FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

Project No.: CCO-26-1833

Prepared for:

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1.0 PROJECT DESCRIPTION

1.1 Purpose

Egis Canada (Egis) has been retained by 1384341 Ontario Ltd. to prepare this Functional Servicing and Stormwater Management Report in support of the Development Permit application for the development located at Block 29 (the Site) on Registered M-Plan 27M-106, within the Coleman Central Subdivision Phase 2.

The main purpose of this report is to demonstrate that the proposed development has access to sufficient public services in accordance with the recommendations and guidelines provided by the Town of Carleton Place (Town), the Mississippi Valley Conservation Authority (MVCA) and the Ministry of the Environment, Conservation and Parks (MECP). This report examines the adequacy of the existing municipal servicing to support the proposed development.

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

- CCO-26-1833, C101 – Site Grading, Drainage & ESC Plan, Rev. 1, dated June 10, 2026, prepared by Egis
- CCO-26-1833, C102 – Site Servicing Plan, Rev. 1, dated June 10, 2026, prepared by Egis

1.2 Site Description

The Site is located on Lewis Street in the Town of Carleton Place. The Site is located within Phase 2 of the Coleman Central Subdivision, identified as Block 29 on M-Plan 27M-106. The Site covers approximately 11,500m^2 of land, and fronts onto Lewis Street. There is an existing drainage ditch on the neighbouring Walmart property that runs adjacent to the rear (northeast) of the Site. See Site Location Plan in Appendix A for more details. The Site Plan is also included in Appendix A.

1.3 Proposed Development and Statistics

The proposed development includes five, two-storey townhouse blocks with 7 units each (35 units total).

1.4 Existing Conditions and Infrastructure

The Site is currently undeveloped. The construction of municipal infrastructure located within the Lewis Street right-of-way (ROW) was recently completed as part of the Coleman Central Subdivision Phase 2 works.

The existing sewer and watermain, as described below, was recently installed as part of the Coleman Central Subdivision Phase 2 construction:

- LEWIS STREET
    - 200 mm diameter PVC watermain
    - 200 mm and 250mm diameter PVC sanitary sewer

- 300mm to 1050 mm diameter PVC and concrete storm sewer

There is an existing stormwater management facility (SWMF) located directly to the south of the proposed development, constructed as part of the Coleman Central Subdivision Phase 2 works. The existing SWMF was designed to accommodate the development of Block 29.

2.0 BACKGROUND STUDIES, STANDARDS, AND REFERENCES

2.1 Background Reports / Reference Information

Reports, memorandums and drawings reviewed during detailed design in support of the proposed Development Permit Application include:

- *Servicing and Stormwater Management Report – Coleman Central Subdivision Phase 2, Revision 8, dated February 2025, prepared by McIntosh Perry*
- *Engineering Drawings, Revision 13, dated February 27, 2026, prepared by Egis*

2.2 Applicable Guidelines and Standards

City of Ottawa:

- City of Ottawa Sewer Design Guidelines, Fourth Edition, December 2025. (***City Sewer Design Guidelines***)
- City of Ottawa Water Distribution Guidelines, First Edition, July 2010. **(City Water Distribution Guidelines)**
  - Technical Bulletin IWSTB-2024-05 (November 18, 2024)
  - Technical Bulletin ISTB-2021-03 (August 18, 2021)
  - Technical Bulletin ISTB-2018-02 (March 21, 2018)
  - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
  - Technical Bulletin ISD-2010-2 (December 15, 2010)

Ministry of Environment, Conservation and Parks:

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

Other:

- Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (***FUS Guidelines***)
- 2024 Ontario Building Code Compendium

3.0 WATER SERVICING

3.1 Existing Watermain

There is an existing 200 mm diameter watermain that extends along the frontage of the Site within Lewis Street, installed as part of the Coleman Central Subdivision Phase 2 works. There are two existing hydrants along the frontage of the Site within Lewis Street, and an additional existing hydrant on a future roadway allowance across from the Site.

3.2 Proposed Water Servicing

Each townhouse unit will be serviced by individual domestic service laterals (19mm dia.) connecting to the existing 200mm diameter watermain on Lewis Street. Fire protection would be provided via the existing hydrants as described above.

3.2.1 Water Demands

Fire demands have been calculated per the 2024 Ontario Building Code (OBC Fire protection guidelines). A fire flow of 75 L/s (4,500 L/min) was calculated for the proposed development, assuming a vertical firewall is installed in each townhouse block. With no firewall, the required fire flow will be 150 L/s (9,000 L/min). The required fire flows for the subdivision were previously calculated as part of the *Servicing and Stormwater Management Report - Coleman Central Subdivision Phase 2 (McIntosh Perry, 2025*). The report indicated a required fire flow of 167 L/s (10,000 L/min). The detailed calculations for the OBC fire flows for the proposed development can be found in Appendix B.

Domestic water demands for the proposed development have been calculated to adhere to the City of Ottawa Water Design Guidelines and can be found in Appendix B. As no additional watermain is proposed for the Block 29 development, the overall water demand for the Coleman Central Subdivision Phase 2 watermain has been updated to account for the Block 29 development. The results have been summarized in ***Table 1***, below.

Table 1: Water Supply Design Criteria and Water Demands (Coleman Central Subdivision Phase 2)

Residential Demand Rate	280 L/person/day
Single Family	3.4 persons/unit
Semi-Detached /Townhouse Unit	2.7 persons/unit
Maximum Daily Peaking Factor	3.70 x avg day
Maximum Hour Peaking Factor	5.60 x avg day

Average Day Demand (L/s)	0.92
Maximum Daily Demand (L/s)	3.41
Peak Hourly Demand (L/s)	5.16
Fire Flow Requirement (L/s)	75 (4,500 L/min) (OBC, with vertical firewalls)

To confirm the adequacy of the existing watermain system to protect the proposed development, public fire hydrants within 150 m of the proposed building were analysed per Table 2 of the FUS Guidelines. Based on FUS Guidelines the existing hydrants within the municipal ROW on Lewis Street, can provide adequate fire protection to the proposed development. The results are summarized in ***Table 2***, below.

Table 2: Fire Protection Confirmation

Building	Fire Flow Demand (L/min)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)	Combined Fire Flow (L/min)
Block 1	4,500	2	0	11,400
Block 2	4,500	2	1	15,180
Block 3	4,500	1	2	13,300
Block 4	4,500	1	1	9,500
Block 5	4,500	2	1	15,180

3.2.2 System Pressures

System pressures for the overall subdivision were previously estimated using Bentley's WaterCAD modelling software as part of the Servicing and *Stormwater Management Report - Coleman Central Subdivision Phase 2 (McIntosh Perry, 2025)*. The model included the demands associated with the proposed Block 29 development (assumed to be 35 apartment units at the time of subdivision design). The three following scenarios were previously analysed to confirm adequate flows/pressures within the system:

- Scenario 1: Average Day Demand
- Scenario 2: Peak Hour Demand
- Scenario 3: Max Day Plus Fire Flow

The analysis confirmed adequate pressures within the system under all three scenarios. The model has since been updated to account for both future planned watermain and water demands associated with the 355 Franktown Road development. This model has been updated as part of this report using EPANET modelling software to account for the minor increase in population within the proposed Block 29 development. The three demand scenarios mentioned above were analysed in two separate model conditions as described below:

- Condition 1: Existing conditions (i.e. only Coleman Central Subdivision Phase 2 developed)
- Condition 2: Future condition in which the 355 Franktown Road property is developed and a future watermain connection is provided from the Coleman Central Subdivision Phase 2 to Franktown Road.

The system pressures for each scenario were analysed based on the city of Ottawa system pressure design criteria parameters outlined in ***Table 3*** below.

Table 3: System Pressure Design Criteria

Maximum Pressure (Avg Day) Condition	<552 kPa (80 psi)
Minimum Pressure (Peak Hour) Condition	>276 kPa (40 psi)
Minimum Pressure (Max Day + Fire Flow) Condition	>140 kPa (20 psi)

The updated model results determined that the existing and proposed 200mm watermain can adequately service the proposed Block 29 development in both the existing and future conditions. The model results are included in Appendix B.

4.0 SANITARY SERVICING

4.1 Existing Sanitary Sewers

There is an existing 250 mm diameter PVC sanitary sewer within Lewis Street that is proposed to service the development.

4.2 Proposed Sanitary Servicing

Each townhouse unit will be serviced by individual service laterals (135mm dia.) connecting to the existing 250mm diameter sanitary sewer on Lewis Street.

4.2.1 Sanitary Demands

The proposed development includes five two-storey townhouse blocks with 7 units each.

The peak design flow for the proposed development was calculated using criteria from the City of Ottawa Sewer Design Guidelines and is summarized in **Table 4** below. Refer to Appendix C for detailed calculations

Table 4: Summary of Estimated Sanitary Flow from Block 29

Design Parameter	Value
Site Area	1.15 ha
Residential Flow Rate	280 L/person/day
Townhouse Unit	2.7 persons/unit
Extraneous Flow Allowance	0.28 L/s/ha
Total Estimated Average Dry Weather Flow (L/s)	0.36
Total Estimated Peak Dry Weather Flow (L/s)	1.16
Total Estimated Peak Wet Weather Flow (L/s)	1.27

The existing 250mm diameter sanitary sewer on Lewis Street was designed as part of the Coleman Central Subdivision Phase 2 and accounted for flows generated from the Block 29 Site. At the time of registration, Block 29 was allocated as a 35-apartment unit development. Currently, 35 townhouse units are proposed, which will result in a slight increase in population compared to the allocated amount. The subdivision sanitary sewer design sheet has been updated to account for the small increase in population at Block 29 and is included in Appendix C. There is sufficient capacity within the existing sanitary sewer system to service the proposed Block 29 development.

5.0 STORM SEWER SERVICING & STORMWATER MANAGEMENT

This section addresses stormwater management for the proposed development of Block 29 with 35 townhouse units. The storm sewer network and SWM pond serving the Coleman Central Subdivision – Phase 2 were designed and approved under the *Servicing and Stormwater Management Report – Coleman Central Subdivision Phase 2 (McIntosh Perry, 2025)* and have since been constructed. In the initial design, Block 29 was designed to entirely drain storm water through a storm sewer that outlets to the SWM pond. The proposed design intends to similarly outlet most storm water to the SWM, however, storm water will be conveyed to the SWM pond by means of a rear yard swale and the storm sewer. Additionally, a small portion of the proposed area (0.10 Ha), will naturally sheet flow off the Site to the rear property line. The purpose of this section is to demonstrate that the runoff generated by the proposed townhouse development does not exceed the capacity of the previously designed storm sewer and pond, and that the approved stormwater management design remains adequate to service the block.

5.1 Existing Storm Sewer and Site Drainage

There are existing storm sewers along the frontage of the Site on Lewis Street, ranging in size from 600mm, 900mm, and 1050mm in diameter. Stormwater runoff from the Site currently sheet drains to the east where it is collected by an existing ditch.

The existing storm sewers installed as part of the Coleman Central Subdivision Phase 2 works have been designed to convey flows from the Block 29 Site area to the existing stormwater management facility. The storm sewer design sheet, and Storm Sewer Drainage Area Plan, included as part of the *Servicing and Stormwater Management Report - Coleman Central Subdivision Phase 2 (McIntosh Perry, 2025*) is included in Appendix D.

5.2 Proposed Storm Servicing

Each townhouse unit will be serviced by individual service laterals (150mm dia.) connecting to the existing storm sewer on Lewis Street. Consistent with the townhouse units designed as part of the Coleman Central Subdivision Phase 2 design, all units will require sump pumps due to relatively shallow storm sewers on Lewis Street. The rear-yard swale will outlet to a ditch inlet catchbasin maintenance hole (DICBMH) at the south of the Site. The DICBMH will outlet to the existing stormwater management pond via a 450mm diameter storm pipe. The storm sewer design sheet for the rear-yard outlet pipe is included in Appendix D. The 450 mm outlet pipe was sized for the 5-year flow and checked against the 100-year flow for overtopping, and an HY-8 analysis confirms that it is adequately sized. Its outlet invert is set approximately 0.02 m above the permanent pool elevation, so under normal conditions the pipe discharges under free-flow conditions and the permanent pool has no backwater effect on the rear-yard swale. During the 5-year and 100-year events the pond stages temporarily above the permanent pool and submerges the outlet, producing tailwater conditions within the outlet pipe and surcharging it. This tailwater remains below the DICBMH, does not back up into the rear-yard swale or affect the rear yards, and the pipe does not overtop at the structure.

5.3 Approved Stormwater Management Design

The subdivision stormwater management design was prepared in accordance with the MECP *Stormwater Management Planning and Design Manual* (March 2003). Runoff from the developed lands drains through the storm sewer system, which was designed for the 5-year event, to the SWM pond located at the southeast corner of the Site. The pond is a wet pond sized for the full subdivision build-out, and it provides both quantity and quality control through an outflow regulated by a multi-stage flow control structure. For quantity control, the pond was designed to limit post-development peak flows to pre-development levels for the 2-, 5-, 10-, 25-, 50- and 100-year design storm events. For quality control, it provides the Enhanced Level of protection, corresponding to a long-term average removal of 80% of total suspended solids, with a permanent pool volume of 1,176 m^3 against a required 1,163 m^3.

