

December 10, 2025  
VH Project No. 32948-23

Chabad of Guelph  
81 College Avenue West  
Guelph, Ontario, N1G 1S2

**Re: Functional Servicing and Stormwater Management Report  
Proposed Chabad Development  
81 College Avenue West, City of Guelph**

## **1.0 Introduction**

Van Harten Surveying Inc. (Van Harten) was retained by Chabad of Guelph to prepare a Functional Servicing and Stormwater Management Report in support of a Zoning By-law Amendment Application for the proposed development located at 81 College Avenue West in the City of Guelph.

This report presents the proposed water servicing, sanitary servicing, and stormwater management strategies for the development in accordance with the applicable municipal standards and engineering best practices. The purpose of this report is to outline the proposed water servicing, sanitary servicing, and stormwater management strategies for the development in accordance with applicable municipal standards. The design and analysis presented herein have been informed by the following background information and reference materials:

- City of Guelph Development Engineering Manual (October 2023)
- City of Guelph As-Constructed Drawings (Received January 2025)
- Geotechnical Investigation and Hydrogeological Assessment prepared by Stonecairn Consulting (July 2025)
- Region of Waterloo and Area Municipalities DGSSMS (January 2025)
- Ministry of the Environment Design Guidelines for Drinking-Water Systems (2008)
- Ministry of the Environment Design Guidelines for Sewage Works (2008)
- 81 College Avenue West Site Plan prepared by a+Link Architecture (December 2025)

This report has been revised in response to the first submission comments received from the City of Guelph on September 23, 2025. Relevant excerpts from the referenced reports and background information are provided in Appendix A.

## **2.0 Existing Site Conditions**

The subject site encompasses approximately 0.33 hectares and is currently occupied by a single detached residential dwelling, an associated driveway, and landscaped areas. The site is bounded by residential dwellings to the north, east, and west, and by College Avenue West to the south.

A Geotechnical Investigation and Hydrogeological Assessment, completed by Stonecain Consulting, was conducted to evaluate the subsurface soil and groundwater conditions. The investigation identified on-site soils as primarily sandy silt and sand and gravel, with a factored (design) infiltration rate estimated between 9 and 12 mm/hr.

Groundwater was encountered at depths ranging from 5.1 to 5.3 metres below ground surface (mbgs) across the site. Based on these findings, low impact development (LID) features are not expected to be adversely affected by groundwater elevations.

## **3.0 Proposed Development Conditions**

According to the Site Plan prepared by a+Link Architecture, the proposed development will consist of the following components:

- A 535 m<sup>2</sup> Chabad facility with an attached 212 m<sup>2</sup> two-storey residence and a 41 m<sup>2</sup> garage/nanny suite
- An asphalt/permeable paver parking lot and internal access drive aisle
- Landscaped and amenity areas

Vehicular access to the development will be provided via a 7.0 metre-wide driveway from College Avenue West. The existing residential dwelling and driveway on the property will be demolished to accommodate the proposed development.

## **4.0 Water Servicing**

### **4.1 Existing Water Servicing**

The site is located within an urban area and has access to the City of Guelph's municipal water distribution system. As-constructed drawings obtained from the City of Guelph were reviewed to identify the existing municipal water infrastructure in proximity to the site. Based on the available records, the following infrastructure is present:

- A 300 mm diameter polyvinyl chloride (PVC) watermain located on College Avenue West (City of Guelph As-Constructed Drawing NC-05)

- A fire hydrant located on the north side of College Avenue West at municipal address 89 College Avenue West, approximately 24 metres east of the site (City of Guelph As-Constructed Drawing NC-05)
- A fire hydrant located on the south side of College Avenue West at the intersection with McGilvray Street, approximately 31 metres east of the site (City of Guelph As-Constructed Drawing NC-05)
- One existing 25 mm diameter (size assumed) water service lateral connected to 81 College Avenue West, which ties into the 300 mm diameter PVC watermain on College Avenue West (City of Guelph As-Constructed Drawing NC-05)

#### 4.2 Water Demand Calculation

The water demand for the proposed development was calculated with reference to the City of Guelph Development Engineering Manual and the Ministry of the Environment Design Guidelines for Drinking-Water Systems. A summary of the projected water demand is provided in Table 1, with detailed calculations included in Appendix B.

*Table 1: Water Demand Calculations – Proposed Development*

Design Guidelines	Average Daily Flow (L/s)	Max. Daily Flow (L/s)	Peak Hour Design Flow (L/s)
City of Guelph	0.10	0.36	0.53

Note: Flows include residential and institutional flows inclusive of peaking factors (i.e. total flows from site).

According to the water demand calculation results outlined in Table 1, the maximum daily water demand for the proposed development is 0.36 L/s, and the peak hour water demand is 0.53 L/s.

#### 4.3 Proposed Fire Flow Calculation

The Fire Underwriters Survey – Water Supply for Public Fire Protection (2020) was used to calculate the required fire flow for the proposed development. The specific required fire flow values can be found in Table 2.

*Table 2: Required Fire Flows*

Fire Flow Criteria	Fire Flow (L/s)	Duration (hours)
FUS 2020	117	2.0

Based on the Fire Underwriters Survey, the required fire flow for the proposed development is 117 L/s for a duration of 2.0 hours. Additional details of the fire flow calculations are provided in Appendix B. It is noted that the mechanical engineer and architect will complete detailed fire flow analyses to ensure all fire suppression requirements are fully addressed for the proposed development.

#### **4.4 Proposed Water Servicing**

The proposed development will be serviced by a new 100 mm diameter PVC water service, connecting to the existing 300 mm diameter PVC watermain on College Avenue West via a tapping sleeve and valve connection. The existing 25 mm water service lateral currently providing water to 81 College Avenue West will be decommissioned to accommodate the proposed development.

Fire protection for the site will be provided by the existing fire hydrant located on the north side of College Avenue West at municipal address 89 College Avenue West, approximately 24 metres east of the site.

Details of the proposed water servicing are provided on the Site Servicing Plan (Drawing C02).

#### **5.0 Sanitary Servicing**

##### **5.1 Existing Sanitary Servicing**

The site is located in an urban area with access to the City of Guelph's municipal sanitary sewage network. As-constructed drawings obtained from the City of Guelph were reviewed to determine the available sanitary sewer infrastructure near the site. According to these drawings, the following services are present:

- A 250 mm diameter sanitary sewer on College Avenue West, draining east to west at a slope of 1.1% (City of Guelph As-Constructed Drawing NC-05).
- A sanitary sewer within the existing sanitary easement bisecting the property, draining east to west.
- A 100 mm sanitary service connected to 81 College Avenue West. This lateral connects to the existing 250 mm sanitary sewer on College Avenue West and includes a future servicing connection (150 mm diameter 'Y' connection) for 83 College Avenue (City of Guelph As-Constructed Drawing NC-05).

## 5.2 Sanitary Demand Calculation

The sanitary demand for the proposed development was completed with reference to the City of Guelph Development Engineering Manual and the Region of Waterloo and Area Municipalities DGSSMS. The sanitary demand for the proposed development is provided in Table 3. Detailed sanitary demand calculations are included in Appendix B.

*Table 3: Sanitary Demand Calculations – Proposed Development*

Design Guidelines	Peak Flow (L/s)	Peak Infiltration Flow (L/s)	Peak Design Flow (L/s)
City of Guelph	0.37	0.08	0.45

According to the sanitary demand calculations shown in Table 3, the peak sanitary design flow for the proposed development is 0.45 L/s.

## 5.3 Proposed Sanitary Servicing

The proposed development will connect to the existing 250 mm diameter PVC sanitary sewer on College Avenue West. The proposed 100 mm service, installed at a 2% slope, has a full flow capacity of 7.31 L/s based on Flowmaster calculations. Therefore, this service has sufficient capacity to accommodate the proposed development.

The existing sanitary lateral servicing 81 College Avenue West will be decommissioned as part of the proposed development.

Details of the sanitary servicing are provided on the Site Servicing Plan (Drawing C02).

## 6.0 Stormwater Management

### 6.1 Stormwater Management Criteria

According to the City of Guelph Stormwater Management Master Plan (December 2022), the site is located within Stormwater Management Policy Area 13 (City-Wide). Based on Table 4.2 of the Master Plan, the following stormwater criteria apply to the site:

**Stormwater Quantity Control:** Control peak flow to match pre-development levels for all design events (2- to 100-year).

**Stormwater Quality Control:** Provide an “enhanced” level of water quality protection, achieving 80% total suspended solids (TSS) removal.

**Infiltration/Water Balance:** Maintain pre-development recharge rate, volume, and hydroperiods at post-development conditions. Provide a minimum of 5 mm volume control.

## 7.0 Existing Storm Servicing

The site is located in an urban area with access to the City of Guelph's storm sewer infrastructure. As-constructed drawings obtained from the City of Guelph were reviewed to determine the available storm sewer infrastructure near the site. According to these drawings, the following infrastructure is present:

- A 900 mm diameter storm sewer on College Avenue West, draining east to west at a slope of 0.4% (City of Guelph As-Constructed Drawing NC-05)

## 7.1 Existing Drainage Patterns

An Existing Drainage Plan has been prepared (Drawing C03) based on the topographic survey conducted by Van Harten in November 2023. The survey identifies a high point approximately at the midpoint of the property, dividing the site into two distinct catchments: a northern catchment (Catchment 102) and a southern catchment (Catchment 101).

Catchment 101 encompasses portions of the existing dwelling, garage, asphalt driveway, and landscaped areas, and drains overland to the College Avenue West right-of-way. Catchment 102 includes the remainder of the dwelling, garage, and landscaped areas, draining overland towards the rear of the property.

Additionally, an external drainage catchment (EXT1) has been incorporated into the stormwater model to account for runoff originating from the rear yards of the properties located east of the site along University Avenue.

The catchment characteristics under existing conditions are summarized in Table 4.

*Table 4: Existing Drainage Area Characteristics*

Catchment	Use	Area (m <sup>2</sup> )	Imp. (%)	Length (m)	Slope (%)	Outlet
101	Res. Dwelling, Driveway and Landscaping	1,837	25.6	42	3.9	College Ave. W ROW
102	Res. Dwelling and Landscaping	1,422	12.4	44	3.6	Rear
EXT1	Ex. Residential	354	26.6	7	1	College Ave. W ROW

Note:

1. Impervious areas based on the topographic survey prepared by Van Harten.

## 7.2 Proposed Drainage Patterns

A Proposed Drainage Plan has been prepared (Drawing C03) based on the Site Grading Plan (Drawing C01). Consistent with the existing drainage patterns, the grading for the proposed development has been designed to direct runoff towards College Avenue West and the rear of the property.

The proposed catchments, Catchments 201, 202, UC1, and EXT1, which include the Chabad building, asphalt entrance and parking lot, and landscaped areas, will outlet to the College Avenue storm sewer network, incorporating both quantity and quality control measures. Catchments 203 and UC2, consisting of the residential building, permeable paver parking lot, and landscaped areas, will outlet to the rear of the property.

The catchment characteristics under proposed conditions are summarized in Table 5.

*Table 5: Proposed Drainage Area Characteristics*

Catchment	Use	Area (m <sup>2</sup> )	Imp. (%)	Length (m)	Slope (%)	Outlet
201	Chabad Roof and Landscape	1,183	74.3	40	3.0	Soakaway
202	Asphalt Access and Parking/Res. Building	1,200	83.4	40	2.0	College Ave. W Sewer
203	Permeable Paver Parking Lot	337	100	20	2.5	Pavers/Rear
UC1	Landscape Area	147	0.0	15	4.0	College Ave. W ROW
UC2	Landscaping	392	0.0	40	1.0	Rear
EXT1	Ex. Residential	354	26.6	7	1	College Ave. W Sewer

Notes:

1. Impervious areas based on the Grading Plan prepared by Van Harten.

## 7.3 Stormwater Quantity Controls

The stormwater management criteria for the site are governed by the City of Guelph Stormwater Management Master Plan Policy Area 13. The quantity control criteria require that post-development peak flows be controlled to match pre-development flow rates for storm events ranging from the 2-year to the 100-year return periods. Stormwater hydraulic modeling for the site was completed using a 4-hour Chicago storm simulation for the 2-year through 100-year design storm events. The Intensity-Duration-Frequency (IDF) curves applied were obtained from the City of Guelph Development Engineering Manual (October 2023).

A pre-development and post-development hydrologic analysis for the site was performed using MIDUSS Version 2.25, as detailed in Appendix C. Information on the 2-year through 100-year design storms is provided in Table 6.

*Table 6: Guelph DEM IDF Parameters*

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
a	475.61	632.75	721.92	822.74	893.80	953.29
b	0.0	0.0	0.0	0.0	0.0	0.0
c	0.738	0.741	0.736	0.725	0.719	0.711
r	0.40	0.40	0.40	0.40	0.40	0.40
T <sub>d</sub>	240	240	240	240	240	240

The hydraulic modelling peak runoff results for the pre-development and post-development-controlled scenarios have been outlined in Table 7 and Table 8 for each respective outlet.

*Table 7: Peak Flow and On-Site Storage Summary – Outlet to College Avenue West*

Design Storm (year)	Calculated Peak Flow (LPS)		Storage Provided (m <sup>3</sup> )
	Existing Uncontrolled	Proposed Controlled <sup>1</sup>	
	101+EXT1	201+202+UC1+EXT1	
2	20	12	113
5	32	16	
10	43	18	
25	58	21	
50	75	23	
100	84	25	

**Notes:**

1. Flows controlled for Catchment 201, Catchment 202, and Catchment EXT1 through the installation of a 100mm dia. orifice pipe.
2. Storage includes the combined storage of the underground storage tank. Catchment 201 is proposed to infiltrate while Catchment 202 will be attenuated and released to the College Avenue Storm sewer.

As shown in Table 7, stormwater quantity controls are required to reduce post-development 100-year flows to match pre-development 100-year flow rates. The proposed stormwater management strategy includes a 100 mm diameter orifice pipe between the proposed underground storage tank and the oil-grit separator to regulate flows from Catchments 201 and 202.

The underground storage tank is designed to provide a total storage volume of 113 m<sup>3</sup> to attenuate the 100-year storm event. The tank will consist of a 69 m<sup>3</sup> permeable linear cell and a 44 m<sup>3</sup> impermeable cell. The permeable cell will capture and infiltrate clean rooftop and landscape runoff from Catchment 201, while the impermeable cell will capture and attenuate parking lot runoff from Catchment 202 and external drainage from Catchment EXT1.

Detailed stormwater management calculations are provided in Appendix C. Detailed drawings of the underground tank will be prepared during the detailed design stage.

Catchment UC1 consists of runoff from the landscaped frontage of the proposed development and will discharge uncontrolled to the College Avenue West storm right-of-way.

*Table 8: Peak Flow and On-Site Storage Summary – Outlet to Rear*

Design Storm (year)	Calculated Peak Flow (LPS)		Storage Provided (m <sup>3</sup> )
	Existing Uncontrolled	Proposed Controlled <sup>1</sup>	
	102	203 + UC2	
2	8	2	54
5	18	4	
10	25	6	
25	35	8	
50	43	9	
100	49	10	

Notes:

1. Storage required to capture and infiltrate the 100-year storm event for Catchment 203. Permeable pavers will provide the storage.

As shown in Table 8, stormwater quantity controls have been implemented to reduce post-development 100-year flows to match pre-development 100-year flows. The proposed stormwater management measures include permeable pavers within the rear parking lot, designed to capture and infiltrate runoff from the 100-year storm event in Catchment 203. Catchment UC2, which consists of runoff from landscaped areas, will continue to drain uncontrolled to the rear of the property, consistent with existing conditions.

The proposed stormwater design ensures that post-development flows to both College Avenue West and the rear of the property are reduced for all storm events up to and including the 100-year event. Details of the proposed storm servicing are provided on the Site Servicing Plan (Drawing C02).

#### **7.4 Stormwater Quality Controls**

As outlined in the City of Guelph Development Engineering Manual, stormwater quality controls must be implemented to achieve an “enhanced” level of water quality protection, defined as 80% total suspended solids (TSS) removal. For the proposed development, this requirement will be met through the installation of an oil-grit separator (Stormceptor EFO4 or equivalent). Details of the proposed oil-grit separator are provided in Appendix C.

## **7.5 Infiltration/Water Balance**

It is our understanding that the water balance criteria for this property require the retention of the first 5 mm of rainfall on-site through infiltration, evapotranspiration, and/or reuse, as well as maintaining pre-development recharge rates, volumes, and hydroperiods under post-development conditions.

To satisfy the 5 mm retention requirement, a total volume of approximately 16.3 m<sup>3</sup> must be captured on-site, based on a lot area of 3,259 m<sup>2</sup>. This volume will be retained through the use of permeable pavers and a permeable underground storage tank. Together, these features will provide an estimated combined void volume of 123 m<sup>3</sup>.

### Monthly Water Balance

A monthly water balance assessment was undertaken for the site under existing and proposed conditions. Methodology generally followed that of Thornthwaite and Mather and the MOE Stormwater Management Planning and Design Manual (2003). Local climatic data (precipitation, monthly mean temperature) were taken from the Waterloo Wellington A Climate Station (Climate Station ID 6149387) 1981 to 2010 Climate Normals. Detailed water balance calculations are provided in Appendix D.

Monthly potential evapotranspiration was calculated using the monthly mean temperature and the station latitude. Actual evapotranspiration and water surplus were calculated based on the soil moisture conditions and monthly average precipitation. The water balance calculation methodology assumed that available water would first be used to overcome any soil moisture deficit prior to any excess being available as surplus.

A soil moisture capacity of 125 mm was assigned under both existing and proposed conditions based on Table 3.1 of the MOE Stormwater Management Planning and Design Manual (silt loam, urban lawn). A weighted infiltration factor was calculated for each condition, considering topography, soils, and surface cover, to distribute the surplus quantity between runoff and infiltration in accordance with the MOE Stormwater Management Planning and Design Manual (2003).

Under post-development conditions, an annual infiltration deficit of 176.7 cubic metres was calculated. This deficit will be mitigated through the combined use of permeable pavers and a permeable underground storage tank. Based on projected runoff from the property between April and October, the enhanced annual recharge volume is estimated at 607.7 cubic metres. This volume exceeds the calculated infiltration deficit, indicating that the proposed infiltration features provide sufficient capacity to meet water balance criteria under post-development conditions.

## 8.0 Erosion and Sediment Control

Temporary sediment control fencing shall be installed around the perimeter of the proposed development, as shown on the Sediment and Control Plan (Drawing C00), and siltsacks shall be placed in all existing and proposed catchbasins during construction to minimize the potential for sediment accumulation in the surrounding municipal storm sewer system. These temporary erosion and sediment control measures may be removed once construction of the proposed building and landscaping is complete and grass growth has been re-established over disturbed areas.

It is important to note that the erosion and sediment control plan is dynamic in nature. Alterations or additions to these measures may be necessary to respond to changing site conditions during construction. Additional erosion and sediment control materials should be kept on-site at all times and installed as required under the direction of the Site Engineer, Contractor, and/or City Staff.

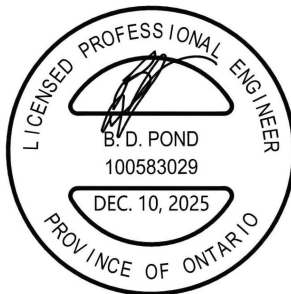
## 9.0 Closure

The completed Functional Servicing and Stormwater Report is specific to the site based on our knowledge of the proposed development and has been prepared to support the Zoning By-Law Application. Please contact our office if you have any questions or require further consultation.

### Van Harten Surveying Inc.



**Brett Pond, P. Eng**  
*Project Manager*



Encl. Appendix A – Background Information  
Encl. Appendix B – Water Supply and Sanitary Demand Calculations  
Encl. Appendix C – Stormwater Management Calculations  
Encl. Appendix D – Water Balance

Encl. Drawings  
Drawing C01 – Site Grading Plan  
Drawing C02 – Site Servicing Plan  
Drawing C03 – Drainage Plans

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**APPENDIX A**  
**BACKGROUND INFORMATION**

	PROPOSED BUILDING		MULCH / GARDEN REFER TO LANDSCAPE DRAWINGS		EX. / EXIST.		TOPOGRAPHIC LINE		FIRE HYDRANT		COMMUNICATION SERVICE		MAN HOLE		EXISTING TREE / PLANTING TO REMAIN
	CONCRETE SIDEWALK - BRUSHED FINISH		GRASS / SOD REFER TO LANDSCAPE DRAWINGS		ENTRANCE / EXIT		TOPOGRAPHIC ELEVATION		FIRE DEPARTMENT CONNECTION		HYDRO SERVICE - OVERHEAD WIRES		CATCH BASIN MAN HOLE		EXISTING TREE / PLANTING TO BE DEMOLISHED & REMOVED
	CONCRETE SIDEWALK - SMOOTH FINISH		PERMEABLE GRASS PARKING PAVERS REFER TO LANDSCAPE DRAWINGS		BUILDING SETBACK LINE		DIRECTION OF TRAFFIC		LIGHT STANDARD - 1 HEAD (w/ CUT-OFF) REFER TO ELEC. DWGS.		WATER SERVICE		LANDSCAPE CATCH BASIN		PROPOSED TREE / PLANTING REFER TO LANDSCAPE DWGS
	B.F. PATH OF TRAVEL w/ WIRE TIE FIN. & COLOURED CONC.		PERMEABLE EXTERIOR PAVEMENT REFER TO LANDSCAPE DRAWINGS		PROPERTY EASEMENT LINE		BARRIER-FREE PARKING SYMBOL PAINTED ON ASPHALT. REFER TO DETAILS ON A1.2.		LIGHT STANDARD - 2 HEAD (w/ CUT-OFF) REFER TO ELEC. DWGS.		SANITARY SERVICE		COMM. PEDESTAL		TREE PROTECTION FENCING REFER TO LANDSCAPE DWGS
	B.F. ACCESSIBLE w/ PAINTED HATCH		RES.		CENTRE LINE OF ROAD		TACTILE WARNING TILE, CAST-IN-PLACE, FLUSH w/ SIDEWALK		LIGHT STANDARD - 3 HEAD (w/ CUT-OFF) REFER TO ELEC. DWGS.		GAS SERVICE		WATER VALVE		
					FIRE ROUTE		BICYCLE RACK		LIGHT STANDARD - 4 HEAD (w/ CUT-OFF) REFER TO ELEC. DWGS.		EXISTING FENCE		CCTV CAMERA		
					PROPOSED SNOW STORAGE		BARRIER FREE PARKING SKENEGE, REFER TO DETAILS ON A1.2.		HYDRO POLE		PROPOSED FENCE		EV CHARGING STATION		

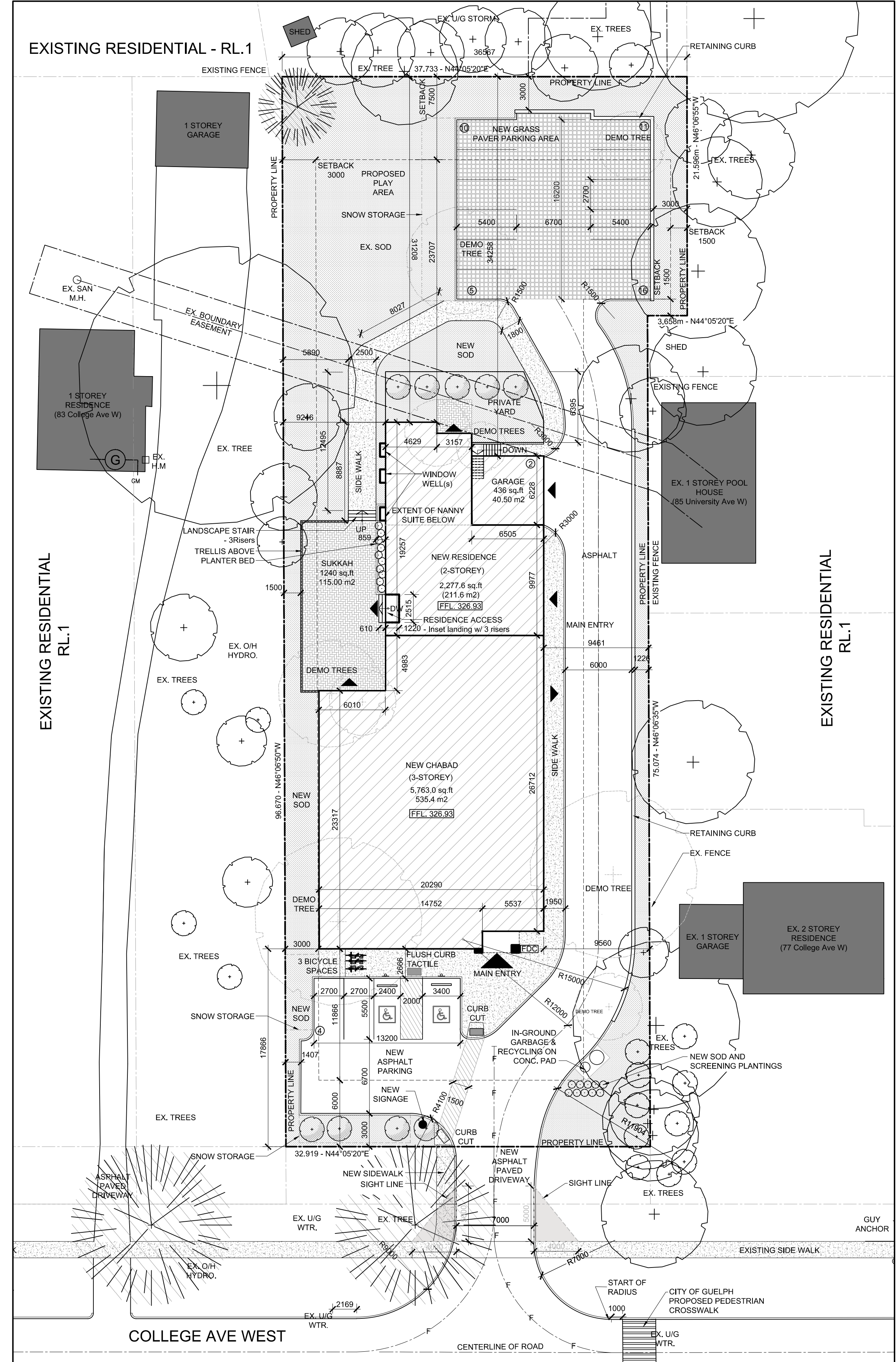
**LEGEND**  
SCALE: N.T.S.

SURVEY INFO - REFER TO SURVEY FOR MORE INFORMATION	
INFORMATION TAKEN FROM TOPOGRAPHIC SURVEY PROVIDED BY VAN HARTEN LAND SURVEYORS AND ENGINEERS - 2023-12-22	
81 COLLEGE AVENUE WEST PART OF LOT 3, REGISTERED PLAN 249 BEING PARTS 7, 8, AND 9, DEPOSITED PLAN 61R-9059 CITY OF GUELPH COUNTY OF WELLINGTON	

**SURVEY INFORMATION**  
SCALE: N.T.S.

SITE & ZONING ANALYSIS	
PROJECT:	CHABAD OF GUELPH
PROJECT ADDRESS - EXISTING:	81 COLLEGE AVE WEST, GUELPH, ON
EXISTING ZONING:	ZONE RL-1 - RESIDENTIAL SINGLE DETACHED
PROPOSED ZONING:	ZONE NI - NEIGHBOURHOOD INSTITUTIONAL
PROPOSED USES:	PLACE OF WORSHIP, RESIDENTIAL
REQUIRED	PROPOSED
LOT AREA (m <sup>2</sup> ) (min.):	700.00 m <sup>2</sup> No Change
LOT FRONTAGE (m) (min.):	30.0 m MIN. No Change
SITE SETBACKS:	
FRONT YARD DEPTH (m) (min.):	6 m MIN. 17.9 m
EXTERIOR SIDE YARD DEPTH (m) (min.):	6 m MIN. n/a
INTERIOR SIDE YARD DEPTH (m) (min.):	6.0 m MIN. (or one half building height) 9.4 m (East) 3.0 m (West)
REAR YARD DEPTH (m) (min.):	7.5 m MIN. 31.2 m MIN.
BUFFER STRIP (m) (min.):	3.0 m MIN. ADJACENT TO INTERIOR SIDE YARD AND REAR LOT LINES. 3.0 m (Rear Yard) 1.2m (Interior Side Yard - East) 1.4m (Interior Side Yard - West)
LANDSCAPE OPEN SPACE (min.):	15% MIN. 48.2%
BUILDING HEIGHT (m) (max.):	4 Storeys 3 Storeys SECTION 3: DEFINITIONS - City of Guelph By-law, 17187 "Building Height" Average finished grade = +327.14 elev. Proposed finished floor level = +326.93 ft. Building Height = 337.73 elev. (10.59m) "Building Height" means the vertical dimension between the average Finished Grade of a Building and the top part of such Building or: (b) in the case of a mansard roof, the deck roof line;
LOT COVERAGE (%) (max.):	n/a 24.0%
LOT DEPTH (m) (min.):	n/a No Change
BUILDING AREA (m <sup>2</sup> ):	n/a 784.3 m <sup>2</sup>
FLOOR AREA - NANNY SUITE (m <sup>2</sup> ):	n/a NANNY SUITE AREA = 62.2 m <sup>2</sup> PERCENTAGE OF PRIVATE RESIDENCE (%) = 10%
GROSS FLOOR AREA (m <sup>2</sup> ):	n/a CHABAD Basement 105.4 m <sup>2</sup> HOUSE Basement 200.0 m <sup>2</sup> Ground Floor 548.1 m <sup>2</sup> Ground Floor 200.0 m <sup>2</sup> Second Floor 426.4 m <sup>2</sup> Second Floor 221.6 m <sup>2</sup> Third Floor 183.8 m <sup>2</sup> TOTAL 1,263.8 m <sup>2</sup> TOTAL 621.6 m <sup>2</sup> TOTAL GFA= 1,885.4 m <sup>2</sup>
PARKING: PARKING FOR PLACE OF WORSHIP (CHABAD): PARKING FOR RESIDENCE:	
STANDARD STALL: 2.7 m x 5.4 m	16 Spaces provided 2 Spaces provided in Garage
STANDARD TWO WAY DRIVEWAY AISLE WIDTH: 6.0 m	TOTAL SPACES PROVIDED = 18
ACCESSIBLE PARKING: DESIGNATED ACCESSIBLE PARKING SPACE REGULATIONS: REFER TO TABLE 5.5 - ACCESSIBLE PARKING RATES	
B/F TYPE 'A' STALL SIZE (min.): 3.4 m x 5.5 m	1 Type 'A' and 1 Type 'B' space provided
B/F TYPE 'B' STALL SIZE (min.): 2.4 m x 5.5 m	
B/F ACCESS AISLE (min.): 2.0 m x 5.5 m	
ACCESSIBLE DRIVEWAY: (a) ACCESS AISLE: 1.5 m (b) DRIVEWAY: 3.4 m	
BICYCLE PARKING: DESIGNATED BICYCLE PARKING SPACE REGULATIONS: 4% OF THE REQUIRED PARKING UNDER TABLE 5.3, 2 SPACES MINIMUM - 3 Spaces provided	
YARD PROTECTION AND PATIO COVERAGE: FRONT/ EXTERIOR SIDE YARD: - 2.4 m (MAX) PROJECTION INTO YARD - 2m (MIN) SETBACK FROM LOT LINE REAR YARD: - 5 m (MAX) PROJECTION INTO YARD - 2 m (MIN) SETBACK FROM LOT LINE INTERIOR SIDE YARD: - 1.2 m (MAX) PROJECTION INTO YARD - CONFORMS - 0.6 m (MIN) SETBACK FROM LOT LINE - CONFORMS NOTE: ROOFED PORCH NOT EXCEEDING 1 STOREY IN HEIGHT	
FENCING: (a) THE MAXIMUM HEIGHT OF A FENCE LOCATED IN A FRONT YARD, INTERIOR SIDE YARD OR EXTERIOR SIDE YARD IS 0.6 m N HEIGHT (b) THE MAXIMUM HEIGHT OF A FENCE LOCATED IN A FRONT YARD, INTERIOR SIDE YARD OR EXTERIOR SIDE YARD WITH A 4 m SETBACK IS 1.6 m N HEIGHT (c) THE MAXIMUM HEIGHT OF A FENCE LOCATED IN A REAR YARD IS 1.8 m IN HEIGHT	
GARBAGE / REFUSE AND OUTDOOR STORAGE: EXTERIOR GARBAGE OR REFUSE SHALL BE STORED IN A CONTAINER AT THE INTERIOR SIDE YARD OR REAR YARD OF THE LOT. GARBAGE LOADING AND UNLOADING AREAS VISIBLE FROM AN ADJOINING SITE SHALL HAVE A VISUAL SCREENING CONSISTING OF A SOLID FENCE. AN OUTDOOR STORAGE AREA IS ONLY PERMITTED IN THE REAR YARD OF THE LOT.	

