			2.9	2.9	0.254	250	PVC	0.50	37.6	43.8	0.86	0.72	7%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A30			0.08	0.58	0.05	0.129	0.167	10.00	76.81			12.8									
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A16	204	CBMH 10	0.05	0.25	0.01	0.035	0.201	10.72	74.13			14.9	14.9	0.305	300	PVC	0.38	21.1	62.1	0.85	0.41	24%
						0.00	0.000	0.000	10.72													
						0.00	0.000	0.000	10.72													
	A17	CBMH 10	106	0.21	0.59	0.12	0.344	0.546	11.14	72.70			39.7	39.7	0.305	300	PVC	0.36	24.9	60.5	0.83	0.50	66%
						0.00	0.000	0.000	11.14													
						0.00	0.000	0.000	11.14													
									11.64													

IRON VALLEY 2
5331 Fernbank
Claridge Homes
Project No.: 121011

STORM SEWER DESIGN SHEET
IRON VALLEY 2
5331 FERNBANK
FLOW RATES BASED ON RATIONAL METHOD

LICENSED PROFESSIONAL ENGINEER — D. D. BLAIR — 100122737 — Nov 14 2025 — PROVINCE OF ONTARIO

NOVATECH — Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)			FLOW							TOTAL FLOW	SEWER DATA							
Street	Catchment ID	From MH	To MH	Area (ha)	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
	A22	106	104	0.09	0.48	0.04	0.120	3.657	15.36	60.94			222.8	239.1	0.762	750	Conc	0.11	72.1	385.0	0.84	1.42	62%
						0.00	0.000	0.000	15.36													
						0.00	0.000	0.000	15.36													
	A26			0.08	0.51	0.04	0.113	3.771	15.36	60.94			229.8									
						0.00	0.000	0.000	15.36													
						0.00	0.000	0.000	15.36													
	A24			0.09	0.61	0.05	0.153	3.923	15.36	60.94			239.1									
						0.00	0.000	0.000	15.36													
						0.00	0.000	0.000	15.36													
									16.78													
	A21	CBMH 1	104	0.06	0.23	0.01	0.038	0.038	10.00	76.81			2.9	31.2	0.305	300	PVC	0.34	26.6	58.8	0.81	0.55	53%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A23			0.21	0.63	0.13	0.368	0.406	10.00	76.81			31.2									
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
									10.55													
	A31	202	CBMH8	0.05	0.25	0.01	0.035	0.035	10.00	76.81			2.7	2.7	0.610	600	Conc	0.15	20.5	247.9	0.85	0.40	1%
						0.00	0.000	0.000	10.00													
						0.00	0.000	0.000	10.00													
	A28	CBMH8	200	0.12	0.64	0.08	0.214	0.248	10.40	75.29			18.7	18.7	0.305	300	PVC	0.37	21.9	61.3	0.84	0.43	30%
						0.00	0.000	0.000	10.40													
						0.00	0.000	0.000	10.40													
	A29	200	CBMH 7	0.09	0.34	0.03	0.085	0.333	10.84	73.74			24.6	24.6	0.381	375	PVC	0.25	16.3	91.4	0.80	0.34	27%
						0.00	0.000	0.000	10.84													
						0.00	0.000	0.000	10.84													
	A25	CBMH 7	104	0.15	0.64	0.10	0.267	0.600	11.18	72.57			43.6	43.6	0.457	450	Conc	0.20	24.9	132.9	0.81	0.51	33%
						0.00	0.000	0.000	11.18													
						0.00	0.000	0.000	11.18													
									11.69													
		104	102			0.00	0.000	4.929	16.78	57.86			285.2	285.2	0.838	825	Conc	0.15	13.3	579.7	1.05	0.21	49%
						0.00	0.000	0.000	16.78													
						0.00	0.000	0.000	16.78													
		102	100			0.00	0.000	4.929	16.99	57.43			283.1	283.1	0.838	825	Conc	0.16	21.3	598.7	1.08	0.33	47%
						0.00	0.000	0.000	16.99													
						0.00	0.000	0.000	16.99													
COPE DR		100	EX STM			0.00	0.000	4.929	17.32	56.79			279.9	279.9	0.838	825	Conc	0.11	18.9	496.4	0.90	0.35	56%
						0.00	0.000	0.000	17.32													
						0.00	0.000	0.000	17.32													
									17.67													

Q = Peak Flow in Litres per Second (L/s)
C = Runoff Coefficient
A = Area in hectares (ha)
I = Rainfall Intensity (mm/hr)

Date:	November 14, 2025
Revised:	
Design By:	AE / BM
Client:	
Claridge Homes	**Dwg. Reference:** 121011-STM; **Checked By:** DDB

Legend:
* Areas/Runoff Coefficients/Time of Concentration based on detailed storm design sheet and drawing (121011-STM)
10.00 Storm sewers designed to the 2 year event (without ponding) for local roads
10.00 Storm sewers designed to the 5 year event (without ponding) for collector roads
10.00 Storm sewers designed to the 10 year event (without ponding) for arterial roads

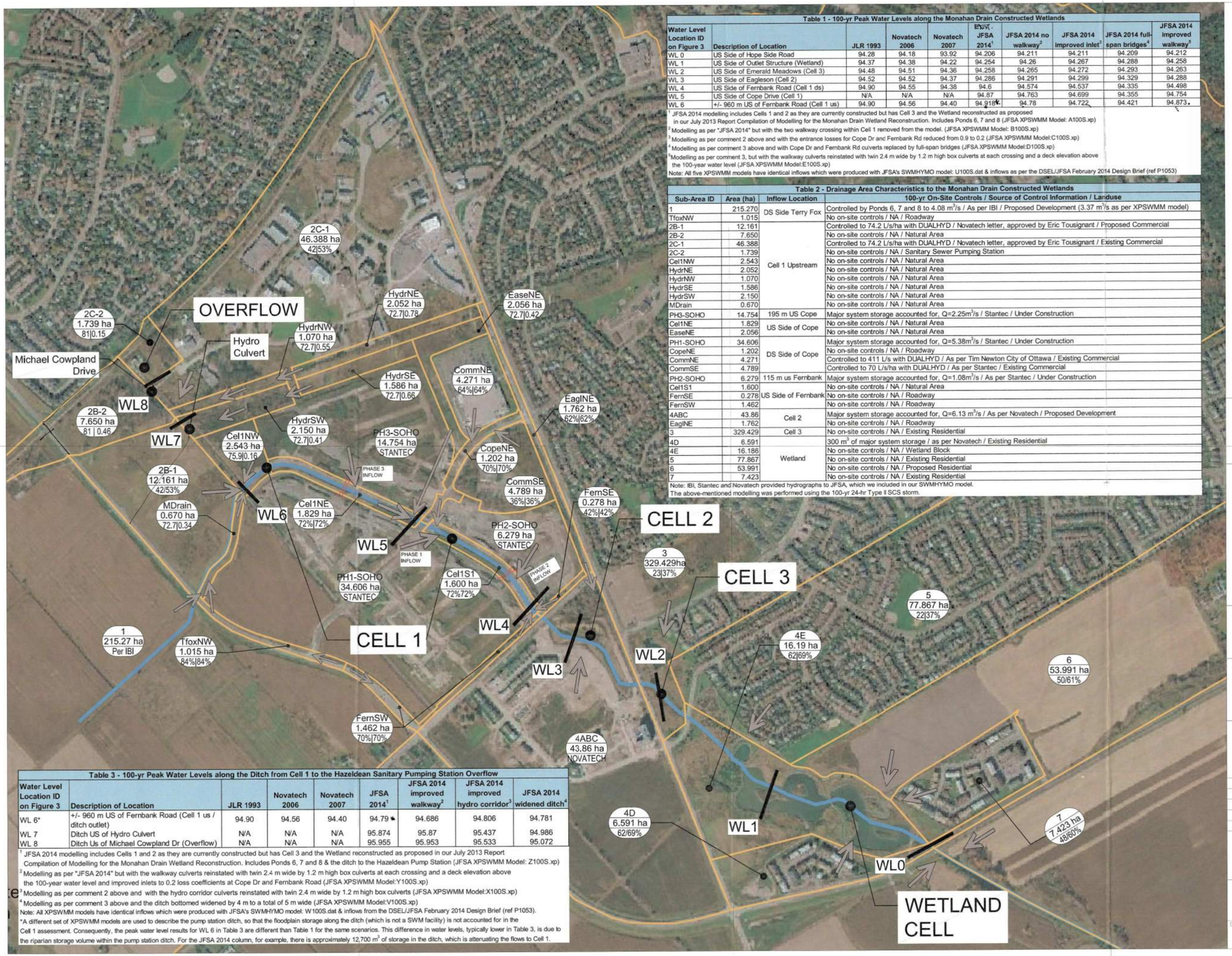


Table 1 - 100-yr Peak Water Levels along the Monahan Drain Constructed Wetlands

Water Level Location ID on Figure 3	Description of Location	JLR 1993	Novatech 2006	Novatech 2007	JFSA 2014[1]	JFSA 2014 no walkway[2]	JFSA 2014 improved inlet[3]	JFSA 2014 full-span bridges[4]	JFSA 2014 improved walkway[5]
WL 0	US Side of Hope Side Road	94.28	94.18	93.92	94.206	94.211	94.211	94.209	94.212
WL 1	US Side of Outlet Structure (Wetland)	94.37	94.38	94.22	94.254	94.26	94.267	94.288	94.258
WL 2	US Side of Emerald Meadows (Cell 3)	94.48	94.51	94.36	94.258	94.265	94.272	94.293	94.263
WL 3	US Side of Eagleson (Cell 2)	94.52	94.52	94.37	94.286	94.291	94.299	94.329	94.288
WL 4	US Side of Fernbank Road (Cell 1 ds)	94.90	94.55	94.38	94.6	94.574	94.537	94.335	94.498
WL 5	US Side of Cope Drive (Cell 1)	N/A	N/A	N/A	94.87	94.763	94.699	94.355	94.754
WL 6	+/- 960 m US of Fernbank Road (Cell 1 us)	94.90	94.56	94.40	94.918	94.78	94.722	94.421	94.873

[1] JFSA 2014 modelling includes Cells 1 and 2 as they are currently constructed but has Cell 3 and the Wetland reconstructed as proposed in our July 2013 Report Compilation of Modelling for the Monahan Drain Wetland Reconstruction. Includes Ponds 6, 7 and 8 (JFSA XPSWMM Model: A100S.xp)

[2] Modelling as per "JFSA 2014" but with the two walkway crossing within Cell 1 removed from the model. (JFSA XPSWMM Model: B100S.xp)

[3] Modelling as per comment 2 above and with the entrance losses for Cope Dr and Fernbank Rd reduced from 0.9 to 0.2 (JFSA XPSWMM Model:C100S.xp)

[4] Modelling as per comment 3 above and with Cope Dr and Fernbank Rd culverts replaced by full-span bridges (JFSA XPSWMM Model:D100S.xp)

[5] Modelling as per comment 3, but with the walkway culverts reinstated with twin 2.4 m wide by 1.2 m high box culverts at each crossing and a deck elevation above the 100-year water level (JFSA XPSWMM Model:E100S.xp)

Note: All five XPSWMM models have identical inflows which were produced with JFSA's SWMHYMO model: U100S.dat & inflows as per the DSEL/JFSA February 2014 Design Brief (ref P1053)

Table 2 - Drainage Area Characteristics to the Monahan Drain Constructed Wetlands

Sub-Area ID	Area (ha)	Inflow Location	100-yr On-Site Controls / Source of Control Information / Landuse
1	215.270	DS Side Terry Fox	Controlled by Ponds 6, 7 and 8 to 4.08 m^3/s / As per IBI / Proposed Development (3.37 m^3/s as per XPSWMM model)
TfoxNW	1.015	Cell 1 Upstream	No on-site controls / NA / Roadway
2B-1	12.161		Controlled to 74.2 L/s/ha with DUALHYD / Novatech letter, approved by Eric Tousignant / Proposed Commercial
2B-2	7.650		No on-site controls / NA / Natural Area
2C-1	46.388		Controlled to 74.2 L/s/ha with DUALHYD / Novatech letter, approved by Eric Tousignant / Existing Commercial
2C-2	1.739		No on-site controls / NA / Sanitary Sewer Pumping Station
Cel1NW	2.543		No on-site controls / NA / Natural Area
HydrNE	2.052		No on-site controls / NA / Natural Area
HydrNW	1.070		No on-site controls / NA / Natural Area
HydrSE	1.586		No on-site controls / NA / Natural Area
HydrSW	2.150		No on-site controls / NA / Natural Area
MDrain	0.670		No on-site controls / NA / Natural Area
PH3-SOHO	14.754	195 m US Cope	Major system storage accounted for, Q=2.25m^3/s / Stantec / Under Construction
Cel1NE	1.829	US Side of Cope	No on-site controls / NA / Natural Area
EaseNE	2.056		No on-site controls / NA / Natural Area
PH1-SOHO	34.606	DS Side of Cope	Major system storage accounted for, Q=5.38m^3/s / Stantec / Under Construction
CopeNE	1.202		No on-site controls / NA / Roadway
CommNE	4.271		Controlled to 411 L/s with DUALHYD / As per Tim Newton City of Ottawa / Existing Commercial
CommSE	4.789		Controlled to 70 L/s/ha with DUALHYD / As per Stantec / Existing Commercial
PH2-SOHO	6.279	115 m us Fernbank	Major system storage accounted for, Q=1.08m^3/s / As per Stantec / Under Construction
Cel1S1	1.600	US Side of Fernbank	No on-site controls / NA / Natural Area
FernSE	0.278		No on-site controls / NA / Roadway
FernSW	1.462		No on-site controls / NA / Roadway
4ABC	43.86	Cell 2	Major system storage accounted for, Q=6.13 m^3/s / As per Novatech / Proposed Development
EagINE	1.762		No on-site controls / NA / Roadway
3	329.429	Cell 3	No on-site controls / NA / Existing Residential
4D	6.591	Wetland	300 m^3 of major system storage / as per Novatech / Existing Residential
4E	16.186		No on-site controls / NA / Wetland Block
5	77.867		No on-site controls / NA / Existing Residential
6	53.991		No on-site controls / NA / Proposed Residential
7	7.423		No on-site controls / NA / Existing Residential

Note: IBI, Stantec and Novatech provided hydrographs to JFSA, which we included in our SWMHYMO model.
The above-mentioned modelling was performed using the 100-yr 24-hr Type II SCS storm.

Table 3 - 100-yr Peak Water Levels along the Ditch from Cell 1 to the Hazeldean Sanitary Pumping Station Overflow

Water Level Location ID on Figure 3	Description of Location	JLR 1993	Novatech 2006	Novatech 2007	JFSA 2014[1]	JFSA 2014 improved walkway[2]	JFSA 2014 improved hydro corridor[3]	JFSA 2014 widened ditch[4]
WL 6*	+/- 960 m US of Fernbank Road (Cell 1 us / ditch outlet)	94.90	94.56	94.40	94.79	94.686	94.806	94.781
WL 7	Ditch US of Hydro Culvert	N/A	N/A	N/A	95.874	95.87	95.437	94.986
WL 8	Ditch Us of Michael Cowpland Dr (Overflow)	N/A	N/A	N/A	95.955	95.953	95.533	95.072

[1] JFSA 2014 modelling includes Cells 1 and 2 as they are currently constructed but has Cell 3 and the Wetland reconstructed as proposed in our July 2013 Report Compilation of Modelling for the Monahan Drain Wetland Reconstruction. Includes Ponds 6, 7 and 8 & the ditch to the Hazeldean Pump Station (JFSA XPSWMM Model: Z100S.xp)

[2] Modelling as per "JFSA 2014" but with the walkway culverts reinstated with twin 2.4 m wide by 1.2 m high box culverts at each crossing and a deck elevation above the 100-year water level and improved inlets to 0.2 loss coefficients at Cope Dr and Fernbank Road (JFSA XPSWMM Model:Y100S.xp)

[3] Modelling as per comment 2 above and with the hydro corridor culverts reinstated with twin 2.4 m wide by 1.2 m high box culverts (JFSA XPSWMM Model:X100S.xp)

[4] Modelling as per comment 3 above and the ditch bottomed widened by 4 m to a total of 5 m wide (JFSA XPSWMM Model:V100S.xp)

Note: All XPSWMM models have identical inflows which were produced with JFSA's SWMHYMO model: W100S.dat & inflows from the DSEL/JFSA February 2014 Design Brief (ref P1053).

*A different set of XPSWMM models are used to describe the pump station ditch, so that the floodplain storage along the ditch (which is not a SWM facility) is not accounted for in the Cell 1 assessment. Consequently, the peak water level results for WL 6 in Table 3 are different than Table 1 for the same scenarios. This difference in water levels, typically lower in Table 3, is due to the riparian storage volume within the pump station ditch. For the JFSA 2014 column, for example, there is approximately 12,700 m^3 of storage in the ditch, which is attenuating the flows to Cell 1.

LEGEND :

- SUBCATCHMENT BOUNDARY
- MONAHAN DRAIN
- DRAINAGE DIRECTION / INFLOW LOCATION TO XPSWMM
- 5 / 77.87 ha / 22/37% — SUB-CATCHMENT ID (STANDHYD) / SUB-CATCHMENT AREA (HA) / DIRECT / TOTAL IMPERVIOUSNESS (%)
- 13 / 121.65 ha / 75.7|1.3 — SUB-CATCHMENT ID (NASHYD) / SUB-CATCHMENT AREA (HA) / CURVE NUMBER | TIME TO PEAK (H)
- WL1 WATER LEVEL LOCATION refer to Table 1
- APPROXIMATE LOCATION of WALKWAYS

SCALE :

0 125 250 375 500 m

N

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT : Ottawa

PROJECT :

CELL 1 MODELLING
MONAHAN DRAIN CONSTRUCTED WETLANDS

BY	DATE	DESCRIPTION	REV
CB	Sept/14	FINAL	3
CB	Feb/13	For Review / Comments	2
CB	Dec/13	For Discussion	1
CB	Sept/13	For Discussion	0

DETAILED DRAINAGE AREAS TO CELL 1 + WATER LEVELS ALONG the MDCW

FIGURE 3

DESIGNED:
DRAWN: CB
VERIFIED:
APPROVED:

DRAWING REF.
902(03)-13\Design\CAD\JFSA Figures 20140905.dwg

DATE: Sept/14
PROJECT No.: 902(03)-13

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Legend

- DRAINAGE AREA NO. / RUNOFF COEFFICIENT / STORM DRAINAGE AREA (ha)
- DRAINAGE AREA BOUNDARY
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED CATCH BASIN (ALL ROAD CB'S TO INCLUDE PERFORATED STUB DRAINS EXTENDING OUT FROM THE CB IN TWO DIRECTIONS PARALLEL TO THE ROADWAY. THESE DRAINS ARE TO BE INSTALLED AT THE BOTTOM OF THE SUBBASE LAYER.)
- PROPOSED SUBDRAIN CATCH BASIN
- PROPOSED 250ø PERFORATED PIPE
- STREET CATCHBASINS TO BE INTERCONNECTED WITH ONLY ONE CONNECTION TO STORM SEWER PER PAIR WHERE NOTED.
- IPEX TYPE 'A' TO BE INSTALLED IN STREET AND REAR YARD CATCHBASINS WHERE NOTED.
- PROPOSED CATCH BASIN / MANHOLE c/w IPEX INLET-CONTROL DEVICE TYPE 'A' OR APPROVED EQUIVALENT
- PONDING AREA LIMITS
- DEPTH=0.20m MAXIMUM PONDING DEPTH
- DIRECTION OF OVERLAND FLOW
- FUTURE PHASE OF STORM DRAINAGE WORKS

Notes

1. IPEX TYPE 'A' TO RESTRICT FLOWS TO THE STORM SEWER TO 22L/s AT 1.8m HEAD.

7	REVISED DRIVEWAY & SIDEWALK LOCATIONS, ISSUED FOR FINAL APPROVAL	KJK	JBL	09.02.25
6	REVISED LOT GRADING AND SERVICING	KJK	JBL	08.11.03
4	ISSUED FOR CONSTRUCTION	KJK	JBL	08.01.21
3	REVISED AS PER CITY COMMENTS AND FINAL APPROVAL	KJK	JBL	07.10.29
2	REVISED AS PER CITY COMMENTS	KJK	JBL	07.08.17
1	ISSUED FOR CITY COMMENTS	KJK	JBL	07.07.12
Revision		By	Appd.	YY.MM.DD
File Name: 160400502C-SD		KJK	JBL	07.03.14
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
CAVANAGH CONSTRUCTION LTD.

SOHO - KANATA SOUTH

Ottawa ON Canada

Title
OVERALL
STORM DRAINAGE PLAN

Project No.	Scale	
160400502C	1:2000 (0, 20, 60, 100m)	
Drawing No.	Sheet	Revision
OSD	49 of 58	7

Iron Valley II - 5331 Fernbank Road (121011)
PCSWMM Model Results (Ponding)

NOVATECH
Engineers, Planners & Landscape Architects

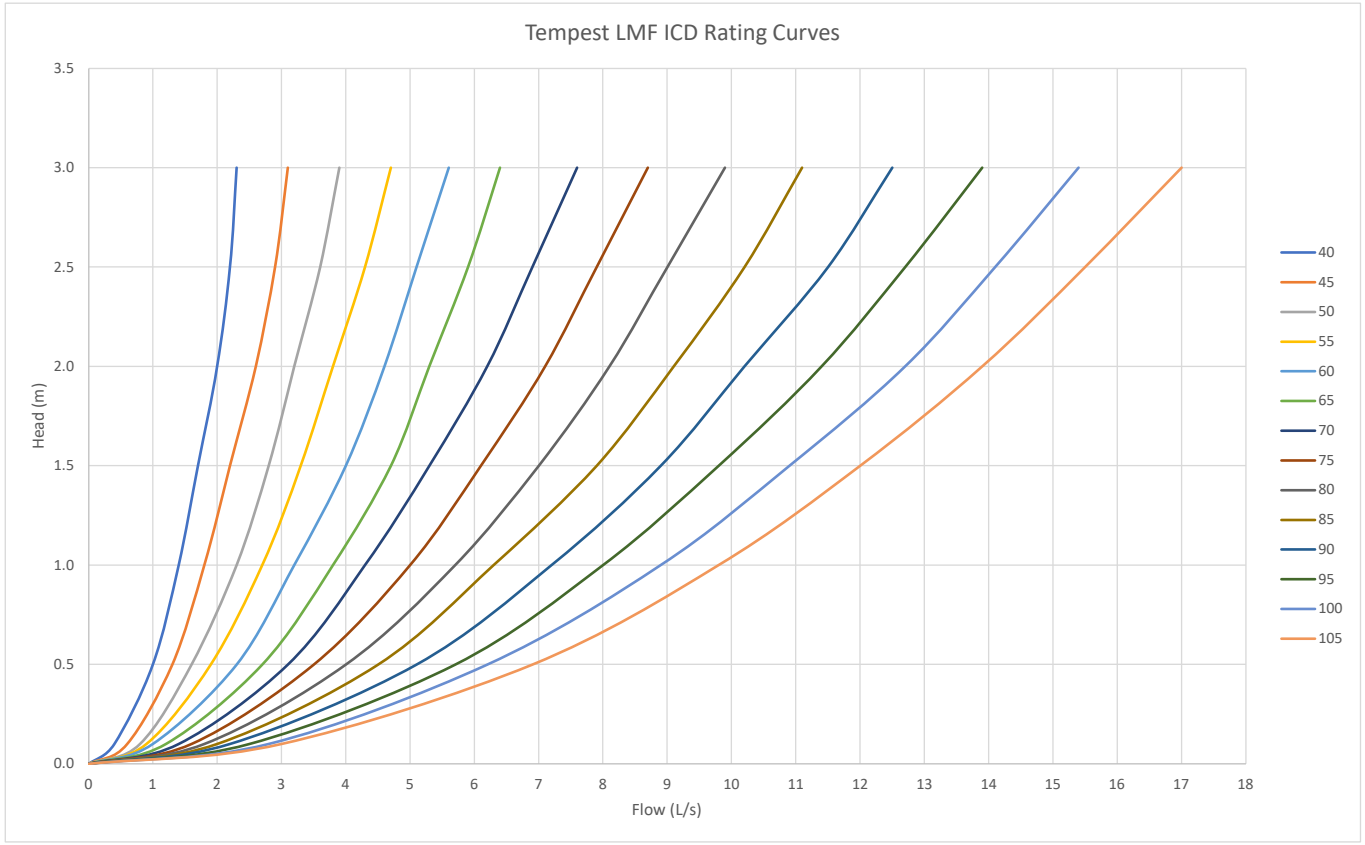
CB ID	Invert Elev. (m)	Rim Elev. (m)	Spill Elev. (m)	Ponding Depth (m)	HGL Elev. (m)[1]				Ponding Depth (m)				Spill Depth (m)			
					2-yr	5-yr	100-yr	100-yr (+20%)	2-yr	5-yr	100-yr	100-yr (+20%)	2-yr	5-yr	100-yr	100-yr (+20%)
CBMH1	94.77	96.74	97.06	0.32	95.71	96.70	97.04	97.09	0.00	0.00	0.30	0.35	0.00	0.00	0.00	0.03
CBMH2	94.86	96.84	97.14	0.30	95.88	96.87	97.10	97.15	0.00	0.03	0.26	0.31	0.00	0.00	0.00	0.01
CBMH3	94.98	97.10	97.38	0.28	95.86	96.56	97.34	97.42	0.00	0.00	0.24	0.32	0.00	0.00	0.00	0.04
CBMH4	95.12	97.31	97.59	0.28	97.28	97.40	97.50	97.54	0.00	0.09	0.19	0.23	0.00	0.00	0.00	0.00
CBMH5	95.29	97.38	97.68	0.30	96.22	97.36	97.61	97.64	0.00	0.00	0.23	0.26	0.00	0.00	0.00	0.00
CBMH7	94.58	96.78	97.08	0.30	94.74	94.79	95.14	95.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CBMH8	94.85	96.92	97.16	0.24	95.40	96.14	97.12	97.17	0.00	0.00	0.20	0.25	0.00	0.00	0.00	0.01
CBMH9	95.17	97.14	97.27	0.13	95.58	96.35	97.19	97.25	0.00	0.00	0.05	0.11	0.00	0.00	0.00	0.00
CBMH10	94.85	96.86	97.20	0.34	95.58	96.34	97.16	97.21	0.00	0.00	0.30	0.35	0.00	0.00	0.00	0.01
CBMH11	94.90	97.08	97.25	0.17	95.46	95.91	97.31	97.43	0.00	0.00	0.23	0.35	0.00	0.00	0.06	0.18
CBMH12	95.15	97.55	97.66	0.11	95.46	95.92	97.31	97.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CBMH13	94.91	97.23	97.37	0.14	95.85	96.98	97.41	97.44	0.00	0.00	0.18	0.21	0.00	0.00	0.04	0.07
CBMH14	95.09	97.23	97.34	0.11	95.80	96.62	97.41	97.44	0.00	0.00	0.18	0.21	0.00	0.00	0.07	0.10
CBMH15	95.35	97.50	97.75	0.25	97.47	97.61	97.69	97.71	0.00	0.11	0.19	0.21	0.00	0.00	0.00	0.00
CICB1	95.42	96.99	97.11	0.12	96.53	97.12	97.14	97.14	0.00	0.13	0.15	0.15	0.00	0.01	0.03	0.03
CICB2	96.04	97.44	97.64	0.20	97.09	97.64	97.66	97.66	0.00	0.20	0.22	0.22	0.00	0.00	0.02	0.02
RYE1	95.61	97.47	97.61	0.14	96.22	97.36	97.61	97.62	0.00	0.00	0.14	0.15	0.00	0.00	0.00	0.01
RYE10	95.47	97.37	97.50	0.13	95.48	95.92	97.31	97.43	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
RYE11	95.64	97.14	97.27	0.13	96.54	97.14	97.23	97.29	0.00	0.00	0.09	0.15	0.00	0.00	0.00	0.02
RYE12	95.76	97.16	97.31	0.15	95.88	96.31	97.35	97.37	0.00	0.00	0.19	0.21	0.00	0.00	0.04	0.06
RYE13	95.91	97.31	97.45	0.14	96.01	96.49	97.46	97.46	0.00	0.00	0.15	0.15	0.00	0.00	0.01	0.01
RYE14	96.10	97.50	97.64	0.14	96.20	96.68	97.66	97.70	0.00	0.00	0.16	0.20	0.00	0.00	0.02	0.06
RYE15	95.55	97.29	97.55	0.26	96.22	97.36	97.61	97.64	0.00	0.07	0.32	0.35	0.00	0.00	0.06	0.09
RYE16	95.52	97.58	97.67	0.09	97.47	97.61	97.68	97.69	0.00	0.03	0.10	0.11	0.00	0.00	0.01	0.02
RYE17	96.26	97.66	97.8	0.14	97.10	97.66	97.74	97.78	0.00	0.00	0.08	0.12	0.00	0.00	0.00	0.00
RYE2	95.53	97.50	97.66	0.16	95.81	96.62	97.42	97.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RYE3	95.96	97.40	97.55	0.15	96.00	96.58	97.43	97.55	0.00	0.00	0.03	0.15	0.00	0.00	0.00	0.00
RYE4	95.26	96.90	97.17	0.27	95.89	96.87	97.13	97.23	0.00	0.00	0.23	0.33	0.00	0.00	0.00	0.06
RYE5	95.15	96.85	97.15	0.30	95.71	96.70	97.05	97.10	0.00	0.00	0.20	0.25	0.00	0.00	0.00	0.00
RYE6	94.91	97.40	97.60	0.20	95.40	96.14	97.14	97.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RYE7	95.03	97.14	97.35	0.21	95.13	95.42	97.35	97.36	0.00	0.00	0.21	0.22	0.00	0.00	0.00	0.01
RYE8	95.19	97.10	97.33	0.23	95.58	96.35	97.19	97.25	0.00	0.00	0.09	0.15	0.00	0.00	0.00	0.00
RYE9	95.30	97.35	97.55	0.20	95.58	96.34	97.16	97.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RYT1	95.32	97.35	97.55	0.20	96.22	97.36	97.61	97.64	0.00	0.01	0.26	0.29	0.00	0.00	0.06	0.09
RYT10	95.01	97.32	97.43	0.11	95.58	96.34	97.16	97.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RYT11	95.16	97.58	97.69	0.11	95.46	95.92	97.31	97.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RYT12	95.45	97.07	97.14	0.07	96.53	97.12	97.15	97.17	0.00	0.05	0.08	0.10	0.00	0.00	0.01	0.03
RYT13	95.59	97.17	97.30	0.13	95.88	96.30	97.31	97.31	0.00	0.00	0.14	0.14	0.00	0.00	0.01	0.01
RYT14	95.72	97.29	97.43	0.14	96.01	96.49	97.43	97.43	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00
RYT15	95.91	97.48	97.59	0.11	96.20	96.68	97.60	97.60	0.00	0.00	0.12	0.12	0.00	0.00	0.01	0.01
RYT16	96.07	97.64	97.66	0.02	97.09	97.65	97.67	97.68	0.00	0.01	0.03	0.04	0.00	0.00	0.01	0.02
RYT3	95.41	97.44	97.65	0.21	95.80	96.61	97.42	97.46	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
RYT4	95.23	97.26	97.50	0.24	95.80	96.61	97.41	97.46	0.00	0.00	0.15	0.20	0.00	0.00	0.00	0.00
RYT5	95.11	97.23	97.38	0.15	95.80	96.61	97.41	97.45	0.00	0.00	0.18	0.22	0.00	0.00	0.03	0.07
RYT6	95.62	97.18	97.55	0.37	95.87	96.57	97.35	97.45	0.00	0.00	0.17	0.27	0.00	0.00	0.00	0.00
RYT7	95.14	97.15	97.35	0.20	95.86	96.57	97.34	97.42	0.00	0.00	0.19	0.27	0.00	0.00	0.00	0.07
RYT8	94.89	96.90	97.20	0.30	95.88	96.87	97.10	97.15	0.00	0.00	0.20	0.25	0.00	0.00	0.00	0.00
RYT9	94.79	96.85	97.15	0.30	95.71	96.69	97.04	97.10	0.00	0.00	0.19	0.25	0.00	0.00	0.00	0.00

Iron Valley II - 5331 Fernbank Road (121011)
PCSWMM Model Results (HGL)

MH ID	Obvert Elevation (m)	T/G Elevation (m)	HGL Elevation[1] (m)	Surcharge (m)	Clearance from T/G (m)	HGL in Stress Test[1] (m)
MH100	94.93	96.96	95.06	0.13	1.90	95.06
MH102	94.96	97.02	95.07	0.11	1.95	95.08
MH104	94.98	97.03	95.08	0.10	1.95	95.09
MH106	95.06	97.13	95.11	0.05	2.02	95.11
MH108	95.13	97.28	95.13	0.00	2.15	95.14
MH110	95.18	97.36	95.14	0.00	2.22	95.15
MH112	95.32	97.49	95.15	0.00	2.34	95.16
MH114	95.47	97.55	95.22	0.00	2.33	95.22
MH116	95.5	97.61	95.22	0.00	2.39	95.22
MH118	95.53	97.67	95.23	0.00	2.44	95.23
MH200	95.07	97.14	95.15	0.08	1.99	95.20
MH202	95.48	97.38	97.13	1.65	0.25	97.18
MH204	95.23	97.12	97.16	1.93	-0.04	97.22
MH206	95.73	97.76	97.69	1.96	0.07	97.69

[1] *3-hour Chicago Storm.*

Iron Valley II - 5331 Fernbank Road (121011)
PCSWMM Model Results (HGL)



Iron Valley II - 5331 Fernbank Road (121011)
PCSWMM Model Schematics

Overall Model Schematic

M:\2021\121011\DATA\Calculations\Sewer Calcs\SWM\121011-PCSWMM Model Schematics.docx

Subcatchments

Minor System (MH IDs)

Iron Valley II - 5331 Fernbank Road (121011)
PCSWMM Model Schematics

NOVATECH
Engineers, Planners & Landscape Architects

Major System (CB IDs)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
-----------------------------------------------------------

WARNING 04: minimum elevation drop used for Conduit MS-RYE2(5)
WARNING 04: minimum elevation drop used for Conduit MS-RYT3(3)
WARNING 04: minimum elevation drop used for Conduit MS-RYT4(3)

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 36
Number of nodes ........... 128
Number of links ........... 174
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
RG-1                 C3hr-100YR                  INTENSITY   10 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A1                          0.04     33.59     29.00    3.7000 RG-1                RYE16
A10                         0.10     86.88     13.00    2.0000 RG-1                RYE3
A11                         0.16     81.67     63.00    2.0000 RG-1                CBMH3
A12                         0.11     99.76     60.00    1.0000 RG-1                CBMH13
A13                         0.03     13.95     67.00    2.5000 RG-1                CBMH12
A14                         0.04     54.66      0.00    2.5000 RG-1                RYE10
A15                         0.14     67.74     51.00    2.5000 RG-1                CBMH11
A16                         0.05     51.31      7.00    2.5000 RG-1                RYE9
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A17                         0.21     67.36     56.00    2.5000 RG-1                CBMH10
A18                         0.24    123.55     60.00    2.1000 RG-1                CBMH2
A19                         0.08     67.46     44.00    3.5000 RG-1                RYE13
A2                          0.14     71.50     66.00    1.9000 RG-1                CBMH15
A20                         0.09     86.54      6.00    3.0000 RG-1                RYE4
A21                         0.06     75.87      4.00    3.0000 RG-1                RYE5
A22                         0.09     56.44     40.00    3.5000 RG-1                RYE11
A23                         0.21     88.90     61.00    2.3000 RG-1                CBMH1
A24                         0.09     86.25     59.00    0.5000 RG-1                CICB1
A25                         0.15     81.73     63.00    2.2000 RG-1                CBMH7
A26                         0.08     46.10     44.00    3.7000 RG-1                RYE12
A27                         0.05     38.18     10.00    3.5000 RG-1                RYE8
A28                         0.12     77.38     63.00    2.5000 RG-1                CBMH8
A29                         0.09     72.32     20.00    3.0000 RG-1                RYE7
A3                          0.12     94.12     20.00    3.0000 RG-1                RYT1
A30                         0.08     50.90     54.00    1.9000 RG-1                CBMH9
A31                         0.05     37.88      7.00    3.4000 RG-1                RYE6
A32                         0.09    108.22     56.00    0.5000 RG-1                CICB2
A4                          0.12     70.22     56.00    2.3000 RG-1                CBMH5
A5                          0.08     66.26     44.00    3.7000 RG-1                RYE17
A6                          0.22    138.68     20.00    2.6000 RG-1                RYE2
A7                          0.08     47.99     59.00    1.2000 RG-1                CBMH14
A8                          0.16     83.48     63.00    1.9000 RG-1                CBMH4
A9                          0.08     65.28     44.00    3.7000 RG-1                RYE14
U1                          0.05    211.95      0.00   15.0000 RG-1                OF1
U2                          0.03     46.95      0.00    5.0000 RG-1                OF3
U3                          0.05    171.70      0.00   15.0000 RG-1                OF2
U4                          0.13     85.36     40.00    3.7000 RG-1                OF4


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Node Summary
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                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
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CBMH4-Dummy          JUNCTION          95.14      3.00       0.0
HP-CBMH1             JUNCTION          97.08      1.00       0.0
HP-CBMH1(2)          JUNCTION          97.06      1.00       0.0
HP-CBMH10            JUNCTION          97.20      1.00       0.0
HP-CBMH11            JUNCTION          97.25      1.00       0.0
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HP-CBMH12	JUNCTION	97.70	1.00	0.0
HP-CBMH13	JUNCTION	97.66	1.00	0.0
HP-CBMH14	JUNCTION	97.34	1.00	0.0
HP-CBMH15	JUNCTION	97.75	1.00	0.0
HP-CBMH2	JUNCTION	97.14	1.00	0.0
HP-CBMH3	JUNCTION	97.37	1.00	0.0
HP-CBMH4	JUNCTION	97.59	1.00	0.0
HP-CBMH5	JUNCTION	97.68	1.00	0.0
HP-CBMH7	JUNCTION	97.16	1.00	0.0
HP-CBMH8	JUNCTION	97.27	1.00	0.0
HP-CBMH9	JUNCTION	97.31	1.00	0.0
HP-CICB1	JUNCTION	97.11	1.00	0.0
HP-CICB2	JUNCTION	97.64	1.00	0.0
HP-RYE10	JUNCTION	97.50	1.00	0.0
HP-RYE12	JUNCTION	97.31	1.00	0.0
HP-RYE15	JUNCTION	97.52	1.00	0.0
HP-RYE16(1)	JUNCTION	97.85	1.00	0.0
HP-RYE2(1)	JUNCTION	97.68	0.30	0.0
HP-RYE2(2)	JUNCTION	97.66	0.30	0.0
HP-RYE2(3)	JUNCTION	97.70	1.00	0.0
HP-RYE3(1)	JUNCTION	97.52	0.30	0.0
HP-RYE3(2)	JUNCTION	97.69	0.30	0.0
HP-RYE3(3)	JUNCTION	97.55	1.00	0.0
HP-RYE4	JUNCTION	97.35	1.00	0.0
HP-RYE4(2)	JUNCTION	97.45	1.00	0.0
HP-RYE5	JUNCTION	97.15	1.00	0.0
HP-RYE6	JUNCTION	97.60	1.00	0.0
HP-RYE7	JUNCTION	97.35	1.00	0.0
HP-RYE8	JUNCTION	97.50	1.00	0.0
HP-RYE9	JUNCTION	97.55	1.00	0.0
HP-RYT1(1)	JUNCTION	97.76	0.30	0.0
HP-RYT1(2)	JUNCTION	97.55	1.00	0.0
HP-RYT10(1)	JUNCTION	97.43	1.00	0.0
HP-RYT10(2)	JUNCTION	97.13	1.00	0.0
HP-RYT11(1)	JUNCTION	97.69	1.00	0.0
HP-RYT11(2)	JUNCTION	97.77	1.00	0.0
HP-RYT13	JUNCTION	97.30	1.00	0.0
HP-RYT14	JUNCTION	97.43	1.00	0.0
HP-RYT15	JUNCTION	97.59	1.00	0.0
HP-RYT3(1)	JUNCTION	97.66	0.30	0.0
HP-RYT3(2)	JUNCTION	97.65	0.30	0.0
HP-RYT4	JUNCTION	97.65	0.30	0.0
HP-RYT4(2)	JUNCTION	97.50	0.30	0.0
HP-RYT5(1)	JUNCTION	97.38	1.00	0.0
HP-RYT5(2)	JUNCTION	97.50	0.30	0.0
HP-RYT5(3)	JUNCTION	97.38	0.30	0.0
HP-RYT6	JUNCTION	97.49	1.00	0.0
HP-RYT7	JUNCTION	97.57	1.00	0.0
HP-RYT7(2)	JUNCTION	97.35	1.00	0.0
HP-RYT8(1)	JUNCTION	97.17	1.00	0.0
HP-RYT8(2)	JUNCTION	97.20	1.00	0.0
HP-RYT9(1)	JUNCTION	97.44	1.00	0.0
HP-RYT9(2)	JUNCTION	97.15	1.00	0.0
RYT01-Dummy	JUNCTION	95.43	3.00	0.0
HP-RYE1	OUTFALL	97.61	1.00	0.0
HP-RYE16(2)	OUTFALL	97.67	1.00	0.0
MH1013	OUTFALL	94.08	0.82	0.0
OF1	OUTFALL	97.00	0.00	0.0
OF2	OUTFALL	97.73	0.00	0.0
OF3	OUTFALL	97.15	0.00	0.0
OF4	OUTFALL	96.85	2.35	0.0
CBMH1	STORAGE	94.77	2.97	0.0
CBMH10	STORAGE	94.85	3.01	0.0
CBMH11	STORAGE	94.90	3.18	0.0
CBMH12	STORAGE	95.15	3.40	0.0
CBMH13	STORAGE	94.91	3.32	0.0
CBMH14	STORAGE	95.09	3.14	0.0
CBMH15	STORAGE	95.35	3.15	0.0
CBMH2	STORAGE	94.86	2.98	0.0
CBMH3	STORAGE	94.98	3.12	0.0
CBMH4	STORAGE	95.12	3.19	0.0
CBMH5	STORAGE	95.29	3.09	0.0
CBMH7	STORAGE	94.58	3.20	0.0
CBMH8	STORAGE	94.85	3.07	0.0
CBMH9	STORAGE	95.17	2.97	0.0
CICB1	STORAGE	95.42	2.57	0.0
CICB2	STORAGE	96.04	2.40	0.0
MH100	STORAGE	94.10	2.86	0.0
MH102	STORAGE	94.13	2.89	0.0
MH104	STORAGE	94.15	2.88	0.0
MH106	STORAGE	94.31	2.82	0.0
MH108	STORAGE	94.53	2.75	0.0

MH110	STORAGE	94.65	2.71	0.0
MH112	STORAGE	94.79	2.70	0.0
MH114	STORAGE	95.09	2.46	0.0
MH116	STORAGE	95.12	2.49	0.0
MH118	STORAGE	95.15	2.52	0.0
MH200	STORAGE	94.69	2.45	0.0
MH202	STORAGE	94.88	2.50	0.0
MH204	STORAGE	94.93	2.19	0.0
MH206	STORAGE	95.48	2.28	0.0
RYE1	STORAGE	95.61	2.86	0.0
RYE10	STORAGE	95.47	2.90	0.0
RYE11	STORAGE	95.64	2.50	0.0
RYE12	STORAGE	95.76	2.40	0.0
RYE13	STORAGE	95.91	2.40	0.0
RYE14	STORAGE	96.10	2.40	0.0
RYE15	STORAGE	95.55	2.74	0.0
RYE16	STORAGE	95.52	3.06	0.0
RYE17	STORAGE	96.26	2.40	0.0
RYE2	STORAGE	95.53	2.97	0.0
RYE3	STORAGE	95.96	2.44	0.0
RYE4	STORAGE	95.26	2.64	0.0
RYE5	STORAGE	95.15	2.70	0.0
RYE6	STORAGE	94.91	3.49	0.0
RYE7	STORAGE	95.03	3.11	0.0
RYE8	STORAGE	95.19	2.91	0.0
RYE9	STORAGE	95.30	3.05	0.0
RYT1	STORAGE	95.32	3.03	0.0
RYT10	STORAGE	95.01	3.31	0.0
RYT11	STORAGE	95.16	3.42	0.0
RYT12	STORAGE	95.45	2.62	0.0
RYT13	STORAGE	95.59	2.58	0.0
RYT14	STORAGE	95.72	2.57	0.0
RYT15	STORAGE	95.91	2.57	0.0
RYT16	STORAGE	96.07	2.57	0.0
RYT3	STORAGE	95.41	3.03	0.0
RYT4	STORAGE	95.23	3.03	0.0
RYT5	STORAGE	95.11	3.12	0.0
RYT6	STORAGE	95.62	2.56	0.0
RYT7	STORAGE	95.14	3.01	0.0
RYT8	STORAGE	94.89	3.01	0.0
RYT9	STORAGE	94.79	3.06	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
100_(STM)	MH202	CBMH8	CONDUIT	20.5	0.1464	0.0130
104_(STM)	RYT9	CBMH1	CONDUIT	20.8	0.0962	0.0130
106_(STM)	RYE5	RYT9	CONDUIT	35.4	0.9896	0.0130
116_(STM)	RYT8	CBMH2	CONDUIT	20.8	0.1444	0.0130
118_(STM)	RYE4	RYT8	CONDUIT	36.0	0.9989	0.0130
124_(STM)	RYT7	CBMH3	CONDUIT	21.8	0.5051	0.0130
128_(STM)	RYT6	RYT7	CONDUIT	47.6	1.0074	0.0130
130_(STM)	RYE3	RYT6	CONDUIT	34.3	0.9925	0.0130
132_(STM)	RYT1	CBMH5	CONDUIT	17.1	0.1755	0.0130
134_(STM)	RYT01-Dummy	RYT1	CONDUIT	22.1	0.4977	0.0130
136_(STM)	RYE6	MH202	CONDUIT	20.1	0.1493	0.0130
150_(1)_(STM)	RYE2	RYT3	CONDUIT	24.8	0.4845	0.0130
152_(1)_(STM)	RYT3	RYT4	CONDUIT	36.7	0.4907	0.0130
173_(STM)	RYE1	RYT01-Dummy	CONDUIT	18.2	0.9901	0.0130
175_(STM)	CBMH12	CBMH11	CONDUIT	38.6	0.5179	0.0130
207_(STM)	RYT4	RYT5	CONDUIT	21.4	0.5145	0.0130
209_(STM)	CBMH4-Dummy	CBMH4	CONDUIT	13.7	0.1461	0.0130
229_(STM)	MH104	MH102	CONDUIT	13.3	0.1503	0.0130
233_(STM)	MH204	CBMH10	CONDUIT	21.1	0.3801	0.0130
236_(STM)	CBMH9	MH204	CONDUIT	37.6	0.5048	0.0130
240_(STM)	MH118	MH116	CONDUIT	8.9	0.3382	0.0130
250_(STM)	RYE8	CBMH9	CONDUIT	15.5	0.1288	0.0130
252_(STM)	RYT10	MH204	CONDUIT	18.2	0.1646	0.0130
253_(STM)	RYE9	RYT10	CONDUIT	28.1	0.9968	0.0130
260_(STM)	RYT5	CBMH14	CONDUIT	3.5	0.5797	0.0130
266_(STM)	RYE10	RYT11	CONDUIT	29.6	1.0129	0.0130
270_(STM)	RYT11	CBMH12	CONDUIT	7.8	0.1280	0.0130
277_(STM)	RYE11	RYT12	CONDUIT	18.7	1.0156	0.0130
278_(STM)	RYT12	CICB1	CONDUIT	3.5	0.8696	0.0130
279_(STM)	RYE12	RYT13	CONDUIT	17.1	0.9954	0.0130
281_(STM)	RYE13	RYT14	CONDUIT	18.7	1.0156	0.0130
283_(STM)	RYE14	RYT15	CONDUIT	18.7	1.0156	0.0130
285_(STM)	RYE15	RYT1	CONDUIT	22.4	1.0264	0.0130
286_(STM)	RYE17	RYT16	CONDUIT	18.7	1.0156	0.0130

