Claridge Homes

CRT Ph 1 Blk 324

Putney Crescent

Design Brief

June 23, 2026

CTR PH1 BLK 324, PUTNEY CRESCENT

Design Brief
City of Ottawa
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Contents

Tables

Appendices

CRT Ph1 Blk 324, Putney Crescent – Design Brief

Appendix A

- Site Plan
- Site Location
- Site Servicing Plan 30259740-C-001
- AOV Legal Plan
- Pre-Consultation City Comments

Appendix B

- Watermain Boundary Conditions CRT Phase 1
- Water Demand Calculations
- FUS Calculations
- InfoWater Pro Water Model

Appendix C

- Sanitary Drainage Area Plan 30259740-C-400
- Sanitary Design Sheet
- CRT Phase 1 - Drainage Area Plan
- CRT Phase 1 - Sanitary Sewer Design Sheet

Appendix D

- Storm Drainage Area Plan 30259740-C-500
- Storm Design Sheet
- CRT Phase 1 – Storm Drainage Area Plan
- CRT Phase 1 - Storm Sewer Design Sheet
- CRT Phase 1 – SWM Excerpt
- Storm Water Management Calculations
- Overflow Depth Calculations
- Ponding Plan 30259740-C-600
- ADS Tank Sizing Report

Appendix E

- Grading Plan 30259740-C-200
- Sediment and Erosion Plan 30259740-C-900

1 Introduction

1.1 Scope

Arcadis Professional Services Canada (Arcadis) has been retained by Claridge Homes to provide engineering and consulting services for the Block 324 with CRT Phase 1 Lands in the Fernbank Community, the site location is illustrated in Figure 1.1 in Appendix A. Arcadis has completed the Detail Design for CRT Lands Phases 1, 2 and 3, with Phase 1, 2, 3A and 3B now in service. This report will provide a logical framework to assist reviewers with evaluation of the design of Block 324 within Phase 1 of the development.

This report will provide a recommended servicing plan for the major municipal infrastructure needed to support development of the subject lands. This report will demonstrate how the proposed municipal servicing is in conformance with the previously approved subdivision design. Any deviation from the approved subdivision design will be identified with rationalization for the change.

This report was prepared in accordance with the Servicing Study Guidelines for Development Applications in the City of Ottawa.

1.2 Background

In 2009, the City of Ottawa completed the Fernbank Community Design Plan (FCDP). The FCDP covers approximately 675 gross hectares of land between the established communities of Stittsville, Kanata West and Kanata South.

In conjunction with preparation of the Community Design Plan, several Class Environmental Assessment Studies/Master Plans were also prepared. Two of those were the Master Servicing Study (MSS) for water and sanitary and an Environmental Management Plan (EMP) for the natural environment and stormwater management. Those reports identify planning level solutions for on-site storm drainage, wastewater collection and water supply and distribution to the community.

1.3 Subject Site

The current Site Plan as prepared Roderick Lahey Architect Inc. (RLA) for the subject property, is in Appendix A. The property covers a total area of approximately 1.8 ha and is bounded by Robert Grant Ave to the east, Putney Cres to the west, a Hydro corridor to the north and a residential block to the south.

The proposed land use for the subject phase, which is in general conformance with the FCDP, will include ten stacked townhouses on private services.

A site plan of the proposed development is included in **Appendix A**.

1.4 Previous Studies

The Fernbank Community development process included several background studies that are pertinent to the subject site. Three integrated Class Environmental Assessment Studies/Master Plans were prepared in support of the FCDP which include:

- Transportation Master Plan;
- Environmental Management Plan (EMP);
- Master Servicing Study (MSS).

In 2011, IBI Group (presently Arcadis) completed a Conceptual Site Servicing Plan for the CRT Lands. That report was designed to assist the City in preparation of draft conditions for development of the subject property.