**ZONING ANALYSIS**  
SCALE: N.T.S.



**SITE PLAN**  
SCALE: 1:250

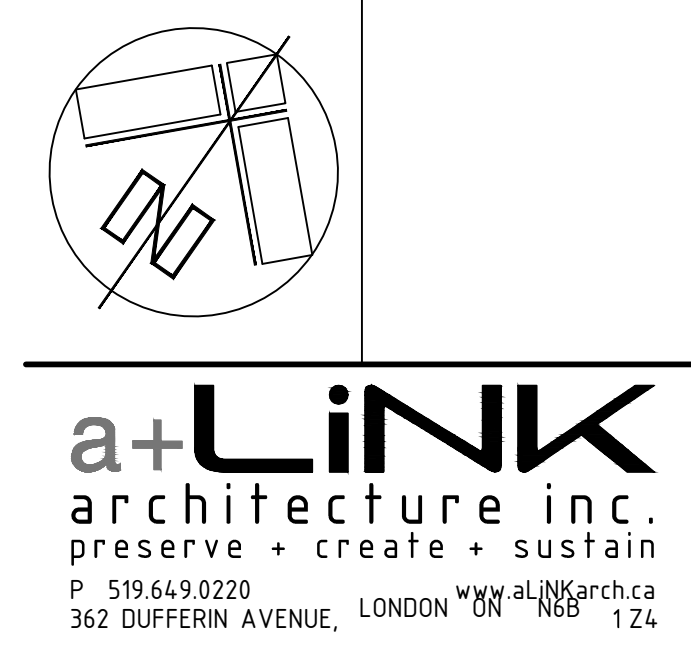
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- NOTES:
1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
  2. DO NOT SCALE DRAWINGS.
  3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS, OR DISCREPANCIES TO THE ARCHITECT OR DESIGN ENGINEER AS APPLICABLE.
  4. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
  5. THE DRAWINGS ARE THE PROPERTY OF THE ARCHITECT AND/OR ENGINEER AND MUST BE RETURNED ON COMPLETION OF THE PROJECT. ANY UNAUTHORIZED USE IS PROHIBITED.
  6. AREA CALCULATIONS ARE APPROXIMATE.
  7. DATE FORMAT: YYYY-MM-DD

ISSUE & REVISION DESIGNATION  
LETTER (A) = ISSUE, No. (1) = REVISION

No.	Date	Issued For / Revisions
A	2025-12-04	ZBA Submission

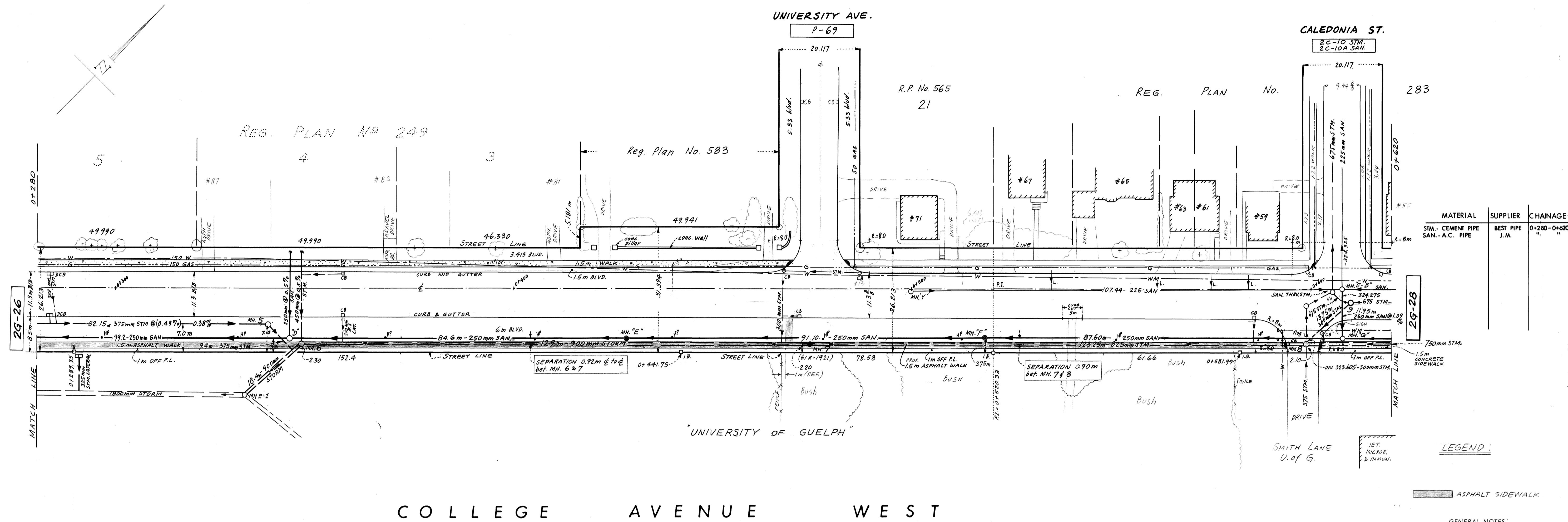
NOT FOR CONSTRUCTION



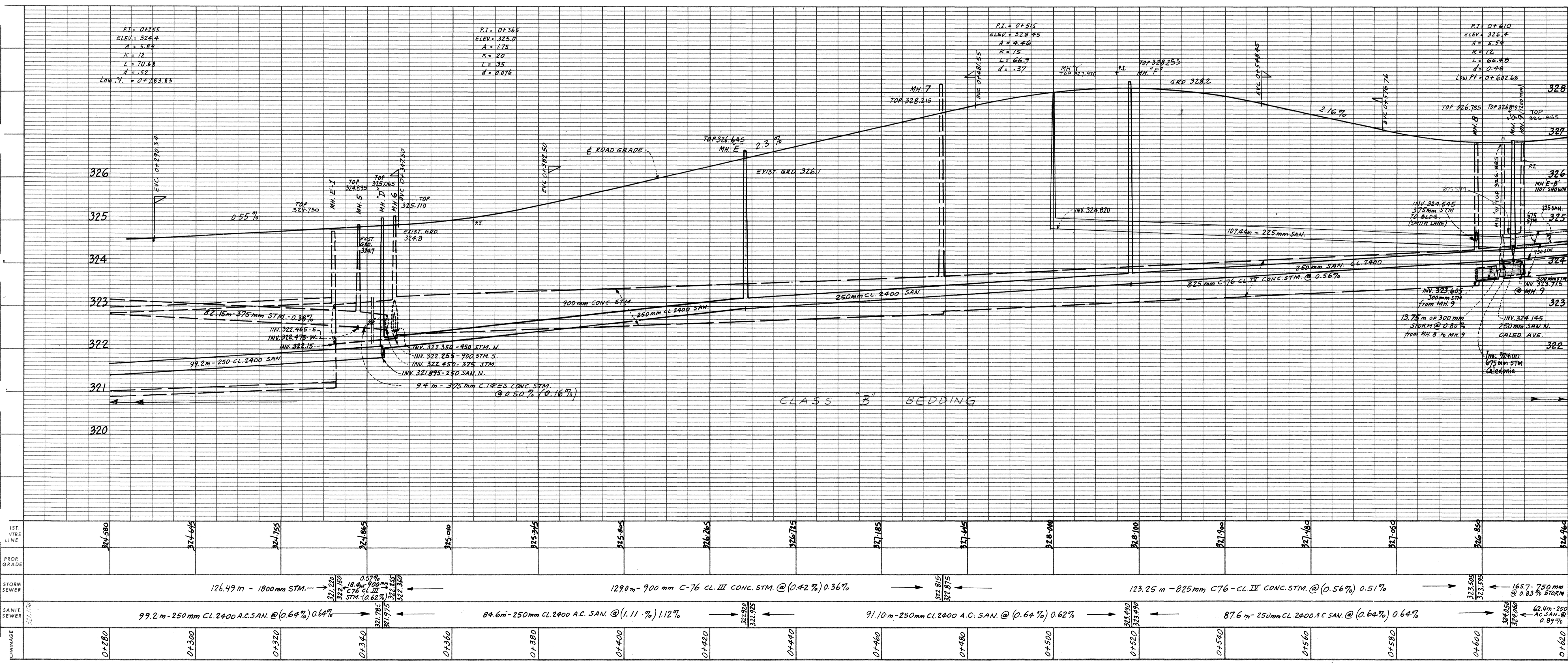
Project: Chabad of Guelph  
81 College Avenue West, Guelph, Ontario

Drawing: SITE PLAN		
Drawn By: CT	Job Captain: AL	Project No.:
Scale: AS SHOWN	2364	
Plot Date: 2025-12-04	Sheet No.:	
Current Issue: A	Current Revision: -	ZBA1(r)

2G-27



COLLEGE AVENUE WEST



GENERAL NOTES:  
 FIELD NOTES: FIELD BOOK 80-10  
 BENCH MARK: No. .... ELEVATION: .....

No.	DATE	DESCRIPTION	BY	CHK'D
2	8/10/24	As Built (Contr # 81-03) RR	JK	

**CITY OF GUELPH**

ENGINEERING DEPARTMENT

**COLLEGE AVE. WEST**  
 RODNEY TO CALEDONIA  
 STA. 0+280 to STA. 0+620

DESIGNED BY: *Albert J. Ferguson*

APPROVED BY: *B. J. Poulton*

REGISTERED PROFESSIONAL ENGINEER  
 CIVIL  
 A. R. FERGUSON  
 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER  
 CIVIL  
 B. J. POULTON  
 PROVINCE OF ONTARIO

EXISTING CENTRELINE	SCALE: H. 1:500 V. 1:50
PROPOSED GRADE	DATE: 80 02 13
STORM SEWER	DRAWN: J. KLIMSTRA
SANITARY SEWER	CHECKED:
CHAINAGE	CONTRACT No.
	DRAWING No. <b>2G-27</b>



House No.

House No. 81

Lot No.

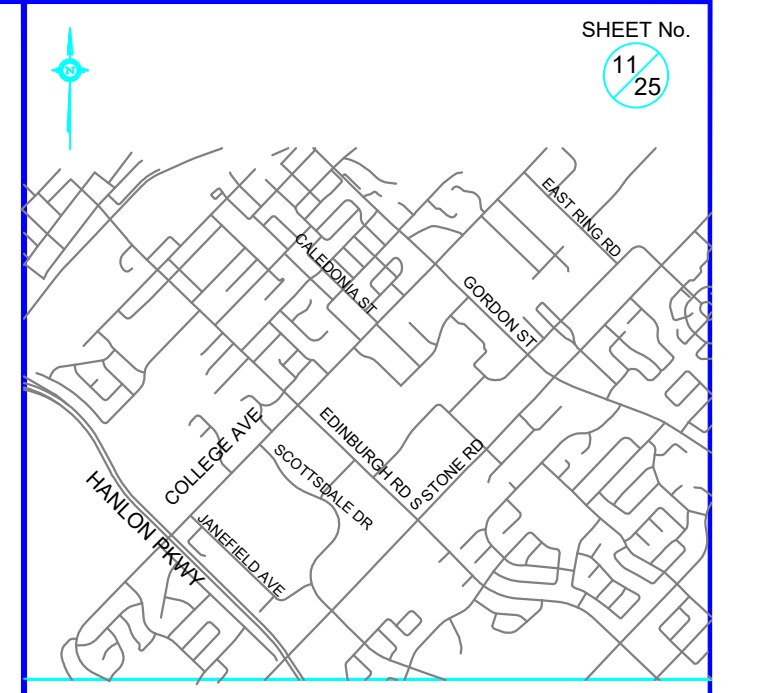
House No.

College Ave. W.

170'5"

176'8"

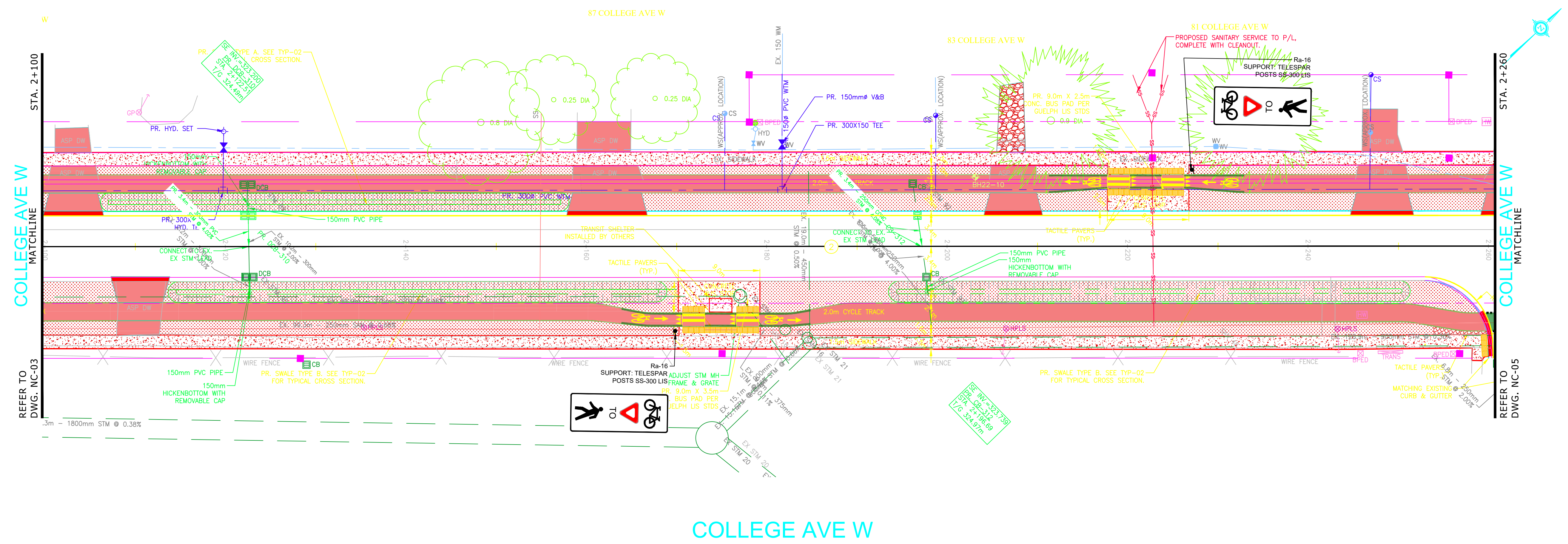
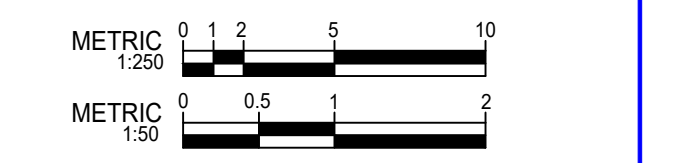
MARKS:



KEY PLAN Scale: NOT TO SCALE

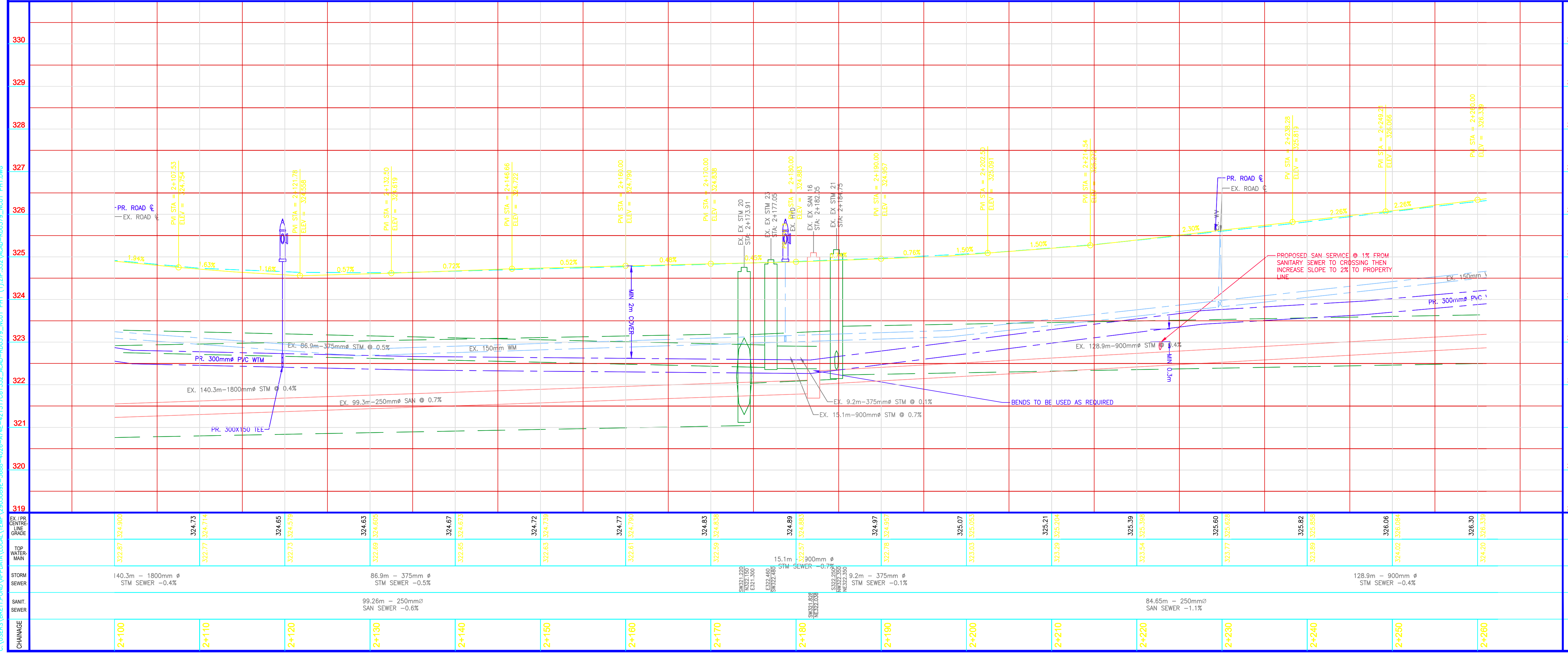
**LEGEND**

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM
- PROPOSED SIDEWALK
- PROPOSED CYCLE TRACK
- PROPOSED GRASS AREA
- PROPOSED TEXTURED PAVERS
- POTENTIAL CONFLICTS



COLLEGE AVE W

C:\USERS\BRET\FOND\APPDATA\LOCAL\TEMP\9305089E-568B-4026-A74E-421517061332\ACAD=RD0379\_NCD1\_P01 (1) J.P. 332\ACAD=RD0379\_NCD1\_P01.DWG



THE POSITION OF POLES, LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND 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, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	DATE	DESCRIPTION	BY:	CHKD.
5	9/11/24	REVISED SANITARY & WATERMAIN	DP	AD
4	4/24/24	ISSUED FOR CONSTRUCTION	DP	ABM
3	3/1/24	ISSUED FOR TENDER	DP	ABM
2	1/24/24	ISSUED FOR 90% DESIGN	DP	ABM
1	7/20/23	ISSUED FOR 60% DESIGN	BW	ABM

ISSUES/REVISIONS

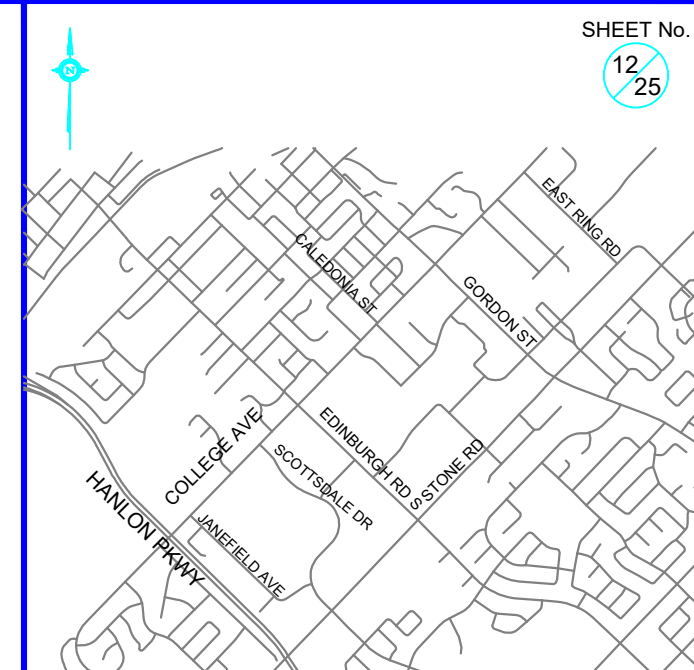
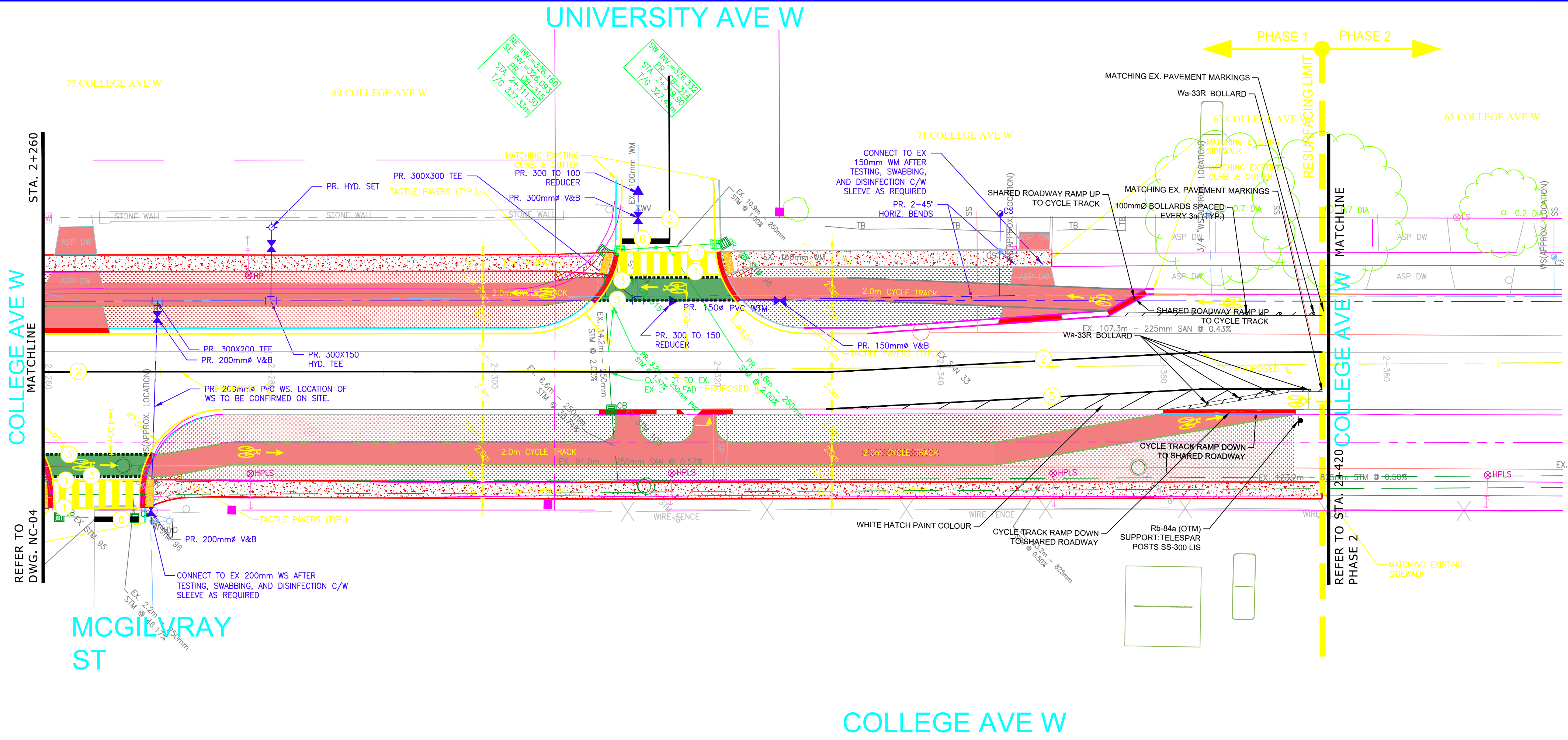
**CITY OF Guelph**

ENGINEERING AND TRANSPORTATION SERVICES

COLLEGE AVE CYCLE TRACKS PHASE 1 JANEFIELD TO UNIVERSITY  
City of Guelph

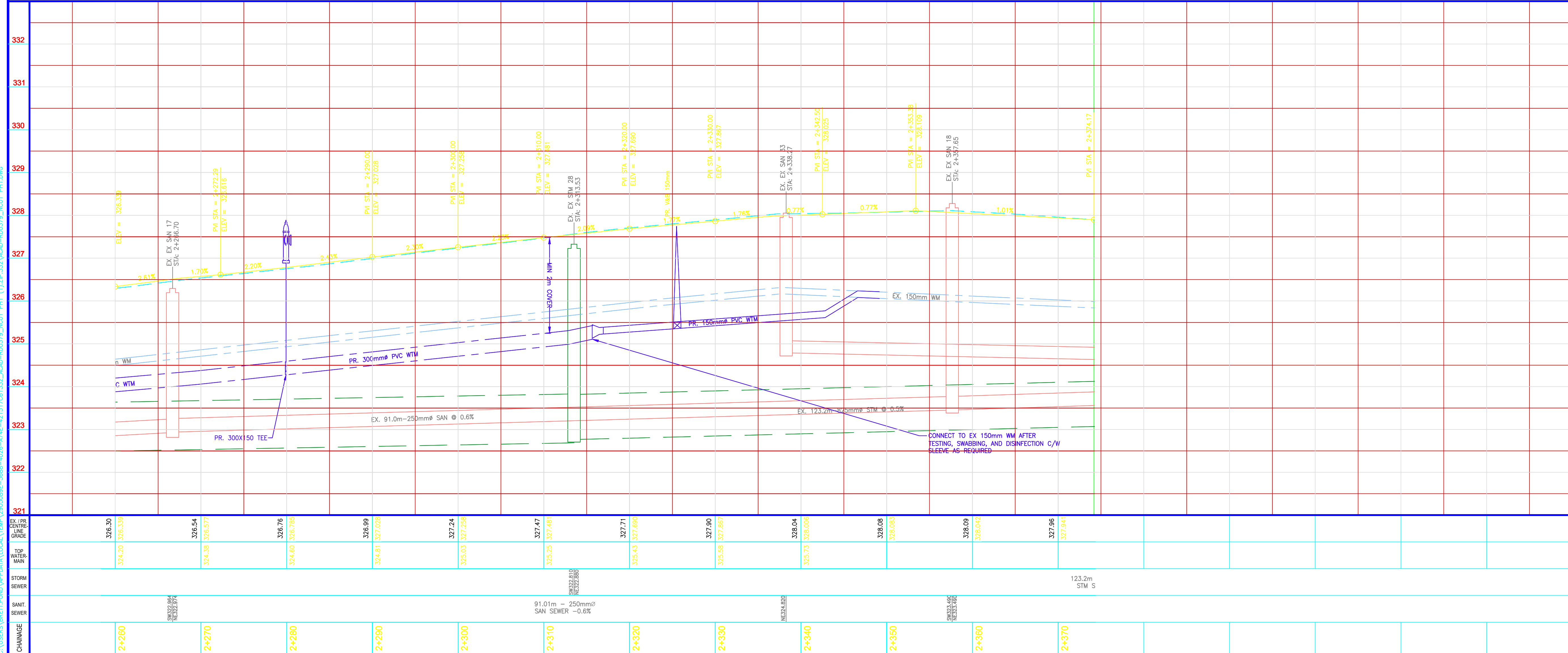
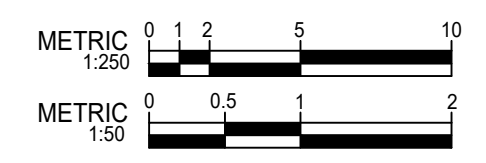
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STA.2+100 TO 2+260