287_(STM)	RYT16	CICB2	CONDUIT	3.5	0.8696	0.0130
288_(STM)	RYE16	MH206	CONDUIT	17.8	0.2254	0.0130
49_(STM)	MH100	MH1013	CONDUIT	18.9	0.1058	0.0130
50_(STM)	MH114	MH112	CONDUIT	58.6	0.2558	0.0130
51_(STM)	MH112	MH110	CONDUIT	72.1	0.1942	0.0130
52_(STM)	MH110	MH108	CONDUIT	21.5	0.2328	0.0130
53_(STM)	MH108	MH106	CONDUIT	50.6	0.1383	0.0130
55_(STM)	MH106	MH104	CONDUIT	72.1	0.1110	0.0130
56_(STM)	MH102	MH100	CONDUIT	21.4	0.1405	0.0130
85_(STM)	MH206	CBMH15	CONDUIT	17.1	0.4687	0.0130
87_(STM)	MH116	MH114	CONDUIT	12.0	0.2500	0.0130
97(1)_(STM)	CBMH7	MH104	CONDUIT	24.9	0.2008	0.0130
97_(STM)	MH200	CBMH7	CONDUIT	16.3	0.2459	0.0130
MS-CBMH(2)	HP-CBMH9	CBMH10	CONDUIT	2.0	23.0921	0.0130
MS-CBMH1(1)	CBMH1	HP-CBMH1	CONDUIT	2.0	-17.2511	0.0130
MS-CBMH1(2)	HP-CBMH1	CBMH7	CONDUIT	2.0	15.1717	0.0130
MS-CBMH1(3)	CBMH1	HP-CBMH1(2)	CONDUIT	2.0	-16.2088	0.0130
MS-CBMH1(4)	HP-CBMH1(2)	OF4	CONDUIT	2.0	-69.3731	0.0130
MS-CBMH10(1)	CBMH10	HP-CBMH10	CONDUIT	2.0	-17.2511	0.0130
MS-CBMH10(2)	HP-CBMH10	HP-CBMH2	CONDUIT	2.0	3.0014	0.0130
MS-CBMH10(3)	HP-CBMH2	CICB1	CONDUIT	2.0	7.5212	0.0130
MS-CBMH11(1)	CBMH11	HP-CBMH11	CONDUIT	2.0	-8.5309	0.0130
MS-CBMH11(2)	HP-CBMH11	HP-RYT14	CONDUIT	2.0	-9.0367	0.0130
MS-CBMH12(1)	HP-CBMH12	CBMH12	CONDUIT	2.0	7.5212	0.0130
MS-CBMH12(2)	HP-CBMH12	CBMH11	CONDUIT	2.0	32.6063	0.0130
MS-CBMH13(1)	CBMH12	HP-CBMH13	CONDUIT	2.0	-5.5083	0.0130
MS-CBMH13(2)	HP-CBMH13	CBMH13	CONDUIT	2.0	22.0148	0.0130
MS-CBMH14(1)	CBMH14	HP-CBMH14	CONDUIT	2.0	-5.5083	0.0130
MS-CBMH14(2)	HP-CBMH14	CBMH13	CONDUIT	2.0	5.5083	0.0130
MS-CBMH15(1)	CBMH15	HP-CBMH15	CONDUIT	2.0	-12.5988	0.0130
MS-CBMH15(2)	HP-CBMH15	CBMH5	CONDUIT	2.0	18.8249	0.0130
MS-CBMH2	HP-CBMH2	CBMH2	CONDUIT	2.0	15.1717	0.0130
MS-CBMH3(1)	CBMH3	HP-CBMH3	CONDUIT	2.0	-13.6247	0.0130
MS-CBMH3(2)	HP-CBMH3	CBMH13	CONDUIT	2.0	7.0172	0.0130
MS-CBMH3(3)	HP-CBMH3	HP-CBMH11	CONDUIT	2.0	6.0108	0.0130
MS-CBMH4(1)	CBMH4	HP-CBMH4	CONDUIT	2.0	-14.1393	0.0130
MS-CBMH4(2)	HP-CBMH4	CBMH14	CONDUIT	2.0	18.2989	0.0130
MS-CBMH5	CBMH5	HP-CBMH5	CONDUIT	2.0	-15.1717	0.0130
MS-CBMH5(2)	HP-CBMH5	CICB2	CONDUIT	2.0	12.0873	0.0130
MS-CBMH7(1)	CBMH7	HP-CBMH7	CONDUIT	2.0	-19.3525	0.0130
MS-CBMH7(2)	HP-CBMH7	CBMH8	CONDUIT	2.0	12.0873	0.0130

MS-CBMH8(1)	CBMH8	HP-CBMH8	CONDUIT	2.0	-17.7743	0.0130
MS-CBMH8(2)	HP-CBMH8	CBMH9	CONDUIT	2.0	6.5138	0.0130
MS-CBMH9(1)	CBMH9	HP-CBMH9	CONDUIT	2.0	-8.5309	0.0130
MS-CICB1(1)	CICB1	HP-CICB1	CONDUIT	2.0	-6.0108	0.0130
MS-CICB1(2)	HP-CICB1	CBMH1	CONDUIT	2.0	18.8249	0.0130
MS-CICB2(1)	CICB2	HP-CICB2	CONDUIT	2.0	-10.0504	0.0130
MS-CICB2(2)	HP-CICB2	CBMH14	CONDUIT	2.0	20.9448	0.0130
MS-RYE(1)	HP-RYE2(1)	RYE2	CONDUIT	8.9	2.0229	0.0300
MS-RYE1	RYE1	HP-RYE1	CONDUIT	2.0	-7.0172	0.0300
MS-RYE10(1)	RYE10	HP-RYE10	CONDUIT	2.0	-6.5138	0.0300
MS-RYE10(2)	HP-RYE10	RYE9	CONDUIT	2.0	7.5212	0.0300
MS-RYE10(3)	HP-RYE10	CBMH11	CONDUIT	2.0	21.4790	0.0130
MS-RYE12(1)	RYE12	HP-RYE12	CONDUIT	2.0	-7.5212	0.0300
MS-RYE12(2)	HP-RYE12	RYE8	CONDUIT	15.6	1.3445	0.0300
MS-RYE15(1)	RYE15	HP-RYE15	CONDUIT	11.2	-2.0540	0.0300
MS-RYE15(2)	HP-RYE15	RYT1	CONDUIT	11.2	1.5180	0.0300
MS-RYE16(1)	RYE16	HP-RYE16(1)	CONDUIT	2.0	-13.6247	0.0300
MS-RYE16(2)	HP-RYE16(1)	CBMH15	CONDUIT	2.0	17.7743	0.0130
MS-RYE16(3)	RYE16	HP-RYE16(2)	CONDUIT	2.0	-4.5046	0.0300
MS-RYE2(2)	RYE2	HP-RYE2(2)	CONDUIT	9.3	-1.7207	0.0300
MS-RYE2(3)	RYE2	HP-RYE2(3)	CONDUIT	2.0	-10.0504	0.0300
MS-RYE2(4)	HP-RYE2(3)	CICB2	CONDUIT	2.0	13.1113	0.0130
MS-RYE2(5)	HP-RYE2(2)	HP-RYT3(1)	CONDUIT	2.8	0.0109	0.0130
MS-RYE3(1)	HP-RYE3(1)	RYE3	CONDUIT	5.4	2.2228	0.0300
MS-RYE3(2)	RYE3	HP-RYE3(2)	CONDUIT	14.0	-2.0719	0.0300
MS-RYE3(3)	HP-RYE3(2)	RYE15	CONDUIT	25.7	1.5566	0.0300
MS-RYE3(4)	RYE3	HP-RYE3(3)	CONDUIT	2.0	-7.5212	0.0300
MS-RYE3(5)	HP-RYE3(3)	CBMH4	CONDUIT	2.0	12.0873	0.0130
MS-RYE4(1)	RYE4	HP-RYE4	CONDUIT	22.5	-2.0004	0.0300
MS-RYE4(2)	HP-RYE4	RYT7	CONDUIT	13.5	1.4816	0.0300
MS-RYE4(3)	RYE4	HP-RYE4(2)	CONDUIT	2.0	-28.6028	0.0300
MS-RYE4(4)	HP-RYE4(2)	RYE13	CONDUIT	2.0	7.0172	0.0300
MS-RYE5(1)	RYE5	HP-RYE5	CONDUIT	14.9	-2.0138	0.0300
MS-RYE5(2)	HP-RYE5	RYT9	CONDUIT	20.5	1.4636	0.0300
MS-RYE6(1)	RYE6	HP-RYE6	CONDUIT	2.0	-10.0504	0.0300
MS-RYE6(2)	HP-RYE6	CBMH8	CONDUIT	2.0	36.1538	0.0130
MS-RYE7(1)	RYE7	HP-RYE7	CONDUIT	2.0	-10.5584	0.0300
MS-RYE7(2)	HP-RYE7	CBMH7	CONDUIT	2.0	29.7331	0.0130
MS-RYE8(1)	RYE8	HP-RYE8	CONDUIT	2.0	-20.4124	0.0300
MS-RYE8(2)	HP-RYE8	CBMH9	CONDUIT	2.0	18.2989	0.0130
MS-RYE9(1)	RYE9	HP-RYE9	CONDUIT	13.1	-1.5269	0.0300

MS-RYE9(2)	HP-RYE9	RYT10	CONDUIT	15.0	1.5335	0.0300
MS-RYT(1)	RYT11	HP-RYT11(1)	CONDUIT	7.7	-1.4287	0.0300
MS-RYT1(1)	RYT1	HP-RYT1(1)	CONDUIT	20.7	-1.9811	0.0300
MS-RYT1(2)	HP-RYT1(1)	RYE1	CONDUIT	19.6	1.4798	0.0300
MS-RYT1(3)	RYT1	HP-RYT1(2)	CONDUIT	2.0	-10.0504	0.0300
MS-RYT1(4)	HP-RYT1(2)	CBMH5	CONDUIT	2.0	8.5309	0.0130
MS-RYT10(1)	RYT10	HP-RYT10(1)	CONDUIT	6.4	-1.7190	0.0300
MS-RYT10(2)	HP-RYT10(1)	HP-RYT10(2)	CONDUIT	9.0	3.3352	0.0300
MS-RYT10(3)	HP-RYT10(2)	CBMH10	CONDUIT	2.0	13.6247	0.0130
MS-RYT11(2)	HP-RYT11(1)	RYE10	CONDUIT	21.9	1.4613	0.0300
MS-RYT11(3)	RYT11	HP-RYT11(2)	CONDUIT	2.0	-9.5432	0.0300
MS-RYT11(4)	HP-RYT11(2)	CBMH12	CONDUIT	2.0	11.0672	0.0130
MS-RYT13(1)	RYT13	HP-RYT13	CONDUIT	2.0	-6.5138	0.0300
MS-RYT13(2)	HP-RYT13	CICB1	CONDUIT	2.0	15.6896	0.0130
MS-RYT14(1)	RYT14	HP-RYT14	CONDUIT	2.0	-7.0172	0.0300
MS-RYT14(2)	HP-RYT14	HP-CBMH2	CONDUIT	2.0	14.6549	0.0130
MS-RYT15(1)	RYT15	HP-RYT15	CONDUIT	2.0	-5.5083	0.0300
MS-RYT15(2)	HP-RYT15	CBMH13	CONDUIT	2.0	18.2989	0.0130
MS-RYT3(1)	HP-RYT3(1)	RYT3	CONDUIT	13.3	1.6544	0.0300
MS-RYT3(2)	RYT3	HP-RYT3(2)	CONDUIT	9.4	-2.2346	0.0300
MS-RYT3(3)	HP-RYT3(2)	HP-RYT4	CONDUIT	2.8	0.0109	0.0130
MS-RYT4(1)	HP-RYT4	RYT4	CONDUIT	25.0	1.5602	0.0300
MS-RYT4(2)	RYT4	HP-RYT4(2)	CONDUIT	11.0	-2.1823	0.0300
MS-RYT4(3)	HP-RYT4(2)	HP-RYT5(2)	CONDUIT	2.8	0.0109	0.0130
MS-RYT5(1)	RYT5	HP-RYT5(1)	CONDUIT	2.0	-7.5212	0.0300
MS-RYT5(2)	HP-RYT5(1)	CBMH14	CONDUIT	2.0	7.5212	0.0130
MS-RYT5(3)	HP-RYT5(2)	RYT5	CONDUIT	10.1	2.6742	0.0300
MS-RYT5(4)	RYT5	HP-RYT5(3)	CONDUIT	8.0	-1.8753	0.0300
MS-RYT6	RYT6	HP-RYT6	CONDUIT	20.4	-1.5198	0.0300
MS-RYT7(1)	RYT7	HP-RYT7	CONDUIT	28.2	-1.4895	0.0300
MS-RYT7(2)	HP-RYT7	RYT6	CONDUIT	19.5	2.0004	0.0300
MS-RYT7(3)	RYT7	HP-RYT7(2)	CONDUIT	2.0	-10.0504	0.0300
MS-RYT7(4)	HP-RYT7(2)	CBMH3	CONDUIT	2.0	12.5988	0.0130
MS-RYT8(1)	RYT8	HP-RYT8(1)	CONDUIT	18.0	-1.5002	0.0300
MS-RYT8(2)	HP-RYT8(1)	RYE4	CONDUIT	18.0	1.5002	0.0300
MS-RYT8(3)	RYT8	HP-RYT8(2)	CONDUIT	2.0	-15.1717	0.0300
MS-RYT8(4)	HP-RYT8(2)	CBMH2	CONDUIT	2.0	18.2989	0.0130
MS-RYT9(1)	RYT9	HP-RYT9(1)	CONDUIT	36.0	-1.6391	0.0300
MS-RYT9(2)	HP-RYT9(1)	RYT8	CONDUIT	36.0	1.5002	0.0300
MS-RYT9(3)	RYT9	HP-RYT9(2)	CONDUIT	2.0	-15.1717	0.0300
MS-RYT9(4)	HP-RYT9(2)	CBMH1	CONDUIT	2.0	20.9448	0.0130

O-CBMH10	CBMH10	MH106	ORIFICE
O-CBMH11	CBMH11	MH108	ORIFICE
O-CBMH13	CBMH13	MH110	ORIFICE
O-CBMH2	CBMH2	MH106	ORIFICE
O-CBMH3	CBMH3	MH110	ORIFICE
O-CICB1	CICB1	MH106	ORIFICE
O-CICB2	CICB2	MH114	ORIFICE
O-RYE7	RYE7	MH200	ORIFICE
O-RYT13	RYT13	MH106	ORIFICE
O-RYT14	RYT14	MH108	ORIFICE
O-RYT15	RYT15	MH112	ORIFICE
O-CBMH1	CBMH1	MH104	OUTLET
O-CBMH14	CBMH14	MH112	OUTLET
O-CBMH15	CBMH15	MH118	OUTLET
O-CBMH4	CBMH4	MH112	OUTLET
O-CBMH5	CBMH5	MH118	OUTLET
O-CBMH8	CBMH8	MH200	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
100_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	234.96
104_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	345.40
106_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	1107.53
116_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	233.37
118_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.44
124_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.26
128_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.69
130_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.25
132_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	257.27
134_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	433.22
136_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	237.29
150_(1)_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	427.40
152_(1)_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	430.16
173_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.18
175_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.80
207_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	440.45

209_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	425.54
229_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	556.46
233_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	59.62
236_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.25
240_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	101.97
250_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	220.36
252_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	249.10
253_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.38
260_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	45.28
266_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.85
270_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	219.72
277_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
278_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	55.46
279_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.33
281_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
283_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
285_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	60.25
286_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
287_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	55.46
288_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	291.50
49_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	466.98
50_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	88.67
51_(STM)	CIRCULAR	0.53	0.22	0.13	0.53	1	189.55
52_(STM)	CIRCULAR	0.53	0.22	0.13	0.53	1	207.50
53_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	228.39
55_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	370.91
56_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	538.11
85_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	40.71
87_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	87.67
97(1)_(STM)	CIRCULAR	0.45	0.16	0.11	0.45	1	127.77
97_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	86.94
MS-CBMH(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	78892.68
MS-CBMH1(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	68188.85
MS-CBMH1(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH1(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	66096.82
MS-CBMH1(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	136741.48
MS-CBMH10(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	68188.85
MS-CBMH10(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	28442.21
MS-CBMH10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-CBMH11(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-CBMH11(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	49352.50
MS-CBMH12(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-CBMH12(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	93746.62
MS-CBMH13(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH13(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	77030.48
MS-CBMH14(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH14(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH15(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	58273.32
MS-CBMH15(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	71231.45
MS-CBMH2	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH3(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	60599.46
MS-CBMH3(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	43489.78
MS-CBMH3(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	40250.57
MS-CBMH4(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	61733.10
MS-CBMH4(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-CBMH5	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH5(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-CBMH7(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	72222.70
MS-CBMH7(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-CBMH8(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	69215.12
MS-CBMH8(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	41900.70
MS-CBMH9(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-CICB1(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	40250.57
MS-CICB1(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	71231.45
MS-CICB2(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	52047.05
MS-CICB2(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	75135.17
MS-RYE(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	594.50
MS-RYE1	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYE10(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18156.97
MS-RYE10(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	76087.17
MS-RYE12(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE12(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	484.67
MS-RYE15(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	599.06
MS-RYE15(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	515.00
MS-RYE16(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	26259.77
MS-RYE16(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	69215.12
MS-RYE16(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	15099.18
MS-RYE2(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	548.30
MS-RYE2(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYE2(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	59446.62
MS-RYE2(5)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67

MS-RYE3(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	623.18
MS-RYE3(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	601.66
MS-RYE3(3)	TRIANGULAR	0.30	0.45	0.15	3.00	1	521.50
MS-RYE3(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE3(5)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-RYE4(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	591.19
MS-RYE4(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	508.79
MS-RYE4(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38047.95
MS-RYE4(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYE5(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	593.17
MS-RYE5(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	505.68
MS-RYE6(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYE6(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	98714.78
MS-RYE7(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	23116.67
MS-RYE7(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	89521.02
MS-RYE8(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	32142.09
MS-RYE8(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYE9(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	516.50
MS-RYE9(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	517.62
MS-RYT(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	499.62
MS-RYT1(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	588.32
MS-RYT1(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	508.47
MS-RYT1(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYT1(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-RYT10(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	548.03
MS-RYT10(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	763.36
MS-RYT10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	60599.46
MS-RYT11(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	505.29
MS-RYT11(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	21977.24
MS-RYT11(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	54616.39
MS-RYT13(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18156.97
MS-RYT13(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	65029.60
MS-RYT14(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYT14(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	62848.65
MS-RYT15(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	16696.95
MS-RYT15(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYT3(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	537.63
MS-RYT3(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	624.84
MS-RYT3(3)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67
MS-RYT4(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	522.10
MS-RYT4(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	617.49
MS-RYT4(3)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67
MS-RYT5(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYT5(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-RYT5(3)	TRIANGULAR	0.30	0.45	0.15	3.00	1	683.54
MS-RYT5(4)	TRIANGULAR	0.30	0.45	0.15	3.00	1	572.41
MS-RYT6	TRIANGULAR	0.30	0.45	0.15	3.00	1	515.30
MS-RYT7(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	510.14
MS-RYT7(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	591.19
MS-RYT7(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYT7(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	58273.32
MS-RYT8(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT8(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT8(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	27710.44
MS-RYT8(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYT9(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	535.14
MS-RYT9(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT9(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	27710.44
MS-RYT9(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	75135.17

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Analysis Options
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Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 05/19/2021 00:00:00
Ending Date .............. 05/21/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
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Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.002	0.453
Total Precipitation	0.266	71.667
Evaporation Loss	0.000	0.000
Infiltration Loss	0.092	24.820
Surface Runoff	0.178	48.020
Final Storage	0.002	0.453
Continuity Error (%)	-1.626	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.178	1.782
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.003
External Outflow	0.178	1.784
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.012	0.118
Final Stored Volume	0.012	0.119
Continuity Error (%)	-0.049	

```
************************
Highest Continuity Errors
************************
Node RYE1 (2.13%)
Node HP-CBMH11 (1.26%)
```

```
Node RYT01-Dummy (-1.15%)
Node CBMH8 (1.12%)
Node MH200 (-1.10%)

***************************
Time-Step Critical Elements
***************************
None

*******************************
Highest Flow Instability Indexes
*******************************
Link O-CBMH3 (139)
Link O-RYE7 (131)
Link O-CBMH8 (59)
Link O-CBMH1 (55)
Link O-CBMH2 (15)

*********************************
Most Frequent Nonconverging Nodes
*********************************
Node HP-RYE1 (0.01%)
Node HP-RYE16(2) (0.01%)
Node MH1013 (0.01%)
Node OF1 (0.01%)
Node OF2 (0.01%)

************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.01
Time Step Frequencies       :
```

```
      1.000 -  0.871 sec      :    99.79 %
      0.871 -  0.758 sec      :     0.17 %
      0.758 -  0.660 sec      :     0.03 %
      0.660 -  0.574 sec      :     0.01 %
      0.574 -  0.500 sec      :     0.01 %
```

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
A1	71.67	0.00	0.00	31.36	20.79	21.05	41.85	0.02	16.76	0.584
A10	71.67	0.00	0.00	38.74	9.32	24.97	34.29	0.03	36.38	0.478
A11	71.67	0.00	0.00	16.38	45.22	10.86	56.08	0.09	72.25	0.783
A12	71.67	0.00	0.00	17.67	43.05	11.86	54.91	0.06	49.78	0.766
A13	71.67	0.00	0.00	14.58	48.10	9.77	57.87	0.02	13.79	0.807
A14	71.67	0.00	0.00	44.20	0.00	29.55	29.55	0.01	15.36	0.412
A15	71.67	0.00	0.00	21.78	36.60	14.16	50.76	0.07	59.76	0.708
A16	71.67	0.00	0.00	41.24	5.02	27.08	32.10	0.02	18.75	0.448
A17	71.67	0.00	0.00	19.69	40.22	12.44	52.66	0.11	87.89	0.735
A18	71.67	0.00	0.00	17.72	43.07	11.70	54.77	0.13	107.13	0.764
A19	71.67	0.00	0.00	24.67	31.56	16.84	48.40	0.04	35.41	0.675
A2	71.67	0.00	0.00	15.04	47.38	10.02	57.40	0.08	63.95	0.801
A20	71.67	0.00	0.00	41.68	4.30	27.41	31.71	0.03	33.75	0.442
A21	71.67	0.00	0.00	42.40	2.87	28.47	31.34	0.02	23.53	0.437
A22	71.67	0.00	0.00	26.56	28.69	17.61	46.30	0.04	38.16	0.646
A23	71.67	0.00	0.00	17.31	43.80	11.31	55.11	0.12	93.04	0.769
A24	71.67	0.00	0.00	18.20	42.35	11.90	54.25	0.05	39.65	0.757
A25	71.67	0.00	0.00	16.35	45.22	10.94	56.16	0.08	68.23	0.784
A26	71.67	0.00	0.00	24.79	31.56	16.45	48.01	0.04	34.35	0.670
A27	71.67	0.00	0.00	39.98	7.17	26.04	33.21	0.02	18.53	0.463
A28	71.67	0.00	0.00	16.30	45.23	11.11	56.34	0.07	55.23	0.786
A29	71.67	0.00	0.00	35.48	14.34	23.29	37.63	0.03	35.25	0.525
A3	71.67	0.00	0.00	35.50	14.34	23.26	37.59	0.05	46.78	0.525
A30	71.67	0.00	0.00	20.37	38.75	13.48	52.22	0.04	35.19	0.729
A31	71.67	0.00	0.00	41.36	5.02	26.81	31.82	0.02	18.05	0.444
A32	71.67	0.00	0.00	19.48	40.18	12.90	53.09	0.05	39.85	0.741
A4	71.67	0.00	0.00	19.47	40.18	12.94	53.12	0.06	53.32	0.741
A5	71.67	0.00	0.00	24.66	31.55	16.85	48.41	0.04	35.43	0.675
A6	71.67	0.00	0.00	35.71	14.34	22.79	37.13	0.08	80.23	0.518
A7	71.67	0.00	0.00	18.21	42.36	11.87	54.23	0.04	35.14	0.757
A8	71.67	0.00	0.00	16.38	45.22	10.86	56.08	0.09	72.23	0.783
A9	71.67	0.00	0.00	24.67	31.56	16.84	48.39	0.04	35.40	0.675
U1	71.67	0.00	0.00	43.62	0.00	32.71	32.71	0.02	21.18	0.456

U2		71.67	0.00	0.00	43.96	0.00	30.52	30.52	0.01
12.30	0.426								
U3		71.67	0.00	0.00	43.64	0.00	32.60	32.60	0.02
21.18	0.455								
U4		71.67	0.00	0.00	26.53	28.69	17.70	46.39	0.06
55.59	0.647								

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min	Reported Max Depth Meters
CBMH4-Dummy	JUNCTION	0.12	2.36	97.50	0	01:31	2.36
HP-CBMH1	JUNCTION	0.00	0.00	97.08	0	00:00	0.00
HP-CBMH1(2)	JUNCTION	0.00	0.00	97.06	0	00:00	0.00
HP-CBMH10	JUNCTION	0.00	0.00	97.20	0	00:00	0.00
HP-CBMH11	JUNCTION	0.00	0.09	97.34	0	01:24	0.08
HP-CBMH12	JUNCTION	0.00	0.00	97.70	0	00:00	0.00
HP-CBMH13	JUNCTION	0.00	0.00	97.66	0	00:00	0.00
HP-CBMH14	JUNCTION	0.00	0.06	97.40	0	01:13	0.06
HP-CBMH15	JUNCTION	0.00	0.00	97.75	0	00:00	0.00
HP-CBMH2	JUNCTION	0.00	0.00	97.14	0	01:08	0.00
HP-CBMH3	JUNCTION	0.00	0.01	97.38	0	01:13	0.01
HP-CBMH4	JUNCTION	0.00	0.00	97.59	0	00:00	0.00
HP-CBMH5	JUNCTION	0.00	0.00	97.68	0	00:00	0.00
HP-CBMH7	JUNCTION	0.00	0.00	97.16	0	00:00	0.00
HP-CBMH8	JUNCTION	0.00	0.00	97.27	0	00:00	0.00
HP-CBMH9	JUNCTION	0.00	0.00	97.31	0	00:00	0.00
HP-CICB1	JUNCTION	0.00	0.01	97.12	0	01:10	0.01
HP-CICB2	JUNCTION	0.00	0.01	97.65	0	01:10	0.01
HP-RYE10	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYE12	JUNCTION	0.00	0.04	97.35	0	01:10	0.04
HP-RYE15	JUNCTION	0.01	0.09	97.61	0	01:47	0.09
HP-RYE16(1)	JUNCTION	0.00	0.00	97.85	0	00:00	0.00
HP-RYE2(1)	JUNCTION	0.00	0.00	97.68	0	00:00	0.00
HP-RYE2(2)	JUNCTION	0.00	0.00	97.66	0	03:01	0.00
HP-RYE2(3)	JUNCTION	0.00	0.00	97.70	0	00:00	0.00
HP-RYE3(1)	JUNCTION	0.00	0.00	97.52	0	00:00	0.00
HP-RYE3(2)	JUNCTION	0.00	0.00	97.69	0	00:00	0.00
HP-RYE3(3)	JUNCTION	0.00	0.00	97.55	0	00:00	0.00
HP-RYE4	JUNCTION	0.00	0.00	97.35	0	00:00	0.00
HP-RYE4(2)	JUNCTION	0.00	0.01	97.46	0	01:10	0.01
HP-RYE5	JUNCTION	0.00	0.00	97.15	0	00:00	0.00
HP-RYE6	JUNCTION	0.00	0.00	97.60	0	00:00	0.00
HP-RYE7	JUNCTION	0.00	0.00	97.35	0	01:11	0.00
HP-RYE8	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYE9	JUNCTION	0.00	0.00	97.55	0	00:00	0.00
HP-RYT1(1)	JUNCTION	0.00	0.00	97.76	0	00:00	0.00
HP-RYT1(2)	JUNCTION	0.00	0.06	97.61	0	01:48	0.06
HP-RYT10(1)	JUNCTION	0.00	0.00	97.43	0	00:00	0.00
HP-RYT10(2)	JUNCTION	0.00	0.03	97.16	0	01:32	0.03
HP-RYT11(1)	JUNCTION	0.00	0.00	97.69	0	00:00	0.00
HP-RYT11(2)	JUNCTION	0.00	0.00	97.77	0	00:00	0.00
HP-RYT13	JUNCTION	0.00	0.00	97.30	0	01:10	0.00
HP-RYT14	JUNCTION	0.00	0.00	97.43	0	01:08	0.00
HP-RYT15	JUNCTION	0.00	0.01	97.60	0	01:10	0.01
HP-RYT3(1)	JUNCTION	0.00	0.00	97.66	0	10:46	0.00
HP-RYT3(2)	JUNCTION	0.00	0.00	97.65	0	00:00	0.00
HP-RYT4	JUNCTION	0.00	0.00	97.65	0	00:00	0.00
HP-RYT4(2)	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYT5(1)	JUNCTION	0.00	0.03	97.41	0	01:12	0.02
HP-RYT5(2)	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYT5(3)	JUNCTION	0.00	0.03	97.41	0	01:13	0.03
HP-RYT6	JUNCTION	0.00	0.00	97.49	0	00:00	0.00
HP-RYT7	JUNCTION	0.00	0.00	97.57	0	00:00	0.00
HP-RYT7(2)	JUNCTION	0.00	0.00	97.35	0	00:00	0.00
HP-RYT8(1)	JUNCTION	0.00	0.00	97.17	0	00:00	0.00
HP-RYT8(2)	JUNCTION	0.00	0.00	97.20	0	00:00	0.00
HP-RYT9(1)	JUNCTION	0.00	0.00	97.44	0	00:00	0.00
HP-RYT9(2)	JUNCTION	0.00	0.00	97.15	0	00:00	0.00
RYT01-Dummy	JUNCTION	0.50	2.18	97.61	0	01:46	2.18
HP-RYE1	OUTFALL	0.00	0.00	97.61	0	01:48	0.00
HP-RYE16(2)	OUTFALL	0.00	0.01	97.68	0	01:21	0.01
MH1013	OUTFALL	0.97	0.97	95.05	0	00:00	0.97
OF1	OUTFALL	0.00	0.00	97.00	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	97.73	0	00:00	0.00
OF3	OUTFALL	0.00	0.00	97.15	0	00:00	0.00

OF4	OUTFALL	0.00	0.00	96.85	0	00:00	0.00
CBMH1	STORAGE	0.85	2.27	97.04	0	02:21	2.27
CBMH10	STORAGE	0.29	2.31	97.16	0	01:32	2.31
CBMH11	STORAGE	0.21	2.41	97.31	0	01:24	2.41
CBMH12	STORAGE	0.05	2.16	97.31	0	01:23	2.16
CBMH13	STORAGE	0.19	2.50	97.41	0	01:13	2.50
CBMH14	STORAGE	0.36	2.32	97.41	0	01:13	2.32
CBMH15	STORAGE	0.31	2.34	97.69	0	01:22	2.34
CBMH2	STORAGE	0.27	2.24	97.10	0	01:28	2.24
CBMH3	STORAGE	0.15	2.36	97.34	0	01:26	2.36
CBMH4	STORAGE	0.13	2.38	97.50	0	01:32	2.38
CBMH5	STORAGE	0.56	2.32	97.61	0	01:46	2.32
CBMH7	STORAGE	0.47	0.56	95.14	0	01:10	0.56
CBMH8	STORAGE	0.32	2.27	97.12	0	01:35	2.27
CBMH9	STORAGE	0.08	2.02	97.19	0	01:13	2.02
CICB1	STORAGE	0.02	1.72	97.14	0	01:10	1.72
CICB2	STORAGE	0.02	1.62	97.66	0	01:10	1.62
MH100	STORAGE	0.95	0.96	95.06	0	01:10	0.96
MH102	STORAGE	0.92	0.94	95.07	0	01:10	0.94
MH104	STORAGE	0.90	0.93	95.08	0	01:10	0.93
MH106	STORAGE	0.74	0.80	95.11	0	01:10	0.80
MH108	STORAGE	0.52	0.60	95.13	0	01:10	0.60
MH110	STORAGE	0.40	0.49	95.14	0	01:10	0.49
MH112	STORAGE	0.26	0.36	95.15	0	01:11	0.36
MH114	STORAGE	0.02	0.13	95.22	0	01:13	0.13
MH116	STORAGE	0.02	0.10	95.22	0	01:13	0.10
MH118	STORAGE	0.02	0.08	95.23	0	01:21	0.08
MH200	STORAGE	0.36	0.46	95.15	0	01:10	0.46
MH202	STORAGE	0.29	2.25	97.13	0	01:33	2.25
MH204	STORAGE	0.21	2.23	97.16	0	01:31	2.23
MH206	STORAGE	0.28	2.21	97.69	0	01:21	2.21
RYE1	STORAGE	0.44	2.00	97.61	0	01:48	2.00
RYE10	STORAGE	0.04	1.84	97.31	0	01:23	1.84
RYE11	STORAGE	0.02	1.59	97.23	0	01:10	1.59
RYE12	STORAGE	0.01	1.59	97.35	0	01:10	1.59
RYE13	STORAGE	0.01	1.55	97.46	0	01:10	1.55
RYE14	STORAGE	0.01	1.56	97.66	0	01:10	1.56
RYE15	STORAGE	0.46	2.06	97.61	0	01:47	2.06
RYE16	STORAGE	0.27	2.16	97.68	0	01:21	2.16
RYE17	STORAGE	0.02	1.48	97.74	0	01:10	1.48
RYE2	STORAGE	0.22	1.89	97.42	0	01:10	1.89
RYE3	STORAGE	0.04	1.47	97.43	0	01:11	1.47
RYE4	STORAGE	0.07	1.87	97.13	0	01:12	1.87
RYE5	STORAGE	0.53	1.90	97.05	0	02:09	1.89
RYE6	STORAGE	0.26	2.23	97.14	0	01:32	2.23
RYE7	STORAGE	0.03	2.32	97.35	0	01:11	2.32
RYE8	STORAGE	0.08	2.00	97.19	0	01:14	2.00
RYE9	STORAGE	0.07	1.86	97.16	0	01:30	1.86
RYT1	STORAGE	0.54	2.29	97.61	0	01:46	2.29
RYT10	STORAGE	0.13	2.15	97.16	0	01:31	2.15
RYT11	STORAGE	0.05	2.15	97.31	0	01:23	2.15
RYT12	STORAGE	0.02	1.70	97.15	0	01:10	1.70
RYT13	STORAGE	0.01	1.72	97.31	0	01:10	1.72
RYT14	STORAGE	0.01	1.71	97.43	0	01:08	1.71
RYT15	STORAGE	0.01	1.69	97.60	0	01:10	1.69
RYT16	STORAGE	0.02	1.60	97.67	0	01:10	1.60
RYT3	STORAGE	0.26	2.01	97.42	0	01:13	2.01
RYT4	STORAGE	0.31	2.18	97.41	0	01:13	2.18
RYT5	STORAGE	0.35	2.30	97.41	0	01:13	2.30
RYT6	STORAGE	0.06	1.73	97.35	0	01:13	1.73
RYT7	STORAGE	0.08	2.20	97.34	0	01:25	2.20
RYT8	STORAGE	0.24	2.21	97.10	0	01:27	2.21
RYT9	STORAGE	0.83	2.25	97.04	0	02:22	2.25

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min		Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent	
CBMH4-Dummy	JUNCTION	0.00	8.65	0	01:01	0	0.00317	-11.303	
HP-CBMH1	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH1(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH10	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH11	JUNCTION	0.00	157.65	0	01:24	0	0.0634	1.274	
HP-CBMH12	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH13	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr

HP-CBMH14	JUNCTION	0.00	121.44	0	01:11	0	0.0748	-0.009	
HP-CBMH15	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH2	JUNCTION	0.00	2.87	0	01:08	0	0.000431	0.002	
HP-CBMH3	JUNCTION	0.00	102.48	0	01:13	0	0.0516	0.003	
HP-CBMH4	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH5	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH7	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH8	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH9	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CICB1	JUNCTION	0.00	71.12	0	01:10	0	0.0305	0.107	
HP-CICB2	JUNCTION	0.00	56.68	0	01:10	0	0.0263	0.133	
HP-RYE10	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE12	JUNCTION	0.00	7.10	0	01:08	0	0.000444	-8.228	
HP-RYE15	JUNCTION	0.00	3.15	0	01:12	0	0.00468	0.075	
HP-RYE16(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE2(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE2(2)	JUNCTION	0.00	0.03	0	00:39	0	2.26e-05	-0.016	ltr
HP-RYE2(3)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(3)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE4	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE4(2)	JUNCTION	0.00	13.27	0	01:10	0	0.0025	0.016	
HP-RYE5	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE6	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE7	JUNCTION	0.00	2.29	0	01:11	0	2.15e-05	-0.819	ltr
HP-RYE8	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE9	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT1(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT1(2)	JUNCTION	0.00	4.15	0	01:46	0	0.0161	-0.001	
HP-RYT10(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT10(2)	JUNCTION	0.00	0.58	0	01:20	0	8.88e-05	-0.168	
HP-RYT11(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT11(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT13	JUNCTION	0.00	12.35	0	01:10	0	0.0023	0.008	
HP-RYT14	JUNCTION	0.00	7.14	0	01:08	0	0.000799	-0.020	
HP-RYT15	JUNCTION	0.00	16.61	0	01:10	0	0.00387	0.023	
HP-RYT3(1)	JUNCTION	0.00	0.03	0	10:46	0	2.26e-05	0.016	ltr
HP-RYT3(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT4	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT4(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT5(1)	JUNCTION	0.00	48.68	0	01:11	0	0.0191	-0.011	
HP-RYT5(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT5(3)	JUNCTION	0.00	1.27	0	01:10	0	6.12e-05	0.000	
HP-RYT6	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT7	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT7(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT8(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT8(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT9(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT9(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
RYT01-Dummy	JUNCTION	0.00	19.13	0	01:03	0	0.0157	-1.138	
HP-RYE1	OUTFALL	0.00	2.74	0	01:48	0	0.00405	0.000	
HP-RYE16(2)	OUTFALL	0.00	15.43	0	01:21	0	0.0242	0.000	
MH1013	OUTFALL	0.00	317.11	0	01:10	0	1.66	0.000	
OF1	OUTFALL	21.18	21.18	0	01:10	0.0164	0.0164	0.000	
OF2	OUTFALL	21.18	21.18	0	01:10	0.0163	0.0163	0.000	
OF3	OUTFALL	12.30	12.30	0	01:10	0.00916	0.00916	0.000	
OF4	OUTFALL	55.59	55.59	0	01:10	0.0603	0.0603	0.000	
CBMH1	STORAGE	93.04	220.72	0	01:09	0.116	0.269	-0.164	
CBMH10	STORAGE	87.89	130.64	0	01:10	0.111	0.205	0.001	
CBMH11	STORAGE	59.76	205.64	0	01:21	0.0711	0.172	-0.456	
CBMH12	STORAGE	13.79	31.30	0	01:04	0.0174	0.0437	-0.019	
CBMH13	STORAGE	49.78	168.34	0	01:11	0.0604	0.139	0.036	
CBMH14	STORAGE	35.14	146.58	0	01:11	0.0434	0.176	-0.044	
CBMH15	STORAGE	63.95	79.64	0	01:05	0.0804	0.103	0.028	
CBMH2	STORAGE	107.13	129.18	0	01:10	0.131	0.176	0.021	
CBMH3	STORAGE	72.25	125.29	0	01:12	0.0897	0.169	0.012	
CBMH4	STORAGE	72.23	72.23	0	01:10	0.0897	0.0933	0.073	
CBMH5	STORAGE	53.32	87.67	0	01:09	0.0638	0.134	-0.000	
CBMH7	STORAGE	68.23	101.47	0	01:10	0.0842	0.208	-0.007	
CBMH8	STORAGE	55.23	89.28	0	01:09	0.0676	0.118	1.136	
CBMH9	STORAGE	35.19	53.97	0	01:09	0.0418	0.0602	-0.027	
CICB1	STORAGE	39.65	90.11	0	01:10	0.0488	0.093	-0.016	
CICB2	STORAGE	39.85	75.08	0	01:10	0.0478	0.0865	0.011	
MH100	STORAGE	0.00	316.81	0	01:10	0	1.66	0.000	
MH102	STORAGE	0.00	316.41	0	01:10	0	1.66	-0.000	
MH104	STORAGE	0.00	315.62	0	01:10	0	1.66	0.026	
MH106	STORAGE	0.00	217.39	0	01:13	0	1.29	0.000	
MH108	STORAGE	0.00	138.21	0	01:14	0	0.842	0.001	
MH110	STORAGE	0.00	97.82	0	01:12	0	0.687	-0.002	
MH112	STORAGE	0.00	52.79	0	01:13	0	0.441	-0.000	

MH114	STORAGE	0.00	23.20	0	01:11	0	0.238	-0.001
MH116	STORAGE	0.00	5.00	0	01:34	0	0.178	0.002
MH118	STORAGE	0.00	4.93	0	01:33	0	0.178	0.000
MH200	STORAGE	0.00	34.44	0	01:11	0	0.124	-1.086
MH202	STORAGE	0.00	35.64	0	01:09	0	0.0553	-0.018
MH204	STORAGE	0.00	55.20	0	01:07	0	0.104	0.009
MH206	STORAGE	0.00	34.11	0	01:04	0	0.0438	0.020
RYE1	STORAGE	0.00	7.91	0	01:07	0	0.00796	2.180
RYE10	STORAGE	15.36	15.36	0	01:10	0.0118	0.0121	-0.056
RYE11	STORAGE	38.16	38.16	0	01:10	0.0417	0.0417	-0.004
RYE12	STORAGE	34.35	34.35	0	01:10	0.0384	0.0385	0.005
RYE13	STORAGE	35.41	35.41	0	01:10	0.0387	0.0387	-0.002
RYE14	STORAGE	35.40	35.40	0	01:10	0.0387	0.0387	-0.005
RYE15	STORAGE	0.00	22.71	0	01:08	0	0.0105	0.030
RYE16	STORAGE	16.76	16.76	0	01:10	0.0167	0.0374	0.008
RYE17	STORAGE	35.43	35.43	0	01:10	0.0387	0.0387	-0.005
RYE2	STORAGE	80.23	80.23	0	01:10	0.0817	0.0817	-0.099
RYE3	STORAGE	36.38	36.38	0	01:10	0.0343	0.0343	-0.121
RYE4	STORAGE	33.75	46.96	0	01:10	0.0285	0.0315	0.011
RYE5	STORAGE	23.53	48.10	0	01:05	0.0188	0.0495	-0.007
RYE6	STORAGE	18.05	18.05	0	01:10	0.0159	0.0228	-0.016
RYE7	STORAGE	35.25	35.25	0	01:10	0.0339	0.0363	0.184
RYE8	STORAGE	18.53	21.29	0	01:10	0.0166	0.0179	0.215
RYE9	STORAGE	18.75	18.75	0	01:10	0.0161	0.0162	-0.038
RYT1	STORAGE	46.78	72.05	0	01:08	0.0451	0.0936	0.016
RYT10	STORAGE	0.00	26.12	0	01:07	0	0.0258	0.017
RYT11	STORAGE	0.00	19.46	0	01:04	0	0.0185	-0.005
RYT12	STORAGE	0.00	38.05	0	01:10	0	0.0417	0.003
RYT13	STORAGE	0.00	31.26	0	01:10	0	0.0381	0.005
RYT14	STORAGE	0.00	25.50	0	01:08	0	0.0362	0.006
RYT15	STORAGE	0.00	35.36	0	01:10	0	0.0387	-0.006
RYT16	STORAGE	0.00	35.37	0	01:10	0	0.0387	0.005
RYT3	STORAGE	0.00	85.96	0	01:09	0	0.0854	-0.027
RYT4	STORAGE	0.00	89.44	0	01:09	0	0.103	0.077
RYT5	STORAGE	0.00	76.89	0	01:08	0	0.124	0.012
RYT6	STORAGE	0.00	34.74	0	01:05	0	0.0382	0.095
RYT7	STORAGE	0.00	35.57	0	01:05	0	0.0494	0.258
RYT8	STORAGE	0.00	41.42	0	01:05	0	0.0441	0.005
RYT9	STORAGE	0.00	101.92	0	01:06	0	0.152	-0.003

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
CBMH4-Dummy	JUNCTION	2.51	1.612	0.638
RYT01-Dummy	JUNCTION	12.07	1.585	0.815
MH204	STORAGE	2.28	1.578	0.000
RYE17	STORAGE	0.62	1.226	0.924

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
CBMH1	0.013	1.4	0.0	0.0	0.088	9.4	0 02:21	104.49
CBMH10	0.001	0.2	0.0	0.0	0.055	9.1	0 01:32	65.80
CBMH11	0.001	0.2	0.0	0.0	0.036	6.4	0 01:24	173.19
CBMH12	0.000	1.6	0.0	0.0	0.002	63.6	0 01:23	24.98
CBMH13	0.000	0.1	0.0	0.0	0.021	3.6	0 01:13	124.52
CBMH14	0.001	0.2	0.0	0.0	0.012	4.0	0 01:13	123.56
CBMH15	0.002	0.2	0.0	0.0	0.039	3.9	0 01:22	36.80
CBMH2	0.002	0.2	0.0	0.0	0.056	7.2	0 01:28	56.37
CBMH3	0.001	0.1	0.0	0.0	0.058	5.8	0 01:26	52.43

CBMH4	0.001	0.1	0.0	0.0	0.040	3.9	0	01:32	13.50
CBMH5	0.005	0.7	0.0	0.0	0.039	6.1	0	01:46	34.73
CBMH7	0.001	0.1	0.0	0.0	0.001	0.1	0	01:10	101.40
CBMH8	0.001	0.2	0.0	0.0	0.024	4.7	0	01:35	37.47
CBMH9	0.000	0.0	0.0	0.0	0.005	0.5	0	01:13	35.25
CICB1	0.000	0.9	0.0	0.0	0.001	66.9	0	01:10	90.05
CICB2	0.000	1.0	0.0	0.0	0.001	67.3	0	01:10	75.03
MH100	0.002	33.2	0.0	0.0	0.002	33.6	0	01:10	317.11
MH102	0.002	31.8	0.0	0.0	0.002	32.6	0	01:10	316.81
MH104	0.002	31.3	0.0	0.0	0.002	32.3	0	01:10	316.41
MH106	0.001	26.3	0.0	0.0	0.001	28.3	0	01:10	218.22
MH108	0.001	19.0	0.0	0.0	0.001	21.9	0	01:10	138.68
MH110	0.000	14.8	0.0	0.0	0.001	18.1	0	01:10	98.18
MH112	0.000	9.7	0.0	0.0	0.000	13.3	0	01:11	54.60
MH114	0.000	0.8	0.0	0.0	0.000	5.3	0	01:13	23.19
MH116	0.000	0.7	0.0	0.0	0.000	4.1	0	01:13	5.18
MH118	0.000	0.6	0.0	0.0	0.000	3.0	0	01:21	5.00
MH200	0.000	14.7	0.0	0.0	0.001	18.6	0	01:10	35.30
MH202	0.001	11.5	0.0	0.0	0.004	90.2	0	01:33	36.50
MH204	0.000	9.5	0.0	0.0	0.002	100.0	0	01:15	45.93
MH206	0.000	12.4	0.0	0.0	0.002	96.7	0	01:21	24.06
RYE1	0.000	15.3	0.0	0.0	0.000	70.1	0	01:48	2.74
RYE10	0.000	1.5	0.0	0.0	0.000	63.6	0	01:23	13.94
RYE11	0.000	0.7	0.0	0.0	0.000	63.6	0	01:10	38.05
RYE12	0.000	0.5	0.0	0.0	0.000	66.4	0	01:10	34.40
RYE13	0.000	0.5	0.0	0.0	0.000	64.5	0	01:10	35.40
RYE14	0.000	0.5	0.0	0.0	0.000	65.2	0	01:10	35.36
RYE15	0.000	16.7	0.0	0.0	0.000	75.3	0	01:47	1.05
RYE16	0.000	9.0	0.0	0.0	0.000	70.8	0	01:21	25.39
RYE17	0.000	0.7	0.0	0.0	0.000	61.5	0	01:10	35.37
RYE2	0.000	7.6	0.0	0.0	0.000	63.7	0	01:10	85.96
RYE3	0.000	1.8	0.0	0.0	0.000	60.1	0	01:11	33.46
RYE4	0.000	2.6	0.0	0.0	0.000	71.0	0	01:12	26.34
RYE5	0.000	19.7	0.0	0.0	0.000	70.2	0	02:09	57.35
RYE6	0.000	7.4	0.0	0.0	0.000	63.8	0	01:32	25.54
RYE7	0.000	1.0	0.0	0.0	0.000	74.6	0	01:11	30.25
RYE8	0.000	2.8	0.0	0.0	0.000	68.9	0	01:14	19.00
RYE9	0.000	2.4	0.0	0.0	0.000	60.9	0	01:30	17.73
RYT1	0.001	18.0	0.0	0.0	0.003	75.7	0	01:46	50.99
RYT10	0.000	3.9	0.0	0.0	0.002	64.9	0	01:31	15.88
RYT11	0.000	1.6	0.0	0.0	0.002	63.0	0	01:23	13.54
RYT12	0.000	0.9	0.0	0.0	0.000	65.0	0	01:10	38.15
RYT13	0.000	0.5	0.0	0.0	0.000	66.5	0	01:10	31.27
RYT14	0.000	0.5	0.0	0.0	0.000	66.6	0	01:08	26.04
RYT15	0.000	0.5	0.0	0.0	0.000	65.7	0	01:10	35.37
RYT16	0.000	0.8	0.0	0.0	0.000	62.2	0	01:10	35.46
RYT3	0.000	8.5	0.0	0.0	0.000	66.2	0	01:13	89.44
RYT4	0.000	10.3	0.0	0.0	0.000	72.1	0	01:13	74.48
RYT5	0.000	11.2	0.0	0.0	0.000	73.7	0	01:13	73.46
RYT6	0.000	2.2	0.0	0.0	0.000	67.7	0	01:13	24.23
RYT7	0.000	2.6	0.0	0.0	0.000	73.0	0	01:25	20.67
RYT8	0.000	8.0	0.0	0.0	0.002	73.4	0	01:27	27.89
RYT9	0.001	27.2	0.0	0.0	0.003	73.6	0	02:22	66.16