In January 2012, Novatech Engineering Consultants Ltd. completed the Fernbank Community Sanitary Trunk Sewer Design Report of the Fernbank Trunk Sewer. That sewer was identified in the 2009 MSS report. The 2012 report built upon previous design elements and included some changes to the proposed sewer design originally identified in the 2009 document. It is the latter report that will provide the design framework for the sanitary sewer design for the subject site.

Subsequent development applications under the Planning Act will be supported by these studies/plans. IBI Group completed the detail design in July 2017 for Phase 1 and September 2020 for Phase 2 of the CRT Lands.

The subject property will follow closely the recommendations of those reports. With respect to the provision of water supply, wastewater disposal and treatment of stormwater runoff, the recommendations of the above noted reports provided development criteria on which the subject property will develop. Any deviations from the previous report will be justified where applicable.

1.5 Geotechnical Considerations

A Geotechnical Investigative Report entitled “Geotechnical Investigation Proposed Residential Development Westwood-Block 324, 5725 Fernbank Road, Ottawa, Ontario”, number PG2236-3, and dated February 3, 2021, was prepared by Paterson Group Inc. The scope of this report also included investigation on the subject lands. The objectives of the investigation include:

- Determination of the subsoil and groundwater conditions;
- Provision of preliminary geotechnical recommendations pertaining to the design and development of the subject site including construction considerations.

Among other items, the report commented on the following:

- Site grading;
- Foundation design;
- Pavement structure;
- Infrastructure construction;
- Groundwater control;
- Tree planting.

Among other considerations, the report confirmed that there are no grade raise limitations for the subject site, and provided recommended Pavement Structure for car park areas and local roads as noted below:

Table 1-1 Pavement Structure – Car Only Parking Areas

Local Road – Parking Areas	Thickness
HL-3 or Superpave 12.5 Asphaltic Concrete Wear Course	50 mm
OPSS Granular A Base	150 mm
OPSS Granular B Type II Subbase	300 mm

Table 1-2 Pavement Structure – Access Lanes, Fire Routes and Heavy Truck Parking Areas

Local Road	Thickness
HL-3 or Superpave 12.5 Asphaltic Concrete Wear Course	40 mm
HL-8 or Superpave 19 Asphaltic Concrete Wear Course	50 mm
OPSS Granular A Base	150 mm
OPSS Granular B Type II Subbase	450 mm

2 Water Supply

2.1 Existing Conditions

As part of Phase 1 of the CRT subdivision, a 200mm diameter watermain was constructed within Putney Crescent adjacent to Block 324.

2.2 Design Criteria

2.2.1 Water Demands

Water demands have been calculated for the full development. The development consists of ten stacked townhouses each with twelve units. Consumption rates are taken from Tables 4.1 and 4.2 at the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Townhouse and Semi-Detached — 2.7 person per Unit
- Residential Average Day Demand — 350 l/cap/day
- Residential Peak Daily Demand — 875 l/cap/day
- Residential Peak Hour Demand — 1,925 l/cap/day

A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day — 0.95 /s
- Maximum Day — 2.36 l/s
- Peak Hour — 5.20 l/s

2.2.2 System Pressure

The Ottawa Design Guidelines – Water Distribution (WDG002), December 2025, City of Ottawa, Clause 4.2.2 states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 480 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in Clause 4.2.2 of the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls will be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

Water Age	A total travel time of 5 days or less during basic day demand is reasonable. A residence time of 8 days should not be exceeded.

2.2.3 Fire Flow Rates

The development consists of stacked townhouses with the majority having 12 units and are 3 stories above ground. A Fire Underwriters Survey (FUS) calculation for a 12-unit, 2-storey, sprinklered wood frame construction building results in a fire flow of 8,000 l/min (133 l/s) An FUS calculation is included in **Appendix B** which calculates a fire flow for Building J fronting Putney Crescent. The building has external exposures in four directions in the calculation. The resulting fire flow demand is 8,000 l/min (133 l/s) which represents the highest fire flow for the Block 324 site and is used in the water model.