Within the approved design, Block 29 (1.25 ha) was divided into two catchments, RES1 (0.60 ha) and RES2 (0.65 ha), split side to side across the block. While the design accounts for 1.25 ha, Block 29 is 1.15 ha due to a widened municipal ROW. Both catchments drained to the block frontage and into the storm sewer system, which conveyed the runoff to the SWM pond. To account for the future development of the block, both catchments were conservatively assumed to be 80% impervious, giving a total of 10,000 m^2 of impervious area and 2,500 m^2 of pervious area, and an assumed composite runoff coefficient of 0.81 was applied to each. With roads, driveways and roof drainage directed to the frontage, the configuration assumed a high proportion of directly connected impervious area, and the storm sewer and pond were sized to receive the block's runoff at this loading.

Detailed analysis of the overall stormwater management design is outlined in the *Servicing and Stormwater Management Report - Coleman Central Subdivision Phase 2 (McIntosh Perry, 2025*).

5.4 Proposed Development of Block 29

Block 29 is proposed for development as 35 townhouse units with associated driveways and internal access. Block 29 has a total area of 1.15 ha, 0.10 ha less than the 1.25 ha assumed in the approved design, due to a widened municipal ROW. Of this 1.15 ha, 1.05 ha (Catchments A1 & A2) drains to the SWM pond while the remaining 0.11 ha (Catchment A3) sheet flows to the rear property line. In the initial approved design catchments were divided between RES1/RES2 which split the block side-to-side and all flows drained entirely to the frontage. The block is now divided into three catchments (A1, A2, & A3). The rear catchment, A1 (0.88 ha), collects rear yard and roof drainage in a flat-bottomed grassed swale that incorporates an underlying perforated pipe with cleanouts. This swale outlets directly to the SWM pond, independent of the storm sewer system. The frontage catchment, A2 (0.16 ha), drains to the front of the block and into the existing storm sewer system within Lewis Street, which conveys flow to the same pond. A3 (0.11 ha captures a small area between the rear-yard swale and the rear property line where flows sheet flow towards the rear property line.

When the impervious surfaces of the proposed townhouse layout (roofs, driveways and internal access) are quantified, the overall imperviousness of Block 29 is approximately 39%, including 4,500 m^2 of impervious area and 7,000 m^2 of pervious area. This is substantially below the 80% assumed in the approved design. Of the total impervious area, 3,625 m^2 is tributary to the rear-yard swale (A1) and 875 m^2 to the storm sewer (A2). The front-

to-back split is a departure from the approved side-to-side configuration, in which the entire block was tributary to the storm sewer. Routing the larger rear catchment to a dedicated swale reduces the proportion of the block reaching the piped system and provides additional lot-level filtration and infiltration ahead of the pond.

5.5 Design Criteria and Methodology

Peak flows were computed using the Rational Method, which is appropriate given that each contributing drainage area is well below the 1 km^2 (100 ha) limit for the method. Flows were calculated as:

$$\mathbf{Q = 0.00278 \cdot C \cdot i \cdot A}$$

Where,

Q = Flow (m^3/s) *flows have been converted to and reported in L/s

C = Runoff Coefficient (dimensionless)

i = Rainfall Intensity (mm/hr)

A = Area (ha)

A time of concentration of 10 minutes was adopted for all catchments, consistent with small, urbanized areas and conservative for peak-flow estimation.

Rainfall intensities are consistent with the IDF data used in the approved servicing report:

Table 5: Rainfall Intensities (Tc = 10 min)

Return Period	Intensity (mm/hr)
2-Year	76.8
5-Year	104.2
100-Year	178.6

Runoff coefficients were area-weighted from the component land covers. The 100-year coefficients incorporate the standard 1.25 antecedent-condition factor, with the impervious value capped at 1.0:

Table 6: Runoff Coefficients

Surface	C (5-year)	C (100-year)
Impervious	0.90	1.00

Pervious	0.20	0.25

5.6 Approved Design Basis (Block 29 at 80% Impervious)

Table 7 presents, using the Rational Method, the runoff that the storm sewer and SWM pond were originally designed to receive from Block 29. These flows reflect the approved assumption of 80% imperviousness, with all runoff directed to the frontage and the storm sewer. They represent the benchmark against which the proposed development is assessed in **Section 5.8**.

Table 7: Approved Design Basis Runoff (Block 29)

Area Name	Area (ha)	Impervious (m^2)	Pervious (m^2)	C 5-Year	C 100-Year	Q (L/s)	
						5-Year	100-Year
RES1	0.60	4,800	1,200	0.81	0.81	140.77	241.25
RES2	0.65	5,200	1,300	0.81	0.81	152.50	261.35
Total	**1.25**	**10,000**	**2,500**	**-**	**-**	**293.28**	**502.60**

5.7 Post-Development Drainage (Proposed Townhouse Development)

The peak flows for the proposed condition were calculated for the three revised catchments, A1, A2 and A3, in accordance with the drainage configuration described in **Section 5.4**. Catchment A3 as previously mentioned drains to the rear property line and offsite as uncontrolled flow. This reflects an existing drainage condition rather than a new outlet, as the rear of the block currently sheds toward this property line as uncontrolled flow. Under the proposed design the contributing area is reduced, since the rear-yard swale is set back a practical distance from the property line and intercepts the majority of the rear yard that would otherwise drain offsite, leaving only the narrow strip between the swale and the property line. The resulting uncontrolled flow is negligible, and no adverse impacts on the adjacent lands are anticipated. This flow discharges to the same ultimate outlet immediately downstream as the controlled drainage leaving the block, in both the existing and proposed conditions. Catchment A1 represents the rear of the block and drains to the rear-yard swale, while Catchment A2 represents the frontage and drains to the storm sewer. Both catchments ultimately discharge to the SWM pond. The resulting flows are summarized in **Table 8**.

The 100-year peak flow from Catchment A1 (244.16 L/s) was used to size the rear-yard swale, as described in **Section 5.9**, since this is the flow the swale must convey on its own. The combined flow from the two catchments

(A1 plus A2) represents the runoff leaving Block 29 and reaching the SWM pond, and this total was used for the comparison against the approved design basis presented in **Section 5.8**.

Table 8: Proposed Post-Development Runoff (Block 29)

Area Name	Area (ha)	Impervious (m^2)	Pervious (m^2)	C 5-Year	C 100-Year	Q (L/s)	
						5-Year	100-Year
A1	0.88	3,625	5,175	0.49	0.56	124.48	244.16*
A2	0.16	875	725	0.58	0.66	27.01	52.43
A3	0.10	0	1,100	0.20	0.25	6.37	13.65
Total	**1.15**	**4,500**	**7,000**	**-**	**-**	**157.86**	**310.25**

**** Design Flow used to size rear-yard swale.***

5.8 Runoff Calculations and Flow Comparison

The proposed development reduces both the impervious fraction of Block 29 and the peak flows reaching the SWM pond relative to the approved design basis, as summarized in **Table 9.**

Table 9: Flow Comparison: Approved Design Basis vs. Proposed Development

Item	Initial Design	Revised Design	Difference
Total Drainage Area (m^2)	12,500	11,500	-1,000
Total Drainage Area to SWM Pond (m^2)	12,500	10,400	-2,100
Impervious Area (m^2)	10,000	4,500	-5,500
Pervious Area (m^2)	2,500	7,000	4,500
Overall Imperviousness (%)	80%	39%	-40.9%
5-Year Total Flow (L/s)	293.28	157.86	-135.41
100-Year Total Flow (L/s)	502.60	310.25	-192.35
5-Year Flow to SWM Pond (L/s)	**293.28**	**151.49**	**-141.79**
100-Year Flow to SWM Pond (L/s)	**502.60**	**296.60**	**-206.00**

The total drainage area reporting to the SWM pond is reduced from the 1.25 ha assumed in the approved design to 1.15 ha (due to the widened municipal ROW). With the rear strip (Catchment A3, 0.11 ha) draining offsite, the

area reporting to the SWM pond is 1.05 ha. Overall imperviousness is reduced from the assumed 80% to approximately 39%, and the peak flow reaching the pond is reduced by approximately 48% for the 5-year event and 41% for the 100-year event. The proposed development therefore delivers less flow to the pond than the loading for which it was designed, and no adverse impacts on the SWM pond are anticipated as a result.

5.9 Major Drainage Routes and Rear-Yard Swale

Consistent with the approved design, the storm sewer conveys the 5-year event. Runoff from events that exceed the 5-year storm is conveyed overland, by way of the road gutters and the proposed rear-yard swale, toward the SWM pond. In the event of a storm exceeding the 100-year event, or a blockage within the storm sewer, an emergency overland flow route directs runoff toward the pond and away from the dwellings.

The rear-yard swale (Catchment A1) was sized to convey its 100-year peak flow of 244.16 L/s using Bentley FlowMaster. A flat-bottomed trapezoidal grassed channel was adopted, with a 1.00 m bottom width and 3:1 (H:V) side slopes, on a longitudinal slope of 0.55% and a roughness coefficient of n = 0.035. At the 100-year peak flow, the channel conveys the runoff at a normal depth of 0.23 m under stable subcritical conditions, with a non-erosive velocity of 0.62 m/s, as summarized in **Table 10**. A channel depth of 0.30 m has been provided, giving approximately 0.07 m of freeboard above the 100-year water level.The underlying perforated pipe and cleanouts provide positive subsurface drainage and dry-weather conveyance.

Table 10: Rear-Yard Swale Conveyance (100-year)

Parameter	Value
Design flow (100-year)	245.4 L/s
Bottom Width (m)	1.00
Side Slopes (H:V)	3:1
Longitudinal Slope (%)	0.55
Normal depth at Design Flow (minimum depth - no freeboard) (m)	0.23
Provided Channel Depth (m)	0.30
Freeboard above 100-year level (m)	0.07
Roughness Coefficient (grassed swale) (n)	0.035
Velocity (m/s)	0.62

Froude number (subcritical)	0.490

5.10 Stormwater Quantity Control

Under the proposed condition, the flow from Block 29 to the storm sewer is reduced from 293.3 L/s to 27.01 L/s for the 5-year event, because the larger rear-yard catchment is now diverted to the swale. The piped system therefore receives materially less flow from Block 29 than in the approved design, and the storm sewer hydraulic grade line is not adversely affected. The total peak inflow to the SWM pond is likewise reduced, to 151.49 L/s from 293.3 L/s for the 5-year event and to 296.6 L/s from 502.6 L/s for the 100-year event.

Because the proposed peak flows and the associated runoff volumes are lower than the approved design basis, the existing pond stage-storage-discharge relationship and the downstream conditions established in the approved report remain valid and conservative. On this basis, the SWM pond remains adequately sized, and re-analysis of the storm sewer hydraulic grade line and the pond routing is not required for this development.

5.11 Stormwater Quality Control

The SWM pond is a wet pond that provides the Enhanced Level of protection, removing a long-term average of 80% of total suspended solids. All runoff from Block 29 that is directed to the pond, arrives by way of either the rear-yard swale (Catchment A1) or the storm sewer (Catchment A2), so Enhanced Level treatment continues to be provided for the controlled drainage. The minor uncontrolled flow from the remaining rear strip (Catchment A3) is generated as sheet flow over grassed area, carries a low sediment load, and is lower than existing conditions, so no quality control is required.

The proposed development reduces the impervious area of Block 29 from the assumed 80% to approximately 39%, so post-development runoff volumes and the associated sediment loadings are lower than the approved design basis. Runoff is generated predominantly by roofs and grassed rear yards, which are low-TSS sources, and the rear-yard swale provides additional filtration and infiltration at the lot level before flow reaches the pond. The post-development quality loading is therefore no greater than the approved condition, and no quality control measures beyond the existing wet pond are required for the development of Block 29.

5.12 Summary

The proposed development of Block 29 as townhouses reduces the overall imperviousness of the block from the assumed 80% to approximately 39%, and reduces the peak flow reaching the SWM pond by approximately 48% for the 5-year event and 41% for the 100-year event relative to the approved design basis. The total block area from the initial approved design is reduced from 1.25 ha to 1.15ha (due to the widened municipal ROW); of this 1.15 ha, 1.05 ha drains to the SWM pond. The rear-yard swale was sized using Bentley FlowMaster to convey the 100-year event and does so under stable, non-erosive conditions, and all controlled drainage from the block continues to report to the approved wet pond for both quantity and quality control.

On this basis, the previously approved and constructed storm sewer and SWM pond remain adequate to service Block 29 without modification. Because the proposed flows are lower than the approved design basis, re-analysis of the storm sewer hydraulic grade line and the pond routing is not required, and no additional stormwater quality control measures are warranted.