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HP-RYE1	1.65	1.43	2.74	0.004
HP-RYE16(2)	2.37	5.94	15.43	0.024
MH1013	82.36	11.79	317.11	1.657
OF1	1.81	5.65	21.18	0.016
OF2	1.85	5.51	21.18	0.016
OF3	1.95	2.90	12.30	0.009
OF4	6.61	5.55	55.59	0.060
System	14.09	38.77	424.89	1.787

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Link Flow Summary
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	Maximum |Flow|	Time of Max Occurrence	Maximum |Veloc|	Max/ Full	Max/ Full

Iron Valley II – 5331 Fernbank Road (121011)
PCSWMM Model Output
100yr, 3-hour Chicago Storm

Link	Type	LPS	days	hr:min	m/sec	Flow	Depth
100_(STM)	CONDUIT	36.50	0	01:10	0.13	0.16	1.00
104_(STM)	CONDUIT	101.92	0	01:06	0.23	0.30	1.00
106_(STM)	CONDUIT	57.35	0	01:07	0.13	0.05	1.00
116_(STM)	CONDUIT	37.54	0	01:05	0.13	0.16	1.00
118_(STM)	CONDUIT	26.34	0	01:11	0.54	0.44	1.00
124_(STM)	CONDUIT	35.57	0	01:05	0.72	0.84	1.00
128_(STM)	CONDUIT	24.23	0	01:11	0.49	0.41	1.00
130_(STM)	CONDUIT	33.46	0	01:10	0.93	0.56	1.00
132_(STM)	CONDUIT	34.96	0	01:09	0.12	0.14	1.00
134_(STM)	CONDUIT	19.13	0	01:03	0.07	0.04	1.00
136_(STM)	CONDUIT	25.54	0	01:09	0.09	0.11	1.00
150_(1)_(STM)	CONDUIT	85.96	0	01:09	0.48	0.20	1.00
152_(1)_(STM)	CONDUIT	89.44	0	01:09	0.32	0.21	1.00
173_(STM)	CONDUIT	7.91	0	01:07	0.16	0.13	1.00
175_(STM)	CONDUIT	24.98	0	01:11	0.51	0.58	1.00
207_(STM)	CONDUIT	74.48	0	01:11	0.26	0.17	1.00
209_(STM)	CONDUIT	8.65	0	01:01	0.07	0.02	1.00
229_(STM)	CONDUIT	316.41	0	01:10	0.59	0.57	1.00
233_(STM)	CONDUIT	46.41	0	01:07	0.66	0.78	1.00
236_(STM)	CONDUIT	35.25	0	01:09	0.72	0.83	1.00
240_(STM)	CONDUIT	5.00	0	01:34	0.44	0.05	0.24
250_(STM)	CONDUIT	19.00	0	01:09	0.08	0.09	1.00
252_(STM)	CONDUIT	22.39	0	01:05	0.08	0.09	1.00
253_(STM)	CONDUIT	17.73	0	01:10	0.36	0.30	1.00
260_(STM)	CONDUIT	76.89	0	01:08	1.57	1.70	1.00
266_(STM)	CONDUIT	13.94	0	01:11	0.28	0.23	1.00
270_(STM)	CONDUIT	19.46	0	01:04	0.19	0.09	1.00
277_(STM)	CONDUIT	38.05	0	01:10	0.78	0.63	1.00
278_(STM)	CONDUIT	38.15	0	01:10	0.78	0.69	1.00
279_(STM)	CONDUIT	31.26	0	01:10	0.64	0.53	1.00
281_(STM)	CONDUIT	25.50	0	01:08	0.52	0.43	1.00
283_(STM)	CONDUIT	35.36	0	01:10	0.72	0.59	1.00
285_(STM)	CONDUIT	22.71	0	01:08	0.46	0.38	1.00
286_(STM)	CONDUIT	35.37	0	01:10	0.72	0.59	1.00
287_(STM)	CONDUIT	35.46	0	01:10	0.72	0.64	1.00
288_(STM)	CONDUIT	25.39	0	01:05	0.16	0.09	1.00
49_(STM)	CONDUIT	317.11	0	01:10	0.59	0.68	1.00
50_(STM)	CONDUIT	23.19	0	01:13	0.56	0.26	0.45
51_(STM)	CONDUIT	54.60	0	01:12	0.29	0.29	0.81
52_(STM)	CONDUIT	98.18	0	01:15	0.46	0.47	0.97
53_(STM)	CONDUIT	138.68	0	01:13	0.49	0.61	1.00
55_(STM)	CONDUIT	218.22	0	01:15	0.49	0.59	1.00
56_(STM)	CONDUIT	316.81	0	01:10	0.59	0.59	1.00
85_(STM)	CONDUIT	34.11	0	01:04	0.69	0.84	1.00
87_(STM)	CONDUIT	5.18	0	01:35	0.42	0.06	0.31
97(1)_(STM)	CONDUIT	101.40	0	01:10	0.64	0.79	1.00
97_(STM)	CONDUIT	35.30	0	01:11	0.32	0.41	1.00
MS-CBMH(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
MS-CBMH1(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
MS-CBMH1(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH1(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
MS-CBMH1(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
MS-CBMH10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH10(3)	CONDUIT	0.95	0	01:08	0.00	0.00	0.07
MS-CBMH11(1)	CONDUIT	181.56	0	01:21	0.48	0.00	0.16
MS-CBMH11(2)	CONDUIT	2.22	0	01:08	0.14	0.00	0.04
MS-CBMH12(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH12(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-CBMH13(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH13(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH14(1)	CONDUIT	121.44	0	01:11	0.39	0.00	0.12
MS-CBMH14(2)	CONDUIT	118.72	0	01:11	0.39	0.00	0.12
MS-CBMH15(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH15(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-CBMH2	CONDUIT	1.35	0	01:08	0.01	0.00	0.13
MS-CBMH3(1)	CONDUIT	62.14	0	01:13	0.25	0.00	0.12
MS-CBMH3(2)	CONDUIT	102.48	0	01:13	0.36	0.00	0.10
MS-CBMH3(3)	CONDUIT	40.35	0	01:13	1.08	0.00	0.05
MS-CBMH4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH5	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-CBMH5(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-CBMH7(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH7(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
MS-CBMH9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
MS-CICB1(1)	CONDUIT	71.12	0	01:10	0.29	0.00	0.08
MS-CICB1(2)	CONDUIT	71.12	0	01:10	1.55	0.00	0.15

MS-CICB2(1)	CONDUIT	56.68	0	01:10	0.17	0.00	0.11
MS-CICB2(2)	CONDUIT	56.69	0	01:10	1.68	0.00	0.09
MS-RYE(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE1	CONDUIT	2.74	0	01:48	0.01	0.00	0.07
MS-RYE10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE10(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-RYE12(1)	CONDUIT	7.10	0	01:08	0.03	0.00	0.12
MS-RYE12(2)	CONDUIT	2.79	0	01:10	0.19	0.01	0.20
MS-RYE15(1)	CONDUIT	1.61	0	01:17	0.01	0.00	0.66
MS-RYE15(2)	CONDUIT	3.15	0	01:12	0.07	0.01	0.60
MS-RYE16(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
MS-RYE16(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYE16(3)	CONDUIT	15.43	0	01:21	0.09	0.00	0.06
MS-RYE2(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE2(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE2(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-RYE2(5)	CONDUIT	0.03	0	00:39	0.00	0.00	0.01
MS-RYE3(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.04
MS-RYE3(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.04
MS-RYE3(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.50
MS-RYE3(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.01
MS-RYE3(5)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYE4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.39
MS-RYE4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.31
MS-RYE4(3)	CONDUIT	13.26	0	01:10	0.05	0.00	0.12
MS-RYE4(4)	CONDUIT	13.27	0	01:10	0.06	0.00	0.08
MS-RYE5(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.33
MS-RYE5(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.32
MS-RYE6(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE6(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYE7(1)	CONDUIT	2.29	0	01:11	0.01	0.00	0.11
MS-RYE7(2)	CONDUIT	1.18	0	01:11	0.00	0.00	0.00
MS-RYE8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
MS-RYE8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
MS-RYE9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE9(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT1(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.44
MS-RYT1(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.24
MS-RYT1(3)	CONDUIT	4.14	0	01:46	0.01	0.00	0.16
MS-RYT1(4)	CONDUIT	4.15	0	01:46	0.01	0.00	0.15
MS-RYT10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.04
MS-RYT10(3)	CONDUIT	0.58	0	01:20	0.00	0.00	0.16
MS-RYT11(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT11(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT11(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT13(1)	CONDUIT	12.35	0	01:10	0.06	0.00	0.07
MS-RYT13(2)	CONDUIT	12.35	0	01:10	0.05	0.00	0.08
MS-RYT14(1)	CONDUIT	7.14	0	01:08	0.03	0.00	0.07
MS-RYT14(2)	CONDUIT	2.87	0	01:08	0.00	0.00	0.00
MS-RYT15(1)	CONDUIT	16.61	0	01:10	0.09	0.00	0.06
MS-RYT15(2)	CONDUIT	16.61	0	01:10	0.11	0.00	0.09
MS-RYT3(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT3(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT3(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
MS-RYT4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
MS-RYT4(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT5(1)	CONDUIT	48.68	0	01:11	0.18	0.00	0.10
MS-RYT5(2)	CONDUIT	48.25	0	01:11	0.18	0.00	0.10
MS-RYT5(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.30
MS-RYT5(4)	CONDUIT	1.27	0	01:10	0.04	0.00	0.35
MS-RYT6	CONDUIT	0.00	0	00:00	0.00	0.00	0.29
MS-RYT7(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.31
MS-RYT7(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.29
MS-RYT7(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-RYT7(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-RYT8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.33
MS-RYT8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.39
MS-RYT8(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYT8(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
MS-RYT9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.32
MS-RYT9(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.33
MS-RYT9(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYT9(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
O-CBMH10	ORIFICE	21.10	0	01:35			1.00
O-CBMH11	ORIFICE	21.76	0	01:27			1.00
O-CBMH13	ORIFICE	22.07	0	01:34			1.00
O-CBMH2	ORIFICE	20.80	0	01:34			1.00
O-CBMH3	ORIFICE	21.89	0	01:36			1.00

O-CICB1	ORIFICE	18.94	0	01:10	1.00
O-CICB2	ORIFICE	18.35	0	01:10	1.00
O-RYE7	ORIFICE	27.98	0	01:11	1.00
O-RYT13	ORIFICE	18.92	0	01:10	1.00
O-RYT14	ORIFICE	18.90	0	01:08	1.00
O-RYT15	ORIFICE	18.76	0	01:10	1.00
O-CBMH1	DUMMY	2.76	0	02:21	
O-CBMH14	DUMMY	2.13	0	01:13	
O-CBMH15	DUMMY	2.81	0	01:22	
O-CBMH4	DUMMY	8.79	0	01:32	
O-CBMH5	DUMMY	2.13	0	01:46	
O-CBMH8	DUMMY	6.58	0	01:35	

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class								
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
100_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106_(STM)	1.00	0.00	0.58	0.00	0.42	0.00	0.00	0.00	0.60	0.00
116_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
118_(STM)	1.00	0.00	0.90	0.00	0.10	0.00	0.00	0.00	0.95	0.00
124_(STM)	1.00	0.00	0.91	0.00	0.09	0.00	0.00	0.00	0.95	0.00
128_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.95	0.00
130_(STM)	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.94	0.00
132_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.59	0.00
134_(STM)	1.00	0.00	0.61	0.00	0.39	0.00	0.00	0.00	0.61	0.00
136_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
150_(1)_(STM)	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.74	0.00
152_(1)_(STM)	1.00	0.66	0.02	0.00	0.31	0.00	0.00	0.00	0.71	0.00
173_(STM)	1.00	0.61	0.05	0.00	0.34	0.00	0.00	0.00	0.66	0.00
175_(STM)	1.00	0.00	0.77	0.00	0.23	0.00	0.00	0.00	0.96	0.00
207_(STM)	1.00	0.66	0.00	0.00	0.34	0.00	0.00	0.00	0.67	0.00
209_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.91	0.00
229_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
233_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
236_(STM)	1.00	0.00	0.75	0.00	0.25	0.00	0.00	0.00	0.94	0.00
240_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.77	0.00
250_(STM)	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.93	0.00
252_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
253_(STM)	1.00	0.00	0.91	0.00	0.09	0.00	0.00	0.00	0.94	0.00
260_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.66	0.00
266_(STM)	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.01	0.00
270_(STM)	1.00	0.77	0.16	0.00	0.07	0.00	0.00	0.00	0.93	0.00
277_(STM)	1.00	0.00	0.01	0.00	0.98	0.01	0.00	0.00	0.97	0.00
278_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.00
279_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.00
281_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.07	0.00
283_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.07	0.00
285_(STM)	1.00	0.00	0.64	0.00	0.36	0.00	0.00	0.00	0.65	0.00
286_(STM)	1.00	0.00	0.01	0.00	0.98	0.01	0.00	0.00	0.98	0.00
287_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.00
288_(STM)	1.00	0.00	0.80	0.00	0.20	0.00	0.00	0.00	0.80	0.00
49_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
50_(STM)	1.00	0.00	0.48	0.00	0.52	0.00	0.00	0.00	1.00	0.00
51_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
52_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
53_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
55_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
56_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
85_(STM)	1.00	0.00	0.00	0.00	0.20	0.00	0.00	0.80	0.00	0.00
87_(STM)	1.00	0.48	0.07	0.00	0.45	0.00	0.00	0.00	0.61	0.00
97(1)_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
97_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(1)	1.00	0.75	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(3)	1.00	0.75	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(3)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-CBMH11(1)	1.00	0.98	0.01	0.00	0.01	0.00	0.00	0.00	0.97	0.00
MS-CBMH11(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-CBMH12(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH12(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MS-CBMH13(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH13(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH14(1)	1.00	0.94	0.04	0.00	0.03	0.00	0.00	0.00	0.95	0.00
MS-CBMH14(2)	1.00	0.97	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
MS-CBMH15(1)	1.00	0.90	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH15(2)	1.00	0.82	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH2	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-CBMH3(1)	1.00	0.97	0.02	0.00	0.01	0.00	0.00	0.00	0.98	0.00
MS-CBMH3(2)	1.00	0.98	0.01	0.00	0.01	0.00	0.00	0.00	0.97	0.00
MS-CBMH3(3)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-CBMH4(1)	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH4(2)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH5	1.00	0.82	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH5(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH7(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH7(2)	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH8(1)	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH8(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH9(1)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CICB1(1)	1.00	0.99	0.00	0.00	0.01	0.00	0.00	0.00	0.97	0.00
MS-CICB1(2)	1.00	0.75	0.25	0.00	0.01	0.00	0.00	0.00	0.98	0.00
MS-CICB2(1)	1.00	0.99	0.00	0.00	0.01	0.00	0.00	0.00	0.97	0.00
MS-CICB2(2)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYE(1)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYE1	1.00	0.84	0.13	0.00	0.02	0.00	0.00	0.00	0.95	0.00
MS-RYE10(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE10(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE10(3)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE12(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE12(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYE15(1)	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.86	0.00
MS-RYE15(2)	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.86	0.00
MS-RYE16(1)	1.00	0.91	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE16(2)	1.00	0.90	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE16(3)	1.00	0.91	0.06	0.00	0.02	0.00	0.00	0.00	0.95	0.00
MS-RYE2(2)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYE2(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE2(4)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE2(5)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(3)	1.00	0.81	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(5)	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(3)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYE4(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-RYE5(1)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE5(2)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE6(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE6(2)	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE7(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYE7(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE8(1)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE8(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE9(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE9(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(1)	1.00	0.81	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(2)	1.00	0.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(3)	1.00	0.81	0.09	0.00	0.10	0.00	0.00	0.00	0.88	0.00
MS-RYT1(4)	1.00	0.82	0.09	0.00	0.10	0.00	0.00	0.00	0.88	0.00
MS-RYT10(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT10(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT10(3)	1.00	0.97	0.02	0.00	0.01	0.00	0.00	0.00	0.96	0.00
MS-RYT11(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT11(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT11(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT13(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-RYT13(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYT14(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-RYT14(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-RYT15(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
MS-RYT15(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
MS-RYT3(1)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYT3(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT3(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(1)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(2)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT5(1)	1.00	0.94	0.06	0.00	0.01	0.00	0.00	0.00	0.97	0.00

MS-RYT5(2)	1.00	0.94	0.06	0.00	0.01	0.00	0.00	0.00	0.97	0.00
MS-RYT5(3)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT5(4)	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.97	0.00
MS-RYT6	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(3)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(4)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(3)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(4)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(1)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(3)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(4)	1.00	0.75	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
100_(STM)	3.18	3.18	3.22	0.01	0.01
104_(STM)	15.65	15.65	15.76	0.01	0.01
106_(STM)	14.16	14.16	15.59	0.01	0.01
116_(STM)	2.05	2.05	2.07	0.01	0.01
118_(STM)	2.04	2.04	2.57	0.01	0.01
124_(STM)	2.00	2.00	2.11	0.01	0.01
128_(STM)	1.77	1.77	2.00	0.01	0.01
130_(STM)	1.65	1.65	1.77	0.01	0.01
132_(STM)	12.54	12.54	12.69	0.01	0.01
134_(STM)	12.07	12.07	12.54	0.01	0.01
136_(STM)	3.15	3.15	3.18	0.01	0.01
150_(1)_(STM)	6.70	6.70	7.24	0.01	0.01
152_(1)_(STM)	7.24	7.24	8.46	0.01	0.01
173_(STM)	12.86	12.86	14.47	0.01	0.01
175_(STM)	1.57	1.57	1.89	0.01	0.01
207_(STM)	8.46	8.46	9.54	0.01	0.01
209_(STM)	2.51	2.51	2.52	0.01	0.01
229_(STM)	48.00	48.00	48.00	0.01	0.01
233_(STM)	2.83	2.83	3.07	0.01	0.01
236_(STM)	2.45	2.45	2.83	0.01	0.01
250_(STM)	2.14	2.14	2.15	0.01	0.01
252_(STM)	2.26	2.26	2.28	0.01	0.01
253_(STM)	2.31	2.31	2.74	0.01	0.01
260_(STM)	14.11	14.11	14.33	0.07	0.01
266_(STM)	1.35	1.35	1.55	0.01	0.01
270_(STM)	1.33	1.33	1.33	0.01	0.01
277_(STM)	0.64	0.64	0.82	0.01	0.01
278_(STM)	0.82	0.82	0.85	0.01	0.01
279_(STM)	0.38	0.38	0.45	0.01	0.01
281_(STM)	0.37	0.37	0.45	0.01	0.01
283_(STM)	0.36	0.36	0.44	0.01	0.01
285_(STM)	13.28	13.28	15.94	0.01	0.01
286_(STM)	0.62	0.62	0.79	0.01	0.01
287_(STM)	0.79	0.79	0.82	0.01	0.01
288_(STM)	6.60	6.60	6.67	0.01	0.01
49_(STM)	48.00	48.00	48.00	0.01	0.01
52_(STM)	0.01	0.01	0.11	0.01	0.01
53_(STM)	0.03	0.03	1.20	0.01	0.01
55_(STM)	1.20	1.20	48.00	0.01	0.01
56_(STM)	48.00	48.00	48.00	0.01	0.01
85_(STM)	7.83	7.83	8.25	0.01	0.01
97(1)_(STM)	48.00	48.00	48.00	0.01	0.05
97_(STM)	0.45	0.45	48.00	0.01	0.01
MS-RYE15(1)	0.01	0.01	2.70	0.01	0.01

Analysis begun on: Fri Nov 14 17:10:32 2025
Analysis ended on: Fri Nov 14 17:10:42 2025
Total elapsed time: 00:00:10

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
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WARNING 04: minimum elevation drop used for Conduit MS-RYE2(5)
WARNING 04: minimum elevation drop used for Conduit MS-RYT3(3)
WARNING 04: minimum elevation drop used for Conduit MS-RYT4(3)

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 36
Number of nodes ........... 128
Number of links ........... 174
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
RG-1                 S24hr-100yr-JFSA            INTENSITY   12 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A1                          0.04     33.59     29.00    3.7000 RG-1                RYE16
A10                         0.10     86.88     13.00    2.0000 RG-1                RYE3
A11                         0.16     81.67     63.00    2.0000 RG-1                CBMH3
A12                         0.11     99.76     60.00    1.0000 RG-1                CBMH13
A13                         0.03     13.95     67.00    2.5000 RG-1                CBMH12
A14                         0.04     54.66      0.00    2.5000 RG-1                RYE10
A15                         0.14     67.74     51.00    2.5000 RG-1                CBMH11
A16                         0.05     51.31      7.00    2.5000 RG-1                RYE9
A17                         0.21     67.36     56.00    2.5000 RG-1                CBMH10
A18                         0.24    123.55     60.00    2.1000 RG-1                CBMH2
A19                         0.08     67.46     44.00    3.5000 RG-1                RYE13
A2                          0.14     71.50     66.00    1.9000 RG-1                CBMH15
A20                         0.09     86.54      6.00    3.0000 RG-1                RYE4
A21                         0.06     75.87      4.00    3.0000 RG-1                RYE5
A22                         0.09     56.44     40.00    3.5000 RG-1                RYE11
A23                         0.21     88.90     61.00    2.3000 RG-1                CBMH1
A24                         0.09     86.25     59.00    0.5000 RG-1                CICB1
A25                         0.15     81.73     63.00    2.2000 RG-1                CBMH7
A26                         0.08     46.10     44.00    3.7000 RG-1                RYE12
A27                         0.05     38.18     10.00    3.5000 RG-1                RYE8
A28                         0.12     77.38     63.00    2.5000 RG-1                CBMH8
A29                         0.09     72.32     20.00    3.0000 RG-1                RYE7
A3                          0.12     94.12     20.00    3.0000 RG-1                RYT1
A30                         0.08     50.90     54.00    1.9000 RG-1                CBMH9
A31                         0.05     37.88      7.00    3.4000 RG-1                RYE6
A32                         0.09    108.22     56.00    0.5000 RG-1                CICB2
A4                          0.12     70.22     56.00    2.3000 RG-1                CBMH5
A5                          0.08     66.26     44.00    3.7000 RG-1                RYE17
A6                          0.22    138.68     20.00    2.6000 RG-1                RYE2
A7                          0.08     47.99     59.00    1.2000 RG-1                CBMH14
A8                          0.16     83.48     63.00    1.9000 RG-1                CBMH4
A9                          0.08     65.28     44.00    3.7000 RG-1                RYE14
U1                          0.05    211.95      0.00   15.0000 RG-1                OF1
U2                          0.03     46.95      0.00    5.0000 RG-1                OF3
U3                          0.05    171.70      0.00   15.0000 RG-1                OF2
U4                          0.13     85.36     40.00    3.7000 RG-1                OF4


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Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
CBMH4-Dummy          JUNCTION          95.14      3.00       0.0
HP-CBMH1             JUNCTION          97.08      1.00       0.0
HP-CBMH1(2)          JUNCTION          97.06      1.00       0.0
HP-CBMH10            JUNCTION          97.20      1.00       0.0
HP-CBMH11            JUNCTION          97.25      1.00       0.0
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HP-CBMH12	JUNCTION	97.70	1.00	0.0
HP-CBMH13	JUNCTION	97.66	1.00	0.0
HP-CBMH14	JUNCTION	97.34	1.00	0.0
HP-CBMH15	JUNCTION	97.75	1.00	0.0
HP-CBMH2	JUNCTION	97.14	1.00	0.0
HP-CBMH3	JUNCTION	97.37	1.00	0.0
HP-CBMH4	JUNCTION	97.59	1.00	0.0
HP-CBMH5	JUNCTION	97.68	1.00	0.0
HP-CBMH7	JUNCTION	97.16	1.00	0.0
HP-CBMH8	JUNCTION	97.27	1.00	0.0
HP-CBMH9	JUNCTION	97.31	1.00	0.0
HP-CICB1	JUNCTION	97.11	1.00	0.0
HP-CICB2	JUNCTION	97.64	1.00	0.0
HP-RYE10	JUNCTION	97.50	1.00	0.0
HP-RYE12	JUNCTION	97.31	1.00	0.0
HP-RYE15	JUNCTION	97.52	1.00	0.0
HP-RYE16(1)	JUNCTION	97.85	1.00	0.0
HP-RYE2(1)	JUNCTION	97.68	0.30	0.0
HP-RYE2(2)	JUNCTION	97.66	0.30	0.0
HP-RYE2(3)	JUNCTION	97.70	1.00	0.0
HP-RYE3(1)	JUNCTION	97.52	0.30	0.0
HP-RYE3(2)	JUNCTION	97.69	0.30	0.0
HP-RYE3(3)	JUNCTION	97.55	1.00	0.0
HP-RYE4	JUNCTION	97.35	1.00	0.0
HP-RYE4(2)	JUNCTION	97.45	1.00	0.0
HP-RYE5	JUNCTION	97.15	1.00	0.0
HP-RYE6	JUNCTION	97.60	1.00	0.0
HP-RYE7	JUNCTION	97.35	1.00	0.0
HP-RYE8	JUNCTION	97.50	1.00	0.0
HP-RYE9	JUNCTION	97.55	1.00	0.0
HP-RYT1(1)	JUNCTION	97.76	0.30	0.0
HP-RYT1(2)	JUNCTION	97.55	1.00	0.0
HP-RYT10(1)	JUNCTION	97.43	1.00	0.0
HP-RYT10(2)	JUNCTION	97.13	1.00	0.0
HP-RYT11(1)	JUNCTION	97.69	1.00	0.0
HP-RYT11(2)	JUNCTION	97.77	1.00	0.0
HP-RYT13	JUNCTION	97.30	1.00	0.0
HP-RYT14	JUNCTION	97.43	1.00	0.0
HP-RYT15	JUNCTION	97.59	1.00	0.0
HP-RYT3(1)	JUNCTION	97.66	0.30	0.0
HP-RYT3(2)	JUNCTION	97.65	0.30	0.0
HP-RYT4	JUNCTION	97.65	0.30	0.0
HP-RYT4(2)	JUNCTION	97.50	0.30	0.0
HP-RYT5(1)	JUNCTION	97.38	1.00	0.0
HP-RYT5(2)	JUNCTION	97.50	0.30	0.0
HP-RYT5(3)	JUNCTION	97.38	0.30	0.0
HP-RYT6	JUNCTION	97.49	1.00	0.0
HP-RYT7	JUNCTION	97.57	1.00	0.0
HP-RYT7(2)	JUNCTION	97.35	1.00	0.0
HP-RYT8(1)	JUNCTION	97.17	1.00	0.0
HP-RYT8(2)	JUNCTION	97.20	1.00	0.0
HP-RYT9(1)	JUNCTION	97.44	1.00	0.0
HP-RYT9(2)	JUNCTION	97.15	1.00	0.0
RYT01-Dummy	JUNCTION	95.43	3.00	0.0
HP-RYE1	OUTFALL	97.61	1.00	0.0
HP-RYE16(2)	OUTFALL	97.67	1.00	0.0
MH1013	OUTFALL	94.08	0.82	0.0
OF1	OUTFALL	97.00	0.00	0.0
OF2	OUTFALL	97.73	0.00	0.0
OF3	OUTFALL	97.15	0.00	0.0
OF4	OUTFALL	96.85	2.35	0.0
CBMH1	STORAGE	94.77	2.97	0.0
CBMH10	STORAGE	94.85	3.01	0.0
CBMH11	STORAGE	94.90	3.18	0.0
CBMH12	STORAGE	95.15	3.40	0.0
CBMH13	STORAGE	94.91	3.32	0.0
CBMH14	STORAGE	95.09	3.14	0.0
CBMH15	STORAGE	95.35	3.15	0.0
CBMH2	STORAGE	94.86	2.98	0.0
CBMH3	STORAGE	94.98	3.12	0.0
CBMH4	STORAGE	95.12	3.19	0.0
CBMH5	STORAGE	95.29	3.09	0.0
CBMH7	STORAGE	94.58	3.20	0.0
CBMH8	STORAGE	94.85	3.07	0.0
CBMH9	STORAGE	95.17	2.97	0.0
CICB1	STORAGE	95.42	2.57	0.0
CICB2	STORAGE	96.04	2.40	0.0
MH100	STORAGE	94.10	2.86	0.0
MH102	STORAGE	94.13	2.89	0.0
MH104	STORAGE	94.15	2.88	0.0
MH106	STORAGE	94.31	2.82	0.0
MH108	STORAGE	94.53	2.75	0.0

MH110	STORAGE	94.65	2.71	0.0
MH112	STORAGE	94.79	2.70	0.0
MH114	STORAGE	95.09	2.46	0.0
MH116	STORAGE	95.12	2.49	0.0
MH118	STORAGE	95.15	2.52	0.0
MH200	STORAGE	94.69	2.45	0.0
MH202	STORAGE	94.88	2.50	0.0
MH204	STORAGE	94.93	2.19	0.0
MH206	STORAGE	95.48	2.28	0.0
RYE1	STORAGE	95.61	2.86	0.0
RYE10	STORAGE	95.47	2.90	0.0
RYE11	STORAGE	95.64	2.50	0.0
RYE12	STORAGE	95.76	2.40	0.0
RYE13	STORAGE	95.91	2.40	0.0
RYE14	STORAGE	96.10	2.40	0.0
RYE15	STORAGE	95.55	2.74	0.0
RYE16	STORAGE	95.52	3.06	0.0
RYE17	STORAGE	96.26	2.40	0.0
RYE2	STORAGE	95.53	2.97	0.0
RYE3	STORAGE	95.96	2.44	0.0
RYE4	STORAGE	95.26	2.64	0.0
RYE5	STORAGE	95.15	2.70	0.0
RYE6	STORAGE	94.91	3.49	0.0
RYE7	STORAGE	95.03	3.11	0.0
RYE8	STORAGE	95.19	2.91	0.0
RYE9	STORAGE	95.30	3.05	0.0
RYT1	STORAGE	95.32	3.03	0.0
RYT10	STORAGE	95.01	3.31	0.0
RYT11	STORAGE	95.16	3.42	0.0
RYT12	STORAGE	95.45	2.62	0.0
RYT13	STORAGE	95.59	2.58	0.0
RYT14	STORAGE	95.72	2.57	0.0
RYT15	STORAGE	95.91	2.57	0.0
RYT16	STORAGE	96.07	2.57	0.0
RYT3	STORAGE	95.41	3.03	0.0
RYT4	STORAGE	95.23	3.03	0.0
RYT5	STORAGE	95.11	3.12	0.0
RYT6	STORAGE	95.62	2.56	0.0
RYT7	STORAGE	95.14	3.01	0.0
RYT8	STORAGE	94.89	3.01	0.0
RYT9	STORAGE	94.79	3.06	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
100_(STM)	MH202	CBMH8	CONDUIT	20.5	0.1464	0.0130
104_(STM)	RYT9	CBMH1	CONDUIT	20.8	0.0962	0.0130
106_(STM)	RYE5	RYT9	CONDUIT	35.4	0.9896	0.0130
116_(STM)	RYT8	CBMH2	CONDUIT	20.8	0.1444	0.0130
118_(STM)	RYE4	RYT8	CONDUIT	36.0	0.9989	0.0130
124_(STM)	RYT7	CBMH3	CONDUIT	21.8	0.5051	0.0130
128_(STM)	RYT6	RYT7	CONDUIT	47.6	1.0074	0.0130
130_(STM)	RYE3	RYT6	CONDUIT	34.3	0.9925	0.0130
132_(STM)	RYT1	CBMH5	CONDUIT	17.1	0.1755	0.0130
134_(STM)	RYT01-Dummy	RYT1	CONDUIT	22.1	0.4977	0.0130
136_(STM)	RYE6	MH202	CONDUIT	20.1	0.1493	0.0130
150_(1)_(STM)	RYE2	RYT3	CONDUIT	24.8	0.4845	0.0130
152_(1)_(STM)	RYT3	RYT4	CONDUIT	36.7	0.4907	0.0130
173_(STM)	RYE1	RYT01-Dummy	CONDUIT	18.2	0.9901	0.0130
175_(STM)	CBMH12	CBMH11	CONDUIT	38.6	0.5179	0.0130
207_(STM)	RYT4	RYT5	CONDUIT	21.4	0.5145	0.0130
209_(STM)	CBMH4-Dummy	CBMH4	CONDUIT	13.7	0.1461	0.0130
229_(STM)	MH104	MH102	CONDUIT	13.3	0.1503	0.0130
233_(STM)	MH204	CBMH10	CONDUIT	21.1	0.3801	0.0130
236_(STM)	CBMH9	MH204	CONDUIT	37.6	0.5048	0.0130
240_(STM)	MH118	MH116	CONDUIT	8.9	0.3382	0.0130
250_(STM)	RYE8	CBMH9	CONDUIT	15.5	0.1288	0.0130
252_(STM)	RYT10	MH204	CONDUIT	18.2	0.1646	0.0130
253_(STM)	RYE9	RYT10	CONDUIT	28.1	0.9968	0.0130
260_(STM)	RYT5	CBMH14	CONDUIT	3.5	0.5797	0.0130
266_(STM)	RYE10	RYT11	CONDUIT	29.6	1.0129	0.0130
270_(STM)	RYT11	CBMH12	CONDUIT	7.8	0.1280	0.0130
277_(STM)	RYE11	RYT12	CONDUIT	18.7	1.0156	0.0130
278_(STM)	RYT12	CICB1	CONDUIT	3.5	0.8696	0.0130
279_(STM)	RYE12	RYT13	CONDUIT	17.1	0.9954	0.0130
281_(STM)	RYE13	RYT14	CONDUIT	18.7	1.0156	0.0130
283_(STM)	RYE14	RYT15	CONDUIT	18.7	1.0156	0.0130
285_(STM)	RYE15	RYT1	CONDUIT	22.4	1.0264	0.0130
286_(STM)	RYE17	RYT16	CONDUIT	18.7	1.0156	0.0130

287_(STM)	RYT16	CICB2	CONDUIT	3.5	0.8696	0.0130
288_(STM)	RYE16	MH206	CONDUIT	17.8	0.2254	0.0130
49_(STM)	MH100	MH1013	CONDUIT	18.9	0.1058	0.0130
50_(STM)	MH114	MH112	CONDUIT	58.6	0.2558	0.0130
51_(STM)	MH112	MH110	CONDUIT	72.1	0.1942	0.0130
52_(STM)	MH110	MH108	CONDUIT	21.5	0.2328	0.0130
53_(STM)	MH108	MH106	CONDUIT	50.6	0.1383	0.0130
55_(STM)	MH106	MH104	CONDUIT	72.1	0.1110	0.0130
56_(STM)	MH102	MH100	CONDUIT	21.4	0.1405	0.0130
85_(STM)	MH206	CBMH15	CONDUIT	17.1	0.4687	0.0130
87_(STM)	MH116	MH114	CONDUIT	12.0	0.2500	0.0130
97(1)_(STM)	CBMH7	MH104	CONDUIT	24.9	0.2008	0.0130
97_(STM)	MH200	CBMH7	CONDUIT	16.3	0.2459	0.0130
MS-CBMH(2)	HP-CBMH9	CBMH10	CONDUIT	2.0	23.0921	0.0130
MS-CBMH1(1)	CBMH1	HP-CBMH1	CONDUIT	2.0	-17.2511	0.0130
MS-CBMH1(2)	HP-CBMH1	CBMH7	CONDUIT	2.0	15.1717	0.0130
MS-CBMH1(3)	CBMH1	HP-CBMH1(2)	CONDUIT	2.0	-16.2088	0.0130
MS-CBMH1(4)	HP-CBMH1(2)	OF4	CONDUIT	2.0	-69.3731	0.0130
MS-CBMH10(1)	CBMH10	HP-CBMH10	CONDUIT	2.0	-17.2511	0.0130
MS-CBMH10(2)	HP-CBMH10	HP-CBMH2	CONDUIT	2.0	3.0014	0.0130
MS-CBMH10(3)	HP-CBMH2	CICB1	CONDUIT	2.0	7.5212	0.0130
MS-CBMH11(1)	CBMH11	HP-CBMH11	CONDUIT	2.0	-8.5309	0.0130
MS-CBMH11(2)	HP-CBMH11	HP-RYT14	CONDUIT	2.0	-9.0367	0.0130
MS-CBMH12(1)	HP-CBMH12	CBMH12	CONDUIT	2.0	7.5212	0.0130
MS-CBMH12(2)	HP-CBMH12	CBMH11	CONDUIT	2.0	32.6063	0.0130
MS-CBMH13(1)	CBMH12	HP-CBMH13	CONDUIT	2.0	-5.5083	0.0130
MS-CBMH13(2)	HP-CBMH13	CBMH13	CONDUIT	2.0	22.0148	0.0130
MS-CBMH14(1)	CBMH14	HP-CBMH14	CONDUIT	2.0	-5.5083	0.0130
MS-CBMH14(2)	HP-CBMH14	CBMH13	CONDUIT	2.0	5.5083	0.0130
MS-CBMH15(1)	CBMH15	HP-CBMH15	CONDUIT	2.0	-12.5988	0.0130
MS-CBMH15(2)	HP-CBMH15	CBMH5	CONDUIT	2.0	18.8249	0.0130
MS-CBMH2	HP-CBMH2	CBMH2	CONDUIT	2.0	15.1717	0.0130
MS-CBMH3(1)	CBMH3	HP-CBMH3	CONDUIT	2.0	-13.6247	0.0130
MS-CBMH3(2)	HP-CBMH3	CBMH13	CONDUIT	2.0	7.0172	0.0130
MS-CBMH3(3)	HP-CBMH3	HP-CBMH11	CONDUIT	2.0	6.0108	0.0130
MS-CBMH4(1)	CBMH4	HP-CBMH4	CONDUIT	2.0	-14.1393	0.0130
MS-CBMH4(2)	HP-CBMH4	CBMH14	CONDUIT	2.0	18.2989	0.0130
MS-CBMH5	CBMH5	HP-CBMH5	CONDUIT	2.0	-15.1717	0.0130
MS-CBMH5(2)	HP-CBMH5	CICB2	CONDUIT	2.0	12.0873	0.0130
MS-CBMH7(1)	CBMH7	HP-CBMH7	CONDUIT	2.0	-19.3525	0.0130
MS-CBMH7(2)	HP-CBMH7	CBMH8	CONDUIT	2.0	12.0873	0.0130

MS-CBMH8(1)	CBMH8	HP-CBMH8	CONDUIT	2.0	-17.7743	0.0130
MS-CBMH8(2)	HP-CBMH8	CBMH9	CONDUIT	2.0	6.5138	0.0130
MS-CBMH9(1)	CBMH9	HP-CBMH9	CONDUIT	2.0	-8.5309	0.0130
MS-CICB1(1)	CICB1	HP-CICB1	CONDUIT	2.0	-6.0108	0.0130
MS-CICB1(2)	HP-CICB1	CBMH1	CONDUIT	2.0	18.8249	0.0130
MS-CICB2(1)	CICB2	HP-CICB2	CONDUIT	2.0	-10.0504	0.0130
MS-CICB2(2)	HP-CICB2	CBMH14	CONDUIT	2.0	20.9448	0.0130
MS-RYE(1)	HP-RYE2(1)	RYE2	CONDUIT	8.9	2.0229	0.0300
MS-RYE1	RYE1	HP-RYE1	CONDUIT	2.0	-7.0172	0.0300
MS-RYE10(1)	RYE10	HP-RYE10	CONDUIT	2.0	-6.5138	0.0300
MS-RYE10(2)	HP-RYE10	RYE9	CONDUIT	2.0	7.5212	0.0300
MS-RYE10(3)	HP-RYE10	CBMH11	CONDUIT	2.0	21.4790	0.0130
MS-RYE12(1)	RYE12	HP-RYE12	CONDUIT	2.0	-7.5212	0.0300
MS-RYE12(2)	HP-RYE12	RYE8	CONDUIT	15.6	1.3445	0.0300
MS-RYE15(1)	RYE15	HP-RYE15	CONDUIT	11.2	-2.0540	0.0300
MS-RYE15(2)	HP-RYE15	RYT1	CONDUIT	11.2	1.5180	0.0300
MS-RYE16(1)	RYE16	HP-RYE16(1)	CONDUIT	2.0	-13.6247	0.0300
MS-RYE16(2)	HP-RYE16(1)	CBMH15	CONDUIT	2.0	17.7743	0.0130
MS-RYE16(3)	RYE16	HP-RYE16(2)	CONDUIT	2.0	-4.5046	0.0300
MS-RYE2(2)	RYE2	HP-RYE2(2)	CONDUIT	9.3	-1.7207	0.0300
MS-RYE2(3)	RYE2	HP-RYE2(3)	CONDUIT	2.0	-10.0504	0.0300
MS-RYE2(4)	HP-RYE2(3)	CICB2	CONDUIT	2.0	13.1113	0.0130
MS-RYE2(5)	HP-RYE2(2)	HP-RYT3(1)	CONDUIT	2.8	0.0109	0.0130
MS-RYE3(1)	HP-RYE3(1)	RYE3	CONDUIT	5.4	2.2228	0.0300
MS-RYE3(2)	RYE3	HP-RYE3(2)	CONDUIT	14.0	-2.0719	0.0300
MS-RYE3(3)	HP-RYE3(2)	RYE15	CONDUIT	25.7	1.5566	0.0300
MS-RYE3(4)	RYE3	HP-RYE3(3)	CONDUIT	2.0	-7.5212	0.0300
MS-RYE3(5)	HP-RYE3(3)	CBMH4	CONDUIT	2.0	12.0873	0.0130
MS-RYE4(1)	RYE4	HP-RYE4	CONDUIT	22.5	-2.0004	0.0300
MS-RYE4(2)	HP-RYE4	RYT7	CONDUIT	13.5	1.4816	0.0300
MS-RYE4(3)	RYE4	HP-RYE4(2)	CONDUIT	2.0	-28.6028	0.0300
MS-RYE4(4)	HP-RYE4(2)	RYE13	CONDUIT	2.0	7.0172	0.0300
MS-RYE5(1)	RYE5	HP-RYE5	CONDUIT	14.9	-2.0138	0.0300
MS-RYE5(2)	HP-RYE5	RYT9	CONDUIT	20.5	1.4636	0.0300
MS-RYE6(1)	RYE6	HP-RYE6	CONDUIT	2.0	-10.0504	0.0300
MS-RYE6(2)	HP-RYE6	CBMH8	CONDUIT	2.0	36.1538	0.0130
MS-RYE7(1)	RYE7	HP-RYE7	CONDUIT	2.0	-10.5584	0.0300
MS-RYE7(2)	HP-RYE7	CBMH7	CONDUIT	2.0	29.7331	0.0130
MS-RYE8(1)	RYE8	HP-RYE8	CONDUIT	2.0	-20.4124	0.0300
MS-RYE8(2)	HP-RYE8	CBMH9	CONDUIT	2.0	18.2989	0.0130
MS-RYE9(1)	RYE9	HP-RYE9	CONDUIT	13.1	-1.5269	0.0300

MS-RYE9(2)	HP-RYE9	RYT10	CONDUIT	15.0	1.5335	0.0300
MS-RYT(1)	RYT11	HP-RYT11(1)	CONDUIT	7.7	-1.4287	0.0300
MS-RYT1(1)	RYT1	HP-RYT1(1)	CONDUIT	20.7	-1.9811	0.0300
MS-RYT1(2)	HP-RYT1(1)	RYE1	CONDUIT	19.6	1.4798	0.0300
MS-RYT1(3)	RYT1	HP-RYT1(2)	CONDUIT	2.0	-10.0504	0.0300
MS-RYT1(4)	HP-RYT1(2)	CBMH5	CONDUIT	2.0	8.5309	0.0130
MS-RYT10(1)	RYT10	HP-RYT10(1)	CONDUIT	6.4	-1.7190	0.0300
MS-RYT10(2)	HP-RYT10(1)	HP-RYT10(2)	CONDUIT	9.0	3.3352	0.0300
MS-RYT10(3)	HP-RYT10(2)	CBMH10	CONDUIT	2.0	13.6247	0.0130
MS-RYT11(2)	HP-RYT11(1)	RYE10	CONDUIT	21.9	1.4613	0.0300
MS-RYT11(3)	RYT11	HP-RYT11(2)	CONDUIT	2.0	-9.5432	0.0300
MS-RYT11(4)	HP-RYT11(2)	CBMH12	CONDUIT	2.0	11.0672	0.0130
MS-RYT13(1)	RYT13	HP-RYT13	CONDUIT	2.0	-6.5138	0.0300
MS-RYT13(2)	HP-RYT13	CICB1	CONDUIT	2.0	15.6896	0.0130
MS-RYT14(1)	RYT14	HP-RYT14	CONDUIT	2.0	-7.0172	0.0300
MS-RYT14(2)	HP-RYT14	HP-CBMH2	CONDUIT	2.0	14.6549	0.0130
MS-RYT15(1)	RYT15	HP-RYT15	CONDUIT	2.0	-5.5083	0.0300
MS-RYT15(2)	HP-RYT15	CBMH13	CONDUIT	2.0	18.2989	0.0130
MS-RYT3(1)	HP-RYT3(1)	RYT3	CONDUIT	13.3	1.6544	0.0300
MS-RYT3(2)	RYT3	HP-RYT3(2)	CONDUIT	9.4	-2.2346	0.0300
MS-RYT3(3)	HP-RYT3(2)	HP-RYT4	CONDUIT	2.8	0.0109	0.0130
MS-RYT4(1)	HP-RYT4	RYT4	CONDUIT	25.0	1.5602	0.0300
MS-RYT4(2)	RYT4	HP-RYT4(2)	CONDUIT	11.0	-2.1823	0.0300
MS-RYT4(3)	HP-RYT4(2)	HP-RYT5(2)	CONDUIT	2.8	0.0109	0.0130
MS-RYT5(1)	RYT5	HP-RYT5(1)	CONDUIT	2.0	-7.5212	0.0300
MS-RYT5(2)	HP-RYT5(1)	CBMH14	CONDUIT	2.0	7.5212	0.0130
MS-RYT5(3)	HP-RYT5(2)	RYT5	CONDUIT	10.1	2.6742	0.0300
MS-RYT5(4)	RYT5	HP-RYT5(3)	CONDUIT	8.0	-1.8753	0.0300
MS-RYT6	RYT6	HP-RYT6	CONDUIT	20.4	-1.5198	0.0300
MS-RYT7(1)	RYT7	HP-RYT7	CONDUIT	28.2	-1.4895	0.0300
MS-RYT7(2)	HP-RYT7	RYT6	CONDUIT	19.5	2.0004	0.0300
MS-RYT7(3)	RYT7	HP-RYT7(2)	CONDUIT	2.0	-10.0504	0.0300
MS-RYT7(4)	HP-RYT7(2)	CBMH3	CONDUIT	2.0	12.5988	0.0130
MS-RYT8(1)	RYT8	HP-RYT8(1)	CONDUIT	18.0	-1.5002	0.0300
MS-RYT8(2)	HP-RYT8(1)	RYE4	CONDUIT	18.0	1.5002	0.0300
MS-RYT8(3)	RYT8	HP-RYT8(2)	CONDUIT	2.0	-15.1717	0.0300
MS-RYT8(4)	HP-RYT8(2)	CBMH2	CONDUIT	2.0	18.2989	0.0130
MS-RYT9(1)	RYT9	HP-RYT9(1)	CONDUIT	36.0	-1.6391	0.0300
MS-RYT9(2)	HP-RYT9(1)	RYT8	CONDUIT	36.0	1.5002	0.0300
MS-RYT9(3)	RYT9	HP-RYT9(2)	CONDUIT	2.0	-15.1717	0.0300
MS-RYT9(4)	HP-RYT9(2)	CBMH1	CONDUIT	2.0	20.9448	0.0130