2.2.4 Boundary Conditions

As part of the CRT Phase 1 design the City of Ottawa has provided hydraulic boundary conditions at two locations along the Trans Canada Trail 400 mm watermain. Separate boundary conditions have been given for the max day plus fire scenario for a 204 l/s and 262 l/s fire flow. As the fire demand for Block 324 is *133.33* l/s per Section 2.2.3 the 204 l/s boundary condition is used in the fire analysis. A copy of the boundary condition is included in **Appendix B** and summarized as follows:

Table 2-1 Hydraulic Boundary Conditions

	Connection 1	connection 2
Max HGL (Basic Day)	161.1 m	161.4 m
Peak Hour	154.7 m	154.8 m
Max Day + Fire (204 l/s Fire Flow)	152.8 m	153.0 m

2.2.5 Hydraulic Model

Block 324 has been added to the water model for CRT Phase 1, the model is developed with the InfoWater Pro program. Boundary conditions from Section 2.2.4 have been incorporated into the model. In Block 324 the fire flows are evaluated at the proposed hydrant locations represented by Nodes J12, J14 and J18. A schematic of the water model for Block 324 is included in **Appendix B**. The proposed watermain will meet the minimum required minimum pressure of 20 psi during maximum daily and fire flow demand.

Results of the hydraulic model are included in **Appendix B** and are summarized below. Plan 3025974-001, provided in **Appendix A** provides details on the proposed watermain layout and notes.

Scenario

Average Day (Max HGL) Pressure Range	524.8 to 545.42 kPa

Peak Hour Pressure Range	443.32 to 464.00 kPa
Max Day + Fire Design Flow Range (133.33 l/s)	385-493 l/s

A comparison of the results and the design criteria is summarized as follows:

Maximum Pressure: All notes have basic day pressures under 552 kPa, therefore pressure reducing control is not required for this development.

Minimum Pressure: All nodes in the model exceed the minimum value of 276 kPa (40 psi).

Fire Flow: The lowest residual pressure within the system during the fire flow scenario is 443 kPa which exceedsthe 138 kPa (20 psi) residual pressure requirement.

An analysis has been run for the dead end watermains as outlined in Section 2.3.1. Results of the analysis for Street 5 indicate residual pressures of 187.5 to 308.7 kPa which meet the minimum 140 kPa requirement. Results for Street 4 South range between 184.5 and 309.7 kPa, while Street 4 North range between 200.6 and 311.0 kPa, both scenarios also exceed the minimum of 140 kPa. Results are included in Appendix B.

2.3 Proposed Water Plan

2.3.1 Proposed Water Plan

A 200 mm watermain is proposed to service the development with a connection to the existing 203 mm watermain stubbed within the site and a new connection to the existing 203 watermain within Putney Crescent. Three new private fire hydrants and one municipal hydrant on Putney Crescent are proposed to provide public hydrant is proposed to provide fire coverage for the site. A district metering chamber per City Standard W3 is to be provided at the property line of the southern connection

Refer to the general plan of services **Drawing C-001** in **Appendix A** for detailed watermain layout for the subject site.

3 Wastewater Disposal

3.1 Existing Conditions

The Fernbank Trunk sewer was extended as part of CRT Lands Phase 1 development. The main trunk sewer for the subject lands was previously constructed in block 328 and 336 and Putney Crescent with servicing stubs designed for this site, it should be noted that it appears from as built records these stubs were not constructed.

The CRT Phase 1 sewer design included an allocation into MH209A for the subject site and surrounding lands. The design of Phase 1 was completed based on the previous Ottawa Sewer Design Guidelines, for which a demand of 350L/Day/cap and infiltration allowance of 0.28l/s/Ha was used. The Phase 1 design had estimated an area allocation of 11.57 Ha and a total population allowance of 515.6 yielding a total peak flow to MH209A of 11.55 l/s under the design criteria at the time.

