FUNCTIONAL SERVICING REPORT

CREEKSIDE CONDOS

LOT 31 & BLOCK H, REGISTER PLAN 455

MUNICIPALITY OF CHATHAM-KENT, ONTARIO

PROJECT NO. 22 - 031

DATED: SEPTEMBER 05, 2024

REVISION: OCTOBER 11, 2024

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1. Introduction

Baird AE was retained to prepare a Functional Servicing Report to review the storage requirements, sanitary capacity, and water servicing for the redevelopment of Creekside Condos in Municipality of Chatham-Kent, Ontario. The property is bounded by Indian Creek Road to the north, an existing open space zone to the east, Indian Creek Drain to east, and Chinnick Drain to the west. The total area of the subject property is 0.92 ha; this report addresses the stormwater management assessment and surrounding infrastructure.

2. Stormwater Management and Quantity Control

2.1 Pre-Development Conditions

As depicted in Figure 1, the existing site consists of an open space area. Soil maps from Soil Survey County of Kent – Report No. 3 indicate that the soil in the site area is Brookston Silt Loam. The hydrological soil group is classified as 'D' Group.

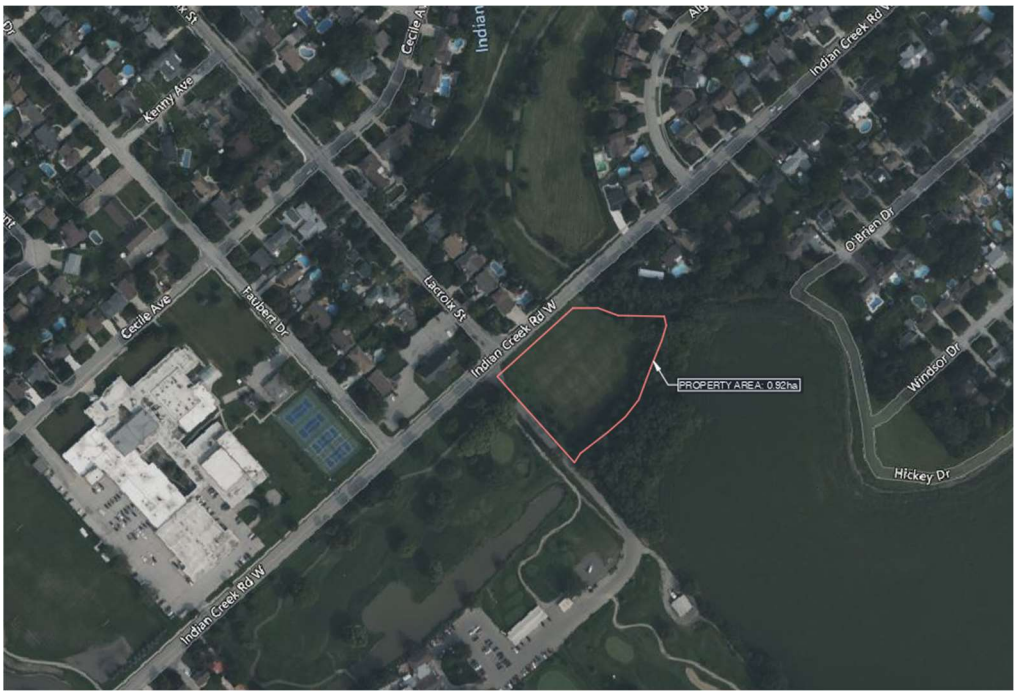

Figure 1: Existing Conditions

A hydrograph for the 2-year allowable event was generated based on the following assumptions:

- 2-year event using Chatham-Kent Ontario IDF Rainfall Data
- C value – 0.1 (Parks, Grass area)

Assuming the existing surface is open space with a C value of 0.1 and the time of concentration was determined to be 15 minutes.

By inputting the above parameters into the Hydraflow Hydrographs Extension for AutoCAD Civil 3D, the 2-year pre-development release rate was calculated to be 16 L/s using the Rational runoff method. Therefore, we will restrict the storm flow to 16 L/s.

2.2 Post Development Conditions

A new 200mm diameter storm service will connect the proposed development to the existing 525mm municipal storm sewer on Indian Creek Road. Calculations for this connection are detailed in Appendix D. Further details will be provided in detail design stage.

The post development hydrologic assessment was performed using the AutoCAD Hydraflow Hydrographs Extension. As shown in Table 1, the calculated composite C value of 0.9. This data, along with additional information, is presented in the model input/output summaries provided in Appendices B this report.

Table 1: Composite C Value

Surface Type	Area (ha)	C value
Grass Area	0.45	0.9
Asphalt / Concrete	0.47	0.9
Composite C Value		0.9

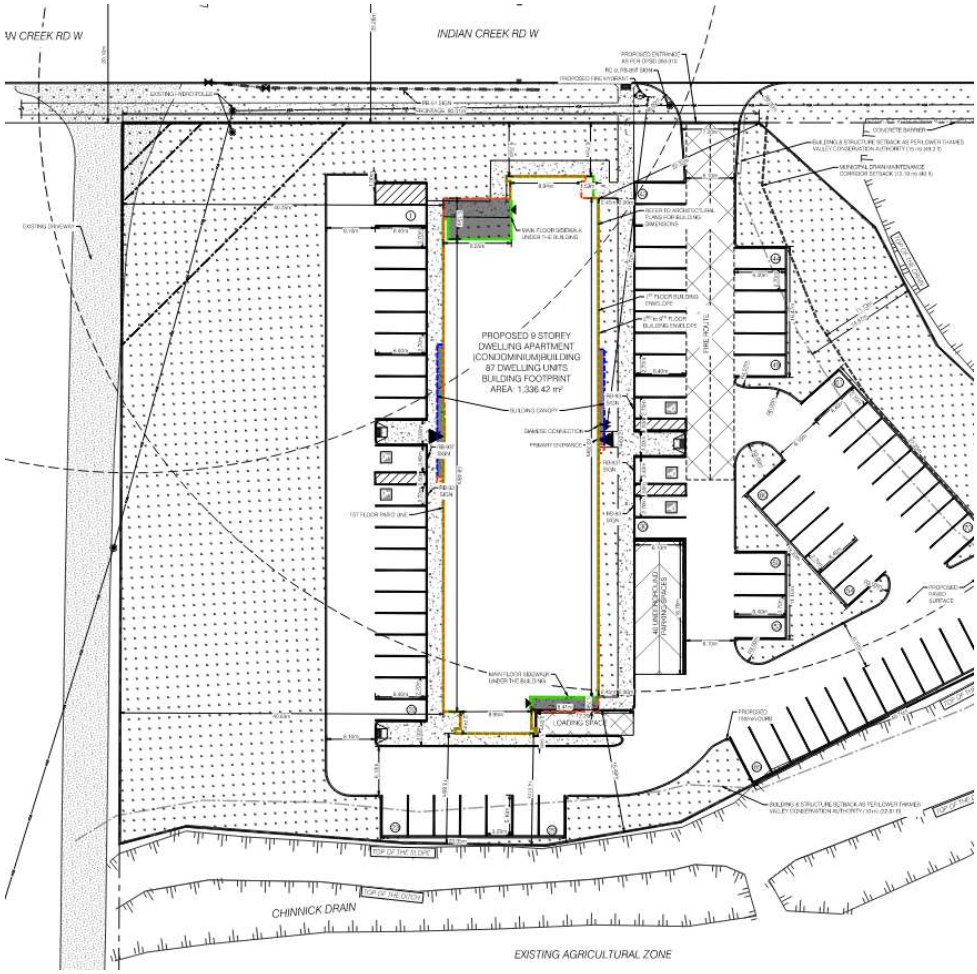

Figure 2: Proposed Development Conditions

2.3 Stormwater Management Criteria

The stormwater management criteria for this development are governed by the Municipality of Chatham-Kent and the Lower Thames Valley Conservation Authority. The requirements include the following:

- Stormwater quantity controls must be implemented to manage peak flows under proposed conditions, up to the 100-year storm, to meet the allowable release rate.
- Water quality control measures are required to achieve a “Normal Protection level’ as per Ministry of the Environment (MOE, 2003) guidelines.
- Erosion and sediment control measures must be implemented to mitigate any potential impacts.

2.4 Storm Quantity Control

For storm quantity control, the Rational method was considered, and storage was provided for the most conservative event. It is ensured that this event remains contained within the site and is maintained below the lowest building opening elevation.

Table 2: Rainfall Intensities used for PCSWMM Modelling

Storm Event	Storm Duration	Rainfall Depth
2-year storm event	24 hours	5.34cm
5-year storm event	24 hours	6.80cm
100-year storm event	24 hours	10.79cm

2.5 Allowable Release Rate and Storage Requirement

Storage during major and minor storm events will be facilitated through the use of pipes and parking lot.

Table 3: Peak Discharges

	Pre-Development Flow (L/s)	Post-Development Flow (L/s)	Discharge Flow (L/s)
2-year storm event	16	144	11
5-year storm event	21	189	14
100-year storm event	35	313	16

The design flow will be restricted to the allowable release rate by using a 100 mm orifice to restrict the flow to pre-development condition. A total storage of 476 m^3 is provided in the surface parking lot. Storage is provided on surface & underground storage chamber. Details for storage will be provided in detail design stage.

The building's Finished Floor Elevation (FFE) is set at 182.000m, which is 0.5m above the top of bank elevation. The top of bank elevation for the Indian Creek Drain is 180.000m, while the Chinnick Drain top of bank elevation is 181.500. There is no ponding during all other rainfall events.

2.6 SWM quality Control

Water quality concerns are addressed through the implementation of a quality unit, such as the Hydro FD-4HC or Next Storm SDD3, or an equivalent system. The Hydro FD-4HC quality unit was appropriately sized based on the rainfall intensity and considering a fine particle size distribution.

The quality unit is designed to treat 80.3% of the total runoff volume while maintaining an overall removal efficiency of 80%. Further details regarding the Oil Grit Separator (OGS) quality unit are provided in Appendix B.

The erosion and sediment control measures for the site will be incorporated into the tender documents and will include the following:

- Installation of silt fence before grading begins on the property to protect downstream areas from migration of sediment in overland flow.
- Placement of filter fabric will be placed over the drainage grates.
- All disturbed areas will be stabilized by restoration of vegetative ground cover as soon as possible.

3. Sanitary Sewer

3.1 Existing Conditions

The existing site consist of open space covered in grass. An existing 250mm sanitary sewer is located on the right-of-way of Lacroix St.

3.2 Proposed Conditions

- The proposed 9-storey apartment will comprise 87 dwelling units, with a projected population of 261 people based on the standard of 3 people per unit.

- Considering the population density and infiltration allowance, the estimated peak sanitary discharge flow for the proposed development is 2.50 l/s. The flow reaching the existing pump station from Lacroix Street is approximately 4.06 l/s.

- An assessment of the capacity of the existing sanitary sewer along Lacroix Street in proximity to the development was conducted. The results indicate that the sanitary sewer pipe is 10.9% full. Further details are provided in the reminder of report.

- To assess the capacity of sewer pipes downstream, flow monitoring was conducted and the results are discussed in section below.

3.3 Monitoring and Sanitary Sewer Capacity

Monitoring Results

In consultation with the Municipality of Chatham-Kent, it was determined that flow monitoring would be conducted at four specific locations along Lacroix Street to assess the capacity of existing pipes. The monitoring locations are described below and shown in the Lacroix Street Sanitary Sewer Collection System Plan (see Appendix A).

Table 4: Monitoring Locations

Name	Location
Monitor Location 1 (FM01)	250mm outlet pipe from Lacroix Street
Monitor Location 2 (FM02)	300mm outlet pipe from Cecile Avenue
Monitor Location 3 (FM03)	250mm outlet pipe north of Cecile Ave on Lacroix Street
Monitor Location 4 (FM04)	250mm outlet pipe north of Cecile Ave on Lacroix Street

The flow rates were recorded at 5-minute intervals, and the below table summarizes the actual peak, average and lean flow at each monitoring location. Detailed graphs of these data are included in Appendix C and are depicted in the figure below.

Figure 3: Flow Monitoring Locations

Table 5: Sanitary sewer flow monitoring results

Junctions	Pipe Size	Peak Flow (l/s)	Peak flow date	Average flow (l/s)	Lean flow (l/s)	Depth (mm)		
						Min	Avg	Max
Monitor Location 1	250mm	14.1	12/16/2023	1.37	0.17	81.0	120.7	731.4
Monitor Location 2	300mm	22.6	01/26/2024	2.11	0.05	38.0	112.5	270.0
Monitor Location 3	250mm	42.7	01/26/2024	6.82	0.03	24.7	75.3	928.8
Monitor Location 4	250mm	35.7	01/26/2024	4.65	0.04	20.1	78.5	1442.5

At the junction of Cecile Avenue and Lacroix Street intersection (Monitoring Location 3), the flow to the existing sanitary sewer system is constrained by the capacity of the Pump Station. The available capacity at the existing pump station on Lacroix Street is 22.7 L/s.

Existing Sewer System

A comprehensive sanitary study was conducted to evaluate the capacity of the existing sanitary systems to accommodate the proposed development. This assessment included the 250mm sanitary sewer south of the intersection of Lacroix Street and Cecile Avenue, the 300mm sanitary sewer east of the intersection, the 300mm sanitary sewer west of the intersection, and the 250mm sanitary sewer north of the intersection. It was determined that the catchment area draining into

this trunk sewer comprises approximately 33.1 hectares, consisting of a mixture of commercial and residential lots. Figure 5 and Table 9 provide a breakdown of the sanitary drainage areas utilized in the analyses.

Table 6: Sanitary Drainage Areas

	Area	Land Use	No. of Units	
			Singles	Multi-Unit/Com
PROPOSED DEV.	0.920	Residential		87
A1	0.244	Residential	1	
A2	0.857	Residential	6	
A3	0.602	Commercial	5	
A4	0.573	Commercial	2	
A5	0.361	Residential	1	
A6	1.223	Residential	6	
A7	0.628	Residential	5	
A8	0.697	Residential	6	
A9	1.437	Residential	8	
A10	11.02	Residential	53	
A11	2.759	Residential/Commercial	11	
A12	7.191	Residential	51	
A13	5.406	Residential	26	
A14	2.648	Residential	53	
A15	2.188	Residential	20	
A16	1.886	Residential	21	

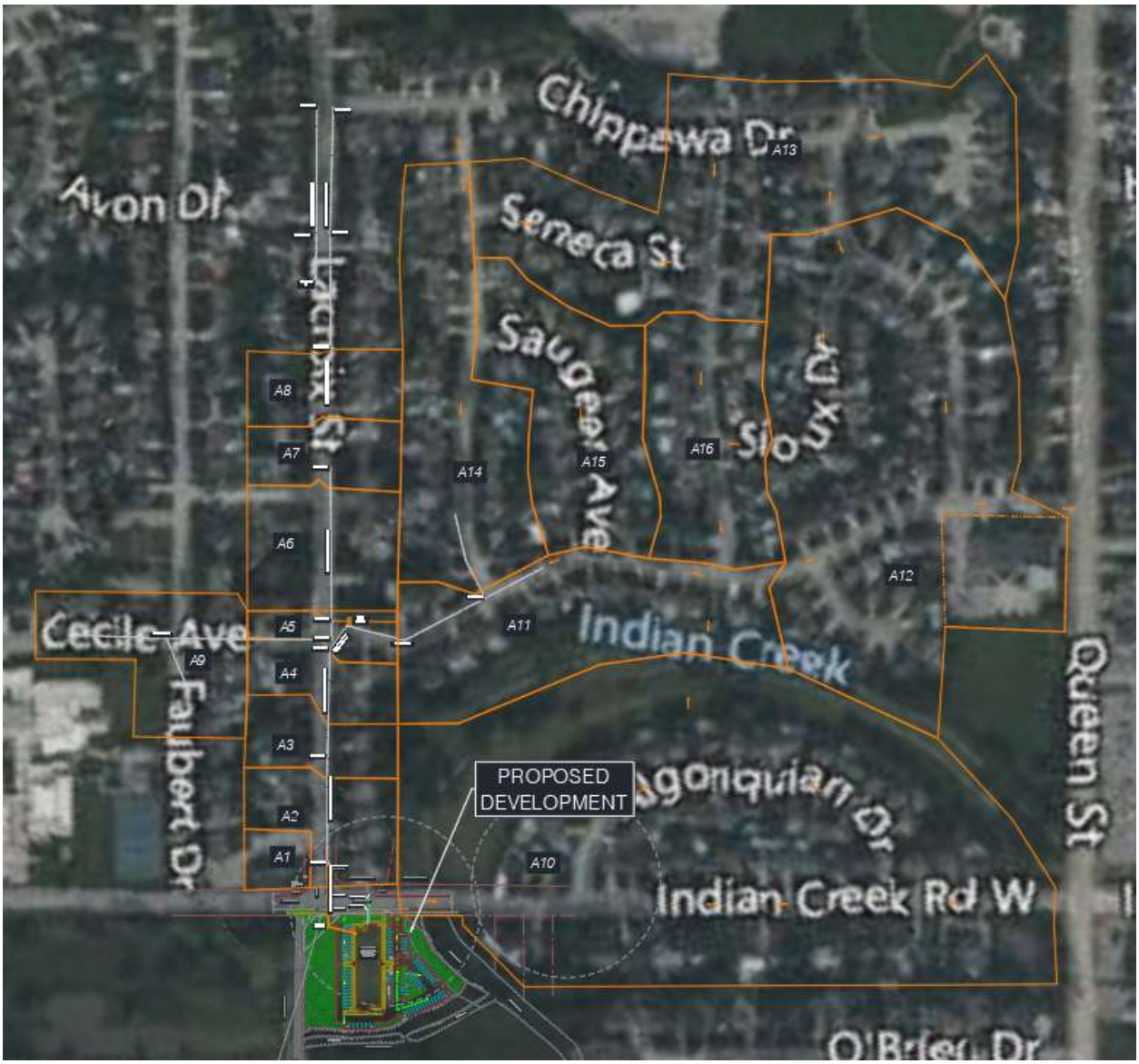

Figure 4: Sanitary Drainage Areas

Population densities of 3.5 and 2.5 persons per unit were assigned to residential areas, while a density of 74 persons/ha was assigned to the commercial areas. An average per capita flow per day of 450 L/cap/day and an infiltration factor of 0.21 L/s/ha were used to calculate the peak sanitary flow for the subject development and sanitary drainage areas.