O-CBMH10	CBMH10	MH106	ORIFICE
O-CBMH11	CBMH11	MH108	ORIFICE
O-CBMH13	CBMH13	MH110	ORIFICE
O-CBMH2	CBMH2	MH106	ORIFICE
O-CBMH3	CBMH3	MH110	ORIFICE
O-CICB1	CICB1	MH106	ORIFICE
O-CICB2	CICB2	MH114	ORIFICE
O-RYE7	RYE7	MH200	ORIFICE
O-RYT13	RYT13	MH106	ORIFICE
O-RYT14	RYT14	MH108	ORIFICE
O-RYT15	RYT15	MH112	ORIFICE
O-CBMH1	CBMH1	MH104	OUTLET
O-CBMH14	CBMH14	MH112	OUTLET
O-CBMH15	CBMH15	MH118	OUTLET
O-CBMH4	CBMH4	MH112	OUTLET
O-CBMH5	CBMH5	MH118	OUTLET
O-CBMH8	CBMH8	MH200	OUTLET

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
100_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	234.96
104_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	345.40
106_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	1107.53
116_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	233.37
118_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.44
124_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.26
128_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.69
130_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.25
132_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	257.27
134_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	433.22
136_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	237.29
150_(1)_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	427.40
152_(1)_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	430.16
173_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.18
175_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.80
207_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	440.45

209_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	425.54
229_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	556.46
233_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	59.62
236_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.25
240_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	101.97
250_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	220.36
252_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	249.10
253_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.38
260_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	45.28
266_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.85
270_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	219.72
277_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
278_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	55.46
279_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.33
281_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
283_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
285_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	60.25
286_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.93
287_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	55.46
288_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	291.50
49_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	466.98
50_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	88.67
51_(STM)	CIRCULAR	0.53	0.22	0.13	0.53	1	189.55
52_(STM)	CIRCULAR	0.53	0.22	0.13	0.53	1	207.50
53_(STM)	CIRCULAR	0.60	0.28	0.15	0.60	1	228.39
55_(STM)	CIRCULAR	0.75	0.44	0.19	0.75	1	370.91
56_(STM)	CIRCULAR	0.82	0.53	0.21	0.82	1	538.11
85_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	40.71
87_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	87.67
97(1)_(STM)	CIRCULAR	0.45	0.16	0.11	0.45	1	127.77
97_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	86.94
MS-CBMH(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	78892.68
MS-CBMH1(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	68188.85
MS-CBMH1(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH1(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	66096.82
MS-CBMH1(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	136741.48
MS-CBMH10(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	68188.85
MS-CBMH10(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	28442.21
MS-CBMH10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-CBMH11(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-CBMH11(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	49352.50
MS-CBMH12(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-CBMH12(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	93746.62
MS-CBMH13(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH13(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	77030.48
MS-CBMH14(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH14(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38531.43
MS-CBMH15(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	58273.32
MS-CBMH15(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	71231.45
MS-CBMH2	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH3(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	60599.46
MS-CBMH3(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	43489.78
MS-CBMH3(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	40250.57
MS-CBMH4(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	61733.10
MS-CBMH4(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-CBMH5	RECT_OPEN	1.00	3.00	0.60	3.00	1	63947.17
MS-CBMH5(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-CBMH7(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	72222.70
MS-CBMH7(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-CBMH8(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	69215.12
MS-CBMH8(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	41900.70
MS-CBMH9(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-CICB1(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	40250.57
MS-CICB1(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	71231.45
MS-CICB2(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	52047.05
MS-CICB2(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	75135.17
MS-RYE(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	594.50
MS-RYE1	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYE10(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18156.97
MS-RYE10(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	76087.17
MS-RYE12(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE12(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	484.67
MS-RYE15(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	599.06
MS-RYE15(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	515.00
MS-RYE16(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	26259.77
MS-RYE16(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	69215.12
MS-RYE16(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	15099.18
MS-RYE2(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	548.30
MS-RYE2(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYE2(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	59446.62
MS-RYE2(5)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67

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]u_□ff4f□□□□4[□□□□□4
OYY=□□□□R4IG□□4_u_4=4Xy_Z4

MS-RYE3(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	623.18
MS-RYE3(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	601.66
MS-RYE3(3)	TRIANGULAR	0.30	0.45	0.15	3.00	1	521.50
MS-RYE3(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYE3(5)	RECT_OPEN	1.00	3.00	0.60	3.00	1	57078.21
MS-RYE4(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	591.19
MS-RYE4(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	508.79
MS-RYE4(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	38047.95
MS-RYE4(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYE5(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	593.17
MS-RYE5(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	505.68
MS-RYE6(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYE6(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	98714.78
MS-RYE7(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	23116.67
MS-RYE7(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	89521.02
MS-RYE8(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	32142.09
MS-RYE8(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYE9(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	516.50
MS-RYE9(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	517.62
MS-RYT(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	499.62
MS-RYT1(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	588.32
MS-RYT1(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	508.47
MS-RYT1(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYT1(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	47951.44
MS-RYT10(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	548.03
MS-RYT10(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	763.36
MS-RYT10(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	60599.46
MS-RYT11(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	505.29
MS-RYT11(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	21977.24
MS-RYT11(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	54616.39
MS-RYT13(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18156.97
MS-RYT13(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	65029.60
MS-RYT14(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	18845.57
MS-RYT14(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	62848.65
MS-RYT15(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	16696.95
MS-RYT15(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYT3(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	537.63
MS-RYT3(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	624.84
MS-RYT3(3)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67
MS-RYT4(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	522.10
MS-RYT4(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	617.49

MS-RYT4(3)	RECT_OPEN	0.30	0.90	0.25	3.00	1	286.67
MS-RYT5(1)	RECT_OPEN	1.00	3.00	0.60	3.00	1	19510.57
MS-RYT5(2)	RECT_OPEN	1.00	3.00	0.60	3.00	1	45024.40
MS-RYT5(3)	TRIANGULAR	0.30	0.45	0.15	3.00	1	683.54
MS-RYT5(4)	TRIANGULAR	0.30	0.45	0.15	3.00	1	572.41
MS-RYT6	TRIANGULAR	0.30	0.45	0.15	3.00	1	515.30
MS-RYT7(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	510.14
MS-RYT7(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	591.19
MS-RYT7(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	22553.72
MS-RYT7(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	58273.32
MS-RYT8(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT8(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT8(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	27710.44
MS-RYT8(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	70229.11
MS-RYT9(1)	TRIANGULAR	0.30	0.45	0.15	3.00	1	535.14
MS-RYT9(2)	TRIANGULAR	0.30	0.45	0.15	3.00	1	511.96
MS-RYT9(3)	RECT_OPEN	1.00	3.00	0.60	3.00	1	27710.44
MS-RYT9(4)	RECT_OPEN	1.00	3.00	0.60	3.00	1	75135.17

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***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 05/19/2021 00:00:00
Ending Date .............. 05/21/2021 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
```

```
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Initial LID Storage	0.002	0.453
Total Precipitation	0.383	103.232
Evaporation Loss	0.000	0.000
Infiltration Loss	0.158	42.604
Surface Runoff	0.226	60.972
Final Storage	0.002	0.453
Continuity Error (%)	-0.332	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.226	2.265
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.001
External Outflow	0.227	2.267
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.012	0.118
Final Stored Volume	0.012	0.119
Continuity Error (%)	-0.047	

```
************************
Highest Continuity Errors
************************
Node MH200 (-8.44%)
Node CBMH8 (8.33%)
```

```
*************************
Time-Step Critical Elements
*************************
None
```

```
*******************************
Highest Flow Instability Indexes
*******************************
Link O-RYE7 (89)
Link O-CBMH3 (74)
Link O-CBMH8 (50)
Link O-CBMH1 (43)
Link O-CBMH2 (8)
```

```
*********************************
Most Frequent Nonconverging Nodes
*********************************
Convergence obtained at all time steps.
```

```
************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.00
Time Step Frequencies       :
    1.000 -  0.871 sec      :    99.97 %
    0.871 -  0.758 sec      :     0.01 %
    0.758 -  0.660 sec      :     0.01 %
    0.660 -  0.574 sec      :     0.01 %
    0.574 -  0.500 sec      :     0.01 %
```

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
A1	103.23	0.00	0.00	53.89	29.94	19.83	49.77	0.02	12.87	0.482
A10	103.23	0.00	0.00	66.38	13.42	23.86	37.28	0.04	30.59	0.361
A11	103.23	0.00	0.00	28.13	65.11	10.28	75.39	0.12	53.57	0.730
A12	103.23	0.00	0.00	30.36	61.98	11.17	73.15	0.08	36.78	0.709
A13	103.23	0.00	0.00	25.05	69.25	9.21	78.46	0.02	10.12	0.760
A14	103.23	0.00	0.00	75.94	0.00	27.89	27.89	0.01	12.36	0.270
A15	103.23	0.00	0.00	37.34	52.69	13.50	66.19	0.09	45.79	0.641
A16	103.23	0.00	0.00	70.77	7.23	25.74	32.97	0.02	15.42	0.319
A17	103.23	0.00	0.00	33.68	57.90	11.94	69.84	0.15	68.17	0.677
A18	103.23	0.00	0.00	30.41	62.00	11.10	73.10	0.18	79.95	0.708
A19	103.23	0.00	0.00	42.43	45.43	15.73	61.16	0.05	26.32	0.592
A2	103.23	0.00	0.00	25.83	68.21	9.47	77.68	0.11	47.10	0.753
A20	103.23	0.00	0.00	71.51	6.19	26.03	32.23	0.03	27.74	0.312
A21	103.23	0.00	0.00	72.86	4.13	26.82	30.95	0.02	18.68	0.300
A22	103.23	0.00	0.00	45.61	41.31	16.68	57.99	0.05	[illegible]	[illegible]
A23	103.23	0.00	0.00	29.70	63.05	10.77	73.82	0.16	69.82	0.715
A24	103.23	0.00	0.00	31.22	60.97	11.32	72.30	0.07	29.84	0.700
A25	103.23	0.00	0.00	28.09	65.10	10.32	75.42	0.11	50.32	0.731
A26	103.23	0.00	0.00	42.57	45.43	15.57	61.01	0.05	26.13	0.591
A27	103.23	0.00	0.00	68.56	10.32	24.82	35.14	0.02	15.38	0.340
A28	103.23	0.00	0.00	28.04	65.08	10.39	75.46	0.09	40.36	0.731
A29	103.23	0.00	0.00	60.88	20.65	22.14	42.79	0.04	28.28	0.414
A3	103.23	0.00	0.00	60.89	20.65	22.12	42.77	0.05	37.65	0.414
A30	103.23	0.00	0.00	34.97	55.78	12.77	68.55	0.05	26.45	0.664
A31	103.23	0.00	0.00	70.90	7.23	25.58	32.81	0.02	15.23	0.318
A32	103.23	0.00	0.00	33.44	57.85	12.22	70.07	0.06	29.85	0.679
A4	103.23	0.00	0.00	33.44	57.85	12.24	70.09	0.08	39.84	0.679
A5	103.23	0.00	0.00	42.43	45.43	15.73	61.16	0.05	26.32	0.592
A6	103.23	0.00	0.00	61.15	20.65	21.83	42.48	0.09	67.42	0.411
A7	103.23	0.00	0.00	31.23	60.98	11.31	72.28	0.06	26.50	0.700
A8	103.23	0.00	0.00	28.13	65.11	10.28	75.39	0.12	53.56	0.730
A9	103.23	0.00	0.00	42.43	45.43	15.73	61.15	0.05	26.32	0.592
U1	103.23	0.00	0.00	75.33	0.00	28.37	28.37	0.01	15.70	0.275
U2	103.23	0.00	0.00	75.66	0.00	28.21	28.21	0.01	9.39	0.273
U3	103.23	0.00	0.00	75.35	0.00	28.41	28.41	0.01	15.70	0.275
U4	103.23	0.00	0.00	45.58	41.30	16.72	58.02	0.08	42.32	0.562

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min	Reported Max Depth Meters
CBMH4-Dummy	JUNCTION	0.11	2.34	97.48	0	12:06	2.34
HP-CBMH1	JUNCTION	0.00	0.00	97.08	0	00:00	0.00
HP-CBMH1(2)	JUNCTION	0.00	0.00	97.06	0	00:00	0.00
HP-CBMH10	JUNCTION	0.00	0.00	97.20	0	00:00	0.00
HP-CBMH11	JUNCTION	0.00	0.04	97.29	0	12:06	0.04
HP-CBMH12	JUNCTION	0.00	0.00	97.70	0	00:00	0.00
HP-CBMH13	JUNCTION	0.00	0.00	97.66	0	00:00	0.00
HP-CBMH14	JUNCTION	0.00	0.06	97.40	0	12:01	0.06
HP-CBMH15	JUNCTION	0.00	0.00	97.75	0	00:00	0.00
HP-CBMH2	JUNCTION	0.00	0.00	97.14	0	11:58	0.00
HP-CBMH3	JUNCTION	0.00	0.01	97.38	0	12:01	0.01
HP-CBMH4	JUNCTION	0.00	0.00	97.59	0	00:00	0.00
HP-CBMH5	JUNCTION	0.00	0.00	97.68	0	00:00	0.00
HP-CBMH7	JUNCTION	0.00	0.00	97.16	0	00:00	0.00
HP-CBMH8	JUNCTION	0.00	0.00	97.27	0	00:00	0.00
HP-CBMH9	JUNCTION	0.00	0.00	97.31	0	00:00	0.00
HP-CICB1	JUNCTION	0.00	0.01	97.12	0	12:00	0.01
HP-CICB2	JUNCTION	0.00	0.01	97.65	0	12:00	0.01
HP-RYE10	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYE12	JUNCTION	0.00	0.03	97.34	0	11:59	0.03
HP-RYE15	JUNCTION	0.01	0.09	97.61	0	12:41	0.09
HP-RYE16(1)	JUNCTION	0.00	0.00	97.85	0	00:00	0.00
HP-RYE2(1)	JUNCTION	0.00	0.00	97.68	0	00:00	0.00
HP-RYE2(2)	JUNCTION	0.00	0.00	97.66	0	19:43	0.00
HP-RYE2(3)	JUNCTION	0.00	0.00	97.70	0	00:00	0.00
HP-RYE3(1)	JUNCTION	0.00	0.00	97.52	0	00:00	0.00
HP-RYE3(2)	JUNCTION	0.00	0.00	97.69	0	00:00	0.00
HP-RYE3(3)	JUNCTION	0.00	0.00	97.55	0	00:00	0.00
HP-RYE4	JUNCTION	0.00	0.00	97.35	0	00:00	0.00
HP-RYE4(2)	JUNCTION	0.00	0.00	97.45	0	12:00	0.00
HP-RYE5	JUNCTION	0.00	0.00	97.15	0	00:00	0.00
HP-RYE6	JUNCTION	0.00	0.00	97.60	0	00:00	0.00
HP-RYE7	JUNCTION	0.00	0.00	97.35	0	00:00	0.00
HP-RYE8	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYE9	JUNCTION	0.00	0.00	97.55	0	00:00	0.00
HP-RYT1(1)	JUNCTION	0.00	0.00	97.76	0	00:00	0.00
HP-RYT1(2)	JUNCTION	0.00	0.06	97.61	0	12:41	0.06
HP-RYT10(1)	JUNCTION	0.00	0.00	97.43	0	00:00	0.00
HP-RYT10(2)	JUNCTION	0.00	0.00	97.13	0	00:00	0.00
HP-RYT11(1)	JUNCTION	0.00	0.00	97.69	0	00:00	0.00
HP-RYT11(2)	JUNCTION	0.00	0.00	97.77	0	00:00	0.00
HP-RYT13	JUNCTION	0.00	0.00	97.30	0	12:00	0.00
HP-RYT14	JUNCTION	0.00	0.00	97.43	0	11:58	0.00
HP-RYT15	JUNCTION	0.00	0.00	97.59	0	11:57	0.00
HP-RYT3(1)	JUNCTION	0.00	0.00	97.66	1	07:17	0.00
HP-RYT3(2)	JUNCTION	0.00	0.00	97.65	0	00:00	0.00
HP-RYT4	JUNCTION	0.00	0.00	97.65	0	00:00	0.00
HP-RYT4(2)	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYT5(1)	JUNCTION	0.00	0.03	97.41	0	12:01	0.03
HP-RYT5(2)	JUNCTION	0.00	0.00	97.50	0	00:00	0.00
HP-RYT5(3)	JUNCTION	0.00	0.03	97.41	0	12:01	0.03
HP-RYT6	JUNCTION	0.00	0.00	97.49	0	00:00	0.00
HP-RYT7	JUNCTION	0.00	0.00	97.57	0	00:00	0.00
HP-RYT7(2)	JUNCTION	0.00	0.00	97.35	0	00:00	0.00
HP-RYT8(1)	JUNCTION	0.00	0.00	97.17	0	00:00	0.00
HP-RYT8(2)	JUNCTION	0.00	0.00	97.20	0	00:00	0.00
HP-RYT9(1)	JUNCTION	0.00	0.00	97.44	0	00:00	0.00
HP-RYT9(2)	JUNCTION	0.00	0.00	97.15	0	00:00	0.00
RYT01-Dummy	JUNCTION	0.59	2.18	97.61	0	12:40	2.18
HP-RYE1	OUTFALL	0.00	0.00	97.61	0	00:00	0.00
HP-RYE16(2)	OUTFALL	0.00	0.01	97.68	0	12:04	0.01
MH1013	OUTFALL	0.97	0.97	95.05	0	00:00	0.97
OF1	OUTFALL	0.00	0.00	97.00	0	00:00	0.00
OF2	OUTFALL	0.00	0.00	97.73	0	00:00	0.00
OF3	OUTFALL	0.00	0.00	97.15	0	00:00	0.00
OF4	OUTFALL	0.00	0.00	96.85	0	00:00	0.00
CBMH1	STORAGE	0.88	2.24	97.01	0	12:47	2.24
CBMH10	STORAGE	0.28	2.27	97.12	0	12:10	2.27
CBMH11	STORAGE	0.20	2.38	97.28	0	12:07	2.38
CBMH12	STORAGE	0.05	2.13	97.28	0	12:06	2.13
CBMH13	STORAGE	0.18	2.50	97.41	0	12:01	2.50
CBMH14	STORAGE	0.47	2.32	97.41	0	12:01	2.32

CBMH15	STORAGE	0.40	2.34	97.69	0	12:04	2.34
CBMH2	STORAGE	0.26	2.22	97.08	0	12:07	2.22
CBMH3	STORAGE	0.14	2.33	97.31	0	12:08	2.33
CBMH4	STORAGE	0.12	2.36	97.48	0	12:06	2.36
CBMH5	STORAGE	0.68	2.32	97.61	0	12:41	2.32
CBMH7	STORAGE	0.47	0.54	95.12	0	12:00	0.54
CBMH8	STORAGE	0.30	2.24	97.09	0	12:10	2.24
CBMH9	STORAGE	0.07	2.02	97.19	0	12:02	2.02
CICB1	STORAGE	0.03	1.71	97.13	0	12:00	1.71
CICB2	STORAGE	0.03	1.61	97.65	0	12:00	1.61
MH100	STORAGE	0.95	0.96	95.06	0	12:00	0.96
MH102	STORAGE	0.92	0.94	95.07	0	12:00	0.94
MH104	STORAGE	0.90	0.93	95.08	0	12:00	0.93
MH106	STORAGE	0.74	0.79	95.10	0	12:00	0.79
MH108	STORAGE	0.52	0.60	95.13	0	12:00	0.60
MH110	STORAGE	0.40	0.49	95.14	0	12:00	0.49
MH112	STORAGE	0.26	0.36	95.15	0	12:01	0.36
MH114	STORAGE	0.03	0.13	95.22	0	12:01	0.13
MH116	STORAGE	0.03	0.10	95.22	0	12:01	0.10
MH118	STORAGE	0.02	0.08	95.23	0	12:02	0.08
MH200	STORAGE	0.36	0.43	95.12	0	12:00	0.43
MH202	STORAGE	0.27	2.22	97.10	0	12:08	2.22
MH204	STORAGE	0.20	2.21	97.14	0	12:03	2.20
MH206	STORAGE	0.35	2.20	97.68	0	12:03	2.20
RYE1	STORAGE	0.51	2.00	97.61	0	12:40	2.00
RYE10	STORAGE	0.03	1.81	97.28	0	12:06	1.81
RYE11	STORAGE	0.02	1.54	97.18	0	12:00	1.54
RYE12	STORAGE	0.01	1.58	97.34	0	11:59	1.58
RYE13	STORAGE	0.01	1.54	97.45	0	12:00	1.54
RYE14	STORAGE	0.01	1.54	97.64	0	11:56	1.54
RYE15	STORAGE	0.54	2.06	97.61	0	12:41	2.06
RYE16	STORAGE	0.34	2.16	97.68	0	12:03	2.16
RYE17	STORAGE	0.02	1.43	97.69	0	12:00	1.43
RYE2	STORAGE	0.28	1.89	97.42	0	12:00	1.89
RYE3	STORAGE	0.04	1.45	97.41	0	12:00	1.45
RYE4	STORAGE	0.06	1.85	97.11	0	12:01	1.85
RYE5	STORAGE	0.56	1.87	97.02	0	12:46	1.87
RYE6	STORAGE	0.24	2.19	97.10	0	12:08	2.19
RYE7	STORAGE	0.03	2.11	97.14	0	12:00	2.10
RYE8	STORAGE	0.07	2.00	97.19	0	12:02	2.00
RYE9	STORAGE	0.06	1.83	97.13	0	12:06	1.83

RYT1	STORAGE	0.66	2.29	97.61	0	12:40	2.29
RYT10	STORAGE	0.12	2.12	97.13	0	12:07	2.12
RYT11	STORAGE	0.04	2.12	97.28	0	12:06	2.12
RYT12	STORAGE	0.02	1.69	97.14	0	12:00	1.69
RYT13	STORAGE	0.02	1.71	97.30	0	12:00	1.71
RYT14	STORAGE	0.02	1.71	97.43	0	11:58	1.71
RYT15	STORAGE	0.02	1.68	97.59	0	11:57	1.68
RYT16	STORAGE	0.02	1.59	97.66	0	12:00	1.59
RYT3	STORAGE	0.32	2.01	97.42	0	12:00	2.01
RYT4	STORAGE	0.39	2.18	97.41	0	12:01	2.18
RYT5	STORAGE	0.46	2.30	97.41	0	12:01	2.30
RYT6	STORAGE	0.05	1.73	97.35	0	12:02	1.73
RYT7	STORAGE	0.07	2.17	97.31	0	12:06	2.17
RYT8	STORAGE	0.23	2.19	97.08	0	12:07	2.19
RYT9	STORAGE	0.86	2.23	97.02	0	12:38	2.23

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent	
CBMH4-Dummy	JUNCTION	0.00	5.19	0 11:42	0	0.00331	-8.756	
HP-CBMH1	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH1(2)	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH10	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH11	JUNCTION	0.00	65.25	0 12:07	0	0.0232	0.712	
HP-CBMH12	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH13	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH14	JUNCTION	0.00	118.00	0 11:59	0	0.0624	-0.014	
HP-CBMH15	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH2	JUNCTION	0.00	1.54	0 11:58	0	0.00022	0.010	
HP-CBMH3	JUNCTION	0.00	105.43	0 12:01	0	0.0391	0.003	
HP-CBMH4	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH5	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr
HP-CBMH7	JUNCTION	0.00	0.00	0 00:00	0	0	0.000	ltr

HP-CBMH8	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CBMH9	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-CICB1	JUNCTION	0.00	47.29	0	12:00	0	0.0242	0.108	
HP-CICB2	JUNCTION	0.00	37.84	0	12:00	0	0.0215	0.121	
HP-RYE10	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE12	JUNCTION	0.00	3.90	0	11:58	0	0.000172	-5.589	
HP-RYE15	JUNCTION	0.00	4.48	0	12:01	0	0.00407	0.049	
HP-RYE16(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE2(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE2(2)	JUNCTION	0.00	0.03	0	00:39	0	2.78e-05	-0.009	ltr
HP-RYE2(3)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE3(3)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE4	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE4(2)	JUNCTION	0.00	5.47	0	12:00	0	0.000911	0.001	
HP-RYE5	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE6	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE7	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE8	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE9	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT1(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT1(2)	JUNCTION	0.00	6.10	0	12:06	0	0.0218	-0.001	
HP-RYT10(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT10(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT11(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT11(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT13	JUNCTION	0.00	6.73	0	12:00	0	0.000915	-0.000	
HP-RYT14	JUNCTION	0.00	3.99	0	11:58	0	0.000407	-0.062	
HP-RYT15	JUNCTION	0.00	7.88	0	11:57	0	0.00187	-0.001	
HP-RYT3(1)	JUNCTION	0.00	0.03	0	01:29	0	2.78e-05	0.009	ltr
HP-RYT3(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT4	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT4(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT5(1)	JUNCTION	0.00	49.13	0	12:00	0	0.0173	-0.012	
HP-RYT5(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT5(3)	JUNCTION	0.00	1.02	0	11:59	0	8.29e-05	0.000	
HP-RYT6	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT7	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT7(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT8(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT8(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT9(1)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYT9(2)	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	ltr
RYT01-Dummy	JUNCTION	0.00	6.04	0	11:53	0	0.0126	-0.955	
HP-RYE1	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	ltr
HP-RYE16(2)	OUTFALL	0.00	14.34	0	12:04	0	0.0152	0.000	
MH1013	OUTFALL	0.00	300.03	0	12:00	0	2.14	0.000	
OF1	OUTFALL	15.70	15.70	0	12:00	0.0142	0.0142	0.000	
OF2	OUTFALL	15.70	15.70	0	12:00	0.0142	0.0142	0.000	
OF3	OUTFALL	9.39	9.39	0	12:00	0.0085	0.0085	0.000	
OF4	OUTFALL	42.32	42.32	0	12:00	0.0755	0.0755	0.000	
CBMH1	STORAGE	69.82	146.23	0	11:59	0.155	0.29	0.342	
CBMH10	STORAGE	68.17	107.39	0	11:58	0.147	0.252	-0.003	
CBMH11	STORAGE	45.79	103.92	0	12:06	0.0928	0.158	-0.101	
CBMH12	STORAGE	10.12	21.51	0	11:59	0.0236	0.0462	-0.014	
CBMH13	STORAGE	36.78	161.41	0	11:59	0.0805	0.145	0.014	
CBMH14	STORAGE	26.50	130.53	0	11:58	0.0579	0.191	-0.033	
CBMH15	STORAGE	47.10	57.82	0	11:59	0.109	0.136	0.013	
CBMH2	STORAGE	79.95	100.15	0	11:53	0.176	0.216	0.016	
CBMH3	STORAGE	53.57	123.55	0	12:00	0.121	0.192	0.017	
CBMH4	STORAGE	53.56	53.56	0	12:00	0.121	0.124	0.055	
CBMH5	STORAGE	39.84	64.21	0	11:55	0.0842	0.169	0.001	
CBMH7	STORAGE	50.32	83.28	0	12:00	0.113	0.262	0.011	
CBMH8	STORAGE	40.36	67.22	0	11:59	0.0906	0.137	9.092	
CBMH9	STORAGE	26.45	42.38	0	11:59	0.0549	0.0734	-0.012	
CICB1	STORAGE	29.84	66.20	0	12:00	0.0651	0.118	-0.011	
CICB2	STORAGE	29.85	56.16	0	12:00	0.0631	0.112	0.002	
MH100	STORAGE	0.00	299.90	0	12:00	0	2.14	0.000	
MH102	STORAGE	0.00	299.76	0	12:00	0	2.14	0.000	
MH104	STORAGE	0.00	299.71	0	12:00	0	2.14	-0.048	
MH106	STORAGE	0.00	217.63	0	12:03	0	1.68	0.000	
MH108	STORAGE	0.00	138.38	0	12:02	0	1.1	0.001	
MH110	STORAGE	0.00	97.86	0	12:02	0	0.909	-0.003	
MH112	STORAGE	0.00	52.79	0	12:01	0	0.619	0.001	
MH114	STORAGE	0.00	23.21	0	12:00	0	0.34	-0.001	
MH116	STORAGE	0.00	5.02	0	12:12	0	0.249	0.001	
MH118	STORAGE	0.00	4.92	0	12:08	0	0.249	0.000	
MH200	STORAGE	0.00	33.17	0	12:00	0	0.139	-7.787	
MH202	STORAGE	0.00	25.16	0	11:56	0	0.0503	-0.026	
MH204	STORAGE	0.00	44.14	0	11:57	0	0.113	0.010	
MH206	STORAGE	0.00	14.20	0	11:49	0	0.0405	0.006	

RYE1	STORAGE	0.00	5.96	0	11:53	0	0.00427	0.042
RYE10	STORAGE	12.36	12.36	0	12:00	0.0112	0.0113	-0.049
RYE11	STORAGE	29.23	29.23	0	12:00	0.0523	0.0523	-0.003
RYE12	STORAGE	26.13	26.13	0	12:00	0.0489	0.049	0.000
RYE13	STORAGE	26.32	26.32	0	12:00	0.049	0.049	-0.008
RYE14	STORAGE	26.32	26.32	0	12:00	0.049	0.049	-0.006
RYE15	STORAGE	0.00	20.58	0	11:53	0	0.0103	0.047
RYE16	STORAGE	12.87	14.34	0	12:03	0.0199	0.0332	0.013
RYE17	STORAGE	26.32	26.32	0	12:00	0.049	0.049	-0.004
RYE2	STORAGE	67.42	67.42	0	12:00	0.0937	0.0937	-0.041
RYE3	STORAGE	30.59	30.59	0	12:00	0.0374	0.0374	-0.088
RYE4	STORAGE	27.74	33.20	0	12:00	0.0291	0.0306	0.010
RYE5	STORAGE	18.68	38.23	0	11:52	0.0186	0.0466	-0.004
RYE6	STORAGE	15.23	15.23	0	12:00	0.0165	0.0221	-0.016
RYE7	STORAGE	28.28	28.28	0	12:00	0.0386	0.04	0.769
RYE8	STORAGE	15.38	16.05	0	12:00	0.0176	0.0185	0.058
RYE9	STORAGE	15.42	15.42	0	12:00	0.0165	0.0168	-0.016
RYT1	STORAGE	37.65	57.85	0	11:53	0.0515	0.104	0.012
RYT10	STORAGE	0.00	20.43	0	11:54	0	0.0249	0.009
RYT11	STORAGE	0.00	12.81	0	11:53	0	0.0161	0.056
RYT12	STORAGE	0.00	29.22	0	12:00	0	0.0523	0.004
RYT13	STORAGE	0.00	25.63	0	12:00	0	0.0488	0.003
RYT14	STORAGE	0.00	22.47	0	11:57	0	0.0481	0.000
RYT15	STORAGE	0.00	26.58	0	11:57	0	0.049	-0.003
RYT16	STORAGE	0.00	26.32	0	12:00	0	0.049	0.005
RYT3	STORAGE	0.00	67.95	0	11:58	0	0.0946	-0.008
RYT4	STORAGE	0.00	74.30	0	11:56	0	0.107	0.033
RYT5	STORAGE	0.00	68.49	0	11:58	0	0.124	0.006
RYT6	STORAGE	0.00	29.65	0	11:59	0	0.0392	0.026
RYT7	STORAGE	0.00	22.73	0	11:59	0	0.048	0.077
RYT8	STORAGE	0.00	30.03	0	11:52	0	0.0407	0.026
RYT9	STORAGE	0.00	80.27	0	11:52	0	0.138	0.001

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Above Crown Meters	Below Rim Meters
CBMH4-Dummy	JUNCTION	2.14	1.591	0.659
RYT01-Dummy	JUNCTION	14.08	1.577	0.823
MH204	STORAGE	1.98	1.557	0.000
RYE17	STORAGE	0.56	1.185	0.965

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
CBMH1	0.012	1.3	0.0	0.0	0.073	7.8	0 12:47	82.77
CBMH10	0.001	0.2	0.0	0.0	0.044	7.4	0 12:10	51.69
CBMH11	0.001	0.1	0.0	0.0	0.027	4.9	0 12:07	79.76
CBMH12	0.000	1.4	0.0	0.0	0.002	62.7	0 12:06	20.62
CBMH13	0.000	0.1	0.0	0.0	0.021	3.6	0 12:01	127.47
CBMH14	0.001	0.2	0.0	0.0	0.012	4.0	0 12:01	120.12
CBMH15	0.003	0.3	0.0	0.0	0.039	3.9	0 12:04	16.89
CBMH2	0.001	0.1	0.0	0.0	0.047	6.0	0 12:07	40.61
CBMH3	0.001	0.1	0.0	0.0	0.046	4.6	0 12:08	40.91
CBMH4	0.001	0.1	0.0	0.0	0.032	3.2	0 12:06	9.82
CBMH5	0.005	0.8	0.0	0.0	0.037	5.7	0 12:41	28.47
CBMH7	0.001	0.1	0.0	0.0	0.001	0.1	0 12:00	83.22
CBMH8	0.001	0.1	0.0	0.0	0.017	3.4	0 12:10	26.66
CBMH9	0.000	0.0	0.0	0.0	0.004	0.5	0 12:02	33.35
CICB1	0.000	1.2	0.0	0.0	0.001	66.5	0 12:00	66.17
CICB2	0.000	1.2	0.0	0.0	0.001	67.1	0 12:00	56.16

MH100	0.002	33.2	0.0	0.0	0.002	33.6	0	12:00	300.03
MH102	0.002	31.8	0.0	0.0	0.002	32.5	0	12:00	299.90
MH104	0.002	31.3	0.0	0.0	0.002	32.2	0	12:00	299.76
MH106	0.001	26.3	0.0	0.0	0.001	28.1	0	12:00	218.40
MH108	0.001	18.9	0.0	0.0	0.001	21.7	0	12:00	138.85
MH110	0.000	14.8	0.0	0.0	0.001	18.0	0	12:00	98.30
MH112	0.000	9.7	0.0	0.0	0.000	13.2	0	12:01	54.42
MH114	0.000	1.2	0.0	0.0	0.000	5.3	0	12:01	23.21
MH116	0.000	1.0	0.0	0.0	0.000	4.1	0	12:01	5.24
MH118	0.000	1.0	0.0	0.0	0.000	3.0	0	12:02	5.02
MH200	0.000	14.7	0.0	0.0	0.000	17.6	0	12:00	33.94
MH202	0.000	10.8	0.0	0.0	0.004	88.8	0	12:08	26.88
MH204	0.000	9.0	0.0	0.0	0.002	100.0	0	12:02	40.65
MH206	0.000	15.4	0.0	0.0	0.002	96.7	0	12:03	13.77
RYE1	0.000	18.0	0.0	0.0	0.000	69.8	0	12:40	1.82
RYE10	0.000	1.1	0.0	0.0	0.000	62.5	0	12:06	12.31
RYE11	0.000	0.8	0.0	0.0	0.000	61.7	0	12:00	29.22
RYE12	0.000	0.6	0.0	0.0	0.000	65.7	0	11:59	26.45
RYE13	0.000	0.6	0.0	0.0	0.000	64.3	0	12:00	26.62
RYE14	0.000	0.6	0.0	0.0	0.000	64.0	0	11:56	26.58
RYE15	0.000	19.6	0.0	0.0	0.000	75.1	0	12:41	0.89
RYE16	0.000	11.1	0.0	0.0	0.000	70.7	0	12:03	14.34
RYE17	0.000	0.8	0.0	0.0	0.000	59.8	0	12:00	26.32
RYE2	0.000	9.5	0.0	0.0	0.000	63.5	0	12:00	67.95
RYE3	0.000	1.5	0.0	0.0	0.000	59.5	0	12:00	29.65
RYE4	0.000	2.2	0.0	0.0	0.000	70.3	0	12:01	22.24
RYE5	0.000	20.6	0.0	0.0	0.000	69.2	0	12:46	41.56
RYE6	0.000	6.9	0.0	0.0	0.000	62.9	0	12:08	20.05
RYE7	0.000	0.9	0.0	0.0	0.000	67.9	0	12:00	26.69
RYE8	0.000	2.4	0.0	0.0	0.000	68.7	0	12:02	15.93
RYE9	0.000	2.0	0.0	0.0	0.000	60.0	0	12:06	14.95
RYT1	0.001	21.6	0.0	0.0	0.003	75.5	0	12:40	37.68
RYT10	0.000	3.6	0.0	0.0	0.002	64.0	0	12:07	14.46
RYT11	0.000	1.2	0.0	0.0	0.002	62.0	0	12:06	11.41
RYT12	0.000	0.9	0.0	0.0	0.000	64.4	0	12:00	29.25
RYT13	0.000	0.7	0.0	0.0	0.000	66.4	0	12:00	25.63
RYT14	0.000	0.7	0.0	0.0	0.000	66.6	0	11:58	22.89
RYT15	0.000	0.7	0.0	0.0	0.000	65.5	0	11:57	26.62
RYT16	0.000	0.9	0.0	0.0	0.000	61.8	0	12:00	26.34
RYT3	0.000	10.6	0.0	0.0	0.000	66.2	0	12:00	74.30
RYT4	0.000	13.0	0.0	0.0	0.000	72.1	0	12:01	68.49
RYT5	0.000	14.7	0.0	0.0	0.000	73.7	0	12:01	66.98
RYT6	0.000	1.9	0.0	0.0	0.000	67.6	0	12:02	22.73
RYT7	0.000	2.2	0.0	0.0	0.000	72.2	0	12:06	18.22
RYT8	0.000	7.6	0.0	0.0	0.002	72.6	0	12:07	26.25
RYT9	0.001	28.1	0.0	0.0	0.003	72.7	0	12:38	38.55

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HP-RYE1	0.00	0.00	0.00	0.000
HP-RYE16(2)	1.83	4.82	14.34	0.015
MH1013	90.41	13.75	300.03	2.140
OF1	1.67	5.05	15.70	0.014
OF2	1.67	5.05	15.70	0.014
OF3	1.84	2.73	9.39	0.009
OF4	50.21	0.88	42.32	0.076
System	21.09	32.28	384.83	2.268

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
100_(STM)	CONDUIT	26.88	0	11:59	0.10	0.11	1.00
104_(STM)	CONDUIT	80.27	0	11:52	0.18	0.23	1.00
106_(STM)	CONDUIT	41.56	0	11:54	0.09	0.04	1.00
116_(STM)	CONDUIT	26.25	0	11:53	0.09	0.11	1.00
118_(STM)	CONDUIT	22.24	0	12:00	0.45	0.37	1.00

124_(STM)	CONDUIT	22.24	0	11:53	0.45	0.53	1.00
128_(STM)	CONDUIT	22.73	0	11:59	0.46	0.38	1.00
130_(STM)	CONDUIT	29.65	0	11:59	0.73	0.50	1.00
132_(STM)	CONDUIT	26.43	0	11:53	0.09	0.10	1.00
134_(STM)	CONDUIT	6.04	0	11:53	0.02	0.01	1.00
136_(STM)	CONDUIT	20.05	0	11:58	0.07	0.08	1.00
150_(1)_(STM)	CONDUIT	67.95	0	11:58	0.29	0.16	1.00
152_(1)_(STM)	CONDUIT	74.30	0	11:56	0.26	0.17	1.00
173_(STM)	CONDUIT	5.96	0	11:53	0.12	0.10	1.00
175_(STM)	CONDUIT	20.62	0	11:59	0.42	0.48	1.00
207_(STM)	CONDUIT	68.49	0	11:58	0.26	0.16	1.00
209_(STM)	CONDUIT	5.19	0	11:42	0.02	0.01	1.00
229_(STM)	CONDUIT	299.76	0	12:00	0.56	0.54	1.00
233_(STM)	CONDUIT	40.65	0	11:57	0.58	0.68	1.00
236_(STM)	CONDUIT	33.35	0	11:56	0.68	0.79	1.00
240_(STM)	CONDUIT	5.02	0	12:12	0.44	0.05	0.24
250_(STM)	CONDUIT	15.93	0	11:59	0.06	0.07	1.00
252_(STM)	CONDUIT	14.46	0	11:55	0.05	0.06	1.00
253_(STM)	CONDUIT	14.95	0	12:00	0.30	0.25	1.00
260_(STM)	CONDUIT	52.29	0	11:54	1.07	1.15	1.00
266_(STM)	CONDUIT	12.31	0	11:59	0.25	0.21	1.00
270_(STM)	CONDUIT	11.41	0	11:59	0.18	0.05	1.00
277_(STM)	CONDUIT	29.22	0	12:00	0.60	0.49	1.00
278_(STM)	CONDUIT	29.25	0	12:00	0.60	0.53	1.00
279_(STM)	CONDUIT	25.63	0	12:00	0.52	0.43	1.00
281_(STM)	CONDUIT	22.47	0	11:57	0.46	0.37	1.00
283_(STM)	CONDUIT	26.58	0	11:57	0.54	0.44	1.00
285_(STM)	CONDUIT	20.58	0	11:53	0.42	0.34	1.00
286_(STM)	CONDUIT	26.32	0	12:00	0.54	0.44	1.00
287_(STM)	CONDUIT	26.34	0	12:00	0.54	0.47	1.00
288_(STM)	CONDUIT	11.90	0	11:59	0.11	0.04	1.00
49_(STM)	CONDUIT	300.03	0	12:00	0.56	0.64	1.00
50_(STM)	CONDUIT	23.21	0	12:01	0.55	0.26	0.45
51_(STM)	CONDUIT	54.42	0	12:02	0.29	0.29	0.80
52_(STM)	CONDUIT	98.30	0	12:05	0.47	0.47	0.96
53_(STM)	CONDUIT	138.85	0	12:03	0.49	0.61	1.00
55_(STM)	CONDUIT	218.40	0	12:03	0.49	0.59	1.00
56_(STM)	CONDUIT	299.90	0	12:00	0.56	0.56	1.00
85_(STM)	CONDUIT	14.20	0	11:49	0.29	0.35	1.00
87_(STM)	CONDUIT	5.24	0	12:11	0.41	0.06	0.31
97(1)_(STM)	CONDUIT	83.22	0	12:00	0.52	0.65	1.00

97_(STM)	CONDUIT	33.94	0	12:00	0.31	0.39	1.00
MS-CBMH(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
MS-CBMH1(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.14
MS-CBMH1(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH1(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.14
MS-CBMH1(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
MS-CBMH10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH10(3)	CONDUIT	0.52	0	11:58	0.00	0.00	0.07
MS-CBMH11(1)	CONDUIT	91.44	0	12:06	0.28	0.00	0.12
MS-CBMH11(2)	CONDUIT	1.27	0	11:58	0.10	0.00	0.02
MS-CBMH12(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH12(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH13(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH13(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH14(1)	CONDUIT	118.00	0	11:59	0.42	0.00	0.12
MS-CBMH14(2)	CONDUIT	117.20	0	11:59	0.43	0.00	0.12
MS-CBMH15(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-CBMH15(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-CBMH2	CONDUIT	0.74	0	11:58	0.00	0.00	0.12
MS-CBMH3(1)	CONDUIT	63.92	0	12:01	0.26	0.00	0.11
MS-CBMH3(2)	CONDUIT	105.43	0	12:01	0.37	0.00	0.10
MS-CBMH3(3)	CONDUIT	41.52	0	12:01	1.09	0.00	0.02
MS-CBMH4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH5	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-CBMH5(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-CBMH7(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-CBMH7(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-CBMH8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.02
MS-CBMH9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.02
MS-CICB1(1)	CONDUIT	47.29	0	12:00	0.21	0.00	0.07
MS-CICB1(2)	CONDUIT	47.29	0	12:00	1.37	0.00	0.14
MS-CICB2(1)	CONDUIT	37.84	0	12:00	0.11	0.00	0.11
MS-CICB2(2)	CONDUIT	37.84	0	12:00	1.43	0.00	0.09
MS-RYE(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE1	CONDUIT	0.00	0	00:00	0.00	0.00	0.07
MS-RYE10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE10(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10

MS-RYE12(1)	CONDUIT	3.90	0	11:58	0.02	0.00	0.10
MS-RYE12(2)	CONDUIT	0.69	0	11:59	0.06	0.00	0.17
MS-RYE15(1)	CONDUIT	2.54	0	12:01	0.02	0.00	0.64
MS-RYE15(2)	CONDUIT	4.48	0	12:01	0.07	0.01	0.57
MS-RYE16(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
MS-RYE16(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYE16(3)	CONDUIT	14.34	0	12:04	0.08	0.00	0.06
MS-RYE2(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE2(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE2(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
MS-RYE2(5)	CONDUIT	0.03	0	00:39	0.00	0.00	0.01
MS-RYE3(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.02
MS-RYE3(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.02
MS-RYE3(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.50
MS-RYE3(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.01
MS-RYE3(5)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-RYE4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.36
MS-RYE4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.27
MS-RYE4(3)	CONDUIT	5.47	0	12:00	0.02	0.00	0.11
MS-RYE4(4)	CONDUIT	5.47	0	12:00	0.02	0.00	0.07
MS-RYE5(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.28
MS-RYE5(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.28
MS-RYE6(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE6(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-RYE7(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE7(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.04
MS-RYE8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.02
MS-RYE9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYE9(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT1(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.43
MS-RYT1(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.23
MS-RYT1(3)	CONDUIT	5.84	0	12:06	0.01	0.00	0.16
MS-RYT1(4)	CONDUIT	6.10	0	12:06	0.02	0.00	0.14
MS-RYT10(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT10(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT10(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
MS-RYT11(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT11(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT11(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT13(1)	CONDUIT	6.73	0	12:00	0.03	0.00	0.07
MS-RYT13(2)	CONDUIT	6.72	0	12:00	0.03	0.00	0.07
MS-RYT14(1)	CONDUIT	3.99	0	11:58	0.02	0.00	0.07
MS-RYT14(2)	CONDUIT	1.54	0	11:58	0.00	0.00	0.00
MS-RYT15(1)	CONDUIT	7.88	0	11:57	0.04	0.00	0.06
MS-RYT15(2)	CONDUIT	7.87	0	11:57	0.06	0.00	0.09
MS-RYT3(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT3(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT3(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT4(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
MS-RYT4(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
MS-RYT4(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
MS-RYT5(1)	CONDUIT	49.13	0	12:00	0.16	0.00	0.10
MS-RYT5(2)	CONDUIT	48.50	0	12:01	0.16	0.00	0.10
MS-RYT5(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.30
MS-RYT5(4)	CONDUIT	1.02	0	11:59	0.03	0.00	0.35
MS-RYT6	CONDUIT	0.00	0	00:00	0.00	0.00	0.28
MS-RYT7(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.27
MS-RYT7(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.28
MS-RYT7(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.08
MS-RYT7(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
MS-RYT8(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.29
MS-RYT8(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.36
MS-RYT8(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.09
MS-RYT8(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.12
MS-RYT9(1)	CONDUIT	0.00	0	00:00	0.00	0.00	0.28
MS-RYT9(2)	CONDUIT	0.00	0	00:00	0.00	0.00	0.29
MS-RYT9(3)	CONDUIT	0.00	0	00:00	0.00	0.00	0.08
MS-RYT9(4)	CONDUIT	0.00	0	00:00	0.00	0.00	0.14
O-CBMH10	ORIFICE	20.93	0	12:13			1.00
O-CBMH11	ORIFICE	21.59	0	12:09			1.00
O-CBMH13	ORIFICE	22.07	0	12:14			1.00
O-CBMH2	ORIFICE	20.67	0	12:13			1.00
O-CBMH3	ORIFICE	21.77	0	12:15			1.00
O-CICB1	ORIFICE	18.88	0	12:00			1.00
O-CICB2	ORIFICE	18.32	0	12:00			1.00
O-RYE7	ORIFICE	26.69	0	12:00			1.00
O-RYT13	ORIFICE	18.91	0	12:00			1.00
O-RYT14	ORIFICE	18.90	0	11:58			1.00
O-RYT15	ORIFICE	18.74	0	11:57			1.00
O-CBMH1	DUMMY	2.75	0	12:47			

O-CBMH14	DUMMY	2.13	0	12:01
O-CBMH15	DUMMY	2.80	0	12:04
O-CBMH4	DUMMY	8.75	0	12:06
O-CBMH5	DUMMY	2.13	0	12:41
O-CBMH8	DUMMY	6.54	0	12:10