6.0 EROSION AND SEDIMENT CONTROL

6.1 Temporary Measures

Before construction begins, temporary silt fence will be installed along the Site boundary, and inlet sediment control devices will be installed in catchbasins and maintenance holes within the Site boundary and adjacent to the Site. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the surrounding property limits. The Contractor, at their discretion or at the instruction of the Town, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-Site to ensure that the Site is operating as intended and no additional sediment finds its way offsite. The silt fence shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences as required. Fibre roll barriers are to be installed at all existing curb inlet catchbasins and filter fabric is to be placed under the grates of all existing catchbasins and manholes along the frontage of the Site and any new structures immediately upon installation. The measures for the existing/proposed structures is to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

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

6.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the Site provides a key component to the control of sediment for the Site, it must be properly maintained once established. Once the construction is complete, it will

be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

7.0 SUMMARY

- Five new two-storey, 7-unit townhouse blocks are proposed at Block 29.
- Each unit will be serviced via individual service laterals, connecting to the existing storm sewer, sanitary sewer, and watermain located in the ROW of Lewis Street
- An existing downstream SWM Facility has been previously constructed to provide appropriate quality and quantity control for Block 29 as part of the Coleman Central Subdivision Phase 2 stormwater management design.
- There is sufficient capacity within the existing sanitary sewer within Lewis Street to service the Site.
- There is sufficient capacity within the existing watermain system to service the proposed Site for both domestic and fire protection purposes.

8.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that the Town of Carleton Place approve this Functional Servicing and Stormwater Management Report in support of the proposed Block 29 development.

This report is respectfully being submitted for approval.

Regards,

Egis Canada Ltd.

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Reviewed by:

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Design Team Lead, Water Resources
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9.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of 1384341 Ontario Ltd. The purpose of the report is to assess the proposed Block 29 development as it relates to the overall Coleman Central Subdivision Phase 2 design, as approved by the town of Carleton Place. Egis reviewed the Site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by Egis, no field verification/measures of any information were conducted.

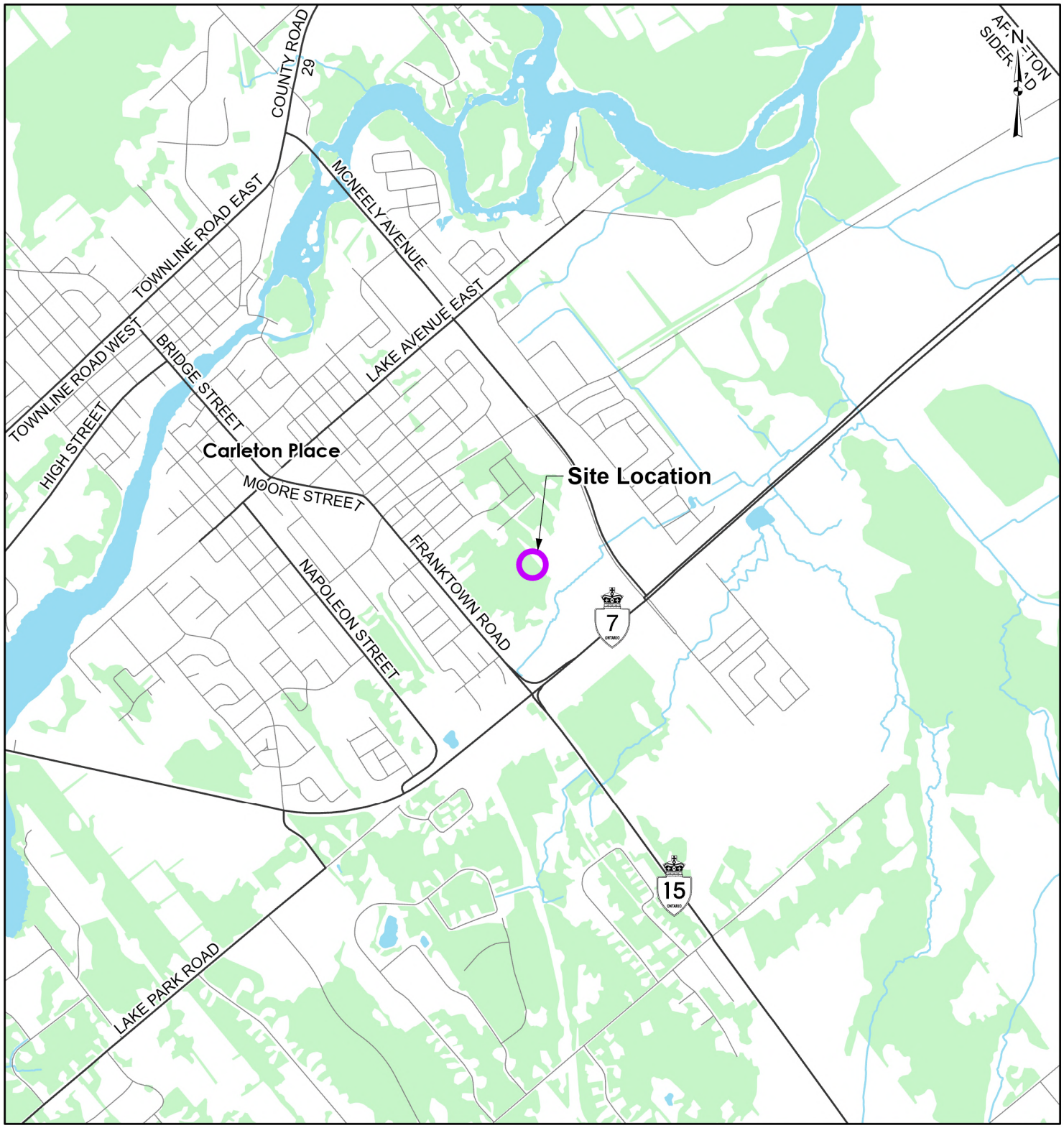
Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. Egis accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

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

APPENDIX A

SITE LOCATION PLAN & SITE PLAN

750 Palladium Drive, Suite 310, Kanata ON, K2V 1C7, Tel. 613-836-2184
info.north-america@egis-group.com | www.egis-group.com



LEGEND

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

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2026.

CLIENT: 1384341 ONTARIO LTD.

PROJECT: BLOCK 29 RESIDENTIAL DEVELOPMENT

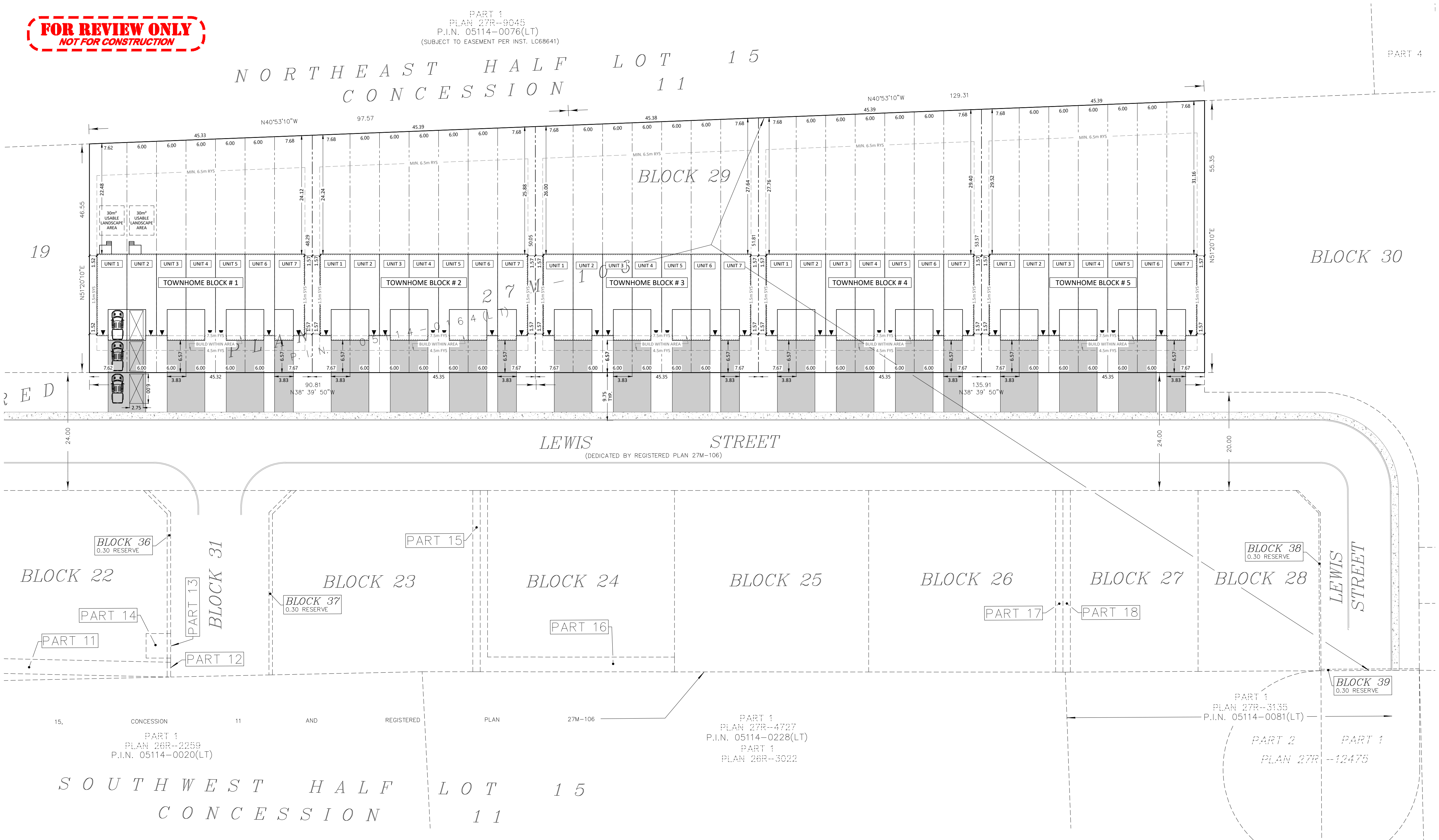
TITLE: SITE LOCATION

egis
750 Palladium Dr, Suite 310, Kanata, ON K2V 1C7
Tel: 613-836-2184 Fax: 613-836-3742

PROJECT NO: CCO-26-1833		FIGURE:
Date	Jun., 05, 2026	1
GIS	AH	
Checked By	MP	

C:\Users\a.hamed\EGIS Group\GIS - Documents\Projects\2026\CCO\CCO-26-1833\aprx\Key Maps\Land Development\CCO-26-1833_keymap.aprx

FOR REVIEW ONLY
NOT FOR CONSTRUCTION



6.3.7 Development Standards - Townhome Dwellings

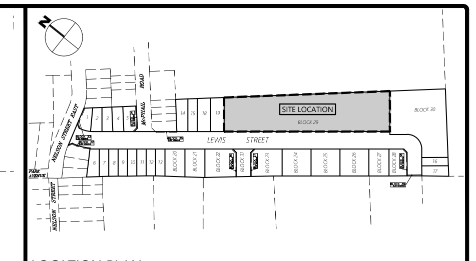
SITE PROVISIONS	REQUIREMENTS
Lot Area (minimum)	Nil
Lot Coverage (maximum)	60%
Lot Frontage (minimum)	5.5 metres (18.04 feet), per unit
Front Yard Build Within Area	4.5 metres, minimum (14.7 feet) 7.5 metres maximum (24.6 feet)
Exterior Side Yard Build Within	4.5 metres, minimum (14.7 feet) 7.5 metres maximum (24.6 feet)
Interior Side Yard (minimum) No side yard shall be required along the common property line or common wall	1.5 metres (4.9 feet)
Rear Yard Depth (Minimum)	6.5 metres (21.3 feet)
Usable Landscaped Open Space in the rear yard (minimum)	30.0 square metres (538 square feet)
Building Height	11.0 metres (36 feet)
Minimum Dwelling Unit Area	83.1 square metres (900 square feet)
No Encroachment Area from front or exterior side lot line	2.5 metres (8.2 feet)
Parking Spaces	2 spaces per dwelling unit, one of which may be provided within the garage