Findings are summarized below, with detailed calculations are provided in Appendix B:

- The existing 250mm sanitary sewer immediately downstream of the proposed development will operate at **12.0%** capacity post-development. And in existing condition sanitary sewer operate at **0.9%** capacity.

- The 250mm sanitary sewer south (FM01) of the intersection of Lacroix Street and Cecile Avenue will operate at **10.9%** capacity.

- The 300mm sanitary sewer east (FM02) of the intersection of Lacroix Street and Cecile Avenue will operate at **16.9%** capacity.

- The 300mm sanitary sewer north (FM03) of the intersection of Lacroix Street and Cecile Avenue will operate at **69.0%** capacity.

Sanitary Sewer System North of Cecile Avenue

The maximum flow from the existing pump is 22.7 L/s. With the combination of the pump flow and flow from the west (1.0l/s), the existing sanitary sewer pipes along Lacroix Street north of Cecile Avenue are not experiencing surcharging, as discussed above (also see design sheet 1).

According to the calculation from AMG, at monitoring locations 3 and 4, representing the existing sanitary pipes north of Cecile Ave, the maximum peak flow is measured at 42.7 L/s and 35.7 L/s, which exceeds the available pipe capacity of 29.7 L/s. It is important to note that the monitoring peak occurred only once during a 4-month monitoring period, and the maximum peak flow does not last for more than a 1-hour.

As per Table 5, the average flow (6.82 L/sat FM03) to the capacity of existing sewer system (37.6 L/s) north of the pump station indicates an available capacity of **82.0%.** However, according to the design sheet, the available capacity of the existing sewer system during peak flow is **30.0%**. Upon comparing both results, it is concluded that the proposed development will have minimal impact on the existing sanitary infrastructure, and the existing infrastructure has sufficient available capacity to accommodate the proposed development. The depth in sewer pipes is discussed in the section below.

Comparison Depth in Sewer System

The table below displays the depth of the existing sewer system, the theoretical depth as per the design sheet, and the monitored depth in the sanitary sewer system.

Table 7: Sanitary Sewer HGL

Monitoring Location	Manhole		Pipe Size (mm)	Theoretical Results HGL (m)		Monitoring Results			
						Maximum (m)		Average (m)	
	Invert (m)	Top Elevation (m)		Pre	Post	Height	HGL	Height	HGL
FM01	178.50	180.80	250	178.51	178.51	0.773	179.27	0.121	178.62
FM02	173.86	180.50	300	173.91	173.91	0.270	174.13	0.112	173.97
FM03	178.00	181.0	250	178.17	178.17	0.928	178.93	0.0753	178.07
FM04	176.94	180.50	250	-	-	1.442	178.38	0.0785	177.01

The maximum monitored Hydraulic Grade Line (HGL) is situated below the roadway elevation, as shown in Table 6. Additionally, the average HGL is significantly lower than the obvert of the existing sewer pipe (i.e. less than half), suggesting ample capacity within the pipe to accommodate additional flow. According to the monitoring results, the maximum surcharge depth was recorded in January and lasted for less than an hour.

In comparison with theoretical results outlined in the design sheet provided in Appendix A, it's observed that the maximum HGL is lower than the obvert of the pipes in the post-development condition. Furthermore, when comparing the theoretical HGLS pre and post development, the results remain consistent. This consistency is a result of the upstream pump which has sufficient capacity, as discussed previously. Therefore, it is reasonable to assume that the proposed development will not have significant impact on the existing infrastructure.

4. Watermain

4.1 Existing Conditions

There is an existing 250mm PVC watermain located within the right-of-way of Indian Creek Road.

4.2 Proposed Conditions

- Potable water for the development will be provided by a 200mm watermain, which will connect to the existing 250mm watermain on Indian Creek Road to supply domestic water supply for the subject development. Based on current interactive mapping for municipal

infrastructure in this area, a direct connection to the municipal water system for the planned development's potable water and fire suppression needs can be established.

- Hydrant testing was conducted at the fire hydrant located on Indian Creek Road. The results, attached in the appendix, indicate that the existing system has sufficient/static residual pressure to meet the fire flow suppression requirements for the proposed development.

- A water meter will be installed within a building to accurately record actual water use for the reserve. A temporary blow-off will be installed at the property line, and a flushing main may be required.

- As per Fire Underwrites Survey (FUS) 1999 and MECP guidelines, hydrants will be provided at a minimum spacing of 75m to a maximum of 150m. Hydrants will have a minimum diameter of 150mm, as per the Municipality of Chatham-Kent guidelines, to ensure compatibility with firefighting Purposes. An existing hydrant is located north of the development.

Domestic water demands were calculated using the parameters from the 2008 MOE design guidelines for drinking water systems. The domestic per capita rate ranges from 270 to 450 L/cap/day, with the 450 L/cap/day rate specified in the Municipality of Chatham-Kent development manual used to calculate the average daily demand for this development.

Table 8: Residential Water Demand

Residential Demand (Ultimate Build Out)
Total Units = 87 units (3.5PPU)
Population = 305 persons
Average Day Demand = 5.49 L/s
Maximum Day Factor (M.D.F) = 3.7
Maximum Day Demand = 5.49 x 3.7 = 20.31 L/s
Peak Hour Factor (P.H.F) = 4.0
Peak Hourly Demand = 5.49 x 4.0 = 21.96 L/s

5. WATER QUALITY, EROSION AND SEDIMENT CONTROL

Water quality treatment for the site will be designed to achieve a “normal level” of protection capable of removing at least 70% of suspended solids. Water quality control for the proposed development will be facilitated through FD water quality units (OGS) installed at outlets. Detailed information on the water quality units will be provided at the detailed design stage

The erosion and sediment control measures for the site during construction will include:

- Installation of a silt fence before grading begins on the property to protect downstream areas from sediment migration in the overland flow.
- Placement of filter fabric will be placed over drainage grates.
- All disturbed areas will be stabilized by the restoration of vegetative ground cover as soon as possible.

Further details regarding sediment control measures for the site will be provided in Appendix E of this report.

6. Conclusion

This functional servicing report should be reviewed alongside the submission material. The report outlines municipal servicing details and proposes servicing and stormwater management plans for the 9-storey apartment building located in the Municipality of Chatham-Kent.

Furthermore, the report demonstrates that approximate stormwater management measures will be provided to satisfy water quality treatment and quantity attenuation criteria. Sanitary service and water supply for the proposed development will utilize existing infrastructure along Indian Creek Road.

Storm Servicing – During minor storm events, runoff will be conveyed to the 525mm Indian Creek Road West storm sewer using a 200mm pipe. Surface and underground attenuation measures will be installed below the underground parking finished floor to manage minor and major design storms. Post-development release rates for all design storms will be lower than the 2-year pre-development release rate. A 100mm orifice will be installed to restrict storm outflow from the site to the pre-development release rate.

Sanitary Servicing – A new 200mm diameter sanitary service will connect the proposed development to the existing 250mm municipal sanitary sewer on Lacroix Street.

The downstream 250mm trunk sewer north of the intersection of Lacroix Street and Cecile Avenue will operate at 69.0% capacity at its peak (as per the design sheet) when considering all potential future developments. Monitoring results indicate that the existing sanitary sewer has the capacity to accommodate flow from the proposed development. Whereas, during the peak period, which occurred once in 4 months, the existing sewer will be at full capacity. It is noted that this peak will dissipate within 1 hour. Therefore, it is concluded that the proposed development will not have any negative effect during the peak periods.

Water Servicing – The proposed development will be serviced via a 150mm water service connection tied into the 250mm PVC watermain on Indian Creek Road West.

If you have any questions or require additional information, please do not hesitate to contact the undersigned at your convenience.

Reviewed By:

Shurjeel Tunio, P.Eng.

Project Engineer

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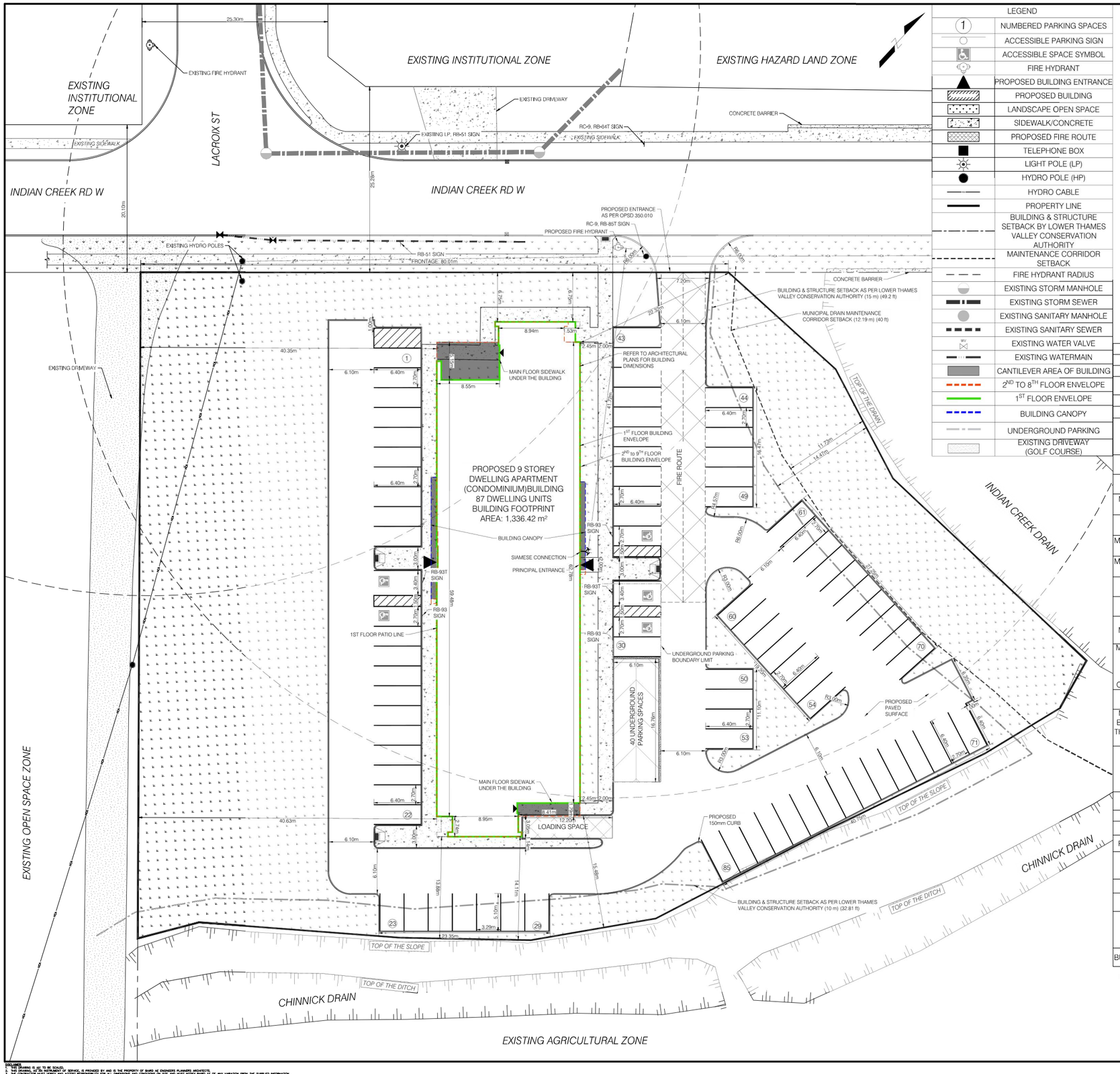
Prepared By:

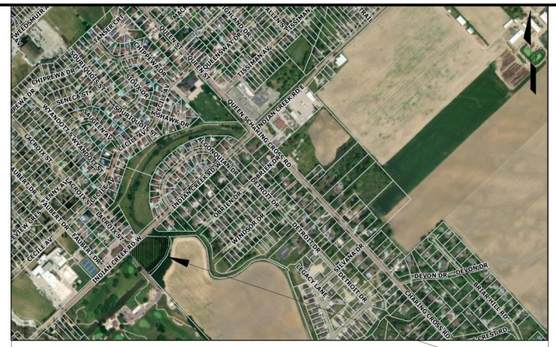
Rizwan Malek, E.I.T.

Civil Designer

Appendix A



LEGEND	
1	NUMBERED PARKING SPACES
	ACCESSIBLE PARKING SIGN
	ACCESSIBLE SPACE SYMBOL
	FIRE HYDRANT
	PROPOSED BUILDING ENTRANCE
	PROPOSED BUILDING
	LANDSCAPE OPEN SPACE
	SIDEWALK/CONCRETE
	PROPOSED FIRE ROUTE
	TELEPHONE BOX
	LIGHT POLE (LP)
	HYDRO POLE (HP)
	HYDRO CABLE
	PROPERTY LINE
	BUILDING & STRUCTURE SETBACK BY LOWER THAMES VALLEY CONSERVATION AUTHORITY
	MAINTENANCE CORRIDOR SETBACK
	FIRE HYDRANT RADIUS
	EXISTING STORM MANHOLE
	EXISTING STORM SEWER
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY SEWER
WV	EXISTING WATER VALVE
	EXISTING WATERMAIN
	CANTILEVER AREA OF BUILDING
	2ND TO 8TH FLOOR ENVELOPE
	1ST FLOOR ENVELOPE
	BUILDING CANOPY
	UNDERGROUND PARKING
	EXISTING DRIVEWAY (GOLF COURSE)