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
100_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
104_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
106_(STM)	1.00	0.00	0.34	0.00	0.66	0.00	0.00	0.00	0.57	0.00
116_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
118_(STM)	1.00	0.00	0.47	0.00	0.53	0.00	0.00	0.00	0.96	0.00
124_(STM)	1.00	0.00	0.47	0.00	0.53	0.00	0.00	0.00	0.96	0.00
128_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00
130_(STM)	1.00	0.00	0.00	0.00	0.87	0.13	0.00	0.00	0.53	0.00
132_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.33	0.00
134_(STM)	1.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.35	0.00
136_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
150_(1)_(STM)	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.60	0.00
152_(1)_(STM)	1.00	0.38	0.02	0.00	0.60	0.00	0.00	0.00	0.49	0.00
173_(STM)	1.00	0.50	0.11	0.00	0.39	0.00	0.00	0.00	0.40	0.00
175_(STM)	1.00	0.00	0.33	0.00	0.67	0.00	0.00	0.00	0.96	0.00
207_(STM)	1.00	0.38	0.00	0.00	0.62	0.00	0.00	0.00	0.54	0.00
209_(STM)	1.00	0.41	0.21	0.00	0.39	0.00	0.00	0.00	0.63	0.00
229_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
233_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
236_(STM)	1.00	0.00	0.32	0.00	0.68	0.00	0.00	0.00	0.94	0.00
240_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.70	0.00
250_(STM)	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.93	0.00
252_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
253_(STM)	1.00	0.00	0.48	0.00	0.52	0.00	0.00	0.00	0.95	0.00
260_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.38	0.00
266_(STM)	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.01	0.00
270_(STM)	1.00	0.33	0.49	0.00	0.18	0.00	0.00	0.00	0.67	0.00
277_(STM)	1.00	0.00	0.00	0.00	0.71	0.28	0.00	0.00	0.98	0.00
278_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.48	0.00
279_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50	0.00
281_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.51	0.00
283_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.51	0.00
285_(STM)	1.00	0.00	0.58	0.00	0.42	0.00	0.00	0.00	0.38	0.00
286_(STM)	1.00	0.00	0.00	0.00	0.71	0.28	0.00	0.00	0.98	0.00
287_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.47	0.00
288_(STM)	1.00	0.00	0.47	0.00	0.53	0.00	0.00	0.00	0.71	0.00
49_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
50_(STM)	1.00	0.00	0.21	0.00	0.79	0.00	0.00	0.00	1.00	0.00
51_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
52_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
53_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
55_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
56_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
85_(STM)	1.00	0.00	0.00	0.00	0.49	0.00	0.00	0.51	0.15	0.00
87_(STM)	1.00	0.21	0.07	0.00	0.72	0.00	0.00	0.00	0.59	0.00
97(1)_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
97_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(1)	1.00	0.73	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(3)	1.00	0.73	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH1(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH10(3)	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CBMH11(1)	1.00	0.99	0.01	0.00	0.01	0.00	0.00	0.00	0.75	0.00
MS-CBMH11(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CBMH12(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH12(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH13(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH13(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH14(1)	1.00	0.93	0.05	0.00	0.02	0.00	0.00	0.00	0.73	0.00
MS-CBMH14(2)	1.00	0.98	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
MS-CBMH15(1)	1.00	0.88	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH15(2)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH2	1.00	0.97	0.02	0.00	0.00	0.00	0.00	0.00	0.75	0.00

MS-CBMH3(1)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CBMH3(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CBMH3(3)	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CBMH4(1)	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH4(2)	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH5	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH5(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH7(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH7(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH8(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH8(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CBMH9(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-CICB1(1)	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CICB1(2)	1.00	0.73	0.26	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CICB2(1)	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-CICB2(2)	1.00	0.93	0.06	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYE(1)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYE1	1.00	0.81	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE10(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE10(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE10(3)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE12(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE12(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYE15(1)	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.61	0.00
MS-RYE15(2)	1.00	0.00	0.00	0.00	0.22	0.00	0.00	0.78	0.62	0.00
MS-RYE16(1)	1.00	0.90	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE16(2)	1.00	0.88	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE16(3)	1.00	0.90	0.08	0.00	0.02	0.00	0.00	0.00	0.73	0.00
MS-RYE2(2)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYE2(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE2(4)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE2(5)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(3)	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE3(5)	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE4(3)	1.00	0.97	0.02	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYE4(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00

MS-RYE5(1)	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE5(2)	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE6(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE6(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE7(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE7(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE8(1)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE8(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE9(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYE9(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(1)	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(2)	1.00	0.81	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT1(3)	1.00	0.78	0.11	0.00	0.11	0.00	0.00	0.00	0.64	0.00
MS-RYT1(4)	1.00	0.78	0.10	0.00	0.11	0.00	0.00	0.00	0.64	0.00
MS-RYT10(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT10(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT10(3)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT11(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT11(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT11(4)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT13(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT13(2)	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT14(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT14(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT15(1)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT15(2)	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT3(1)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MS-RYT3(2)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT3(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(1)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(2)	1.00	0.94	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT4(3)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT5(1)	1.00	0.93	0.06	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT5(2)	1.00	0.93	0.06	0.00	0.00	0.00	0.00	0.00	0.75	0.00
MS-RYT5(3)	1.00	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT5(4)	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.75	0.00
MS-RYT6	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(1)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(2)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT7(3)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MS-RYT7(4)	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(1)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(3)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT8(4)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(1)	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(2)	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(3)	1.00	0.77	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS-RYT9(4)	1.00	0.73	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
100_(STM)	2.88	2.88	2.92	0.01	0.01
104_(STM)	16.38	16.38	16.50	0.01	0.01
106_(STM)	14.83	14.83	16.33	0.01	0.01
116_(STM)	1.77	1.77	1.80	0.01	0.01
118_(STM)	1.76	1.76	2.36	0.01	0.01
124_(STM)	1.74	1.74	1.82	0.01	0.01
128_(STM)	1.45	1.45	1.74	0.01	0.01
130_(STM)	1.32	1.32	1.45	0.01	0.01
132_(STM)	14.57	14.57	14.73	0.01	0.01
134_(STM)	14.08	14.08	14.57	0.01	0.01
136_(STM)	2.83	2.83	2.88	0.01	0.01
150_(1)_(STM)	8.55	8.55	9.25	0.01	0.01
152_(1)_(STM)	9.25	9.25	10.90	0.01	0.01
173_(STM)	14.91	14.91	16.71	0.01	0.01
175_(STM)	1.36	1.36	1.67	0.01	0.01
207_(STM)	10.90	10.90	12.39	0.01	0.01
209_(STM)	2.14	2.14	2.15	0.01	0.01
229_(STM)	48.00	48.00	48.00	0.01	0.01
233_(STM)	2.67	2.67	2.98	0.01	0.01
236_(STM)	2.23	2.23	2.67	0.01	0.01
250_(STM)	1.80	1.80	1.81	0.01	0.01
252_(STM)	1.95	1.95	1.98	0.01	0.01
253_(STM)	2.02	2.02	2.56	0.01	0.01
260_(STM)	18.21	18.21	18.67	0.05	0.01
266_(STM)	1.10	1.10	1.34	0.01	0.01
270_(STM)	1.08	1.08	1.09	0.01	0.01
277_(STM)	0.58	0.58	0.71	0.01	0.01
278_(STM)	0.71	0.71	0.73	0.01	0.01
279_(STM)	0.33	0.33	0.41	0.01	0.01
281_(STM)	0.32	0.32	0.43	0.01	0.01
283_(STM)	0.31	0.31	0.42	0.01	0.01
285_(STM)	15.36	15.36	18.78	0.01	0.01
286_(STM)	0.56	0.56	0.68	0.01	0.01
287_(STM)	0.68	0.68	0.70	0.01	0.01
288_(STM)	8.11	8.11	8.22	0.01	0.01
49_(STM)	48.00	48.00	48.00	0.01	0.01
52_(STM)	0.01	0.01	0.09	0.01	0.01
53_(STM)	0.01	0.01	1.00	0.01	0.01
55_(STM)	1.00	1.00	48.00	0.01	0.01
56_(STM)	48.00	48.00	48.00	0.01	0.01
85_(STM)	10.24	10.24	11.15	0.01	0.01
97(1)_(STM)	48.00	48.00	48.00	0.01	0.01
97_(STM)	0.33	0.33	48.00	0.01	0.01
MS-RYE15(1)	0.01	0.01	2.64	0.01	0.01

Analysis begun on: Fri Nov 14 17:03:49 2025
Analysis ended on: Fri Nov 14 17:04:00 2025
Total elapsed time: 00:00:11

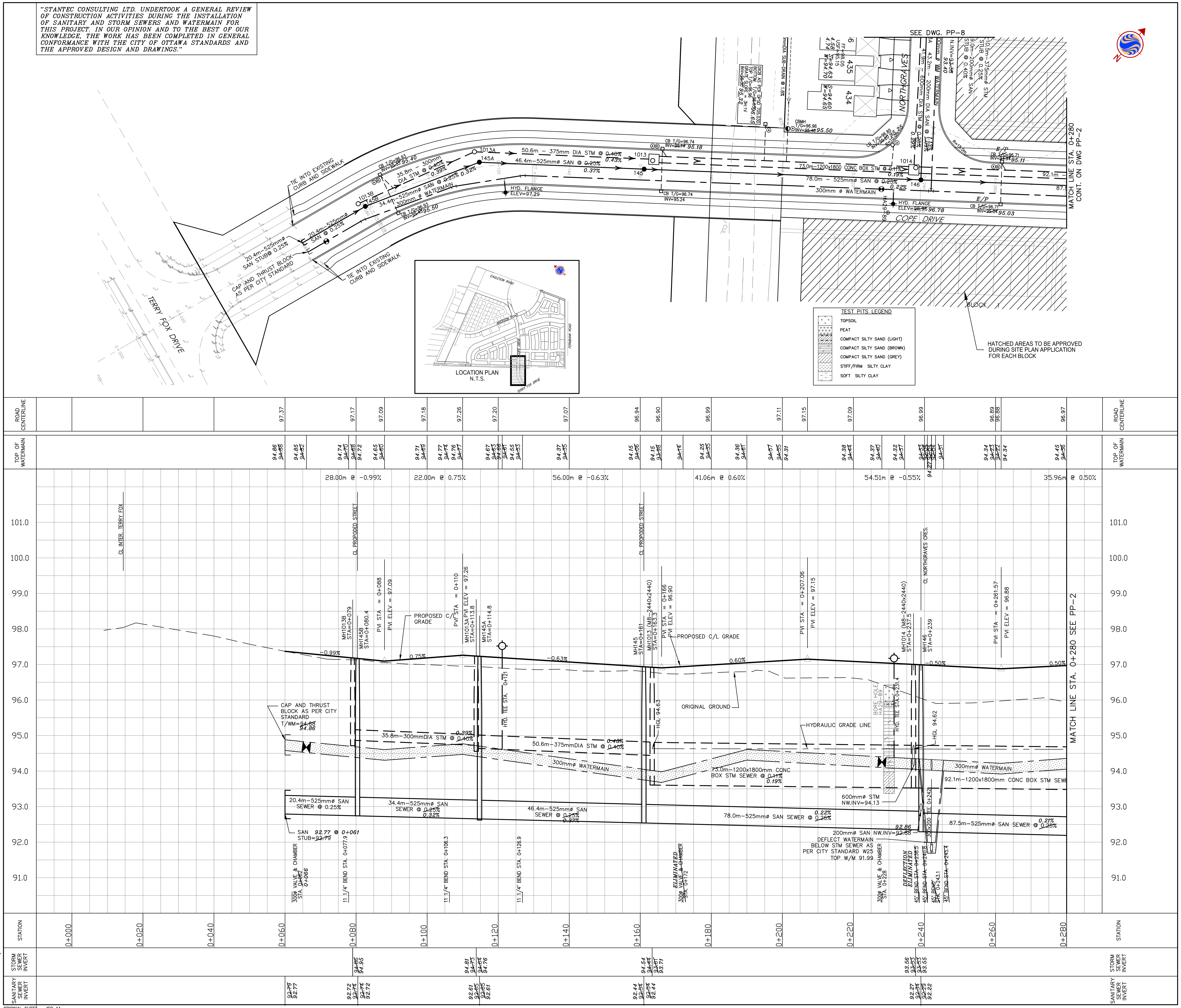
HGL Summary Phase 1 (JFSA - 2019)

Notes:

1) both 24hr SCS and 3hr CHI storm HGL uses 24hr SCS dynamic BC from JFSA Monahan Drain Future-VIL VURL model (March 2019) a fixed BC = 94.708 (100 yr SCS peak at PH1 outlet) was also used for the 3hr CHI event

Name	Ground (m)	USF (m)	HGL (m)			Difference USF-HGL (m)			Invert (m)
			24hr SCS	3hr CHI	Fixed 3hr CHI BC = 94.708	24hr SCS	3hr CHI	Fixed 3hr CHI BC=94.708	
1001	98.17	96.15	95.32	95.32	95.32	0.83	0.83	0.83	95.32
1002	97.85	96.08	95.28	95.28	95.28	0.80	0.80	0.80	95.07
1004E	97.91	95.84	95.17	95.17	95.17	0.67	0.67	0.67	95.43
1004N	97.91	95.84	95.53	95.53	95.53	0.31	0.31	0.31	-
1005	97.91	95.70	94.97	94.97	95.09	0.73	0.73	0.61	94.91
1006	97.70	95.50	94.83	94.74	95.05	0.67	0.76	0.45	94.35
1007	98.02	N/A	95.16	95.16	95.16	-	-	-	95.16
1008	97.95	N/A	95.10	95.10	95.13	-	-	-	94.89
1009	97.74	95.88	94.99	95.00	95.09	0.89	0.88	0.79	94.69
1010	97.67	95.77	94.82	94.78	95.05	0.95	0.99	0.72	94.44
1011	97.35	95.23	94.76	94.71	95.00	0.47	0.52	0.23	94.11
1012	97.02	N/A	94.76	94.71	95.00	-	-	-	93.91
1013	96.92	N/A	94.78	94.71	95.05	-	-	-	93.61
1014	97.00	N/A	94.77	94.71	95.03	-	-	-	93.53
1015	97.49	N/A	94.75	94.71	94.99	-	-	-	93.43
1016	96.79	N/A	94.74	94.71	94.95	-	-	-	93.33
1017	97.86	96.00	95.14	95.14	95.14	0.86	0.86	0.86	95.14
1018	97.78	95.60	95.05	95.05	95.07	0.55	0.55	0.53	94.85
1019	97.44	95.67	94.85	94.77	95.04	0.82	0.90	0.63	94.59
1020	97.40	95.32	94.85	94.72	95.04	0.47	0.60	0.28	94.49
1021	97.25	95.32	94.84	94.71	95.03	0.48	0.61	0.29	94.38
1022	97.53	95.70	95.12	95.12	95.15	0.58	0.58	0.55	94.88
1023	97.34	95.29	94.93	94.92	95.10	0.36	0.37	0.19	94.57
1024	97.19	95.27	94.83	94.71	95.03	0.44	0.56	0.24	94.18
1025	97.17	95.27	94.82	94.71	95.01	0.45	0.56	0.26	94.04
1026	97.55	95.47	94.89	94.89	95.07	0.58	0.58	0.40	94.76
1027	97.31	95.39	94.86	94.76	95.06	0.53	0.63	0.33	94.44
1028	97.09	95.31	94.81	94.71	95.00	0.50	0.60	0.31	94.18
1029	96.95	95.09	94.80	94.71	94.98	0.29	0.38	0.11	93.91
1030	98.00	95.23	94.75	94.71	94.91	0.48	0.52	0.32	94.39
1031	98.00	95.10	94.74	94.71	94.90	0.36	0.39	0.20	94.01
1033N	97.50	95.85	95.23	95.23	95.23	0.62	0.62	0.62	95.23
1033S	97.50	95.85	95.32	95.32	95.32	0.53	0.53	0.53	-
1034	97.43	95.75	95.32	95.32	95.32	0.43	0.43	0.43	95.11
1035	97.20	95.65	95.18	95.18	95.24	0.47	0.47	0.41	94.99
1035N	97.20	95.65	95.03	95.03	95.09	0.62	0.62	0.56	-
1036	97.34	95.51	94.91	94.89	95.07	0.60	0.62	0.44	94.60
1037	97.50	95.73	95.13	95.13	95.13	0.60	0.60	0.60	95.13
1038	97.33	95.58	95.12	95.12	95.12	0.46	0.46	0.46	94.94
1039	97.26	95.27	94.84	94.78	95.05	0.43	0.49	0.22	94.46
1040	97.15	95.40	94.89	94.89	95.02	0.51	0.51	0.38	94.76
1041	97.14	95.28	94.81	94.71	95.02	0.47	0.57	0.26	94.48
1042	97.19	95.14	94.79	94.71	95.00	0.35	0.43	0.14	94.09
1043	97.07	95.42	94.90	94.82	95.12	0.52	0.60	0.30	94.45
1044	97.02	95.32	94.79	94.79	94.99	0.53	0.53	0.33	94.65
1045	97.00	95.09	94.77	94.71	94.98	0.32	0.38	0.11	94.25
1046	96.70	95.00	94.76	94.71	94.96	0.24	0.29	0.04	93.86
1047	96.63	94.90	94.74	94.71	94.94	0.16	0.19	-0.04	93.74
1048	96.50	N/A	94.74	94.71	94.91	-	-	-	-
1048A	96.07	N/A	94.75	94.71	94.93	-	-	-	-
1049	96.86	95.05	94.74	94.71	94.92	0.31	0.34	0.13	93.72
1050	96.83	95.02	94.73	94.71	94.91	0.29	0.31	0.11	93.70
1051	96.75	95.02	94.75	94.71	94.89	0.27	0.31	0.13	93.58
1052	97.04	N/A	94.76	94.71	94.83	-	-	-	93.13
1053	97.22	95.42	95.06	95.06	95.22	0.36	0.36	0.20	94.72
1053B	97.20	N/A	94.81	95.15	94.80	-	-		93.09
DIVERSION	95.65	N/A	94.80	94.69	94.83	-	-	-	93.09
Monahan	95.05	N/A	94.71	94.71	94.71	-	-	-	92.88
N138	95.65	N/A	94.74	94.71	94.74	-	-	-	93.08

Level of clearance to USF less than 0.3 m
Level of clearance to USF less than 0.0 m



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Notes

1 ALL MATERIALS AND CONSTRUCTION METHODS TO BE IN ACCORDANCE WITH OPS AND CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS AND OPSD SUPPLEMENT. ONTARIO PROVINCIAL STANDARDS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.

2 SERVICE AND UTILITY LOCATIONS ARE APPROXIMATE, CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING SERVICES AND UTILITIES PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCATES FROM ALL UTILITY COMPANIES TO LOCATE EXISTING UTILITIES PRIOR TO EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION AND REINSTATEMENT.

3 ALL DISTURBED AREAS SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE ENGINEER & THE CITY. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH OPSD 509.010 AND OPSS 310.

4 STORM AND SANITARY SEWERS 375mm DIA. OR SMALLER SHALL BE PVC SDR 35. STORM AND SANITARY SEWERS LARGER THAN 375mm DIA. SHALL BE CONCRETE CSA A 257 CLASS 100 D. INSTALLED AS PER CITY OF OTTAWA S6 AND S7

5 THE CONTRACTOR SHALL CONSTRUCT WATERMAIN, WATER SERVICES, CONNECTIONS & APPURTENANCES AS PER CITY OF OTTAWA SPECIFICATIONS & SHALL CO-ORDINATE AND PAY ALL RELATED COSTS INCLUDING THE COST OF CONNECTION, INSPECTION & DISINFECTION BY CITY PERSONNEL. SERVICE CONNECTIONS SHALL BE INSTALLED A MINIMUM OF 2400mm FROM ANY CATCHBASIN, MANHOLE, OR OBJECT THAT MAY CONTRIBUTE TO FREEZING. THERMAL INSULATION SHALL BE INSTALLED ON ALL PROPOSED CB'S ON THE W/M STREET SIDE WHERE 2400mm SEPARATION CANNOT BE ACHIEVED. (AS PER CITY OF OTTAWA W22 & W23)(CATHODIC PROTECTION AS PER CITY OF OTTAWA W40 AND W42). WATERMAIN PIPE MATERIAL SHALL BE PVC CL.150 DR18. DEFLECTION OF WATERMAIN PIPE IS NOT TO EXCEED 1/2 OF THAT SPECIFIED BY THE MANUFACTURER.

6 STREET LIGHTING TO CITY OF OTTAWA STANDARDS.

7 STORM AND SANITARY MANHOLES SHALL BE 1200mm DIAMETER IN ACCORDANCE WITH OPSD-701.01 (UNLESS OTHERWISE NOTED) c/w FRAME AND COVER AS PER CITY OF OTTAWA S24 AND S25. ALL MANHOLE SIZES TO BE CONFIRMED BY SUPPLIER PRIOR TO INSTALLATION.

8 CATCH BASINS SHALL BE IN ACCORDANCE WITH CITY STANDARDS c/w FRAME AND GRATE AS PER S20 AND S21 FOR REAR YARDS AND S3 FOR STREET CB'S. PROVIDE 150mm ADJUSTED SPACERS. ALL CATCH BASINS SHALL HAVE SUMPS (600mm DEEP). CATCH BASIN LEADS SHALL BE 200mm DIA.(MIN) PVC SDR 35 AT 1.0% GR. STREET CB'S WILL BE INSTALLED WITH 'IPEX' INLET CONTROL DEVICE (ICD)

9 EXCESS EXCAVATED MATERIAL SHALL BE PLACED AT A LOCATION ON SITE AS DIRECTED BY THE OWNER.

10 THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE PROTECTION FOR RECEIVING STORM SEWERS OR DRAINAGE DURING CONSTRUCTION ACTIVITIES. (ie: FILTER CLOTH ON CATCH BASINS, STRAW BALE CHECK DAMS AND SEDIMENT CONTROLS AROUND ALL DISTURBED AREAS). DEWATERING SHALL BE PUMPED INTO SEDIMENT TRAPS. (SEE EROSION CONTROL PLAN).

11 GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300 mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA

12 SEWER TRENCH SHALL CONSIST OF A CLASS "B" BEDDING AS PER CITY OF OTTAWA STANDARDS S6 AND S7. COMPACTION SHALL BE A MINIMUM OF 98% STANDARD PROCTOR DENSITY.

13 ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.

14 ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH ARCHITECT AND THE CITY OF OTTAWA PRIOR TO TREE CUTTING.

15 CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL STORM AND SANITARY SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.

16 ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE CONSULTANT.

17 SUB-EXCAVATE SOFT AREAS & FILL WITH GRANULAR 'B' COMPACTED IN 0.15m LAYERS.

18 FOR ALL LANDSCAPING FEATURES (ie. TREES, WALKWAYS, PARK DETAILS, NOISE BARRIERS, FENCES etc.) REFER TO LANDSCAPE ARCHITECT PLAN

19 CONCRETE CURBS SHALL BE CONSTRUCTED AS PER CITY STANDARD SC1.1 & SC1.3

20 ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

21 PRESSURE REDUCING VALVES ARE REQUIRED ON ALL UNITS AS PER THE ONTARIO BUILDING CODE.

22 THE CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING NO. S8. THE SEALS SHOULD BE AT LEAST 1.5m LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUBBEDDING AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPACTABLE BROWN SILTY CLAY PLACED IN MAXIMUM 225mm THICK LOOSE LAYERS COMPACTED TO A MINIMUM OF 95% OF THE MATERIAL'S SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT STRATEGIC LOCATIONS AT NO MORE THAN 50m INTERVALS IN THE SERVICE TRENCHES.

23 REFER TO GEOTECHNICAL REPORT PREPARDED BY HOULE CHEVRIER ENGINEERING DATED SEPT 21, 2006 FOR ALL TEST PIT AND BORE HOLE INFORMATION.

24 GEOTECHNICAL ENGINEER TO CONFIRM AND DIRECT ON SITE PLACEMENT AND COMPACTION OF BLAST ROCK WITHIN THE R.O.W. AND THE UNDER SIDE OF FOUNDATIONS.

8	AS RECORDED – STAGE 'A'	DT	JJ	09.06.16
7	REVISED DRIVEWAY & SIDEWALK LOCATIONS, ISSUED FOR FINAL APPROVAL	KJK	JBL	09.02.25
6	REVISED FINISHED ROAD GRADES ON COPE, TEMPLEFORD AND NORTHGRAVES (s)	KJK	JBL	08.11.12
5	REVISED LOT GRADING AND SERVICING	KJK	JBL	08.11.03
4	ISSUED FOR CONSTRUCTION	KJK	JBL	08.01.21
3	REVISED AS PER CITY COMMENTS AND FINAL APPROVAL	KJK	JBL	07.10.29
2	REVISED AS PER CITY COMMENTS	KJK	JBL	07.08.17
1.	ISSUED FOR CITY COMMENTS	KJK	JBL	07.07.12
Revision		By	Appd.	YY.MM.DD

File Name: 160400502C–Cope Drive	NI	JBL	KJK	07.03.26
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Seal

RECORD DRAWING
DATE JUN.16/09

Client/Project
CAVANAGH CONSTRUCTION LTD.

SOHO - KANATA SOUTH

Ottawa ON Canada

Title
COPE DRIVE
STA. 0+000 TO STA. 0+280

Project No. 160400502C
Scale 1:500H 1:50V

Drawing No. PP-1
Sheet 7 of 58
Revision 8

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.30m above the 100-year water level (City of Ottawa).
- Major system flow to be restricted to 781 L/s during the 100 year storm event (Soho West (Phase 1 and 2), Stormwater Management Report)
- Rooftop and parking lot storage to be maximized where possible.
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.30m (City of Ottawa).
- Provide adequate emergency overflow conveyance off-site (City of Ottawa).
- Enhanced quality control (80% TSS removal) has been provided downstream of the development in Vortechs Cell 1 hydrodynamic separator.

5.2.1 Allowable Release Rate

The overall approach for storm servicing and stormwater management for the proposed development was initially outlined in the Serviceability Report – Cavanaugh Construction Ltd. / Karam SOHO West – Rev 3, Stantec Consulting Ltd., October 31, 2007 and Cavanaugh Construction – Soho West (Phase 1 and 2), Stormwater Management Report, Stantec Consulting Ltd. October 31, 2007

Discharge rates were assigned to the undeveloped parcels upstream of the SOHO Phase 1 subdivision. These are summarized in **Table 1** below. The external contributions are also identified on the Overall Storm Drainage Plan, OSD, SOHO-Kanata South included in **Appendix C.4**. The subject lands were identified as FUT-13B in the SOHO Phase 1 design.

Table 1: Target Release Rates for External Development Lands – SOHO-Kanata South

Drainage Area	Description	Minor System 100 Year Storm (L/s)	Major System 100 Year Storm (L/s)	Total Flow 100 Year Storm (L/s)
FUT-13A	Claridge Residential Lands	702.10	1,537	2,239
FUT-13B	Commercial Shopping Development (subject lands)	317.10	781	1,098

Segment	Maximum Volume Used (m^3)	Max. Ponding Depth (cm)	Depth at Curb/Swale (cm)	Max. ICD Inflow (L/s)	Overflow Peak[1] (L/s)
1-6CR	4.1	10.00	10.25	44.00	282
1-6DS	-	-	26.17	22.00	32
1-7AR	-	-	4.44	0.00	42
1-8AR	21.2	19.00	10.86	44.00	334
1-8BS	-	-	27.45	22.00	47
1-9AR	0.7	6.00	3.79	22.00	6
1-9BS	-	-	25.55	22.00	26
1-10AR	4.3	10.00	7.02	22.00	102
1-10BS	-	-	28.50	22.00	51
1-10CS	-	-	15.92	9.74	0
1-11AR	4.3	12.00	10.12	22.00	293
1-11BS	-	-	16.02	9.92	0
1-12AP	19.9	20.00	0.89	22.00	27
1-12BP	14.2	15.00	0.67	19.82	0
FUT-13AR	495.6	N/A	23.26	702.10	1,537
FUT-13BR	223.8	N/A	16.56	317.10	781
COPE-13AR	21.2	19.00	20.01	22.00	1,817
COPE-13BR	14.9	16.00	6.02	22.00	53
1-13AR	-	13.00	5.24	22.00	37
1-13BS	-	-	24.63	22.00	36
1-14R	62.0	22.00	20.07	22.00	1,833
1-15AR	43.8	22.00	20.22	22.00	1,869
1-15BR	21.3	17.00	10.64	22.00	337
1-16AS	-	-	31.33*	22.00	93
1-16BR	9.3	24.00	12.78	22.00	552
1-17AR	19.9	16.00	6.53	22.00	79
1-18AR	4.3	9.00	7.79	22.00	140
1-18BS	-	-	28.79	22.00	66
1-20AR	4.3	9.00	9.74	22.00	262
1-22AR	4.3	11.00	11.28	22.00	392
1-22BR	4.3	10.00	11.90	22.00	444
1-22CS	-	-	27.28	22.00	43
1-23AR	49.2	27.00	14.91	44.00	800
1-23BR	21.3	20.00	12.37	22.00	500
1-23CS	-	-	29.47	22.00	58
1-23DS	-	-	13.7		
1-23ES	-	-	24.3		
1-25AR	6.3	12.00	15.0		
1-26AR	6.3	12.00	6.41		
1-27AR	1.8	7.00	7.05		
1-27BR	1.8	7.00	7.81		
1-27CS	-	-	28.7		
1-27DS	-	-	28.1		
1-27ES	-	-	27.2		
1-28AR	21.2	20.00	16.1		
1-30AR	32.0	21.00	6.6(		
1-31AR	32.0	18.00	17.5		

MINOR SYSTEM:
SITE AREA = 3.73ha
ALLOWABLE = 317.10 L/s (85L/s/ha)

MAJOR SYSTEM STORAGE:
SITE AREA = 3.73ha
MAXIMUM VOLUME USED = 223.8m^3
(60m^3/ha)

PROPOSED DEVELOPMENT
IRON VALLEY 2

FERNBANK ROAD

COPE DRIVE

TERRY FOX DRIVE

SITE BENCHMARK
FIRE HYDRANT
Top of Spindle
Elevation=98.10

DRAINAGE AREA BOUNDARY = 2822.9m²

SOFT SURFACE AREA = 1921.6m²

HARD SURFACE AREA = 901.3m²

29.8m-600mmØ CSP CULVERT @ 0.5%
INV.NW=96.67 OBV.=97.27
INV.SE=96.53 OBV=97.13

33.6m-600mmØ CSP CULVERT @ 0.4%
INV.N=95.96 OBV.=96.48
INV.S=95.83 OBV=96.43

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

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

POST DEVELOPMENT AREA
TRIBUTARY TO CULVERT AT TERRY FOX DRIVE

1 : 1500 (0 15 30 45 60)

NOV 2025	121011	FIG-CULV

SHT11X17.DWG - 279mmX432mm

M:\2021\121011\CAD\Design\Figures\Culvert\121011-Culvert.dwg, CULVERT, Feb 18, 2022 - 2:21pm, rgrayton

Appendix B
SANITARY SEWER DESIGN

SANITARY SEWER DESIGN SHEET
IRON VALLEY 2 - 5331 FERNBANK RD
Developer: Claridge Homes

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT # : 121011
DESIGNED BY : AE/BM
CHECKED BY : DDB
DATE PREPARED : 14-Nov-25

LOCATION				RESIDENTIAL									PARK			INFILTRATION			FLOW	PROPOSED SEWER							
				INDIVIDUAL					CUMULATIVE																		
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Apartment Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)	PEAK FACTOR M	POPULATION FLOW Qr(p) (L/s)	AREA (ha.)	Accu. AREA (ha.)	PARK FLOW Qc(p) (L/s)	Total Area (ha.)	Accu. Total AREA (ha.)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/D_{full}
	217	117	A1			24	0.050	0.31	0.050	0.31	3.7	0.60		0.00	0.00	0.31	0.31	0.10	0.70	44.0	200	203.20	DR 35	1.00	34.2	1.06	2.0%	0.00
	215	117	A2			9	0.019	0.13	0.019	0.13	3.7	0.23		0.00	0.00	0.13	0.13	0.04	0.27	29.0	200	203.20	DR 35	1.00	34.2	1.06	0.8%	0.00
	117	115	A3			3	0.006	0.02	0.076	0.46	3.6	0.89		0.00	0.00	0.02	0.46	0.15	1.04	8.6	200	203.20	DR 35	0.35	20.2	0.62	5.1%	0.16
	115	113	A4					0.02	0.076	0.48	3.6	0.89	0.04	0.04	0.00	0.06	0.52	0.17	1.06	12.6	200	203.20	DR 35	0.40	21.6	0.67	4.9%	0.12
	113	111	A5					0.18	0.076	0.66	3.6	0.89	0.11	0.15	0.01	0.29	0.81	0.27	1.16	58.0	200	203.20	DR 35	0.33	19.7	0.61	5.9%	0.16
	213	111	A6			24	0.050	0.20	0.050	0.20	3.7	0.60		0.00	0.00	0.20	0.20	0.07	0.66	43.0	200	203.20	DR 35	1.00	34.2	1.06	1.9%	0.00
	111	109	A7					0.31	0.126	1.17	3.6	1.46	0.06	0.21	0.01	0.37	1.38	0.46	1.92	72.1	200	203.20	DR 35	0.33	19.7	0.61	9.8%	0.19
	211	109	A8			24	0.050	0.20	0.050	0.20	3.7	0.60		0.00	0.00	0.20	0.20	0.07	0.66	43.0	200	203.20	DR 35	1.00	34.2	1.06	1.9%	0.00
	109	107	A9					0.41	0.176	1.78	3.5	2.02		0.21	0.01	0.41	1.99	0.66	2.69	71.2	200	203.20	DR 35	0.34	20.0	0.62	13.5%	0.23
	209	107	A10			24	0.050	0.20	0.050	0.20	3.7	0.60		0.00	0.00	0.20	0.20	0.07	0.66	43.0	200	203.20	DR 35	1.00	34.2	1.06	1.9%	0.00
	207	107	A11			24	0.050	0.30	0.050	0.30	3.7	0.60		0.00	0.00	0.30	0.30	0.10	0.70	39.0	200	203.20	DR 35	1.00	34.2	1.06	2.0%	0.00
	107	105	A12					0.30	0.277	2.58	3.5	3.12		0.21	0.01	0.30	2.79	0.92	4.05	72.9	200	203.20	DR 35	0.34	20.0	0.62	20.3%	0.30
	205	105	A13			24	0.050	0.20	0.050	0.20	3.7	0.60		0.00	0.00	0.20	0.20	0.07	0.66	43.0	200	203.20	DR 35	1.00	34.2	1.06	1.9%	0.00
	203	201	A14			12	0.025	0.35	0.025	0.35	3.7	0.30		0.00	0.00	0.35	0.35	0.12	0.42	36.0	200	203.20	DR 35	1.00	34.2	1.06	1.2%	0.00
	201	105	A15			24	0.050	0.16	0.076	0.51	3.6	0.89		0.00	0.00	0.16	0.51	0.17	1.06	39.2	200	203.20	DR 35	0.33	19.7	0.61	5.4%	0.16
	105	103	A16					0.17	0.403	3.46	3.4	4.46		0.21	0.01	0.17	3.67	1.21	5.68	15.9	200	203.20	DR 35	0.38	21.1	0.65	26.9%	0.34
	103	101						0.00	0.403	3.46	3.4	4.46		0.21	0.01	0.00	3.67	1.21	5.68	21.6	200	203.20	DR 35	2.00	48.4	1.49	11.7%	0.23
COPE DRIVE	101	*EX SANMH*						0.00	0.403	3.46	3.4	4.46		0.21	0.01	0.00	3.67	1.21	5.68	15.0	200	203.20	DR 35	2.00	48.4	1.49	11.7%	0.23

Notes:
1. Q(d) = Qr(p) + Q(i) + Qc(p)
2. Q(i) = 0.33 L/sec/ha
3. Qr(p) = (P*q*M/86,400)
3. Qc(p) = (A*q*Pf)/86,400

Definitions:
Q(d) = Design Flow (L/sec)
Qr(p) = Population Flow (L/sec), Residential
Q(i) = Extraneous Flow (L/sec)
Qc(p) = Population Flow (L/sec), Commercial/Institutional/Park

P = Population (3.4 persons per single unit, 2.7 persons per townhouse unit, 2.1 persons per apartment unit)
q = Average per capita flow = 280 L/cap/day - Residential
q = Average per gross ha. flow = 3700 L/gross ha/day - Park (20L/day/person, 185 persons/ha - as per Appendix 4-A of the City of Ottawa Sewer Design Guidelines)
M = Harmon Formula (maximum of 4.0)
Min pipe size 200mm @ min. slope 0.32%
Mannings n = 0.013
Pf = Peak factor (Commercial/Institional/Park) = 1.0 (less than 20% of total contributing areas), 1.5 (if area is 20% or greater of total contributing area)

day and maximum day demands. At a residual pressure of 20 psi, the available fire flow in the adjacent distribution systems was greater than 10,000 L/min.

4.0 SANITARY SEWER

4.1 Design Flows

The design criteria used to determine the sanitary flows produced by the proposed development is as follows;

Design Residential Domestic Flow per capita	350 L/cap/day
Capita per dwelling	2.7 persons per townhouse
Residential Peak Factor	Where P is population in 1000s; $P.F. = 1 + \frac{14}{\sqrt{4 + P^{0.5}}}$
Commercial Flow	50,000 L/ha/day
Commercial Peak Factor	1.5
Light Industrial Flow	35,000 L/ha/day
Light Industrial (Business Park) Peak Factor	4 (Appendix 4-B Ottawa Sewer Design Guidelines)
Infiltration	0.28 L/ha/day
Minimum Velocity	0.60 m/s
Minimum Pipe Size	250 mm dia. (0.432 % slope)

Table 4.1 - Sanitary Design Flows under Proposed Land Use and Zoning

	Proposed Zoning	Area (ha)	Pop. (1000's)	Peak Popul. Flow Q(p) (L/s)	Peak Busi. Flow Q(i) (L/s)	Peak Comm. Flow Q(c) (L/s)	Peak Extran. Flow Q(e) (L/s)	Peak Design Flow Q(d) (L/s)
Business Park (Light Industrial)	IP	13.58			22.00		3.80	25.81
Residential	R4	8.14	0.608	9.67			2.28	11.95
Commercial	IP	3.73				3.24	1.04	4.28
Total		25.45	0.608	9.67	22.00	3.24	7.13	42.04

16.23 L/s SAN Flow to Cope Dr.

Serviceability Report

Cavanagh Construction Ltd. / Karam

SOHO West – Rev 3

Project #604-00502

Urban Land
1505 Laperriere Avenue
Ottawa, Ontario
K1Z 7T1
(613) 722-4420

October 31, 2007

Stantec

Stantec

Cavanagh Construction

SOHO Development Phase 1 and 2

DATE: April 2007
REVISION: October 2007
DESIGNED BY: MJS
CHECKED BY: KK

SANITARY SEWER DESIGN SHEET

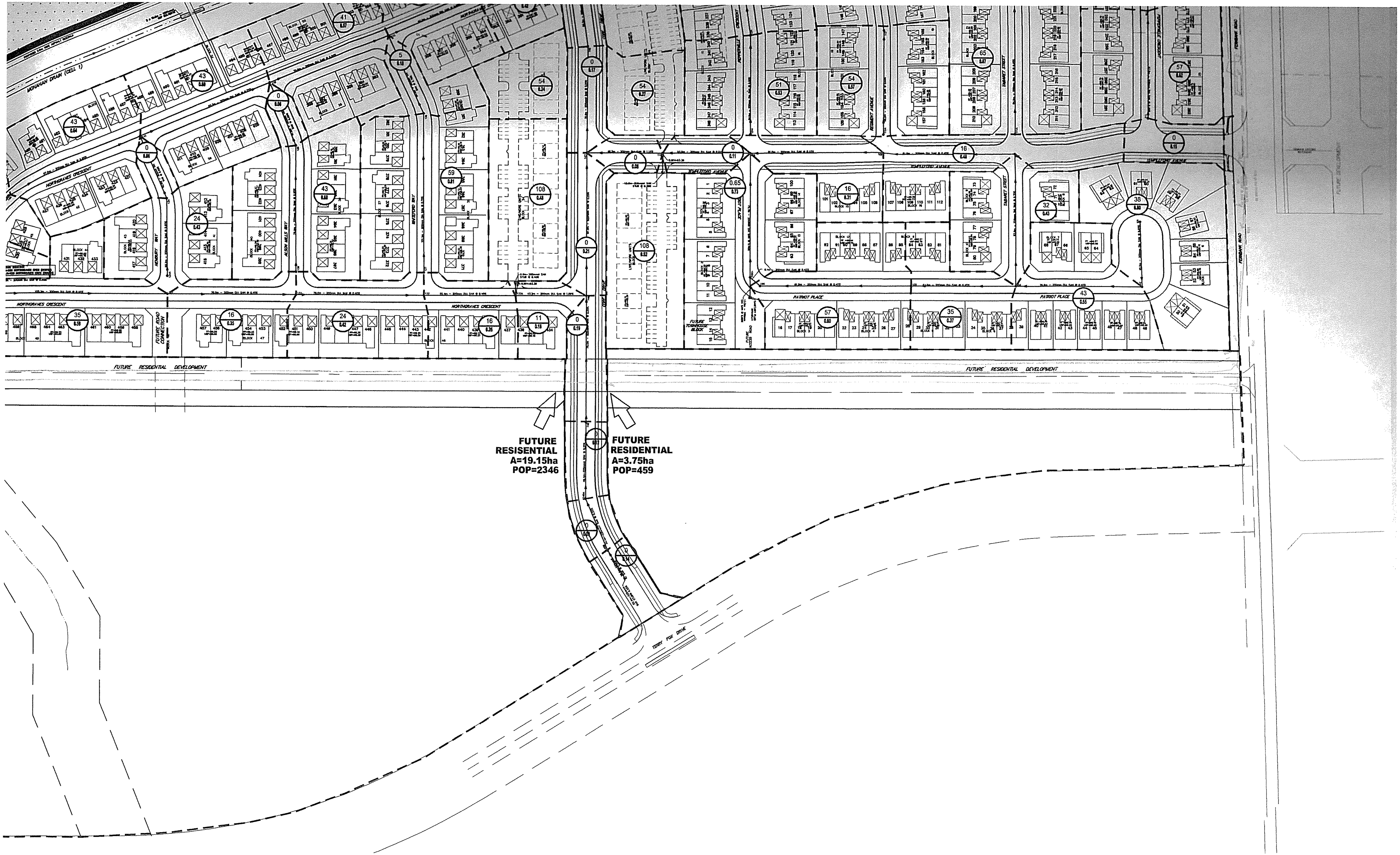
(City of Ottawa)

FILE NUMBER: 1604-00502

DESIGN PARAMETERS

AVG. DAILY FLOW / PERSON =	350	l/p/day	COMMERCIAL	50,000.00	l/Ha/day
MINIMUM VELOCITY =	0.60	m/s	LIGHT INDUSTRIAL	35,000.00	l/Ha/day
n =	0.013		INSTITUTIONAL	0.60	l/s/Ha
MAX PEAK FACTOR =	4.0		INFILTRATION	0.28	l/s/Ha
MIN PEAK FACTOR =	2.4		RESIDENTIAL HARMON PEAKING FACTOR PERSONS/UNIT =		4.0
			KANATA WEST REPORT PERSONS/UNIT =		3.0
Peaking Factor Industrial:	1.5		POPULATION DENSITY PER UNIT =	Single Family =	3.4
Peaking Factor Comm. / Inst.:	1.5			Townhouse =	2.7

LOCATION			RESIDENTIAL AREA AND POPULATION								COMM		INDUST		INSTIT		C+I+I	INFILTRATION				PIPE					
STREET	FROM M.H	TO M.H	AREA (ha)	UNITS Singles	UNITS Towns	UNITS* (KWR)	POP	CUMULATIVE AREA (ha)	CUMULATIVE POP	PEAK FACT	PEAK FLOW (l/s)	AREA (ha)	ACCU AREA (ha)	AREA (ha)	ACCU AREA (ha)	AREA (ha)	ACCU AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	(FULL) (m/s)	VEL. (ACT.) (m/s)
Phase 1																												
PATRIOT PLACE	101	102	0.80	14	0	38		0.80	38	4.00	0.52							0.00	0.80	0.80	0.224	0.84	40.5	200	0.65	26.88	0.84	0.34
PATRIOT PLACE	102	104	0.55	16	0	43		1.35	81	4.00	1.04							0.00	0.55	1.35	0.378	1.69	76.9	200	0.45	22.40	0.70	0.36
PATRIOT PLACE	104	105	0.37	13	0	35		1.72	116	4.00	1.88							0.00	0.37	1.72	0.482	2.36	64.0	200	0.45	22.40	0.70	0.43
PATRIOT PLACE	105	106	0.60	21	0	57		2.32	173	4.00	2.80							0.00	0.60	2.32	0.650	3.45	98.0	200	0.45	22.40	0.70	0.48
PATRIOT PLACE	106	109	0.73	24	0	65		3.05	238	4.00	3.86							0.00	0.73	3.05	0.854	4.71	81.0	200	0.45	22.40	0.70	0.53
TABARET STREET	104	107	0.43	12	0	32		0.43	32	4.00	0.52							0.00	0.43	0.43	0.120	0.64	83.8	200	0.70	27.84	0.87	0.35
TEMPLEFORD AVENUE	107	108	0.48	6	0	16		0.91	48	4.00	0.78							0.00	0.48	0.91	0.255	1.04	81.0	200	0.45	22.40	0.70	0.33
TEMPLEFORD AVENUE	108	109	0.31	6	0	16		1.22	64	4.00	1.04							0.00	0.31	1.22	0.342	1.38	81.0	200	0.45	22.40	0.70	0.36
TEMPLEFORD AVENUE	109	110	0.11	0	0	0		4.38	302	4.00	4.89							0.00	0.11	4.38	1.226	6.12	53.6	200	0.84	30.72	0.96	0.71
BLOCK 1	110B	110	0.52	40	0	108		0.52	108	4.00	1.75							0.00	0.52	0.52	0.146	1.90	111.5	200	0.75	29.12	0.91	0.47
TEMPLEFORD AVENUE	110	147	0.08	0	0	0		4.98	410	4.00	6.64							0.00	0.08	4.98	1.394	8.03	46.5	200	1.18	36.48	1.14	0.89
NORTHGRAVES	129	130	0.20	3	0	8		0.20	8	4.00	0.13							0.00	0.20	0.20	0.056	0.19	13.0	200	0.65	26.88	0.84	0.00
NORTHGRAVES	130	131	0.59	13	0	35		0.79	43	4.00	0.70							0.00	0.59	0.79	0.221	0.92	105.2	200	0.45	22.40	0.70	0.33
NORTHGRAVES	131	132	0.35	6	0	16		1.14	59	4.00	0.96							0.00	0.35	1.14	0.319	1.28	78.0	200	0.45	22.40	0.70	0.33
NORTHGRAVES	132	133	0.42	9	0	24		1.56	83	4.00	1.34							0.00	0.42	1.56	0.437	1.78	78.0	200	0.45	22.40	0.70	0.36
NORTHGRAVES	133	133A	0.26	6	0	16		1.82	99	4.00	1.60							0.00	0.26	1.82	0.510	2.11	55.4	200	0.45	22.40	0.70	0.41
BLOCK 34 ****	133C	133B	0.24	20	0	54		0.24	54	4.00	0.88							0.00	0.24	0.24	0.067	0.95	42.5	200	0.65	26.88	0.84	0.34
BLOCK 34 ****	133B	133A	0.48	40	0	108		0.72	162	4.00	2.63							0.00	0.48	0.72	0.202	2.83	113.0	200	0.40	21.12	0.66	0.44
NORTHGRAVES	133A	146	0.16	4	0	11		2.70	272	4.00	4.11							0.00	0.16	2.70	0.756	5.17	43.2	200	1.09	34.88	1.09	0.75
COPE DR ***	STUB	145B	125.14	0	0	8075		125.14	8075	3.05	99.77			28.72	28.72			17.45	153.86	153.86	43.081	160.30	20.4	525	0.25	223.00	1.00	1.09
COPE DR	145B	145A	0.09	0	0	0		125.23	8075	3.05	99.77				28.72			17.45	0.09	153.95	43.106	160.33	34.4	525	0.25	223.00	1.00	1.09
COPE DR	145A	145	0.12	0	0	0		125.35	8075	3.05	99.77				28.72			17.45	0.12	154.07	43.140	160.36	46.4	525	0.25	223.00	1.00	1.09
COPE DR	145	146	23.14	0	0	2811		148.49	10886	2.92	128.77				28.72			17.45	23.14	177.21	49.619	195.84	78.0	525	0.25	223.00	1.00	1.14
HENBURY WAY	134A	134	0.43	9	0	24		0.43	24	4.00	0.39							0.00	0.43	0.43	0.120	0.51	58.3	200	0.65	26.88	0.84	0.00
HENBURY WAY	134	141	0.06	0	0	0		0.49	24	4.00	0.39							0.00	0.06	0.49	0.137	0.53	42.6	200	0.65	26.88	0.84	0.00
ALSON MILLS WAY	135	136	0.68	16	0	43		0.68	43	4.00	0.70							0.00	0.68	0.68	0.190	0.89	79.9	200	0.65	26.88	0.84	0.34
ALSON MILLS WAY	136	142	0.06	0	0	0		0.74	43	4.00	0.70							0.00	0.06	0.74	0.207	0.91	41.6	200	0.82	30.40	0.95	0.38
WHITEFORD WAY	137	138	0.81	22	0	59		0.81	59	4.00	0.96							0.00	0.81	0.81	0.227	1.19	101.1	200	0.78	29.44	0.92	0.43
WHITEFORD WAY	138	143	0.18	2	0	5		0.99	64	4.00	1.04							0.00	0.18	0.99	0.277	1.32	54.4	200	0.78	29.44	0.92	0.43
NORTHGRAVES	129	139	0.22	4	0	11		0.22	11	4.00	0.18							0.00	0.22	0.22	0.062	0.24	26.7	200	0.65	26.88	0.84	0.00
NORTHGRAVES	139	140	0.29	7	0	19		0.51	30	4.00	0.49							0.00	0.29	0.51	0.143	0.63	31.2	200	0.45	22.40	0.70	0.28
NORTHGRAVES	140	141	0.64	16	0	43		1.15	73	4.00	1.18							0.00	0.64	8.00	2.240	3.42	87.6	200	0.65	26.88	0.84	0.55
NORTHGRAVES	141	142	0.60	16	0	43		2.24	140	4.00	2.27							0.00	0.60	9.09	2.545	4.82	85.7	200	0.35	19.84	0.62	0.50
NORTHGRAVES	142	143	0.57	15	0	41		3.55	224	4.00	3.63							0.00	0.57	10.40	2.912	6.54	79.8	200	0.55	24.96	0.78	0.64
NORTHGRAVES	143	144	0.44	11	0	30		4.98	318	4.00	5.15							0.00	0.44	11.83	3.312	8.46	60.0	200	0.69	27.84	0.87	0.76
NORTHGRAVES	144	149	0.42	10	0	27		5.40	345	4.00	5.59							0.00	0.42	12.25	3.430	9.02	64.5	200	0.69	27.84	0.87	0.77



FUTURE RESISENTIAL
A=19.15ha
POP=2346
FUTURE RESIDENTIAL
A=3.75ha
POP=459
FUTURE RESIDENTIAL DEVELOPMENT
FUTURE RESIDENTIAL DEVELOPMENT
NORTHGRAVES CRESCENT
PATRIOT PLACE
TERRY FOX DRIVE

Trevor McKay

From: Cripps, Brad <brad.cripps@ottawa.ca>
Sent: Wednesday, March 20, 2019 11:52 AM
To: Trevor McKay
Cc: Surprenant, Eric
Subject: RE: Comment Clarification - D07-16-190001 & D07-16-18-0027

Hello Trevor,

The comment that was provided related to the Bridlewood 3 application was provided by the water resources group. I have reached out to them to confirm what was meant by that comment and the implications. My understanding now is that there is a spill relief protection for the Fernbank and Stittsville trunk lines near the Hazeldean PS at 95.3m, however there is no such spill point in the South Glencairn trunk line. The operation of the pump station has been set up so that during large events the Fernbank and Stittsville trunk lines will be isolated and allowed to spill if there is a need while the pump station capacity will be reserved for the South Glencairn trunk line.