3.2 Design Criteria

The sanitary sewers for the subject site will be based on the City of Ottawa design criteria. It should be noted that the sanitary sewer design for this study incorporates the latest City of Ottawa design parameters identified in Technical Bulletin ISTB-2018-01. Some of the key criteria will include the following:

- Residential Flow — 1 Bed = 1.4 p/p/u; 2 Bed = 2.1 p/p/u
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

3.3 Recommended Wastewater Plan

The proposed site plan has a tributary area of 1.85Ha, and a population contribution of 328 to MH 209A. The total peak flow to MH209A from Phase 1 including the subject parcel is 12.54 l/s, which is 0.9 l/s greater than the original design of 11.55/s. The outlet pipe of MH209 is a 250 mmØ at 0.7% representing an available capacity of 51.91 l/s, therefore, the increase of 0.9 l/s from the subject site is not anticipated to present capacity concerns for the downstream network. A copy of the original design sheet and the updated design sheet is included in **Appendix C.**

3.4 Local Extraneous Flows

All sanitary sewers will be constructed to City of Ottawa standards, including testing prior to being put into service. There are no unusual local conditions within the subject site that are expected to contribute extraneous flows higher than those noted in the City's guidelines. No external lands will drain through this site.

3.5 Sewer Calculations

Detailed sanitary sewer design sheets, using recommendations from the MSS, and criteria of the City of Ottawa and the provincial Ministry of Environment, and Sanitary Drainage Area Plans Drawings 30259740-C-400 is provided in **Appendix C**. It demonstrates the sewers have been designed to meet governmental requirements.

4 Site Stormwater Management

4.1 Background

The subject site is part of the larger development referred to as Fernbank Community Development. The stormwater management strategy was outlined in the following reports:

- Conceptual site servicing plan stormwater management plan and erosion and sediment control plan CRT lands Fernbank community (IBI Group, August 2011)
- Design brief CRT Lands – Phase 1 Fernbank Community Development (IBI Group, July 2017)

The subject site is part of the drainage area that ultimately discharges to the Pond 6 SWM Facility.

The trunk storm sewer to the pond and the pond itself were previously constructed.

4.2 Design Criteria

In accordance with the City of Ottawa Sewer Design Guideline the following parameters were implemented in developing the stormwater management design:

• Design Storm	1:2year return (Ottawa)
• Rational Method Sewer Sizing	
• Initial Time of Concentration	10 minutes
• Runoff Coefficients	
– Landscaped Areas	C = 0.25
– Asphalt/Concrete	C = 0.90
– Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter (200 mm diamter CB Leads)

4.3 System Concept

According to the CRT Phase 1 report prepared by IBI Group, the development of the downstream stormwater system included the expected stormwater servicing needs of the subject property. The existing storm sewers constructed adjacent to the site were oversized to provide the needed capacity for minor storm runoff from the subject site. Minor storm runoff from the subject site will connect to the existing 975 mmØ sewer in block 316. See Appendix D for an excerpt of the allowable release rate from the site in the CRT Ph 1 report. The total allowable release rate for the subject site is 381.83 l/s. The sewer design sheet, and tributary area plan from CRT Phase 1 are included in **Appendix D**. The service stub for the site was assigned a 5-yr flow of 493.82 l/s. This included 112.87 l/s for 0.56 Ha adjacent parcel, Block 343.

4.3.1 Dual Drainage Design

The dual drainage system proposed for the subject site will accommodate both major and minor stormwater runoff. Minor flow from the subject site will be conveyed through the storm sewer network and discharge into the existing 975 mmØ sewer in Block 316.