KEY PLAN
SCALE 1:10,000

SITE DATA:			
EXISTING ZONING:	RESIDENTIAL LOW DENSITY (RL1-E) ZONE		
PROPOSED SITE ZONING:	RESIDENTIAL HIGH DENSITY EXCEPTION-XX (RH2-XX) ZONE		
PERMITTED USE:	DWELLING APARTMENT, AMONGST OTHER USES PERMITTED WITHIN THE RH2-XX ZONE		
PROPOSED USE:	DWELLING APARTMENT		
DESCRIPTION:	REQUIRED:	PROVIDED:	ZONING COMPLIANCE:
MIN. LOT AREA:	FIRST 5 UNITS 836.1 m² + 92.8 m² FOR EACH ADDITIONAL UNIT (82 UNITS) : 87 UNITS 8,445.7 m² (90,908.76 sq. ft.)	9,267.21m² (99,751.42 sq. ft.) 87 DWELLING UNITS (106.5m² / UNIT)	COMPLIES
MIN. FRONTAGE:	26.82 m (88 ft)	80.01 m (262.5 ft)	COMPLIES
MAX. BUILDING HEIGHT:	N/A	30.33 m (99.5 ft)	COMPLIES
MIN. FRONT YARD SETBACK (NORTH):	7.62 m (25 ft)	6.75 m (22.14 ft)	RELIEF REQUESTED
MIN. REAR YARD SETBACK (SOUTH)	7.62 m (25 ft) ≥ ½ HEIGHT OF BUILDING: 15.16m (49.74 ft)	13.88 m (45.54 ft)	RELIEF REQUESTED
MIN. INTERIOR YARD SETBACK (WEST):	7.62 m (25 ft) ≥ ½ HEIGHT OF BUILDING: 15.16m (49.74 ft)	40.35 m (132.38 ft)	COMPLIES
MIN. INTERIOR YARD SETBACK (EAST):	7.62 m (25 ft) ≥ ½ HEIGHT OF BUILDING: 15.16m (49.74 ft)	22.32 m (73.23 ft)	COMPLIES
MAX. LOT COVERAGE:	33%	14.42% (1,336.42 m²) (14,385.10 sq.ft.)	COMPLIES
MIN. LANDSCAPE OPEN SPACE:	N/A	48.90% (4,442.72 m²) (47,821.04 sq. ft)	COMPLIES
MAX. RESIDENTIAL DENSITY:	125 DWELLING UNITS PER HECTARE = 115 DWELLING UNITS	93 DWELLING UNITS PER HECTARES	COMPLIES
MIN. BUILDING & STRUCTURE SETBACK TO THE WATERCOURSE & DRAIN (DETERMINED BY CONSERVATION AUTHORITY):	INDIAN CREEK DRAIN: 15m CHINNICK DRAIN: 10m (STRUCTURE SETBACK)	INDIAN CREEK DRAIN: 15m CHINNICK DRAIN: 10m	COMPLIES
MIN. DRIVE-WAY WIDTH:	7.20 m - 12.00 m	7.20 m (23.60 ft)	COMPLIES
MIN. PARKING CALCULATED BASED ON DWELLING (MORE THAN THREE DWELLING UNITS PER BUILDING):	1.25 SPACES PER UNIT OF TOTAL 87 UNITS: 109 SPACES	1.43 SPACES PER UNIT OF TOTAL 87 UNITS: 125 SPACES	COMPLIES
ACCESSIBLE PARKING:	1 SPACE FOR PERSON WITH DISABILITIES + (3% OF TOTAL SPACES(125)): 5 SPACES 2 (TYPE-A SPACES) 3 (TYPE-B SPACES)	5 SPACES (2 TYPE-A SPACES) (3 TYPE-B SPACES)	COMPLIES
LOADING SPACES:	N/A	1 SPACE	COMPLIES
LOT/BUILDING INFO:			
EXISTING LOT AREA:	9,267.21 m² (99,751.42 sq. ft., 0.92 ha, 2.29 ac)		
PROPOSED BUILDING AREA:	1,336.42 m² (14,385.10 sq.ft.)		
TOTAL BUILDING GFA:	TOTAL GFA: 11,739.84 m² (126,366.59 sq. ft.) 1ST FLOOR GFA: 1,256.32 m² (13,522.92 sq. ft.) 2ND TO 9TH FLOOR GFA: (1,310.44 m² X 8 FLOORS): 10,483.52 m² (112,843.67 sq. ft.)		
TOTAL UNITS:	87 DWELLING UNITS		
HEIGHT OF BUILDING/ NUMBER OF STOREYS:	30.33 m (99.5 ft) 9 STOREYS		
TOTAL PARKING SPACES:	125 PARKING SPACES 120 STANDARD PARKING SPACES 2 TYPE-A ACCESSIBLE PARKING SPACES 3 TYPE-B ACCESSIBLE PARKING SPACES		
BUILDING USE & OCCUPANCY:	RESIDENTIAL C ANY HEIGHT, ANY AREA, SPRINKLERED (OBC 3.2.2.42)		

NOTES:
1. ALL FIRE DEPARTMENT SIGNAGE TO BE COMPLETED AFTER CONSTRUCTION IN COORDINATION WITH FIRE DEPARTMENT.
2. ALL ACCESSIBLE PARKING SPACES TO HAVE RB-93T & RB-93 SIGNS INSTALLED.
3. GARBAGE COLLECTION UNIT TO BE ROLLED OUT ON LOADING SPACE FOR PRIVATE PICKUP SERVICE.
4. ALL LIGHTING TO BE DARK SKY COMPLIANT.
5. FIRE ROUTE TO BE IN COMPLIANCE WITH OBC REQUIREMENTS.

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PARTNER / CONSULTANTS

REVISIONS

Date	Revision
JULY 25, 2024	ZBA SUBMISSION
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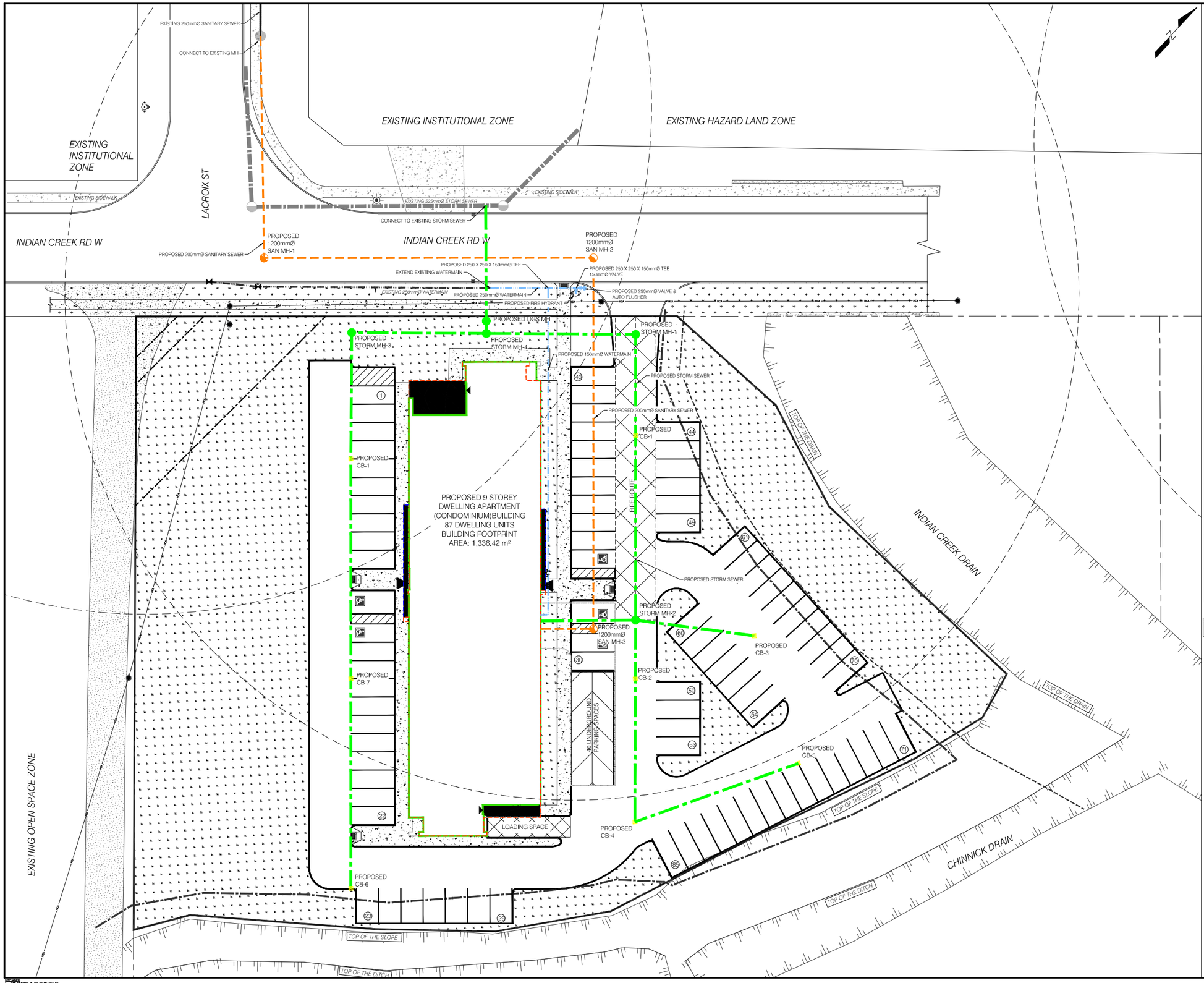
DATE: JUNE 17, 2024
SCALE: 1:250
DRAWN BY: M.R. ☐ PRELIMINARY
CHECKED BY: B.P. ☐ CONSTRUCTION
APPROVED BY: ---- ☐ RECORD

PROJECT TITLE: CREEKSIDE CONDOS
LOT 31 & BLOCK H, REGISTER PLAN 455, MUNICIPALITY OF CHATHAM-KENT
SHEET TITLE: CONCEPT SITE PLAN
JOB NUMBER: 22-031
SHEET NUMBER: 01



LEGEND	
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	ACCESSIBLE PARKING SIGN
	ACCESSIBLE SPACE SYMBOL
	FIRE HYDRANT
	PROPOSED BUILDING ENTRANCE
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	PROPOSED FIRE ROUTE
	TELEPHONE BOX
	LIGHT POLE (LP)
	HYDRO POLE (HP)
	HYDRO CABLE
	PROPERTY LINE
	BUILDING & STRUCTURE SETBACK BY LOWER THAMES VALLEY CONSERVATION AUTHORITY
	MAINTENANCE CORRIDOR SETBACK
	SIGHT TRIANGLE
	FIRE HYDRANT RADIUS
	CANTILEVER AREA OF BUILDING
	2ND TO 8TH FLOOR ENVELOPE
	1ST FLOOR ENVELOPE
	BUILDING CANOPY
	UNDERGROUND PARKING
	EXISTING DRIVEWAY (GOLF COURSE)

SERVICING LEGEND		
DESCRIPTION	EXISTING	NEW
STORM SEWER		
STORM SERVICE		
SANITARY SEWER		
SANITARY SERVICE		
WATERMAIN		
WATER SERVICE		
FIRE HYDRANT		
CATCH BASIN		
DOUBLE CATCH BASIN		
STORM MANHOLE		
SANITARY MANHOLE		
REAR YARD CATCH BASIN		

GENERAL NOTE:
1. STORM SEWER SIZES & SLOPES SHALL BE DETERMINED IN DETAIL DESIGN STAGE.
2. STORM MH SIZE SHALL BE DETERMINED IN DETAIL DESIGN STAGE

BAIRD|AE architecture + engineering
27 Princess Street, Unit 102, Leamington ON N8H 2X6
1330 Provincial Road, Unit 100, Windsor ON N8W 3W1
519-322-4001

PARTNER / CONSULTANTS

REVISIONS

Date	Revision
JULY 11, 2024	ZBA SUBMISSION

DATE:	OCT 19, 2023
SCALE:	1:250
DRAWN BY: M.R.	PRELIMINARY
CHECKED BY: B.P.	CONSTRUCTION
APPROVED BY: -----	RECORD

PROJECT TITLE
CREEKSIDE CONDOS
LOT 31 & BLOCK H, REGISTER PLAN 455, MUNICIPALITY OF CHATHAM-KENT

SHEET TITLE
CONCEPTUAL SITE SERVICING PLAN

JOB NUMBER 22-031

SHEET NUMBER 03

July 24, 2024

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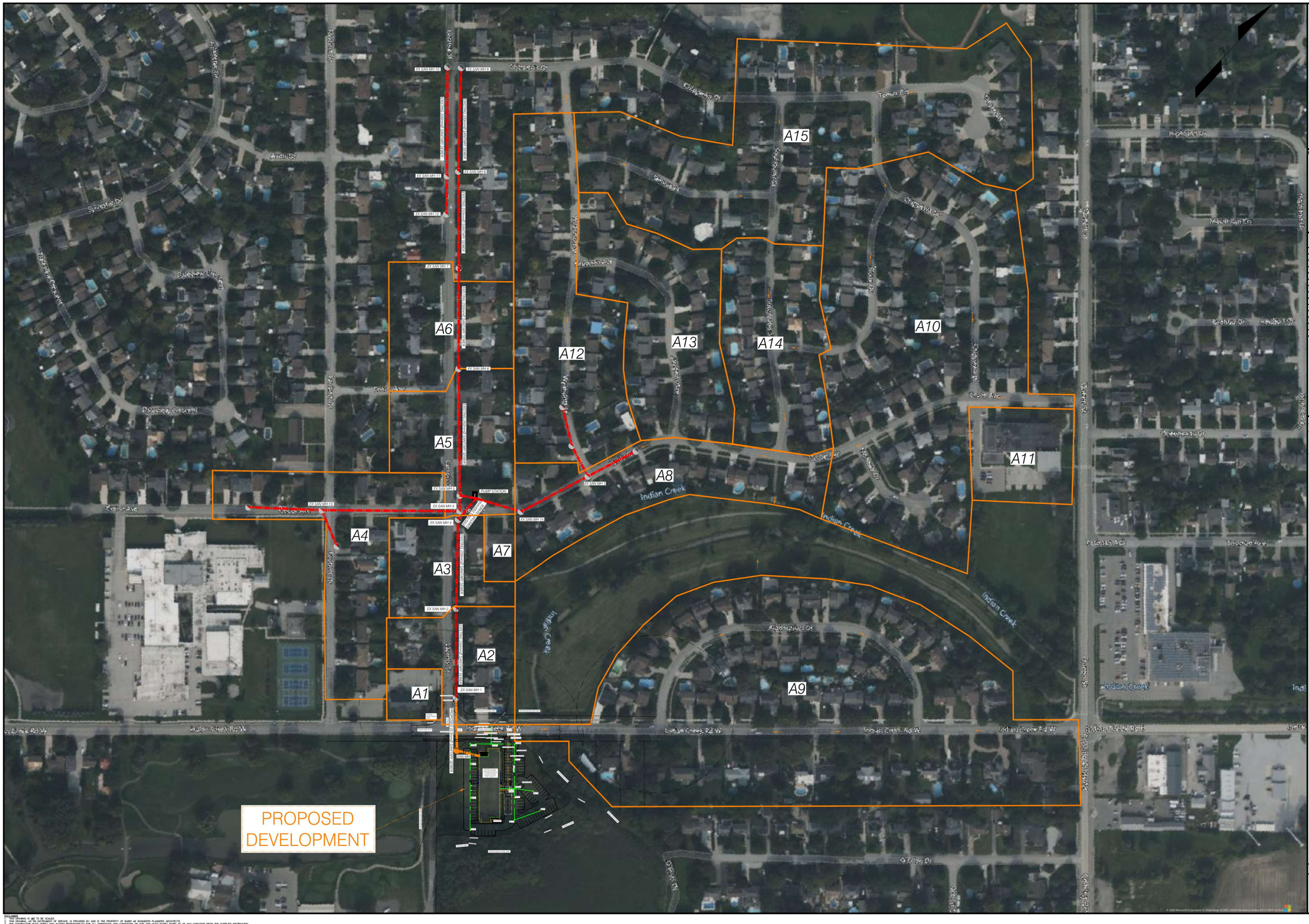

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BAIRD|AE architecture + engineering
info@bairdae.ca
Toll Free 1-844-842-9188
www.bairdae.ca
Local 519-326-6161

PARTNER / CONSULTANTS

REVISIONS

Date	Revision
JULY 25, 2024	ZBA SUBMISSION
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DATE:	OCT 19, 2023
SCALE:	1:1500
DRAWN BY: M.R.	PRELIMINARY
CHECKED BY: B.P.	CONSTRUCTION
APPROVED BY: ----	RECORD

PROJECT TITLE
CREEKSIDE CONDOS
LOT 31 & BLOCK H, REGISTER PLAN 455, MUNICIPALITY OF CHATHAM-KENT

SHEET TITLE
SANITARY STUDY AREA

JOB NUMBER 22-031

SHEET NUMBER 01

August 27, 2024

CLASSIC FIRE + LIFE SAFETY

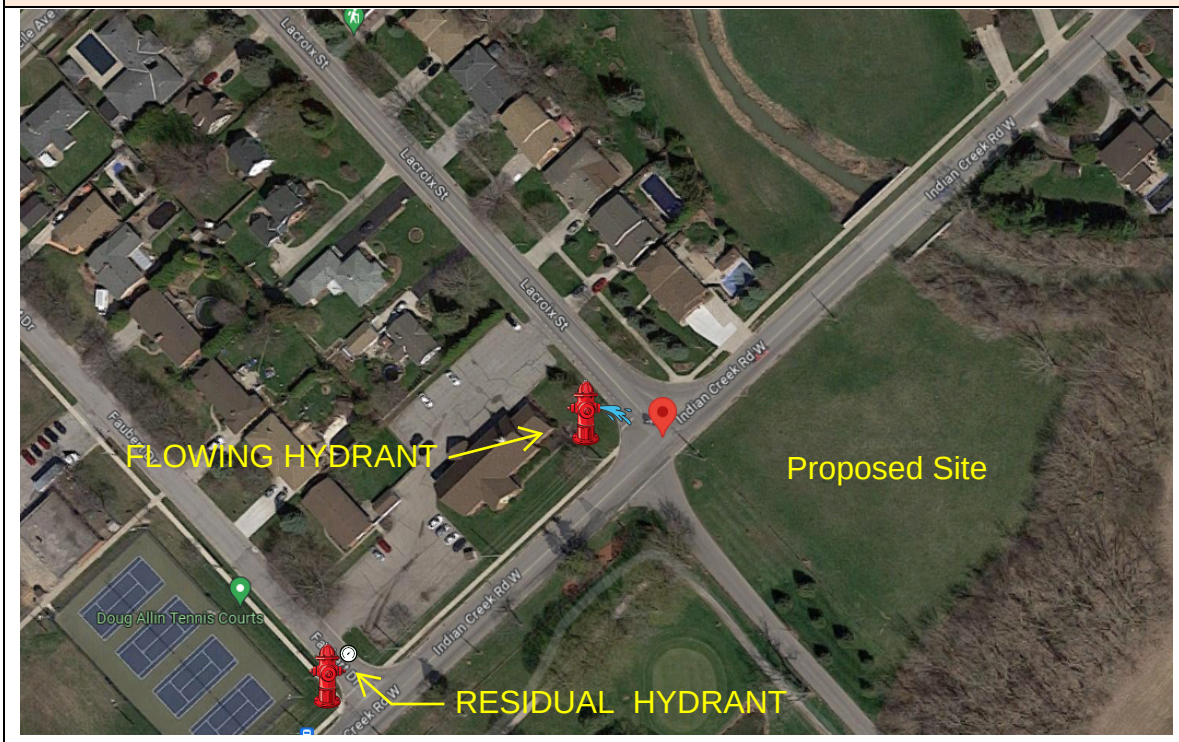
FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