In speaking with infrastructure planning their recommendation is to use 95.3m as an approximate design value for selecting appropriate USF elevations to provide some level of protection during a large event. In your email below a reference to 99.3m as a minimum USF, can you confirm where this value was determined?

If you would like to discuss further please feel free to contact me.

Brad Cripps, P.Eng.
Project Manager, Infrastructure Approvals
Development Review West
City of Ottawa
110 Laurier Avenue West, Ottawa ON, K1P 1J1
613-580-2424, Ext. 28699
Brad.Cripps@ottawa.ca

From: Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Sent: March 18, 2019 3:21 PM
To: Cripps, Brad <brad.cripps@ottawa.ca>
Subject: FW: Comment Clarification - D07-16-190001 & D07-16-18-0027

Hi Brad,

Could you review the below. I was sure that you had spoken to me about this. Any information you can provide them on this?

Thanks
Eric S.

From: Trevor McKay <t.mcKay@novatech-eng.com>
Sent: March 18, 2019 1:55 PM
To: Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Cc: Drew Blair <D.Blair@novatech-eng.com>; Marc St.Pierre <m.stpierre@novatech-eng.com>
Subject: Comment Clarification - D07-16-190001 & D07-16-18-0027

Eric,

Further to my voicemail early last week, we are requesting clarification on the intent/meaning of comments that we have received in response to the submissions for draft plan approval on the Van Gaal Lands (1039 Terry Fox Drive & 5331 Fernbank Road, D07-16-18-0027) and Bridlewood 3 (866 & 898 Eagleson Road and 1355 & 1365 Terry Fox Drive, D07-16-190001).

We have been informed that you will be the Engineering lead on both files, taking over from Gabrielle Schaeffer.

We have received different information regarding the sanitary sewer outlet conditions on both projects.

1. On the Van Gaal lands project we were informed during the pre-consultation that the sanitary sewer had an overflow at the Hazeldean Pump Station and that an elevation of 99.30 should be used for the minimum USF on site.
2. On the Bridlewood 3 project, we have received a comment (#46) which states that the Hazledean PS does not have an overflow for this branch of the sanitary sewer.

Based on our understanding of the sanitary sewer system, both proposed outlets flow to the trunk sewer on Akerson Road. They share a common outlet from the corner of Cope Drive and Akerson Road to the Hazledean Pump Station.

We would also like clarification on what the requirements relating to the submission of an HGL analysis for the sanitary sewer are for draft approval. We understand the request for an HGL analysis, however it is our suggestion that based on the proposed USF elevations being higher than downstream developments, that this should be a requirement at the detail design phase.

Your clarification is appreciated. We are available should you wish to call and discuss.

Trevor McKay, B.Eng., E.I.T., Project Coordinator | Engineering/Contract Administration
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 291 | Cell: 613.263.9113 | Fax: 613.254.5867

'

'

Appendix C
HYDRAULIC ANALYSIS

Population and Consumption Rate Calculations

Node	Number of Units	Persons per Unit	Population	Consumption Rates (L/s)		
				Average Daily	Maximum Daily	Maximum Hourly
R1	0	2.10	0	0.00	0.00	0.00
R2	0	2.10	0	0.00	0.00	0.00
N1	0	2.10	0	0.00	0.00	0.00
N2	0	2.10	0	0.00	0.00	0.00
N3	0	2.10	0	0.00	0.00	0.00
N4	0	2.10	0	0.00	0.00	0.00
N5	0	2.10	0	0.00	0.00	0.00
N6	12	2.10	25	0.08	0.25	0.37
N7	0	2.10	0	0.00	0.00	0.00
N8	0	2.10	0	0.00	0.00	0.00
N9	0	2.10	0	0.00	0.00	0.00
N10	0	2.10	0	0.00	0.00	0.00
N11	24	2.10	50	0.16	0.49	0.74
N12	12	2.10	25	0.08	0.25	0.37
N13	24	2.10	50	0.16	0.49	0.74
N14	24	2.10	50	0.16	0.49	0.74
N15	24	2.10	50	0.16	0.49	0.74
N16	24	2.10	50	0.16	0.49	0.74
N17	24	2.10	50	0.16	0.49	0.74
N18	24	2.10	50	0.16	0.49	0.74
Total	**192**	**2.10**	**403**	**1.31**	**3.92**	**5.88**

Water Demand Parameters

Zen Units	2.10	persons/unit
Residential Demand	280	L/c/day
Residential Max Day	3.0	x Avg Day
Residential Peak Hour	4.5	x Avg Day
Max Fire Flow (FF1)	266.67	L/s

AVERAGE DAY DEMAND / HIGH PRESSURE CHECK

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi	Age hours
Resvr R1	162.20	2.72	162.20	0.00	0.00	0.00	0.0
Resvr R2	162.30	-4.00	162.30	0.00	0.00	0.00	0.0
Junc N1	96.90	0.00	162.20	65.30	640.59	92.91	1.7
Junc N2	97.00	0.00	162.20	65.20	639.61	92.77	1.5
Junc N3	97.20	0.00	162.21	65.01	637.75	92.50	1.3
Junc N4	97.40	0.00	162.22	64.82	635.88	92.23	1.2
Junc N5	97.60	0.00	162.23	64.63	634.02	91.96	1.0
Junc N6	97.60	0.08	162.24	64.64	634.12	91.97	0.8
Junc N7	97.70	0.00	162.25	64.55	633.24	91.84	0.7
Junc N8	97.40	0.00	162.27	64.87	636.37	92.30	0.4
Junc N9	97.00	0.00	162.29	65.29	640.49	92.90	0.1
Junc N10	96.90	0.00	162.30	65.40	641.57	93.05	0.0
Junc N11	97.40	0.16	162.20	64.80	635.69	92.20	1.9
Junc N12	97.30	0.08	162.20	64.90	636.67	92.34	2.9
Junc N13	97.00	0.16	162.20	65.20	639.61	92.77	2.1
Junc N14	97.10	0.16	162.21	65.11	638.73	92.64	1.9
Junc N15	97.00	0.16	162.21	65.21	639.71	92.78	1.8
Junc N16	97.30	0.16	162.22	64.92	636.87	92.37	1.7
Junc N17	97.50	0.16	162.23	64.73	635.00	92.10	1.5
Junc N18	97.70	0.16	162.24	64.54	633.14	91.83	1.5

Maximum Pressure
Maximum Age

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	-2.72	0.09	0.08	0.042
Pipe 1.1	1.0	200	110	2.72	0.09	0.07	0.039
Pipe 2	75.0	200	110	-3.12	0.10	0.10	0.041
Pipe 3	67.0	200	110	-3.44	0.11	0.12	0.040
Pipe 4	72.0	200	110	-3.60	0.11	0.13	0.040
Pipe 5	82.0	200	110	-3.76	0.12	0.15	0.040
Pipe 6	29.0	200	110	-4.00	0.13	0.16	0.039
Pipe 7	144.0	200	110	-4.00	0.13	0.16	0.039
Pipe 8	141.0	200	110	-4.00	0.13	0.16	0.039
Pipe 9	46.0	200	110	-4.00	0.13	0.16	0.039
Pipe 9.1	1.0	200	110	-4.00	0.13	0.15	0.036
Pipe 10	44.0	100	100	0.24	0.03	0.03	0.066
Pipe 11	36.0	100	100	0.08	0.01	0.00	0.078
Pipe 12	38.0	100	100	-0.16	0.02	0.01	0.069
Pipe 13	42.0	100	100	0.16	0.02	0.01	0.069
Pipe 14	38.0	100	100	-0.16	0.02	0.01	0.067
Pipe 15	38.0	100	100	-0.16	0.02	0.01	0.067
Pipe 16	38.0	100	100	-0.16	0.02	0.01	0.069
Pipe 17	50.0	100	100	0.16	0.02	0.01	0.070

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	155.70	-2.76	155.70	0.00	0.00	0.00
Resvr R2	155.70	-1.17	155.70	0.00	0.00	0.00
Junc N1	96.90	0.00	155.70	58.80	576.83	83.66
Junc N2	97.00	0.00	155.70	58.70	575.85	83.52
Junc N3	97.20	0.00	155.69	58.49	573.79	83.22
Junc N4	97.40	0.00	155.69	58.29	571.82	82.94
Junc N5	97.60	0.00	155.69	58.09	569.86	82.65
Junc N6	97.60	0.25	155.69	58.09	569.86	82.65
Junc N7	97.70	0.00	155.69	57.99	568.88	82.51
Junc N8	97.40	0.00	155.70	58.30	571.92	82.95
Junc N9	97.00	0.00	155.70	58.70	575.85	83.52
Junc N10	96.90	0.00	155.70	58.80	576.83	83.66
Junc N11	97.40	0.49	155.69	58.29	571.82	82.94
Junc N12	97.30	0.25	155.68	58.38	572.71	83.06
Junc N13	97.00	0.49	155.69	58.69	575.75	83.51
Junc N14	97.10	0.49	155.69	58.59	574.77	83.36
Junc N15	97.00	0.49	155.69	58.69	575.75	83.51

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	2.76	0.09	0.08	0.042
Pipe 1.1	1.0	200	110	-2.76	0.09	0.08	0.043
Pipe 2	75.0	200	110	1.53	0.05	0.03	0.045
Pipe 3	67.0	200	110	0.55	0.02	0.00	0.052
Pipe 4	72.0	200	110	0.06	0.00	0.00	0.146
Pipe 5	82.0	200	110	-0.43	0.01	0.00	0.057
Pipe 6	29.0	200	110	-1.17	0.04	0.02	0.047
Pipe 7	144.0	200	110	-1.17	0.04	0.02	0.047
Pipe 8	141.0	200	110	-1.17	0.04	0.02	0.047
Pipe 9	46.0	200	110	-1.17	0.04	0.02	0.047
Pipe 9.1	1.0	200	110	-1.17	0.04	0.02	0.053
Pipe 10	44.0	100	100	0.74	0.09	0.25	0.055
Pipe 11	36.0	100	100	0.25	0.03	0.03	0.065
Pipe 12	38.0	100	100	-0.49	0.06	0.12	0.059
Pipe 13	42.0	100	100	0.49	0.06	0.12	0.059

MAXIMUM DAY + FIRE FLOW DEMAND AT N3

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	150.50	-190.22	150.50	0.00	0.00	0.00
Resvr R2	150.50	-82.37	150.50	0.00	0.00	0.00
Junc N1	96.90	0.00	150.29	53.39	523.76	75.96
Junc N2	97.00	0.00	140.54	43.54	427.13	61.95
Junc N3	97.20	266.67	125.24	28.04	275.07	39.90
Junc N4	97.40	0.00	128.03	30.63	300.48	43.58
Junc N5	97.60	0.00	131.07	33.47	328.34	47.62
Junc N6	97.60	0.37	134.59	36.99	362.87	52.63
Junc N7	97.70	0.00	135.87	38.17	374.45	54.31
Junc N8	97.40	0.00	142.22	44.82	439.68	63.77
Junc N9	97.00	0.00	148.43	51.43	504.53	73.18
Junc N10	96.90	0.00	150.46	53.56	525.42	76.21
Junc N11	97.40	0.74	140.51	43.11	422.91	61.34
Junc N12	97.30	0.37	140.51	43.21	423.89	61.48
Junc N13	97.00	0.74	140.53	43.53	427.03	61.94
Junc N14	97.10	0.74	125.23	28.13	275.96	40.02
Junc N15	97.00	0.74	125.24	28.24	277.03	40.18
Junc N16	97.30	0.74	128.02	30.72	301.36	43.71
Junc N17	97.50	0.74	131.06	33.56	329.22	47.75
Junc N18	97.70	0.74	134.58	36.88	361.79	52.47

Minimum Pressure
Applied Fire Flow

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	190.22	6.05	207.60	0.022
Pipe 1.1	1.0	200	110	-190.22	6.05	207.61	0.022
Pipe 2	75.0	200	110	188.37	6.00	203.88	0.022
Pipe 3	67.0	200	110	-79.78	2.54	41.53	0.025
Pipe 4	72.0	200	110	-80.52	2.56	42.25	0.025
Pipe 5	82.0	200	110	-81.26	2.59	42.97	0.025
Pipe 6	29.0	200	110	-82.37	2.62	44.06	0.025
Pipe 7	144.0	200	110	-82.37	2.62	44.06	0.025
Pipe 8	141.0	200	110	-82.37	2.62	44.06	0.025
Pipe 9	46.0	200	110	-82.37	2.62	44.06	0.025
Pipe 9.1	1.0	200	110	-82.37	2.62	44.07	0.025
Pipe 10	44.0	100	100	1.11	0.14	0.53	0.052
Pipe 11	36.0	100	100	0.37	0.05	0.07	0.061
Pipe 12	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 13	42.0	100	100	0.74	0.09	0.25	0.055
Pipe 14	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 15	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 16	38.0	100	100	-0.74	0.09	0.25	0.055

MAXIMUM DAY + FIRE FLOW DEMAND AT N4

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	150.50	-172.55	150.50	0.00	0.00	0.00
Resvr R2	150.50	-100.04	150.50	0.00	0.00	0.00
Junc N1	96.90	0.00	150.33	53.43	524.15	76.02
Junc N2	97.00	0.00	142.18	45.18	443.22	64.28
Junc N3	97.20	0.00	129.44	32.24	316.27	45.87
Junc N4	97.40	266.67	118.24	20.84	204.44	29.65
Junc N5	97.60	0.00	122.63	25.03	245.54	35.61
Junc N6	97.60	0.37	127.70	30.10	295.28	42.83
Junc N7	97.70	0.00	129.53	31.83	312.25	45.29
Junc N8	97.40	0.00	138.63	41.23	404.47	58.66
Junc N9	97.00	0.00	147.53	50.53	495.70	71.90
Junc N10	96.90	0.00	150.44	53.54	525.23	76.18
Junc N11	97.40	0.74	142.16	44.76	439.10	63.69
Junc N12	97.30	0.37	142.16	44.86	440.08	63.83
Junc N13	97.00	0.74	142.17	45.17	443.12	64.27
Junc N14	97.10	0.74	129.43	32.33	317.16	46.00
Junc N15	97.00	0.74	129.43	32.43	318.14	46.14
Junc N16	97.30	0.74	118.23	20.93	205.32	29.78
Junc N17	97.50	0.74	122.62	25.12	246.43	35.74
Junc N18	97.70	0.74	127.69	29.99	294.20	42.67

Minimum Pressure
Applied Fire Flow

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	172.55	5.49	173.31	0.023
Pipe 1.1	1.0	200	110	-172.55	5.49	173.32	0.023
Pipe 2	75.0	200	110	170.70	5.43	169.89	0.023
Pipe 3	67.0	200	110	169.22	5.39	167.17	0.023
Pipe 4	72.0	200	110	-98.19	3.13	61.00	0.025
Pipe 5	82.0	200	110	-98.93	3.15	61.86	0.024
Pipe 6	29.0	200	110	-100.04	3.18	63.15	0.024
Pipe 7	144.0	200	110	-100.04	3.18	63.15	0.024
Pipe 8	141.0	200	110	-100.04	3.18	63.15	0.024
Pipe 9	46.0	200	110	-100.04	3.18	63.15	0.024
Pipe 9.1	1.0	200	110	-100.04	3.18	63.15	0.024
Pipe 10	44.0	100	100	1.11	0.14	0.53	0.052
Pipe 11	36.0	100	100	0.37	0.05	0.07	0.061
Pipe 12	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 13	42.0	100	100	0.74	0.09	0.25	0.055
Pipe 14	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 15	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 16	38.0	100	100	-0.74	0.09	0.25	0.055

MAXIMUM DAY + FIRE FLOW DEMAND AT N5

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	150.50	-156.45	150.50	0.00	0.00	0.00
Resvr R2	150.50	-116.14	150.50	0.00	0.00	0.00
Junc N1	96.90	0.00	150.36	53.46	524.44	76.06
Junc N2	97.00	0.00	143.56	46.56	456.75	66.25
Junc N3	97.20	0.00	132.96	35.76	350.81	50.88
Junc N4	97.40	0.00	123.65	26.25	257.51	37.35
Junc N5	97.60	266.67	113.74	16.14	158.33	22.96
Junc N6	97.60	0.37	120.44	22.84	224.06	32.50
Junc N7	97.70	0.00	122.86	25.16	246.82	35.80
Junc N8	97.40	0.00	134.85	37.45	367.38	53.28
Junc N9	97.00	0.00	146.59	49.59	486.48	70.56
Junc N10	96.90	0.00	150.42	53.52	525.03	76.15
Junc N11	97.40	0.74	143.54	46.14	452.63	65.65
Junc N12	97.30	0.37	143.54	46.24	453.61	65.79
Junc N13	97.00	0.74	143.55	46.55	456.66	66.23
Junc N14	97.10	0.74	132.95	35.85	351.69	51.01
Junc N15	97.00	0.74	132.95	35.95	352.67	51.15
Junc N16	97.30	0.74	123.64	26.34	258.40	37.48
Junc N17	97.50	0.74	113.73	16.23	159.22	23.09
Junc N18	97.70	0.74	120.43	22.73	222.98	32.34

Minimum Pressure
Applied Fire Flow

MAXIMUM DAY + FIRE FLOW DEMAND AT N5

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	156.45	4.98	144.55	0.023
Pipe 1.1	1.0	200	110	-156.45	4.98	144.56	0.023
Pipe 2	75.0	200	110	154.60	4.92	141.40	0.023
Pipe 3	67.0	200	110	153.12	4.87	138.91	0.023
Pipe 4	72.0	200	110	152.38	4.85	137.67	0.023
Pipe 5	82.0	200	110	-115.03	3.66	81.79	0.024
Pipe 6	29.0	200	110	-116.14	3.70	83.26	0.024
Pipe 7	144.0	200	110	-116.14	3.70	83.26	0.024
Pipe 8	141.0	200	110	-116.14	3.70	83.26	0.024
Pipe 9	46.0	200	110	-116.14	3.70	83.26	0.024
Pipe 9.1	1.0	200	110	-116.14	3.70	83.26	0.024
Pipe 10	44.0	100	100	1.11	0.14	0.53	0.052
Pipe 11	36.0	100	100	0.37	0.05	0.07	0.061
Pipe 12	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 13	42.0	100	100	0.74	0.09	0.25	0.055
Pipe 14	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 15	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 16	38.0	100	100	-0.74	0.09	0.25	0.055

MAXIMUM DAY + FIRE FLOW DEMAND AT N6

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	150.50	-139.57	150.50	0.00	0.00	0.00
Resvr R2	150.50	-133.02	150.50	0.00	0.00	0.00
Junc N1	96.90	0.00	150.38	53.48	524.64	76.09
Junc N2	97.00	0.00	144.88	47.88	469.70	68.12
Junc N3	97.20	0.00	136.32	39.12	383.77	55.66
Junc N4	97.40	0.00	128.83	31.43	308.33	44.72
Junc N5	97.60	0.00	120.85	23.25	228.08	33.08
Junc N6	97.60	267.04	111.86	14.26	139.89	20.29
Junc N7	97.70	0.00	114.96	17.26	169.32	24.56
Junc N8	97.40	0.00	130.38	32.98	323.53	46.92
Junc N9	97.00	0.00	145.47	48.47	475.49	68.96
Junc N10	96.90	0.00	150.39	53.49	524.74	76.11
Junc N11	97.40	0.74	144.86	47.46	465.58	67.53
Junc N12	97.30	0.37	144.86	47.56	466.56	67.67
Junc N13	97.00	0.74	144.87	47.87	469.60	68.11
Junc N14	97.10	0.74	136.31	39.21	384.65	55.79
Junc N15	97.00	0.74	136.31	39.31	385.63	55.93
Junc N16	97.30	0.74	128.82	31.52	309.21	44.85
Junc N17	97.50	0.74	120.84	23.34	228.97	33.21
Junc N18	97.70	0.74	111.85	14.15	138.81	20.13

Minimum Pressure
Applied Fire Flow

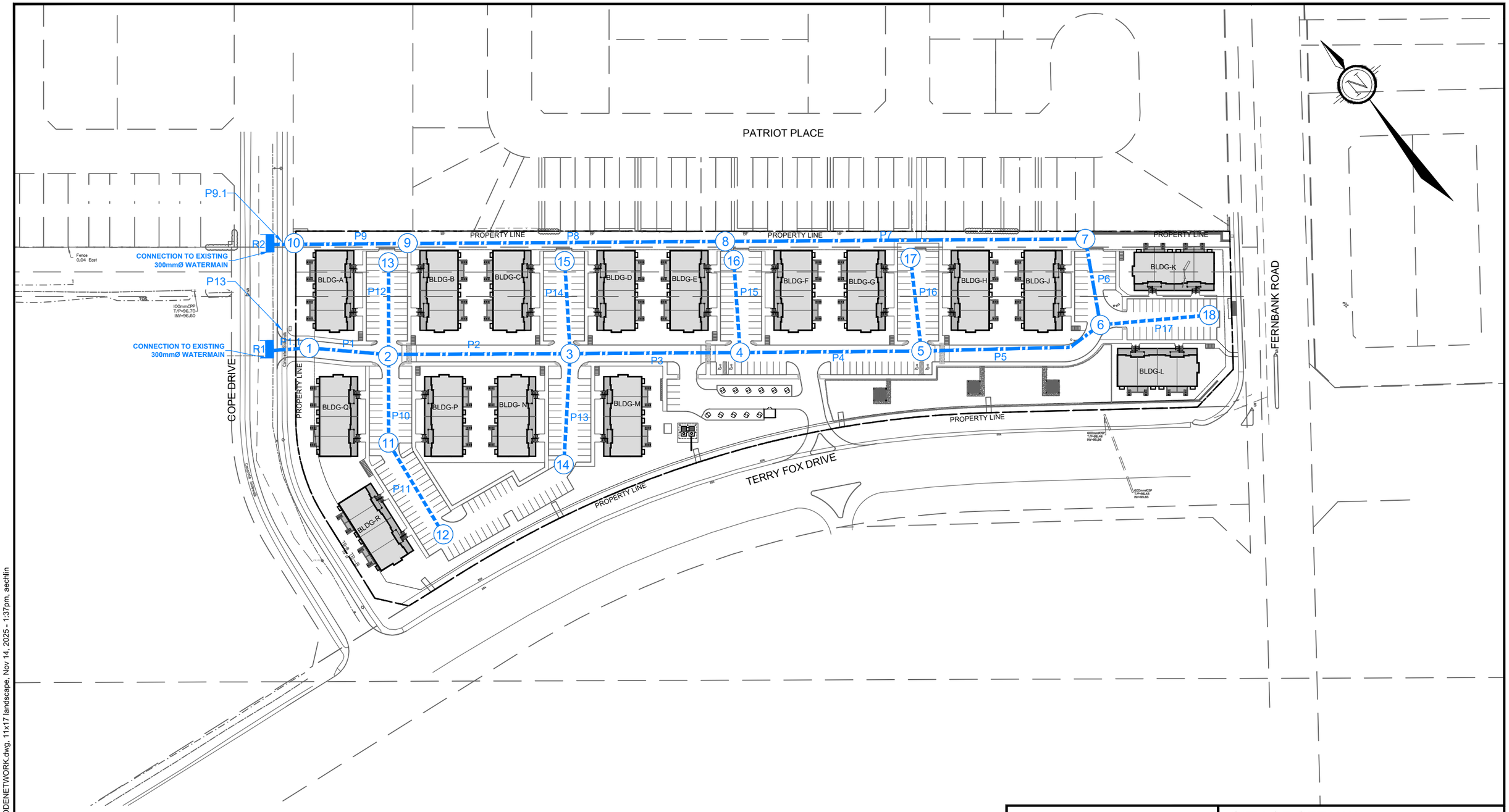
Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	47.0	200	110	139.57	4.44	117.01	0.023
Pipe 1.1	1.0	200	110	-139.57	4.44	117.02	0.023
Pipe 2	75.0	200	110	137.72	4.38	114.15	0.023
Pipe 3	67.0	200	110	136.24	4.34	111.89	0.023
Pipe 4	72.0	200	110	135.50	4.31	110.77	0.023
Pipe 5	82.0	200	110	134.76	4.29	109.65	0.023
Pipe 6	29.0	200	110	-133.02	4.23	107.04	0.023
Pipe 7	144.0	200	110	-133.02	4.23	107.04	0.023
Pipe 8	141.0	200	110	-133.02	4.23	107.04	0.023
Pipe 9	46.0	200	110	-133.02	4.23	107.04	0.023
Pipe 9.1	1.0	200	110	-133.02	4.23	107.04	0.023
Pipe 10	44.0	100	100	1.11	0.14	0.53	0.052
Pipe 11	36.0	100	100	0.37	0.05	0.07	0.061
Pipe 12	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 13	42.0	100	100	0.74	0.09	0.25	0.055
Pipe 14	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 15	38.0	100	100	-0.74	0.09	0.25	0.055
Pipe 16	38.0	100	100	-0.74	0.09	0.25	0.055

MAXIMUM DAY + FIRE FLOW DEMAND SUMMARY

Maximum day plus fire flow demand was modeled for each node.
The following is a summary of the minimum pressures that occurred for each operating condition.

Fire at Junction	Demand (L/s)			Minimum Pressure			
	Maximum Daily	Fire Flow	Max Day + Fire	(m)	kPa	psi	Node
Ultimate Condition							
N3	5.88	266.67	272.55	28.04	275.07	39.90	N3
N4	5.88	266.67	272.55	20.84	204.44	29.65	N4
N5	5.88	266.67	272.55	16.14	158.33	22.96	N5
N6	5.88	266.67	272.55	14.15	138.81	20.13	N18



LEGEND

- SITE BOUNDARY
- PROPOSED 200mm WATERMAIN (P5)
- PROPOSED 100mm WATERMAIN (P5)
- (1) PROPOSED NODE AND ID NUMBER
- R1 EXISTING RESERVOIR AND ID NUMBER

NOVATECH
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Website www.novatech-eng.com

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

PROPOSED WATER NETWORK PLAN

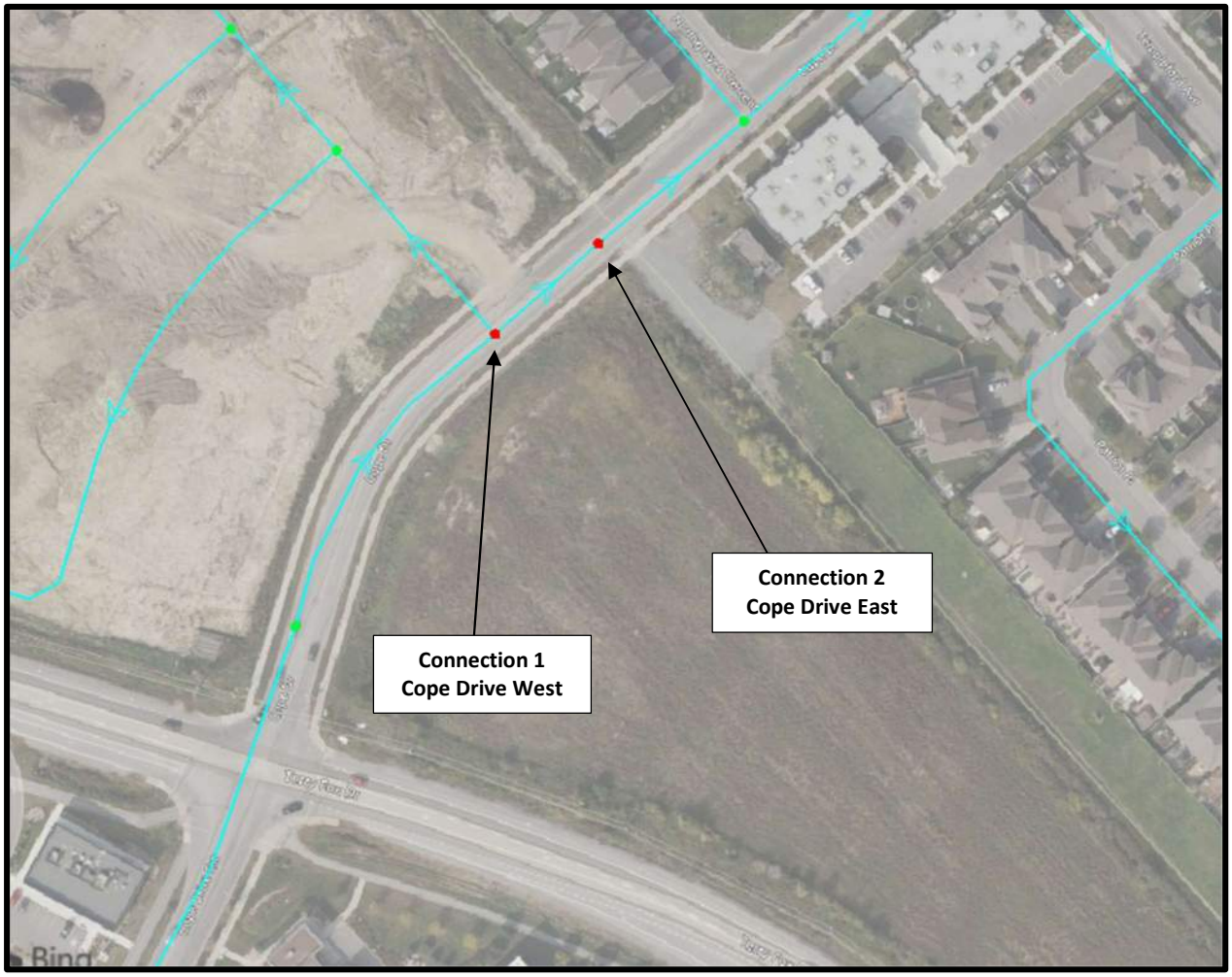
SCALE 1 : 1500 (0, 15, 30, 45, 60)
DATE NOV 2025
JOB 121011
FIGURE FIG-6

Boundary Conditions
5331 Fernbank Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	79	1.31
Maximum Daily Demand	236	3.93
Peak Hour	353	5.89
Fire Flow Demand #1	12,000	200.00
Fire Flow Demand #2	13,000	216.67
Fire Flow Demand #3	16,000	266.67

Location



Results

Connection 1 – Cope Drive West

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	162.2	93.0
Peak Hour	155.7	83.6
Max Day plus Fire Flow #1	153.2	80.1
Max Day plus Fire Flow #2	152.6	79.2
Max Day plus Fire Flow #3	150.5	76.3

[1] Ground Elevation = 96.9 m

Connection 2 – Cope Drive East

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	162.3	93.1
Peak Hour	155.7	83.6
Max Day plus Fire Flow #1	153.2	80.2
Max Day plus Fire Flow #2	152.6	79.3
Max Day plus Fire Flow #3	150.5	76.4

[1] Ground Elevation = 96.8 m

Notes

1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.
2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

5331 Fernbank Road - Iron Valley Phase 2
Water Demand

	Number of Units	Design Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Multi-Unit Apartment Blocks	192	404	1.31	3.93	5.89
Total	192	404	**1.31**	**3.93**	**5.89**

Water Demand Parameters

Multi-Unit Apartment Blocks	2.1	persons/unit
Residential Demand	280.0	L/c/day
Residential Maximum Daily Demand	3.0	x Avg Day
Residential Hour Demand	4.5	x Avg Day
Fireflow Demand 1 (FF1) - Max Fire Flow	**267**	L/s
Fireflow Demand 2 (FF2)	**217**	L/s
Fireflow Demand 3 (FF3)	**200**	L/s

Notes:
1) Water demand based on MOE Design Guidelines for Drinking Water Systems 2008 (< 500 population)
2) Fireflows calculated as per 2020 Fire Underwriter's Survey Guidelines.

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121011
Project Name: 5331 Fernbank Road - Iron Valley Phase 2
Date: 9/5/2025
Input By: Billy McEwen
Reviewed By: Drew Blair
Drawing Reference: 121011-Figure-BC1

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multi-Unit Apartment Blocks
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	425			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,275**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**10,200**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	3.1 - 10 m		20%	**6,120**
		East Side	20.1 - 30 m		10%	
		South Side	10.1 - 20 m		15%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**60%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**16,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**267**
				or	USGPM	4,227

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121011
Project Name: 5331 Fernbank Road - Iron Valley Phase 2
Date: 9/5/2025
Input By: Billy McEwen
Reviewed By: Drew Blair
Drawing Reference: 121011-Figure-BC1

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multi-Unit Apartment Blocks
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	425			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,275**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**10,200**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**2,550**
		East Side	20.1 - 30 m		10%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**25%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**13,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**217**
				or	USGPM	3,435

FUS - Fire Flow Calculations

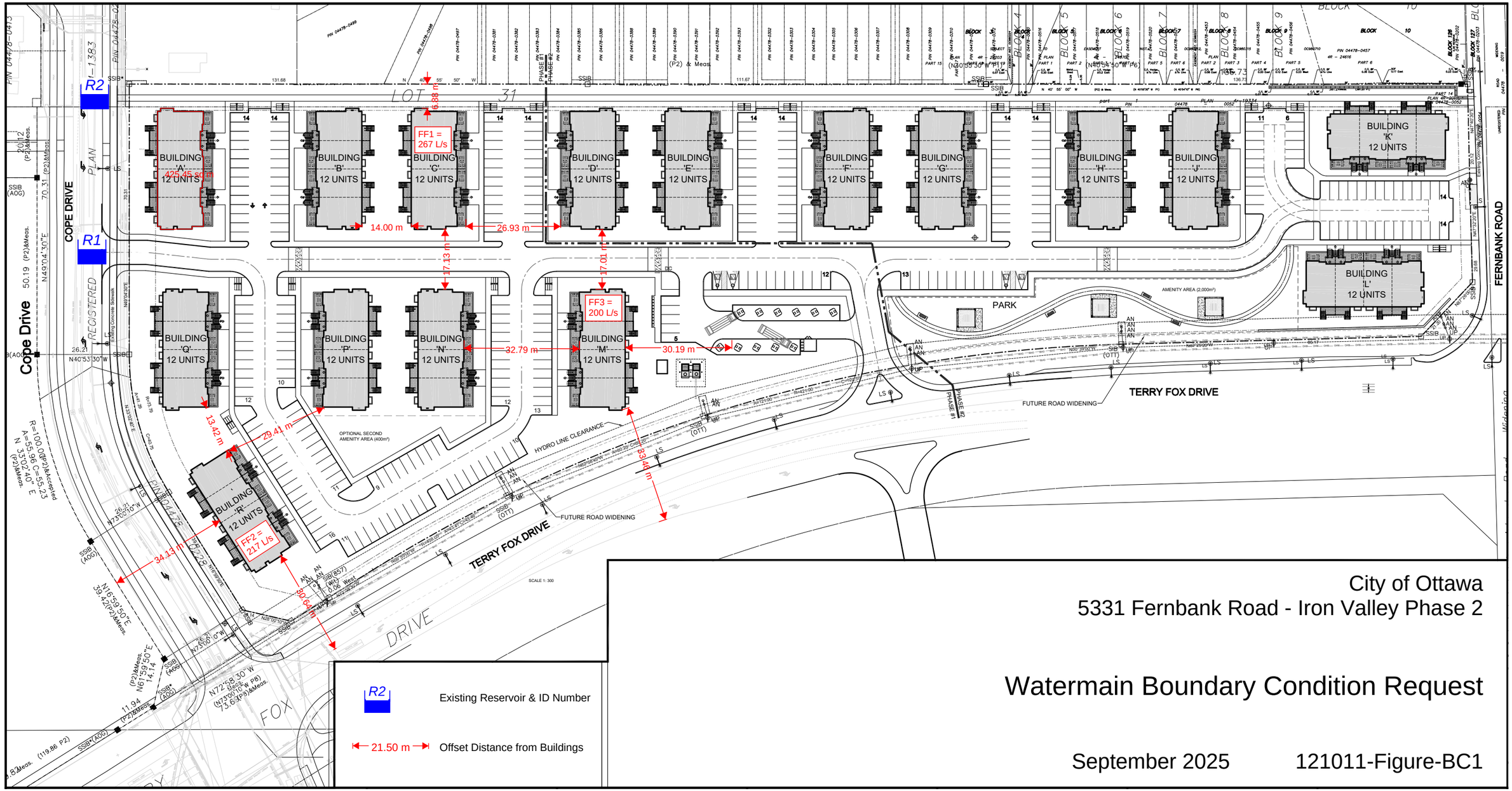
NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121011
Project Name: 5331 Fernbank Road - Iron Valley Phase 2
Date: 9/5/2025
Input By: Billy McEwen
Reviewed By: Drew Blair
Drawing Reference: 121011-Figure-BC1

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multi-Unit Apartment Blocks
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	425			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,275**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**10,200**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**1,530**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**15%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170



R2 — Existing Reservoir & ID Number

21.50 m — Offset Distance from Buildings

City of Ottawa
5331 Fernbank Road - Iron Valley Phase 2

Watermain Boundary Condition Request

September 2025 121011-Figure-BC1

Appendix D
EROSION AND SEDIMENT CONTROL

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

Scope of Work

The work under the applicable items includes the preparation, implementation and monitoring of an Erosion and Sediment Control Plan to prevent sediment-laden runoff resulting from the Contractor's construction operations from entering all sewers and watercourses both within and downstream from the Working Area. The plan shall include management and monitoring of water discharged from dewatering operations. The specification is limited to the management of sediment laden water and the management of contaminants such as hydrocarbons and volatile organic compounds present within groundwater at the site shall be managed as described elsewhere in the contract documents.

General

The Contractor acknowledges that surface erosion and sediment runoff resulting from construction operations has potential to cause a detrimental impact to any downstream watercourse, and that all construction operations that may impact upon water quality shall be carried out in a manner that strictly meets the requirements of all applicable legislation and regulations.

Accordingly, the Contractor shall be responsible for determining and conforming to the requirements of the Ontario Ministry of the Environment (MOE), the Ontario Ministry of Natural Resources, the City of Ottawa, applicable Conservation Authorities and any other Governmental Regulatory Agencies (collectively "Regulatory Agencies") having jurisdiction in the Working Area or over any potentially affected watercourses.

Erosion and Sediment Control Plan

Before commencing the Work, the Contractor shall submit to the Contract Administrator six copies of a detailed Erosion and Sediment Control Plan. The ESC Plan will consist of a written description and detailed drawings indicating the on-site activities and measures to be used to control erosion and sediment movement for each step of the Work. The written description shall be signed by, and the drawings shall bear the stamp and signature of a qualified Professional Engineer licensed in Ontario, herein designated as the Engineer of Record (EOR).

The Contractor acknowledges that the scheduling of the implementation of erosion and sediment controls is the key component for successful sediment control. Accordingly, the ESC Plan will contain a detailed schedule which identifies the following:

- Phasing of the steps for the installation of all control measures.
- Inspection, monitoring and maintenance of all control measures during construction.

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

- Phasing of the removal and disposal of the control measures.

The Contractor acknowledges that no one measure is likely to be 100% effective for erosion protection and controlling sediment runoff and water discharges from the site. Therefore, where necessary the ESC Plan will implement sequential measures arranged in such a manner so as to mitigate sediment release from construction operations and achieve specific maximum permitted criteria where applicable. Suggested on-site measures may include, but shall not be limited to, the following methods: sediment ponds, filter bags, pump filters, settling tanks, silt fences, straw bales, filter cloths, check dams and/or berms, or other recognized technologies and methods available at the time of construction. Specific measures shall be installed in accordance with the requirements of OPSS 805 where appropriate, or in accordance with manufacturer's recommendations.

Inspection and Monitoring of Mitigation Measures

The Contractor shall be solely responsible for inspecting, monitoring and maintaining the effectiveness of the ESC Plan upon implementation. The Contractor shall submit to the Contract Administrator weekly inspection reports demonstrating the performance of the installed measures, identifying deficiencies and indentifying required maintenance issues. These reports shall be prepared, signed by the EOR and provided to the Contract Administrator within 48 hours of the inspection.

- Maintenance issues are defined as any measure which is not functioning to the satisfaction of the EOR and in the opinion of the EOR may be repaired by the contractor with subsequent re-inspection at the next scheduled EOR site inspection.
- Deficiencies are defined as any measure or lack of measure which has potential to cause an adverse environmental impact at the site given the current/forecasted conditions and schedule of the work.

Maintenance issues which have previously been identified but not adequately corrected shall be considered deficiencies.

Deficiencies shall be immediately corrected. Corrective actions shall be re-inspected and documented by the EOR. Re-inspection reports shall be specific to the deficiency observed and may be written field reports.

EOR monitoring reports submitted shall include:

- The date and time of the inspection and monitoring.
- General description of the mitigating measures being utilized at the site.
- Confirmation as to the effectiveness of the measures inspected.

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

- Description of any maintenance issue which requires minor repair, improvement or maintenance.
- Description of any deficiency observed including timeline for correction and re-inspection.
- Deficiency re-inspection reports outstanding for the site.

The Contractor shall notify the Contract Administrator in all situations where a regulatory agency has identified deficiencies in erosion/sediment control measures, quality of runoff or quality of water quality discharged from dewatering operation.

Where in the opinion of the Contract Administrator either the proof of performance submitted is or the measures implemented are considered inadequate, the Contractor shall have the EOR review measures in the presence of the Contract Administrator within 24 hours of being notified in writing.

The Contractor shall monitor all weather forecasts and schedule the Work in order to minimize the risk of sediment-laden water from entering any watercourse or sewer system. The ESC Plan shall contain a Contingency Plan to include the provision of additional labour, equipment or materials to install additional control measures, and detail an emergency response plan in case of an accidental event. As such, the Contractor shall have additional control materials on site at all times which are easily accessible and may be implemented at a moment's notice.

Contractor's Responsibilities

The Contractor shall ensure that all workers, including sub-contractors, in the Working Area are aware of the importance of the erosion and sediment control measures and informed of the consequences of the failure to comply with the requirements of all Regulatory Agencies and the specifications detailed herein.

The Contractor shall periodically, and when requested by the Contract Administrator or EOR, clean out accumulated sediment deposits as required at the sediment control devices, including those deposits that may originate from outside the construction area. Accumulated sediment shall be removed in such a manner that prevents the deposition of this material into any sewer or watercourse and avoids damage to the control measure. The sediment shall be removed from the site at the Contractor's expense and managed in compliance with the requirements for excess earth material, as specified elsewhere in the Contract.

The Contractor shall immediately report to applicable regulatory agencies and the Contract Administrator any accidental discharges of sediment material into either the watercourse or the storm sewer system. Failure to report will be constitute a breach of this specification and the Contractor may also be subject to the penalties imposed by any

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

applicable Regulatory Agency. Appropriate response measures, including any repairs to existing control measures or the implementation of additional control measures, shall be carried out by the Contractor without delay.

The sediment control measures shall be removed when, in the opinion of the EOR, the measure(s) is no longer required. No control measure may be permanently removed without prior written authorization from the EOR. All sediment and erosion control measures shall be removed in a manner that avoids the entry of sediment or debris into any sewer or watercourse within or downstream of the Working Area. All accumulated sediment shall be removed from the Working Area at the Contractor's expense and managed in compliance with the requirements for excess earth material, as specified elsewhere in the Contract. Any seeding and mulching, temporary cover, sodding or original turf cover that is disturbed by the removal of the control measures and accumulated sediment, shall be brought to final grade and restored. Payment for the supply and placing of ground cover at these locations shall be made under the applicable items listed elsewhere in the Contract.

Where, in the opinion of either the Contract Administrator or a Regulatory Agency, any of the terms specified herein have either not been complied with or not performed in a suitable manner, the Contract Administrator or Regulatory Agency has the right to immediately withdraw its permission to continue the work but may renew its permission upon being satisfied that the defaults and/or deficiencies in the performance of this specification by the Contractor have been remedied. No compensation will be made to the Contractor for the withdrawal of permission to do the work resulting from non-compliance with the requirements of this specification and the Regulatory Agencies.

In addition to any other remedy and/or penalty provided by law, where there has been default or non-compliance with any of the terms specified herein and the Contractor refuses to perform or rectify same within forty-eight (48) hours of the receipt of the written demand of the Contract Administrator to do so, the Owner is hereby entitled to enter upon the Working Area and either complete the work in conformity with the Contract or have the work done that it considers necessary to complete the Work to its intended condition, whichever, in the Owner's sole opinion, is the most reasonable course of action. The Contractor and the Owner further agree that the costs incurred for any such work shall be retained by the Owner from monies otherwise due to the Contractor.

Monitoring of Water Quality Impacts and Point Source Discharges

The Contractor shall monitor runoff quality and quantity of water discharged from dewatering operations. The work shall include turbidity monitoring of impacts to watercourses (upstream vs downstream conditions), total suspended solids (TSS) monitoring of point sources such as those from dewatering operations. Discharge shall be in accordance with site specific constraints, regulatory requirements and sewer use bylaw

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

requirements. Where no specific criteria has otherwise been identified, the contractor shall meet the following discharge objective.

Source	Objective	Monitoring Frequency (min)
Watercourse Impacts	Downstream turbidity not to exceed upstream levels by greater than 25%	Minimum of daily for first three days of operation Minimum of twice weekly on an ongoing basis Daily for situations where the work is being conducted within 20 metres of a watercourse.
Discharge from Dewatering Operations	TSS maximum level of 25 mg/L	Minimum of daily for first three days of operation Minimum of twice weekly on an ongoing basis

Monitoring frequency to increase where scheduled construction operations have potential to impair water quality.

Mitigation and Action by Contractor Where Monitoring Indicates Water Impacts or Discharges Over Criteria or Objectives

Where site specific criteria or objectives are not attained, the Contractor and/or EOR shall immediately notify applicable regulatory agency of the monitoring results and possible impacts to sewers and watercourses. The Contractor shall implement an Action/Mitigation Plan acceptable to the EOR and applicable regulatory agency prior to continuing or resuming construction activities.