The surface flow not captured by the minor system during rainfalls more than the 1:100yr event will be conveyed via the major system. Storage will be provided by a combination of subsurface methods including two stormtech units, clear stone trenches and through surface ponding within the parking lot, sized to accommodate on-site flows up to the 1:100yr rainfall events. Please note there is no proposed ponding within the parking lot during 1:2-year event. If the maximum storage is utilized or if the inlet is blocked, the excess flow will cascade to the next downstream sag. Major flow up to 100-year storm event will be restricted and detained on-site, except small, landscaped areas fronting Putney Crescent, Robert Grant Avenue and a small area abutting the existing dry pond in block 316. Emergency overflow will be directed towards aforementioned dry pond. A portion of the adjacent parcel block 343 drains through this site, and similar dual drainage system for that parcel will be employed. The minor system flow will be accommodated by the pipe system in block 324, and block 343 will be required to provide onsite storage to accommodate the 1:100 rainfall events, an emergency overland flow into block 324 will also be provided.

4.3.2 Proposed Minor System

Using the criteria identified in Section 4.2, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in **Appendix D**. The general plan of services, depicting all on-site storm sewers can be found in **Appendix A**.

The owner of the site will be responsible for regular maintenance of the on-site sewers, catch basins, storage chambers and inlet control devices (ICDs). Maintenance includes but is not limited to the cost of regular cleaning of the storage chambers, storm sewer structures and ICDs as necessary. The site owner will also be responsible for replacement of damaged or missing catch basin structures, grates or ICDs as needed.

4.4 Stormwater Management

4.4.1 Water Quality Control

The subject site is part of the larger Fernbank development where an end of pipe quality control Storm Water Management facility has been constructed and is operational. This site was identified to be developed with a runoff coefficient of 0.80, the actual runoff coefficient is approximately 0.66, therefore no negative impact is anticipated on the downstream Pond 6 SWM facility.

4.4.2 Water Quantity Control

As noted in section 4.4 above, the downstream sewer design limits the subject site to a maximum minor system release rate of 381.83 l/s into the existing 975 mm Dia storm sewer system. Surface flows in excess of the site's allowable release rate will be stored in strategic subsurface storage facilities and gradually released into the minor system to respect the site's allowable release rate. Due to the proposed sloped roofs no roof top storage is used, and the relatively flat site grading severely limits available surface storage. The proposed underground storage system is the StrormTech system (or approved equal). This system operates as a closed system and it does not rely on infiltration to discharge the collected storm water. Collected storm water will discharge into the storm sewer, the flow rate is controlled by an ICD. The system has been sized to accommodate the design volume to accommodate up to the 1:100yr event. Therefore, very limited surface storage is being utilized to meet the site demands and there will no active surface ponding within the parking lots during the 2-yr storm event. However, should an inlet be blocked or during extreme events a minimum 300mm freeboard is provided between an overflow elevation and building envelope or opening. Overland flow routes are provided to permit emergency overland flow away from buildings and out to the adjacent dry pond. A copy of a Storm tech info sheets has been provided in **Appendix D**.

4.5 On-Site Detention Summary

For areas where on-site detention is feasible, runoff is designed to be limited to the 5-year post-development storm event. Flows exceeding the target release rate will be contained on-site via surface storage within StormTech tanks, clear stone trenches, and parking lot storage. Several catchbasins will be equipped with inlet control devices to attenuate flows. The modified rational method was used to determine the resulting storage volumes during the 2-year, 5-year, and 100-year storm events. Available surface ponding within the parking area was determined using CAD surface volume tools. A summary of the ICD type and corresponding storage details is provided in Table 4.1 below.

During the 100-year event, overland flow from areas S100 and S101 overflows to drainage area S102, where runoff is detained via surface storage. The overflow capacities of each cascading ponding area were evaluated to ensure there is sufficient overflow capacity to convey drainage towards S102 during the 100-year event. The volume of overflow conveyed to S103 is 12.87 m^3. Assuming a Tc of 15 minutes, corresponding to the maximum storage volume required, this volume can be reverse calculated to a runoff of 19.50 L/s. Based on the spill point cross-section from S101, a simple rectangular channel with a bottom width of 37.00 m at a grade of 1.35% can convey 20.91 L/s at an overflow depth of 0.03 m (ponding elevation 107.18 m). Refer to **Appendix D** for detailed overflow calculations.