PROJECT INFORMATION			
Project Name:	Indian Creek Road Condos	Const. Project #:	SMC-0008739
Site Address:	Indian Creek Rd W/Lacroix	Design Project #:	2023-CFLS-639
City Contact:	Chris Lalonde ext 4276	Phone #:	519-352-7354
CFLS Contact:	Addison Klassen	Phone #:	519-257-0769
Technical Contact:	**Andy Coghlin**	Phone #:	**519-476-0761**

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
☑ Static / Residual & Flow Hydrants	☑ City Hydrant(s)	City:
☐ Flow Direction (if the main is dead end)	☐ Site Hydrant(s)	Site:

SITE NOTES

CLASSIC FIRE + LIFE SAFETY

FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
CFLS Personnel Present:	Addison Klassen	Test Date:	2023-11-07
City / External Company:	Chatham Kent Utilities	Test Time:	8:00am

TEST EQUIPMENT	
☑ Hose Monsters with built in Pitot	Hose length used: 25'
☐ Hand held pitot gauge	☐ Pollard diffuser elbow with built in Pitot
☐ Other:	

TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)				Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports								59
1 Port	2.5	0.9	17				692	56
2 Ports	2.5	0.9	12	12			1,163	56
3 Ports	2.5	0.9					0	
4 Ports	2.5	0.9					0	
0 Ports	**STATIC RE-CHECK**							59

TEST NOTES

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	59
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

CREEKSIDE CONDOS
STORM SEWER DESIGN SHEET (5-YEAR EVENT)

LOCATION				AREA (ha)				FLOW							SEWER DATA									PROFILE			
Area ID	Area Included	From	To	Pavement	Green Space	Condo Building	Total (HA)	Indiv 2.78 AC	Accum 5 2.78AC	Time of Conc.	Design Storm	Rainfall Intensity	Peak Flow (L/sec)	Qtotal (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full	Upstream Elevation		Downstream Elevation	
		Node	Node	0.90	0.15	0.95																		Invert (m)	Ground (m)	Invert (m)	Ground (m)
A1		Storage	Storm sewer	0.35	0.44	0.13	0.92	1.41	1.41	15.00	5	88.40	124.82	124.82	0.200	200	PVC	1.00	18.90	32.8	1.04	0.30	49%				

Q = 2.78 AIR, where
Q= Peak Flow in Litres per Second (l/s)
A= Area in hectares (ha)
I= Rainfall Intensity (mm/hr)
R= Runoff Coefficient

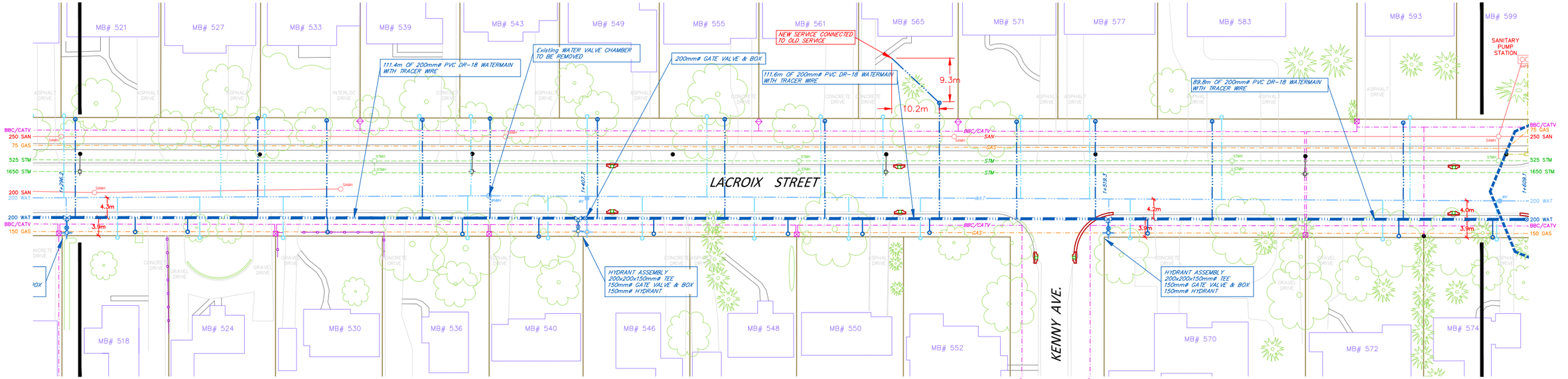
1) Chatham-Kent Rainafall Intensity Curves
2) Min Pipe Velocity = 0.80 m/s
3) Tc =15 min
Minimum cover = 1m
I= =1259 / (Tc + 8.8)^0.838

BAIRD|AE architecture + engineering

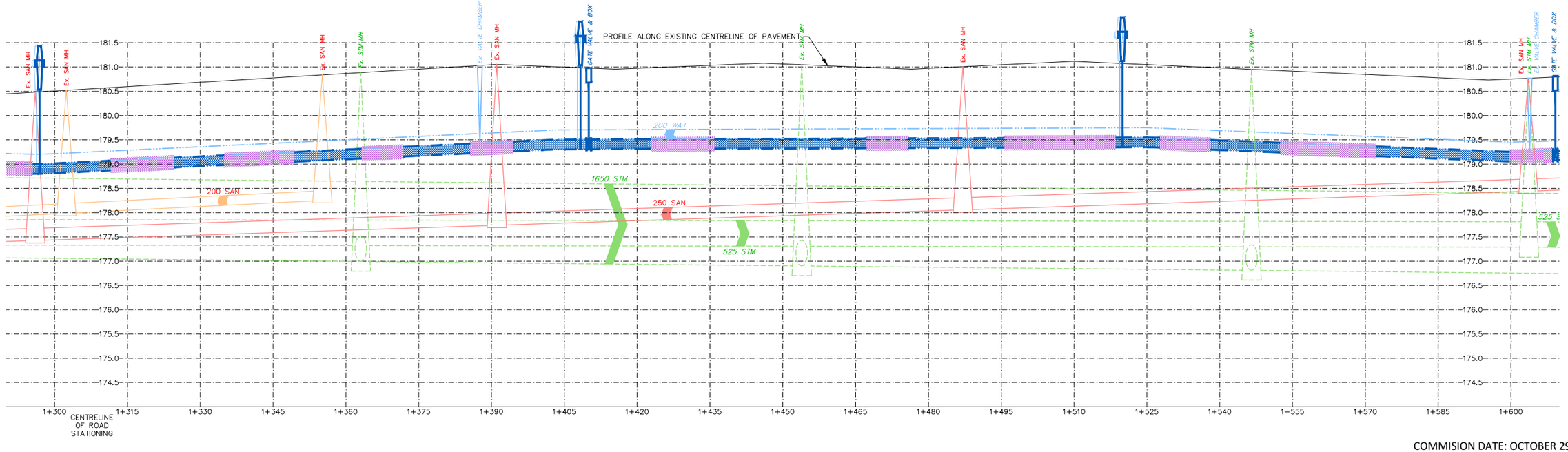
Consultant:	Baird AE - Architects & Engineers
Date:	September 5, 2024
Design By:	Shurjeel Tunio, P.Eng.

Client:	**Dwg. Reference:**	**Checked and Stamped:**
Creekside Condo	23-009	Shurjeel Tunio, P.Eng.

TC#114046



PLAN



PROFILE

COMMISION DATE: OCTOBER 29, 2014

AS-BUILT DRAWING

APPROVALS:			MUNICIPALITY OF CHATHAM – KENT Infrastructure & Engineering Services Engineering & Transportation		LACROIX STREET WATERMAIN REPLACEMENT AND ROAD REHABILITATION COMMUNITY OF CHATHAM PROPOSED WATERMAIN WORKS PLAN & PROFILE
RELATED APPROVALS:	P.ENG.	STAMP		DESIGNED M.J.L. DRAWN M.J.L. CHECKED N.M.C. APPROVED G.A.N. DATE AUG. 2009 SCALE 1 : 400 Hor 1 : 40 Ver.	PROJECT NO. * SHEET NO. 4 OF 7 SHEETS CONTRACT NO T09.182
	DATE	STAMP			

NO.	REVISIONS	BY	DATE
2.	AS CONSTRUCTED	BMF	JAN. 2015
1.	ISSUED FOR TENDERING	MJL	AUG. 2009

TC#114047

1+600

1+855

CECILE AVE.

INDIAN CREEK ROAD

LACROIX STREET

SANITARY PUMP STATION

66.0m OF 200mm∅ PVC DR-18 WATERMAIN WITH TRACER WIRE

110.2m OF 200mm∅ PVC DR-18 WATERMAIN WITH TRACER WIRE

28.0m OF 200mm∅ PVC DR-18 WATERMAIN WITH TRACER WIRE

MB# 599 MB# 192 MB# 615 MB# 619 MB# 623 MB# 627 MB# 631 MB# 635

MB# 574 MB# 600 MB# 602 MB# 608 MB# 612 MB# 624 MB# 630 MB# 632

BBC/CATV 250 SAN 75 GAS 525 STM 1650 STM 200 WAT 200 WAT BBC/CATV 150 GAS

4.0m 3.9m 10.5m 6.2m 9.6m 2.9m 10.5m

SEE DETAIL 'B' – PAGE 6

NEW SERVICE CONNECTED TO OLD SERVICE

HYDRANT ASSEMBLY
200x200x150mm∅ TEE
150mm∅ GATE VALVE & BOX
150mm∅ HYDRANT

HYDRANT ASSEMBLY
200x200x150mm∅ TEE
150mm∅ GATE VALVE & BOX
150mm∅ HYDRANT

250x250x200mm∅ TAPPING SLEEVE
200mm∅ TAPPING VALVE & BOX

150mm∅ PLUG TO BE INSTALLED AT END OF EXISTING PIPE LENGTH, RESTRAINED

MATCH LINE

STATION

PLAN

PROFILE ALONG EXISTING CENTRELINE OF PAVEMENT

Ex. SAN MH Ex. STM MH EX. VALVE CHAMBER GATE VALVE & BOX Ex. STM MH Ex. WAT 150 TEE Ex. SAN MH Ex. WAT 200 TEE Ex. SAN MH GATE VALVE & BOX Ex. STM MH Ex. STM MH Ex. SAN MH Ex. STM MH Ex. SAN MH Ex. WAT (BLOWOFF) GATE VALVE & BOX Ex. STM MH Ex. WAT 150 TEE Ex. WAT 200 BEND

200 WAT

1800 STM

250 SAN

525 STM

525 STM

900 STM

1450 x 2300 STM

181.5 181.0 180.5 180.0 179.5 179.0 178.5 178.0 177.5 177.0 176.5 176.0 175.5 175.0 174.5

1+600 1+615 1+630 1+645 1+660 1+675 1+690 1+705 1+720 1+735 1+750 1+765 1+780 1+795 1+810 1+825 1+840 1+855

CENTRELINE OF ROAD STATIONING

PROFILE

COMMISION DATE: OCTOBER 29, 2014

AS-BUILT DRAWING

APPROVALS:

RELATED APPROVALS:

P.ENG.

DATE

STAMP

STAMP

MUNICIPALITY OF
CHATHAM – KENT
Infrastructure & Engineering Services
Engineering & Transportation

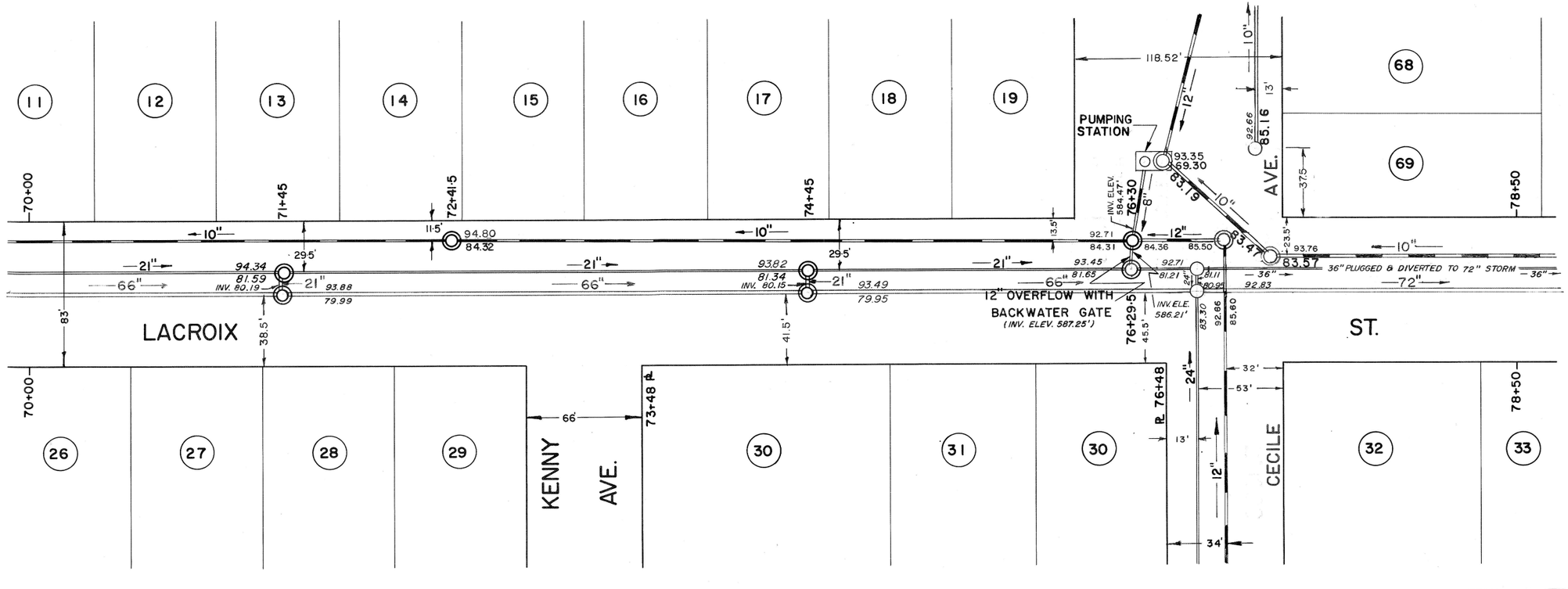
NO.	REVISIONS	BY	DATE
2.	AS CONSTRUCTED	BMF	JAN. 2015
1.	ISSUED FOR TENDERING	MJL	AUG. 2009

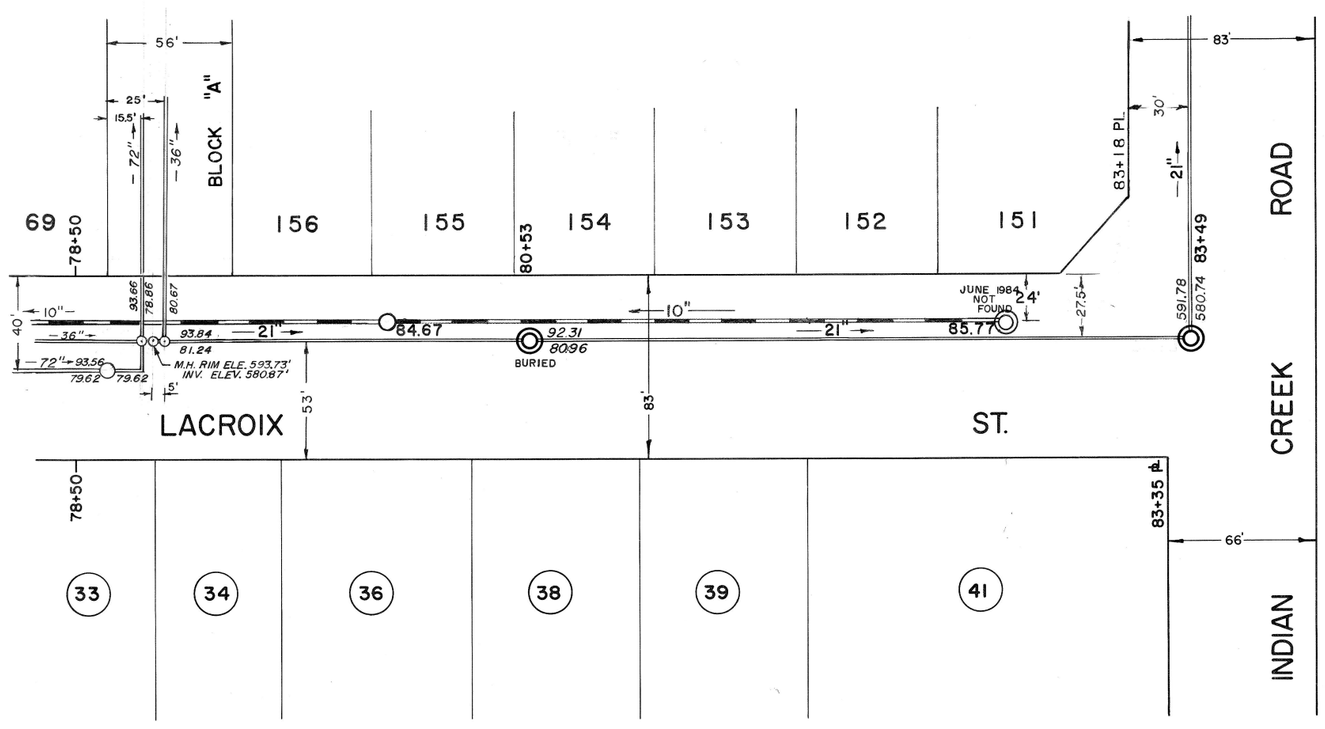
DESIGNED M.J.L.
DRAWN M.J.L.
CHECKED N.M.C.
APPROVED G.A.N.
DATE AUG. 2009
SCALE 1 : 400 Hor
1 : 40 Ver

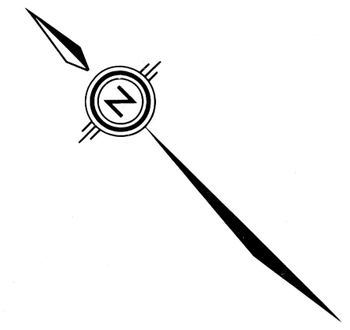
LACROIX STREET WATERMAIN REPLACEMENT AND ROAD REHABILITATION
COMMUNITY OF CHATHAM

PROPOSED WATERMAIN WORKS
PLAN & PROFILE

PROJECT NO. *
SHEET NO. 5 OF 7 SHEETS
CONTRACT NO T09.182







NOTE: ALL MEASUREMENTS SHOWN ARE APPROXIMATIONS ONLY, AND ARE TO BE VARIFIED PRIOR TO ANY CONSTRUCTION.