BLOCK 29 DEVELOPMENT STATISTICS

TOWNHOME BLOCK # 1			TOWNHOME BLOCK # 2			TOWNHOME BLOCK # 3			TOWNHOME BLOCK # 4			TOWNHOME BLOCK # 5		
UNIT #	LOT FRONTAGE (m)	LOT AREA (m2)	UNIT #	LOT FRONTAGE (m)	LOT AREA (m2)	UNIT #	LOT FRONTAGE (m)	LOT AREA (m2)	UNIT #	LOT FRONTAGE (m)	LOT AREA (m2)	UNIT #	LOT FRONTAGE (m)	LOT AREA (m2)
1	7.62	355.82	1	7.67	371.51	1	7.67	385.01	1	7.67	398.51	1	7.67	412.01
2	6.00	281.66	2	6.00	292.22	2	6.00	302.78	2	6.00	313.33	2	6.00	323.89
3	6.00	283.05	3	6.00	293.61	3	6.00	304.17	3	6.00	314.73	3	6.00	325.29
4	6.00	284.45	4	6.00	295.01	4	6.00	305.57	4	6.00	316.13	4	6.00	326.69
5	6.00	285.85	5	6.00	296.41	5	6.00	306.97	5	6.00	317.53	5	6.00	328.09
6	6.00	287.25	6	6.00	297.81	6	6.00	308.36	6	6.00	318.92	6	6.00	329.48
7	7.67	369.23	7	7.67	382.73	7	7.67	396.23	7	7.67	409.73	7	7.67	423.22
TOTAL	**45.29**	**2,147.30**	**TOTAL**	**45.34**	**2,229.29**	**TOTAL**	**45.34**	**2,309.09**	**TOTAL**	**45.34**	**2,388.88**	**TOTAL**	**45.34**	**2,468.67**

DISCLAIMER:

ANY LEGAL BOUNDARY AND/OR TITLE AREA INFORMATION SHOWN ON THIS PLAN IS COMPILED FROM REGISTERED PLANS 27M-106 AND 27R-12519. EGIS DOES NOT CERTIFY THAT THE BOUNDARIES AND TITLES OF THE PROPERTIES SHOWN ON THIS PLAN ARE ACCURATE WITHIN THE MEANING OF THE SURVEYS ACT. PROPER LEGAL SURVEY RE-ESTABLISHMENT OF ANY BOUNDARY LOCATIONS OF PROPERTIES ON THIS PLAN MUST BE COMPLETED BY AN ONTARIO LAND SURVEYOR WORKING WITHIN THE SURVEYS ACT, SURVEYOR'S ACT, AND LAND TITLES OR REGISTRY ACT AND REGULATIONS MADE THEREUNDER.



LOCATION PLAN

LEGEND

- CONCRETE SIDEWALK (COLEMAN 2 DESIGN LAYOUT)
- CONCRETE CURB (COLEMAN 2 DESIGN LAYOUT)
- SITE BOUNDARY
- EXISTING LEGAL FABRIC
- PROPOSED PROPERTY LINE (TOWNHOME BLOCK)
- PROPOSED FUTURE PROPERTY LIMIT (UNITS)
- MIN. 6.5m RYS — MINIMUM SETBACKS
- RYS — REAR YARD SETBACK
- FYS — FRONT YARD SETBACK
- SYS — SIDE YARD SETBACK (INTERIOR)
- PROPOSED 7-UNIT TOWNHOME
- PROPOSED DRIVEWAY AND TYPICAL PARKING SPACES PROVIDED
- PARKING SPACE DIMENSIONS (6.0, 2.75)

No.	Revisions	Date
2	ISSUED TO TOWN FOR REVIEW	JUNE 10, 2026
1	REVISED PER KEEPER CO. COMMENTS	JUNE 02, 2026
0	ISSUED TO CLIENT	APR. 01, 2026

Check and verify all dimensions before proceeding with the work

Do not scale drawings

SCALE 1 : 400 (0, 10, 20, 30, 40 Metres)

egis
750 Palladium Drive, Suite 310
Kanata, ON K2V 1C7
Tel: 613-836-2184
Fax: 613-836-3742
www.egis-group.com

Stamp:

Client:
1384341 ONTARIO LTD.
9094 CAVANAGH ROAD, ASHTON, ON K0A 1B0

Project:
BLOCK 29 RESIDENTIAL DEVELOPMENT
COLEMAN CENTRAL PHASE 2 SUBDIVISION
TOWN OF CARLETON PLACE

Drawing Title:
SITE PLAN

Scale: 1:400		Project Number:	CCO-26-1833
Drawn By: S.HALL			
Checked By: B.ALCHAWA		Drawing Number:	C100
Designed By:			

FILENAME: U:\Infrastructure\2026\CCO-26-1833 Cavanagh - Block 29 Multi-Residential- Coleman Subdivision Phase 2\12 - Drawings\CCO-26-1833-Block29-SITE.dwg
LAST SAVED: Wednesday, June 10, 2026 LAST SAVED BY: s.hall
LAST PLOTTED: Wednesday, June 10, 2026 CTB FILE USED: Egis-CV-STANDARD.ctb

APPENDIX B

WATERMAIN CALCULATIONS

CCO-26-1833 - Block 29 - Coleman Phase II - Water Demands

Project:	Block 29 - Coleman Phase II
Project No.:	CCO-26-1833
Designed By:	MP
Checked By:	MP
Date:	June 4, 2026
Site Area:	1.15 gross ha

Residential	**NUMBER OF UNITS**		**UNIT RATE**	
Single Family	17	homes	3.4	persons/unit
Semi-detached	4	homes	2.7	persons/unit
Townhouse	80	homes	2.7	persons/unit
Bachelor Apartment		units	1.4	persons/unit
1 Bedroom Apartment		units	1.4	persons/unit
2 Bedroom Apartment		units	2.1	persons/unit
3 Bedroom Apartment		units	3.1	persons/unit
Average Apartment		units	1.8	persons/unit
Total Population	**285**	**persons**		
Commercial/Amenity		m2		
Industrial - Light (Distillery)		m2		
Industrial - Heavy		m2		

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m² /d	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	L/(Space/d)	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	**Residential**	**0.92**	**L/s**
	Commercial/Industrial/ Institutional	**0.00**	**L/s**

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	3.7	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	**Residential**	**3.42**	**L/s**
	Commercial/Industrial/ Institutional	**0.00**	**L/s**

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	5.6	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	**Residential**	**5.17**	**L/s**
	Commercial/Industrial/ Institutional	**0.00**	**L/s**

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

AVERAGE DAILY DEMAND	0.92	L/s
MAXIMUM DAILY DEMAND	3.42	L/s
MAXIMUM HOUR DEMAND	5.17	L/s

CCO-26-1833 - Block 29 - Coleman Phase II - OBC Fire Calculations

Project:	Block 29 - Coleman Phase II
Project No.:	CCO-26-1833
Designed By:	MP
Checked By:	AO
Date:	June 11, 2026

Ontario 2024 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting* - 7-Unit, 2-Storey Townhome, *No firewall

Building is classified as Group : C (Residential) (from table 3.2.2.55)

Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+…etc.]

K	**23**	(from Table 1 pg A-31)
V	**5,961**	(Total building volume in m³.) → V= bldg footprint * bldg height
Stot	**2.0**	(From figure 1 pg A-32) V= 727m2 * 8.2m
Q =	**274,224.40 L**	V = 5,961 m³

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

9,000	**L/min**	**if Q > 270,000 L**
150	**L/sec**	
2378	**gpm**	

From Figure 1 (A-32)

Snorth	1.5	m	0.5
Seast	22	m	0.0
Ssouth	1.5	m	0.5
Swest	21	m	0.0

*approximate distances

CCO-26-1833 - Block 29 - Coleman Phase II - OBC Fire Calculations

Project:	Block 29 - Coleman Phase II
Project No.:	CCO-26-1833
Designed By:	MP
Checked By:	AO
Date:	June 11, 2026

Ontario 2024 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting* - 7-Unit, 2-Storey Townhome, *with Vertical Firewall Between Units 3/4

Building is classified as Group : C (Residential) (from table 3.2.2.55)

Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+…etc.]

K	**23**	(from Table 1 pg A-31)
V	**3,403**	(Total building volume in m³.) → V= bldg footprint * bldg height
Stot	**2.0**	(From figure 1 pg A-32) → V= 415m2 * 8.2m
Q =	**156,538.00 L**	V = 3,403 m³

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

4,500 L/min **if Q > 135,000 L and < 162,000 L**
75 L/sec
1189 gpm

From Figure 1 (A-32)

Snorth	1.5	m	0.5
Seast	22	m	0.0
Ssouth	1.5	m	0.5
Swest	21	m	0.0

*approximate distances

WATER DEMAND CALCULATIONS

PROJECT: Coleman Central Subdivision - Phase 2
LOCATION: Carleton Place
CLIENT: Cavanagh Construction Ltd.

LOCATION		INDIVIDUAL						FLOW									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STREET	JUNCTION	UNIT TYPES				AREA	POPULATION	PEAKING FACTORS		AVERAGE DAY FLOW Q(a)		MAX DAY FLOW Q(max)		PEAK HOURLY FLOW Q(h)		FIRE FLOW (FUS)	
		SF	SD	TH	APT	(ha)		MAX DAY	PEAK HOUR	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)
Coleman Street Subdivision - Phase 2																	
LEWIS	J-2						0.0	3.70	5.60	0.00	0.00	0.00	0.00	0.00	0.00	167.00	10,000
LEWIS	J-3	5					17.0	3.70	5.60	0.06	3.31	0.20	12.23	0.31	18.51	167.00	10,000
LEWIS	J-4	2	2	8			33.8	3.70	5.60	0.11	6.57	0.41	24.32	0.61	36.80	167.00	10,000
LEWIS	J-5		2	47			132.3	3.70	5.60	0.43	25.73	1.59	95.18	2.40	144.06	167.00	10,000
LEWIS	J-6			12			32.4	3.70	5.60	0.11	6.30	0.39	23.31	0.59	35.28	167.00	10,000
LEWIS	J-7			6			16.2	3.70	5.60	0.05	3.15	0.19	11.66	0.29	17.64	167.00	10,000
LEWIS	J-8			7			18.9	3.70	5.60	0.06	3.68	0.23	13.60	0.34	20.58	167.00	10,000
LEWIS	J-9						0.0	3.70	5.60	0.00	0.00	0.00	0.00	0.00	0.00	167.00	10,000
LEWIS	J-10	2					6.8	3.70	5.60	0.02	1.32	0.08	4.89	0.12	7.40	167.00	10,000
McPHAIL	J-11						0.0	3.70	5.60	0.00	0.00	0.00	0.00	0.00	0.00	167.00	10,000
FUT. ROAD	J-12						0.0	3.70	5.60	0.00	0.00	0.00	0.00	0.00	0.00	167.00	10,000
WALMART	J-13						0.0	3.70	5.60	0.00	0.00	0.00	0.00	0.00	0.00	167.00	10,000
LEWIS	J-14	8					27.2	3.70	5.60	0.09	5.29	0.33	19.57	0.49	29.62	167.00	10,000
TOTALS		17	4	80	0	0	284.6			0.92	55.34	3.41	204.75	5.16	309.90		

Design Parameters:

Single Family	3.4	p/p/u
TH/SD	2.7	p/p/u
Average Apartment	1.8	p/p/u

Notes:

1. Domestic Flow: 280 L/(cap·day)

Q (a) = Average Daily Flow
Q (max) = Maximum Daily Flow — Q (max) = Q(a) * Peaking Factor
Q (h) = Peak Hour Flow — Q (h) = Q(a) * Peaking Factor
Q (min) = Night Minimum Hour Flow — Q (min) = Q(a) * Peaking Factor