EX. PR. CENTRELINE GRADE	SCALES: HOR: 1:250, VER: 1:50
TOP OF WATERMAIN	DATE DRAWN: 9/11/24
STORM SEWER	DRAWN BY: DP
SANITARY SEWER	CHECKED BY: AM
CHAINAGE	CONSULTANT DRAWING No.
	CONTRACT No. PROJECT No. 24-015 RD0379
	CITY REFERENCE No. REV. NC-04 1



KEY PLAN Scale : NOT TO SCALE

- LEGEND**
- PROPOSED WATERMAIN
  - PROPOSED SANITARY
  - PROPOSED STORM
  - PROPOSED SIDEWALK
  - PROPOSED CYCLE TRACK
  - PROPOSED GRASS AREA
  - PROPOSED TEXTURED PAVEMENT
  - POTENTIAL CONFLICTS



THE POSITION OF POLES, LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND 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, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

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2	1/24/24	ISSUED FOR 90% DESIGN	DP	ABM
1	7/20/23	ISSUED FOR 60% DESIGN	BW	ABM

**CITY OF Guelph**

ENGINEERING AND TRANSPORTATION SERVICES

COLLEGE AVE  
CYCLE TRACKS PHASE 1  
JANEFIELD TO UNIVERSITY  
City of Guelph

#####  
STA. 2+250 TO 2+375

EX. PR. CENTRELINE GRADE	SCALES: HOR: 1:250, VER: 1:50
TOP OF WATERMAIN	DATE DRAWN: 9/11/24
STORM SEWER	DRAWN BY: DP
SANITARY SEWER	CHECKED BY: AM
CHAINAGE	CONSULTANT DRAWING No.
	CONTRACT No. PROJECT No.
	24-015 RD0379
	CITY REFERENCE No. REV.
	NC-05 1

C:\USERS\BRET\FORD\APPDATA\LOCAL\TEMP\9305089E-568B-4026-A74E-421517061332\ACAD-RD0379\_NCD1\_P11 (1).DWG

**APPENDIX B**  
**WATER SUPPLY AND SANITARY DEMAND CALCULATIONS**

Project No: 32948-23  
 Project Name: 81 College Avenue West  
 Project Location: City of Guelph  
 Date: 2025-02-03  
 Update: 2025-07-08



## Sanitary Design Flow Calculation

### Site Characteristics

Site Area = 0.326 ha \*Per Site Plan

### **Residential**

Number of Units = 1 units  
 Population per Unit = 3.4 ppu \*Per Guelph DEM Single Detached  
 Site Population = 4 people

### **Chabad (Institutional)**

Floor area = 548 m2 \*GFA Per Site Plan  
 Population per m2 = 0.7 ppsqm  
 Population = 783 people \*Per OBC Table 3.1.17.1 for Group A-2 - Assembly Occupancy, Religious Facility

### Residential Design Flow

Average Daily Sanitary Flow = 300 L/cap/day  
 Site Population = 4 people  
 Site Average Daily Flow = 0.01 L/s  
 Harmon Peaking Factor = 4.00 \*Min PF = 2 , Max PF = 4  
**Peak Residential Design Flow = 0.06 L/s** =Average Daily Flow \* Peaking Factor

### Institutional Design Flow

Average Daily Sanitary Flow = 0.25 L/s/ha \*Per Region of Waterloo DGSSMS  
 Site Average Daily Flow = 0.08 L/s  
 Harmon Peaking Factor = 3.87 \*Min PF = 2 , Max PF = 4  
**Peak Institutional Design Flow = 0.31 L/s** =Average Daily Flow \* Peaking Factor

### Inflow and Infiltration

Average Inflow per Hectare = 0.25 L/s/ha  
 Site Area = 0.326 ha  
**Total Infiltration Flow = 0.08 L/s**

	Design Guideline*	Peak Residential Flow (L/s)	Peak Infiltration Flow (L/s)	Peak Design Flow (L/s)
<b>Residential</b>	City of Guelph	0.06	0.00	0.06
<b>Institutional</b>		0.31	0.08	0.40
			<b>Total</b>	<b>0.45</b>

\*Sanitary design flow calculations complete with reference to the City of Guelph Development Engineering Manual (October 2023), Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services (January 2025) and the Ontario Building Code (2024)

Project No: 32948-23  
 Project Name: 81 College Avenue West  
 Project Location: City of Guelph  
 Date: 2025-02-03  
 Update: 2025-07-08



## Water Design Flow Calculation

### Site Characteristics

Site Area = 0.326 ha

### **Notes:**

\*Per Site Plan

### **Residential**

Number of Units = 1 units

Population per Unit = 3.4 ppu

Site Population = 4 people

\*Per Guelph DEM Single Detached

### **Chabad (Institutional)**

Floor area = 548 m2

Population per m2 = 0.7 ppsqm

Population = 783 people

\*GFA Per Site Plan

\*Per OBC Table 3.1.17.1 for Group A-2 - Assembly Occupancy, Religious Facility

### Residential Design Flow

Average Daily Water Flow = 300 L/cap/day

Site Population = 4 people

**Site Average Daily Flow = 0.01 L/s**

MOE Max. Day Peak Factor = 9.50

MOE Peak Hour Factor = 14.30

**Peak Max. Day Design Flow = 0.13 L/s**

**Peak Hour Design Flow = 0.20 L/s**

=sanitary demand design flow

\*Per MOE Design Guidelines (2008)

=Average Daily Flow \* Max Day PF

=Average Daily Flow \* Max Hour PF

### Institutional Design Flow

Average Daily Water Flow = 0.25 L/s/ha

**Site Average Daily Flow = 0.08 L/s**

MOE Max. Day Peak Factor = 2.75

MOE Peak Hour Factor = 4.13

**Peak Max. Day Design Flow = 0.22 L/s**

**Peak Hour Design Flow = 0.34 L/s**

\*Per Region of Waterloo DGSSMS

\*Per MOE Design Guidelines (2008)

=Average Daily Flow \* Max Day PF

=Average Daily Flow \* Max Hour PF

Design Guideline	Design Guideline*	Average Daily Flow (L/s)	Max. Day Flow (L/s)	Peak Hour Design Flow (L/s)
Residential	City of Guelph	0.01	0.13	0.20
Institutional		0.08	0.22	0.34
	<b>Total</b>	<b>0.10</b>	<b>0.36</b>	<b>0.53</b>

\*Sanitary design flow calculations complete with reference to the City of Guelph Development Engineering Manual (October 2023), Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services (January 2025), MOE Drinking Water Systems 2008, and the Ontario Building Code (2024)

## 100mm dia. Service

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

---

Input Data	
Roughness Coefficient	0.013
Channel Slope	2.000 %
Normal Depth	100.0 mm
Diameter	100.0 mm
Discharge	7.31 L/s

---

Results	
Discharge	7.31 L/s
Normal Depth	100.0 mm
Flow Area	0.0 m <sup>2</sup>
Wetted Perimeter	0.3 m
Hydraulic Radius	25.0 mm
Top Width	0.00 m
Critical Depth	86.4 mm
Percent Full	100.0 %
Critical Slope	1.842 %
Velocity	0.93 m/s
Velocity Head	0.04 m
Specific Energy	0.14 m
Froude Number	(N/A)
Maximum Discharge	7.86 L/s
Discharge Full	7.31 L/s
Slope Full	2.000 %
Flow Type	Undefined

---

GVF Input Data	
Downstream Depth	0.0 mm
Length	0.0 m
Number Of Steps	0

---

GVF Output Data	
Upstream Depth	0.0 mm
Profile Description	N/A
Profile Headloss	0.00 m
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity m/s
Upstream Velocity	Infinity m/s
Normal Depth	100.0 mm
Critical Depth	86.4 mm
Channel Slope	2.000 %
Critical Slope	1.842 %

Project No: 32948-23  
 Project Name: 81 College Avenue West  
 Project Location: City of Guelph  
 Date: 2025-02-03  
 Update: 2025-07-08



## Water Supply for Fire Protection - Fire Underwriters Survey 2020

### Required Fire Flow (RFF)

Equation:  $RFF = 220 * C * \sqrt{A}$

RFF = Required Fire Flow (LPM)

C = Construction Coefficient

A = Effective Floor Area (m<sup>2</sup>)

Construction Coefficient = 1.0  
 Total Effective Floor Area = 1,523 m<sup>2</sup>  
 Required Fire Flow = 9,000 LPM

\*Construction Type III - Ordinary Construction

\*Per Site Plan

### Occupancy and Contents Adjustment Factor

Description of Major Occupancy = Assembly (A2)  
 Occupancy and Contents Adjustment Factor = 0%  
 Occupancy Reduction/Increase = 0 LPM  
 Occupancy Adjusted Required Fire Flow = 9,000 LPM

### Automatic Sprinkler Protection

Automatic Sprinkler System Design	With Complete Building Coverage	With Partial Building Coverage
Automatic sprinkler protection (NFPA 13)	30%	30% * Percent of Floor Area Sprinklered
Water Supply is Standard	10%	10% * Percent of Floor Area Sprinklered
Fully Supervised	10%	10% * Percent of Floor Area Sprinklered

Sprinkler Adjustment Factor = 50%  
 Automatic Sprinkler Reduction = 4,500 LPM

Project No: 32948-23  
 Project Name: 81 College Avenue West  
 Project Location: City of Guelph  
 Date: 2025-02-03  
 Update: 2025-07-08



## Water Supply for Fire Protection - Fire Underwriters Survey 2020

### Exposure Adjustment Charge

Separation Distance (m)	Maximum Exposure Adjustment Charge
0 m to 3 m	25%
3.1 m to 10 m	20%
10.1 m to 20 m	15%
20.1 m to 30 m	10%
> 30 m	0%

Exposure Direction	Structure	Exposure Distance (m)	Exposure Adjustment Charge
North	-	>30	0%
East	Residential	12	15%
South	-	>30	0%
West	Residential	21	10%

Exposure Adjustment Charge = 25%  
 Exposure Adjustment Charge = 2,250 LPM

### Fire Flow Summary

Required Fire Flow = 9,000 LPM  
 Occupancy Adjusted Fire Flow = 9,000 LPM  
 Automatic Sprinkler Reduction = 4,500 LPM  
 Exposure Adjustment Charge = 2,250 LPM

**Calculated Fire Flow = 7,000 LPM      117 LPS**  
**Required Duration = 2.0 hr**

**APPENDIX C**  
**STORMWATER MANAGEMENT CALCULATIONS**

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-05  
 Update: 2025-12-10



## MIDUSS PARAMETERS

### Horton Parameters

	Impervious Areas	Pervious Areas
Maximum Infiltration (mm/hr)*	0.0	34.0
Minimum Infiltration (mm/hr)*	0.0	9.0
Lag Constant (hr)	0.00	0.50
Depression Storage (mm)	1.5	5.0

\*Infiltration Rates (safety factor inclusive) per Geotechnical Investigation and Hydrogeological Assessment prepared by Stoncairn Consulting

### IDF Parameters

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
A	475.61	632.75	721.92	822.74	893.80	953.29
B	0	0	0	0	0	0
C	0.738	0.741	0.736	0.725	0.719	0.711
R	0.4	0.4	0.4	0.4	0.4	0.4
Duration (min)	240	240	240	240	240	240
Total Depth (mm)	33.321	43.607	51.134	61.897	69.491	77.438

\*IDF Parameters per Table 5-2 of the City of Guelph Development Engineering Manual (October 2023)

### Catchment Parameters - Pre-Development

Catchment ID	Outlet	Catchment Area <i>sq.m.</i>	Catchment Length <i>m</i>	Slope <i>%</i>	Impervious Area <i>sq.m.</i>	% Impervious
101	College Ave. ROW	1,837	42	3.9%	470	25.6%
102	Rear	1,422	44	3.6%	177	12.4%
EXT1	College Ave. ROW	354	7	1.0%	94	26.6%
TOTAL		3,613			741	20.5%

\*Pre-Development Catchment Parameters per Topographic Survey complete by Van Harten.

### Catchment Parameters - Post-Development

Catchment ID	Outlet	Catchment Area <i>sq.m.</i>	Catchment Length <i>m</i>	Slope <i>%</i>	Impervious Area <i>sq.m.</i>	% Impervious <i>%</i>
201	Soakaway	1,183	40	3.0%	879	74.3%
202	College Ave. Sewer	1,200	40	2.0%	1,001	83.4%
203	Pavers/Rear	337	20	2.5%	337	100.0%
UC1	College Ave. ROW	147	15	4.0%	0	0.0%
UC2	Rear	392	40	1.0%	0	0.0%
EXT1	College Ave. Sewer	354	7	1.0%	94	26.6%
TOTAL		3,613			2,311	64.0%

\*Post-Development Catchment Parameters per Grading Plan complete by Van Harten.

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-05  
 Update: 2025-02-06



**Underground Storage Stage-Storage - Open Bottom Chamber**

Tank Invert = 324.00 m  
 Tank Obvert = 324.65 m  
 Porosity = 0.89  
 Surface Area = 120 m<sup>2</sup>

Elevation (m)	Depth (m)	Volume (m <sup>3</sup> )	Cumulative Volume (m <sup>3</sup> )
324.00	0.00	0.00	0.00
324.10	0.10	10.68	10.68
324.20	0.20	10.68	21.36
324.30	0.30	10.68	32.04
324.40	0.40	10.68	42.72
324.50	0.50	10.68	53.40
324.65	0.65	16.02	69.42

**Underground Storage Drawdown Calculation**

$$A = \frac{1,000V}{Pn\Delta t}$$

Bottom area of trench (m <sup>2</sup> )	120
Reservoir Depth (m)	0.65
Volume to be Infiltrated (m <sup>3</sup> )	69.42
Infiltration Rate (mm/hr)	12
Porosity of storage media	0.89
Retention time (hours)	<b>54.2</b>

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-05  
 Update: 2025-02-06



**Underground Storage Stage-Storage - Impervious Chamber**

Tank Invert = 324.00 m  
 Tank Obvert = 324.65 m  
 Porosity = 0.89  
 Surface Area = 75 m<sup>2</sup>

Elevation (m)	Depth (m)	Volume (m <sup>3</sup> )	Cumulative Volume (m <sup>3</sup> )
324.00	0.00	0.00	0.00
324.10	0.10	6.68	6.68
324.20	0.20	6.68	13.35
324.30	0.30	6.68	20.03
324.40	0.40	6.68	26.70
324.50	0.50	6.68	33.38
324.65	0.65	10.01	43.39

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-05  
 Update: 2025-02-06



**Pavers Subgrade Stage-Storage**

Surface Elevation = 327.04 m  
 Porosity = 0.4 m  
 Surface Area = 337 m<sup>2</sup>

Elevation (m)	Depth (m)	Volume (m <sup>3</sup> )	Cumulative Volume (m <sup>3</sup> )
326.53	0.00	0.00	0.00
326.58	0.05	6.74	6.74
326.63	0.10	6.74	13.48
326.68	0.15	6.74	20.22
326.73	0.20	6.74	26.96
326.78	0.25	6.74	33.70
326.83	0.30	6.74	40.44
326.88	0.35	6.74	47.18
326.93	0.40	6.74	53.92
326.94	0.41	0.00	53.92
326.99	0.46	0.00	53.92
327.04	0.51	0.00	53.92

\*Only stone reservoir and granular base course volume utilized for storage purposes in MIDUSS modelling. Elevation 327.04 to 326.93 is comprised of pavers and bedding course.

**Pavers Drawdown Calculation**

$$A = \frac{1,000V}{Pn\Delta t}$$

Bottom area of pavers (m <sup>2</sup> )	337
Reservoir Depth (m)	0.40
Volume to be Infiltrated (m <sup>3</sup> )	53.92
Infiltration Rate (mm/hr)	12
Porosity of storage media	0.4
Retention time (hours)	<b>33.3</b>

```

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"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
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"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
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"          Licensee name:                     Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:             2025-12-10 at 8:42:13 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
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"          Total depth                          33.321  mm"
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"          25.600 % Impervious"
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"          3.900 Overland Slope"
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"          0.047 Impervious Area"
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"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"

```

```

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"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.016  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137    0.047    0.184    hectare"
"      Time of concentration  14.125  1.930    6.187    minutes"
"      Time to Centroid      112.240  116.948  115.304  minutes"
"      Rainfall depth      33.321  33.321  33.321  mm"
"      Rainfall volume      45.61   15.70   61.31   c.m"
"      Rainfall losses      27.515  1.863   20.948  mm"
"      Runoff depth         5.805   31.458  12.372  mm"
"      Runoff volume        7.95    14.82   22.77   c.m"
"      Runoff coefficient    0.174   0.944   0.371   "
"      Maximum flow         0.008   0.014   0.016   c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.016  0.016  0.000  0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.016  0.016  0.016  0.000"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"              0.016  0.016  0.016  0.000"
" 33      CATCHMENT 1"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          1  Catchment EXT1"
"      26.600  % Impervious"
"          0.035  Total Area"
"          7.000  Flow length"
"          1.000  Overland Slope"
"          0.026  Pervious Area"
"          7.000  Pervious length"
"          1.000  Pervious slope"
"          0.009  Impervious Area"
"          7.000  Impervious length"
"          1.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.004      0.016      0.016      0.000 c.m/sec"
"      Catchment 1          Pervious  Impervious Total Area  "
"      Surface Area          0.026      0.009      0.035      hectare"
"      Time of concentration  7.251      0.991      3.125      minutes"
"      Time to Centroid      106.758    115.434    112.477    minutes"
"      Rainfall depth        33.321    33.321    33.321     mm"
"      Rainfall volume       8.66      3.14      11.80      c.m"
"      Rainfall losses       27.591    2.748     20.982     mm"
"      Runoff depth          5.730     30.573    12.338     mm"
"      Runoff volume         1.49      2.88      4.37       c.m"
"      Runoff coefficient    0.172     0.918     0.370      "
"      Maximum flow         0.002     0.003     0.004      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.004      0.020      0.016      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"          0.004      0.020      0.020      0.000"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"          0.004      0.000      0.020      0.000"
" 33      CATCHMENT 102"
"      1      Triangular SCS"
"      1      Equal length"
"      2      Horton equation"
"      102    No description"
"      12.400  % Impervious"
"      0.142  Total Area"
"      44.000  Flow length"
"      3.600  Overland Slope"
"      0.124  Pervious Area"
"      44.000  Pervious length"
"      3.600  Pervious slope"
"      0.018  Impervious Area"
"      44.000  Impervious length"
"      3.600  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.008      0.000      0.020      0.000 c.m/sec"
"      Catchment 102          Pervious  Impervious Total Area  "
"      Surface Area          0.124     0.018     0.142     hectare"

```

"	Time of concentration	14.878	2.033	9.296	minutes"
"	Time to Centroid	112.870	117.120	114.717	minutes"
"	Rainfall depth	33.321	33.321	33.321	mm"
"	Rainfall volume	41.45	5.87	47.32	c.m"
"	Rainfall losses	27.512	1.787	24.322	mm"
"	Runoff depth	5.809	31.534	8.999	mm"
"	Runoff volume	7.23	5.55	12.78	c.m"
"	Runoff coefficient	0.174	0.946	0.270	"
"	Maximum flow	0.007	0.005	0.008	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.057	hectare"
"	Total % impervious			25.761"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    PRE-5.out"
"          Licensee name:                     Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:            2025-12-10 at 8:52:04 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          632.750 Coefficient A"
"          0.000  Constant B"
"          0.741  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    188.288  mm/hr"
"          Total depth                          43.607  mm"
"          6  005hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          101 Catchment 101"
"          25.600 % Impervious"
"          0.184 Total Area"
"          42.000 Flow length"
"          3.900 Overland Slope"
"          0.137 Pervious Area"
"          42.000 Pervious length"
"          3.900 Pervious slope"
"          0.047 Impervious Area"
"          42.000 Impervious length"
"          3.900 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"

```

```

"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.026  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137    0.047    0.184    hectare"
"      Time of concentration  10.954  1.725    5.865    minutes"
"      Time to Centroid      110.707  115.724  113.473  minutes"
"      Rainfall depth      43.607  43.607  43.607  mm"
"      Rainfall volume      59.70   20.54   80.24   c.m"
"      Rainfall losses      31.981  2.075   24.325  mm"
"      Runoff depth         11.626  41.532  19.282  mm"
"      Runoff volume        15.92   19.56   35.48   c.m"
"      Runoff coefficient    0.267   0.952   0.442   "
"      Maximum flow         0.016   0.019   0.026   c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.026  0.026  0.000  0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.026  0.026  0.026  0.000"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"              0.026  0.026  0.026  0.000"
" 33      CATCHMENT 1"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          1  Catchment EXT1"
"      26.600  % Impervious"
"          0.035  Total Area"
"          7.000  Flow length"
"          1.000  Overland Slope"
"          0.026  Pervious Area"
"          7.000  Pervious length"
"          1.000  Pervious slope"
"          0.009  Impervious Area"
"          7.000  Impervious length"
"          1.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.006	0.026	0.026	0.000	c.m/sec"
"		Catchment 1	Pervious	Impervious	Total Area	"
"		Surface Area	0.026	0.009	0.035	hectare"
"		Time of concentration	5.623	0.886	2.990	minutes"
"		Time to Centroid	106.124	114.212	110.620	minutes"
"		Rainfall depth	43.607	43.607	43.607	mm"
"		Rainfall volume	11.20	4.06	15.26	c.m"
"		Rainfall losses	31.989	3.480	24.406	mm"
"		Runoff depth	11.618	40.127	19.201	mm"
"		Runoff volume	2.98	3.74	6.72	c.m"
"		Runoff coefficient	0.266	0.920	0.440	"
"		Maximum flow	0.005	0.004	0.006	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.006	0.032	0.026	0.000"	
" 40		HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"				
"		0.006	0.032	0.032	0.000"	
" 40		HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"				
"		0.006	0.000	0.032	0.000"	
" 33		CATCHMENT 102"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	102	No description"				
"	12.400	% Impervious"				
"	0.142	Total Area"				
"	44.000	Flow length"				
"	3.600	Overland Slope"				
"	0.124	Pervious Area"				
"	44.000	Pervious length"				
"	3.600	Pervious slope"				
"	0.018	Impervious Area"				
"	44.000	Impervious length"				
"	3.600	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	34.000	Pervious Max.infiltration"				
"	9.000	Pervious Min.infiltration"				
"	0.500	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.018	0.000	0.032	0.000	c.m/sec"
"		Catchment 102	Pervious	Impervious	Total Area	"
"		Surface Area	0.124	0.018	0.142	hectare"

"	Time of concentration	11.538	1.817	8.274	minutes"
"	Time to Centroid	111.244	115.858	112.793	minutes"
"	Rainfall depth	43.607	43.607	43.607	mm"
"	Rainfall volume	54.24	7.68	61.92	c.m"
"	Rainfall losses	31.959	2.007	28.245	mm"
"	Runoff depth	11.648	41.600	15.362	mm"
"	Runoff volume	14.49	7.32	21.81	c.m"
"	Runoff coefficient	0.267	0.954	0.352	"
"	Maximum flow	0.014	0.007	0.018	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.056	hectare"
"	Total % impervious			25.760"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                         C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    PRE-10.out"
"          Licensee name:                      Brett Pond"
"          Company                             Vanharten Surveying"
"          Date & Time last used:             2025-12-10 at 8:54:38 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          721.920 Coefficient A"
"          0.000  Constant B"
"          0.736  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    216.508  mm/hr"
"          Total depth                          51.134  mm"
"          6  010hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          101  Catchment 101"
"          25.600  % Impervious"
"          0.184  Total Area"
"          42.000  Flow length"
"          3.900  Overland Slope"
"          0.137  Pervious Area"
"          42.000  Pervious length"
"          3.900  Pervious slope"
"          0.047  Impervious Area"
"          42.000  Impervious length"
"          3.900  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"

```

```

"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.035  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137  0.047  0.184  hectare"
"      Time of concentration  9.856  1.631  5.600  minutes"
"      Time to Centroid      110.813  115.278  113.124  minutes"
"      Rainfall depth      51.134  51.134  51.134  mm"
"      Rainfall volume      70.00  24.09  94.09  c.m"
"      Rainfall losses      35.443  2.227  26.939  mm"
"      Runoff depth      15.692  48.908  24.195  mm"
"      Runoff volume      21.48  23.04  44.52  c.m"
"      Runoff coefficient  0.307  0.956  0.473  "
"      Maximum flow      0.024  0.022  0.035  c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.035  0.035  0.000  0.000"
" 40  HYDROGRAPH Copy to Outflow"
"      8  Copy to Outflow"
"          0.035  0.035  0.035  0.000"
" 40  HYDROGRAPH Next link "
"      5  Next link "
"          0.035  0.035  0.035  0.000"
" 33  CATCHMENT 1"
"      1  Triangular SCS"
"      1  Equal length"
"      2  Horton equation"
"      1  Catchment EXT1"
"      26.600  % Impervious"
"      0.035  Total Area"
"      7.000  Flow length"
"      1.000  Overland Slope"
"      0.026  Pervious Area"
"      7.000  Pervious length"
"      1.000  Pervious slope"
"      0.009  Impervious Area"
"      7.000  Impervious length"
"      1.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.008	0.035	0.035	0.000	c.m/sec"
"		Catchment 1	Pervious	Impervious	Total Area	"
"		Surface Area	0.026	0.009	0.035	hectare"
"		Time of concentration	5.060	0.837	2.876	minutes"
"		Time to Centroid	106.452	113.758	110.232	minutes"
"		Rainfall depth	51.134	51.134	51.134	mm"
"		Rainfall volume	13.14	4.76	17.90	c.m"
"		Rainfall losses	35.196	3.996	26.897	mm"
"		Runoff depth	15.938	47.139	24.238	mm"
"		Runoff volume	4.09	4.39	8.48	c.m"
"		Runoff coefficient	0.312	0.922	0.474	"
"		Maximum flow	0.006	0.005	0.008	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.008	0.043	0.035	0.000"	
" 40		HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"				
"		0.008	0.043	0.043	0.000"	
" 40		HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"				
"		0.008	0.000	0.043	0.000"	
" 33		CATCHMENT 102"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	102	No description"				
"	12.400	% Impervious"				
"	0.142	Total Area"				
"	44.000	Flow length"				
"	3.600	Overland Slope"				
"	0.124	Pervious Area"				
"	44.000	Pervious length"				
"	3.600	Pervious slope"				
"	0.018	Impervious Area"				
"	44.000	Impervious length"				
"	3.600	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	34.000	Pervious Max.infiltration"				
"	9.000	Pervious Min.infiltration"				
"	0.500	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.025	0.000	0.043	0.000	c.m/sec"
"		Catchment 102	Pervious	Impervious	Total Area	"
"		Surface Area	0.124	0.018	0.142	hectare"

"	Time of concentration	10.382	1.718	7.743	minutes"
"	Time to Centroid	111.386	115.441	112.621	minutes"
"	Rainfall depth	51.134	51.134	51.134	mm"
"	Rainfall volume	63.61	9.00	72.61	c.m"
"	Rainfall losses	35.308	2.173	31.200	mm"
"	Runoff depth	15.826	48.962	19.935	mm"
"	Runoff volume	19.69	8.62	28.31	c.m"
"	Runoff coefficient	0.309	0.958	0.390	"
"	Maximum flow	0.020	0.008	0.025	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.056	hectare"
"	Total % impervious			25.760"	
" 19	EXIT"				

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"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                         C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    PRE-25.out"
"          Licensee name:                     Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:             2025-12-10 at 8:56:49 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          822.740 Coefficient A"
"          0.000  Constant B"
"          0.725  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    251.029  mm/hr"
"          Total depth                          61.897  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          101  Catchment 101"
"          25.600  % Impervious"
"          0.184  Total Area"
"          42.000  Flow length"
"          3.900  Overland Slope"
"          0.137  Pervious Area"
"          42.000  Pervious length"
"          3.900  Pervious slope"
"          0.047  Impervious Area"
"          42.000  Impervious length"
"          3.900  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"

```

```

"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.048  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137      0.047      0.184      hectare"
"      Time of concentration  8.796      1.537      5.363      minutes"
"      Time to Centroid      112.028      114.914      113.393      minutes"
"      Rainfall depth      61.897      61.897      61.897      mm"
"      Rainfall volume      84.73      29.16      113.89      c.m"
"      Rainfall losses      39.136      2.552      29.771      mm"
"      Runoff depth      22.761      59.345      32.126      mm"
"      Runoff volume      31.16      27.95      59.11      c.m"
"      Runoff coefficient      0.368      0.959      0.519      "
"      Maximum flow      0.035      0.026      0.048      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.048  0.048  0.000  0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"          0.048  0.048  0.048  0.000"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.048  0.048  0.048  0.000"
" 33      CATCHMENT 1"
"      1      Triangular SCS"
"      1      Equal length"
"      2      Horton equation"
"      1      Catchment EXT1"
"      26.600  % Impervious"
"      0.035  Total Area"
"      7.000  Flow length"
"      1.000  Overland Slope"
"      0.026  Pervious Area"
"      7.000  Pervious length"
"      1.000  Pervious slope"
"      0.009  Impervious Area"
"      7.000  Impervious length"
"      1.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.011	0.048	0.048	0.000	c.m/sec"
"		Catchment 1	Pervious	Impervious	Total Area	"
"		Surface Area	0.026	0.009	0.035	hectare"
"		Time of concentration	4.515	0.789	2.732	minutes"
"		Time to Centroid	107.472	113.437	110.327	minutes"
"		Rainfall depth	61.897	61.897	61.897	mm"
"		Rainfall volume	15.90	5.76	21.66	c.m"
"		Rainfall losses	39.301	4.658	30.086	mm"
"		Runoff depth	22.595	57.239	31.811	mm"
"		Runoff volume	5.80	5.33	11.13	c.m"
"		Runoff coefficient	0.365	0.925	0.514	"
"		Maximum flow	0.008	0.005	0.011	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.011	0.058	0.048	0.000"	
" 40		HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"				
"		0.011	0.058	0.058	0.000"	
" 40		HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"				
"		0.011	0.000	0.058	0.000"	
" 33		CATCHMENT 102"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	102	No description"				
"	12.400	% Impervious"				
"	0.142	Total Area"				
"	44.000	Flow length"				
"	3.600	Overland Slope"				
"	0.124	Pervious Area"				
"	44.000	Pervious length"				
"	3.600	Pervious slope"				
"	0.018	Impervious Area"				
"	44.000	Impervious length"				
"	3.600	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	34.000	Pervious Max.infiltration"				
"	9.000	Pervious Min.infiltration"				
"	0.500	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.035	0.000	0.058	0.000	c.m/sec"
"		Catchment 102	Pervious	Impervious	Total Area	"
"		Surface Area	0.124	0.018	0.142	hectare"