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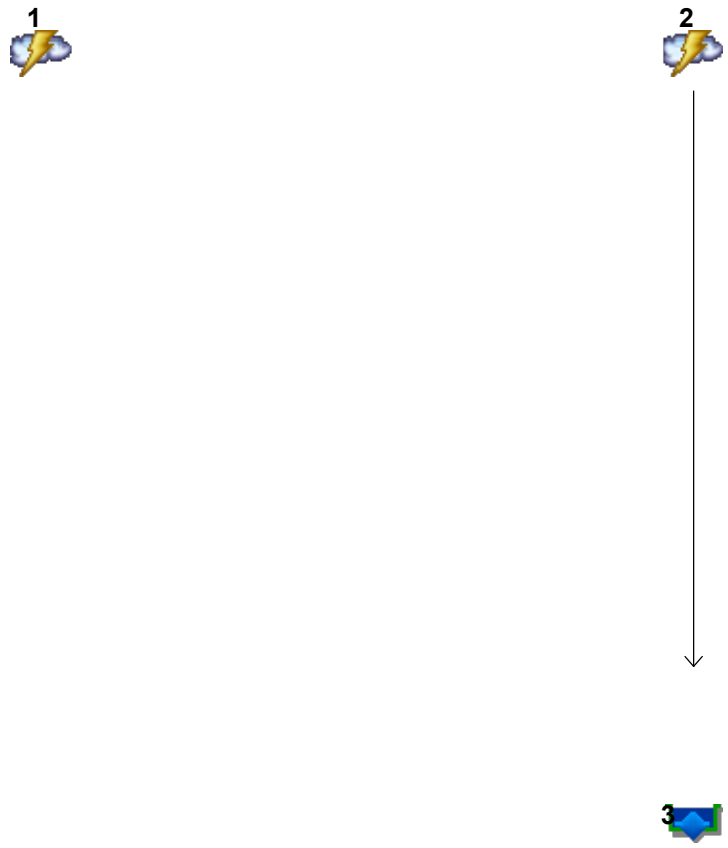
REVISIONS	CITY OF CHATHAM, ONT.
MAY 11, 1961.	OFFICE OF THE CITY ENGINEER
MAR 4, 1963	LACROIX ST.
JAN 3, 1964	90 5528
NOV. 3, 1983	SCALE: 1" = 50'-0"
	DATE: SEPT. 6, 1960.
	R.H.
	H 2
	4 OF 4

H2 4

Appendix B

Hydraflow Table of Contents

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	PRE DEVELOPMENT
2	Rational	POST DEVELOPMENT
3	Reservoir	OUTLET

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cms)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	0.000	0.016	-------	0.021	-------	-------	-------	0.035	PRE DEVELOPMENT
2	Rational	------	0.000	0.144	-------	0.189	-------	-------	-------	0.313	POST DEVELOPMENT
3	Reservoir	2	0.000	0.011	-------	0.014	-------	-------	-------	0.016	OUTLET

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

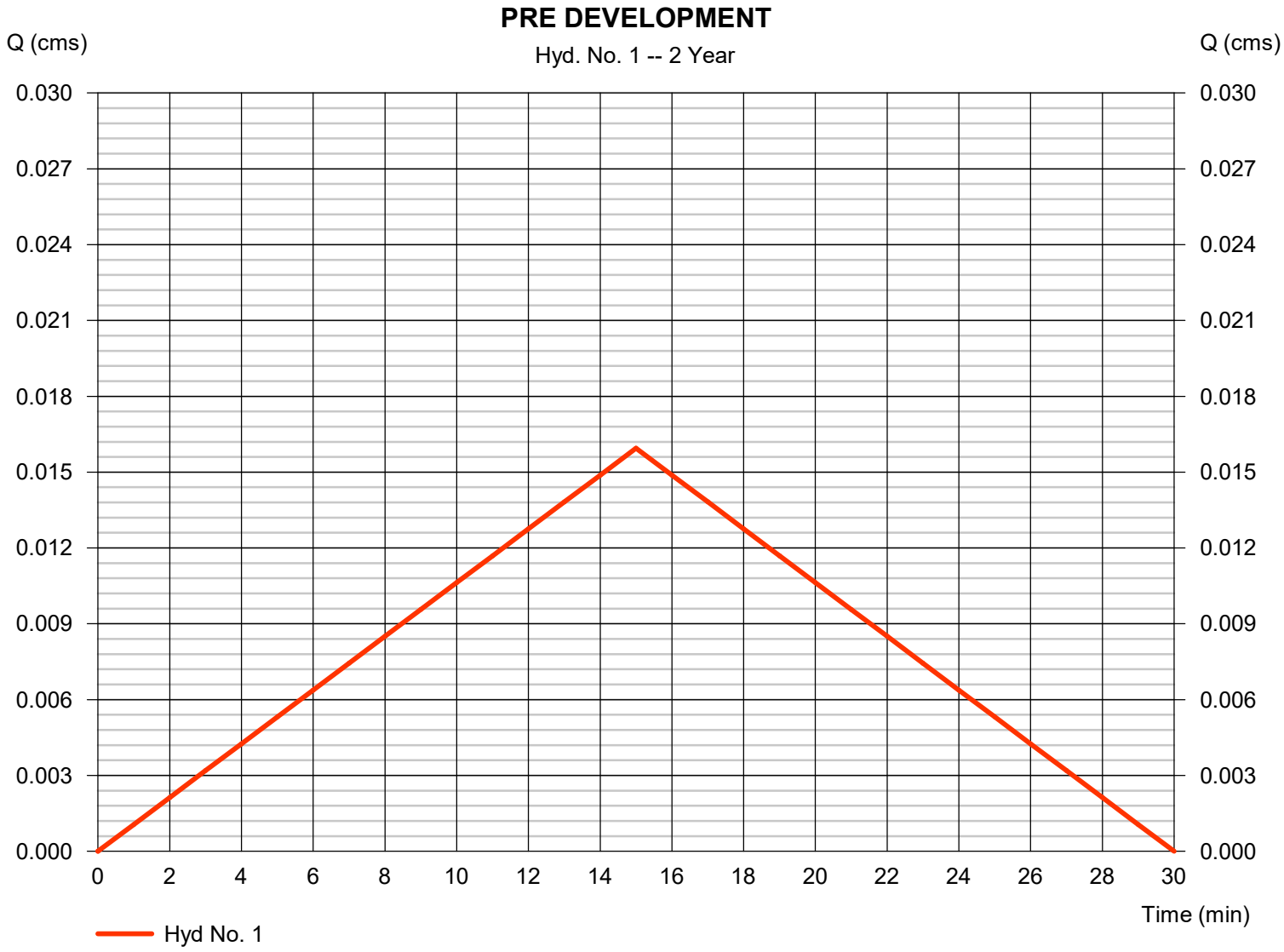
Hyd. No.	Hydrograph type (origin)	Peak flow (cms)	Time interval (min)	Time to Peak (min)	Hyd. volume (cum)	Inflow hyd(s)	Maximum elevation (m)	Total strge used (cum)	Hydrograph Description
1	Rational	0.016	1	15	14.4	------	------	------	PRE DEVELOPMENT
2	Rational	0.144	1	15	129.2	------	------	------	POST DEVELOPMENT
3	Reservoir	0.011	1	29	77.8	2	180.14	4,282	OUTLET

Hydrograph Report

Hyd. No. 1

PRE DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.016 cms
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	14.4 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.1
Intensity	=	62.916 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1



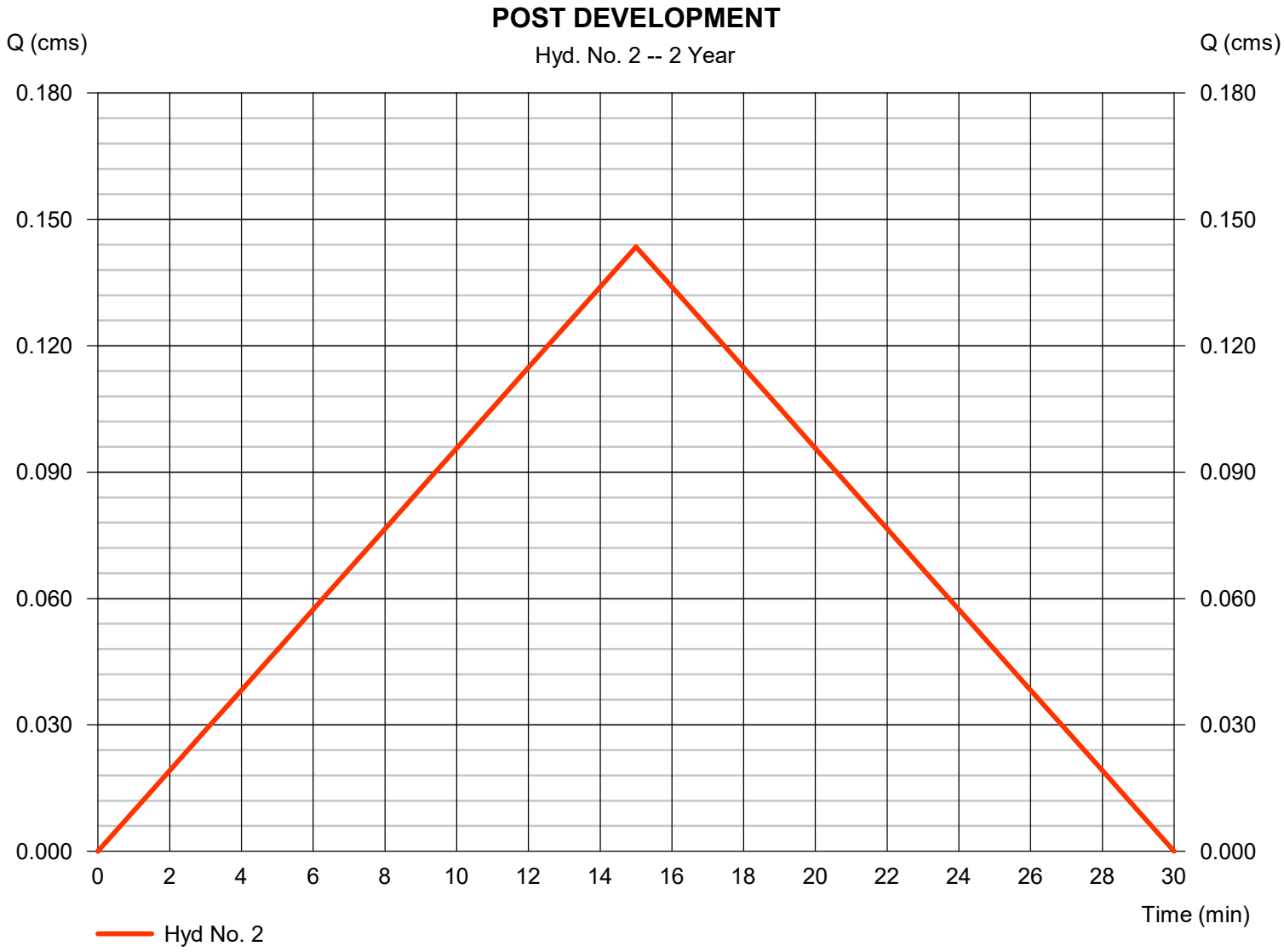
Hydrograph Report

Hyd. No. 2

POST DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.144 cms
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	129.2 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.9*
Intensity	=	62.916 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(0.470 x 0.90) + (0.450 x 0.90)] / 0.920



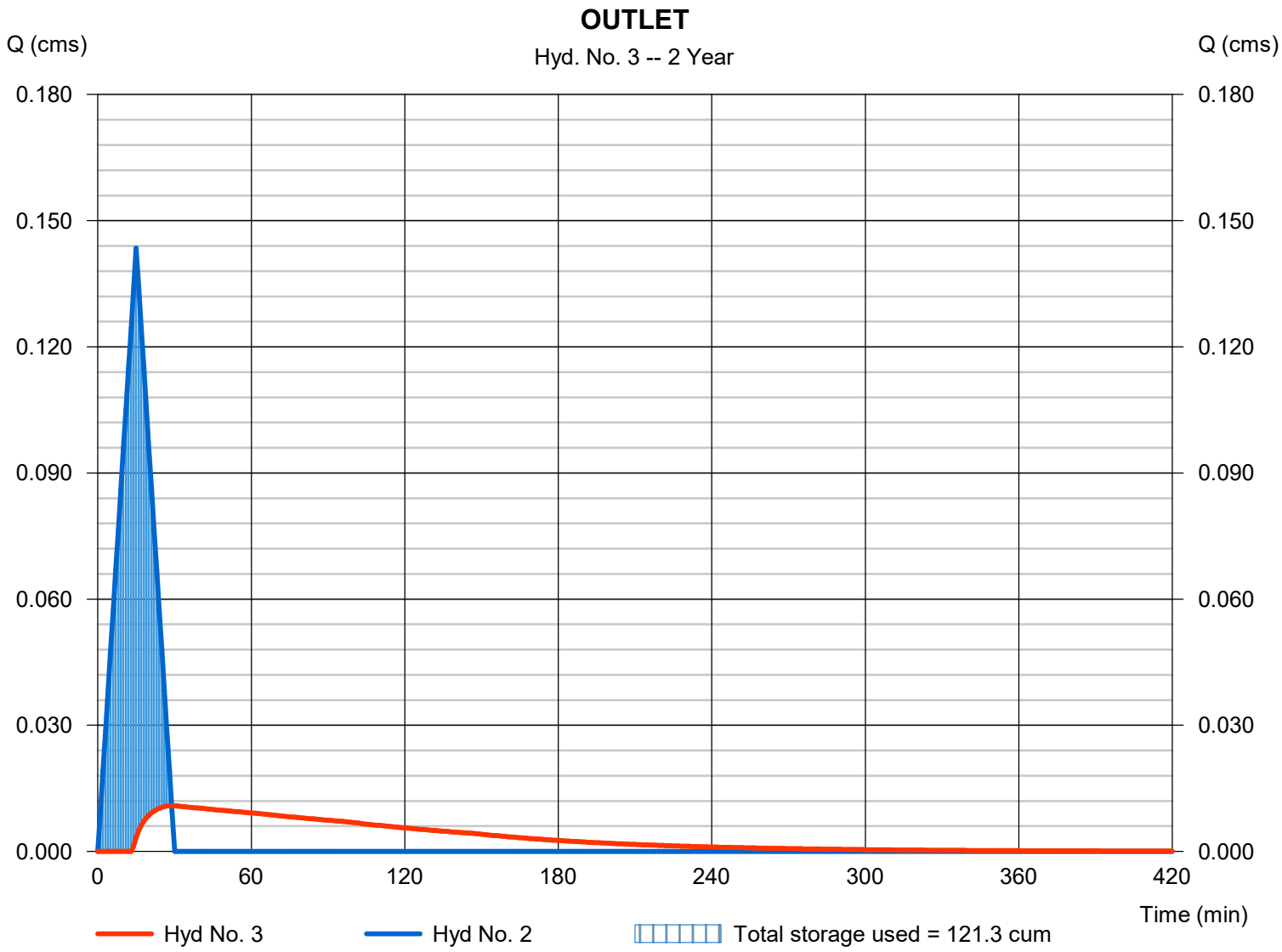
Hydrograph Report

Hyd. No. 3

OUTLET

Hydrograph type	=	Reservoir	Peak discharge	=	0.011 cms
Storm frequency	=	2 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	77.8 cum
Inflow hyd. No.	=	2 - POST DEVELOPMENT	Max. Elevation	=	180.14 m
Reservoir name	=	<New Pond>	Max. Storage	=	121.3 cum