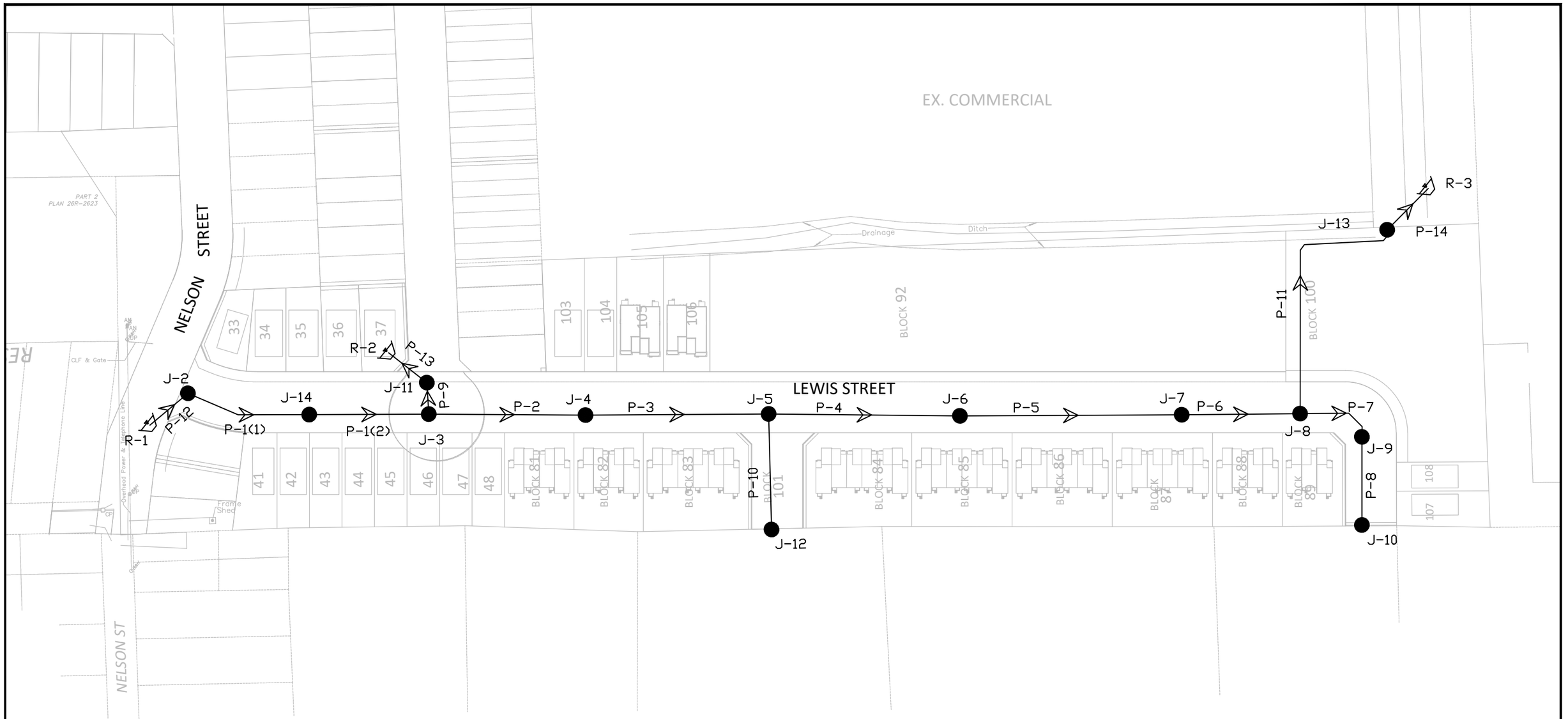
REFERENCE: CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010
MOE - DESIGN GUIDELINES FOR DRINKING-WATER SYSTEMS 2008

Designed: MP

Checked: AO

Project No.: CCO-18-0360-01

750 Palladium Drive, Suite 310, Kanata ON K2V 1C7 | T. 613-836-2184 | F. 613-836-2184
info.north-america@egis-group.com



McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: CAVANAGH DEVELOPMENTS
9094 CAVANAGH RD, ASHTON, ON

Project: COLEMAN CENTRAL SUBDIVISION - PHASE 2
CARLETON PLACE, ON

Drawing Title: HYDRAULIC WATER MODEL

Drawn by:	Checked By:
J.H.	C.H.
Scale: 1:1500	Project Number: CCO-18-0360

No.	Revisions	Date
2	UPDATED LAYOUT	2024-11-22
1	SUBMISSION NO.3	2022-09-28

Drawing Number: C1

FILENAME: U:\Ottawa\01 Project - Proposals\2018 Jobs\CCO\CCO-18-0360-01 Cavanagh_ NuGlobe Subdivision Ph 2_ Carleton Place\Civil\03 - Servicing\WaterCAD\Background\Pipes_Export_2024-11-28.dwg
LAST SAVED: Thursday, November 28, 2024 1:45 PM SAVED BY: JHewson
LAST PLOTTED: Thursday, November 28, 2024 1:47 PM PLOTTED BY: JHewson

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Average Day Demands

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	181.14	67.1
J-14	133.56	0.09	181.15	67.7
J-3	133.31	0.06	181.16	68.0
J-4	133.5	0.11	181.16	67.8
J-5	133.19	0.43	181.16	68.2
J-6	133.35	0.11	181.17	68.0
J-7	133.35	0.05	181.17	68.0
J-8	133.06	0.06	181.17	68.4
J-9	133.12	0	181.17	68.3
J-10	133.1	0.02	181.17	68.4
J-11	133.26	0	181.16	68.1
J-12	133.27	0	181.16	68.1
J-13	130.65	0	181.18	71.9

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	181.14	181.14
R-2	181.16	181.16
R-3	181.18	181.18

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Peak Hour Demands

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	181.04	67.0
J-14	133.56	0.49	180.99	67.4
J-3	133.31	0.31	180.95	67.7
J-4	133.5	0.61	180.91	67.4
J-5	133.19	2.4	180.88	67.8
J-6	133.35	0.59	180.86	67.6
J-7	133.35	0.29	180.84	67.5
J-8	133.06	0.34	180.83	67.9
J-9	133.12	0	180.83	67.8
J-10	133.1	0.12	180.83	67.9
J-11	133.26	0	180.95	67.8
J-12	133.27	0	180.88	67.7
J-13	130.65	0	180.81	71.3

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	181.06	181.06
R-2	180.95	180.95
R-3	180.81	180.81

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Max Day + Fire Flow Demands - Block 1/2

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.87	45.4
J-14	133.56	0.33	165.39	45.3
J-3	133.31	0.2	164.95	45.0
J-4	133.5	0.41	160.64	38.6
J-5	133.19	1.59	155.67	32.0
J-6	133.35	95.39	155.56	31.6
J-7	133.35	0.19	158.97	36.4
J-8	133.06	0.23	160.82	39.5
J-9	13.12	0	160.82	39.4
J-10	133.1	0.08	160.82	39.4
J-11	133.26	0	165.34	45.6
J-12	133.27	95	153.33	28.5
J-13	130.65	0	164.9	48.7

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Max Day + Fire Flow Demands - Block 3

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.96	45.6
J-14	133.56	0.33	165.69	45.7
J-3	133.31	0.2	165.46	45.7
J-4	133.5	0.41	163.26	42.3
J-5	133.19	1.59	160.74	39.2
J-6	133.35	95.39	158.32	35.5
J-7	133.35	63.73	158.58	35.9
J-8	133.06	0.23	160.54	39.1
J-9	13.12	0	160.54	39.0
J-10	133.1	0.08	160.54	39.0
J-11	133.26	0	165.65	46.1
J-12	133.27	0	160.74	39.1
J-13	130.65	0	164.85	48.6

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Max Day + Fire Flow Demands - Block 4

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.96	45.6
J-14	133.56	0.33	165.7	45.7
J-3	133.31	0.2	165.47	45.7
J-4	133.5	0.41	163.33	42.4
J-5	133.19	1.59	160.88	39.4
J-6	133.35	63.72	158.52	35.8
J-7	133.35	95.19	158.45	35.7
J-8	133.06	0.23	160.44	38.9
J-9	13.12	0	160.44	38.8
J-10	133.1	0.08	160.44	38.9
J-11	133.26	0	165.65	46.1
J-12	133.27	0	160.88	39.3
J-13	130.65	0	164.83	48.6

Reservoir Table

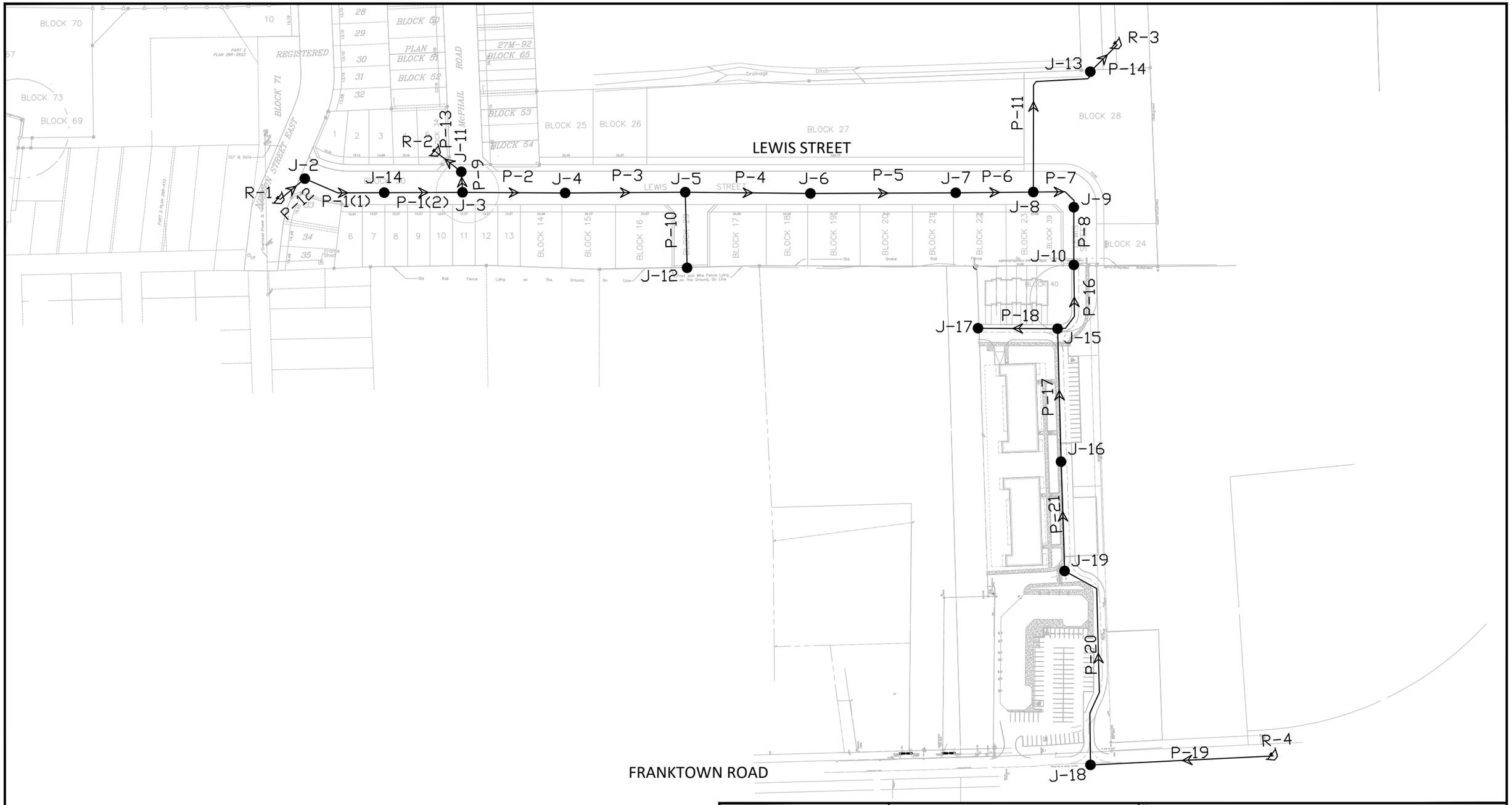
Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81

Block 29 - Coleman Central Phase 2 Subdivision Water Model
Max Day + Fire Flow Demands - Block 5

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.96	45.6
J-14	133.56	0.33	165.71	45.7
J-3	133.31	0.2	165.48	45.7
J-4	133.5	0.41	163.38	42.5
J-5	133.19	1.59	160.97	39.5
J-6	133.35	0.39	158.65	36.0
J-7	133.35	95.19	155.88	32.0
J-8	133.06	0.23	156.05	32.7
J-9	13.12	95	154.43	30.3
J-10	133.1	0.08	154.43	30.3
J-11	133.26	0	165.66	46.1
J-12	133.27	0	160.97	39.4
J-13	130.65	0	164.03	47.5

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81



Client:	11309455 CANADA INC 768 BOULEVARD SAINT-JOSEPH SUITE 100, GATINEAU, QUEBEC
Project:	355 FRANKTOWN ROAD CARLETON PLACE, ON
Drawing Title:	HYDRAULIC WATER MODEL

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Drawn by:	Checked By:
J.H.	B.C.
Scale: N.T.S.	Project Number: CCO-22-0402

No.	Revisions	Date
2	UPDATE LAYOUT	2024-MAR
1	WATER MODEL	2023-AUG

Drawing Number: C1

FILENAME: \\Ottawa\01 Project - Proposals\2018 Jobs\CCO\CCO-18-0360-01 Cavanagh_ NuGlobe Subdivision Ph 2_Carleton Place\Civil\03 - Servicing\WaterCAD\Background\Pipes_Export_2023-08-31.dwg
LAST SAVED: Thursday, March 14, 2024 - 4:57:00 PM (EST) J.Hewson
LAST PLOTTED: Thursday, March 14, 2024 - 5:08:18 PM (EST) J.Hewson
LAST PLOTTED BY: J.Hewson

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Average Day Demands

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	181.14	67.1
J-14	133.56	0.11	181.15	67.7
J-3	133.31	0.07	181.16	68.0
J-4	133.5	0.12	181.16	67.8
J-5	133.19	0.39	181.17	68.2
J-6	133.35	0.1	181.17	68.0
J-7	133.35	0.1	181.18	68.0
J-8	133.06	0.04	181.18	68.4
J-9	133.12	0.03	181.19	68.4
J-10	133.1	0.08	181.2	68.4
J-11	133.26	0	181.16	68.1
J-12	133.27	0	181.17	68.1
J-13	130.65	0	181.18	71.9
J-15	133.31	0	181.21	68.1
J-16	133.91	0.58	181.23	67.3
J-17	134.88	0.06	181.21	65.9
J-18	136.18	0	181.29	64.1
J-19	136.41	0.25	181.25	63.8