"	Time of concentration	9.264	1.619	7.193	minutes"
"	Time to Centroid	112.484	115.101	113.193	minutes"
"	Rainfall depth	61.897	61.897	61.897	mm"
"	Rainfall volume	76.99	10.90	87.89	c.m"
"	Rainfall losses	39.244	2.416	34.677	mm"
"	Runoff depth	22.653	59.481	27.220	mm"
"	Runoff volume	28.18	10.47	38.65	c.m"
"	Runoff coefficient	0.366	0.961	0.440	"
"	Maximum flow	0.030	0.009	0.035	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.056	hectare"
"	Total % impervious			25.760"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    PRE-50.out"
"          Licensee name:                      Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 8:59:07 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          893.800 Coefficient A"
"          0.000  Constant B"
"          0.719  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    275.287  mm/hr"
"          Total depth                          69.491  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          101  Catchment 101"
"          25.600  % Impervious"
"          0.184  Total Area"
"          42.000  Flow length"
"          3.900  Overland Slope"
"          0.137  Pervious Area"
"          42.000  Pervious length"
"          3.900  Pervious slope"
"          0.047  Impervious Area"
"          42.000  Impervious length"
"          3.900  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"

```

```

"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.064  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137      0.047      0.184      hectare"
"      Time of concentration  8.235      1.482      5.201      minutes"
"      Time to Centroid      113.320      114.689      113.935      minutes"
"      Rainfall depth      69.491      69.491      69.491      mm"
"      Rainfall volume      95.13      32.73      127.86      c.m"
"      Rainfall losses      41.372      2.809      31.500      mm"
"      Runoff depth      28.118      66.682      37.991      mm"
"      Runoff volume      38.49      31.41      69.90      c.m"
"      Runoff coefficient      0.405      0.960      0.547      "
"      Maximum flow      0.050      0.028      0.064      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.064  0.064  0.000  0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"          0.064  0.064  0.064  0.000"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.064  0.064  0.064  0.000"
" 33      CATCHMENT 1"
"      1      Triangular SCS"
"      1      Equal length"
"      2      Horton equation"
"      1      Catchment EXT1"
"      26.600  % Impervious"
"      0.035  Total Area"
"      7.000  Flow length"
"      1.000  Overland Slope"
"      0.026  Pervious Area"
"      7.000  Pervious length"
"      1.000  Pervious slope"
"      0.009  Impervious Area"
"      7.000  Impervious length"
"      1.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.013      0.064      0.064      0.000 c.m/sec"
"      Catchment 1          Pervious  Impervious Total Area  "
"      Surface Area          0.026      0.009      0.035      hectare"
"      Time of concentration  4.228      0.761      2.639      minutes"
"      Time to Centroid      108.429    113.275    110.649    minutes"
"      Rainfall depth        69.491    69.491    69.491    mm"
"      Rainfall volume       17.85     6.47      24.32     c.m"
"      Rainfall losses       41.876    5.069     32.085    mm"
"      Runoff depth          27.615    64.422    37.406    mm"
"      Runoff volume         7.09     6.00      13.09     c.m"
"      Runoff coefficient     0.397     0.927     0.538     "
"      Maximum flow          0.010     0.006     0.013     c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4  Add Runoff  "
"          0.013      0.075      0.064      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8  Copy to Outflow"
"          0.013      0.075      0.075      0.000"
" 40      HYDROGRAPH Start - New Tributary"
"      2  Start - New Tributary"
"          0.013      0.000      0.075      0.000"
" 33      CATCHMENT 102"
"      1  Triangular SCS"
"      1  Equal length"
"      2  Horton equation"
"      102 No description"
"      12.400 % Impervious"
"      0.142 Total Area"
"      44.000 Flow length"
"      3.600 Overland Slope"
"      0.124 Pervious Area"
"      44.000 Pervious length"
"      3.600 Pervious slope"
"      0.018 Impervious Area"
"      44.000 Impervious length"
"      3.600 Impervious slope"
"      0.250 Pervious Manning 'n'"
"      34.000 Pervious Max.infiltration"
"      9.000 Pervious Min.infiltration"
"      0.500 Pervious Lag constant (hours)"
"      5.000 Pervious Depression storage"
"      0.015 Impervious Manning 'n'"
"      0.000 Impervious Max.infiltration"
"      0.000 Impervious Min.infiltration"
"      0.001 Impervious Lag constant (hours)"
"      1.500 Impervious Depression storage"
"          0.043      0.000      0.075      0.000 c.m/sec"
"      Catchment 102          Pervious  Impervious Total Area  "
"      Surface Area          0.124     0.018     0.142     hectare"

```

"	Time of concentration	8.674	1.561	6.882	minutes"
"	Time to Centroid	113.558	114.872	113.889	minutes"
"	Rainfall depth	69.491	69.491	69.491	mm"
"	Rainfall volume	86.44	12.24	98.68	c.m"
"	Rainfall losses	41.397	2.654	36.593	mm"
"	Runoff depth	28.094	66.837	32.898	mm"
"	Runoff volume	34.95	11.77	46.72	c.m"
"	Runoff coefficient	0.404	0.962	0.473	"
"	Maximum flow	0.038	0.010	0.043	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.056	hectare"
"	Total % impervious			25.760"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                     PRE-100.out"
"          Licensee name:                       Brett Pond"
"          Company                             Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 9:02:33 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          180.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          953.290 Coefficient A"
"          0.000  Constant B"
"          0.711  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    297.317  mm/hr"
"          Total depth                          77.438  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          101  Catchment 101"
"          25.600  % Impervious"
"          0.184  Total Area"
"          42.000  Flow length"
"          3.900  Overland Slope"
"          0.137  Pervious Area"
"          42.000  Pervious length"
"          3.900  Pervious slope"
"          0.047  Impervious Area"
"          42.000  Impervious length"
"          3.900  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"

```

```

"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.071  0.000  0.000  0.000 c.m/sec"
"      Catchment 101      Pervious  Impervious  Total Area  "
"      Surface Area      0.137      0.047      0.184      hectare"
"      Time of concentration  7.924      1.437      5.134      minutes"
"      Time to Centroid      114.988      114.594      114.818      minutes"
"      Rainfall depth      77.438      77.438      77.438      mm"
"      Rainfall volume      106.01      36.48      142.49      c.m"
"      Rainfall losses      43.497      3.001      33.130      mm"
"      Runoff depth      33.941      74.437      44.308      mm"
"      Runoff volume      46.46      35.06      81.53      c.m"
"      Runoff coefficient      0.438      0.961      0.572      "
"      Maximum flow      0.056      0.031      0.071      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.071  0.071  0.000  0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"          0.071  0.071  0.071  0.000"
" 40      HYDROGRAPH Next link  "
"      5      Next link  "
"          0.071  0.071  0.071  0.000"
" 33      CATCHMENT 1"
"      1      Triangular SCS"
"      1      Equal length"
"      2      Horton equation"
"      1      Catchment EXT1"
"      26.600  % Impervious"
"      0.035  Total Area"
"      7.000  Flow length"
"      1.000  Overland Slope"
"      0.026  Pervious Area"
"      7.000  Pervious length"
"      1.000  Pervious slope"
"      0.009  Impervious Area"
"      7.000  Impervious length"
"      1.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.015      0.071      0.071      0.000 c.m/sec"
"      Catchment 1          Pervious  Impervious Total Area  "
"      Surface Area          0.026      0.009      0.035      hectare"
"      Time of concentration  4.068      0.738      2.603      minutes"
"      Time to Centroid      109.847    113.331    111.379    minutes"
"      Rainfall depth        77.438    77.438    77.438    mm"
"      Rainfall volume        19.89      7.21      27.10      c.m"
"      Rainfall losses        44.198    5.436    33.887    mm"
"      Runoff depth           33.241    72.002    43.551    mm"
"      Runoff volume          8.54      6.70      15.24      c.m"
"      Runoff coefficient      0.429      0.930      0.562      "
"      Maximum flow           0.011      0.007      0.015      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.015      0.084      0.071      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"          0.015      0.084      0.084      0.000"
" 40      HYDROGRAPH Start - New Tributary"
"      2      Start - New Tributary"
"          0.015      0.000      0.084      0.000"
" 33      CATCHMENT 102"
"      1      Triangular SCS"
"      1      Equal length"
"      2      Horton equation"
"      102    No description"
"      12.400 % Impervious"
"      0.142  Total Area"
"      44.000 Flow length"
"      3.600  Overland Slope"
"      0.124  Pervious Area"
"      44.000 Pervious length"
"      3.600  Pervious slope"
"      0.018  Impervious Area"
"      44.000 Impervious length"
"      3.600  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000 Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.049      0.000      0.084      0.000 c.m/sec"
"      Catchment 102          Pervious  Impervious Total Area  "
"      Surface Area          0.124      0.018      0.142      hectare"

```

"	Time of concentration	8.346	1.513	6.728	minutes"
"	Time to Centroid	115.318	114.754	115.185	minutes"
"	Rainfall depth	77.438	77.438	77.438	mm"
"	Rainfall volume	96.33	13.64	109.96	c.m"
"	Rainfall losses	43.454	2.920	38.428	mm"
"	Runoff depth	33.984	74.519	39.010	mm"
"	Runoff volume	42.27	13.12	55.39	c.m"
"	Runoff coefficient	0.439	0.962	0.504	"
"	Maximum flow	0.044	0.011	0.049	c.m/sec"
" 38	START/RE-START TOTALS 102"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			0.219	hectare"
"	Total Impervious area			0.056	hectare"
"	Total % impervious			25.760"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                     POST-2YR.out"
"          Licensee name:                       Brett Pond"
"          Company                             Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 11:29:05 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          475.610 Coefficient A"
"          0.000  Constant B"
"          0.738  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    142.193  mm/hr"
"          Total depth                          33.321  mm"
"          4  2hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 203"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          203  Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.011      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious      Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 10.342      1.413      1.413      minutes"
"      Time to Centroid      109.039      115.993      115.993      minutes"
"      Rainfall depth      33.321      33.321      33.321      mm"
"      Rainfall volume      0.00      11.33      11.33      c.m"
"      Rainfall losses      27.563      2.165      2.165      mm"
"      Runoff depth      5.758      31.156      31.156      mm"
"      Runoff volume      0.00      10.59      10.59      c.m"
"      Runoff coefficient      0.000      0.935      0.935      "
"      Maximum flow      0.000      0.011      0.011      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.011      0.011      0.000      0.000"
" 54      POND DESIGN"
"      0.011      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      10.6      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.582      metre"
"      Maximum storage      7.079      c.m"
"      Centroidal lag      13.305      hours"
"          0.011      0.011      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.011      0.000      0.000      0.000"
" 33      CATCHMENT 2"

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"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"    0.010  % Impervious"
"    0.039  Total Area"
"   40.000  Flow length"
"    1.000  Overland Slope"
"    0.039  Pervious Area"
"   40.000  Pervious length"
"    1.000  Pervious slope"
"    0.000  Impervious Area"
"   40.000  Impervious length"
"    1.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"   34.000  Pervious Max.infiltration"
"    9.000  Pervious Min.infiltration"
"    0.500  Pervious Lag constant (hours)"
"    5.000  Pervious Depression storage"
"    0.015  Impervious Manning 'n'"
"    0.000  Impervious Max.infiltration"
"    0.000  Impervious Min.infiltration"
"    0.001  Impervious Lag constant (hours)"
"    1.500  Impervious Depression storage"
"          0.002    0.000    0.000    0.000 c.m/sec"
"          Catchment 2          Pervious  Impervious Total Area "
"          Surface Area          0.039    0.000    0.039    hectare"
"          Time of concentration  20.634    2.819    20.625    minutes"
"          Time to Centroid      117.489   118.597   117.490   minutes"
"          Rainfall depth        33.321    33.321    33.321    mm"
"          Rainfall volume        12.99     0.00     13.00     c.m"
"          Rainfall losses        27.510    1.834    27.508    mm"
"          Runoff depth           5.810    31.487    5.813    mm"
"          Runoff volume           2.27     0.00     2.27     c.m"
"          Runoff coefficient      0.174    0.945    0.174    "
"          Maximum flow           0.002    0.000    0.002    c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.002    0.002    0.000    0.000"
" 40          HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"          0.002    0.002    0.002    0.000"
" 40          HYDROGRAPH  Combine  99"
"          6  Combine "
"          99  Node #"
"          Rear Flows"
"          Maximum flow           0.002    c.m/sec"
"          Hydrograph volume       3.120    c.m"
"          0.002    0.002    0.002    0.002"
" 40          HYDROGRAPH Start - New Tributary"

```

```

"          2  Start - New Tributary"
"          0.002    0.000    0.002    0.002"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          201 Catchment 201"
"          74.300 % Impervious"
"          0.118 Total Area"
"          40.000 Flow length"
"          3.000 Overland Slope"
"          0.030 Pervious Area"
"          40.000 Pervious length"
"          3.000 Pervious slope"
"          0.088 Impervious Area"
"          40.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.026    0.000    0.002    0.002 c.m/sec"
"          Catchment 201      Pervious      Impervious Total Area "
"          Surface Area      0.030      0.088      0.118      hectare"
"          Time of concentration 14.841      2.028      2.795      minutes"
"          Time to Centroid      112.841      117.110      116.854      minutes"
"          Rainfall depth      33.321      33.321      33.321      mm"
"          Rainfall volume      10.10      29.21      39.32      c.m"
"          Rainfall losses      27.512      1.789      8.400      mm"
"          Runoff depth      5.809      31.531      24.921      mm"
"          Runoff volume      1.76      27.64      29.41      c.m"
"          Runoff coefficient      0.174      0.946      0.748      "
"          Maximum flow      0.002      0.025      0.026      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.026    0.026    0.002    0.002"
" 54      POND DESIGN"
"          0.026 Current peak flow      c.m/sec"
"          0.004 Target outflow      c.m/sec"
"          29.4 Hydrograph volume      c.m"
"          8. Number of stages"
"          324.000 Minimum water level      metre"
"          324.650 Maximum water level      metre"
"          324.000 Starting water level      metre"

```

```

"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100  1.01E-05  10.680"
"          324.200  1.01E-05  21.360"
"          324.300  1.01E-05  32.040"
"          324.400  1.01E-05  42.720"
"          324.500  1.01E-05  53.400"
"          324.650  1.01E-05  69.420"
"          324.660   0.00308  69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.000   c.m/sec"
"          Maximum level                324.119  metre"
"          Maximum storage                12.731  c.m"
"          Centroidal lag                13.264  hours"
"          0.026   0.026   0.000   0.002 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"          0.026   0.000   0.000   0.002"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          202 Catchment 202"
"          83.400 % Impervious"
"          0.120 Total Area"
"          40.000 Flow length"
"          2.000 Overland Slope"
"          0.020 Pervious Area"
"          40.000 Pervious length"
"          2.000 Pervious slope"
"          0.100 Impervious Area"
"          40.000 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.028   0.000   0.000   0.002 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area      0.020      0.100      0.120      hectare"

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"	Time of concentration	16.760	2.290	2.799	minutes"
"	Time to Centroid	114.305	117.616	117.499	minutes"
"	Rainfall depth	33.321	33.321	33.321	mm"
"	Rainfall volume	6.64	33.35	39.98	c.m"
"	Rainfall losses	27.528	1.709	5.995	mm"
"	Runoff depth	5.793	31.612	27.326	mm"
"	Runoff volume	1.15	31.64	32.79	c.m"
"	Runoff coefficient	0.174	0.949	0.820	"
"	Maximum flow	0.001	0.028	0.028	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.028	0.028	0.000	0.002"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.028	0.028	0.028	0.002"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"		0.028	0.028	0.028	0.002"
" 33	CATCHMENT 3"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	3 Catchment EXT1"				
"	26.600 % Impervious"				
"	0.035 Total Area"				
"	7.000 Flow length"				
"	1.000 Overland Slope"				
"	0.026 Pervious Area"				
"	7.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.009 Impervious Area"				
"	7.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	34.000 Pervious Max.infiltration"				
"	9.000 Pervious Min.infiltration"				
"	0.500 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.004	0.028	0.028	0.002 c.m/sec"
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	7.251	0.991	3.125	minutes"
"	Time to Centroid	106.758	115.434	112.477	minutes"
"	Rainfall depth	33.321	33.321	33.321	mm"
"	Rainfall volume	8.56	3.10	11.66	c.m"

"		Rainfall losses	27.591	2.748	20.982	mm"
"		Runoff depth	5.730	30.573	12.338	mm"
"		Runoff volume	1.47	2.85	4.32	c.m"
"		Runoff coefficient	0.172	0.918	0.370	"
"		Maximum flow	0.002	0.003	0.004	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.004	0.032	0.028	0.002"	
" 54		POND DESIGN"				
"	0.032	Current peak flow	c.m/sec"			
"	0.020	Target outflow	c.m/sec"			
"	38.0	Hydrograph volume	c.m"			
"	8.	Number of stages"				
"	324.000	Minimum water level	metre"			
"	324.650	Maximum water level	metre"			
"	324.000	Starting water level	metre"			
"	0	Keep Design Data: 1 = True; 0 = False"				
"		Level Discharge	Volume"			
"	324.000	0.000	0.000"			
"	324.100	0.00508	6.680"			
"	324.200	0.01016	13.350"			
"	324.300	0.01344	20.030"			
"	324.400	0.01607	26.700"			
"	324.500	0.01832	33.380"			
"	324.650	0.02126	43.390"			
"	324.660	0.02144	43.400"			
"	1.	ORIFICES"				
"		Orifice Orifice Orifice Number of"				
"		invert coefficie diameter orifices"				
"	324.000	0.800	0.1000	1.000"		
"	1.	SUPERPIPES_1"				
"	1.	Type 1 is Pipe"				
"		Downstream Pipe Pipe Pipe Pipe Number of"				
"		Invert Length Width Height Grade % Pipes"				
"		324.390 39.900 1.500 1.500 0.300 1.000"				
"		Peak outflow	0.011	c.m/sec"		
"		Maximum level	324.223	metre"		
"		Maximum storage	14.856	c.m"		
"		Centroidal lag	2.562	hours"		
"		0.004 0.032 0.011 0.002	c.m/sec"			
" 40		HYDROGRAPH Next link "				
"	5	Next link "				
"		0.004 0.011 0.011 0.002"				
" 33		CATCHMENT 1"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	1	Catchment UC1"				
"	0.010	% Impervious"				
"	0.015	Total Area"				

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.001    0.011    0.011    0.002 c.m/sec"
"      Catchment 1      Pervious  Impervious Total Area  "
"      Surface Area      0.015    0.000    0.015    hectare"
"      Time of concentration  7.558    1.033    7.554    minutes"
"      Time to Centroid      107.098    115.520    107.103    minutes"
"      Rainfall depth      33.321    33.321    33.321    mm"
"      Rainfall volume      5.00    0.00    5.00    c.m"
"      Rainfall losses      27.549    2.656    27.547    mm"
"      Runoff depth      5.772    30.665    5.774    mm"
"      Runoff volume      0.87    0.00    0.87    c.m"
"      Runoff coefficient    0.173    0.920    0.173    "
"      Maximum flow      0.001    0.000    0.001    c.m/sec"
" 40  HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.001    0.012    0.011    0.002"
" 38  START/RE-START TOTALS 1"
"      3  Runoff Totals on EXIT"
"      Total Catchment area      0.361    hectare"
"      Total Impervious area      0.231    hectare"
"      Total % impervious      64.008"
" 19  EXIT"

```

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                         C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    POST-5YR.out"
"          Licensee name:                     Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:            2025-12-10 at 11:32:45 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          632.750 Coefficient A"
"          0.000  Constant B"
"          0.741  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    188.288  mm/hr"
"          Total depth                          43.607  mm"
"          4  Shyd  Hydrograph extension used in this file"
" 33      CATCHMENT 203"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          203  Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.014      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious      Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 8.020      1.263      1.263      minutes"
"      Time to Centroid 108.442      114.811      114.811      minutes"
"      Rainfall depth 43.607      43.607      43.607      mm"
"      Rainfall volume 0.00      14.83      14.83      c.m"
"      Rainfall losses 31.970      2.546      2.546      mm"
"      Runoff depth 11.637      41.061      41.061      mm"
"      Runoff volume 0.00      13.96      13.96      c.m"
"      Runoff coefficient 0.000      0.942      0.942      "
"      Maximum flow 0.000      0.014      0.014      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.014      0.014      0.000      0.000"
" 54      POND DESIGN"
"      0.014      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      14.0      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.582      metre"
"      Maximum storage      7.025      c.m"
"      Centroidal lag      13.266      hours"
"          0.014      0.014      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.014      0.000      0.000      0.000"
" 33      CATCHMENT 2"

```

```

"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"    0.010  % Impervious"
"    0.039  Total Area"
"   40.000  Flow length"
"    1.000  Overland Slope"
"    0.039  Pervious Area"
"   40.000  Pervious length"
"    1.000  Pervious slope"
"    0.000  Impervious Area"
"   40.000  Impervious length"
"    1.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"   34.000  Pervious Max.infiltration"
"    9.000  Pervious Min.infiltration"
"    0.500  Pervious Lag constant (hours)"
"    5.000  Pervious Depression storage"
"    0.015  Impervious Manning 'n'"
"    0.000  Impervious Max.infiltration"
"    0.000  Impervious Min.infiltration"
"    0.001  Impervious Lag constant (hours)"
"    1.500  Impervious Depression storage"
"          0.004    0.000    0.000    0.000 c.m/sec"
"          Catchment 2          Pervious  Impervious Total Area  "
"          Surface Area          0.039    0.000    0.039    hectare"
"          Time of concentration  16.002    2.520    15.997    minutes"
"          Time to Centroid      115.149    117.093    115.150    minutes"
"          Rainfall depth        43.607    43.607    43.607    mm"
"          Rainfall volume       17.01     0.00     17.01     c.m"
"          Rainfall losses       32.043    1.802    32.040    mm"
"          Runoff depth          11.564    41.805    11.567    mm"
"          Runoff volume         4.51     0.00     4.51     c.m"
"          Runoff coefficient     0.265    0.959    0.265    "
"          Maximum flow          0.004    0.000    0.004    c.m/sec"
" 40          HYDROGRAPH Add Runoff  "
"          4  Add Runoff  "
"          0.004    0.004    0.000    0.000"
" 40          HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"          0.004    0.004    0.004    0.000"
" 40          HYDROGRAPH  Combine  99"
"          6  Combine  "
"          99  Node #"
"          Rear Flows"
"          Maximum flow          0.004    c.m/sec"
"          Hydrograph volume      5.367    c.m"
"          0.004    0.004    0.004    0.004"
" 40          HYDROGRAPH Start - New Tributary"

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```

"          2  Start - New Tributary"
"          0.004    0.000    0.004    0.004"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          201 Catchment 201"
"          74.300 % Impervious"
"          0.118 Total Area"
"          40.000 Flow length"
"          3.000 Overland Slope"
"          0.030 Pervious Area"
"          40.000 Pervious length"
"          3.000 Pervious slope"
"          0.088 Impervious Area"
"          40.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.035    0.000    0.004    0.004 c.m/sec"
"          Catchment 201      Pervious  Impervious Total Area "
"          Surface Area      0.030    0.088    0.118    hectare"
"          Time of concentration  11.509    1.812    2.669    minutes"
"          Time to Centroid      111.219    115.852    115.443    minutes"
"          Rainfall depth      43.607    43.607    43.607    mm"
"          Rainfall volume      13.22    38.23    51.46    c.m"
"          Rainfall losses      31.959    2.010    9.707    mm"
"          Runoff depth      11.648    41.597    33.900    mm"
"          Runoff volume      3.53    36.47    40.00    c.m"
"          Runoff coefficient    0.267    0.954    0.777    "
"          Maximum flow      0.003    0.034    0.035    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.035    0.035    0.004    0.004"
" 54      POND DESIGN"
"          0.035 Current peak flow    c.m/sec"
"          0.004 Target outflow    c.m/sec"
"          40.0 Hydrograph volume    c.m"
"          8. Number of stages"
"          324.000 Minimum water level    metre"
"          324.650 Maximum water level    metre"
"          324.000 Starting water level    metre"

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"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100  1.01E-05  10.680"
"          324.200  1.01E-05  21.360"
"          324.300  1.01E-05  32.040"
"          324.400  1.01E-05  42.720"
"          324.500  1.01E-05  53.400"
"          324.650  1.01E-05  69.420"
"          324.660   0.00308  69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.000   c.m/sec"
"          Maximum level                324.120  metre"
"          Maximum storage                12.835  c.m"
"          Centroidal lag                13.217  hours"
"          0.035   0.035   0.000   0.004 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"          0.035   0.000   0.000   0.004"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          202 Catchment 202"
"          83.400 % Impervious"
"          0.120 Total Area"
"          40.000 Flow length"
"          2.000 Overland Slope"
"          0.020 Pervious Area"
"          40.000 Pervious length"
"          2.000 Pervious slope"
"          0.100 Impervious Area"
"          40.000 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.039   0.000   0.000   0.004 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area      0.020      0.100      0.120      hectare"

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"	Time of concentration	12.998	2.047	2.617	minutes"
"	Time to Centroid	112.396	116.237	116.037	minutes"
"	Rainfall depth	43.607	43.607	43.607	mm"
"	Rainfall volume	8.69	43.64	52.33	c.m"
"	Rainfall losses	32.094	1.862	6.881	mm"
"	Runoff depth	11.513	41.745	36.726	mm"
"	Runoff volume	2.29	41.78	44.07	c.m"
"	Runoff coefficient	0.264	0.957	0.842	"
"	Maximum flow	0.002	0.038	0.039	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.039	0.039	0.000	0.004"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.039	0.039	0.039	0.004"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"		0.039	0.039	0.039	0.004"
" 33	CATCHMENT 3"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	3 Catchment EXT1"				
"	26.600 % Impervious"				
"	0.035 Total Area"				
"	7.000 Flow length"				
"	1.000 Overland Slope"				
"	0.026 Pervious Area"				
"	7.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.009 Impervious Area"				
"	7.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	34.000 Pervious Max.infiltration"				
"	9.000 Pervious Min.infiltration"				
"	0.500 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.006	0.039	0.039	0.004 c.m/sec"
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	5.623	0.886	2.990	minutes"
"	Time to Centroid	106.124	114.212	110.620	minutes"
"	Rainfall depth	43.607	43.607	43.607	mm"
"	Rainfall volume	11.20	4.06	15.26	c.m"

"		Rainfall losses	31.989	3.480	24.406	mm"
"		Runoff depth	11.618	40.127	19.201	mm"
"		Runoff volume	2.98	3.74	6.72	c.m"
"		Runoff coefficient	0.266	0.920	0.440	"
"		Maximum flow	0.005	0.004	0.006	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			0.006	0.045	0.039	0.004"
" 54		POND DESIGN"				
"	0.045	Current peak flow		c.m/sec"		
"	0.020	Target outflow		c.m/sec"		
"	51.7	Hydrograph volume		c.m"		
"	8.	Number of stages"				
"	324.000	Minimum water level		metre"		
"	324.650	Maximum water level		metre"		
"	324.000	Starting water level		metre"		
"	0	Keep Design Data: 1 = True; 0 = False"				
"		Level Discharge		Volume"		
"	324.000	0.000		0.000"		
"	324.100	0.00508		6.680"		
"	324.200	0.01016		13.350"		
"	324.300	0.01344		20.030"		
"	324.400	0.01607		26.700"		
"	324.500	0.01832		33.380"		
"	324.650	0.02126		43.390"		
"	324.660	0.02144		43.400"		
"	1.	ORIFICES"				
"		Orifice Orifice Orifice Number of"				
"		invert coefficie diameter orifices"				
"	324.000	0.800		0.1000		1.000"
"	1.	SUPERPIPES_1"				
"	1.	Type 1 is Pipe"				
"		Downstream Pipe Pipe Pipe Pipe Number of"				
"		Invert Length Width Height Grade % Pipes"				
"		324.390 39.900 1.500 1.500 0.300 1.000"				
"		Peak outflow		0.014		c.m/sec"
"		Maximum level		324.317		metre"
"		Maximum storage		21.143		c.m"
"		Centroidal lag		2.484		hours"
"		0.006 0.045		0.014		0.004 c.m/sec"
" 40		HYDROGRAPH Next link "				
"	5	Next link "				
"			0.006	0.014	0.014	0.004"
" 33		CATCHMENT 1"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	1	Catchment UC1"				
"	0.010	% Impervious"				
"	0.015	Total Area"				

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.003   0.014   0.014   0.004 c.m/sec"
"      Catchment 1      Pervious  Impervious Total Area  "
"      Surface Area      0.015      0.000      0.015      hectare"
"      Time of concentration  5.861      0.923      5.859      minutes"
"      Time to Centroid      106.314      114.316      106.317      minutes"
"      Rainfall depth      43.607      43.607      43.607      mm"
"      Rainfall volume      6.54      0.00      6.54      c.m"
"      Rainfall losses      32.032      3.357      32.030      mm"
"      Runoff depth      11.574      40.250      11.577      mm"
"      Runoff volume      1.74      0.00      1.74      c.m"
"      Runoff coefficient      0.265      0.923      0.265      "
"      Maximum flow      0.003      0.000      0.003      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.003   0.016   0.014   0.004"
" 38      START/RE-START TOTALS 1"
"      3      Runoff Totals on EXIT"
"      Total Catchment area      0.361      hectare"
"      Total Impervious area      0.231      hectare"
"      Total % impervious      64.008"
" 19      EXIT"

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"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                      POST-10YR.out"
"          Licensee name:                        Brett Pond"
"          Company                               Vanharten Surveying"
"          Date & Time last used:                2025-12-10 at 11:36:56 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          721.920 Coefficient A"
"          0.000  Constant B"
"          0.736  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    216.508  mm/hr"
"          Total depth                          51.134  mm"
"          5  10hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 203"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          203  Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

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"      1.500  Impervious Depression storage"
"          0.017      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious      Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 7.217      1.194      1.194      minutes"
"      Time to Centroid      108.576      114.492      114.492      minutes"
"      Rainfall depth      51.134      51.134      51.134      mm"
"      Rainfall volume      0.00      17.39      17.39      c.m"
"      Rainfall losses      35.396      2.839      2.839      mm"
"      Runoff depth      15.738      48.296      48.296      mm"
"      Runoff volume      0.00      16.42      16.42      c.m"
"      Runoff coefficient      0.000      0.944      0.944      "
"      Maximum flow      0.000      0.017      0.017      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.017      0.017      0.000      0.000"
" 54      POND DESIGN"
"      0.017      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      16.4      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.592      metre"
"      Maximum storage      8.335      c.m"
"      Centroidal lag      13.236      hours"
"          0.017      0.017      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link  "
"      5      Next link  "
"          0.017      0.000      0.000      0.000"
" 33      CATCHMENT 2"

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"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"    0.010  % Impervious"
"    0.039  Total Area"
"   40.000  Flow length"
"    1.000  Overland Slope"
"    0.039  Pervious Area"
"   40.000  Pervious length"
"    1.000  Pervious slope"
"    0.000  Impervious Area"
"   40.000  Impervious length"
"    1.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"   34.000  Pervious Max.infiltration"
"    9.000  Pervious Min.infiltration"
"    0.500  Pervious Lag constant (hours)"
"    5.000  Pervious Depression storage"
"    0.015  Impervious Manning 'n'"
"    0.000  Impervious Max.infiltration"
"    0.000  Impervious Min.infiltration"
"    0.001  Impervious Lag constant (hours)"
"    1.500  Impervious Depression storage"
"                0.006      0.000      0.000      0.000 c.m/sec"
"      Catchment 2      Pervious      Impervious Total Area "
"      Surface Area      0.039      0.000      0.039      hectare"
"      Time of concentration  14.399      2.383      14.395      minutes"
"      Time to Centroid      115.320      116.598      115.321      minutes"
"      Rainfall depth      51.134      51.134      51.134      mm"
"      Rainfall volume      19.94      0.00      19.94      c.m"
"      Rainfall losses      35.189      1.818      35.186      mm"
"      Runoff depth      15.945      49.316      15.949      mm"
"      Runoff volume      6.22      0.00      6.22      c.m"
"      Runoff coefficient      0.312      0.964      0.312      "
"      Maximum flow      0.006      0.000      0.006      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"                0.006      0.006      0.000      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"      8      Copy to Outflow"
"                0.006      0.006      0.006      0.000"
" 40      HYDROGRAPH Combine 99"
"      6      Combine "
"      99     Node #"
"      Rear Flows"
"      Maximum flow                0.006      c.m/sec"
"      Hydrograph volume            7.078      c.m"
"                0.006      0.006      0.006      0.006"
" 40      HYDROGRAPH Start - New Tributary"

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"          2  Start - New Tributary"
"          0.006    0.000    0.006    0.006"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          201 Catchment 201"
"          74.300 % Impervious"
"          0.118 Total Area"
"          40.000 Flow length"
"          3.000 Overland Slope"
"          0.030 Pervious Area"
"          40.000 Pervious length"
"          3.000 Pervious slope"
"          0.088 Impervious Area"
"          40.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.042    0.000    0.006    0.006 c.m/sec"
"          Catchment 201      Pervious      Impervious Total Area "
"          Surface Area      0.030      0.088      0.118      hectare"
"          Time of concentration 10.356      1.714      2.583      minutes"
"          Time to Centroid 111.359      115.433      115.023      minutes"
"          Rainfall depth 51.134      51.134      51.134      mm"
"          Rainfall volume 15.51      44.83      60.34      c.m"
"          Rainfall losses 35.314      2.174      10.691      mm"
"          Runoff depth 15.820      48.960      40.443      mm"
"          Runoff volume 4.80      42.93      47.72      c.m"
"          Runoff coefficient 0.309      0.957      0.791      "
"          Maximum flow 0.005      0.040      0.042      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.042    0.042    0.006    0.006"
" 54      POND DESIGN"
"          0.042 Current peak flow      c.m/sec"
"          0.004 Target outflow      c.m/sec"
"          47.7 Hydrograph volume      c.m"
"          8. Number of stages"
"          324.000 Minimum water level      metre"
"          324.650 Maximum water level      metre"
"          324.000 Starting water level      metre"