Measurement and Basis of Payment

Item – Erosion and Sediment Control Plan and Monitoring

Payment at the Contract price for the item “Erosion and Sediment Control Plan and Monitoring” shall be full compensation for the preparation and monitoring of the Erosion and Sediment Control Plan.

Payment shall be based upon the following schedule:

a) 25% upon satisfactory submission and implementation of the ESC Plan; and,
b) 75% pro-rated into equal payments over the term of the contract.

EROSION AND SEDIMENT CONTROL PLAN, MONITORING, AND MEASURES

This payment schedule may only be modified as agreed upon in writing between the Contractor and the Contract Administrator.

Item – Erosion and Sediment Control Measures

Payment at the Contract price for the item "Erosion and Sediment Control Measures" shall be full compensation for the implementation and maintenance of erosion and sediment control measures required for the site, and shall include all labour, equipment and materials to supply, construct, monitor and maintain all erosion and sediment control measures detailed therein.

Payment shall be based upon the following schedule:

a) 20% upon satisfactory installation of the control measures;
b) 70% pro-rated into equal payments over the term of the contract; and,
c) 10% upon successful completion and removal of the ESC Plan protection measures.

This payment schedule may only be modified as agreed upon in writing between the Contractor and the Contract Administrator.

Warrant: For work which is conducted in close proximity to watercourses or environmentally sensitive areas.

Appendix E
CORRESPONDENCE

Drew Blair

From: Mike Petepiece
Sent: Friday, May 7, 2021 2:00 PM
To: Marc St.Pierre; Drew Blair
Subject: FW: SOHO Phase 1 - Monahan Drain

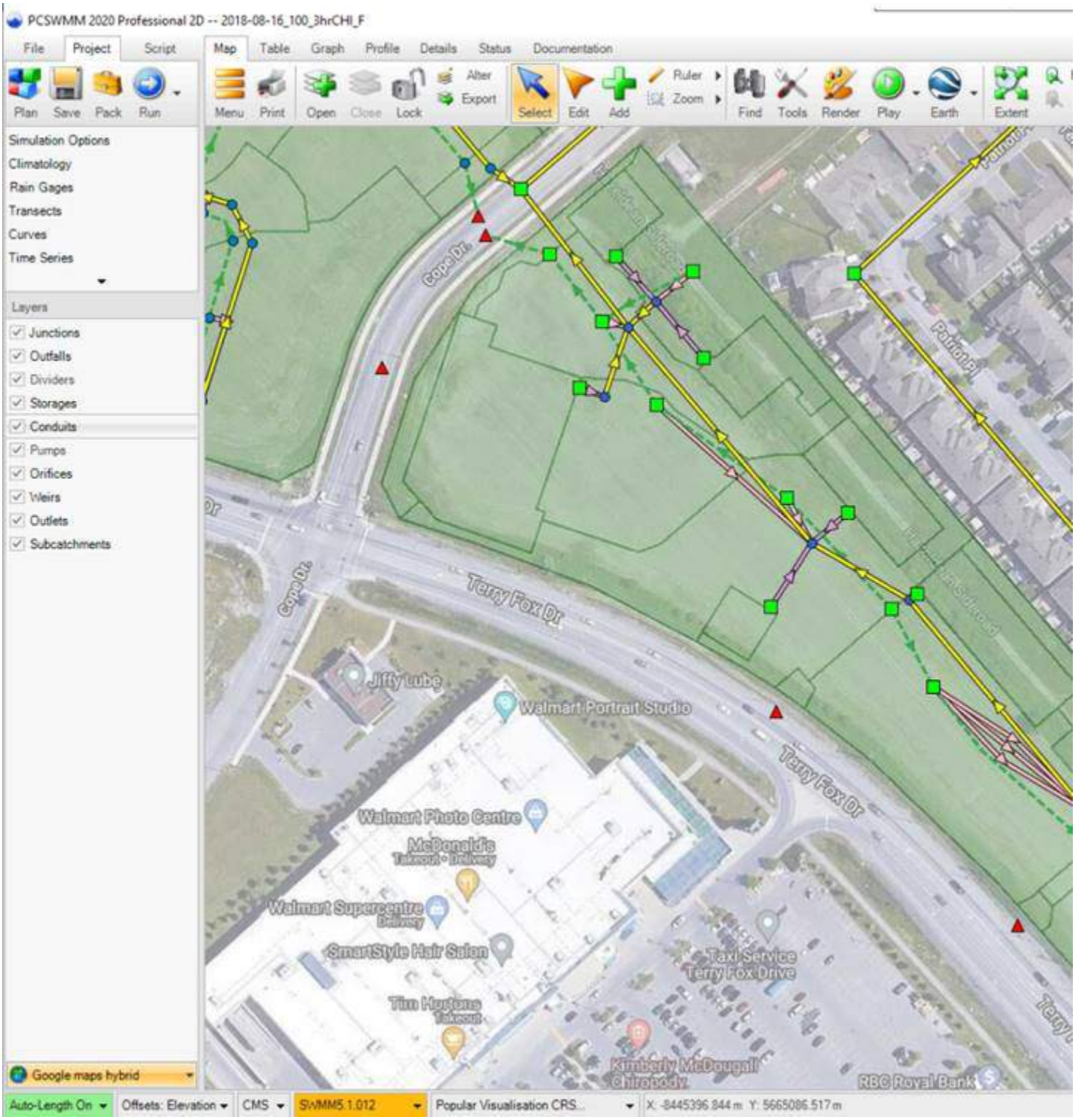
Hi Drew/MSP,
I met with Jonathon Burnett at JFSA this morning and he confirmed that the latest modeling for our area has a minor system inlet rate of 85 L/s/ha (316 L/s divided by 3.73 ha).
See email below.

Michael Petepiece, P.Eng., Senior Project Manager | Water Resources
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 235 | Cell: 613.299.4677 | Fax: 613.254.5867

From: Jonathon Burnett <jburnett@jfsa.com>
Sent: Friday, May 7, 2021 1:04 PM
To: Mike Petepiece <m.petepiece@novatech-eng.com>
Subject: SOHO Phase 1 - Monahan Drain

Hi Mike,

Looking over the Stantec model we have on file, I can confirm that the peak 100-Year minor system flow is 316 L/s (from memory I think the report you showed me today said 317 L/s).
Although I was not able to replicate the major system overflow as the model has many overflow locations.
Below is a screenshot from the model; it appears that Stantec did model these lands in reasonably high detail in the past.



Regards,

Jono Burnett, B.Eng., P.Eng
Water Resources Engineer

JFSA

52 Springbrook Drive, Ottawa ON, K2S 1B9
Tel.: 613-322-1253 | Email: jburnett@jfsa.com | Website: www.jfsa.com
Ottawa-Paris(ON)-Gatineau-Montréal-Québec

Drew Blair

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: Wednesday, May 12, 2021 9:50 AM
To: Drew Blair
Cc: Marc St.Pierre
Subject: RE: Pre-Consultation Follow-Up: 5331 Fernbank

Hi Drew,

Please go ahead and use the JFSA figure.

Thanks,

From: Kuruvilla, Santhosh
Sent: May 11, 2021 2:44 PM
To: Drew Blair <D.Blair@novatech-eng.com>
Cc: Marc St.Pierre <m.stpierre@novatech-eng.com>
Subject: RE: Pre-Consultation Follow-Up: 5331 Fernbank

Hi Drew,

Thanks for your quick response.

I will check with my colleague who gave me the quantity control criteria for this site (70L/S/Ha) and get back to you.

Thanks,

Santhosh

From: Drew Blair <D.Blair@novatech-eng.com>
Sent: May 11, 2021 2:14 PM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Cc: Marc St.Pierre <m.stpierre@novatech-eng.com>
Subject: RE: Pre-Consultation Follow-Up: 5331 Fernbank

It's not clearly spelled out in the text of the 2019 JFSA report. It is contained in the modelling files (provided by Stantec) that JFSA used for the overall Monahan Drain analysis including our site. I have attached the email we received from JFSA that confirms the 85L/s/Ha release rate for our site.

Please let us know if you need anything further.

Thanks,

Drew

Drew Blair, P.Eng., Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 236 | Fax: 613.254.5867

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: Tuesday, May 11, 2021 2:09 PM
To: Drew Blair <D.Blair@novatech-eng.com>
Cc: Marc St.Pierre <m.stpierre@novatech-eng.com>
Subject: RE: Pre-Consultation Follow-Up: 5331 Fernbank

Hi Drew,

Thanks for your email.

Could you please let me know where (on what page) you found the stormwater quantity control criteria (85 L/s/Ha) for this development in the 2019 JFSA report?

Thanks,

Santhosh

From: Drew Blair <D.Blair@novatech-eng.com>
Sent: May 10, 2021 3:11 PM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Cc: Marc St.Pierre <m.stpierre@novatech-eng.com>
Subject: FW: Pre-Consultation Follow-Up: 5331 Fernbank

We are currently working on our review of the stormwater design criteria from the 2019 J. F. Sabourin & Associates (JFSA) Monahan Drain Constructed Wetlands report that includes our site at 5331 Fernbank and have a question for you. The following statement "stormwater quantity control criteria – post development peak flow from the site shall be controlled to 70 L/s/ha" was provided in the pre-consultation notes below from the City for this site. From our review with JFSA and their 2019 report, our understanding from them is that the post development peak 100-Year minor system flow is 316 L/s for our site which divided by the site area of 3.7Ha is a minor system peak release rate of 85L/s/Ha. We will provide the background information and correspondence as part of our site plan submission.

Please confirm that we can proceed with the post development peak flow rate of 85L/s/Ha as per the 2019 JFSA report.

Please let us know if you need any further information.

Thanks,

Drew

Drew Blair, P.Eng., Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 236 | Fax: 613.254.5867

From: Vincent Denomme <vincent.denomme@claridgehomes.com>
Sent: Thursday, February 18, 2021 9:14 AM
To: Shawn Malhotra <shawn.malhotra@claridgehomes.com>; Drew Blair <D.Blair@novatech-eng.com>; Marc St.Pierre <m.stpierre@novatech-eng.com>; Colleen McKeracher <cmckeracher@rlaarchitecture.ca>; Jim Burghout <jim.burghout@claridgehomes.com>; Brad Byvelds <B.Byvelds@novatech-eng.com>; Greg Winters <G.Winters@novatech-eng.com>
Subject: Fwd: Pre-Consultation Follow-Up: 5331 Fernbank

All,

See pre-consult comments for your review.

---------- Forwarded message ---------
From: **McCreight, Laurel** <Laurel.McCreight@ottawa.ca>
Date: Wed, Feb 17, 2021 at 8:05 AM
Subject: Pre-Consultation Follow-Up: 5331 Fernbank
To: Vincent Denomme <vincent.denomme@claridgehomes.com>

Hi Vincent,

Please refer to the below regarding the Pre-Application for 5331 Fernbank Road for a Site Plan Control Application for a residential development containing 16 walk-up apartment buildings. I have also attached the required Plans & Study List for application submission.

Below are staff's preliminary comments based on the information available at the time of the pre-consultation meeting:

Planning / Urban Design

- A public parkette should be provided as discussed in the pre-consult meeting.
    - Parks staff have indicated that a minimum size of 0.266 ha would be required based on the dedication requirements.
    - An illustration of a preferred location has been provided.

- The pathway block located on the east side of the subject site should be provided with a public outlet to Terry Fox Drive, and/or Cope Drive/Fernbank Road.
    - This could be achieved by way of a pathway block, or private pathways with a public pedestrian easement.
- Garbage buildings in various locations are preferable to the current proposed molok/earth bin proposal.
    - Please consult the waste management guidelines for planned unit developments.
- Variation of the building placement along the east edge of the site is encouraged.
    - Slightly off setting the blocks would create visual interest and allow for additional plantings abutting the north/south private drive aisle.
- Internal walkways should connect to existing and planned sidewalks within the right of way.
- Concrete sidewalks should be provided internal to the site.
- Parking areas should be consolidated to the greatest extent possible to allow for additional landscaping on site.
- The proposed amenity areas labelled as park should be designed to provide buffering from Terry Fox Drive for future users.
    - This is not an ideal location for a private amenity on-site, and if retained should be designed for passive use vs. active play etc.
- Please ensure that the final landscape design incorporates four season design – wind, shadow, conifers etc. and CPTED principles.
- There are areas that do not appear to provide the appropriate landscape buffers for parking areas.
- Consideration should be given to alternatives to the loop at the south end of the site (hammerhead etc.) to reduce the amount of hard surface required in that area.
- A design brief is required as part of the subject application.
    - A terms of reference is attached.
- You are encouraged to contact the Ward Councillor, Councillor Allan Hubley, about the proposal.

Parks

- Parkland dedication required rather than cash-in-lieu of parkland.
- Density and location of existing/proposed parks nearby are not close enough to serve these residents.
- Park size of approximately 0.266 ha requirement based on current unit types/property area - at the small end of our park sizes, but still appropriate for some play features for residents of this development.
- The area around Block A is best location due to frontage requirements and it is quieter than Terry Fox.
    - Full park requirements can be seen in the City's Park Development Manual.
- Pathway block at the end of Tabaret – important to provide connectivity to that existing path and new park (see comments above from Planning/Urban Design).
- What are intentions for narrow parcel – Part 1, Block 98?

    - We would like to see a pathway connection here with the park.
    - Consider dedicating a pathway block in the former ROW lands to provide the connectivity, especially if there are concerns regarding crossing privately-owned lands.

Please contact Infrastructure Parks Planner Reid Shepherd for follow-up questions.

Engineering

- Stormwater quantity control criteria – post development peak flow from the site shall be controlled to 70 L/s/ha.

- Existing sanitary sewer is available on Cope Drive to make service connection.
- Existing storm sewer is available on Cope Drive to make service connection.
- Existing watermain is available on Cope Drive to make service connection.
- If looping is required for water, a second service connection is required.
- Stormwater quality control – Consult with the Conservation Authority (RVCA) for their requirements.
    - Include the correspondence with RVCA in the stormwater/site servicing report.
- As per the City of Ottawa Slope Stability Guidelines for Development Applications an engineering report is required for any retaining walls proposed 1.0 m or greater in height within the subject site that addresses the global stability of the wall and provides structural details.
    - A Retaining Wall Stability Analysis Report and Retaining Wall Structural Details are required to be provided from a Professional Engineer licensed in the Province of Ontario that demonstrates the proposed retaining wall structure has been assessed for global instability as per City standards.
    - Please ensure the analysis and required documentation are provided as part of the submission to address this comment.
- Emergency routes will need to be satisfactory to Fire Services.
    - Please show fire routes on the site plan.
    - For information regarding fire route provisions, please consult with Kevin Heiss at kevin.heiss@ottawa.ca.
- Clearly show and label the property lines on all sides of the property.
- Clearly show and label all the easements (if any) on the property, on all plans.
- When calculating the post development composite runoff coefficient (C), please provide a drawing showing the individual drainage area and its runoff coefficient.
- When using the modified rational method to calculate the storage requirements for the site, the underground storage should not be included in the overall available storage.
    - The modified rational method assumes that the restricted flow rate is constant throughout the storm which, in this case, underestimates the storage requirement prior to the 1:100-year head elevation being reached. Alternately, if you wish to include the underground storage, you may use an assumed average release rate equal to 50% of the peak allowable rate.
    - Otherwise, disregard the underground storage as available storage or provide modeling to support the design.
- Engineering plans are to be submitted on standard A1 size (594mm x 841mm) sheets.
- Phase 1 ESA and Phase 2 ESA must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

1. Provide the following information for water main boundary conditions:

    1. Location map with water service connection location(s).
    2. Average daily demand (l/s).
    3. Maximum daily demand (l/s).
    4. Maximum hourly demand (l/s).
    5. Fire flow demand (provide detailed fire flow calculations based on Fire Underwriters survey (FUS) Water Supply for Public Fire Protection). Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).
    6. Hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

- If you are proposing any exterior light fixtures, all must be included and approved as part of the site plan approval. Therefore, the lights must be clearly identified by make, model and part number. All external light

fixtures must meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the applicant must provide certification from an acceptable professional engineer. The location of all exterior fixtures, a table showing the fixture types (including make, model, part number), and the mounting heights must be included on a plan.

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans are to be submitted on standard A1 size sheets (594mm x 841mm) sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below:
- https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:

  InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>

  (613) 580-2424 ext. 44455

Please contact Infrastructure Project Manager Santhosh Kuruvilla for follow-up questions.

Transportation

- Follow Traffic Impact Assessment Guidelines
  - A TIA is required. Submit Scoping report at your earliest convenience.
  - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
  - Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
  - Synchro files are required at Step 4.
  - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- ROW protection on Terry Fox and Cope is 44.5 and 24 metres, respectively.
- A sidewalk on Terry Fox is strongly recommended.
- No full movement access will be permitted on this segment of Terry Fox.
- A Road Noise Impact Study is required.

- For the two private accesses, provide enough throat length for arterial/collector as per TAC guidelines.
- On site plan:
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
    - Turning movement diagrams required for internal movements (loading areas, garbage).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
    - Show lane/aisle widths.
    - Sidewalk is to be continuous across access as per City Specification 7.1.
    - Grey out any area that will not be impacted by this application.
- The City recommends development on private property be in accordance with the Accessibility Design Standards (AODA legislation). As the site proposed is residential, it is suggested that the design conforms to the Site Plan Checklist, which summarizes AODA requirements (attached).

Please contact Transportation Project Manager, Mike Giampa for follow-up questions.

Other

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Laurel

Laurel McCreight MCIP, RPP

Planner

Development Review West

Urbaniste

Examen des demandes d'aménagement ouest

City of Ottawa | Ville d'Ottawa

613.580.2424 ext./poste 16587

ottawa.ca/planning / ottawa.ca/urbanisme

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Vincent Dénommé
613-233-6030 ex 247

www.claridgehomes.com
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Appendix F
DRAWINGS

GENERAL

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL, AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN AND PAY ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
5. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. GAS, HYDRO, TELEPHONE OR ANY OTHER UTILITY THAT MAY EXIST ON SITE OR WITHIN THE STREETLINES MUST BE LOCATED BY ITS OWN UTILITIES AND VERIFIED PRIOR TO CONSTRUCTION.
6. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
7. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
8. ALL UNDERGROUND SERVICES MATERIALS AND INSTALLATIONS TO BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND CODES OF THE MUNICIPALITY.
9. ALL SURFACE DRAINAGE SHALL BE SELF-CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
10. WHEREVER PIPES ARE PASSING THROUGH UNCOMPACTED FILL AREA, THE BEDDING TRENCH SHALL BE EXCAVATED TO THE UNDISTURBED GROUND LEVEL AND BACKFILLED WITH GRANULAR "A" COMPACTED TO 100% STANDARD PROCTOR DENSITY.
11. BEFORE COMMENCING CONSTRUCTION PROVIDE PROOF OF COMPREHENSIVE ALL RISK AND OPERATIONAL LIABILITY INSURANCE INCLUDING BLASTING (ONLY IF REQUIRED). INSURANCE POLICY TO NAME THE OWNER, ENGINEER AND ARCHITECT AS CO-INSURED. AMOUNT OF INSURANCE TO BE SPECIFIED BY OWNERS AGENT.
12. CONNECTION TO EXISTING SYSTEMS AS DETAILED, INCLUDING ALL RESTORATION WORK NECESSARY TO REINSTATE SURFACES TO THE CONDITION THAT EXISTED PRIOR TO CONSTRUCTION OR BETTER.
13. STANDARD ROAD CUT SHALL BE IN ACCORDANCE WITH CITY STANDARD R10.
14. ASPHALT REINSTATEMENT SHALL BE IN ACCORDANCE WITH CITY STANDARD R25.
15. CONCRETE SIDEWALK TO BE CONSTRUCTED AS PER CITY STANDARDS SC-3, SC-5, SC-7, AND SC-8
16. CONTRACTOR TO PROVIDE LINE/PARKING PAINT LINES
17. BOULEVARDS SHALL BE REINSTATED WITH 150mm OF TOPSOIL AND SODDED.
18. INVESTIGATION REPORT FOR SUBSURFACE INFORMATION PREPARED BY THE GEOTECHNICAL CONSULTANT. INTERPRETATION OF INFORMATION IS THE RESPONSIBILITY OF THE CONTRACTOR.
19. REMOVE TOPSOIL AND STOCKPILE ONSITE IN A SUITABLE LOCATION.
20. TOPSOIL IN FILL AREA TO BE STRIPPED AND CLEAN FILL TO BE PLACED AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
21. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
22. THE ORIGINAL TOPOGRAPHY AND GROUND ELEVATIONS, SERVICING AND SURVEY DATA SHOWN ON THIS PLAN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL INFORMATION OBTAINED FROM THESE PLANS.
23. THICKNESS OF GRANULAR MATERIAL AND ASPHALT LAYERS SHALL BE IN ACCORDANCE WITH CITY STANDARD ROAD CROSS SECTION AND AS PER THE GEOTECHNICAL CONSULTANTS RECOMMENDATIONS.
24. ALL ELEVATIONS ARE GEODETIC AND UTILITIZE METRIC UNITS. ALL MEASUREMENTS UTILIZE METRIC UNITS.
25. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INDICATE:PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANTS LOCATIONS, T/MW ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
26. REFER TO ARCHITECTS AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS

SEWERS

1. ALL SEWER MATERIALS AND CONSTRUCTION METHODS MUST FOLLOW CITY OF OTTAWA STANDARDS.
2. ALL CATCHBASIN MANHOLES AND MANHOLES SHALL BE PRECAST AND CONFORM TO CITY OF OTTAWA DETAILS S24, S24.1, S25, S28, S28.1 AND OPSD 701.010.
3. ALL CATCHBASINS SHALL BE PRECAST AND CONFORM TO OPSD 705.010.
4. ALL CATCHBASIN MANHOLES AND CATCHBASINS TO HAVE A MINIMUM 0.6m SUMP AS PER OPSD UNLESS NOTED OTHERWISE.
5. REARYARD CATCHBASINS SHALL BE IN ACCORDANCE WITH CITY STANDARD DETAIL S29,S30 AND S31.
6. ALL CATCHBASINS SHALL INCLUDE 6.0m OF 150mmØ PERFORATED SUBDRAIN C/W FILTER CLOTH.
7. ROAD CATCHBASINS WITH SOLID COVER TO BE AS PER S19 SOLID COVER ALTERNATIVE.
8. ALL CATCHBASIN LEADS TO BE 200MM DIAMETER AND ALL REAR YARD CATCHBASIN LEADS TO BE 250MM DIAMETER, UNLESS OTHERWISE NOTED.
9. STORM SEWER SHALL BE CONCRETE CL III WITH TYPE "B" BEDDING OR PVC PIPE SDR 35 THROUGHOUT EXCEPT AT RISERS, UNLESS OTHERWISE NOTED, AS PER OPSD.
10. ALL PROPOSED FOUNDATION DRAINS SHALL BE CONNECTED TO STORM SEWER.
11. MANHOLE BENCHING SHALL FOLLOW MUNICIPALITY STANDARD DETAIL FOR MANHOLES WITH CONNECTING PIPES 900mm OR LARGER.
12. SEWER TRENCHING AND BEDDING SHALL BE AS PER CLASS "B" BEDDING CITY OF OTTAWA STANDARD DRAWING S-7, UNLESS NOTED OTHERWISE. BEDDING SHALL BE COMPACTED TO MINIMUM 98% STANDARD PROCTOR DRY DENSITY. CLEAR STONE BEDDING SHALL NOT BE PERMITTED.
13. SANITARY SEWERS AND CONNECTIONS 150mmØ AND SMALLER TO BE PVC SDR 28.
14. SANITARY SEWERS AND CONNECTIONS 200mmØ AND LARGER TO BE PVC SDR 35 WITH TYPE "B" BEDDING THROUGHOUT EXCEPT AT RISERS, UNLESS OTHERWISE NOTED.
15. ALL STORM AND SANITARY SERVICES ARE TO BE THE SIZES INDICATED AND THE MATERIAL SHALL BE PVC DR-28 @ 1.0% MINIMUM SLOPE.
16. INSULATE ALL STORM AND SANITARY SEWERS THAT HAVE LESS THAN 2.0m AND 2.5m OF EFFECTIVE COVER RESPECTIVELY WITH THERMAL INSULATION. PROVIDE 150mm OF CLEARANCE BETWEEN PIPE AND INSULATION.
17. SANITARY AND STORM SERVICES ARE TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, AT A MINIMUM SLOPE OF 1.0% UNLESS OTHERWISE INDICATED.
18. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS, LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS
19. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mm OR GREATER PRIOR TO BASE COURSE ASPHALT.UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH, CLEAN AND RE-TELEVISE ALL SEWERS & APPURTENANCES.
20. FULL PORT BACKWATER VALVES ARE REQUIRED ON THE SANITARY SERIES INSTALLED AS PER THE MANUFACTURERS BUILDING; INSTALLED AS PER ST. DWG S14.
21. WATERTIGHT COVERS TO BE LOCATED WITHIN STORMWATER MANAGEMENT PONDING AREAS AS PER OPSD 401.030. REFER TO SANITARY AND STORM WATERTIGHT LID TABLES.

WATERMAINS

1. CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. WATERMAIN TO BE PVC DR 18. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY CONTRACTOR. CONNECTION TO EXISTING WATERMAIN BY CITY OF OTTAWA. NO WORK TO COMMENCE UNLESS A CITY WATER WORKS INSPECTOR IS ON SITE.
2. WATERMAIN MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.25m OVER AND 0.50m UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
3. WATERMAINS ARE TO HAVE A MINIMUM COVER OF 2.4m WITH A MINIMUM HORIZONTAL SPACING OF 2.0m FROM THEMSELVES AND OTHER UTILITIES, AS PER CITY OF OTTAWA STANDARD DETAIL R-20.
4. PROVIDE THERMAL INSULATION FOR WATERMAIN AT OPEN STRUCTURES PER CITY OF OTTAWA STANDARD DETAIL W-23.
5. IF WATERMAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.
6. ALL CURB STOPS TO BE INSTALLED ON THE PROPERTY LINE UNLESS OTHERWISE NOTED.
7. WATERMAIN TRENCHING AND BEDDING TO CONFORM TO CITY OF OTTAWA STANDARD DETAIL W-17.
8. VALVES AND VALVE BOXES TO CONFORM WITH CITY OF OTTAWA STANDARD DETAIL W-24.
9. FIRE HYDRANT C/W VALVE AND BOX SHALL CONFORM TO CITY OF OTTAWA STANDARD DETAIL W-19.
10. CONCRETE THRUST BLOCKS ARE TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS W25.3 AND W25.4.
11. ALL WATERMAIN SERVICE INSTALLATIONS AT SEWER CROSSINGS PER CITY OF OTTAWA STANDARD DETAIL W-38.
12. WATER METER SHALL CONFORM TO CITY OF OTTAWA STANDARD DETAIL W-32. INSTALLATION BY CITY OF OTTAWA.
13. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0M OF FOUNDATION WALL AND LEAVE 6.0M OF COIL UNLESS OTHERWISE INDICATED
14. PRESSURE REDUCING VALVES (PRV) ARE TO BE INSTALLED ON EVERY WATER SERVICE.

TYPICAL SERVICING NOTES:

1. NO HORIZONTAL BENDS IN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED BY THE CITY. MAXIMUM OF TWO 22.5° HORIZONTAL BENDS FOR SANITARY AND STORM SERVICES.
2. 1.0 % MINIMUM SANITARY AND STORM SERVICE GRADIENT WITH 2% PREFERRED.
3. STORM SERVICE LATERAL SHALL BE LOCATED TO THE LEFT OF SANITARY SERVICE LATERAL WHEN LOOKING AT THE STRUCTURE FROM THE STREET. SERVICE SIZES IN CONFORMANCE WITH S11.
4. SEE S7 FOR PIPE FOUNDATION, EMBEDMENT AND FINAL BACKFILL REQUIREMENTS.
5. MULTIPLE TAPS WITH SADDLES IN PVC WATERMAIN SHALL BE STAGGERED AND MINIMUM 600mm APART.
6. ELEVATION OF SERVICES VARIABLE DEPENDING ON GRADIENT AND/OR DEPTH OF COVER.
7. ALL DIMENSIONS ARE IN MILLIMETRES.
8. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELVEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.
9. GRADE AND/OR FILL BEHIND PROPOSED CURB AND BETWEEN BUILDINGS AND CURBS, WHERE REQUIRED TO PROVIDE POSITIVE DRAINAGE.
10. REFER TO ELECTRICAL DESIGN FOR UTILITY LOCATIONS.
11. SEE W27 FOR ADDITIONAL WATER SERVICING SCENARIOS.

GRADING

1. CONTACT CITY FOR ROUGH GRADING INSPECTION PRIOR TO PLACEMENT OF TOPSOIL OR TOPSOIL AND SOD.
2. FINISHED GRADING WILL NOT ADVERSELY AFFECT DRAINAGE PATTERNS OF ADJACENT LANDS.
3. MAXIMUM (3:1) SLOPES AT PROPERTY LINE AND WITHIN THE SITE UNLESS OTHERWISE INDICATED.
4. MATCH EXISTING ELEVATIONS AT ALL PROPERTY LINES. ENSURE POSITIVE DRAINAGE WHETHER INDICATED OR NOT.
5. WHERE EXISTING GRADE IS FOUND TO BE MORE THAN 300mm BELOW THE PROPOSED GRADES INDICATED ON THIS GRADING PLAN, CONTACT ENGINEER IMMEDIATELY.
6. SWALES LESS THAN 1.5% SHALL HAVE A 250mm SUBDRAIN AS PER CITY OF OTTAWA STANDARD S29, S30 AND S31.
7. MINIMUM OF 2% AND MAXIMUM OF 6% GRADE FOR GRASSED AREAS UNLESS OTHERWISE NOTED. SIDEWALK CROSSFALL NOT TO EXCEED 2%.
8. CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED
10. ALL PROPOSED STEPS IN WALKWAYS ARE TO BE WITHIN THE PROPERTY BOUNDARY.
11. ALL RETAINING WALLS GREATER THAN 1.0m IN HEIGHT ARE TO BE DEISGNED, REVIEWED, INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER.
12. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS

UTILITY NOTES:

1. CONTRACTOR TO CONTACT RESPECTIVE UTILITY COMPANIES TO DETERMINE EXACT LOCATION OF EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR TO ASSUME ALL LIABILITY FOR DAMAGE TO EXISTING UTILITIES.
2. EXTEND ENCASED DUCT CROSSINGS 1.0m FROM BACK OF CURB OR SIDEWALK ON EACH SIDE.
3. CONTRACTOR SHALL EXCAVATE, BACKFILL, AND RESTORE ALL SURFACES TO EXISTING CONDITIONS FOR HYDRO PRIMARY, BELL, AND CABLEVISION CABLES.
4. CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCT WORK AND TRANSFORMER PAD. SINGLE PHASE TRANSFORMER PAD PER HYDRO OTTAWA DETAIL UCS0003.
5. TEMPORARILY COIL ALL SERVICE WIRES ON A 76mm X 76mm X 2.4m WOODEN POST FOR EACH UNIT WITH ENOUGH CONDUCTOR TO ALLOW FOR COMPLETION OF TRENCHING AND BUILDING CONNECTION.
6. MINIMUM 1.5m CLEARANCE TO BE PROVIDED FROM WATER SERVICES TO ALL PEDESTALS, TRANSFORMER PADS, ROAD DUCT CROSSINGS, AND STREET LIGHTS.
7. MINIMUM 3.0m CLEARANCE TO BE PROVIDED FROM HYDRANT TO ALL ABOVE GROUND STRUCTURES INCLUDING STREETLIGHTS, BELL PEDESTALS, CABLE PEDESTALS, TRANSFORMERS, SECTIONALIZERS, ETC.

PAVEMENT STRUCTURE NOTES

1. SUBGRADE MATERIAL SHALL BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY
2. ROADWAY GRANULAR MATERIAL SHALL BE PLACED IN MAXIMUM 300mm LIFTS AND COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY
3. ASPHALTIC CONCRETE TO BE COMPACTED TO AT LEAST 97% OF MARSHALL DENSITY
4. ROADWAY SUBGRADE TO BE INSPECTED BY THE GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION TO REVIEW THE GRANULAR 'B' DEPTH AND FOR THE NECESSITY OF A WOVEN GEOTEXTILE BELOW THE GRANULAR MATERIALS.
5. PRIOR TO THE PLACEMENT OF TOPLIFT, CONTRACTOR IS TO ADJUST ALL STRUCTURES AS PER CITY OF OTTAWA STANDARD R-2.

EROSION AND SEDIMENT CONTROL NOTES:

1. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS AND DURING ALL PHASES OF THE SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCK AS BUT NOT LIMITED TO INSTALLING CATCHBASIN INSERTS ACROSS MH & CBS AND INSTALLING AND MAINTAINING LIGHT DUTY SILT FENCE BARRIERS AND STRAW BALE/ROCK CHECK DAMS AS REQUIRED.
2. CONDITIONS OF THE SILT FENCE AND STRAW BALE/ROCK CHECK DAMS TO BE INSPECTED REGULARLY AND REPLACED OR REPAIRED AS INSTRUCTED BY THE ENGINEER.
3. THE CONTRACTOR SHALL ENSURE THAT ROADS ARE KEPT CLEAN AT ALL TIMES USING SUCH PRACTICES AS WASHING DOWN TRUCK TIRES, ROAD SWEEPING AND FLUSHING ETC.
4. THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM HIS CONSTRUCTION OPERATIONS WILL HAVE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN A MANNER THAT STRICTLY MEETS THE REQUIREMENTS OF ALL APPLICABLE LEGISLATION AND REGULATIONS.
5. AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT HIS OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF FROM ENTERING ANY SEWER OR WATERCOURSE WITHIN DOWNSTREAM OF THE WORKING AREA FOR THIS PROJECT THE SUGGESTED ON-SITE MEASURES SHALL INCLUDE BUT SHALL NOT BE LIMITED TO THE FOLLOWING METHODS:
   -CATCH BASIN SILTSACKS
   -MAINTENANCE HOLE AND REAR YARD CATCH BASIN FILTERS
   -LIGHT DUTY SILT FENCE
   -MUD MATS
   -STRAW BALE CHECK DAMS

   SPECIFIC MEASURES SHALL BE INSTALLED AT THE SPECIFIED LOCATIONS AND IN ACCORDANCE WITH THE REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR ANY REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR THE REGULATORY AGENCY. AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIMES WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT A MOMENT'S NOTICE.
7. THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING IN THE WORKING AREA ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES AND THE SPECIFICATIONS DETAILED HEREIN.
8. THE CONTRACTOR SHALL PERIODICALLY, OR WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO ANY SEWER OR WATERCOURSE AND AVOIDS DAMAGE TO THE CONTROL MEASURE. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

PAVEMENT STRUCTURE:

REFER TO GEOTECHNICAL REPORT FOR SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS

Light Duty Parking
50mm HL3 OR SUPERPAVE 12.5
150mm GRAN 'A'
300mm GRAN 'B' TYPE II

Access Lanes and Heavy Duty Truck Parking
40mm SUPERPAVE 12.5 CLASS B
50mm SUPERPAVE 19.0 CLASS B
150mm GRAN 'A'
400mm GRAN 'B' TYPE II

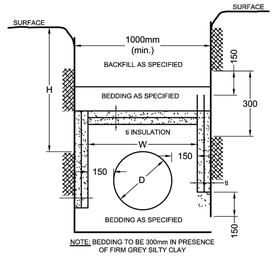
* GRANULAR BASE TO BE COMPACTED TO 99% STANDARD PROCTOR DRY DENSITY.

SEWER & WATERMAIN INSULATION NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 2.0m COVER AND ALL WATERMAIN WITH LESS THAN 2.4m OF COVER WITH EXPANDED POLYSTYRENE INSULATION AS PER OPSD 1109.030.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER WITH 50mm MINIMUM (SEE TABLE)

COVER SEWER / WATER (mm)	INSULATION THICKNESS (mm)
2000-1700 / 2400-2100	50
1700-1400 / 2100-1800	75
1400-1100 / 1800-1500	100

T = THICKNESS OF INSULATION (mm)
W = WIDTH OF INSULATION (mm)
W = D + 300 (1000 min.)
D = O.D OF PIPE (mm)



INSULATION DETAIL FOR SHALLOW SEWERS & WATERMAIN

LEGEND

- SITE BOUNDARY
- 97.75 — PROPOSED ELEVATION
- 98.00 — EXISTING ELEVATION
- 98.85TW — PROPOSED TOP OF WALL ELEVATION
- 97.75BW — PROPOSED BOTTOM OF WALL ELEVATION
- 96.00CLD — PROPOSED CENTERLINE OF DITCH ELEVATION
- 97.55(S) — PROPOSED SWALE ELEVATION
- 97.40 — PROPOSED TERRACE ELEVATION
- 1.3% — PROPOSED SLOPE
- PROPOSED CENTRELINE SWALE
- PROPOSED TERRACING (MAXIMUM 3:1 SLOPE)
- BARRIER CURB — PROPOSED BARRIER CURB AS PER SC1.1
- PROPOSED TWSI AS PER CITY OF OTTAWA DETAIL 7.2
- PROPOSED RETAINING WALL
- PROPOSED SIDEWALK
- 97.35 — STATIC PONDING AREA AND SPILL DEPTH ELEVATION
- 98.45 / 97.95 — 1:100yr PONDING AREA AND ELEVATION; 1:5yr PONDING AREA AND ELEVATION
- 98.00 / 97.50 / 97.00 — *EXISTING* CONTOUR LINE AND CONTOUR ELEVATION
- USF — PROPOSED UNDERSIDE OF FOOTING ELEVATION
- HYD. T/F — PROPOSED HYDRANT TOP OF FLANGE ELEVATION
- T/G — PROPOSED TOP OF GRATE ELEVATION
- PROPOSED MAJOR OVERLAND FLOW ROUTE
- AREA 1 / 815-813 / 0.81 / 89.1 — AREA ID; MANHOLE TO MANHOLE; POPULATION EQUIVALENT; AREA IN HECTARES
- SANITARY DRAINAGE AREA BOUNDARY
- 1.00 / 1 / 105-103 / 0.50 — DRAINAGE AREA (hectares); AREA IDENTIFICATION; MANHOLE TO MANHOLE; RUN-OFF COEFFICIENT
- DRAINAGE AREA BOUNDARY
- 101 — PROPOSED SANITARY MANHOLE
- 100 — PROPOSED STORM MANHOLE
- CBMH1 — PROPOSED CATCHBASIN/MANHOLE
- CB1 — PROPOSED CATCHBASIN
- CICB3 — PROPOSED CURB INLET CATCHBASIN
- CB 2 — PROPOSED CATCHBASIN & LEAD
- RYE 1 — PROPOSED REAR YARD ELBOW
- RYT 1 — PROPOSED REAR YARD TEE
- V&VB — PROPOSED VALVE & VALVE BOX LOCATION
- PROPOSED HYDRANT C/W VALVE & LEAD
- 200mmØ — PROPOSED WATERMAIN AND DIAMETER
- HYD — PROPOSED VALVE LOCATION
- V&VB — VALVE & VALVE BOX
- V&VC — VALVE & VALVE CHAMBER
- T/F=98.45 — PROPOSED TOP OF BOTTOM FLANGE
- BEND 11.25° 22.5° 45° — PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE
- PRV — PRESSURE REDUCING VALVE
- PROPOSED DIRECTION OF FLOW

- CBMH 101 — PROPOSED CATCHBASIN MANHOLE INSERT
- PROPOSED CATCHBASIN INSERT
- PROPOSED SILT FENCE (SEE OPSD
- PROPOSED ROCK CHECK DAM (SEE OPSD 219.210)
- PROPOSED MUD MAT
- PROPOSED STRAW BALE (SEE OPSD 219.180)
- PROPOSED TWSI AS PER SC7.3
- CONCRETE
- ROAD CUT AS PER CITY OF OTTAWA DETAIL R10
- STM MH — *EXISTING STORM MANHOLE AND SEWER*
- SAN MH — *EXISTING SANITARY MANHOLE AND SEWER*
- VVB — *EXISTING VALVE AND VALE BOX*
- *EXISTING FIRE HYDRANT*
- EX.CB — *EXISTING CATCHBASIN*
- T/G — *EXISTING TOP OF GRATE*
- EX UP — *EXISTING UTILITY POLE C/W GUY WIRES*
- LS — *EXISTING LIGHT STANDARD*
- *EXISTING ℄ DITCH*
- 7A — 450mmØ — *EXISTING SANITARY MANHOLE & SEWER*
- 300mmØ — *EXISTING WATERMAIN*
- HYD — *EXISTING FIRE HYDRANT C/W LEAD*
- V&VB — *EXISTING VALVE & VALVE BOX LOCATION*
- V&VC — *EXISTING VALVE & VALVE CHAMBER LOCATION*
- UP — *EXISTING UTILITY POLE*
- OHW — *EXISTING OVER HEAD WIRE*
- *EXISTING SIDEWALK*
- MH 101 — *EXISTING SANITARY MH & SEWER*
- MH 102 — *EXISTING STORM MH & SEWER*
- 200mmØ WM — *EXISTING WATERMAIN*

SANITARY MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15
MH ID
105
109
205
207
209
211
213
215
217

STORM MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15
MH ID
104
108
110
114
204

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

No.	REVISION	DATE	BY
6.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
5.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
4.	ISSUED FOR TENDER	MAY 20/22	DDB
3.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
2.	REVISED PER CITY COMMENTS	NOV 5/21	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE

DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — D. D. BLAIR — 100122737 — NOV 14 2025 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
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Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
NOTES, LEGENDS AND DETAILS

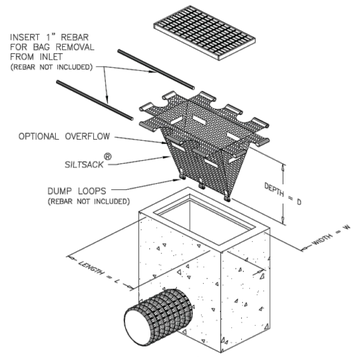
PROJECT No. 121011-00
REV REV # 6
DRAWING No. 121011-NLD

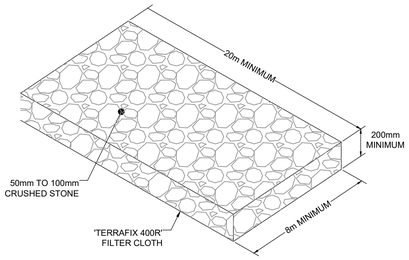
D07-12-21-0080

#18539

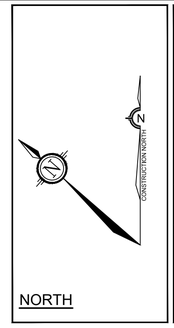
LEGEND

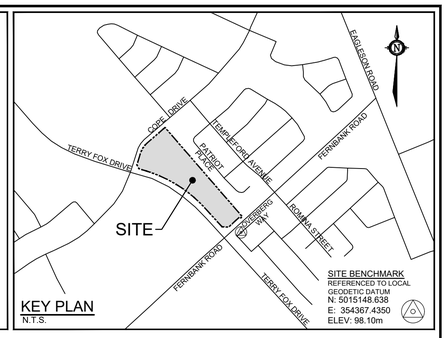
- SITE BOUNDARY
- MAXIMUM 3:1 SIDESLOPE
- PROPOSED CENTRELINE SWALE
- HYD — PROPOSED HYDRANT LOCATION
- 112 — PROPOSED SANITARY MANHOLE
- 820 — PROPOSED STORM MANHOLE
- CBMH 101 — PROPOSED CATCHBASIN MANHOLE INSERT
- PROPOSED CATCHBASIN INSERT
- PROPOSED SILT FENCE (SEE OPSD 219.110)
- PROPOSED MUD MAT
- PROPOSED STRAW BALE (SEE OPSD 219.180)

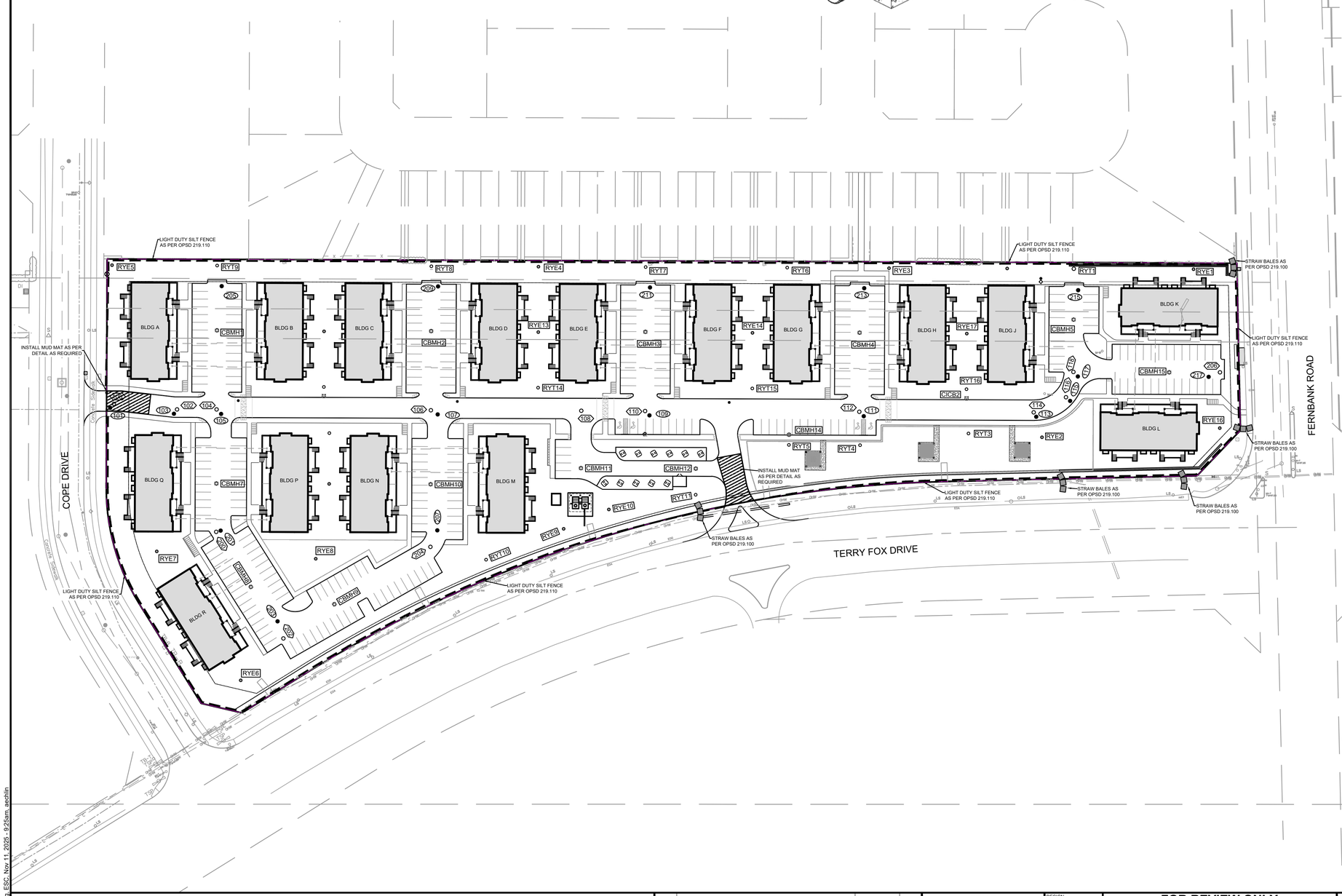


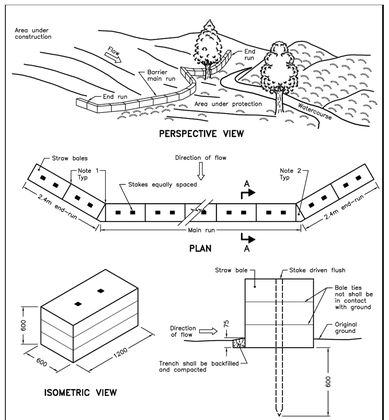


MUD MAT DETAIL
NTS



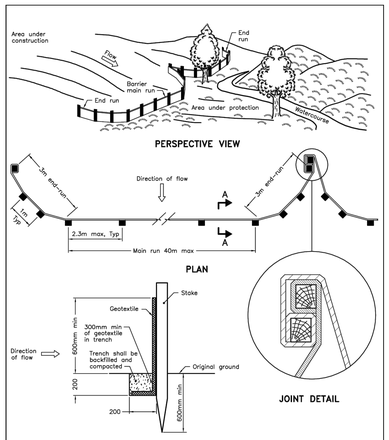






NOTES:
1 Straw bales shall be butted tightly against adjoining bales to prevent sediment flow through barrier.
2 Caulk and compact gaps with loose straw.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2	
LIGHT–DUTY STRAW BALE BARRIER			OPSD 219.100



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2	
LIGHT–DUTY SILT FENCE BARRIER			OPSD 219.110

REFER TO 121011-NLD FOR ADDITIONAL NOTES

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

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1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE
1:750
1:750
0 10 20 30

DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
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NOV 19 2025
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CITY OF OTTAWA
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IRON VALLEY 2

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 121011-00
REV REV # 6
DRAWING No. 121011-ESC

D07-12-21-0080
#18539

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PLANA1.DWG - 841mmx594mm

LEGEND

- SITE BOUNDARY
- PROPOSED STORM MANHOLE & SEWER
- PROPOSED SANITARY MANHOLE & SEWER
- PROPOSED WATERMAIN
- PROPOSED VALVE & VALVE BOX
- PROPOSED CURB STOP LOCATION
- PROPOSED DISTRICT METERING AREA (DMA) CHAMBER (AS PER CITY OF OTTAWA DETAIL W3.3)
- PROPOSED HYDRANT C/W VALVE & VALVE BOX
- PROPOSED TWSI AS PER CITY OF OTTAWA DETAIL SC7.2
- PROPOSED TREES
- PROPOSED CURB INLET CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED REAR YARD ELBOW
- PROPOSED REAR YARD TEE
- PROPOSED HYDRO METER LOCATION
- PROPOSED HYDRO STEP DOWN TRANSFORMER LOCATION
- PROPOSED WATER METER LOCATION
- PROPOSED REMOTE WATER METER LOCATION
- PROPOSED GAS METER LOCATION
- PROPOSED PRESSURE REDUCING VALVE
- PROPOSED RETAINING WALL
- EXISTING STORM MANHOLE AND SEWER
- EXISTING SANITARY MANHOLE AND SEWER
- EXISTING WATERMAIN
- EXISTING UNDERGROUND GAS
- EXISTING VALVE AND VALE BOX
- EXISTING FIRE HYDRANT
- EXISTING CATCHBASIN
- EXISTING TOP OF GRATE
- EXISTING HYDRAULIC GRADE LINE
- EXISTING UTILITY POLE C/W GUY WIRES
- EXISTING STREETLIGHT

PRE- AND POST-CONSTRUCTION SANITARY CCTV REQUIRED (123.8m REQUIRED)

PRE- AND POST-CONSTRUCTION STORM CCTV REQUIRED (125.6m REQUIRED)

CONTRACTOR TO PERFORM CONFINED SPACE ENTRY AND VERIFY INVERTS AND STRUCTURE ORIENTATION FOR ALL CONNECTIONS PRIOR TO ANY CONSTRUCTION. PRE and POST CONDITION CCTV INSPECTIONS TO PROVIDE FULL REVIEW OF INTERIOR OF EX.SANMHs AND EX.STMMHs

CONNECT TO EXISTING

INSTALL 300mm VALVE & VALVE BOX ON EXISTING

ROAD CUT AS PER CITY OF OTTAWA DETAIL R10

REMOVE AND CAP EXISTING DICB

RELOCATE EXISTING CATCHBASIN. CONNECT TO EXISTING CATCHBASIN LEAD

CONNECT TO LOWERED WATERMAIN T/WM=93.59 TO BE LOWERED TO T/WM=93.59

INSTALL 100mm x 2.4m INSULATION

INSTALL 50mm x 2.4m INSULATION

INSTALL 75mm x 2.4m INSULATION

INSTALL 75mm x 2.4m INSULATION

INSTALL 75mm x 2.4m INSULATION

REDUCER TO PIPE

REDUCER

STM PIPE

HDPE STM @ 0.14%

HDPE STM @ 0.15%

21.0m 250mm HDPE STM @ 1.00%

APPROXIMATE FUTURE TERRY FOX ROAD WIDENING

2.25m

PROPERTY LINE

COPE DRIVE

TERRY FOX DRIVE

BLDG A

BLDG B

BLDG C

BLDG D

BLDG E

BLDG M

BLDG N

BLDG P

BLDG Q

BLDG R

MATCHLINE: REFER TO 121011-GP2 FOR CONTINUATION

NORTH

CONSTRUCTION NORTH

KEY PLAN
N.T.S.