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	181.14	181.14
R-2	181.16	181.16
R-3	181.18	181.18
R-4	181.32	181.32

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Peak Hour Demands

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	181.04	67.0
J-14	133.56	0.49	180.99	67.4
J-3	133.31	0.31	180.95	67.7
J-4	133.5	0.61	180.91	67.4
J-5	133.19	2.4	180.86	67.8
J-6	133.35	0.59	180.84	67.5
J-7	133.35	0.29	180.81	67.5
J-8	133.06	0.34	180.8	67.9
J-9	133.12	0.03	180.78	67.8
J-10	133.1	0.12	180.77	67.8
J-11	133.26	0	180.95	67.8
J-12	133.27	0	180.86	67.7
J-13	130.65	0	180.81	71.3
J-15	133.31	0	180.74	67.4
J-16	133.91	8.15	180.7	66.5
J-17	134.88	0.06	180.74	65.2
J-18	136.18	0	180.72	63.3
J-19	136.41	3.58	180.7	63.0

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	181.06	181.06
R-2	180.95	180.95
R-3	180.81	180.81
R-4	180.74	180.74

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Max Day + Fire Flow Demands - Block 1/2

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.89	45.5
J-14	133.56	0.33	165.45	45.3
J-3	133.31	0.2	165.05	45.1
J-4	133.5	0.41	161.19	39.4
J-5	133.19	1.59	156.74	33.5
J-6	133.35	95.39	156.71	33.2
J-7	133.35	0.19	160.63	38.8
J-8	133.06	0.23	162.75	42.2
J-9	13.12	0.03	162.89	42.3
J-10	133.1	0.08	163.05	42.6
J-11	133.26	0	165.4	45.7
J-12	133.27	95	154.4	30.0
J-13	130.65	0	165.25	49.2
J-15	133.31	0	163.25	42.6
J-16	133.91	5.51	163.48	42.0
J-17	134.88	0.57	163.25	40.3
J-18	136.18	0	165.23	41.3
J-19	136.41	2.38	164.23	39.6

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81
R-4	165.74	165.74

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Max Day + Fire Flow Demands - Block 3

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.97	45.6
J-14	133.56	0.33	165.75	45.8
J-3	133.31	0.2	165.55	45.8
J-4	133.5	0.41	163.76	43.0
J-5	133.19	1.59	161.71	40.6
J-6	133.35	95.39	159.74	37.5
J-7	133.35	63.52	160.22	38.2
J-8	133.06	0.23	162.52	41.9
J-9	13.12	0.03	162.67	42.0
J-10	133.1	0.08	162.85	42.3
J-11	133.26	0	165.71	46.1
J-12	133.27	0	161.71	40.4
J-13	130.65	0	165.21	49.1
J-15	133.31	0	163.07	42.3
J-16	133.91	5.41	163.32	41.8
J-17	134.88	0.57	163.07	40.1
J-18	136.18	0	165.2	41.3
J-19	136.41	2.37	164.12	39.4

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81
R-4	165.74	165.74

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Max Day + Fire Flow Demands - Block 4

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.98	45.6
J-14	133.56	0.33	165.77	45.8
J-3	133.31	0.2	165.58	45.9
J-4	133.5	0.41	163.91	43.2
J-5	133.19	1.59	162	41.0
J-6	133.35	61.72	160.16	38.1
J-7	133.35	95.19	160.16	38.1
J-8	133.06	0.23	162.48	41.8
J-9	13.12	0.03	162.64	42.0
J-10	133.1	0.08	162.82	42.3
J-11	133.26	0	165.72	46.2
J-12	133.27	0	162	40.9
J-13	130.65	0	165.2	49.1
J-15	133.31	0	163.04	42.3
J-16	133.91	5.41	163.29	41.8
J-17	134.88	0.57	163.04	40.0
J-18	136.18	0	165.19	41.3
J-19	136.41	2.37	164.11	39.4

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81
R-4	165.74	165.74

Block 29 - Coleman Central Phase 2 Subdivision + Future Development & Watermain Water Model
Max Day + Fire Flow Demands - Block 5

Junction ID	Elevation (m)	Demand (L/s)	Hydraulic Grade Line (m)	Pressure (psi)
J-2	133.92	0	165.99	45.6
J-14	133.56	0.33	165.81	45.9
J-3	133.31	0.2	165.65	46.0
J-4	133.5	0.41	164.27	43.8
J-5	133.19	1.59	162.69	41.9
J-6	133.35	0.39	161.19	39.6
J-7	133.35	95.19	159.4	37.0
J-8	133.06	0.23	159.84	38.1
J-9	13.12	95.03	159.3	37.2
J-10	133.1	0.08	159.71	37.8
J-11	133.26	0	165.77	46.2
J-12	133.27	0	162.69	41.8
J-13	130.65	0	164.72	48.4
J-15	133.31	0	160.25	38.3
J-16	133.91	5.41	160.83	38.3
J-17	134.88	0.57	160.25	36.1
J-18	136.18	0	164.65	40.5
J-19	136.41	2.37	162.51	37.1

Reservoir Table

Junction ID	Elevation (m)	Hydraulic Grade Line (m)
R-1	166.06	166.06
R-2	165.95	165.95
R-3	165.81	165.81
R-4	165.74	165.74

APPENDIX C

SANITARY CALCULATIONS

750 Palladium Drive, Suite 310, Kanata ON, K2V 1C7, Tel. 613-836-2184
info.north-america@egis-group.com | www.egis-group.com

CCO-26-1833 - Block 29 - Coleman Phase II - Sanitary Demands

Project:	Block 29 - Coleman Phase II			
Project No.:	CCO-26-1833			
Designed By:	MNP			
Checked By:	AO			
Date:	June 4, 2026			
Site Area	1.15	Gross ha		
Bachelor			1.40	Persons per unit
1 Bedroom			1.40	Persons per unit
2 Bedroom			2.10	Persons per unit
Townhouse	35		2.70	Persons per unit
Total Population	95	Persons		
Commercial Area		m^2		
Amenity		m^2		
Commercial		m^2		

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	
Residential Peaking Factor	3.60	** Using Harmon Formula =* 1+(14/(4+P^0.5))*0.8
		where P = population in thousands, Harmon's Correction Factor = 0.8
Mannings coefficient (n)	0.013	
Demand (per capita)	280	L/day
Infiltration allowance	0.28	L/s/Ha

EXTRANEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.06
Wet	0.12
Total	**0.32**

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	95	0.31
Industrial - Light**	35,000	L/gross ha/d		0
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial / Amenity	2,800	L/(1000m^2/d)		0
Restaurant	125	L/(9.2m^2/d)		0
Schools	70	L/(Student/d)		0
Trailer Parks no Hook-Ups	340	L/(space/d)		0
Trailer Park with Hook-Ups	800	L/(space/d)		0
Campgrounds	225	L/(campsite/d)		0
Mobile Home Parks	1,000	L/(Space/d)		0
Motels	150	L/(bed-space/d)		0
Hotels	225	L/(bed-space/d)		0
Office	75	L/7.0m^2/d		0
Tourist Commercial	28,000	L/gross ha/d		0
Other Commercial	28,000	L/gross ha/d		0

AVERAGE RESIDENTIAL FLOW	**0.31**	**L/s**
PEAK RESIDENTIAL FLOW	**1.10**	**L/s**
AVERAGE ICI FLOW	**0.00**	**L/s**
PEAK INSTITUTIONAL/COMMERCIAL FLOW	**0.00**	**L/s**
PEAK INDUSTRIAL FLOW	**0.00**	**L/s**
TOTAL PEAK ICI FLOW	**0.00**	**L/s**

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	**0.36**	**L/s**
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	**1.16**	**L/s**
TOTAL ESTIMATED PEAK WET WEATHER FLOW	**1.27**	**L/s**

SANITARY SEWER DESIGN SHEET

PROJECT: Coleman Central Subdivsion Phase 2 - Onsite Network
LOCATION: Carleton Place
CLIENT: Cavanagh Developments Ltd.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY	
				SF	SD	TH	APT	(ha)	IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								L/s	(%)
													IND	CUM	IND	CUM	IND	CUM											
Lewis St.	201	MH201A	MH202A	1				0.11	3.4	3.4	3.76	0.04							0.00	0.11	0.11	0.04	0.08	27.59	19.24	200	0.65	0.851	27.51	99.72
Lewis St.	202	MH202A	MH203A	12		1		0.92	43.5	46.9	3.66	0.56							0.00	0.92	1.03	0.34	0.89	27.59	116.00	200	0.65	0.851	26.69	96.76
Lewis St.	203	MH203A	MH205A			18		0.84	48.6	95.5	3.60	1.11							0.00	0.84	1.86	0.61	1.73	20.24	95.70	200	0.35	0.624	18.51	91.46
Future Rd	204, R2b, R2e, R2f	CAP	MH205A				200	6.78	648.0	648.0	3.33	6.99							0.00	6.78	6.78	2.24	9.23	20.24	18.19	200	0.35	0.624	11.01	54.39
Lewis St.	205	MH205A	MH206A			49		1.87	132.3	875.8	3.27	9.28							0.00	1.87	10.51	3.47	12.75	36.70	120.00	250	0.35	0.724	23.95	65.27
Lewis St.	206	MH206A	MH210A			9		0.48	24.3	900.1	3.26	9.52							0.00	0.48	10.99	3.63	13.15	36.70	83.10	250	0.35	0.724	23.56	64.18
Lewis St.	207, R2c, R2d	MH207A	MH208A			3		4.11	585.1	585.1	3.35	6.35	0.42	0.42	0.79	0.79			0.59	4.11	4.11	1.36	8.30	20.24	37.17	200	0.35	0.624	11.95	59.01
Lewis St.	208	MH208A	MH209A					0.05	0.0	585.1	3.35	6.35		0.42		0.79			0.59	0.05	4.16	1.37	8.31	20.24	9.52	200	0.35	0.624	11.93	58.93
Lewis St.	209	MH209A	MH210A			3		0.11	8.1	593.2	3.35	6.44		0.42		0.79			0.59	0.11	4.26	1.41	8.43	20.24	23.81	200	0.35	0.624	11.81	58.35
Pond Block	210	MH210A	MH211A					0.54	0.0	1493.3	3.14	15.22		0.42		0.79			0.59	0.54	15.80	5.21	21.02	36.70	66.43	250	0.35	0.724	15.68	42.73
		MH211A	EX. MH SAN						0.0	1493.3	3.14	15.22		0.42		0.79			0.59		15.80	5.21	21.02	36.70	35.79	250	0.35	0.724	15.68	42.73

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	28,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	1.5

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5)*1)
where P = population in thousands

Designed: MP
Checked: AO
Project No.: CCO-26-1833

No.	Revision	Date
1	Issued For Review	2021-04-27
2	Issued For Review	2021-12.17
3	Issued For Review	2022.03.21
4	Revised as per Comments	2022.10.07
5	Revised as per Comments	2023.05.31
6	Revised per Block 29 Site Plan	2026.06.04

Sheet No: 1 of 1

APPENDIX D

STORM SERVICING / STORMWATER MANAGEMENT CALCULATIONS

750 Palladium Drive, Suite 310, Kanata ON, K2V 1C7, Tel. 613-836-2184
info.north-america@egis-group.com | *www.egis-group.com*

STORM SEWER DESIGN SHEET

PROJECT: Coleman Central Subdivision - Phase 2
LOCATION: Carleton Place
CLIENT: Cavanagh Construction Ltd.