```

```

"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100   1.01E-05   10.680"
"          324.200   1.01E-05   21.360"
"          324.300   1.01E-05   32.040"
"          324.400   1.01E-05   42.720"
"          324.500   1.01E-05   53.400"
"          324.650   1.01E-05   69.420"
"          324.660   0.00308   69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.000   c.m/sec"
"          Maximum level                324.145   metre"
"          Maximum storage                15.527   c.m"
"          Centroidal lag                13.181   hours"
"          0.042   0.042   0.000   0.006 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5   Next link "
"          0.042   0.000   0.000   0.006"
" 33      CATCHMENT 202"
"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"          202  Catchment 202"
"          83.400 % Impervious"
"          0.120  Total Area"
"          40.000  Flow length"
"          2.000  Overland Slope"
"          0.020  Pervious Area"
"          40.000  Pervious length"
"          2.000  Pervious slope"
"          0.100  Impervious Area"
"          40.000  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"
"          1.500  Impervious Depression storage"
"          0.045   0.000   0.000   0.006 c.m/sec"
"          Catchment 202      Pervious  Impervious Total Area "
"          Surface Area      0.020   0.100   0.120   hectare"

```

"	Time of concentration	11.695	1.936	2.528	minutes"
"	Time to Centroid	112.696	115.765	115.579	minutes"
"	Rainfall depth	51.134	51.134	51.134	mm"
"	Rainfall volume	10.19	51.18	61.36	c.m"
"	Rainfall losses	35.193	2.062	7.562	mm"
"	Runoff depth	15.941	49.073	43.573	mm"
"	Runoff volume	3.18	49.11	52.29	c.m"
"	Runoff coefficient	0.312	0.960	0.852	"
"	Maximum flow	0.003	0.045	0.045	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.045	0.045	0.000	0.006"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.045	0.045	0.045	0.006"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"		0.045	0.045	0.045	0.006"
" 33	CATCHMENT 3"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	3 Catchment EXT1"				
"	26.600 % Impervious"				
"	0.035 Total Area"				
"	7.000 Flow length"				
"	1.000 Overland Slope"				
"	0.026 Pervious Area"				
"	7.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.009 Impervious Area"				
"	7.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	34.000 Pervious Max.infiltration"				
"	9.000 Pervious Min.infiltration"				
"	0.500 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.008	0.045	0.045	0.006 c.m/sec"
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	5.060	0.837	2.876	minutes"
"	Time to Centroid	106.452	113.758	110.232	minutes"
"	Rainfall depth	51.134	51.134	51.134	mm"
"	Rainfall volume	13.14	4.76	17.90	c.m"

"		Rainfall losses	35.196	3.996	26.897	mm"
"		Runoff depth	15.938	47.139	24.238	mm"
"		Runoff volume	4.09	4.39	8.48	c.m"
"		Runoff coefficient	0.312	0.922	0.474	"
"		Maximum flow	0.006	0.005	0.008	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			0.008	0.054	0.045	0.006"
" 54		POND DESIGN"				
"	0.054	Current peak flow		c.m/sec"		
"	0.020	Target outflow		c.m/sec"		
"	61.6	Hydrograph volume		c.m"		
"	8.	Number of stages"				
"	324.000	Minimum water level		metre"		
"	324.650	Maximum water level		metre"		
"	324.000	Starting water level		metre"		
"	0	Keep Design Data: 1 = True; 0 = False"				
"		Level Discharge		Volume"		
"	324.000	0.000		0.000"		
"	324.100	0.00508		6.680"		
"	324.200	0.01016		13.350"		
"	324.300	0.01344		20.030"		
"	324.400	0.01607		26.700"		
"	324.500	0.01832		33.380"		
"	324.650	0.02126		43.390"		
"	324.660	0.02144		43.400"		
"	1.	ORIFICES"				
"		Orifice invert	Orifice coefficient	Orifice diameter	Number of orifices"	
"	324.000	0.800		0.1000	1.000"	
"	1.	SUPERPIPES_1"				
"	1.	Type 1 is Pipe"				
"		Downstream Invert	Pipe Length	Pipe Width	Pipe Height	Pipe Grade %
"		324.390	39.900	1.500	1.500	0.300
"		Peak outflow		0.016		c.m/sec"
"		Maximum level		324.381		metre"
"		Maximum storage		25.440		c.m"
"		Centroidal lag		2.458		hours"
"		0.008	0.054	0.016	0.006	c.m/sec"
" 40		HYDROGRAPH Next link "				
"	5	Next link "				
"			0.008	0.016	0.016	0.006"
" 33		CATCHMENT 1"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	1	Catchment UC1"				
"	0.010	% Impervious"				
"	0.015	Total Area"				

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.004    0.016    0.016    0.006 c.m/sec"
"      Catchment 1      Pervious  Impervious Total Area  "
"      Surface Area      0.015    0.000    0.015    hectare"
"      Time of concentration  5.274    0.873    5.273    minutes"
"      Time to Centroid      106.643  113.862  106.645  minutes"
"      Rainfall depth      51.134    51.134    51.134    mm"
"      Rainfall volume      7.67     0.00     7.67     c.m"
"      Rainfall losses      35.203    3.861    35.200    mm"
"      Runoff depth      15.931    47.274    15.935    mm"
"      Runoff volume      2.39     0.00     2.39     c.m"
"      Runoff coefficient    0.312    0.924    0.312    "
"      Maximum flow      0.004    0.000    0.004    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.004    0.018    0.016    0.006"
" 38 START/RE-START TOTALS 1"
"      3  Runoff Totals on EXIT"
"      Total Catchment area      0.361    hectare"
"      Total Impervious area      0.231    hectare"
"      Total % impervious      64.008"
" 19 EXIT"

```

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                         C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                    POST-25YR.out"
"          Licensee name:                      Brett Pond"
"          Company                            Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 11:39:41 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1      Chicago storm"
"          822.740 Coefficient A"
"          0.000  Constant B"
"          0.725  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    251.029  mm/hr"
"          Total depth                          61.897  mm"
"          5  25hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 203"
"          1      Triangular SCS"
"          1      Equal length"
"          2      Horton equation"
"          203    Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

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"      1.500  Impervious Depression storage"
"          0.019      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 6.440      1.126      1.126      minutes"
"      Time to Centroid      109.565      114.266      114.266      minutes"
"      Rainfall depth      61.897      61.897      61.897      mm"
"      Rainfall volume      0.00      21.04      21.04      c.m"
"      Rainfall losses      39.495      3.299      3.299      mm"
"      Runoff depth      22.402      58.598      58.598      mm"
"      Runoff volume      0.00      19.92      19.92      c.m"
"      Runoff coefficient      0.000      0.947      0.947      "
"      Maximum flow      0.000      0.019      0.019      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.019      0.019      0.000      0.000"
" 54      POND DESIGN"
"      0.019      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      19.9      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.587      metre"
"      Maximum storage      7.700      c.m"
"      Centroidal lag      13.196      hours"
"          0.019      0.019      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link  "
"      5      Next link  "
"          0.019      0.000      0.000      0.000"
" 33      CATCHMENT 2"

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"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"    0.010  % Impervious"
"    0.039  Total Area"
"   40.000  Flow length"
"    1.000  Overland Slope"
"    0.039  Pervious Area"
"   40.000  Pervious length"
"    1.000  Pervious slope"
"    0.000  Impervious Area"
"   40.000  Impervious length"
"    1.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"   34.000  Pervious Max.infiltration"
"    9.000  Pervious Min.infiltration"
"    0.500  Pervious Lag constant (hours)"
"    5.000  Pervious Depression storage"
"    0.015  Impervious Manning 'n'"
"    0.000  Impervious Max.infiltration"
"    0.000  Impervious Min.infiltration"
"    0.001  Impervious Lag constant (hours)"
"    1.500  Impervious Depression storage"
"          0.008      0.000      0.000      0.000 c.m/sec"
"          Catchment 2          Pervious  Impervious Total Area "
"          Surface Area          0.039      0.000      0.039      hectare"
"          Time of concentration  12.849      2.246      12.846      minutes"
"          Time to Centroid      116.317     116.214     116.317     minutes"
"          Rainfall depth        61.897      61.897      61.897      mm"
"          Rainfall volume       24.14       0.00       24.14      c.m"
"          Rainfall losses       39.293      1.942      39.289      mm"
"          Runoff depth          22.604      59.955      22.608      mm"
"          Runoff volume         8.81        0.00       8.82      c.m"
"          Runoff coefficient     0.365      0.969      0.365      "
"          Maximum flow          0.008      0.000      0.008      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.008      0.008      0.000      0.000"
" 40          HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"          0.008      0.008      0.008      0.000"
" 40          HYDROGRAPH  Combine  99"
"          6  Combine "
"          99  Node #"
"          Rear Flows"
"          Maximum flow          0.008      c.m/sec"
"          Hydrograph volume     9.678      c.m"
"          0.008      0.008      0.008      0.008"
" 40          HYDROGRAPH Start - New Tributary"

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"          2  Start - New Tributary"
"          0.008    0.000    0.008    0.008"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          201 Catchment 201"
"          74.300 % Impervious"
"          0.118 Total Area"
"          40.000 Flow length"
"          3.000 Overland Slope"
"          0.030 Pervious Area"
"          40.000 Pervious length"
"          3.000 Pervious slope"
"          0.088 Impervious Area"
"          40.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.050    0.000    0.008    0.008 c.m/sec"
"          Catchment 201      Pervious      Impervious Total Area "
"          Surface Area      0.030      0.088      0.118      hectare"
"          Time of concentration 9.241      1.615      2.503      minutes"
"          Time to Centroid 112.461     115.093     114.787     minutes"
"          Rainfall depth 61.897      61.897      61.897      mm"
"          Rainfall volume 18.77      54.27      73.04      c.m"
"          Rainfall losses 39.237      2.422      11.884      mm"
"          Runoff depth 22.660      59.475      50.013      mm"
"          Runoff volume 6.87      52.14      59.02      c.m"
"          Runoff coefficient 0.366      0.961      0.808      "
"          Maximum flow 0.007      0.047      0.050      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.050    0.050    0.008    0.008"
" 54      POND DESIGN"
"          0.050 Current peak flow c.m/sec"
"          0.004 Target outflow c.m/sec"
"          59.0 Hydrograph volume c.m"
"          8. Number of stages"
"          324.000 Minimum water level metre"
"          324.650 Maximum water level metre"
"          324.000 Starting water level metre"

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"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100   1.01E-05   10.680"
"          324.200   1.01E-05   21.360"
"          324.300   1.01E-05   32.040"
"          324.400   1.01E-05   42.720"
"          324.500   1.01E-05   53.400"
"          324.650   1.01E-05   69.420"
"          324.660   0.00308   69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.000   c.m/sec"
"          Maximum level                324.126   metre"
"          Maximum storage                13.413   c.m"
"          Centroidal lag                13.124   hours"
"          0.050   0.050   0.000   0.008 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5   Next link "
"          0.050   0.000   0.000   0.008"
" 33      CATCHMENT 202"
"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"          202  Catchment 202"
"          83.400 % Impervious"
"          0.120  Total Area"
"          40.000  Flow length"
"          2.000  Overland Slope"
"          0.020  Pervious Area"
"          40.000  Pervious length"
"          2.000  Pervious slope"
"          0.100  Impervious Area"
"          40.000  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"
"          1.500  Impervious Depression storage"
"          0.054   0.000   0.000   0.008 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area      0.020      0.100      0.120      hectare"

```

"	Time of concentration	10.437	1.824	2.430	minutes"
"	Time to Centroid	113.762	115.488	115.366	minutes"
"	Rainfall depth	61.897	61.897	61.897	mm"
"	Rainfall volume	12.33	61.95	74.28	c.m"
"	Rainfall losses	39.242	2.239	8.381	mm"
"	Runoff depth	22.655	59.658	53.516	mm"
"	Runoff volume	4.51	59.71	64.22	c.m"
"	Runoff coefficient	0.366	0.964	0.865	"
"	Maximum flow	0.004	0.053	0.054	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.054	0.054	0.000	0.008"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.054	0.054	0.054	0.008"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"		0.054	0.054	0.054	0.008"
" 33	CATCHMENT 3"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	3 Catchment EXT1"				
"	26.600 % Impervious"				
"	0.035 Total Area"				
"	7.000 Flow length"				
"	1.000 Overland Slope"				
"	0.026 Pervious Area"				
"	7.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.009 Impervious Area"				
"	7.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	34.000 Pervious Max.infiltration"				
"	9.000 Pervious Min.infiltration"				
"	0.500 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.011	0.054	0.054	0.008 c.m/sec"
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	4.515	0.789	2.732	minutes"
"	Time to Centroid	107.472	113.437	110.327	minutes"
"	Rainfall depth	61.897	61.897	61.897	mm"
"	Rainfall volume	15.90	5.76	21.66	c.m"

```

"          Rainfall losses          39.301      4.658      30.086      mm"
"          Runoff depth              22.595      57.239      31.811      mm"
"          Runoff volume              5.80        5.33        11.13       c.m"
"          Runoff coefficient         0.365      0.925      0.514       "
"          Maximum flow              0.008      0.005      0.011       c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4      Add Runoff "
"                  0.011      0.065      0.054      0.008"
" 54      POND DESIGN"
"          0.065      Current peak flow      c.m/sec"
"          0.020      Target outflow      c.m/sec"
"          76.2      Hydrograph volume      c.m"
"          8.      Number of stages"
"          324.000      Minimum water level      metre"
"          324.650      Maximum water level      metre"
"          324.000      Starting water level      metre"
"          0      Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge      Volume"
"          324.000      0.000      0.000"
"          324.100      0.00508      6.680"
"          324.200      0.01016      13.350"
"          324.300      0.01344      20.030"
"          324.400      0.01607      26.700"
"          324.500      0.01832      33.380"
"          324.650      0.02126      43.390"
"          324.660      0.02144      43.400"
"          1.      ORIFICES"
"                  Orifice      Orifice      Orifice Number of"
"                  invert coefficie      diameter      orifices"
"          324.000      0.800      0.1000      1.000"
"          1.      SUPERPIPES_1"
"          1.      Type 1 is Pipe"
"                  Downstream      Pipe      Pipe      Pipe      Pipe Number of"
"                  Invert      Length      Width      Height      Grade %      Pipes"
"          324.390      39.900      1.500      1.500      0.300      1.000"
"          Peak outflow              0.018      c.m/sec"
"          Maximum level              324.472      metre"
"          Maximum storage              31.539      c.m"
"          Centroidal lag              2.443      hours"
"          0.011      0.065      0.018      0.008 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"                  0.011      0.018      0.018      0.008"
" 33      CATCHMENT 1"
"          1      Triangular SCS"
"          1      Equal length"
"          2      Horton equation"
"          1      Catchment UC1"
"          0.010      % Impervious"
"          0.015      Total Area"

```

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.005    0.018    0.018    0.008 c.m/sec"
"      Catchment 1          Pervious  Impervious Total Area  "
"      Surface Area          0.015    0.000    0.015    hectare"
"      Time of concentration  4.706    0.823    4.705    minutes"
"      Time to Centroid      107.704  113.525  107.705  minutes"
"      Rainfall depth        61.897    61.897    61.897    mm"
"      Rainfall volume        9.28      0.00      9.28      c.m"
"      Rainfall losses        39.198    4.534    39.195    mm"
"      Runoff depth           22.699    57.363    22.702    mm"
"      Runoff volume           3.40      0.00      3.41      c.m"
"      Runoff coefficient      0.367    0.927    0.367    "
"      Maximum flow           0.005    0.000    0.005    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.005    0.021    0.018    0.008"
" 38 START/RE-START TOTALS 1"
"      3  Runoff Totals on EXIT"
"      Total Catchment area          0.361    hectare"
"      Total Impervious area          0.231    hectare"
"      Total % impervious            64.008"
" 19 EXIT"

```

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                     POST-50YR.out"
"          Licensee name:                       Brett Pond"
"          Company                             Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 11:42:45 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          893.800 Coefficient A"
"          0.000  Constant B"
"          0.719  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    275.287  mm/hr"
"          Total depth                          69.491  mm"
"          5  50hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 203"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          203 Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.021      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious      Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 6.030      1.085      1.085      minutes"
"      Time to Centroid 110.593      114.107      114.107      minutes"
"      Rainfall depth 69.491      69.491      69.491      mm"
"      Rainfall volume 0.00      23.63      23.63      c.m"
"      Rainfall losses 41.594      3.682      3.683      mm"
"      Runoff depth 27.897      65.809      65.808      mm"
"      Runoff volume 0.00      22.37      22.37      c.m"
"      Runoff coefficient 0.000      0.947      0.947      "
"      Maximum flow 0.000      0.021      0.021      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.021      0.021      0.000      0.000"
" 54      POND DESIGN"
"      0.021      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      22.4      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.595      metre"
"      Maximum storage      8.733      c.m"
"      Centroidal lag      13.170      hours"
"          0.021      0.021      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.021      0.000      0.000      0.000"
" 33      CATCHMENT 2"

```

```

"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"    0.010  % Impervious"
"    0.039  Total Area"
"   40.000  Flow length"
"    1.000  Overland Slope"
"    0.039  Pervious Area"
"   40.000  Pervious length"
"    1.000  Pervious slope"
"    0.000  Impervious Area"
"   40.000  Impervious length"
"    1.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"   34.000  Pervious Max.infiltration"
"    9.000  Pervious Min.infiltration"
"    0.500  Pervious Lag constant (hours)"
"    5.000  Pervious Depression storage"
"    0.015  Impervious Manning 'n'"
"    0.000  Impervious Max.infiltration"
"    0.000  Impervious Min.infiltration"
"    0.001  Impervious Lag constant (hours)"
"    1.500  Impervious Depression storage"
"          0.009    0.000    0.000    0.000 c.m/sec"
"          Catchment 2          Pervious  Impervious Total Area  "
"          Surface Area          0.039    0.000    0.039    hectare"
"          Time of concentration  12.030    2.165    12.028    minutes"
"          Time to Centroid      117.423    115.971    117.422    minutes"
"          Rainfall depth        69.491    69.491    69.491    mm"
"          Rainfall volume       27.10     0.00     27.10     c.m"
"          Rainfall losses       41.404    2.084    41.400    mm"
"          Runoff depth          28.087    67.407    28.091    mm"
"          Runoff volume         10.95     0.00     10.96     c.m"
"          Runoff coefficient     0.404    0.970    0.404     "
"          Maximum flow          0.009    0.000    0.009     c.m/sec"
" 40          HYDROGRAPH Add Runoff  "
"          4  Add Runoff  "
"          0.009    0.009    0.000    0.000"
" 40          HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"          0.009    0.009    0.009    0.000"
" 40          HYDROGRAPH  Combine  99"
"          6  Combine  "
"          99  Node #"
"          Rear Flows"
"          Maximum flow          0.009    c.m/sec"
"          Hydrograph volume     11.819    c.m"
"          0.009    0.009    0.009    0.009"
" 40          HYDROGRAPH Start - New Tributary"

```

```

"          2  Start - New Tributary"
"          0.009    0.000    0.009    0.009"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          201  Catchment 201"
"          74.300  % Impervious"
"          0.118  Total Area"
"          40.000  Flow length"
"          3.000  Overland Slope"
"          0.030  Pervious Area"
"          40.000  Pervious length"
"          3.000  Pervious slope"
"          0.088  Impervious Area"
"          40.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"
"          1.500  Impervious Depression storage"
"          0.056    0.000    0.009    0.009 c.m/sec"
"          Catchment 201      Pervious      Impervious      Total Area  "
"          Surface Area      0.030      0.088      0.118      hectare"
"          Time of concentration  8.653      1.557      2.458      minutes"
"          Time to Centroid      113.533      114.863      114.694      minutes"
"          Rainfall depth      69.491      69.491      69.491      mm"
"          Rainfall volume      21.07      60.93      82.00      c.m"
"          Rainfall losses      41.395      2.662      12.616      mm"
"          Runoff depth      28.096      66.829      56.875      mm"
"          Runoff volume      8.52      58.59      67.11      c.m"
"          Runoff coefficient      0.404      0.962      0.818      "
"          Maximum flow      0.009      0.052      0.056      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"          0.056    0.056    0.009    0.009"
" 54      POND DESIGN"
"          0.056  Current peak flow    c.m/sec"
"          0.004  Target outflow    c.m/sec"
"          67.1  Hydrograph volume    c.m"
"          8.  Number of stages"
"          324.000  Minimum water level    metre"
"          324.650  Maximum water level    metre"
"          324.000  Starting water level    metre"

```

```

"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100  1.01E-05  10.680"
"          324.200  1.01E-05  21.360"
"          324.300  1.01E-05  32.040"
"          324.400  1.01E-05  42.720"
"          324.500  1.01E-05  53.400"
"          324.650  1.01E-05  69.420"
"          324.660   0.00308  69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.000   c.m/sec"
"          Maximum level                324.113  metre"
"          Maximum storage                12.084  c.m"
"          Centroidal lag                13.087  hours"
"          0.056   0.056   0.000   0.009 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"          0.056   0.000   0.000   0.009"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          202 Catchment 202"
"          83.400 % Impervious"
"          0.120 Total Area"
"          40.000 Flow length"
"          2.000 Overland Slope"
"          0.020 Pervious Area"
"          40.000 Pervious length"
"          2.000 Pervious slope"
"          0.100 Impervious Area"
"          40.000 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          34.000 Pervious Max.infiltration"
"          9.000 Pervious Min.infiltration"
"          0.500 Pervious Lag constant (hours)"
"          5.000 Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"
"          1.500 Impervious Depression storage"
"          0.060   0.000   0.000   0.009 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area      0.020      0.100      0.120      hectare"

```

"	Time of concentration	9.772	1.758	2.368	minutes"
"	Time to Centroid	114.744	115.298	115.256	minutes"
"	Rainfall depth	69.491	69.491	69.491	mm"
"	Rainfall volume	13.84	69.55	83.39	c.m"
"	Rainfall losses	41.744	2.404	8.935	mm"
"	Runoff depth	27.747	67.087	60.556	mm"
"	Runoff volume	5.53	67.14	72.67	c.m"
"	Runoff coefficient	0.399	0.965	0.871	"
"	Maximum flow	0.005	0.058	0.060	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4	Add Runoff "			
"		0.060	0.060	0.000	0.009"
" 40	HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"			
"		0.060	0.060	0.060	0.009"
" 40	HYDROGRAPH Next link "				
"	5	Next link "			
"		0.060	0.060	0.060	0.009"
" 33	CATCHMENT 3"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3	Catchment EXT1"			
"	26.600	% Impervious"			
"	0.035	Total Area"			
"	7.000	Flow length"			
"	1.000	Overland Slope"			
"	0.026	Pervious Area"			
"	7.000	Pervious length"			
"	1.000	Pervious slope"			
"	0.009	Impervious Area"			
"	7.000	Impervious length"			
"	1.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	34.000	Pervious Max.infiltration"			
"	9.000	Pervious Min.infiltration"			
"	0.500	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.013	0.060	0.060	0.009 c.m/sec"
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	4.228	0.761	2.639	minutes"
"	Time to Centroid	108.429	113.275	110.649	minutes"
"	Rainfall depth	69.491	69.491	69.491	mm"
"	Rainfall volume	17.85	6.47	24.32	c.m"

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"          Rainfall losses          41.876      5.069      32.085      mm"
"          Runoff depth              27.615      64.422      37.406      mm"
"          Runoff volume              7.09        6.00        13.09       c.m"
"          Runoff coefficient         0.397      0.927      0.538       "
"          Maximum flow               0.010      0.006      0.013       c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4      Add Runoff "
"                  0.013      0.073      0.060      0.009"
" 54      POND DESIGN"
"          0.073      Current peak flow      c.m/sec"
"          0.020      Target outflow      c.m/sec"
"          86.6      Hydrograph volume      c.m"
"          8.      Number of stages"
"          324.000      Minimum water level      metre"
"          324.650      Maximum water level      metre"
"          324.000      Starting water level      metre"
"          0      Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge      Volume"
"          324.000      0.000      0.000"
"          324.100      0.00508      6.680"
"          324.200      0.01016      13.350"
"          324.300      0.01344      20.030"
"          324.400      0.01607      26.700"
"          324.500      0.01832      33.380"
"          324.650      0.02126      43.390"
"          324.660      0.02144      43.400"
"          1.      ORIFICES"
"                  Orifice      Orifice      Orifice Number of"
"                  invert coefficie      diameter      orifices"
"          324.000      0.800      0.1000      1.000"
"          1.      SUPERPIPES_1"
"          1.      Type 1 is Pipe"
"                  Downstream      Pipe      Pipe      Pipe      Pipe Number of"
"                  Invert      Length      Width      Height      Grade %      Pipes"
"          324.390      39.900      1.500      1.500      0.300      1.000"
"          Peak outflow              0.019      c.m/sec"
"          Maximum level              324.538      metre"
"          Maximum storage              35.929      c.m"
"          Centroidal lag              2.440      hours"
"          0.013      0.073      0.019      0.009 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"                  0.013      0.019      0.019      0.009"
" 33      CATCHMENT 1"
"          1      Triangular SCS"
"          1      Equal length"
"          2      Horton equation"
"          1      Catchment UC1"
"          0.010      % Impervious"
"          0.015      Total Area"

```

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.006   0.019   0.019   0.009 c.m/sec"
"      Catchment 1          Pervious  Impervious Total Area  "
"      Surface Area          0.015    0.000    0.015    hectare"
"      Time of concentration  4.406    0.793    4.406    minutes"
"      Time to Centroid      108.639  113.333  108.640  minutes"
"      Rainfall depth        69.491    69.491    69.491    mm"
"      Rainfall volume       10.42     0.00     10.42    c.m"
"      Rainfall losses       41.727    4.969    41.723    mm"
"      Runoff depth          27.764    64.522    27.768    mm"
"      Runoff volume         4.16     0.00     4.17     c.m"
"      Runoff coefficient     0.400    0.928    0.400    "
"      Maximum flow          0.006    0.000    0.006    c.m/sec"
" 40 HYDROGRAPH Add Runoff "
"      4  Add Runoff "
"          0.006   0.023   0.019   0.009"
" 38 START/RE-START TOTALS 1"
"      3  Runoff Totals on EXIT"
"      Total Catchment area          0.361    hectare"
"      Total Impervious area          0.231    hectare"
"      Total % impervious            64.008"
" 19 EXIT"

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```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          C:\Users\brett.pond\Desktop\
"          Design Sheets - Eng Standards\Working Files\81 College Street
MIDUSS"
"          Output filename:                     POST-100yr.out"
"          Licensee name:                       Brett Pond"
"          Company                             Vanharten Surveying"
"          Date & Time last used:              2025-12-10 at 11:24:38 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          953.290 Coefficient A"
"          0.000  Constant B"
"          0.711  Exponent C"
"          0.400  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    297.317  mm/hr"
"          Total depth                          77.438  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 203"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          203  Catchment 203 - Outlet to Rear"
"          100.000 % Impervious"
"          0.034  Total Area"
"          20.000  Flow length"
"          2.500  Overland Slope"
"          0.000  Pervious Area"
"          20.000  Pervious length"
"          2.500  Pervious slope"
"          0.034  Impervious Area"
"          20.000  Impervious length"
"          2.500  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