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

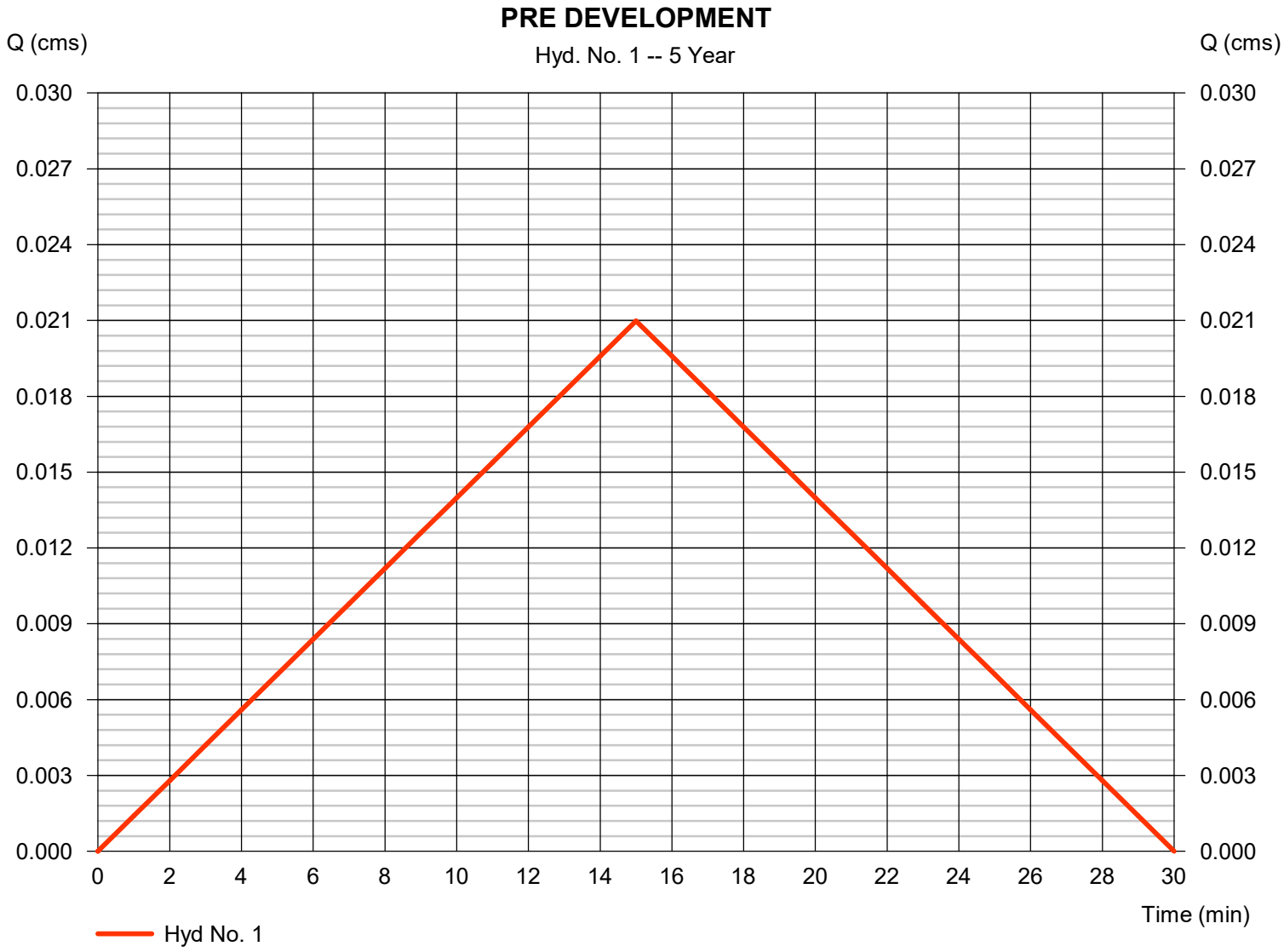
Hyd. No.	Hydrograph type (origin)	Peak flow (cms)	Time interval (min)	Time to Peak (min)	Hyd. volume (cum)	Inflow hyd(s)	Maximum elevation (m)	Total strge used (cum)	Hydrograph Description
1	Rational	0.021	1	15	18.9	------	------	------	PRE DEVELOPMENT
2	Rational	0.189	1	15	170.0	------	------	------	POST DEVELOPMENT
3	Reservoir	0.014	1	29	118.6	2	180.49	5,613	OUTLET

Hydrograph Report

Hyd. No. 1

PRE DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.021 cms
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	18.9 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.1
Intensity	=	82.800 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1



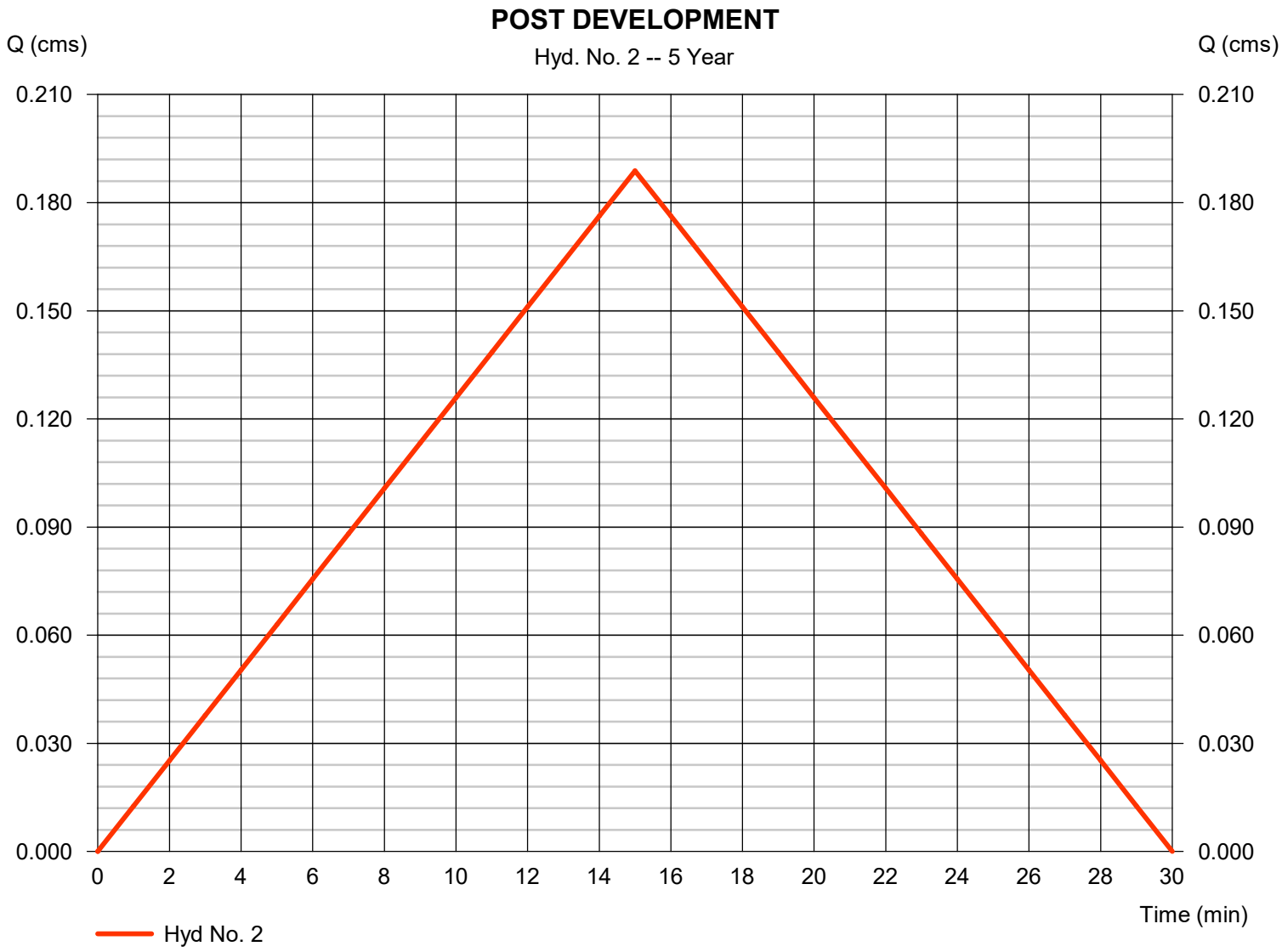
Hydrograph Report

Hyd. No. 2

POST DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.189 cms
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	170.0 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.9*
Intensity	=	82.800 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(0.470 x 0.90) + (0.450 x 0.90)] / 0.920



Hydrograph Report

Hyd. No. 3

OUTLET

Hydrograph type	=	Reservoir	Peak discharge	=	0.014 cms
Storm frequency	=	5 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	118.6 cum
Inflow hyd. No.	=	2 - POST DEVELOPMENT	Max. Elevation	=	180.49 m
Reservoir name	=	<New Pond>	Max. Storage	=	158.9 cum

Storage Indication method used.

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

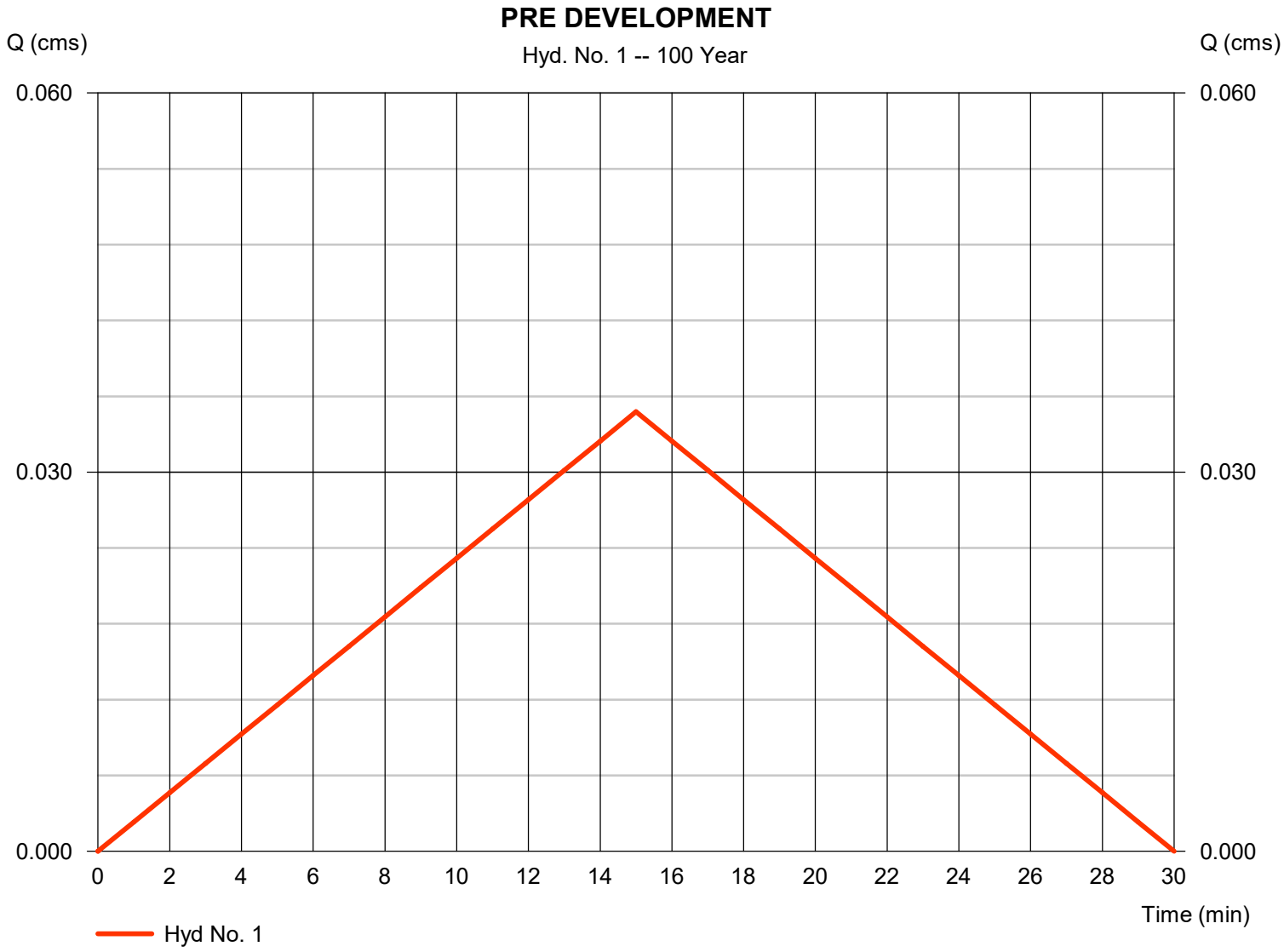
Hyd. No.	Hydrograph type (origin)	Peak flow (cms)	Time interval (min)	Time to Peak (min)	Hyd. volume (cum)	Inflow hyd(s)	Maximum elevation (m)	Total strge used (cum)	Hydrograph Description
1	Rational	0.035	1	15	31.3	------	------	------	PRE DEVELOPMENT
2	Rational	0.313	1	15	281.7	------	------	------	POST DEVELOPMENT
3	Reservoir	0.016	1	29	230.4	2	180.75	9,389	OUTLET

Hydrograph Report

Hyd. No. 1

PRE DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.035 cms
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	31.3 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.1
Intensity	=	137.214 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1



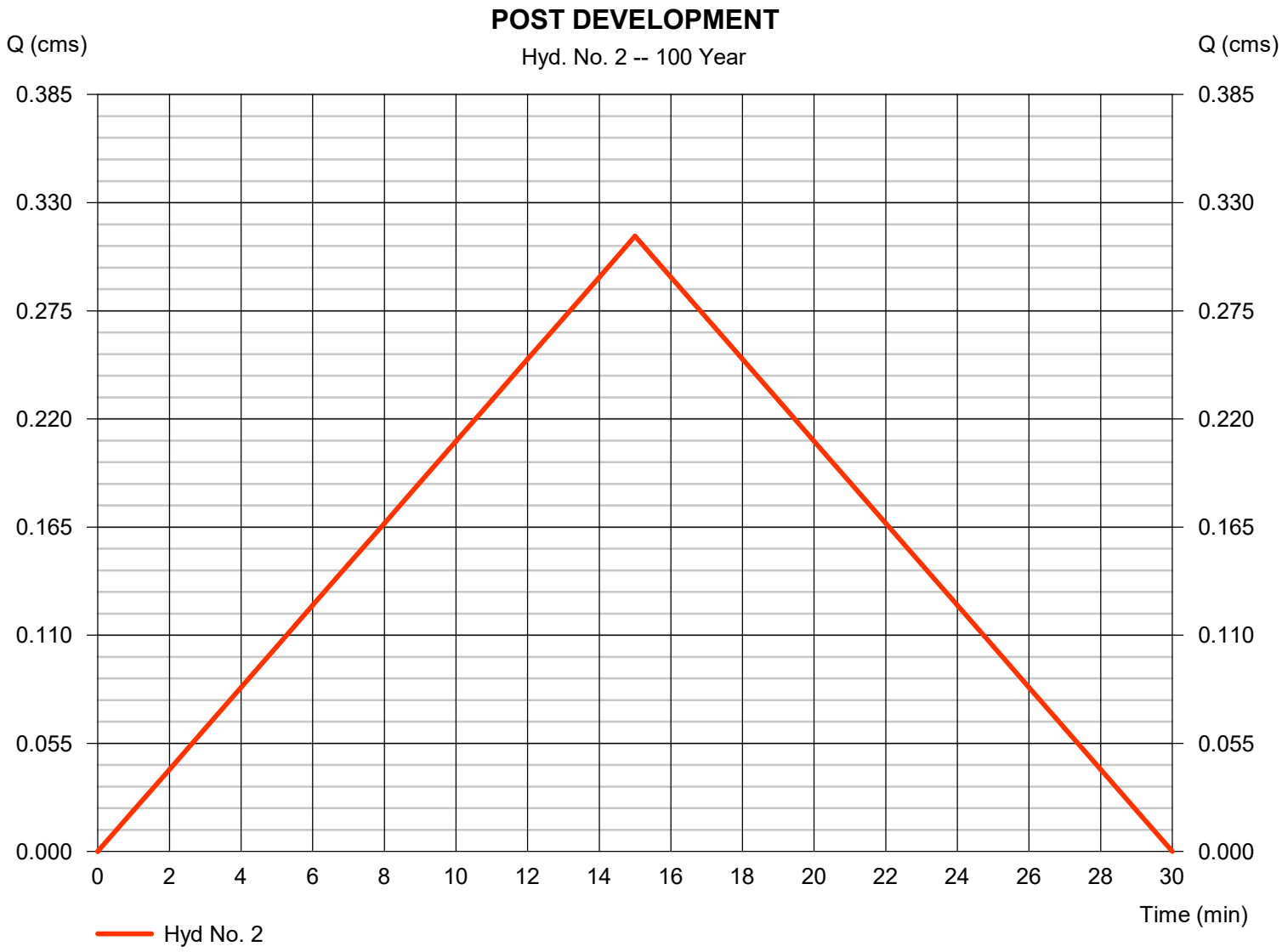
Hydrograph Report

Hyd. No. 2

POST DEVELOPMENT

Hydrograph type	=	Rational	Peak discharge	=	0.313 cms
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	281.7 cum
Drainage area	=	0.920 hectare	Runoff coeff.	=	0.9*
Intensity	=	137.214 mm/hr	Tc by User	=	15.00 min
IDF Curve	=	CHATHAM KENT.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(0.470 x 0.90) + (0.450 x 0.90)] / 0.920