McINTOSH PERRY

LOCATION				CONTRIBUTING AREA (ha)														RATIONAL DESIGN FLOW										SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
STREET	AREA ID	FROM MH	TO MH	C-VALUE 0.10	0.18	0.22	0.24	0.25	0.34	0.38	0.40	0.44	0.63	0.67	0.71	0.72	0.81	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
		201	202														0.00	0.00	10.00	0.40	10.40	104.19	122.14	178.56	0.00				0.00	58.82	19.29	300			0.34	0.806	58.82	100.00%
	S202	202	203									0.74					0.46	0.46	15.00	2.31	17.31	83.56	97.85	142.89	107.68				107.68	133.02	112.19	450			0.20	0.810	25.34	19.05%
	S203	203	205							0.20					0.56		0.48	0.95	17.31	2.08	19.39	76.77	89.88	131.19	202.33				202.33	230.96	98.70	600			0.13	0.791	28.63	12.40%
	R204a	LCB266	LCB267		0.28												0.05	0.05	15.00	0.70	15.70	83.56	97.85	142.89	11.71				11.71	41.62	34.46	250			0.45	0.821	29.91	71.87%
	R204b	LCB267	LCB268		1.09												0.20	0.25	15.70	0.78	16.48	81.36	95.27	139.11	55.78				55.78	62.04	57.27	250			1.00	1.224	6.26	10.09%
		LCB268	LCB269														0.00	0.25	16.48	0.54	17.02	79.07	92.57	135.14	54.20				54.20	129.34	36.82	375			0.50	1.134	75.13	58.09%
	R204c	LCB269	CBMH274			1.94											0.43	0.67	17.02	0.43	17.45	77.55	90.79	132.54	145.18				145.18	163.60	36.82	375			0.80	1.435	18.42	11.26%
	S204	CBMH274	204	3.29													0.33	1.00	17.45	0.08	17.53	76.40	89.44	130.55	212.91				212.91	258.68	11.13	375			2.00	2.269	45.77	17.69%
		204	205														0.00	1.00	17.53	0.75	18.28	76.19	89.19	130.18	212.31				212.31	286.47	44.44	600			0.20	0.982	74.16	25.89%
	R205a	LCB271	RYCB270						0.34								0.12	0.12	10.00	0.65	10.65	104.19	122.14	178.56	33.48		57.38		57.38	71.33	38.34	300			0.50	0.978	13.95	19.56%
	R205b	RYCB270	205						0.15								0.05	0.17	10.65	0.98	11.63	100.86	118.22	172.80	46.71		80.03		80.03	91.46	46.95	375			0.25	0.802	11.43	12.49%
	RES1, R205	205	206					0.16								0.60	0.52	2.64	19.39	1.98	21.36	71.63	83.83	122.32	492.87		56.65		549.52	597.22	107.89	900			0.10	0.909	47.70	7.99%
	R206a	RYCB272	206						0.24								0.08	0.08	10.00	0.85	10.85	104.19	122.14	178.56	23.64		40.51		40.51	67.67	47.03	300			0.45	0.927	27.17	40.15%
	RES2, S206a, S206b	206	209				0.24	0.27					0.40	0.34		0.65	1.16	3.88	21.36	1.98	23.35	67.39	78.85	115.03	712.03		26.09		738.13	900.87	120.00	1050			0.10	1.008	162.74	18.06%
		209	208														0.00	3.88	23.35	0.07	23.42	63.67	74.48	108.61	687.11		1,172.19		1,172.19	1,661.12	8.13	1050			0.34	1.858	488.93	29.43%
	R207	207	208						0.14								0.05	0.05	10.00	0.86	10.86	104.19	122.14	178.56	13.41		22.97		22.97	58.82	41.65	300			0.34	0.806	35.85	60.95%
		208	POND														0.00	3.93	23.35	0.24	23.59	63.67	74.48	108.61	695.30				695.30	900.87	14.56	1050			0.10	1.008	205.57	22.82%
	R208									0.08							0.03	0.03	10.00	0.00	10.00	104.19	122.14	178.56	8.81				8.81									
	POND BLOCK										0.59						0.26	0.26	10.00	0.00	10.00	104.19	122.14	178.56	75.04				75.04									
FRANKTOWN OUTLET		STUB	MH109														0.00	0.18	12.41	0.47	12.88	92.98	108.94	159.17	46.31			611.30	657.61	809.89	28.56	975			0.12	1.051	152.28	18.80%
		MH109	MH110														0.00	0.18	12.88	0.56	13.44	91.10	106.72	155.91	45.37			611.30	656.67	784.83	39.10	525	3x525		0.34	1.171	128.16	16.33%
		MH110	HEADWALL														0.00	0.18	13.44	0.32	13.76	88.96	104.21	152.22	44.31			611.30	655.61	784.83	22.62	525	3x525		0.34	1.171	129.22	16.46%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: C.H.
Checked: B.C.
Project No.: CP-18-0360-01

No.	Revision	Date
1.	ISSUED FOR REVIEW	2021-02-09
2.	REVISED PER COMMENTS	2022-01-28
3.	REVISED PER COMMENTS	2022-09-13
4.	REVISED PER COMMENTS	2023-05-31
5.	REVISED PER COMMENTS	2023-09-08
6.	UPDATED AS PER REVISED DRAFT PLAN	2024.11.22

Sheet No: 1 of 1

STORM SEWER DESIGN SHEET

PROJECT: Block 29
LOCATION: Block 29 - Coleman Subdivision
CLIENT: Cavanagh Developments

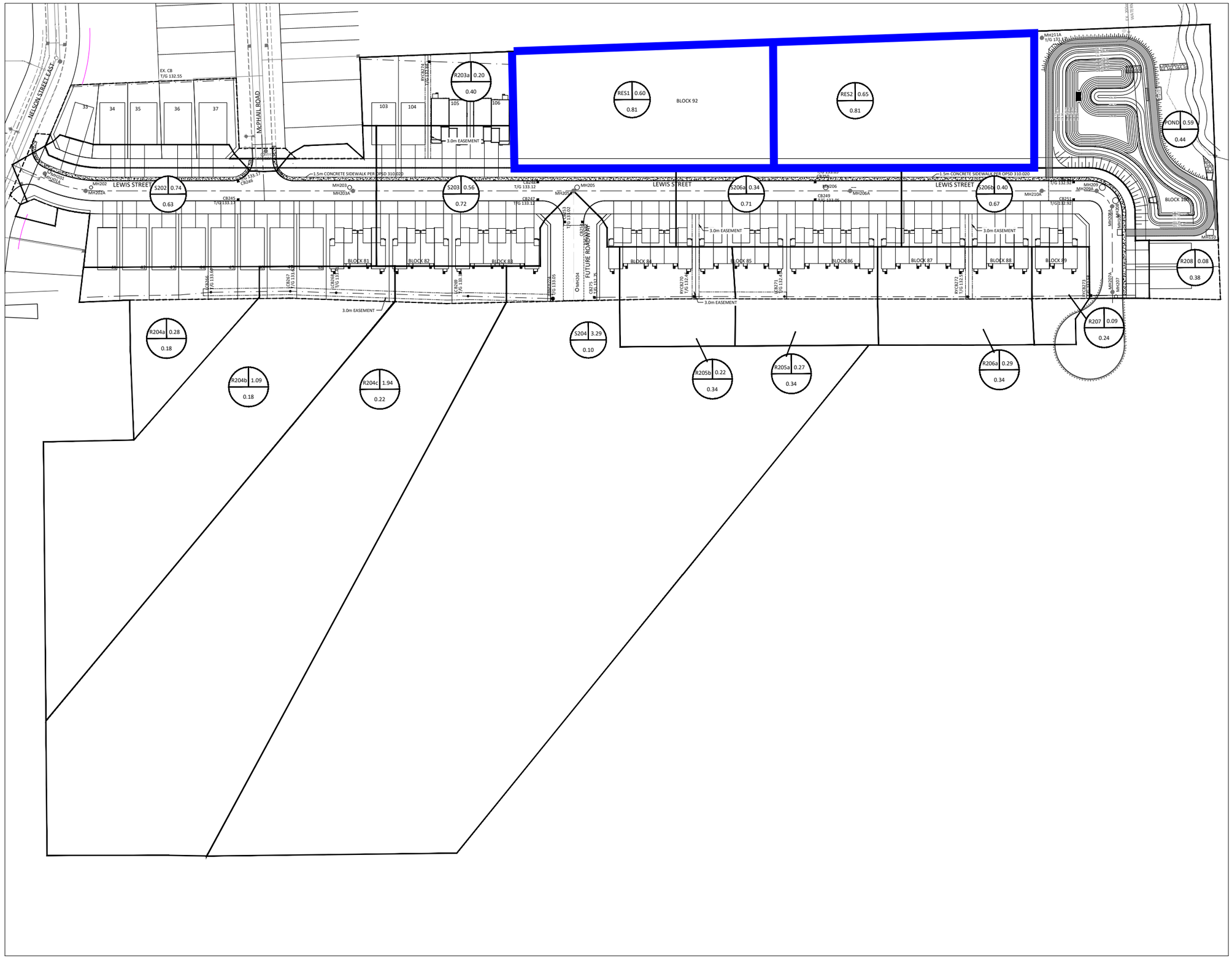
LOCATION		CONTRIBUTING AREA (ha)							RATIONAL DESIGN FLOW								SEWER DATA						
1	2	3		11	12	13	20	21	22	23	24	25	27	28	30	32	33	34	35	38	39	40	41
		2 & 5 - YEAR				100 - YEAR																	
FROM MH	TO MH	C-VALUE 0.20	C-VALUE 0.90	INDIV AC	CUMUL AC	C-VALUE 0.56	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	AVAIL CAP (5yr) (%)
DICBMH1	SWM POND	0.52	0.36	0.43	0.43	0.88	0.49	0.49	10.00	0.28	10.28	104.19	178.56	123.97	244.62	123.97	162.91	16.45	450	0.30	0.992	38.94	23.90%

Definitions:

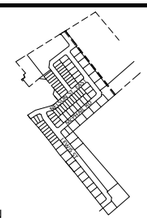
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i5 = 998.071 / (TC+6.053)^0.814]
[i10 = 1174.184 / (TC+6.014)^0.816]
[i100 = 1735.688 / (TC+6.014)^0.820]
Manning's Coefficient (n) = 0.013

Designed:	MP
Checked:	AO
Project No.:	CCO-26-1833
Sheet No,:	1 of 1

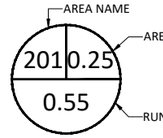
No.	Revision	Date



LOCATION PLAN



LEGEND



FOR REVIEW ONLY
NOT FOR CONSTRUCTION

No.	Revisions	Date
6	UPDATED AS PER RVISED DRAFT PLAN	OCT. 25, 2024
5	REVISED AS PER COMMENTS	MAY 31, 2023
4	REVISED AS PER COMMENTS	MAR. 9, 2023
3	REVISED AS PER COMMENTS	NOV. 2, 2022
2	REVISED AS PER COMMENTS	MAR. 21, 2022
1	ISSUED FOR REVIEW	AUG. 20, 2021

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

SCALE 1 : 500
0 10 20 30 40 50 Metres

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

Stamp:

Client:
CAVANAGH DEVELOPMENTS
9094 CAVANAGH RD, ASHTON, ON K0A 1B0

Project:
COLEMAN CENTRAL SUBDIVISION - PHASE 2

Drawing Title:
POST-DEVELOPMENT DRAINAGE PLAN

Scale: 1:750	Project Number: CP-18-0360-01
Drawn By: C.H.	
Checked By: B.C.	Drawing Number: 502
Designed By: C.H.	

FILENAME: I:\Ottawa\01 Project - Proposals\2018 Jobs\CCO\CCO-18-0360-01 Cavanagh_NuGlobe Subdivision Ph 2_Carleton Place\Civil\12- Drawings\Production\CCO-18-0360-01 DRAINAGE AREA PLANS.dwg
LAST SAVED: Tuesday, December 03, 2024 LAST SAVED BY: c.hampel
LAST PLOTTED: Tuesday, December 03, 2024 08:41 (EST)

CCO-18-0360 - COLEMAN SUBDIVISION PH 2 - POST-DEVELOPMENT

	Impervious Areas		
	Single Family House Area	170	m^2
	Single Fanuily Driveway Area	75	m^2
	Town House Area	127.5	m^2
	TownHouse Driveway Area	38.5	m^2
A1	Full Road Width including sidewalk and curb	10.4	m