```

"      1.500  Impervious Depression storage"
"          0.023      0.000      0.000      0.000 c.m/sec"
"      Catchment 203      Pervious      Impervious      Total Area  "
"      Surface Area      0.000      0.034      0.034      hectare"
"      Time of concentration 5.802      1.052      1.052      minutes"
"      Time to Centroid 112.099      114.015      114.015      minutes"
"      Rainfall depth 77.438      77.438      77.438      mm"
"      Rainfall volume 0.00      26.33      26.33      c.m"
"      Rainfall losses 43.642      4.078      4.078      mm"
"      Runoff depth 33.797      73.360      73.360      mm"
"      Runoff volume 0.00      24.94      24.94      c.m"
"      Runoff coefficient 0.000      0.947      0.947      "
"      Maximum flow 0.000      0.023      0.023      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"          0.023      0.023      0.000      0.000"
" 54      POND DESIGN"
"      0.023      Current peak flow      c.m/sec"
"      0.001      Target outflow      c.m/sec"
"      24.9      Hydrograph volume      c.m"
"      11.      Number of stages"
"      326.530      Minimum water level      metre"
"      327.290      Maximum water level      metre"
"      326.530      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      326.530      0.000      0.000"
"      326.580      1.01E-05      6.740"
"      326.630      1.01E-05      13.480"
"      326.680      1.01E-05      20.220"
"      326.730      1.01E-05      26.960"
"      326.780      1.01E-05      33.700"
"      326.830      1.01E-05      40.440"
"      326.880      1.01E-05      47.180"
"      326.930      1.01E-05      53.920"
"      327.140      1.01E-05      54.000"
"      327.290      0.04458      54.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"      327.140      0.900      0.500      0.000      0.000"
"      Peak outflow      0.000      c.m/sec"
"      Maximum level      326.582      metre"
"      Maximum storage      7.004      c.m"
"      Centroidal lag      13.141      hours"
"          0.023      0.023      0.000      0.000 c.m/sec"
" 40      HYDROGRAPH Next link "
"      5      Next link "
"          0.023      0.000      0.000      0.000"
" 33      CATCHMENT 2"

```

```

"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          2  Catchment UC2"
"      0.010  % Impervious"
"      0.039  Total Area"
"     40.000  Flow length"
"      1.000  Overland Slope"
"      0.039  Pervious Area"
"     40.000  Pervious length"
"      1.000  Pervious slope"
"      0.000  Impervious Area"
"     40.000  Impervious length"
"      1.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"     34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.010      0.000      0.000      0.000 c.m/sec"
"          Catchment 2          Pervious  Impervious Total Area  "
"          Surface Area          0.039      0.000      0.039      hectare"
"          Time of concentration  11.576      2.099      11.574      minutes"
"          Time to Centroid      119.428      115.846      119.427      minutes"
"          Rainfall depth        77.438      77.438      77.438      mm"
"          Rainfall volume       30.20       0.00       30.20       c.m"
"          Rainfall losses       43.462      2.247      43.457      mm"
"          Runoff depth          33.977      75.191      33.981      mm"
"          Runoff volume         13.25       0.00       13.25       c.m"
"          Runoff coefficient     0.439      0.971      0.439      "
"          Maximum flow          0.010      0.000      0.010      c.m/sec"
" 40          HYDROGRAPH Add Runoff  "
"          4  Add Runoff  "
"          0.010      0.010      0.000      0.000"
" 40          HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"          0.010      0.010      0.010      0.000"
" 40          HYDROGRAPH  Combine  99"
"          6  Combine  "
"          99  Node #"
"          Rear Flows"
"          Maximum flow          0.010      c.m/sec"
"          Hydrograph volume     14.118      c.m"
"          0.010      0.010      0.010      0.010"
" 40          HYDROGRAPH Start - New Tributary"

```

```

"          2  Start - New Tributary"
"              0.010      0.000      0.010      0.010"
" 33      CATCHMENT 201"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"      201  Catchment 201"
" 74.300  % Impervious"
"  0.118  Total Area"
" 40.000  Flow length"
"  3.000  Overland Slope"
"  0.030  Pervious Area"
" 40.000  Pervious length"
"  3.000  Pervious slope"
"  0.088  Impervious Area"
" 40.000  Impervious length"
"  3.000  Impervious slope"
"  0.250  Pervious Manning 'n'"
" 34.000  Pervious Max.infiltration"
"  9.000  Pervious Min.infiltration"
"  0.500  Pervious Lag constant (hours)"
"  5.000  Pervious Depression storage"
"  0.015  Impervious Manning 'n'"
"  0.000  Impervious Max.infiltration"
"  0.000  Impervious Min.infiltration"
"  0.001  Impervious Lag constant (hours)"
"  1.500  Impervious Depression storage"
"              0.059      0.000      0.010      0.010 c.m/sec"
"          Catchment 201      Pervious      Impervious      Total Area  "
"          Surface Area      0.030      0.088      0.118      hectare"
"          Time of concentration  8.326      1.510      2.438      minutes"
"          Time to Centroid      115.524      114.746      114.852      minutes"
"          Rainfall depth      77.438      77.438      77.438      mm"
"          Rainfall volume      23.48      67.89      91.38      c.m"
"          Rainfall losses      43.453      2.926      13.341      mm"
"          Runoff depth      33.985      74.512      64.097      mm"
"          Runoff volume      10.31      65.33      75.63      c.m"
"          Runoff coefficient      0.439      0.962      0.828      "
"          Maximum flow      0.012      0.057      0.059      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.059      0.059      0.010      0.010"
" 54      POND DESIGN"
"  0.059  Current peak flow      c.m/sec"
"  0.004  Target outflow      c.m/sec"
"  75.6   Hydrograph volume      c.m"
"  8.     Number of stages"
" 324.000  Minimum water level      metre"
" 324.650  Maximum water level      metre"
" 324.000  Starting water level      metre"

```

```

"      0   Keep Design Data: 1 = True; 0 = False"
"          Level Discharge   Volume"
"          324.000   0.000   0.000"
"          324.100  1.01E-05  10.680"
"          324.200  1.01E-05  21.360"
"          324.300  1.01E-05  32.040"
"          324.400  1.01E-05  42.720"
"          324.500  1.01E-05  53.400"
"          324.650  1.01E-05  69.420"
"          324.660   0.00308  69.430"
"      1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          324.650   0.900   2.000   0.000   0.000"
"          Peak outflow                0.001   c.m/sec"
"          Maximum level                324.660  metre"
"          Maximum storage                69.430   c.m"
"          Centroidal lag                5.171   hours"
"          0.059   0.059   0.001   0.010 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5   Next link "
"          0.059   0.001   0.001   0.010"
" 33      CATCHMENT 202"
"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"          202  Catchment 202"
"          83.400 % Impervious"
"          0.120  Total Area"
"          40.000  Flow length"
"          2.000  Overland Slope"
"          0.020  Pervious Area"
"          40.000  Pervious length"
"          2.000  Pervious slope"
"          0.100  Impervious Area"
"          40.000  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          34.000  Pervious Max.infiltration"
"          9.000  Pervious Min.infiltration"
"          0.500  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"
"          1.500  Impervious Depression storage"
"          0.066   0.001   0.001   0.010 c.m/sec"
"          Catchment 202      Pervious  Impervious Total Area "
"          Surface Area      0.020   0.100   0.120   hectare"

```

"	Time of concentration	9.402	1.705	2.339	minutes"
"	Time to Centroid	116.636	115.187	115.307	minutes"
"	Rainfall depth	77.438	77.438	77.438	mm"
"	Rainfall volume	15.43	77.50	92.93	c.m"
"	Rainfall losses	43.683	2.563	9.389	mm"
"	Runoff depth	33.755	74.875	68.049	mm"
"	Runoff volume	6.72	74.94	81.66	c.m"
"	Runoff coefficient	0.436	0.967	0.879	"
"	Maximum flow	0.006	0.064	0.066	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.066	0.066	0.001	0.010"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.066	0.066	0.066	0.010"	
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.066	0.066	0.066	0.010"	
" 33	CATCHMENT 3"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	3 Catchment EXT1"				
"	26.600 % Impervious"				
"	0.035 Total Area"				
"	7.000 Flow length"				
"	1.000 Overland Slope"				
"	0.026 Pervious Area"				
"	7.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.009 Impervious Area"				
"	7.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	34.000 Pervious Max.infiltration"				
"	9.000 Pervious Min.infiltration"				
"	0.500 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.015	0.066	0.066	0.010 c.m/sec"	
"	Catchment 3	Pervious	Impervious	Total Area	"
"	Surface Area	0.026	0.009	0.035	hectare"
"	Time of concentration	4.068	0.738	2.603	minutes"
"	Time to Centroid	109.847	113.331	111.379	minutes"
"	Rainfall depth	77.438	77.438	77.438	mm"
"	Rainfall volume	19.89	7.21	27.10	c.m"

"	Rainfall losses	44.198	5.436	33.887	mm"
"	Runoff depth	33.241	72.002	43.551	mm"
"	Runoff volume	8.54	6.70	15.24	c.m"
"	Runoff coefficient	0.429	0.930	0.562	"
"	Maximum flow	0.011	0.007	0.015	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.015 0.080 0.066 0.010"				
" 54	POND DESIGN"				
"	0.080 Current peak flow	c.m/sec"			
"	0.020 Target outflow	c.m/sec"			
"	102.2 Hydrograph volume	c.m"			
"	8. Number of stages"				
"	324.000 Minimum water level	metre"			
"	324.650 Maximum water level	metre"			
"	324.000 Starting water level	metre"			
"	0 Keep Design Data: 1 = True; 0 = False"				
"	Level Discharge	Volume"			
"	324.000 0.000	0.000"			
"	324.100 0.00508	6.680"			
"	324.200 0.01016	13.350"			
"	324.300 0.01344	20.030"			
"	324.400 0.01607	26.700"			
"	324.500 0.01832	33.380"			
"	324.650 0.02126	43.390"			
"	324.660 0.02144	43.400"			
"	1. ORIFICES"				
"	Orifice Orifice Orifice Number of"				
"	invert coefficie diameter orifices"				
"	324.000 0.800 0.1000 1.000"				
"	1. SUPERPIPES_1"				
"	1. Type 1 is Pipe"				
"	Downstream Pipe	Pipe	Pipe	Pipe	Pipe Number of"
"	Invert Length	Width	Height	Grade %	Pipes"
"	324.390 39.900	1.500	1.500	0.300	1.000"
"	Peak outflow	0.020	c.m/sec"		
"	Maximum level	324.601	metre"		
"	Maximum storage	40.120	c.m"		
"	Centroidal lag	2.511	hours"		
"	0.015 0.080 0.020 0.010	c.m/sec"			
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.015 0.020 0.020 0.010"				
" 33	CATCHMENT 1"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1 Catchment UC1"				
"	0.010 % Impervious"				
"	0.015 Total Area"				