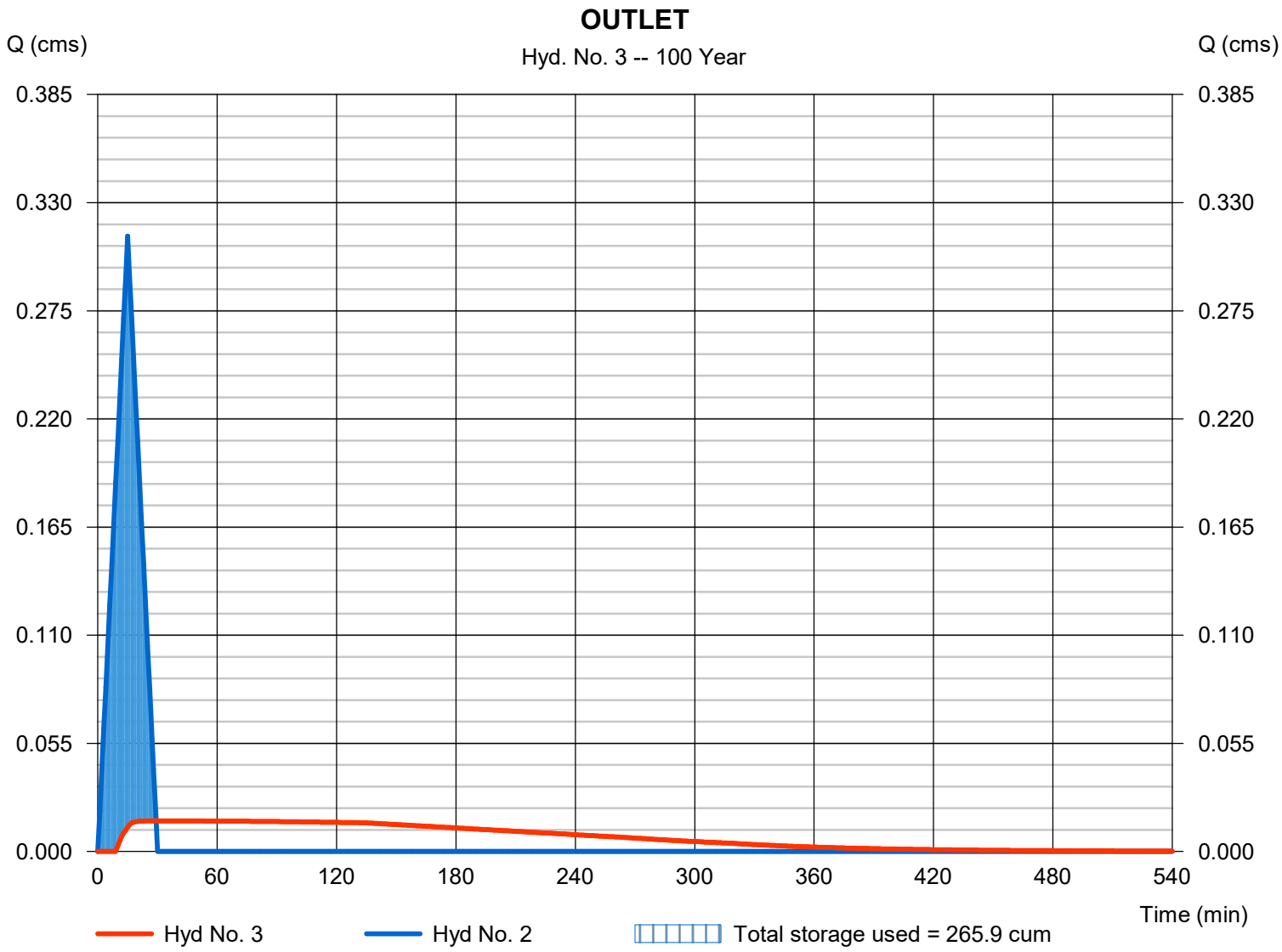
Hydrograph Report

Hyd. No. 3

OUTLET

Hydrograph type	=	Reservoir	Peak discharge	=	0.016 cms
Storm frequency	=	100 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	230.4 cum
Inflow hyd. No.	=	2 - POST DEVELOPMENT	Max. Elevation	=	180.75 m
Reservoir name	=	<New Pond>	Max. Storage	=	265.9 cum

Storage Indication method used.



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	42.1603	0.2540	1.7798	--------
3	0.0000	0.0000	0.0000	--------
5	55.3222	0.2540	1.7771	--------
10	64.6757	0.2540	1.7826	--------
25	75.6108	0.2540	1.7808	--------
50	83.7078	0.2540	1.7792	--------
100	92.0298	0.2540	1.7807	--------

File name: CHATHAM KENT.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (mm/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0	0	0	0	0	0	0	0	0	0	0	0
2	135	83	63	51	44	39	35	32	29	27	25	24
3	0	0	0	0	0	0	0	0	0	0	0	0
5	177	110	83	68	58	51	46	42	39	36	33	31
10	206	128	96	79	67	59	53	48	45	41	39	36
25	241	149	113	92	79	70	62	57	52	49	45	43
50	267	166	125	102	88	77	69	63	58	54	50	47
100	294	182	137	112	96	85	76	69	64	59	55	52

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (mm)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	32	53	0	68	78	90	99	108
SCS 6-Hr	0	0	0	0	0	0	0	0
Huff-1st	0	0	0	0	0	0	0	0
Huff-2nd	0	0	0	0	0	0	0	0
Huff-3rd	0	0	0	0	0	0	0	0
Huff-4th	0	0	0	0	0	0	0	0
Huff-Indy	0	0	0	0	0	0	0	0
Custom	0	0	0	0	0	0	0	0

Appendix C

INDIAN CREEK CONDOS
SANITARY STUDY

Design Sheet 1 - EXISTING DEVELOPMENT FLOW

CATCHMENT AREA			AREAS				DESIGN POPULATION					DESIGN FLOW			SEWER DATA							
Area Included	From Node	To Node	Residential (ha)	Commercial (ha)	Institutional (ha)	Total Area (ha)	Residential (ppl)	Commercial (ppl)	Institutional (ppl)	Total (ppl)	Harmon Peaking Factor	Sewage (L/s)	Infiltration (L/s)	Cumulative Total Flow (L/s)	Dia. (m) Actual	Dia. (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
Lacroix Street																						
PROPOSED DEVELOPMENT	MH1	EX. MH1	0.920	0.000	0.000	0.920	0	0	0	0	4.50	0.00	0.19	0.19	0.200	200	0.40	47.27	20.7	0.66	1.19	0.9%
A1, A2	EX. MH1	EX. MH2	1.026	0.000	0.254	1.280	21	0	0	21	2.63	0.22	0.27	0.68	0.250	250	0.31	80.00	33.2	0.68	1.97	2.0%
A3	EX. MH2	EX. MH3	0.894	0.000	0.000	0.894	21	0	0	21	2.63	0.22	0.19	1.08	0.250	250	0.37	81.00	36.1	0.74	1.83	3.0%
	EX. MH3	PUMP STATION	0.000	0.000	0.000	0.000	0	0	0	0	4.50	0.00	0.00	1.08	0.250	250	0.39	24.42	37.1	0.76	0.54	2.9%
Cecile Aveue east of Lacroix St																						
A8 - A16	EX MH14	PUMP STATION	28.788	0.000	0.872	29.660	522	0	0	522	1.52	3.19	6.23	9.42	0.300	300	0.75	43.00	83.7	1.18	0.61	11.3%
-	PUMP STATION	EX MH5												22.70								
Cecile Avenue west and north of Cecile/Lacroix Street																						
A4	EX MH4	EX MH5	2.010	0.000	0.000	2.010	42	0	0	42	2.34	0.39	0.42	0.81	0.250	250	0.33	15.00	34.1	0.70	0.36	2.4%
A5	EX MH5	EX. MH6	0.315	0.000	0.000	0.315	18	0	0	18	2.70	0.19	0.07	23.77	0.250	250	0.35	115.50	35.1	0.72	2.69	67.6%
A6	EX. MH6	EX. MH7	1.218	0.000	0.000	1.218	27	0	0	27	2.52	0.36	0.26	24.38	0.250	250	0.36	96.00	35.6	0.73	2.20	68.4%

Average Flow per Person (l/day) =	340	**Population Densities**						
Infiltration (l /s/ha) =	0.21	Residential =	3	persons/unit	Apartment=	3	persons/unit	
Pipe Friction "n" =	0.013	Commercial =	74	persons/ha				
Pipe velocity range (m/s) =	0.6	Institutional=		Depends on use	Commerical / institutional : 2.5 L/d per m²			
Pipe Type =	P.V.C. SDR-35	Multi-unit	3	persons/unit	Harmon Peaking Factor =		1 + (14/(4+P^0.5))	

BAIRD|AE architecture + engineering

Date:	August 28, 2024
Design By:	Shurjeel Tunio, P.Eng
Project No:	22-031
Dwg. Reference:	Indian Creek Condos
Reviewed By:	Shurjeel Tunio, P.Eng

North, South and West of Intersection

Area Name	Area (Ha)	Land Use	No. of Units		Total Floor Area
			Singles	Multi-unit	
A1	0.254	Institutional	-	-	416
A2	1.026	Residential	7		
A3	0.894	Residential	7		
A4	2.010	Residential	14		
A5	0.315	Residential	6		
A6	1.218	Residential	9		
	5.717				

East of Intersection

Area Name	Area (Ha)	Land Use	No. of Units		Total Floor Area
			Singles	Multi-unit	
A7	0.187	Residential	2		
A8	1.910	Residential	15		
A9	8.256	Residential	60		
A10	6.186	Residential	60		
A11	0.872	Institutional	-		2370
A12	2.745	Residential	26		
A13	2.201	Residential	21		
A14	1.868	Residential	19		
A15	5.435	Residential	48		
	29.660				

INDIAN CREEK CONDOS
SANITARY STUDY

Design Sheet 2 - EXISTING AND PROPOSED DEVELOPMENT FLOW

CATCHMENT AREA			AREAS				DESIGN POPULATION					DESIGN FLOW			SEWER DATA							
Area Included	From Node	To Node	Residential (ha)	Commercial (ha)	Institutional (ha)	Total Area (ha)	Residential (ppl)	Commercial (ppl)	Institutional (ppl)	Total (ppl)	Harmon Peaking Factor	Sewage (L/s)	Infiltration (L/s)	Cumulative Total Flow (L/s)	Dia. (m) Actual	Dia. (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
Lacroix Street																						
PROPOSED DEVELOPMENT	MH1	EX. MH1	0.920	0.000	0.000	0.920	261	0	0	261	1.69	1.74	0.19	1.93	0.200	200	0.40	47.27	20.7	0.66	1.19	9.3%
A1, A2	EX. MH1	EX. MH2	1.026	0.000	0.254	1.280	21	0	50	71	2.13	0.59	0.27	2.80	0.250	250	0.31	80.00	33.2	0.68	1.97	8.4%
A3	EX. MH2	EX. MH3	0.894	0.000	0.000	0.894	21	0	0	21	2.63	0.22	0.19	3.20	0.250	250	0.37	81.00	36.1	0.74	1.83	8.9%
	EX. MH3	PUMP STATION	0.000	0.000	0.000	0.000	0	0	0	0	4.50	0.00	0.00	3.20	0.250	250	0.39	24.42	37.1	0.76	0.54	8.6%
Cecile Aveue east of Lacroix St																						
A8 - A16	EX MH14	PUMP STATION	28.788	0.000	0.872	29.660	522	0	0	522	1.52	3.19	6.23	9.42	0.300	300	0.75	43.00	83.7	1.18	0.61	11.3%
-	PUMP STATION	EX MH5												22.70								
Cecile Avenue west and north of Cecile/Lacroix Street																						
A4	EX MH4	EX MH5	2.010	0.000	0.000	2.010	42	0	0	42	2.34	0.39	0.42	0.81	0.250	250	0.33	15.00	34.1	0.70	0.36	2.4%
A5	EX MH5	EX. MH6	0.315	0.000	0.000	0.315	18	0	0	18	2.70	0.19	0.07	23.77	0.250	250	0.35	115.50	35.1	0.72	2.69	67.6%
A6	EX. MH6	EX. MH7	1.218	0.000	0.000	1.218	27	0	0	27	2.52	0.36	0.26	24.38	0.250	250	0.36	96.00	35.6	0.73	2.20	68.4%

Average Flow per Person (l/day) =	340	**Population Densities**						
Infiltration (l /s/ha) =	0.21	Residential =	3	persons/unit	Apartment=	3	persons/unit	
Pipe Friction "n" =	0.013	Commercial =	74	persons/ha				
Pipe velocity range (m/s) =	0.6	Institutional=		Depends on use	Commerical / institutional : 2.5 L/d per m²			
Pipe Type =	P.V.C. SDR-35	Multi-unit	3	persons/unit	Harmon Peaking Factor =		1 + (14/(4+P^0.5))	

BAIRD|AE architecture + engineering

Date:	August 28, 2024
Design By:	Shurjeel Tunio, P.Eng
Project No:	22-031
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A5	0.315	Residential	6	0	
A6	1.218	Residential	9		
	5.717				

East of Intersection

Area Name	Area (Ha)	Land Use	No. of Units		Total Floor Area
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A13	2.201	Residential	21		
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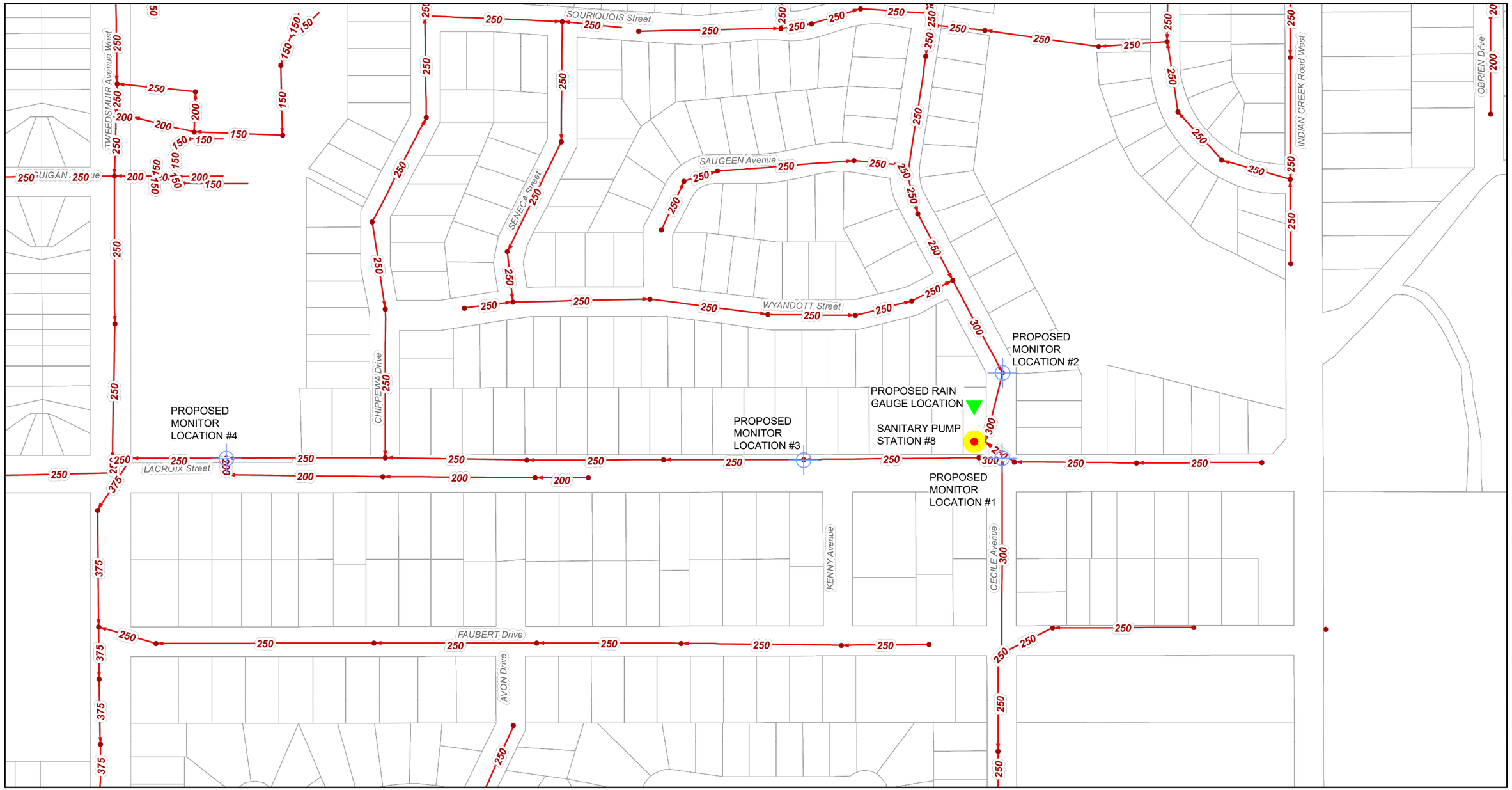
A15	5.435	Residential	48		
	29.660				