Drainage Area ID	Total Area (ha)	Single Family			Townhouse			Roads		Grand Total Impervious Area (ha)	Percent Impervious	Directly Connected[4]	Pervious Area					Impervious Flow Length (m)	Impervious Slope	Manning's n	Depression Storage (mm)	Weighted C Value
		Driveways	# Units	Total Impervious Area (m^2)	Driveways	# Units	Total Impervious Area (m^2)	Length (m)	Total Impervious Area (m^2)				CN Value[5]	Initial Abstraction (mm)	Pervious Flow length (m)	Pervious Slope	Manning's n					
S202	0.74	13.0	8.0	2335	2.0	2.0	332	160.0	1664.00	0.43	58.5%	47.6%	61	5.0	10.0	2.0%	0.25	160.0	1.0%	0.13	1.0	0.63
R204a+ R204b	1.37	0.0	0.0	0	0.0	0.0	0	0.0	452.00	0.05	3.3%	3.3%	60	5.0	10.0	2.0%	0.25		1.0%	0.13	1.0	0.18
R203a	0.20				0.0	8.0	510			0.05	25.5%	25.5%	61	5.0	10.0	2.0%	0.25		1.0%	0.13	1.0	0.40
R203b	1.94								1345.00	0.13	6.9%	6.9%	61	5.0	10.0	2.0%	0.25		1.0%	0.13	1.0	0.22
S203	0.56	0.0	0.0	0	21.0	13.0	2466	130.0	1352.00	0.38	68.2%	57.9%	61	5.0	10.0	2.0%	0.25	130.0	1.0%	0.13	1.0	0.72
S204	3.29	0.0	0.0	0	0.0	0.0	0	45.0	468.00	0.05	1.4%	1.4%	61	5.0	10.0	2.0%	0.25	45.0	1.0%	0.13	1.0	0.10
RES1[2]	0.60									0.48	80.0%	75.0%	61	5.0	10.0	2.0%	0.25	55.0	1.0%	0.13	1.0	0.81
R205a[6]	0.15	0.0	0.0	0	0.0	5.0	318.75	0.0	0.00	0.03	21.3%	0.0%	61	5.0	10.0	2.0%	0.25	8.5	1.0%	0.13	1.0	0.27
S206a[1]	0.38	0.0	0.0	0	13.0	7.0	1393	110.0	1144.00	0.25	66.8%	66.8%	61	5.0	10.0	2.0%	0.25	110.0	1.0%	0.13	1.0	0.70
RES2[2]	0.65									0.52	80.0%	75.0%	61	5.0	10.0	2.0%	0.25	55.0	1.0%	0.13	1.0	0.81
R205b[6]	0.34	0.0	0.0	0	0.0	8.0	510	0.0	0.00	0.05	15.0%	0.0%	61	5.0	10.0	2.0%	0.25	8.5	1.0%	0.13	1.0	0.21
R206a[6]	0.24	0.0	0.0	0	0.0	7.0	446.25	0.0	0.00	0.04	18.6%	0.0%	61	5.0	10.0	2.0%	0.25	8.5	1.0%	0.13	1.0	0.24
S206b[1]	0.38	0.0	0.0	0	11.0	6.0	1188.5	120.0	1248.00	0.24	64.1%	64.1%	61	5.0	10.0	2.0%	0.25	50.0	1.0%	0.13	1.0	0.67
R207[6]	0.14	0.0	0.0	0	0.0	4.0	255	0.0	0.00	0.03	18.2%	0.0%	61	5.0	10.0	2.0%	0.25	8.5	1.0%	0.13	1.0	0.24
R208[1]	0.06	0.0	0.0	0	0.0	3.0	191.25	0.0	0.00	0.02	31.9%	0.0%	61	5.0	10.0	2.0%	0.25	8.5	1.0%	0.13	1.0	0.37
Pond[3]	0.59									0.21	35.0%	35.0%	61	5.0	10.0	2.0%	0.25	35.0	1.0%	0.13	1.0	0.44

Notes
1 - # of units divided by two if only have the roof is tributray to the drainage area
2 - RES1 and RES2 - Assumed impervious values for hi-density residental development
3 - Pond subcatcment estimated impervious values based on size of SWM Pond
4 - Road and Drive and half the roof area
5 - Table 5.9 City of Ottawa Sewer Design Guidelines Lawns Good Condition
6 - assume half the roof of simeral number of townhouses for extended drainage area
Nash Hyd - Tp value 0.3 hours or noted below

11.63	Total Area
2.97	Total Imperviousness
25.5%	Total Impeviousness
Wet Pond 140 m^3/ha including 40m^3/ha for extended detention	
1163	Total Permanent Pool Required
465.2	m^3 Extended Detention

3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

Airport Formula

For use when the runoff coefficient is less than 0.4

$t_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$

Where

tc = time of concentration in minutes
C = runoff coefficient
L = watershed length in metres
S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

R202

C =	0.18	T_C =	51.9 min	T_p =	34.8 min
L =	300 m			$T_p = 0.67\ T_c$	
S_w =	1 %	T_C =	0.87 hours	T_p =	0.58 hours

R202b

C =	0.22	T_C =	53.8 min	T_p =	36.0 min
L =	350 m			$T_p = 0.67\ T_c$	
S_w =	1 %	T_C =	0.90 hours	T_p =	0.60 hours

R204

C =	0.10	T_C =	65.2 min	T_p =	43.7 min
L =	400 m			$T_p = 0.67\ T_c$	
S_w =	1 %	T_C =	1.09 hours	T_p =	0.73 hours

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CCO-18-0360 - COLEMAN SUBDIVISION PH 2 - POST-DEVELOPMENT RESULTS

Uncontrolled - Small Drainage Areas

Retrurn Period (yrs)	To Future Pond Location			Total from Site		
	12 Hour SCS	24 Hour SCS	4 Hour Chicago	12 Hour SCS	24 Hour SCS	4 Hour Chicago
2	0.45	0.48	0.05	0.45	0.49	0.52
5	0.63	0.68	0.73	0.64	0.69	0.74
10	0.78	0.83	0.90	0.78	0.84	0.90
25	0.95	1.02	1.10	0.96	1.03	1.11
50	1.09	1.17	1.26	1.10	1.18	1.27
100	1.25	1.33	1.43	1.26	1.34	1.44

Controlled - Small Drainage Areas

Retrurn Period (yrs)	Pond Outflow			Total from Site		
	12 Hour SCS	24 Hour SCS	4 Hour Chicago	12 Hour SCS	24 Hour SCS	4 Hour Chicago
2	0.06	0.06	0.05	0.06	0.06	0.05
5	0.12	0.13	0.08	0.12	0.13	0.08
10	0.18	0.19	0.14	0.18	0.19	0.14
25	0.24	0.25	0.20	0.24	0.25	0.20
50	0.28	0.29	0.24	0.28	0.29	0.24
100	0.31	0.32	0.27	0.32	0.33	0.27

CCO-26-1833 - Block 29 - Coleman Central Subdivision

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

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Proposed Design Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)
RES1	4,800	0	1,200	**0.81**	**0.81**
RES2	5,200	0	1,300	**0.81**	**0.81**

Proposed Design Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
RES1	0.60	0.81	0.81	10	**140.77**	**241.25**
RES2	0.65	0.81	0.81	10	**152.50**	**261.35**
Total	**1.25**				**293.28**	**502.60**

CCO-26-1833 - Block 29 - Coleman Central Subdivision

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

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Initial Design Runoff Coefficient

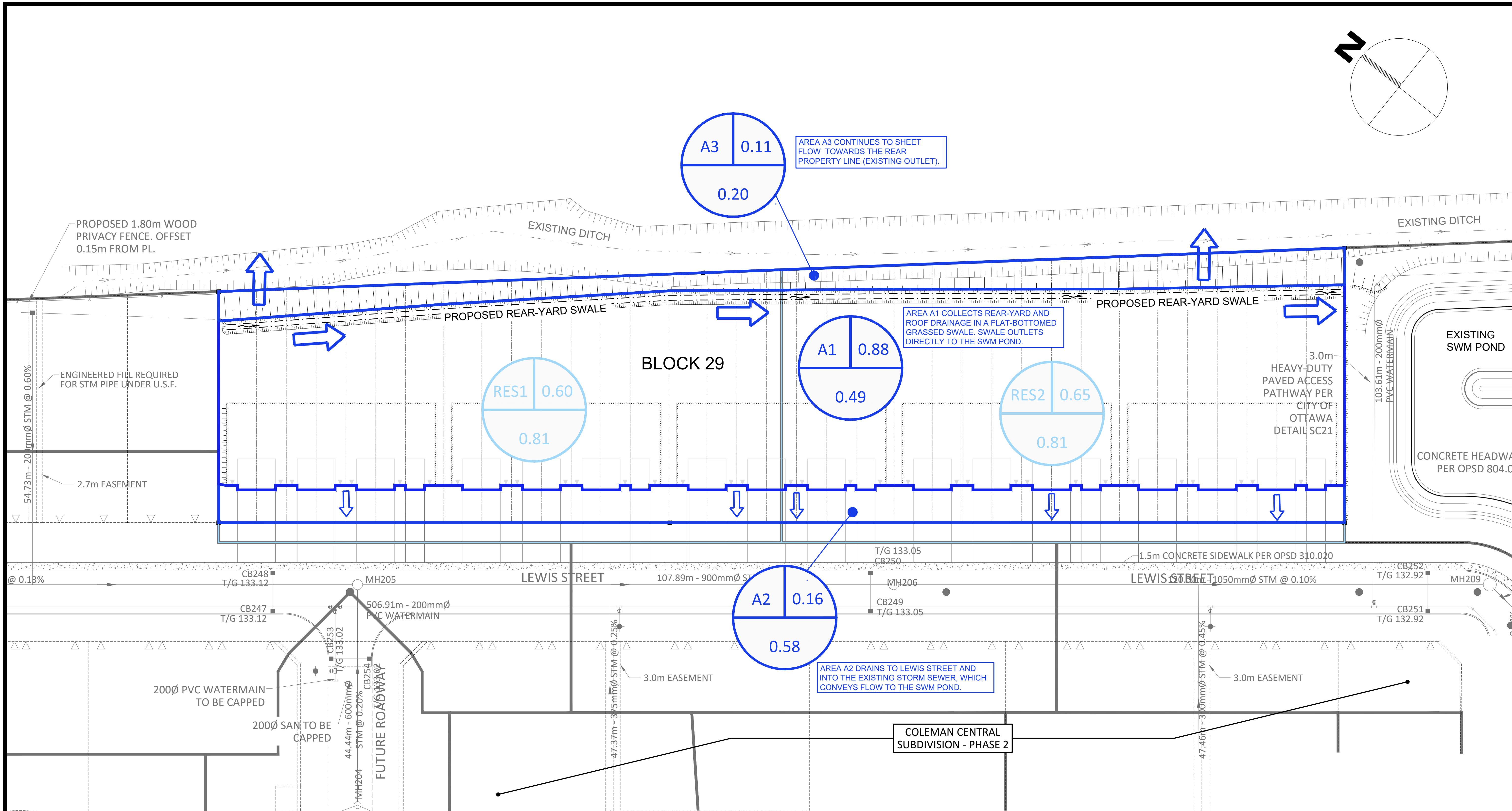
Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (5-year)	Average C (100-year)	
A1	3,625	0	5,175	**0.49**	**0.56**	* to SWM Pond
A2	875	0	725	**0.58**	**0.66**	* to SWM Pond
A3	0	0	1,100	**0.20**	**0.25**	* offsite

Initial Design Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
					5-Year	100-Year	
A1	0.88	0.49	0.56	10	**124.48**	**244.16**	* to SWM Pond
A2	0.16	0.58	0.66	10	**27.01**	**52.43**	* to SWM Pond
A3	0.11	0.20	0.25	10	**6.37**	**13.65**	* offsite
Total	**1.15**				**157.86**	**310.25**	

Initial to Proposed Design Flow Comparison

Item	Initial Design	Revised Design	Difference
Total Drainage Area (m2)	12,500	11,500	-1,000
Total Drainage Area to SWM Pond (m2)	12,500	10,400	-2,100
Impervious Area (m2)	10,000	4,500	-5,500
Pervious Area (m2)	2,500	7,000	4,500
Overall Imperviousness	80%	39%	-40.9%
5-Year Total Flow (L/s)	293.28	157.86	-135.41
100-Year Total Flow (L/s)	502.60	310.25	-192.35
5-Year Flow to SWM Pond (L/s)	293.28	151.49	-141.79
100-Year Flow to SWM Pond (L/s)	502.60	296.60	-206.00



LEGEND

- PROPOSED BLOCK 29 DRAINAGE AREA BOUNDARY
- AREA ID (A3), AREA (Ha) (0.10), RUNOFF COEFFICIENT (5-YEAR) (0.20)
- ORIGINAL BLOCK 29 DRAINAGE AREA BOUNDARY PER COLEMAN CENTRAL SUBDIVISION (RES1 0.60 0.81)
- PROPOSED MAJOR OVERLAND FLOW DIRECTION

SCALE 1 : 750

0 25 50 75 Metres

Stamp:

Stamp:

egis
750 Palladium Drive, Suite 310
Kanata, ON K2V 1C7
Tel: 613-836-2184 Fax: 613-836-3742
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Client:	1384341 ONTARIO LTD.
Project:	BLOCK 29 RESIDENTIAL DEVELOPMENT
Title:	SWM AREAS COMPARISON
Drawn by:	Scale: 1:750
Checked By:	Date:
Project Number:	CCO-26-1833
Drawing Number:	FIG 2

No.	Revision / Issue	Date

Coleman Central Phase 2 (Block 29) - Rear Yard Swale

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	0.550	%
Left Side Slope	3.000	H:V
Right Side Slope	3.000	H:V
Bottom Width	1.00	m
Discharge	244.16	L/s

Results		
Normal Depth	0.23	m
Flow Area	0.4	m²
Wetted Perimeter	2.5	m
Hydraulic Radius	0.16	m
Top Width	2.39	m
Critical Depth	0.16	m
Critical Slope	2.537	%
Velocity	0.62	m/s
Velocity Head	0.02	m
Specific Energy	0.25	m
Froude Number	0.490	
Flow Type	Subcritical	

GVF Input Data		
Downstream Depth	0.00	m
Length	0.0	m
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	m
Profile Description	N/A	
Profile Headloss	0.00	m
Downstream Velocity	0.00	m/s
Upstream Velocity	0.00	m/s
Normal Depth	0.23	m
Critical Depth	0.16	m
Channel Slope	0.550	%
Critical Slope	2.537	%