```

"      15.000  Flow length"
"      4.000  Overland Slope"
"      0.015  Pervious Area"
"      15.000  Pervious length"
"      4.000  Pervious slope"
"      0.000  Impervious Area"
"      15.000  Impervious length"
"      4.000  Impervious slope"
"      0.250  Pervious Manning 'n'"
"      34.000  Pervious Max.infiltration"
"      9.000  Pervious Min.infiltration"
"      0.500  Pervious Lag constant (hours)"
"      5.000  Pervious Depression storage"
"      0.015  Impervious Manning 'n'"
"      0.000  Impervious Max.infiltration"
"      0.000  Impervious Min.infiltration"
"      0.001  Impervious Lag constant (hours)"
"      1.500  Impervious Depression storage"
"          0.007    0.020    0.020    0.010 c.m/sec"
"      Catchment 1      Pervious  Impervious Total Area  "
"      Surface Area      0.015    0.000    0.015    hectare"
"      Time of concentration  4.240    0.769    4.239    minutes"
"      Time to Centroid      110.073    113.313    110.073    minutes"
"      Rainfall depth      77.438    77.438    77.438    mm"
"      Rainfall volume      11.61    0.00    11.62    c.m"
"      Rainfall losses      43.989    5.360    43.985    mm"
"      Runoff depth      33.449    72.078    33.453    mm"
"      Runoff volume      5.02    0.00    5.02    c.m"
"      Runoff coefficient    0.432    0.931    0.432    "
"      Maximum flow      0.007    0.000    0.007    c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"          0.007    0.025    0.020    0.010"
" 38      START/RE-START TOTALS 1"
"      3      Runoff Totals on EXIT"
"      Total Catchment area      0.361    hectare"
"      Total Impervious area      0.231    hectare"
"      Total % impervious      64.008"
" 19      EXIT"

```

**Imbrium® Systems**  
**ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION**

12/10/2025

Province:	Ontario
City:	Guelph
Nearest Rainfall Station:	WATERLOO WELLINGTON AP
Climate Station Id:	6149387
Years of Rainfall Data:	34

Project Name:	81 College Avenue West
Project Number:	32948-23
Designer Name:	Brett Pond
Designer Company:	Van Harten
Designer Email:	brett.pond@vanharten.com
Designer Phone:	519-994-0425
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	81 College Avenue West
------------	------------------------

Drainage Area (ha):	0.27
% Imperviousness:	72.10

Runoff Coefficient 'c': 0.73

Particle Size Distribution:	Fine
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Target TSS Removal (%):	80.0
-------------------------	------

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	7.49
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	25.00
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	248
Estimated Average Annual Sediment Volume (L/yr):	201

Net Annual Sediment (TSS) Load Reduction Sizing Summary	
Stormceptor Model	TSS Removal Provided (%)
EFO4	91
EFO5	95
EFO6	97
EFO8	99
EFO10	100
EFO12	100

**Recommended Stormceptor EFO Model: EFO4**  
**Estimated Net Annual Sediment (TSS) Load Reduction (%): 91**  
**Water Quality Runoff Volume Capture (%): > 90**



### THIRD-PARTY TESTING AND VERIFICATION

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

### PERFORMANCE

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

### PARTICLE SIZE DISTRIBUTION (PSD)

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

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

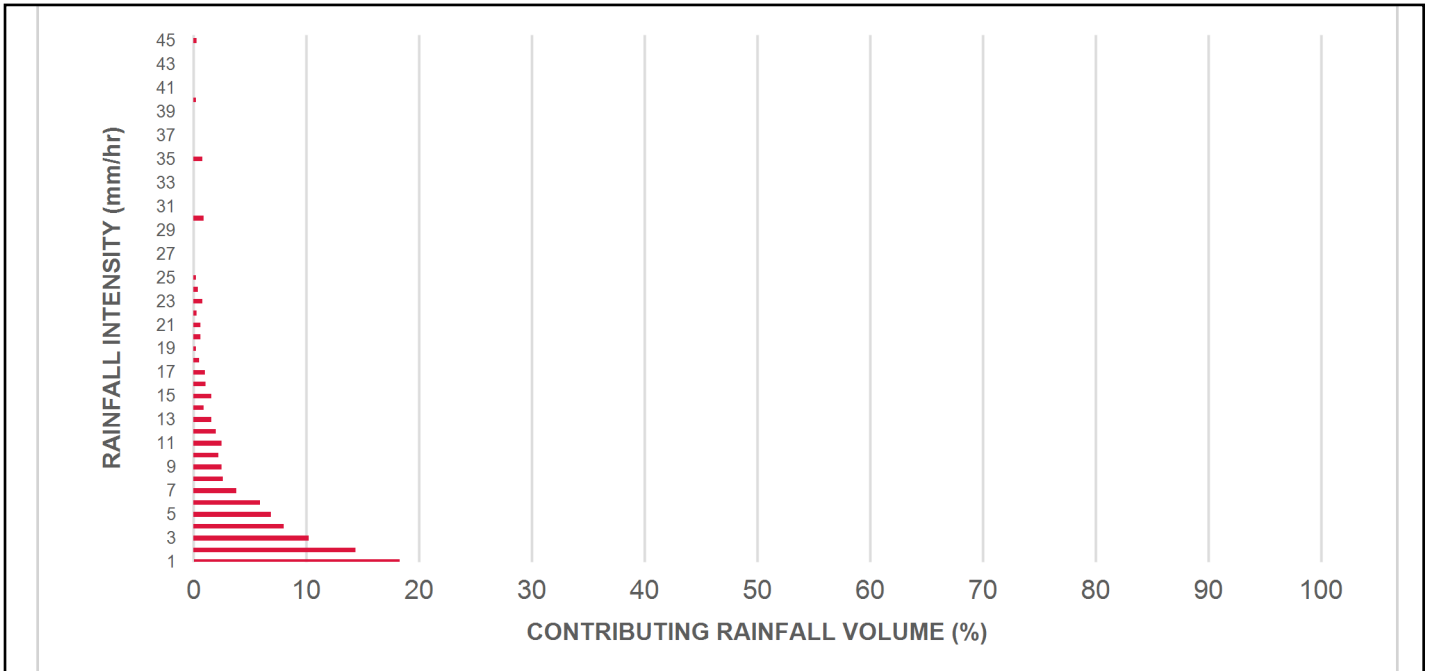
**Upstream Flow Controlled Results**

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	0.27	16.0	14.0	100	8.5	8.5
1.00	18.3	26.8	0.55	33.0	27.0	100	18.3	26.8
2.00	14.4	41.3	1.10	66.0	55.0	100	14.4	41.3
3.00	10.2	51.5	1.65	99.0	82.0	98	10.1	51.3
4.00	8.0	59.5	2.20	132.0	110.0	95	7.6	58.9
5.00	6.9	66.4	2.75	165.0	137.0	92	6.4	65.3
6.00	5.9	72.3	3.30	198.0	165.0	88	5.2	70.4
7.00	3.8	76.1	3.85	231.0	192.0	84	3.2	73.6
8.00	2.6	78.7	4.40	264.0	220.0	82	2.1	75.8
9.00	2.5	81.1	4.95	297.0	247.0	81	2.0	77.8
10.00	2.2	83.3	5.50	330.0	275.0	80	1.7	79.5
11.00	2.5	85.8	6.05	363.0	302.0	78	2.0	81.5
12.00	2.0	87.8	6.60	396.0	330.0	77	1.5	83.0
13.00	1.6	89.4	7.15	429.0	357.0	76	1.2	84.2
14.00	0.9	90.4	7.70	462.0	385.0	75	0.7	84.9
15.00	1.6	91.9	8.25	495.0	412.0	73	1.1	86.1
16.00	1.1	93.0	8.80	528.0	440.0	72	0.8	86.9
17.00	1.0	94.0	9.35	561.0	467.0	71	0.7	87.6
18.00	0.5	94.6	9.90	594.0	495.0	70	0.4	88.0
19.00	0.2	94.8	10.45	627.0	522.0	68	0.2	88.2
20.00	0.6	95.4	11.00	660.0	550.0	67	0.4	88.6
21.00	0.6	96.1	11.55	693.0	577.0	66	0.4	89.0
22.00	0.3	96.4	12.10	726.0	605.0	65	0.2	89.2
23.00	0.8	97.2	12.65	759.0	632.0	64	0.5	89.7
24.00	0.4	97.6	13.20	792.0	660.0	64	0.3	90.0
25.00	0.2	97.8	13.75	825.0	687.0	64	0.1	90.1
30.00	0.9	98.7	16.50	990.0	825.0	63	0.5	90.6
35.00	0.8	99.5	19.25	1155.0	962.0	62	0.5	91.2
40.00	0.2	99.7	22.00	1320.0	1100.0	59	0.1	91.3
45.00	0.3	100.0	24.75	1485.0	1237.0	56	0.2	91.4
<b>Estimated Net Annual Sediment (TSS) Load Reduction =</b>								<b>91 %</b>

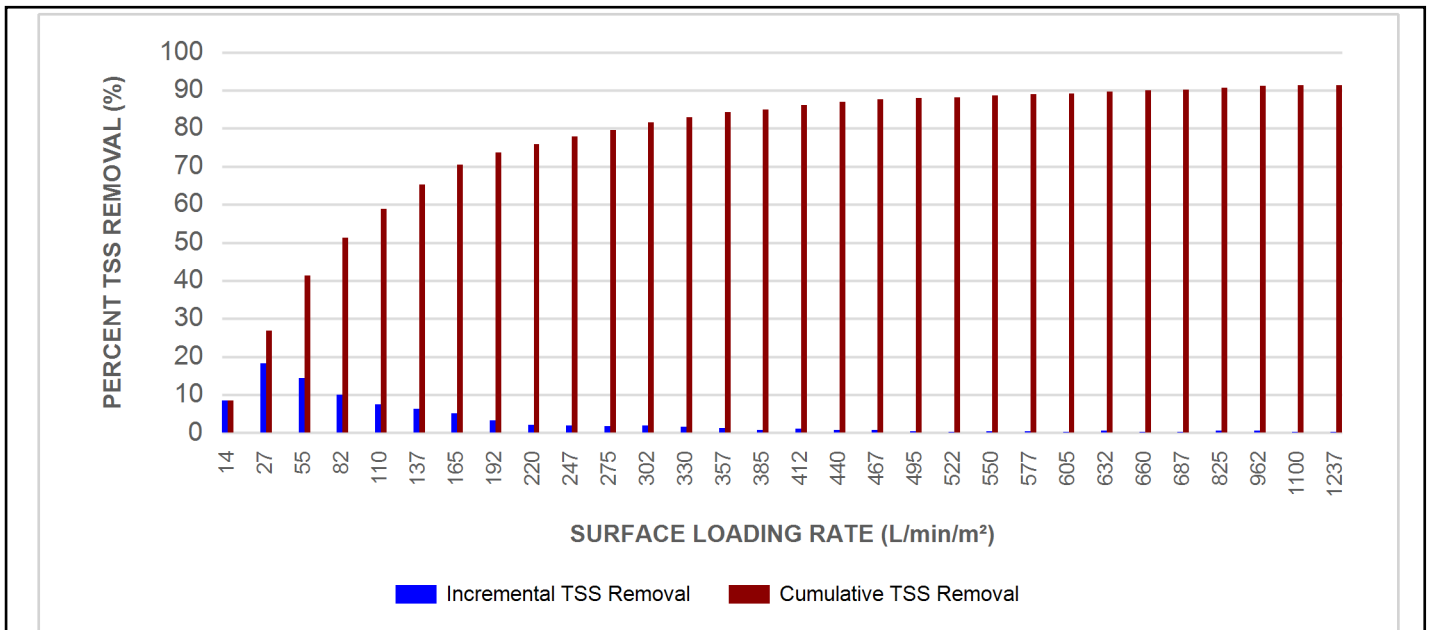
Climate Station ID: 6149387 Years of Rainfall Data: 34



**RAINFALL DATA FROM WATERLOO WELLINGTON AP RAINFALL STATION**



**INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL**



Maximum Pipe Diameter / Peak Conveyance

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

SCOUR PREVENTION AND ONLINE CONFIGURATION

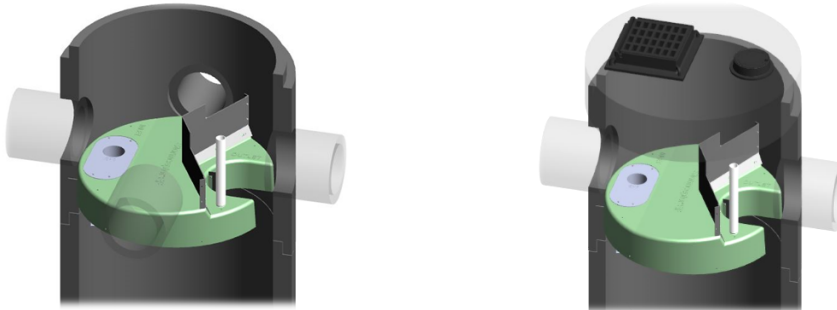
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance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

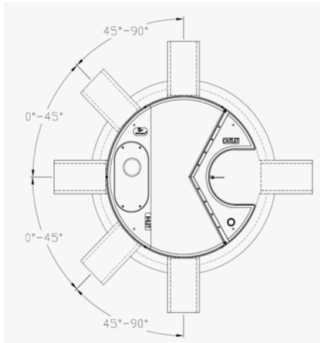
DESIGN FLEXIBILITY

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

OIL CAPTURE AND RETENTION

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





**INLET-TO-OUTLET DROP**

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

- 0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
- 45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

**HEAD LOSS**

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

**Pollutant Capacity**

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

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

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

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

**STANDARD STORMCEPTOR EF/EFO DRAWINGS**

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

**STANDARD STORMCEPTOR EF/EFO SPECIFICATION**

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

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

### PART 1 – GENERAL

#### 1.1 WORK INCLUDED

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

#### 1.2 REFERENCE STANDARDS & PROCEDURES

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

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

#### 1.3 SUBMITTALS

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

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

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

### PART 2 – PRODUCTS

#### 2.1 OGS POLLUTANT STORAGE

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

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

### PART 3 – PERFORMANCE & DESIGN

### 3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

### 3.2 SIZING METHODOLOGY

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

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

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

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

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

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

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

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

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

### 3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid

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

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

**APPENDIX D**  
**WATER BALANCE**

Project No: 32948-23  
Project Name: Proposed Chabad  
Project Location: 81 College Street West, Guelph  
Date: 2025-02-20  
Update: 2025-07-08



## Water Balance Summary Page

	Annual Volumes (cu.m.)			
	Infiltration	Evaporation + Evapotranspiration	Runoff	Total
Existing Condition	341.4	1599.1	1045.7	2986.2
Proposed Condition	164.7	925.9	1895.6	2986.2

**Infiltration Deficit (annual)                      176.7 cu.m.**

Project No: 32948-23  
 Project Name: Proposed Chabad  
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 Date: 2025-02-20  
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### Climate Data

Climate Station WATERLOO WELLINGTON A  
 Climate Station ID 6149387  
 Data Period 1981 to 2010 Canadian Climate Normals station data  
 Latitude 43°27'00.000" N

Month	Mean Temp T deg C	Heat Index I	"α" α	Potential Evapotranspiration mm	Daily Correction Factor	Total Precipitation P mm	Adjusted Potential Evapotranspiration PET mm	P-PET mm
Jan	-6.5	0.00	0.49	0.0	0.81	65.2	0.0	65.2
Feb	-5.5	0.00	0.49	0.0	0.81	54.9	0.0	54.9
Mar	-1.0	0.00	0.49	0.0	1.03	61.0	0.0	61.0
Apr	6.2	1.38	0.52	29.1	1.12	74.5	32.7	41.8
May	12.5	4.00	0.56	61.1	1.27	82.3	77.6	4.7
Jun	17.6	6.72	0.61	87.7	1.29	82.4	112.9	-30.5
Jul	20.0	8.16	0.63	100.4	1.30	98.6	130.9	-32.3
Aug	18.9	7.49	0.62	94.5	1.20	83.9	113.8	-29.9
Sep	14.5	5.01	0.58	71.4	1.06	87.8	75.5	12.3
Oct	8.2	2.11	0.53	39.1	0.95	67.4	37.0	30.4
Nov	2.5	0.35	0.50	11.1	0.81	87.1	9.0	78.1
Dec	-3.3	0.00	0.49	0.0	0.77	71.2	0.0	71.2
<b>Annual</b>	7.0	<b>35.23</b>	<b>1.06</b>	<b>494.4</b>	-	<b>916.3</b>	<b>589.5</b>	<b>326.8</b>

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-20  
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## EXISTING CONDITION WATER BALANCE

### Catchment Data

Catchment Area	0.3259 ha	
Impervious Area	0.0647 ha	
Pervious Area ( <i>remainder</i> )	0.2612 ha	
Infiltration Factor <sup>1</sup>	0.4	
Topography	0.1	
Soils	0.2	
Cover	0.1	
Soil Moisture Capacity <sup>2</sup>	125 mm	Silty Sand per Stonecainr Consulting - Geotechnical Investigation and Hydrogeological Assessment"
Impervious evaporation assumption	10% of rainfall evaporates from impervious surfaces; no evapotranspiration from impervious areas	
% imperviousness	19.9%	

### Catchment Summary

Infiltration	341.4 cu.m.
Evapotranspiration + Evaporation	1599.1 cu.m.
Runoff	1045.7 cu.m.
<b>Total</b>	<b>2986.2 cu.m.</b>

Month	Precipitation mm	Pervious Area									Impervious Areas		Pervious <sup>3</sup>			Impervious Areas	
		Adjusted Potential Evapo-transpiration mm	P-PET mm	Change in Soil Moisture Storage mm	Soil Moisture Storage <sup>5</sup> mm	Actual Evapo-transpiration mm	Soil Moisture Deficit mm	Water Surplus <sup>4</sup> mm	Potential Pervious Infiltration mm	Potential Pervious Runoff mm	Potential Impervious Evaporation mm	Potential Impervious Runoff mm	Evapo-transpiration cu.m.	Runoff cu.m.	Infiltration cu.m.	Evaporation cu.m.	Runoff cu.m.
Jan	65.2	0.0	65.2	0.0	125.0	0.0	0.0	65.2	26.1	39.1	6.5	58.7	0.0	0.0	0.0	4.2	38.0
Feb	54.9	0.0	54.9	0.0	125.0	0.0	0.0	54.9	22.0	32.9	5.5	49.4	0.0	0.0	0.0	3.6	32.0
Mar	61.0	0.0	61.0	0.0	125.0	0.0	0.0	61.0	24.4	36.6	6.1	54.9	0.0	0.0	0.0	3.9	35.5
Apr	74.5	32.7	41.8	0.0	125.0	32.7	0.0	41.8	16.7	25.1	7.5	67.1	85.4	460.9	307.3	4.8	43.4
May	82.3	77.6	4.7	0.0	125.0	77.6	0.0	4.7	1.9	2.8	8.2	74.1	202.7	7.4	4.9	5.3	47.9
Jun	82.4	112.9	-30.5	-30.5	94.5	112.9	30.5	0.0	0.0	0.0	8.2	74.2	295.0	0.0	0.0	5.3	48.0
Jul	98.6	130.9	-32.3	-32.3	62.1	130.9	62.9	0.0	0.0	0.0	9.9	88.7	342.0	0.0	0.0	6.4	57.4
Aug	83.9	113.8	-29.9	-29.9	32.2	113.8	92.8	0.0	0.0	0.0	8.4	75.5	297.4	0.0	0.0	5.4	48.9
Sep	87.8	75.5	12.3	12.3	44.5	75.5	80.5	0.0	0.0	0.0	8.8	79.0	197.3	0.0	0.0	5.7	51.1
Oct	67.4	37.0	30.4	30.4	74.9	37.0	50.1	0.0	0.0	0.0	6.7	60.7	96.6	0.0	0.0	4.4	39.2
Nov	87.1	9.0	78.1	50.1	125.0	9.0	0.0	28.0	11.2	16.8	8.7	78.4	23.4	43.9	29.3	5.6	50.7
Dec	71.2	0.0	71.2	0.0	125.0	0.0	0.0	71.2	28.5	42.7	7.1	64.1	0.0	0.0	0.0	4.6	41.5
<b>Annual</b>	<b>916.3</b>	<b>589.5</b>				<b>589.5</b>		<b>326.8</b>	<b>130.7</b>	<b>196.1</b>	<b>91.6</b>	<b>824.7</b>	<b>1539.8</b>	<b>512.2</b>	<b>341.4</b>	<b>59.3</b>	<b>533.6</b>

- Notes:
- Infiltration factors based on Ontario Ministry of Environment, 2003 Stormwater Management Planning and Design Manual
  - Soil Moisture Capacity is assumed based on Water Holding Capacity per Table 3.1 of the Ontario Ministry of Environment, 2003 Stormwater Management Planning and Design Manual.
  - For pervious areas: runoff, infiltration and evapotranspiration do not occur in months where the average temperature is less than 0 deg C. Precipitation is assumed to accumulate as snowfall during these months and is applied in April for this data set, which is the first month where the average temperature exceeds 0 deg C.
  - Surplus water is not available for runoff or infiltration during months where the evapotranspiration exceeds the precipitation
  - Soil moisture storage is assumed to be at a maximum in the month of March

Project No: 32948-23  
 Project Name: Proposed Chabad  
 Project Location: 81 College Street West, Guelph  
 Date: 2025-02-20  
 Update: 2025-07-08



## PROPOSED CONDITION WATER BALANCE

### Catchment Data

Catchment Area	0.3259 ha	
Impervious Area	0.1999 ha	
Pervious Area ( <i>remainder</i> )	0.1260 ha	
Infiltration Factor <sup>1</sup>	0.4	
Topography	0.1	
Soils	0.2	
Cover	0.1	
Soil Moisture Capacity <sup>2</sup>	125 mm	Silty Sand per Stonecainr Consulting - Geotechnical Investigation and Hydrogeological Assessment"
Impervious evaporation assumption	10.0% of rainfall evaporates from impervious surfaces; no evapotranspiration from impervious areas	
% imperviousness	61.3%	

### Catchment Summary

Infiltration	164.7 cu.m.
Evapotranspiration + Evaporation	925.9 cu.m.
Runoff	1895.6 cu.m.
<b>Total</b>	<b>2986.2 cu.m.</b>

Month	Precipitation mm	Pervious Area									Impervious Areas		Pervious <sup>3</sup>			Impervious Areas	
		Adjusted Potential Evapo-transpiration mm	P-PET mm	Change in Soil Moisture Storage mm	Soil Moisture Storage <sup>5</sup> mm	Actual Evapo-transpiration mm	Soil Moisture Deficit mm	Water Surplus <sup>4</sup> mm	Potential Pervious Infiltration mm	Potential Pervious Runoff mm	Potential Impervious Evaporation mm	Potential Impervious Runoff mm	Evapo-transpiration cu.m.	Runoff cu.m.	Infiltration cu.m.	Evaporation cu.m.	Runoff cu.m.
Jan	65.2	0.0	65.2	0.0	125.0	0.0	0.0	65.2	26.1	39.1	6.5	58.7	0.0	0.0	0.0	13.0	117.3
Feb	54.9	0.0	54.9	0.0	125.0	0.0	0.0	54.9	22.0	32.9	5.5	49.4	0.0	0.0	0.0	11.0	98.8
Mar	61.0	0.0	61.0	0.0	125.0	0.0	0.0	61.0	24.4	36.6	6.1	54.9	0.0	0.0	0.0	12.2	109.7
Apr	74.5	32.7	41.8	0.0	125.0	32.7	0.0	41.8	16.7	25.1	7.5	67.1	41.2	222.3	148.2	14.9	134.0
May	82.3	77.6	4.7	0.0	125.0	77.6	0.0	4.7	1.9	2.8	8.2	74.1	97.8	3.5	2.4	16.5	148.1
Jun	82.4	112.9	-30.5	-30.5	94.5	112.9	30.5	0.0	0.0	0.0	8.2	74.2	142.3	0.0	0.0	16.5	148.2
Jul	98.6	130.9	-32.3	-32.3	62.1	130.9	62.9	0.0	0.0	0.0	9.9	88.7	165.0	0.0	0.0	19.7	177.4
Aug	83.9	113.8	-29.9	-29.9	32.2	113.8	92.8	0.0	0.0	0.0	8.4	75.5	143.4	0.0	0.0	16.8	150.9
Sep	87.8	75.5	12.3	12.3	44.5	75.5	80.5	0.0	0.0	0.0	8.8	79.0	95.2	0.0	0.0	17.6	158.0
Oct	67.4	37.0	30.4	30.4	74.9	37.0	50.1	0.0	0.0	0.0	6.7	60.7	46.6	0.0	0.0	13.5	121.3
Nov	87.1	9.0	78.1	50.1	125.0	9.0	0.0	28.0	11.2	16.8	8.7	78.4	11.3	21.2	14.1	17.4	156.7
Dec	71.2	0.0	71.2	0.0	125.0	0.0	0.0	71.2	28.5	42.7	7.1	64.1	0.0	0.0	0.0	14.2	128.1
<b>Annual</b>	<b>916.3</b>	<b>589.5</b>				<b>589.5</b>		<b>326.8</b>	<b>130.7</b>	<b>196.1</b>	<b>91.6</b>	<b>824.7</b>	<b>742.8</b>	<b>247.1</b>	<b>164.7</b>	<b>183.2</b>	<b>1648.5</b>

- Notes:
- Infiltration factors based on Ontario Ministry of Environment, 2003 Stormwater Management Planning and Design Manual
  - Soil Moisture Capacity is assumed based on Water Holding Capacity per Table 3.1 of the Ontario Ministry of Environment, 2003 Stormwater Management Planning and Design Manual.
  - For pervious areas: runoff, infiltration and evapotranspiration do not occur in months where the average temperature is less than 0 deg C. Precipitation is assumed to accumulate as snowfall during these months and is applied in April for this data set, which is the first month where the average temperature exceeds 0 deg C.
  - Surplus water is not available for runoff or infiltration during months where the evapotranspiration exceeds the precipitation
  - Soil moisture storage is assumed to be at a maximum in the month of March

Project No: 32948-23  
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## WATER BALANCE MITIGATION - CATCHMENT 201 AND 203