SITE

EAGLESON ROAD
COPE DRIVE
TERRY FOX DRIVE
TEMPLEMORE AVENUE
PATRIOT RIDGE
FERNBANK ROAD
ROSANNA STREET
CASTLEBERRY WAY

SITE BENCHMARK
REFERENCED TO LOCAL GEODETIC DATUM
N: 5015148.638
E: 354367.4350
ELEV: 98.10m

PIPE CROSSING TABLE

CROSSING #	WATERMAIN	SANITARY	STORM
1	INV = 92.98 OBV = 93.18		INV = 94.69 OBV = 94.99
2	INV = 92.98 OBV = 93.18	INV = 93.72 OBV = 93.92	
3		INV = 93.62 OBV = 93.82	INV = 94.53 OBV = 94.98
4		INV = 93.69 OBV = 93.89	INV = 94.23 OBV = 94.98
5	INV = 93.00 OBV = 93.10		INV = 94.23 OBV = 94.98
6	INV = 93.00 OBV = 93.10	INV = 93.66 OBV = 93.86	
7	INV = 94.50 OBV = 94.70		INV = 95.41 OBV = 95.66
8		INV = 93.77 OBV = 93.97	INV = 95.53 OBV = 94.78
9	INV = 93.26 OBV = 93.46		INV = 94.77 OBV = 95.07
10	INV = 93.26 OBV = 93.46	INV = 94.00 OBV = 94.20	
11		INV = 93.97 OBV = 94.17	INV = 94.46 OBV = 95.06
12	INV = 93.30 OBV = 93.40		INV = 94.47 OBV = 95.07
13	INV = 93.30 OBV = 93.40	INV = 93.94 OBV = 94.14	
14		INV = 93.89 OBV = 94.09	INV = 94.76 OBV = 95.06
15	INV = 94.63 OBV = 94.83		INV = 95.68 OBV = 95.93
16		INV = 94.09 OBV = 94.29	INV = 94.83 OBV = 95.13
17	INV = 93.53 OBV = 93.73		INV = 94.89 OBV = 95.19
18	INV = 93.53 OBV = 93.73	INV = 94.27 OBV = 94.47	
19		INV = 94.24 OBV = 94.44	INV = 94.65 OBV = 95.18
20		INV = 94.17 OBV = 94.37	INV = 94.89 OBV = 95.19
30	INV = 94.05 OBV = 94.25		INV = 94.79 OBV = 95.54
31	INV = 94.15 OBV = 94.35		INV = 94.89 OBV = 95.49
32	INV = 94.40 OBV = 94.60		INV = 95.13 OBV = 95.38

* WATERMAIN CROSSING AS PER W25 & W25.2 PROVIDE THERMAL INSULATION AS PER W22 WHERE THERE IS LESS THAN 2.4m COVER.

SAN MANHOLE TABLE

MANHOLE ID	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)
101	1200	1+028.42	96.94	SE=93.10 NW=93.07
103	1200	1+050.12	97.04	SE=93.56 NW=93.53
105	1200	1+065.88	97.04	NE=93.68 NW=93.62 SE=93.65 SW=93.68
107	1200	1+138.76	97.11	SE=93.93 NW=93.90 SW=93.96 NE=93.96
109	1200	1+210.01	97.35	SE=94.20 NW=94.17 NE=94.23
201	1200	3+041.42	97.14	S=93.84 NE=93.81
203	1200	3+077.08	97.23	N=94.20
205	1200	2+040.73	97.00	SW=94.11
207	1200	3+141.50	97.01	NE=94.35
209	1200	4+040.90	97.07	SW=94.39
211	1200	6+040.80	97.33	SW=94.66

STM MANHOLE TABLE

MANHOLE ID	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)
100	1500	1+029.68	96.96	N=94.10 SE=94.10
102	1500	1+051.06	97.03	NW=94.13 SE=94.13
104	1800	1+064.37	97.03	SE=94.23 SW=94.53 NE=94.68 NW=94.15
106	1500	1+136.45	97.13	SE=94.46 NE=94.76 NW=94.31 SW=94.76
108	1200	1+187.05	97.28	SE=94.60 SW=94.83 NW=94.53
110	1200	1+208.53	97.36	SE=94.65 NE=94.88 NW=94.65 SW=94.88
200	1200	3+041.42	97.14	NE=94.69 S=94.77 NW=94.82
202	1500	3+080.10	97.38	N=94.88 W=94.88
204	1200	3+135.29	97.10	W=94.98 NE=94.93 SE=94.98

REAR YARD CATCHBASIN TABLE

CB No.	SIZE(mm)	T/G ELEV(m)	INVERT(m)	ICD SIZE (mm)
RYE4	300	96.90	NW=95.26	
RYE5	300	96.85	SE=95.15	
RYE6	300	97.40	E=94.92	
RYE7	1200	97.14	SE=95.03	ICD
RYE8	300	97.10	SW=95.20	
RYE9	1200	97.35	NW=95.30	
RYE10	300	97.37	SE=95.47	
RYE11	300	97.14	SW=95.64	
RYE12	300	97.16	NE=95.76	
RYE13	300	97.31	SW=95.91	
RYT7	300	97.15	SW=95.14 SE=95.14	
RYT8	300	96.90	SW=94.90 SE=94.90	
RYT9	300	96.85	SW=94.80 NW=94.80	
RYT10	1200	97.32	NW=95.02 SE=95.02	
RYT12	300	97.07	NE=95.45 SW=95.45	
RYT13	300	97.17	SW=95.59 NE=95.59	ICD
RYT14	300	97.29	NE=95.72 SW=95.72	ICD

CATCHBASIN TABLE

CB No.	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)	ICD DIA.(mm)
CB1	600 x 600	1+019.58	96.77		
CBMH1	1500	2+025.87	96.74	SW=94.77 NE=94.77	TEMPEST LMF VORTEX 45
CBMH2	1500	4+025.87	96.84	SW=94.86 NE=94.86	ICD
CBMH3	1200	6+025.86	97.10	SW=94.98 NE=95.03	ICD
CBMH7	1200	3+025.66	96.78	SW=94.65 NE=94.58	
CBMH8	1200	3+062.79	96.92	S=94.85 N=94.85	TEMPEST LMF VORTEX 70
CBMH9	1200	3+097.52	97.14	E=95.17 NE=95.17	
CBMH10	1200	3+157	96.86	SW=94.85 NE=94.85	ICD
CBMH11	1800	5+017.92	97.08	NE=94.90 SE=94.95	ICD
CBMH13	1200	1+208.45	97.23	NE=94.91	ICD
CICB1	600 x 600	1+100.41	96.99	NE=95.42 SW=95.42	ICD

STORM MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15

MH ID
104
108
110
204

SANITARY MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15

MH ID
105
109
205
207
209
211

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

No.	REVISION	DATE	BY
6.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
5.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
4.	ISSUED FOR TENDER	MAY 20/22	DDB
3.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
2.	REVISED PER CITY COMMENTS	NOV 5/21	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE
1:400
1:400
0 4 8 12 16

DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
NOV 14 2025
PROVINCE OF ONTARIO

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

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 121011-00
REV REV # 6
DRAWING No. 121011-GP1

D07-12-21-0080
#18539

M:\2021\121011\CAD\Design\121011-GP.dwg, GP1, Nov 17, 2025 - 2:38pm, chasna
PLANAT.DWG - 841mmx594mm

LEGEND

- SITE BOUNDARY
- PROPOSED STORM MANHOLE & SEWER
- PROPOSED SANITARY MANHOLE & SEWER
- PROPOSED WATERMAIN
- PROPOSED VALVE & VALVE BOX
- PROPOSED CURB STOP LOCATION
- PROPOSED DISTRICT METERING AREA (DMA) CHAMBER (AS PER CITY OF OTTAWA DETAIL W3.3)
- PROPOSED HYDRANT C/W VALVE & VALVE BOX
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED REAR YARD ELBOW
- PROPOSED REAR YARD TEE
- PROPOSED TWSI AS PER CITY OF OTTAWA DETAIL SC7.2
- PROPOSED TREES
- PROPOSED HYDRO METER LOCATION
- PROPOSED HYDRO STEP DOWN TRANSFORMER LOCATION
- PROPOSED WATER METER LOCATION
- PROPOSED REMOTE WATER METER LOCATION
- PROPOSED GAS METER LOCATION
- PROPOSED PRESSURE REDUCING VALVE
- PROPOSED RETAINING WALL
- EXISTING STORM MANHOLE AND SEWER
- EXISTING SANITARY MANHOLE AND SEWER
- EXISTING WATERMAIN
- EXISTING UNDERGROUND GAS
- EXISTING VALVE AND VALE BOX
- EXISTING FIRE HYDRANT
- EXISTING CATCHBASIN
- EXISTING TOP OF GRATE
- EXISTING HYDRAULIC GRADE LINE
- EXISTING UTILITY POLE C/W GUY WIRES
- EXISTING STREETLIGHT

NORTH

CONSTRUCTION NORTH

KEY PLAN
N.T.S.

SITE

TERRY FOX DRIVE
CAPE CROMER
PATRIOT RIDGE
TEMPLEMORE AVENUE
FERNBANK ROAD
EARLESTON ROAD
ROMANA STREET
CASTLEBERRY PL.

SITE BENCHMARK
REFERENCED TO LOCAL GEODETIC DATUM
N: 5015148.638
E: 354367.4350
ELEV: 98.10m

MATCHLINE: REFER TO 121011-GP1 FOR CONTINUATION

PROPERTY LINE

BLDG E
BLDG F
BLDG G
BLDG H
BLDG J
BLDG K
BLDG L

FERNBANK ROAD

TERRY FOX DRIVE

INSTALL 50mm x 2.4m INSULATION
INSTALL 75mm x 2.4m INSULATION
INSTALL 100mm x 2.4m INSULATION

RETAINING WALL

PROPOSED 2:1 SLOPED GRATE TOP T/G=96.95 BOTTOM T/G=96.20

PROPOSED CONCRETE BUS PAD AS PER CITY OF OTTAWA STANDARD DETAIL SC11

REDUCER TO STM PIPE

HYDRO OTTAWA TO REPLACE EXISTING POLES AND INSTALL TALLER POLES TO PROVIDE ADEQUATE CLEARANCE FROM OVERHEAD WIRES TO PROPOSED ENTRANCE

APPROXIMATE FUTURE TERRY FOX ROAD WIDENING

2.25m

600mmØCSP T/P=96.48 INV=95.96

INV.NW=96.67 OBV=97.27
INV.SE=96.53 OBV=97.13

EX.STMMH T/G=97.67

EX.STMMH T/G=97.41

EX.STMMH T/G=97.55

EX.DICB T/G=96.20

EX.CB T/G=97.21

EX.CB T/G=96.38

EX.CB T/G=96.36

SAN MANHOLE TABLE

MANHOLE ID	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)
109	1200	1+210.01	97.35	SE=94.20 NW=94.17 NE=94.23
111	1200	1+282.11	97.43	SE=94.47 NW=94.44 NE=94.50
113	1200	1+340.05	97.54	NW=94.66 SE=94.69
115	1200	1+351.12	97.60	NE=94.77 NW=94.74
117	1200	1+359.04	97.67	SW=94.80 SE=94.86 NE=94.83
211	1200	6+040.80	97.33	SW=94.66
213	1200	8+040.80	97.50	SW=94.93
215	1200	9+031.37	97.50	SW=95.12
217	1200	1+403.45	97.70	NW=95.30

STM MANHOLE TABLE

MANHOLE ID	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)
108	1200	1+187.05	97.28	SE=94.60 SW=94.83 NW=94.53
110	1200	1+208.53	97.36	SE=94.65 NE=94.88 NW=94.65 SW=94.88
112	1200	1+280.61	97.47	SE=94.94 NE=95.02 NW=94.79
114	1200	1+339.26	97.55	NW=95.09 SE=95.09
116	1200	1+351.13	97.61	NE=95.12 NW=95.12
118	1200	1+358.97	97.67	SE=95.50 NE=95.50 SW=95.15
206	1200	1+407.25	97.76	NW=95.75 SW=95.75

PIPE CROSSING TABLE

CROSSING #	WATERMAIN	SANITARY	STORM
16		INV = 94.09 OBV = 94.29	INV = 94.83 OBV = 95.13
17	INV = 93.53 OBV = 93.73		INV = 94.89 OBV = 95.19
18	INV = 93.53 OBV = 93.73	INV = 94.27 OBV = 94.47	
19		INV = 94.24 OBV = 94.44	INV = 94.65 OBV = 95.18
20		INV = 94.17 OBV = 94.37	INV = 94.89 OBV = 95.19
21	INV = 94.78 OBV = 94.98		INV = 95.87 OBV = 96.12
22		INV = 94.36 OBV = 94.56	INV = 95.06 OBV = 95.31
23	INV = 93.80 OBV = 94.00		INV = 95.03 OBV = 95.33
24	INV = 93.80 OBV = 94.00	INV = 94.54 OBV = 94.74	
25		INV = 94.51 OBV = 94.71	INV = 94.94 OBV = 95.32
26	INV = 94.87 OBV = 95.07		INV = 96.03 OBV = 96.28
27		INV = 94.84 OBV = 95.04	INV = 95.56 OBV = 95.86
*28	INV = 94.25 OBV = 94.35	INV = 94.87 OBV = 95.07	
*29	INV = 94.25 OBV = 94.35		INV = 95.56 OBV = 95.86
32	INV = 94.40 OBV = 94.60		INV = 95.13 OBV = 95.38

* WATERMAIN CROSSING AS PER W25 & W25.2 PROVIDE THERMAL INSULATION AS PER W22 WHERE THERE IS LESS THAN 2.4m COVER.

CATCHBASIN TABLE

CB No.	SIZE(mm)	STATION	T/G ELEV(m)	INVERT(m)	ICD DIA.(mm)
CBMH3	1200	6+025.86	97.10	SW=94.98 NE=95.03	ICD TBD
CBMH4	1500	8+025.86	97.31	SW=95.12 NE=95.20	TEMPEST LMF VORTEX 80
CBMH5	1500	9+021.47	97.38	SW=95.56 NE=95.56	TEMPEST LMF VORTEX 40
CBMH11	1800	5+017.92	97.08	NE=94.90 SE=94.95	ICD TBD
CBMH12	1200	5+054.40	97.55	NW=95.15 SW=95.15	
CBMH13	1200	1+208.45	97.23	NE=94.91	ICD TBD
CBMH14	1200	1+256.96	97.23	NE=95.09 SW=95.09	TEMPEST LMF VORTEX 40
CBMH15	1200	1+390.18	97.50	SE=95.67 NW=95.62	TEMPEST LMF VORTEX 45
CICB2	600x600	1+316.65	97.44	NE=96.04 SW=96.04	ICD TBD

REAR YARD CATCHBASIN TABLE

CB No.	SIZE(mm)	T/G ELEV(m)	INVERT(m)	ICD SIZE (mm)
RYE1	300	97.47	NW=95.88	
RYE2	300	97.50	NW=95.51	
RYE3	300	97.40	NW=95.96	
RYE10	300	97.37	SE=95.47	
RYE14	300	97.50	SW=96.10	
RYE15	300	97.29	SE=95.82	
RYE16	300	97.58	NE=95.79	
RYE17	300	97.66	SW=96.26	
RYT1	1200	97.35	SW=95.59 SE=95.59 NW=95.59	
RYT3	300	97.44	SE=95.39 NW=95.41	
RYT4	300	97.26	SE=95.23 NW=95.23	
RYT5	300	97.23	NE=95.11 SE=95.11	
RYT6	300	97.18	NW=95.62 SE=95.62	
RYT7	300	97.15	SW=95.14 SE=95.14	
RYT11	300	97.58	NW=95.17 NE=95.17	
RYT15	300	97.48	NE=95.91 SW=95.91	ICD TBD
RYT16	300	97.64	SW=96.07 NE=96.07	

SANITARY MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15

MH ID
109
211
213
215
217

STORM MANHOLES THAT REQUIRE WATERTIGHT LIDS AS PER CITY SPEC MS-22.15

MH ID
108
110
114

NOTE:
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No.	REVISION	DATE	BY
6.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
5.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
4.	ISSUED FOR TENDER	MAY 20/22	DDB
3.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
2.	REVISED PER CITY COMMENTS	NOV 5/21	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE
1:400
1:400
0 4 8 12 16

DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
NOV 14 2025
PROVINCE OF ONTARIO

NOVATECH
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Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 121011-00
REV REV # 6
DRAWING No. 121011-GP2

D07-12-21-0080

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PLAN41.DWG - BH Instruments

#18539

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

No.	REVISION	DATE	BY
5	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
4.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
3.	ISSUED FOR TENDER	MAY 20/22	DDB
2.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	NOV 5/21	DDB

SCALE
1:500 HORIZONTAL
1:50 VERTICAL

DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER D. D. BLAIR 100122737 NOV 14 2025 PROVINCE OF ONTARIO

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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

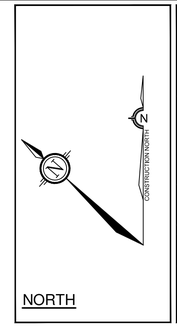
DRAWING NAME
PLAN AND PROFILE

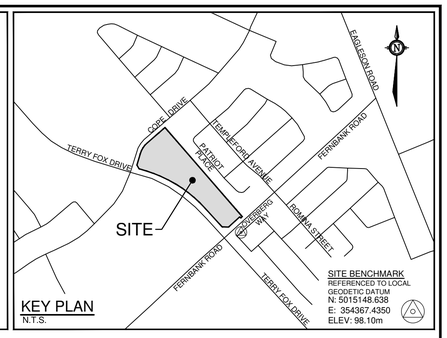
PROJECT No. 121011-00
REV # 5
DRAWING No. 121011-PR

PLANA1.DWG - 841mmx594mm

D07-12-21-0080

#18539





LEGEND

- SITE BOUNDARY
- PROPOSED ELEVATION / *EXISTING ELEVATION*
- PROPOSED TOP OF WALL ELEVATION / PROPOSED BOTTOM OF WALL ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED SWALE ELEVATION
- PROPOSED TOP OF GRATE ELEVATION
- PROPOSED CENTERLINE OF DITCH ELEVATION
- PROPOSED RETAINING WALL
- FF= FINISHED FLOOR ELEVATION
- T/F= TOP OF FOUNDATION ELEVATION
- USF= UNDERSIDE OF FOOTING ELEVATION
- MUSF= MINIMUM UNDERSIDE OF FOOTING ELEVATION
- PROPOSED TERRACE ELEVATION
- MAXIMUM 3:1 SIDESLOPE
- PROPOSED CENTRELINE SWALE
- PROPOSED GRADE AND DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- HYD PROPOSED HYDRANT LOCATION
- T/F=127.55 PROPOSED TOP OF BOTTOM FLANGE
- VVB PROPOSED VALVE & VALVE BOX
- CS PROPOSED CURB STOP LOCATION
- DMA PROPOSED WATER CHAMBER (AS PER CITY OF OTTAWA DETAIL W3)
- VVC PROPOSED VALVE & VALVE CHAMBER (AS PER CITY OF OTTAWA DETAIL W3)
- 101 PROPOSED SANITARY MANHOLE
- 104 PROPOSED STORM MANHOLE
- CB 1 PROPOSED ROAD CATCHBASIN
- CBMH 1 PROPOSED CATCHBASIN MANHOLE
- RYE 1 PROPOSED REAR YARD ELBOW
- RYT 1 PROPOSED REAR YARD TEE
- M PROPOSED WATER METER LOCATION
- R PROPOSED REMOTE WATER METER LOCATION
- PROPOSED TWSI AS PER CITY OF OTTAWA DETAIL 7.2
- 100YR PONDING LIMITS AND ELEVATION
- 1:5yr PONDING AREA AND ELEVATION
- *EXISTING CONTOUR LINE AND ELEVATION*
- EX.HYD *EXISTING FIRE HYDRANT*
- EX.SANMH *EXISTING SANITARY MANHOLE*
- EX.STMMH *EXISTING STORMMANHOLE*
- VVB *EXISTING WATER VALVE*
- HP *EXISTING HYDRO POLE*
- EX.CB *EXISTING CATCH BASIN*

PAVEMENT STRUCTURE DETAILS

*REFER TO GEOTECHNICAL REPORT FOR SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS.

ACCESS LANES AND HEAVY DUTY TRUCK PARKING

- 40mm SUPERPAVE 12.5
- 50mm SUPERPAVE 19.0
- 150mm GRANULAR 'A'
- 400mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

LIGHT DUTY PARKING

- 50mm HL3 OR SUPERPAVE 12.5
- 150mm GRANULAR 'A'
- 300mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

NOTE:
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7.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
6.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
5.	ISSUED FOR ADDENDUM #2	JUNE 8/22	DDB
4.	ISSUED FOR TENDER	MAY 20/22	DDB
3.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
2.	REVISED PER CITY COMMENTS	NOV 5/21	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE: 1:400 (1:400, 0 4 8 12 16)

DESIGN: DDB
CHECKED: MSP
DRAWN: ATE
CHECKED: DDB
APPROVED: MSP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — D. D. BLAIR — 100122737 — Nov 14 2025 — PROVINCE OF ONTARIO

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

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
GRADING PLAN

PROJECT No. 121011-00
REV REV # 6
REV # 7
DRAWING No. 121011-GR1

D07-12-21-0080
#18539

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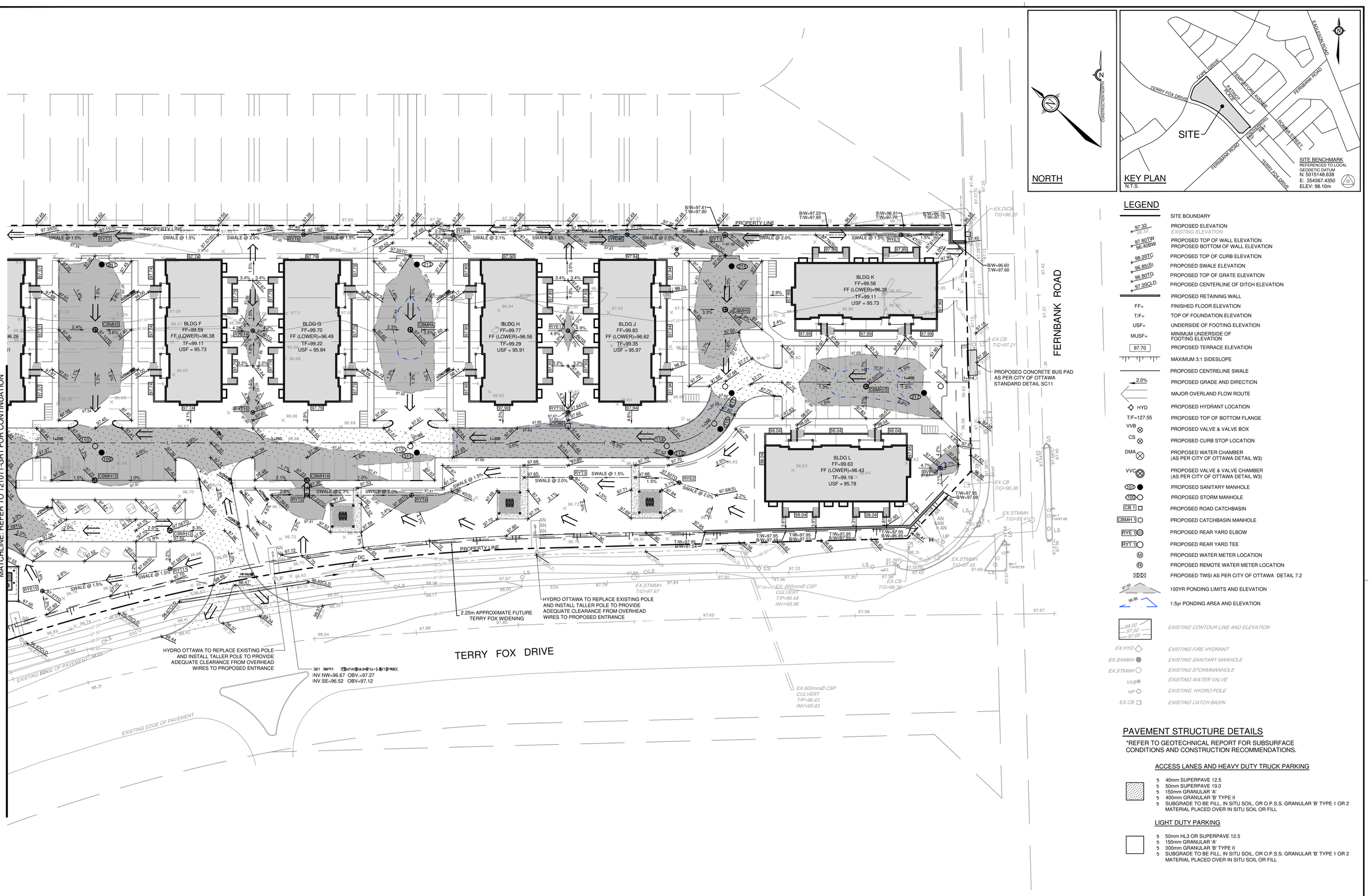
PLANA1.DWG - 841mm×594mm



KEY PLAN
N.T.S.

SITE BENCHMARK
REFERENCED TO LOCAL GEODETIC DATUM
N: 5015148.638
E: 354367.4350
ELEV: 98.10m

LEGEND

- SITE BOUNDARY
- 97.32 / 96.52 — PROPOSED ELEVATION / *EXISTING ELEVATION*
- 97.80TW / 96.40BW — PROPOSED TOP OF WALL ELEVATION / PROPOSED BOTTOM OF WALL ELEVATION
- 98.20TC — PROPOSED TOP OF CURB ELEVATION
- 96.85(S) — PROPOSED SWALE ELEVATION
- 96.80TG — PROPOSED TOP OF GRATE ELEVATION
- 97.20CLD — PROPOSED CENTERLINE OF DITCH ELEVATION
- PROPOSED RETAINING WALL
- FF= FINISHED FLOOR ELEVATION
- T/F= TOP OF FOUNDATION ELEVATION
- USF= UNDERSIDE OF FOOTING ELEVATION
- MUSF= MINIMUM UNDERSIDE OF FOOTING ELEVATION
- 97.70 — PROPOSED TERRACE ELEVATION
- MAXIMUM 3:1 SIDESLOPE
- PROPOSED CENTRELINE SWALE
- 2.0% — PROPOSED GRADE AND DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- HYD — PROPOSED HYDRANT LOCATION
- T/F=127.55 — PROPOSED TOP OF BOTTOM FLANGE
- VVB — PROPOSED VALVE & VALVE BOX
- CS — PROPOSED CURB STOP LOCATION
- DMA — PROPOSED WATER CHAMBER (AS PER CITY OF OTTAWA DETAIL W3)
- VVC — PROPOSED VALVE & VALVE CHAMBER (AS PER CITY OF OTTAWA DETAIL W3)
- 101 — PROPOSED SANITARY MANHOLE
- 100 — PROPOSED STORM MANHOLE
- CB 1 — PROPOSED ROAD CATCHBASIN
- CBMH 1 — PROPOSED CATCHBASIN MANHOLE
- RYE 1 — PROPOSED REAR YARD ELBOW
- RYT 1 — PROPOSED REAR YARD TEE
- M — PROPOSED WATER METER LOCATION
- R — PROPOSED REMOTE WATER METER LOCATION
- PROPOSED TWSI AS PER CITY OF OTTAWA DETAIL 7.2
- 97.55 — 100YR PONDING LIMITS AND ELEVATION
- 96.85 — 1:5yr PONDING AREA AND ELEVATION
- 98.00 / 97.50 / 97.00 — *EXISTING CONTOUR LINE AND ELEVATION*
- EX.HYD — *EXISTING FIRE HYDRANT*
- EX.SANMH — *EXISTING SANITARY MANHOLE*
- EX.STMMH — *EXISTING STORMMANHOLE*
- VVB — *EXISTING WATER VALVE*
- HP — *EXISTING HYDRO POLE*
- EX.CB — *EXISTING CATCH BASIN*

PAVEMENT STRUCTURE DETAILS

*REFER TO GEOTECHNICAL REPORT FOR SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS.

ACCESS LANES AND HEAVY DUTY TRUCK PARKING

- 40mm SUPERPAVE 12.5
- 50mm SUPERPAVE 19.0
- 150mm GRANULAR 'A'
- 400mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

LIGHT DUTY PARKING

- 50mm HL3 OR SUPERPAVE 12.5
- 150mm GRANULAR 'A'
- 300mm GRANULAR 'B' TYPE II
- SUBGRADE TO BE FILL, IN SITU SOIL, OR O.P.S.S. GRANULAR 'B' TYPE 1 OR 2 MATERIAL PLACED OVER IN SITU SOIL OR FILL

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

No.	REVISION	DATE	BY
7.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
6.	RE-ISSUED FOR TENDER	JAN 18/24	DDB
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SCALE
1:400
1:400
0 4 8 12 16

DESIGN DDB
CHECKED MSP
DRAWN ATE
CHECKED DDB
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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
GRADING PLAN

PROJECT No. 121011-00
REV REV # 7
DRAWING No. 121011-GR2

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PLAN11.DWG - 841mmx594mm

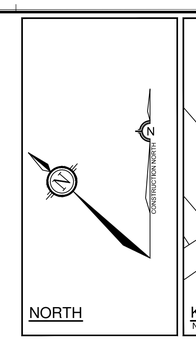
D07-12-21-0080
#18539

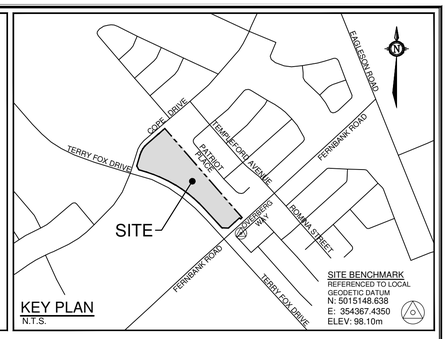
LEGEND

- PROPERTY LINE
- 200 — PROPOSED STORM MH & SEWER WITH DIRECTION OF FLOW
- CICB 1 — PROPOSED CURB INLET CATCHBASIN
- CB 1 — PROPOSED ROAD CATCHBASIN
- CBMH 101 — PROPOSED CATCHBASIN MANHOLE
- RYE 1 — PROPOSED REAR YARD ELBOW
- RYT 1 — PROPOSED REAR YARD TEE
- DRAINAGE AREA BOUNDARY
- MAJOR OVERLAND FLOW ROUTE
- 1.00 / A1 / 105-103 / 0.50 — DRAINAGE AREA (hectares) / AREA IDENTIFICATION / MANHOLE TO MANHOLE / RUN-OFF COEFFICIENT
- 97.44 / 96.85 — 1:100yr PONDING AREA AND ELEVATION / 1:5yr PONDING AREA AND ELEVATION
- PROPOSED TREES

NOTES:

*100 YEAR PONDING DEPTH IS GREATER THAN THE STATIC PONDING DEPTH DUE TO CASCADING WATER INTO THE NEXT AREA. THIS HAS BEEN ACCOUNTED FOR IN THE STORMWATER MANAGEMENT REPORT AND CONFORMS TO THE ALLOWABLE RELEASE RATE FROM THE SITE.





PONDING[1]

CB No.	RIM ELEV. (m)	EVENT	WATER LEVEL ELEV. (DEPTH) (m)
CBMH01	96.74	2yr	(0.00) 95.71
		5yr	(0.00) 96.70
		100yr	(0.30) 97.04
		Static	(0.32) 97.06
		100yr + 20%	(0.35) 97.09
CBMH02	96.84	2yr	(0.00) 95.88
		5yr	(0.03) 96.87
		100yr	(0.26) 97.10
		Static	(0.30) 97.14
		100yr + 20%	(0.31) 97.15
CBMH03	97.10	2yr	(0.00) 95.86
		5yr	(0.00) 96.56
		100yr	(0.24) 97.34
		Static	(0.28) 97.38
		100yr + 20%	(0.32) 97.42
CBMH04	97.31	2yr	(0.00) 97.28
		5yr	(0.09) 97.40
		100yr	(0.19) 97.50
		Static	(0.28) 97.59
		100yr + 20%	(0.23) 97.54
CBMH05	97.38	2yr	(0.00) 96.22
		5yr	(0.00) 97.36
		100yr	(0.23) 97.61
		Static	(0.30) 97.68
		100yr + 20%	(0.26) 97.64
CBMH07	96.78	2yr	(0.00) 94.74
		5yr	(0.00) 94.79
		100yr	(0.00) 95.14
		Static	(0.30) 97.08
		100yr + 20%	(0.00) 95.19

[1]BASED ON PCSWMM MODEL (3-HOUR CHICAGO STORM DISTRIBUTION)

PONDING[1]

CB No.	RIM ELEV. (m)	EVENT	WATER LEVEL ELEV. (DEPTH) (m)
CBMH08	96.92	2yr	(0.00) 95.40
		5yr	(0.00) 96.14
		100yr	(0.20) 97.12
		Static	(0.24) 97.16
		100yr + 20%	(0.25) 97.17
CBMH09	97.14	2yr	(0.00) 95.58
		5yr	(0.00) 96.35
		100yr	(0.05) 97.19
		Static	(0.13) 97.27
		100yr + 20%	(0.11) 97.25
CBMH10	96.86	2yr	(0.00) 95.58
		5yr	(0.00) 96.34
		100yr	(0.30) 97.16
		Static	(0.34) 97.20
		100yr + 20%	(0.35) 97.21
CBMH11	97.08	2yr	(0.00) 95.46
		5yr	(0.00) 95.91
		100yr	(0.23) 97.31
		Static	(0.17) 97.25
		100yr + 20%	(0.35) 97.43
CBMH12	97.55	2yr	(0.00) 95.46
		5yr	(0.00) 95.92
		100yr	(0.00) 97.31
		Static	(0.11) 97.66
		100yr + 20%	(0.00) 97.43
CBMH13	97.23	2yr	(0.00) 95.85
		5yr	(0.00) 96.98
		100yr	(0.18) 97.41
		Static	(0.14) 97.37
		100yr + 20%	(0.21) 97.44
CBMH14	97.23	2yr	(0.00) 95.80
		5yr	(0.00) 96.62
		100yr	(0.18) 97.41
		Static	(0.11) 97.34
		100yr + 20%	(0.21) 97.44
CBMH15	97.50	2yr	(0.00) 97.47
		5yr	(0.11) 97.61
		100yr	(0.19) 97.69
		Static	(0.25) 97.75
		100yr + 20%	(0.21) 97.71

[1]BASED ON PCSWMM MODEL (3-HOUR CHICAGO STORM DISTRIBUTION)

PONDING[1]

CB No.	RIM ELEV. (m)	EVENT	WATER LEVEL ELEV. (DEPTH) (m)
CIBC1	96.99	2yr	(0.00) 96.53
		5yr	(0.13) 96.12
		100yr	(0.15) 97.14
		Static	(0.12) 97.11
		100yr + 20%	(0.15) 97.14
CIBC2	97.44	2yr	(0.00) 97.09
		5yr	(0.20) 96.64
		100yr	(0.22) 97.66
		Static	(0.20) 97.64
		100yr + 20%	(0.22) 97.66
RYE01	97.47	2yr	(0.00) 96.22
		5yr	(0.00) 97.36
		100yr	(0.14) 97.61
		Static	(0.14) 97.61
		100yr + 20%	(0.15) 97.62
RYE02	97.50	2yr	(0.00) 95.81
		5yr	(0.00) 96.62
		100yr	(0.00) 97.42
		Static	(0.16) 97.66
		100yr + 20%	(0.00) 97.47
RYE03	97.40	2yr	(0.00) 96.00
		5yr	(0.00) 96.58
		100yr	(0.03) 97.43
		Static	(0.15) 97.55
		100yr + 20%	(0.15) 97.55
RYE04	96.90	2yr	(0.00) 95.89
		5yr	(0.00) 96.87
		100yr	(0.23) 97.13
		Static	(0.27) 97.17
		100yr + 20%	(0.33) 97.23
RYE05	96.85	2yr	(0.00) 95.71
		5yr	(0.00) 96.70
		100yr	(0.20) 97.05
		Static	(0.30) 97.15
		100yr + 20%	(0.25) 97.10
RYE06	97.40	2yr	(0.00) 95.40
		5yr	(0.00) 96.14
		100yr	(0.00) 97.14
		Static	(0.20) 97.60
		100yr + 20%	(0.00) 97.18
RYE07	97.14	2yr	(0.00) 95.13
		5yr	(0.00) 95.42
		100yr	(0.21) 97.35
		Static	(0.21) 97.35
		100yr + 20%	(0.22) 97.36

[1]BASED ON PCSWMM MODEL (3-HOUR CHICAGO STORM DISTRIBUTION)

PONDING[1]

CB No.	RIM ELEV. (m)	EVENT	WATER LEVEL ELEV. (DEPTH) (m)
RYE08	97.10	2yr	(0.00) 95.58
		5yr	(0.00) 96.35
		100yr	(0.09) 97.19
		Static	(0.23) 97.33
		100yr + 20%	(0.15) 97.25
RYE09	97.35	2yr	(0.00) 95.58
		5yr	(0.00) 96.34
		100yr	(0.00) 97.16
		Static	(0.20) 97.55
		100yr + 20%	(0.00) 97.22
RYE10	97.37	2yr	(0.00) 95.48
		5yr	(0.00) 95.92
		100yr	(0.00) 97.31
		Static	(0.13) 97.50
		100yr + 20%	(0.06) 97.43
RYE11	97.14	2yr	(0.00) 96.54
		5yr	(0.00) 97.14
		100yr	(0.09) 97.23
		Static	(0.13) 97.27
		100yr + 20%	(0.15) 97.29
RYE12	97.16	2yr	(0.00) 95.88
		5yr	(0.00) 96.31
		100yr	(0.19) 97.35
		Static	(0.15) 97.31
		100yr + 20%	(0.21) 97.37
RYE13	97.31	2yr	(0.00) 96.01
		5yr	(0.00) 96.49
		100yr	(0.15) 97.46
		Static	(0.14) 97.45
		100yr + 20%	(0.15) 97.46
RYE14	97.50	2yr	(0.00) 96.20
		5yr	(0.00) 96.68
		100yr	(0.16) 97.66
		Static	(0.14) 97.64
		100yr + 20%	(0.20) 97.70
RYE15	97.29	2yr	(0.00) 96.22
		5yr	(0.07) 97.36
		100yr	(0.32) 97.61
		Static	(0.26) 97.55
		100yr + 20%	(0.35) 97.64
RYE16	97.58	2yr	(0.00) 97.47
		5yr	(0.03) 97.61
		100yr	(0.10) 97.68
		Static	(0.09) 97.67
		100yr + 20%	(0.11) 97.69
RYE17	97.66	2yr	(0.00) 97.10
		5yr	(0.00) 97.66
		100yr	(0.08) 97.74
		Static	(0.14) 97.80
		100yr + 20%	(0.12) 97.78
RYT01	97.35	2yr	(0.00) 96.22
		5yr	(0.01) 97.36
		100yr	(0.26) 97.61
		Static	(0.20) 97.55
		100yr + 20%	(0.29) 97.64
RYT03	97.44	2yr	(0.00) 95.80
		5yr	(0.00) 96.61
		100yr	(0.00) 97.42
		Static	(0.21) 97.65
		100yr + 20%	(0.02) 97.46
RYT04	97.26	2yr	(0.00) 95.80
		5yr	(0.00) 96.61
		100yr	(0.15) 97.41
		Static	(0.24) 97.50
		100yr + 20%	(0.20) 97.46
RYT05	97.23	2yr	(0.00) 95.80
		5yr	(0.00) 96.61
		100yr	(0.18) 97.41
		Static	(0.15) 97.38
		100yr + 20%	(0.22) 97.45
RYT06	97.18	2yr	(0.00) 95.87
		5yr	(0.00) 96.57
		100yr	(0.17) 97.35
		Static	(0.37) 97.55
		100yr + 20%	(0.27) 97.45

PONDING[1]

CB No.	RIM ELEV. (m)	EVENT	WATER LEVEL ELEV. (DEPTH) (m)
RYT07	97.15	2yr	(0.00) 95.86
		5yr	(0.00) 96.57
		100yr	(0.19) 97.34
		Static	(0.20) 97.35
		100yr + 20%	(0.27) 97.42
RYT08	96.90	2yr	(0.00) 95.88
		5yr	(0.00) 96.87
		100yr	(0.20) 97.10
		Static	(0.30) 97.20
		100yr + 20%	(0.25) 97.15
RYT09	96.85	2yr	(0.00) 95.71
		5yr	(0.00) 96.69
		100yr	(0.19) 97.04
		Static	(0.30) 97.15
		100yr + 20%	(0.25) 97.10
RYT10	97.32	2yr	(0.00) 95.58
		5yr	(0.00) 96.34
		100yr	(0.00) 97.16
		Static	(0.11) 97.43
		100yr + 20%	(0.00) 97.22
RYT11	97.58	2yr	(0.00) 95.46
		5yr	(0.00) 95.92
		100yr	(0.00) 97.31
		Static	(0.11) 97.69
		100yr + 20%	(0.00) 97.43
RYT12	97.07	2yr	(0.00) 96.53
		5yr	(0.05) 97.12
		100yr	(0.08) 97.15
		Static	(0.07) 97.14
		100yr + 20%	(0.10) 97.17
RYT13	97.17	2yr	(0.00) 95.88
		5yr	(0.00) 96.30
		100yr	(0.14) 97.31
		Static	(0.13) 97.30
		100yr + 20%	(0.14) 97.31
RYT14	97.29	2yr	(0.00) 96.01
		5yr	(0.00) 96.49
		100yr	(0.14) 97.43
		Static	(0.14) 97.43
		100yr + 20%	(0.14) 97.43
RYT15	97.48	2yr	(0.00) 96.20
		5yr	(0.00) 96.68
		100yr	(0.12) 97.60
		Static	(0.11) 97.59
		100yr + 20%	(0.12) 97.60
RYT16	97.64	2yr	(0.00) 97.09
		5yr	(0.01) 97.65
		100yr	(0.03) 97.67
		Static	(0.02) 97.66
		100yr + 20%	(0.04) 97.68

[1]BASED ON PCSWMM MODEL (3-HOUR CHICAGO STORM DISTRIBUTION)

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PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
5.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
4.	ISSUED FOR TENDER	MAY 16/22	DDB
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1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE: 1:750

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0 10 20 30

DESIGN: BM
CHECKED: DDB
DRAWN: ATE
CHECKED: BM
APPROVED: DDB

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LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
Nov 14 2025
PROVINCE OF ONTARIO

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CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 121011-00
REV # 5
DRAWING No. 121011-STM

D07-12-21-0080
#18539

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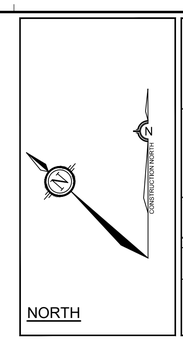
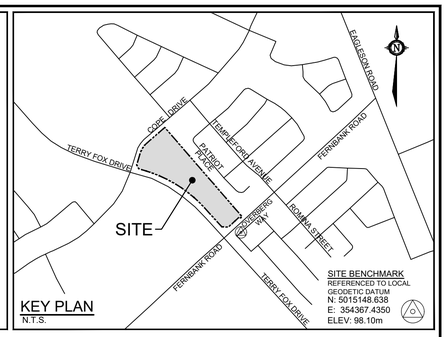
PLANA1.DWG - 841mmx594mm





LEGEND

- AREA 1 / 815-813 / 0.18 / 25 — AREA ID; MANHOLE TO MANHOLE; POPULATION EQUIVALENT; AREA IN HECTARES
- SANITARY DRAINAGE AREA BOUNDARY
- PROPOSED SANITARY SEWER AND MANHOLE
- POPOSED SANITARY SEWER WITH DIRECTION OF FLOW
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING SANITARY SEWER WITH DIRECTION OF FLOW

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

PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
5.	REVISED SITE PLAN SUBMISSION	NOV 14/25	DDB
4.	ISSUED FOR TENDER	MAY 16/22	DDB
3.	REVISED PER CITY COMMENTS	FEB 17/22	DDB
2.	REVISED PER CITY COMMENTS	NOV 5/21	DDB
1.	ISSUED FOR CITY OF OTTAWA REVIEW	JUN 2/21	DDB

SCALE
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DESIGN BM
CHECKED DDB
DRAWN ATE
CHECKED BM
APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
NOV 14 2025
PROVINCE OF ONTARIO

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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
5331 FERNBANK ROAD
IRON VALLEY 2

DRAWING NAME
SANITARY DRAINAGE AREA PLAN

PROJECT No. 121011-00
REV REV # 5
DRAWING No. 121011-SAN

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