Sanitary Sewers

Sanitary Maintenance Holes

Sanitary Pump Station

Monitoring Location

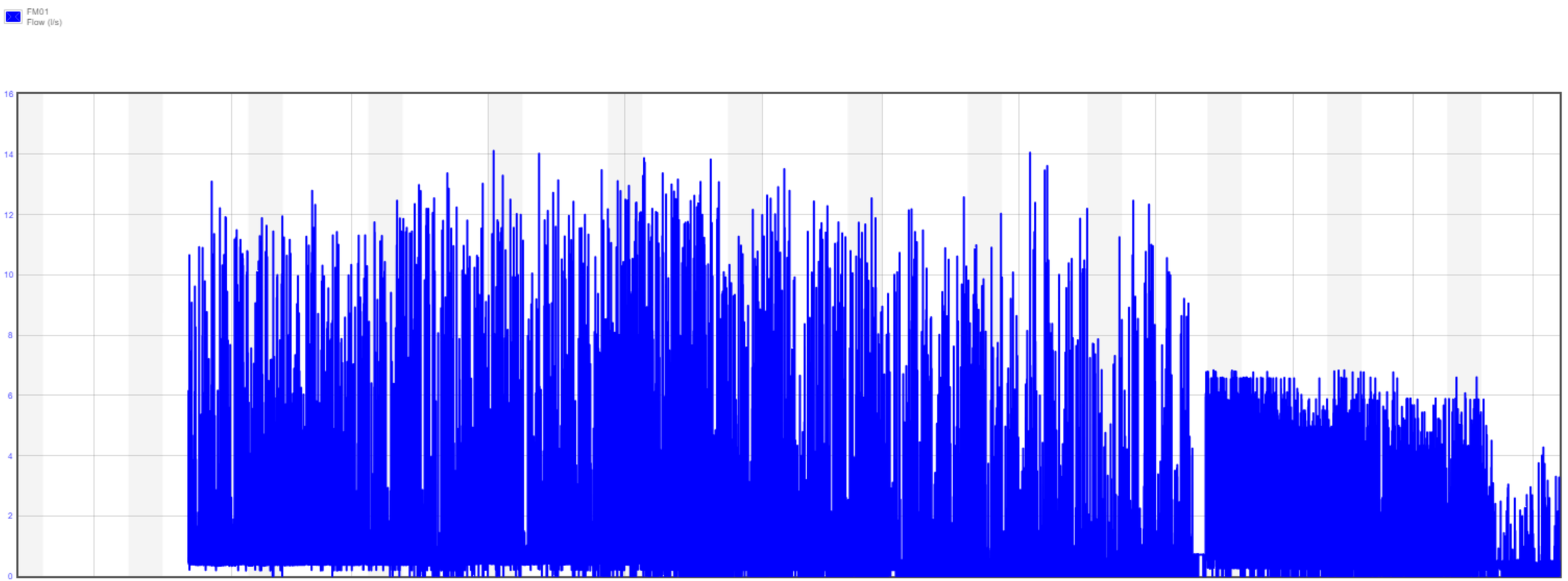
Legend

Municipality of Chatham-Kent Infrastructure Data General Disclaimer: The Municipality of Chatham-Kent makes no representation whatsoever about the suitability or accuracy of the information contained in the documents and related graphics published on this document for any purpose. All such documents and related graphics are provided "as is" without warranty of any kind and may include inaccuracies and/or errors. The Municipality of Chatham-Kent hereby disclaims all representations and warranties. If planning to dig or excavate, located must be requested and completed prior to work being done.

N E S W

Lacroix Street
Sanitary Sewer Collection System
Community of Chatham

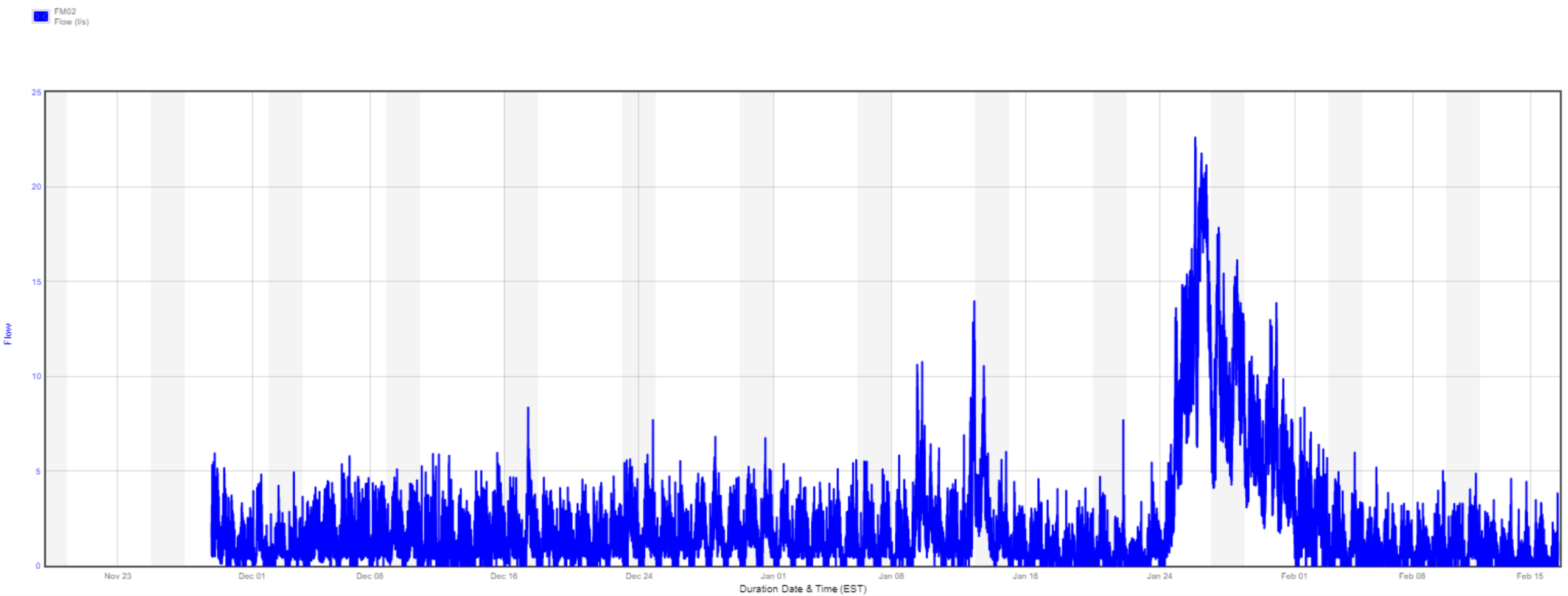
Chatham-Kent
Cultivating Growth, Shore to Shore



Type:	Maximum Depth(mm)	Minimum Depth(mm)	Average Depth(mm)	Maximum Velocity(m/s)	Minimum Velocity(m/s)	Average Velocity(m/s)	Maximum Flow(l/s)	Minimum Flow(l/s)	Average Flow(l/s)
Value:	0	0	NaN	0	0	NaN	14.11	0.17	1.37
Date:	n/a	n/a	---	n/a	n/a	---	12/16/2023	01/11/2024	---
Time:	n/a	n/a	---	n/a	n/a	---	07:40	00:05	---

Type:	Maximum pH	Minimum pH	Average pH
Value:	0	0	NaN
Date:	n/a	n/a	---
Time:	n/a	n/a	---

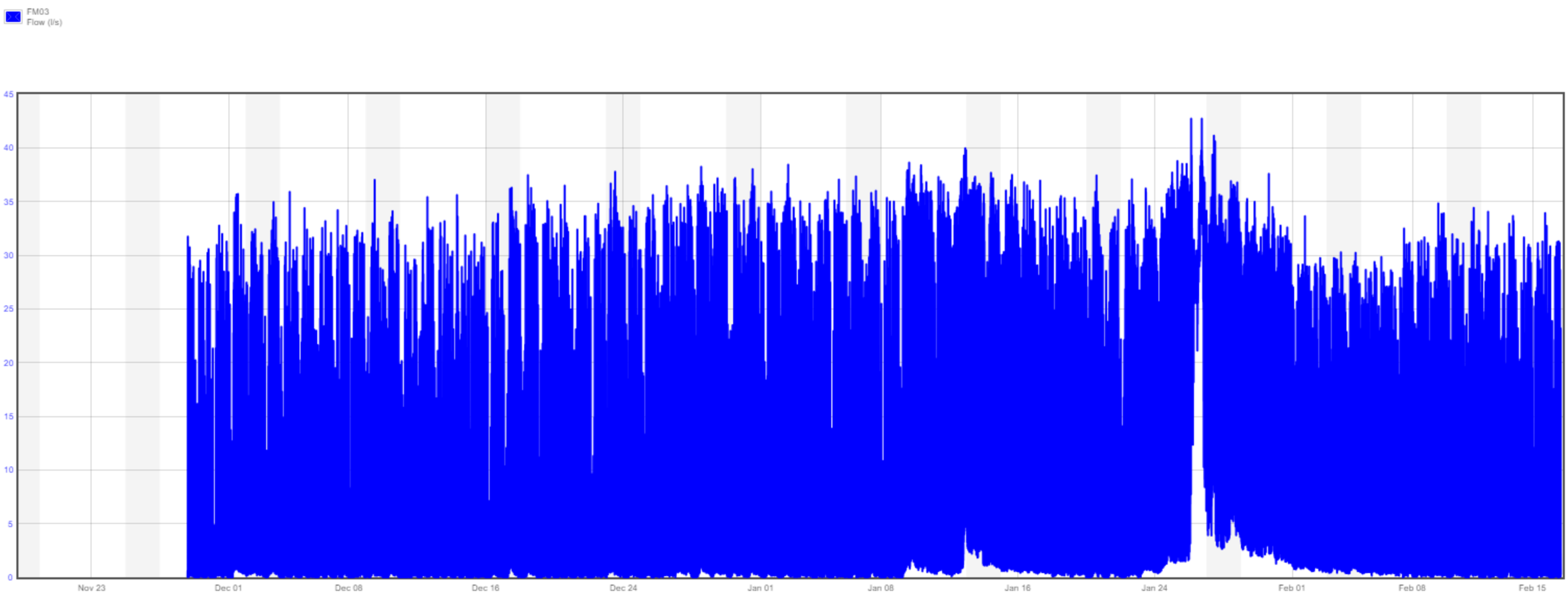
Show Table



Type:	Maximum Depth(mm)	Minimum Depth(mm)	Average Depth(mm)	Maximum Velocity(m/s)	Minimum Velocity(m/s)	Average Velocity(m/s)	Maximum Flow(l/s)	Minimum Flow(l/s)	Average Flow(l/s)
Value:	0	0	NaN	0	0	NaN	22.61	0.05	2.11
Date:	n/a	n/a	---	n/a	n/a	---	01/26/2024	11/30/2023	---
Time:	n/a	n/a	---	n/a	n/a	---	01:55	03:40	---

Type:	Maximum pH	Minimum pH	Average pH
Value:	0	0	NaN
Date:	n/a	n/a	---
Time:	n/a	n/a	---

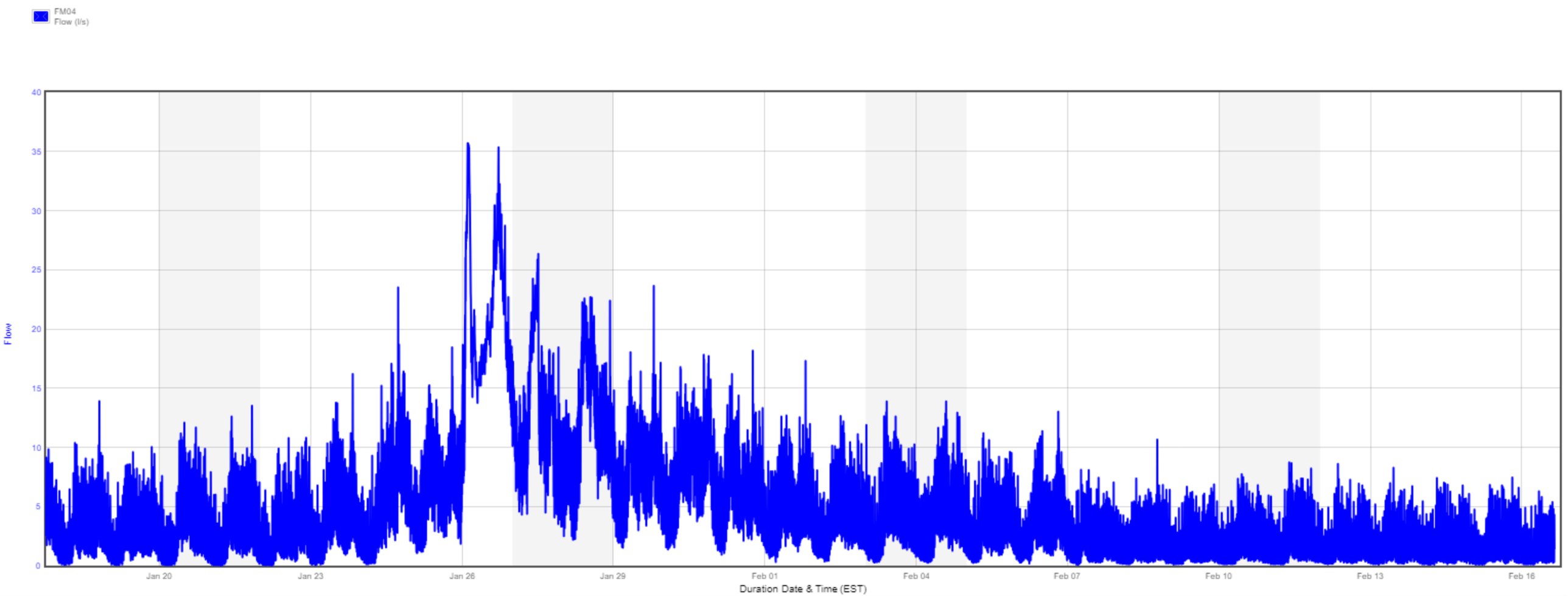
Show Table



Type:	Maximum Depth(mm)	Minimum Depth(mm)	Average Depth(mm)	Maximum Velocity(m/s)	Minimum Velocity(m/s)	Average Velocity(m/s)	Maximum Flow(l/s)	Minimum Flow(l/s)	Average Flow(l/s)
Value:	0	0	NaN	0	0	NaN	42.71	0.03	6.82
Date:	n/a	n/a	---	n/a	n/a	---	01/26/2024	02/10/2024	---
Time:	n/a	n/a	---	n/a	n/a	---	02:30	00:25	---

Type:	Maximum pH	Minimum pH	Average pH
Value:	0	0	NaN
Date:	n/a	n/a	---
Time:	n/a	n/a	---

Show Table



Type:	Maximum Depth(mm)	Minimum Depth(mm)	Average Depth(mm)	Maximum Velocity(m/s)	Minimum Velocity(m/s)	Average Velocity(m/s)	Maximum Flow(l/s)	Minimum Flow(l/s)	Average Flow(l/s)
Value:	0	0	NaN	0	0	NaN	35.7	0.04	4.65
Date:	n/a	n/a	---	n/a	n/a	---	01/26/2024	01/19/2024	---
Time:	n/a	n/a	---	n/a	n/a	---	02:45	05:05	---

Type:	Maximum pH	Minimum pH	Average pH
Value:	0	0	NaN
Date:	n/a	n/a	---
Time:	n/a	n/a	---

Show Table