### Soakaway Feature Details

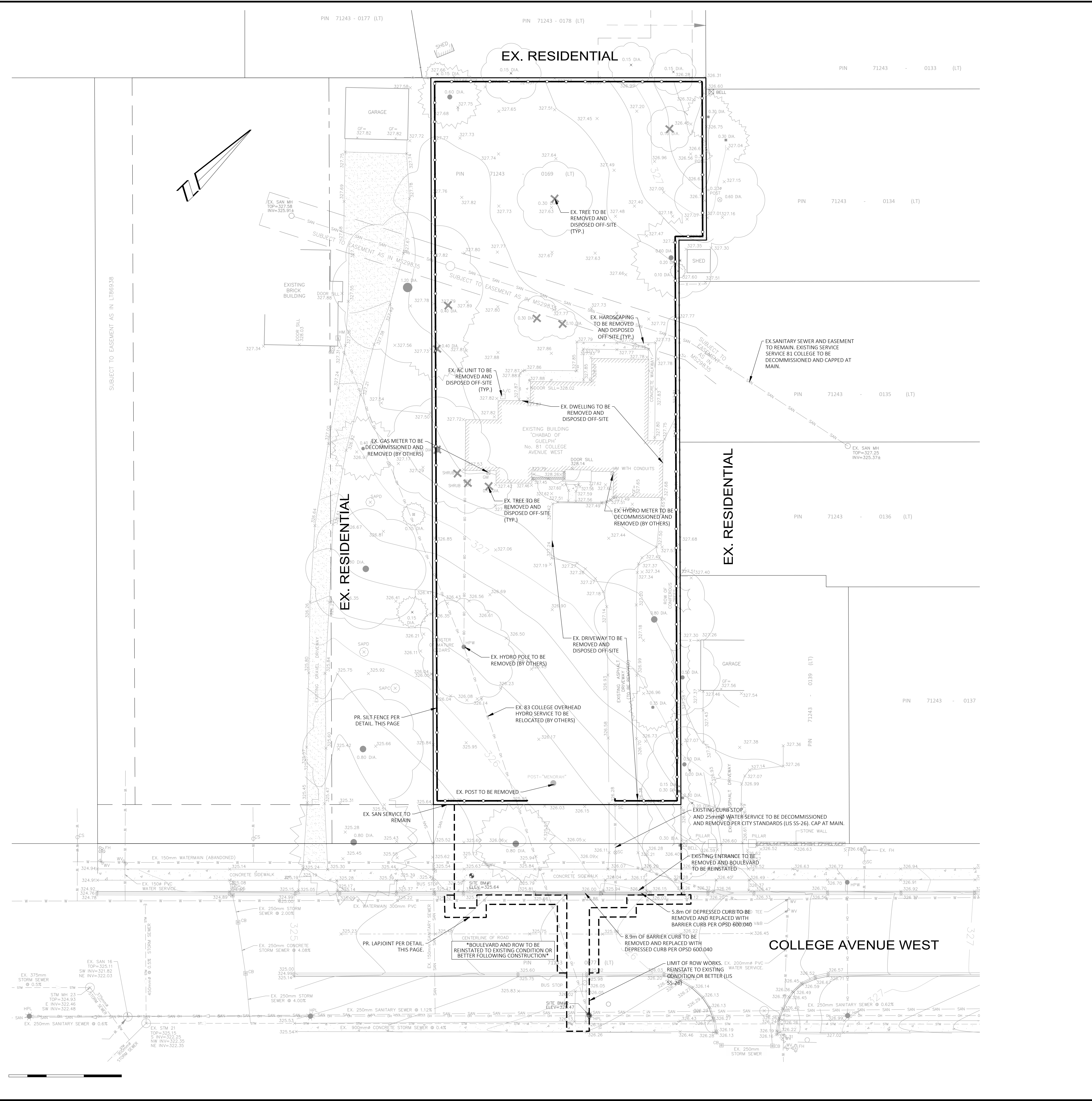
Contributing Drainage Area 1,520 sq.m.  
 Contributing Drainage Area RC 0.77  
 Feature Available Storage Volume 123 cu.m.  
 Drawdown time 2.26 day (with design infiltration rate)

Month	Impervious Area Runoff Depth <sup>2</sup> mm	Days in Month	Potential Recharge <sup>3</sup> cu.m.	Available Recharge Volume <sup>4</sup> cu.m.	Recharge (soakaway) <sup>5</sup> cu.m.	
January	58.7	31	1688.4	68.7	0.0	
February	49.4	28	1525.0	57.8	0.0	
March	54.9	31	1688.4	64.3	0.0	
April	67.1	30	1633.9	78.5	78.5	
May	74.1	31	1688.4	86.7	86.7	
June	74.2	30	1633.9	86.8	86.8	
July	88.7	31	1688.4	103.9	103.9	
August	75.5	31	1688.4	88.4	88.4	
September	79.0	30	1633.9	92.5	92.5	
October	60.7	31	1688.4	71.0	71.0	
November	78.4	30	1633.9	91.7	0.0	
December	64.1	31	1688.4	75.0	0.0	
<b>TOTAL</b>					607.7	cu.m.

### Notes:

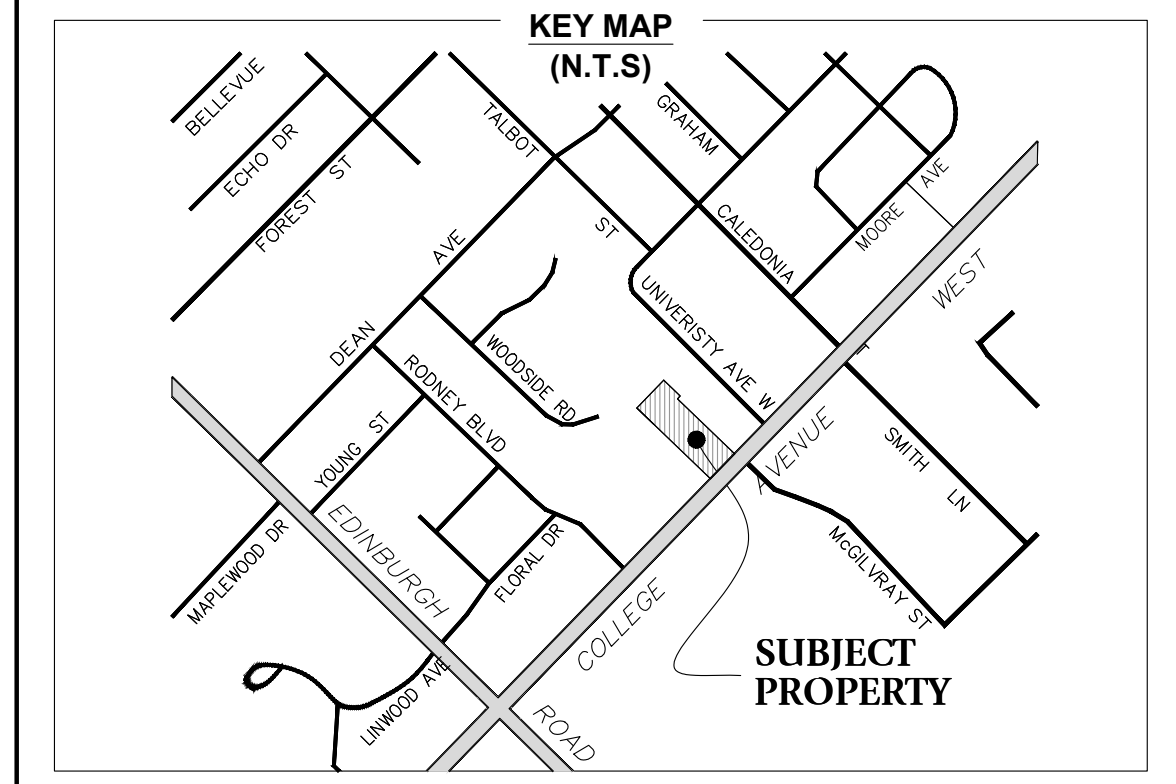
- 1 Contributing drainage area is the clean roof area and landscaped area connected to the infiltration features.
  - 2 Impervious potential runoff depth from previous table (includes a 10% reduction in available depth for depression storage and evaporation)
  - 3 Potential recharge is calculated based on the drawdown period and days per month and assumes that the feature fully drawdown between rainfall events.
  - 4 Available recharge volume is the volume available from the contributing drainage area (e.g. runoff depth x contributing drainage area).
  - 5 Additional recharge soakaway is the lesser of the potential recharge volume and the available recharge volume
- We have assumed that the connected roofs will not contribute to the soakaway during the winter months (e.g. November through March)

## DRAWINGS



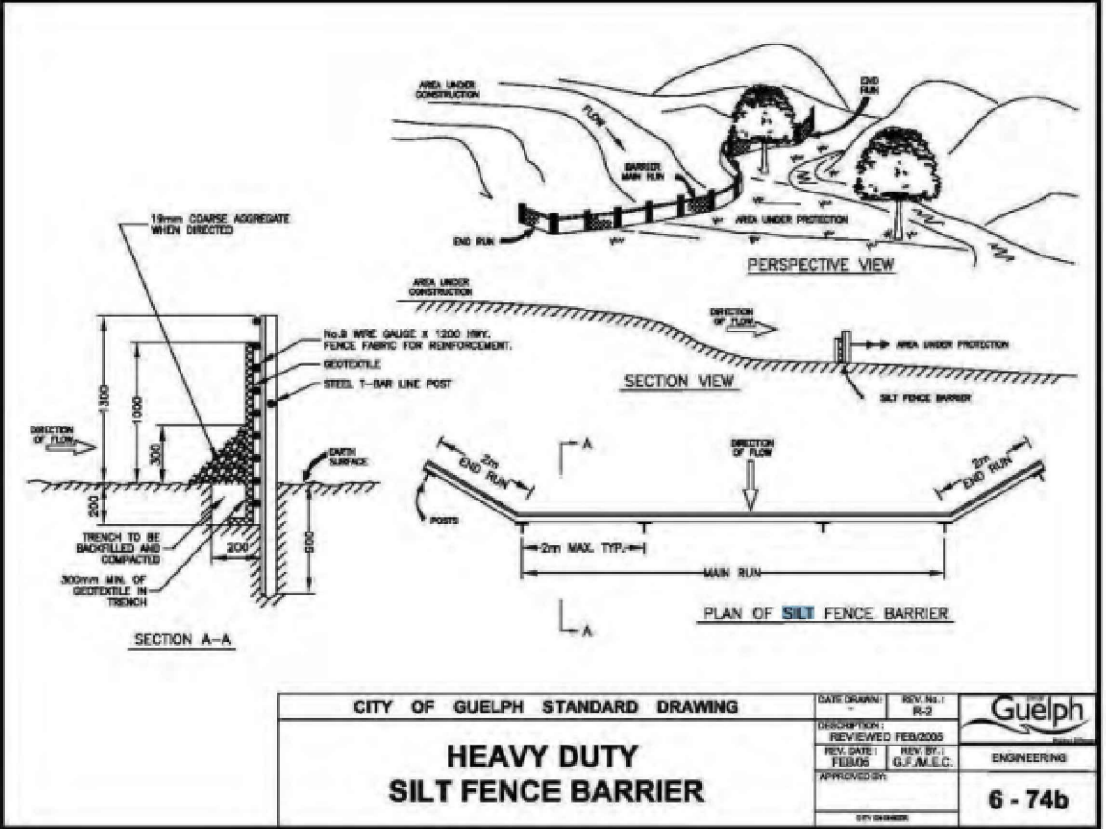
**EROSION AND SEDIMENT CONTROL NOTES**

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES TO BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROLS SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF INSPECTION.
2. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT TEMPORARY SEDIMENT CONTROLS ARE FUNCTIONING AS INTENDED THROUGHOUT THE CONSTRUCTION PERIOD.
3. DISTURBED AREAS TO BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED/RESTORED AS THE WORK PROGRESSES.
4. ALL DISTURBED GROUND LEFT INACTIVE FOR 30 DAYS SHALL BE VEGETATED, SUBJECT TO WEATHER CONDITIONS.
5. THE EROSION AND SEDIMENT CONTROL STRATEGIES ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE IDENTIFIED MEASURES ON THE PLAN ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. ADDITIONAL ESC MEASURES ARE TO BE KEPT ON SITE AND USED AS NECESSARY. NO ALTERNATIVE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE DESIGN CONSULTANT AND THE CITY.
6. INSPECTION OF ESC MEASURES SHOULD OCCUR, AT MINIMUM: DURING PERIODS OF EARTHWORKS ACTIVITIES:
  - ON A WEEKLY BASIS;
  - AFTER EVERY RAINFALL EVENT (25mm RAIN IN ANY 24 HOUR PERIOD);
  - AFTER SIGNIFICANT SNOWMELT EVENTS;
  - DAILY DURING PERIODS OF EXTENDED RAIN OR SNOWMELT.
7. DURING INACTIVE PERIODS:
  - ONCE A MONTH;
  - AFTER SIGNIFICANT RAINFALL OR SNOWMELT EVENTS.
8. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, TO BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO SEWERS AND/OR DITCHES.
9. ALL CONSTRUCTION VEHICLES MUST ENTER AND EXIT THE SITE ONLY FROM THE APPROVED ACCESS ROUTE.
10. CONTRACTOR TO BE RESPONSIBLE FOR PROVISION, MAINTENANCE AND RESTORATION OF THE CONSTRUCTION ACCESS.
11. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING MUNICIPAL ROADWAYS AND SIDEWALKS ARE CLEARED OF ALL SEDIMENTS FROM VEHICULAR TRACKING AT THE END OF EACH WORKING DAY. STREET SWEEPING TO BE UNDERTAKEN AS NEEDED. ANY MATERIAL TRACKED FROM THE SITE SHALL BE PROMPTLY REMOVED FROM THE ROADWAY AT THE CONTRACTOR'S EXPENSE.
12. DUST SUPPRESSION IS TO BE PROVIDED AS REQUIRED OR AS DIRECTED BY THE CITY.
13. THE CONTRACTOR SHALL TAKE CARE AND CONTROL SPILLS, FLUIDS AND MATERIALS DURING CONSTRUCTION TO MINIMIZE RISK TO THE ENVIRONMENT.
14. DEWATERING WILL NOT BE PERMITTED DURING CONSTRUCTION. SHOULD DEWATERING BE REQUIRED, A SEPARATE PLAN AND APPROVAL IS TO BE OBTAINED. NO PUMPING OF SEDIMENT LADEN RUNOFF FROM THE SITE IS PERMITTED AT ANY TIME.
15. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE STABILIZATION.
16. ACCUMULATED SEDIMENT TO BE REMOVED FROM THE SEDIMENT BARRIER ONCE IT REACHES A DEPTH OF MAXIMUM 300mm. ALL ACCUMULATED SEDIMENT IS TO BE REMOVED PRIOR TO REMOVING THE TEMPORARY SEDIMENT CONTROL FENCING.
17. AN AFTER HOURS CONTACT LIST IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES. ALL THE PLANS SHOULD HAVE THE NAME AND CONTACT INFORMATION FOR THE PERSON RESPONSIBLE FOR MAINTENANCE OF ESC MEASURES.
18. ANY SEDIMENT OR OTHER SPILL FROM THE SITE IS TO BE REPORTED TO THE MINISTRY OF ENVIRONMENT (SPILL ACTION CENTRE) AT 1-800-268-6060.



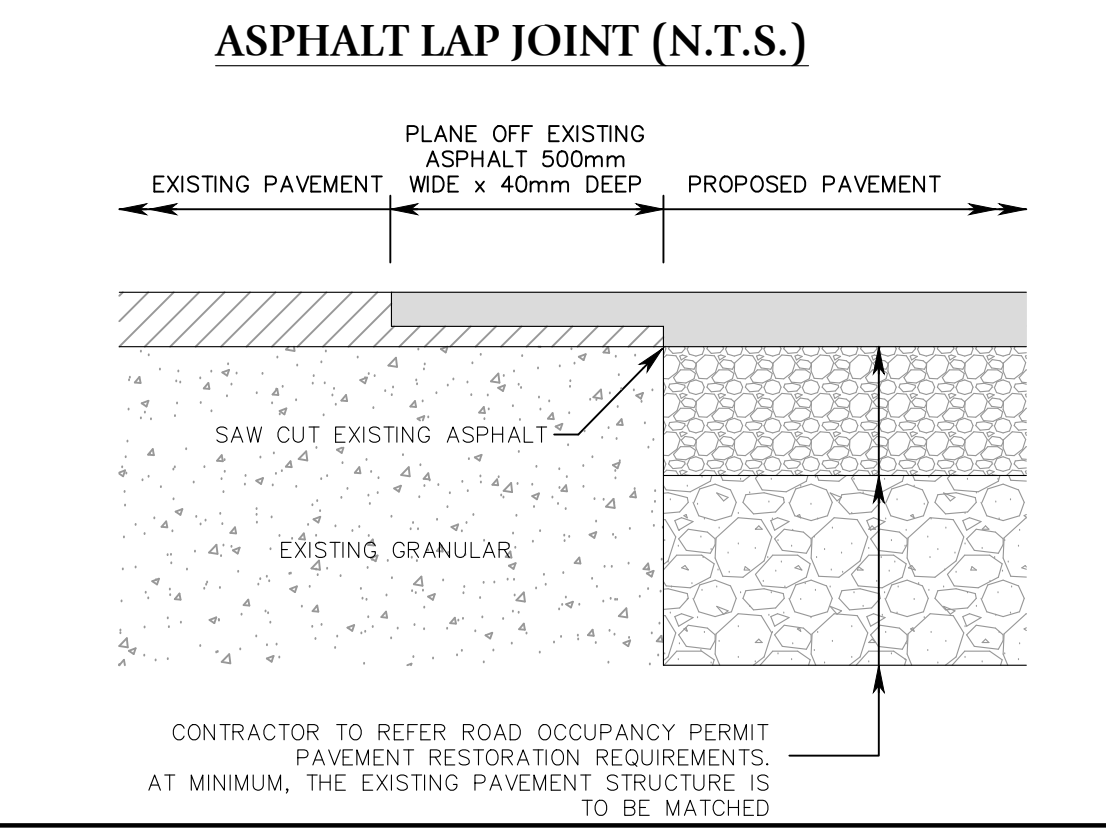
**LEGEND:**

EXISTING SPOT ELEVATION	+ 327.71	DECIDUOUS TREE	(Symbol)
EXISTING CONTOUR (0.25m INTERVAL)	327	CONIFEROUS TREE	(Symbol)
EX. TREE TO BE REMOVED	X	TREE TO BE REMOVED	(Symbol)
EX. OVERHEAD HYDRO	OH		
EX. FENCELINE	X-X-X-X-X		
EX. CENTRALINE OF ROAD	---		
EX. GAS LINE	GAS		
EX. SANITARY SEWER	SAN		
EX. WATER SERVICE	W		
EX. GAS METER	GM		
PROP. SILT FENCE	---		
EX. MANHOLE	(Symbol)		
EX. WATER VALVE	WV		



**CALL BEFORE YOU DIG**  
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**METRIC:**  
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



NO.	ISSUED FOR 2nd SUBMISSION	BY	DATE
1	ISSUED FOR 2nd SUBMISSION	BP	DEC. 10, 2025

**CAUTION:**  
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**Van Harten**  
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**BOUNDARIES NOTE**  
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**NOT FOR CONSTRUCTION**

**LEGAL DESCRIPTION:**  
 PART OF LOT 3, REGISTERED PLAN 249  
 BEING PARTS 7, 8 AND 9  
 DEPOSITED PLAN 61R-9059  
 CITY OF GUELPH  
 COUNTY OF WELLINGTON

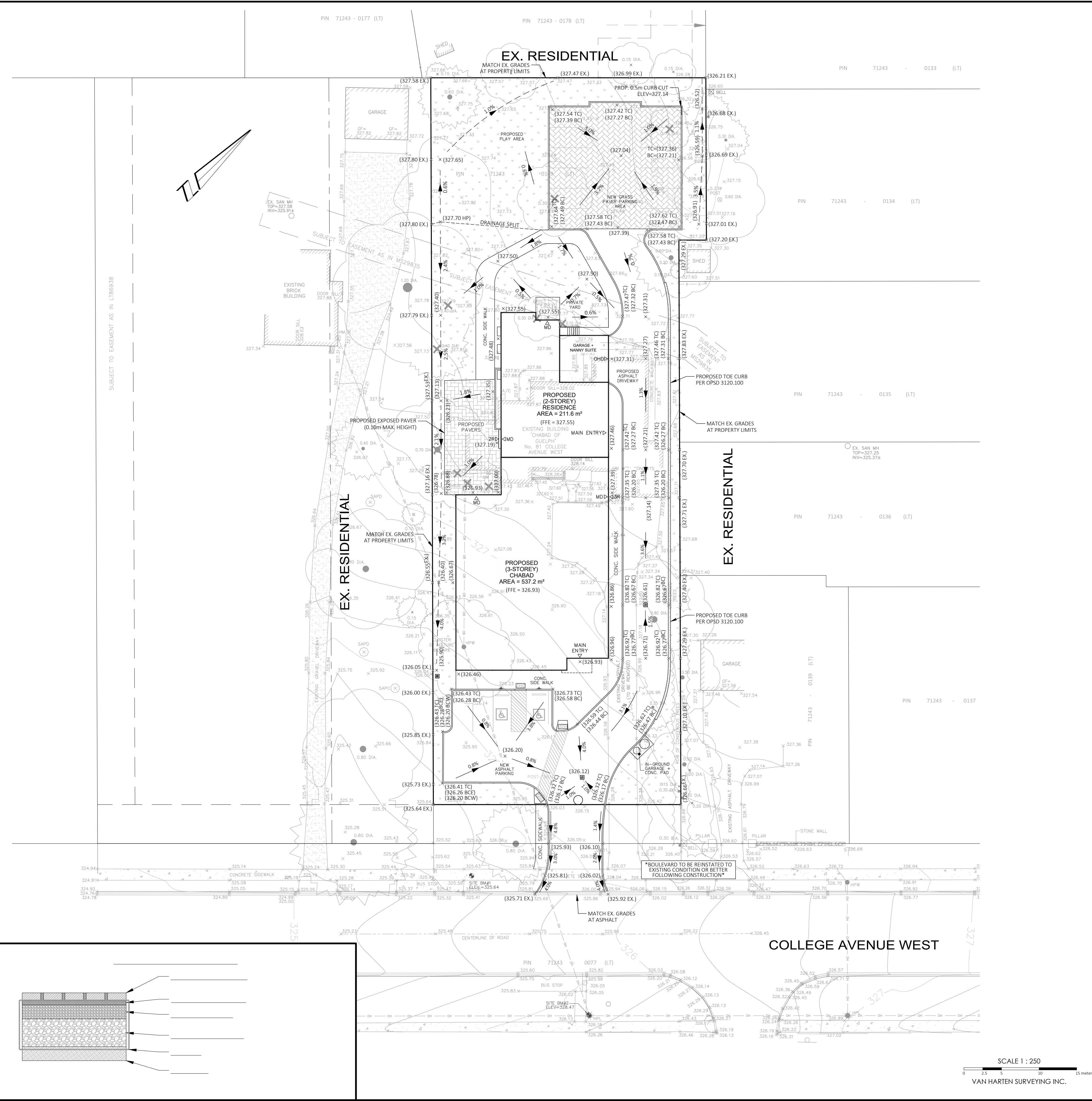
**CLIENT:**  
 CHABAD OF GUELPH

**PROJECT No:**  
 32948-23

**PROJECT:**  
 PROPOSED CHABAD BUILDING  
 81 COLLEGE AVENUE WEST

**DRAWING TITLE:**  
 REMOVALS, EROSION AND SEDIMENT  
 CONTROL PLAN

**SHEET No:** 1 OF 4  
**DRAWING No:** C00  
**REVISION:** 1



**GENERAL NOTES:**

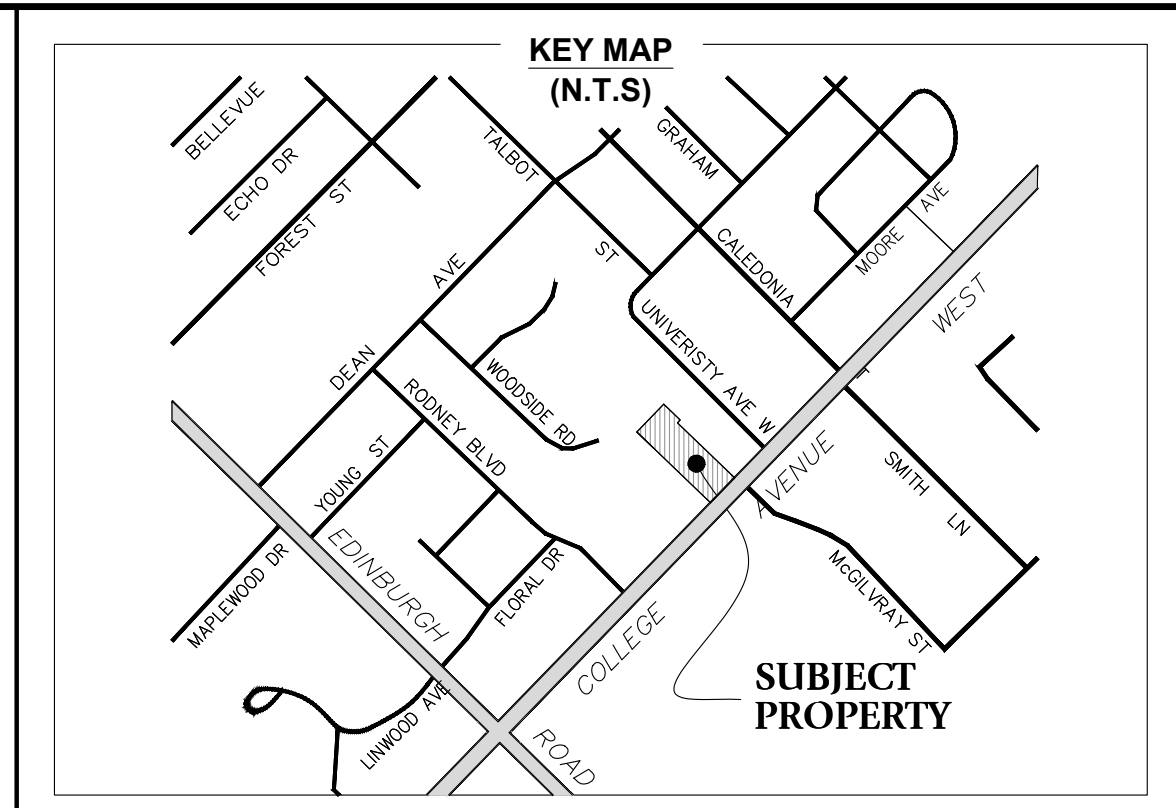
- CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH MOST RECENT VERSION OF CITY OF GUELPH MUNICIPAL SERVING STANDARDS, THE ONTARIO BUILDING CODE, AND GPS AND OPSS AND UNDERGROUND SERVICE MATERIALS AND METHODS TO BE IN ACCORDANCE WITH THE LATEST APPLICABLE CODES AND STANDARDS.
- LIST OF MATERIAL: SEE THE CITY OF GUELPH DEM FOR MATERIAL SPECS, TO BE SUBMITTED TO THE CITY A MINIMUM OF 2 WEEKS PRIOR TO START OF CONSTRUCTION.
- ALL CONSTRUCTION TO BE CARRIED OUT IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
- A PRE-CONSTRUCTION MEETING IS REQUIRED BETWEEN THE DEVELOPER, DEVELOPER ENGINEER AND CONTRACTOR, AND CITY STAFF PRIOR TO THE START OF ANY CONSTRUCTION.
- CONTRACTOR TO SUBMIT PROOF OF INSURANCE AND WSIB CLEARANCE CERTIFICATE TO THE CITY PRIOR TO THE START OF CONSTRUCTION.
- THE OWNER IS RESPONSIBLE FOR THE COORDINATION OF ALL REQUIRED UTILITIES.
- THE OWNER IS RESPONSIBLE FOR SATISFYING HIMSELF THAT THERE IS ADEQUATE FIRE PROTECTION AVAILABLE FOR HIS PURPOSES.
- TEMPORARY SEDIMENT CONTROLS TO BE INSTALLED PRIOR TO ANY CONSTRUCTION ON SITE AND MAINTAINED FOR THE DURATION OF THE CONSTRUCTION PERIOD TO THE SATISFACTION OF THE CITY.
- DISTURBED AREAS TO BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RELATING TO DAMAGE OF SAME.
- THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES FOR THE PURPOSES OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.
- A GEOTECHNICAL CONSULTANT IS TO BE RETAINED TO CARRY OUT NECESSARY INSPECTIONS AND TESTING DURING CONSTRUCTION OF THE WORKS TO ENSURE PLACEMENT OF PROPER MATERIALS AND ADEQUATE COMPACTION.
- UNLESS OTHERWISE SPECIFIED BY THE GEOTECHNICAL CONSULTANT, THE PAVEMENT STRUCTURE FOR PARKING AREAS SHALL COMPRISE OF A MIN. 40mm H.L.S, 60mm H.L.R OR H.L.B, 150mm GRANULAR 'A' AND 450mm GRANULAR 'B'.
- IT IS RECOMMENDED THAT A TACKCOAT IN CONFORMANCE WITH OPSS 308 BE APPLIED TO THE EDGE AND SURFACE OF ALL MILLED ASPHALT PRIOR TO PLACEMENT OF NEW ASPHALT.
- ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY AN OLS AT THE CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.
- ANY ERRORS, OMISSIONS AND/OR CHANGE OF CONDITIONS ON SITE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
- THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR TRANSACTION OR MORTGAGE PURPOSES.
- FOLLOWUP OF EXISTING BUILDING AND CONSTRUCTION OF NEW BUILDING TO DEMOLITION RECOMMENDATIONS OUTLINED BY THE GEOTECHNICAL ENGINEER.

**WORKS WITHIN THE MUNICIPAL RIGHT OF WAY**

- AN ENTRANCE PERMIT IS REQUIRED PRIOR TO CONSTRUCTION OF THE PROPOSED SITE ENTRANCE.
- A ROAD OCCUPANCY PERMIT IS REQUIRED PRIOR TO ANY CONSTRUCTION WITHIN THE MUNICIPAL RIGHT-OF-WAY.
- CONTRACTOR TO CONFORM TO REQUIREMENTS OF ENTRANCE PERMIT AND ROAD OCCUPANCY PERMIT WHERE THE PERMITS DIFFER FROM THESE NOTES, THE PERMIT CONDITIONS SHALL TAKE PRECEDENCE.
- ALL WORKS WITHIN THE MUNICIPAL RIGHT-OF-WAY ARE AT THE DEVELOPER'S COST AND ARE TO BE COMPLETED BY A CITY APPROVED CONTRACTOR.
- NO WORK SHALL PROCEED WITHIN CITY ROAD ALLOWANCES OR ON OTHER CITY PROPERTY WITHOUT PRIOR (MINIMUM 96 HOURS) WRITTEN NOTIFICATION TO THE CITY AND NOT UNTIL RECEIPT OF CITY APPROVAL. CONTRACTOR TO PROVIDE THE CITY WITH PROOF OF INSURANCE AND WSIB CLEARANCE CERTIFICATE PRIOR TO CONSTRUCTION.
- CONTRACTOR TO BE RESPONSIBLE FOR PROPERLY COMPACTING BACKFILL MATERIAL AND RESTORING SURFACES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY.
- ALL MATERIAL TO BE PLACED IN LAYERS NOT EXCEEDING 300mm LIFTS. GEOTECHNICAL TESTING TO BE COMPLETED BY THE GEOTECHNICAL CONSULTANT WITH RESULTS PROVIDED TO THE CITY.
- ALL GRANULAR AND ASPHALT MATERIALS AND PLACEMENT TO BE IN ACCORDANCE WITH OPSS 310, 314, AND 1010 UNLESS OTHERWISE SPECIFIED.
- BOULEVARDS THAT ARE NOT HARD-SURFACED AREA TO BE RESTORED WITH MINIMUM 200mm TOPSOIL AND No. 1 NURSERY SOIL TO THE SATISFACTION OF THE CITY.
- REPLACEMENT CONCRETE CURB AND GUTTER TO BE PER OPSD 600.040.
- SIDEWALK PANELS TO BE REPLACED IN FULL CONCRETE SIDEWALK TO BE PLACED AT A MINIMUM OF 2% GRADE SLOPE TOWARDS THE ROAD UNLESS OTHERWISE STATED ON THE GRADING PLAN WITH A MINIMUM THICKNESS OF 125mm WITH THE THICKNESS INCREASING TO 200mm AT BUILDING ENTRANCES AND AT PEDESTRIAN RAMPS. A GRANULAR 'A' BASE SHALL BE A MINIMUM OF 125mm THICKNESS AND INCREASED TO MATCH THICKNESS OF CONCRETE AT VARIOUS LOCATIONS. ALL CONSTRUCTION JOINTS TO BE SAW CUT IN HARDENED CONCRETE WITHIN A SUFFICIENT TIME OF PLACING SIDEWALK.
- WHERE NEW ASPHALT MATCHES EXISTING ASPHALT, A MINIMUM 0.5m LAP JOINT SHALL BE INSTALLED.
- STREET CURBS ARE TO BE CONTINUOUS THROUGH THE PROPOSED ENTRANCE.
- SUBDRAINS TO REMAIN INTACT AND AT GRADE DURING CONSTRUCTION AND ROAD RESTORATION.
- ROAD MUST BE MAINTAINED TO A MINIMUM OF ONE LANE AT ALL TIMES FOR EMERGENCY ACCESS PER QTM GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL, BOOK 7 - TEMPORARY CONDITIONS. THE CONTRACTOR IS TO SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY PRIOR TO CONSTRUCTION.

**GRADING NOTES:**

- UNDERSIDE OF FOOTING TO BE MINIMUM 1.22m BELOW EXTERIOR GRADES AROUND BUILDING. TOP OF FOUNDATION WALL TO BE MINIMUM 0.15m ABOVE EXTERIOR GRADES AROUND BUILDING. LOT TO BE GRADED SO THAT WATER DOES NOT POND AT/NEAR BUILDINGS.
- DRIVEWAY AND PARKING AREAS TO BE BETWEEN 0.8% AND 5% UNLESS OTHERWISE NOTED.
- TACTILE WARNING PLATES ARE TO BE PROVIDED AT ALL DROP CURB LOCATIONS PER OPSD 310.039.
- ACCESSIBLE PATH TO BE GRADED AT MAXIMUM 5%.
- ALL LANDSCAPE AREAS ON SITE TO BE RESTORED WITH MINIMUM OF 150mm TOPSOIL AND EITHER SEED OR SOD UNLESS OTHERWISE SPECIFIED BY LANDSCAPE PLANS.
- MATCH EXISTING GRADES AT ALL PROPERTY LIMITS. GRADING NOT TO EXTEND ONTO ADJACENT PROPERTIES WITHOUT PRIOR WRITTEN CONSENT OF ADJACENT PROPERTY OWNER.
- SLOPES TO BE MAXIMUM 4H:1V UNLESS OTHERWISE NOTED.
- RETAINING WALLS TO BE DESIGNED BY OTHERS AND IN CONFORMANCE WITH THE ONTARIO BUILDING CODE.
- UNLESS OTHERWISE RECOMMENDED BY A GEOTECHNICAL CONSULTANT, ALL PARKING GRANULAR MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY.
- UNLESS OTHERWISE RECOMMENDED BY A GEOTECHNICAL CONSULTANT, ALL GENERAL BACKFILL TO BE APPROVED MATERIAL AND COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
- FILL MATERIALS TO BE FREE OF ANY DELETERIOUS MATERIAL INCLUDING DEBRIS, LARGE ROCKS, ORGANICS, ETC. FILL MATERIAL TO BE FREE FROM LENSES, POCKETS OR LAYERS OF MATERIAL WHICH ARE SIGNIFICANTLY DIFFERENT IN GRADATION FROM SURROUNDING MATERIAL IN THE SAME ZONING. CARE SHOULD BE TAKEN TO ENSURE THAT FILL MATERIAL DOES NOT SEGREGATE DURING TRANSPORTATION OR STORAGE. IF SEGREGATION OCCURS, MATERIAL SHOULD BE MIXED PRIOR TO PLACEMENT.
- ALL EARTHWORKS ACTIVITIES TO BE UNDERTAKEN IN COMPLIANCE WITH 0.Reg 406/19 REGARDING ON-SITE AND EXCESS SOIL MANAGEMENT.



**LEGEND:**

EXISTING SPOT ELEVATION	+ 327.71	DECIDUOUS TREE	(Symbol)
EXISTING CONTOUR (0.25m INTERVAL)	327	CONIFEROUS TREE	(Symbol)
PROPOSED SWALE	(Symbol)	TREE TO BE REMOVED	(Symbol)
PROPOSED GRADE	x (326.93)		
PROPOSED DRAINAGE DIRECTION	1.4%		
PROPOSED CATCHBASIN	CB		
PROPOSED MANHOLE	MH		
PROPOSED 3:1 MAXIMUM SLOPE	(Symbol)		

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**BENCHMARK**  
 ELEVATIONS ARE BASED ON GPS OBSERVATIONS TO PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM AND HAVE BEEN CORRECTED TO ORTHOMETRIC ELEVATIONS ON THE GVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTV2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

SITE BENCH MARK 1:  
 CUT CROSS ON SIDEWALK, 325.64m.  
 SITE BENCH MARK 2:  
 NAIL IN HYDRO POLE, 328.47m.

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

NO.	REVISION	BY	DATE
1	ISSUED FOR 2nd SUBMISSION	BP	DEC. 10, 2025
0	ISSUED FOR 1st SUBMISSION	BP	JULY 8, 2025

**DRAWING REVISION SCHEDULE**

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 - THIS SKETCH IS PROTECTED BY COPYRIGHT

LICENCED PROFESSIONAL ENGINEER  
 100583029  
 DEC 10 2025  
 PROVINCE OF ONTARIO

**Van Harten**  
 LAND SURVEYORS - ENGINEERS

Kitchener/Waterloo Ph: 519-742-8371  
 Guelph Ph: 519-821-2763  
 Orangeville Ph: 519-940-4110

www.vanharten.com info@vanharten.com

DRAWN BY: CE DESIGN BY: BP CHECKED BY: BP

G:\GUELPH\249\ACAD\LD\PILOT 3 (32948-23 CHABAD OF GUELPH) UTM 2010 REV 1.dwg

**LEGAL DESCRIPTION:**  
 PART OF LOT 3, REGISTERED PLAN 249  
 BEING PARTS 7, 8 AND 9  
 DEPOSITED PLAN 61R-9059  
 CITY OF GUELPH  
 COUNTY OF WELLINGTON

CLIENT: CHABAD OF GUELPH  
 PROJECT No: 32948-23

PROJECT: PROPOSED CHABAD BUILDING  
 81 COLLEGE AVENUE WEST

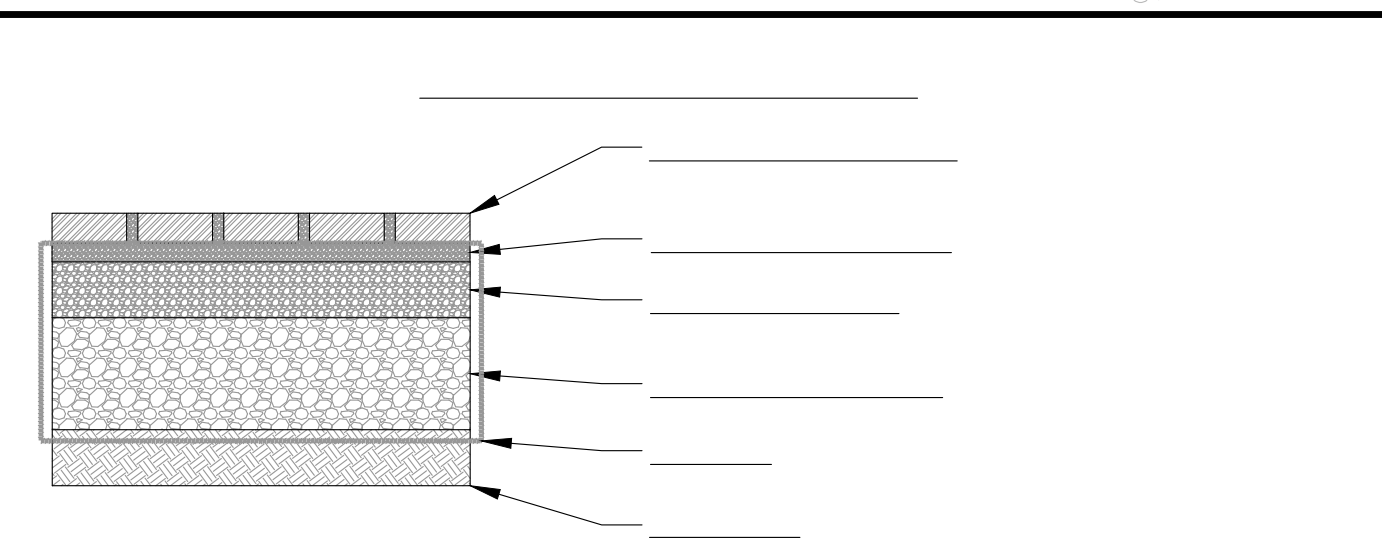
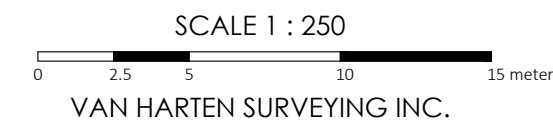
DRAWING TITLE: SITE GRADING PLAN

SHEET No: 2 OF 4	DRAWING No: C01	REVISION: 1
DRAWING SCALE: 1:250		

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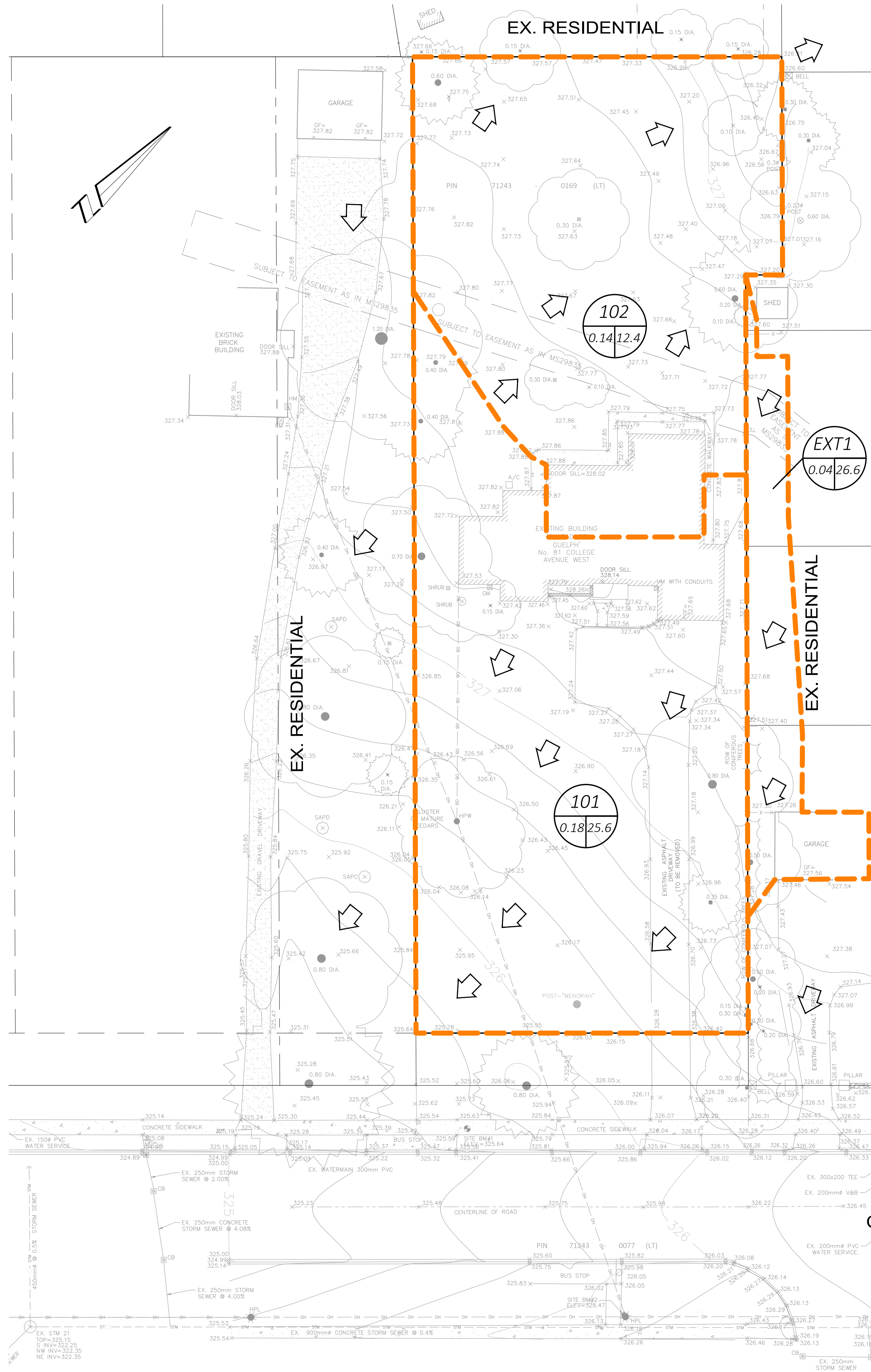
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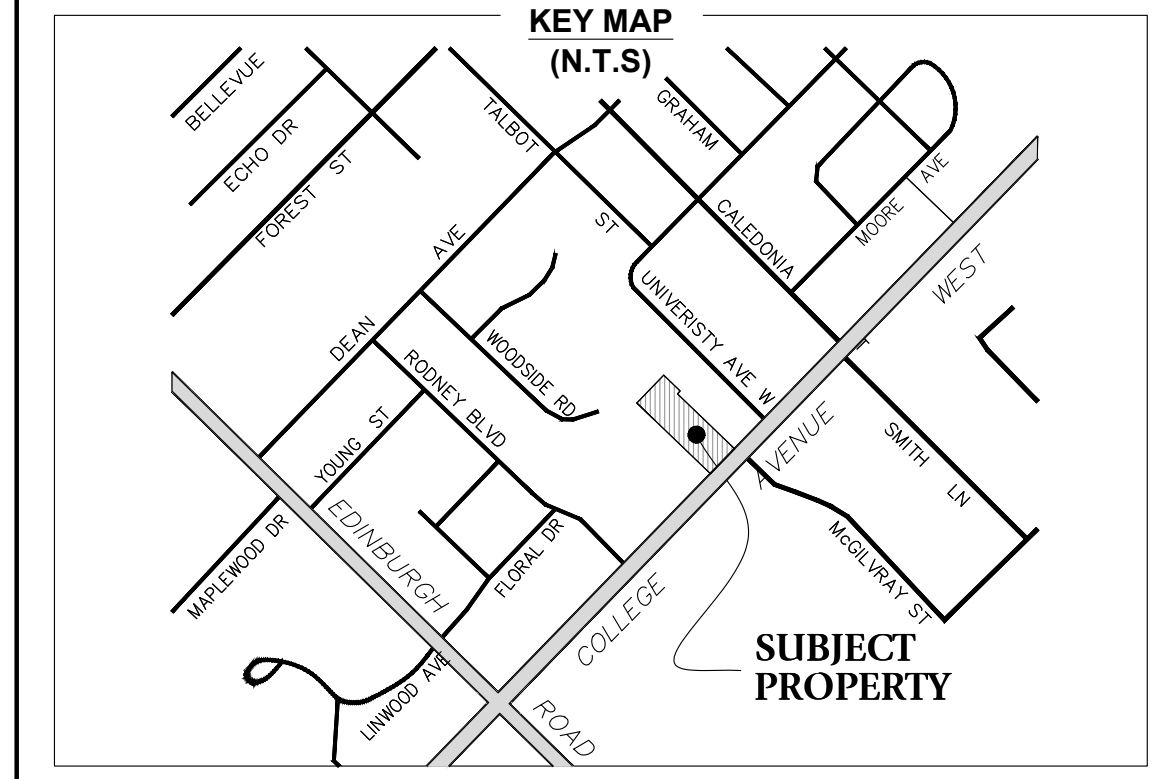
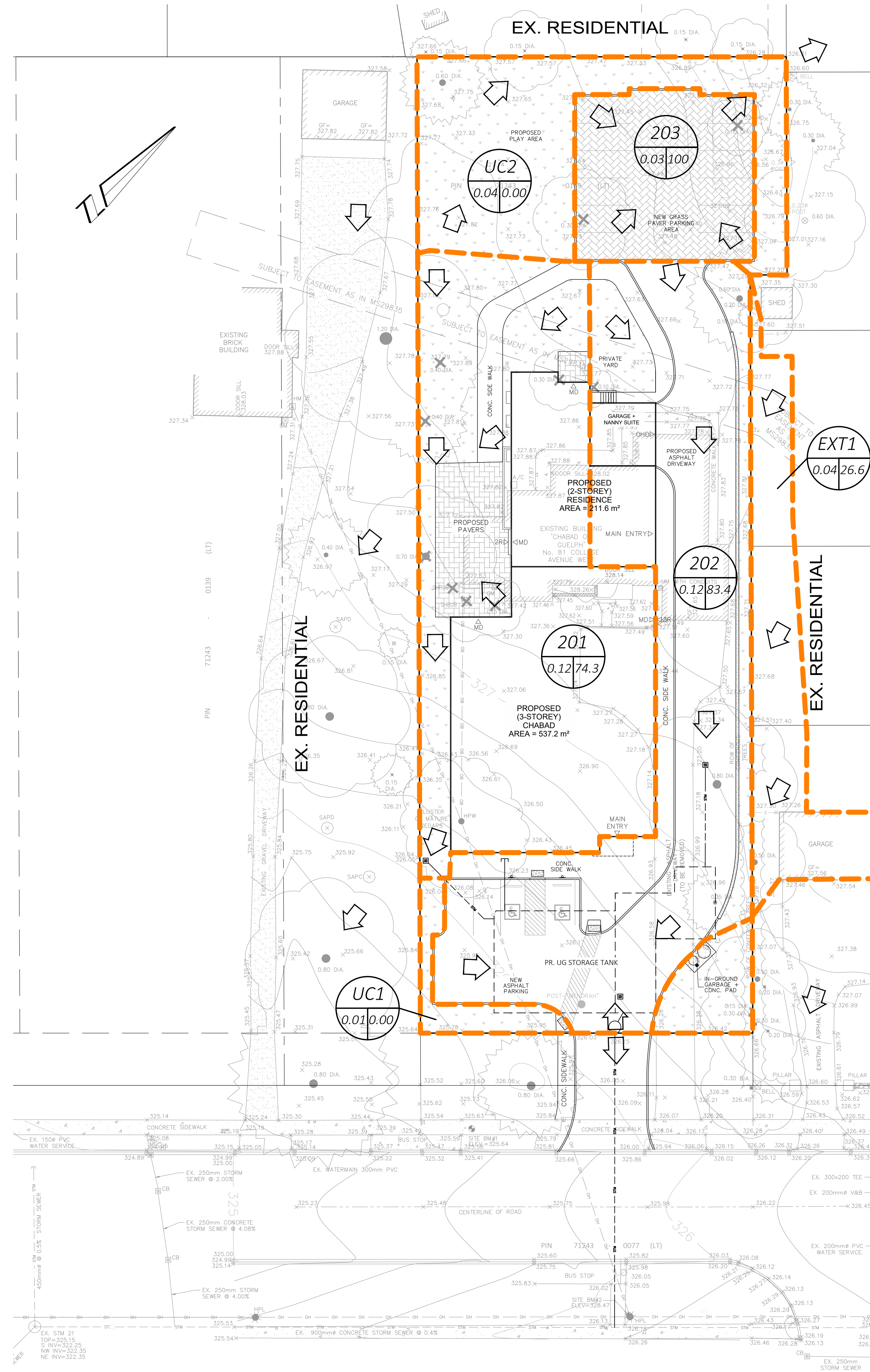




**PRE-DEVELOPMENT  
DRAINAGE PLAN**



**POST-DEVELOPMENT  
DRAINAGE PLAN**



**LEGEND:**

- PR. STORM SEWER
- PR. RETAINING WALL
- PR. MANHOLE
- PR. CATCHBASIN
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- PR. SLOPE

**101** CATCHMENT I.D.  
0.07/29.9 AREA (ha) | PERCENT IMP. (%)

**METRIC:**  
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NO.	REVISION	ISSUED FOR 1st SUBMISSION	ISSUED FOR 2nd SUBMISSION	BY	DATE
1				BP	DEC. 10, 2025
0				BP	JULY 8, 2025

**REVISION SCHEDULE**

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LICENCED PROFESSIONAL ENGINEER  
B.D. POND  
100583029  
DEC 10 2025  
PROVINCE OF ONTARIO

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DRAWN BY: CE DESIGN BY: BP CHECKED BY: BP

G:\GUELPH\249\ACAD\LD\PTLOT 3 (32948-23 CHABAD OF GUELPH) UTM 2010 REV 1.dwg

**LEGAL DESCRIPTION:**  
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BEING PARTS 7, 8 AND 9  
DEPOSITED PLAN 61R-9059  
CITY OF GUELPH  
COUNTY OF WELLINGTON

**CLIENT:** CHABAD OF GUELPH

**PROJECT No:** 32948-23

**PROJECT:** PROPOSED CHABAD BUILDING  
81 COLLEGE AVENUE WEST

**DRAWING TITLE:** DRAINAGE PLANS

<b>SHEET No:</b> 4 OF 4	<b>DRAWING No:</b> C03	<b>REVISION:</b> 1
<b>DRAWING SCALE:</b> 1:250		