Table 4-1 Post-Development Storage Summary Table

Drainage Area	ICD Type	ICD Restricted Flow (L/s)	100 Year Storage Required (m^3)	Storage Provided (m^3)	Upstream Overflow (m^3)	100 Year Overflow (m^3)
S100	IPEX MHF	26.00	29.26	16.33		12.93

Drainage Area	ICD Type	ICD Restricted Flow (L/s)	100 Year Storage Required (m^3)	Storage Provided (m^3)	Upstream Overflow (m^3)	100 Year Overflow (m^3)
S101	IPEX MHF	50.00	24.62	11.75	12.93	12.87
S102	IPEX MHF	25.00	40.77	41.35	12.87	
S103	IPEX MHF	45.00	19.98	50.04		
S104	IPEX LMF	6.00	1.67	20.60		
S105	IPEX MHF	30.00	13.19	20.83		
S106	IPEX MHF	25.00	79.99	83.73		
RY106	IPEX LMF	10.00	6.64	11.53		
S107	IPEX MHF	20.00	37.76	38.92		
S108	IPEX MHF	15.00	6.32	17.37		
RY113	IPEX LMF	10.00	14.15	28.61		
RY116 & BLK342	IPEX MHF	23.00	39.98	48.54		
RY119	IPEX LMF	10.00	9.45	10.65		

4.6 100-YEAR + 20% Stress Test

A cursory review of the 100-year + 20% stress test event and overflow depth has been performed using the modified rational method. The calculations are included in the modified rational stormwater management sheets in **Appendix D**.

A summary of the required storage volumes and overflow balances is provided below.

Table 4-2 Post-Development 100yr+20% Stress Test Storage Summary Table

Drainage Area	ICD Restricted Flow (L/s)	100 Year+20% Storage Required (m^3)	Storage Provided (m^3)	Upstream Overflow (m^3)	100 Year+20% Overflow (m^3)
S100	26.00	40.11	16.33		23.78
RY116 & BLK342	23.00	52.12	48.54		3.57
S101	50.00	43.35	11.75	27.35	31.70
S102	25.00	69.98	41.35	31.70	28.33
S103	45.00	61.76	50.04	28.33	11.72
S105	30.00	31.14	20.83	11.72	10.31
RY119	10.00	12.54	10.65		1.90
S106	25.00	103.88	93.73	1.90	20.15
RY113	10.00	38.63	28.61	21.50	10.03
RY106	40.00	19.80	11.53	10.03	8.27
S107	20.00	50.12	38.92		11.20
S108	15.00	40.66	17.37	29.78	29.78

During the 100-year+20% stress test event, overland flow from the areas S100, RY116, BLK342, S101, and S102 overflow to drainage area S103 where runoff is detained via surface storage. Stress test runoff from areas RY106, S106, S107, RY113 and RY119 cascade towards area S108 prior to discharging north of the site towards Block 316. Sufficient storage has been provided within area S105 to ensure the stress event is stored within that drainage area. The overflow capacities of each cascading ponding area were evaluated to ensure there is sufficient overflow capacity to convey drainage towards the emergency outlet during the stress event. The volume of overflow leaving the site from S108 is 23.29 m^3. Assuming a Tc of 11 minutes, corresponding to the maximum storage volume required, this volume can be reversed calculated to a runoff of 35.29 l/s. Based on the spill point cross section from S108 at the north of the site, a simple rectangular channel with a bottom of 9.00m at a grade of 3.79% can convey 43.33 l/s at an overflow depth of 0.02m (Ponding 105.52m). Refer to **Appendix D** for detailed overflow calculations.

5 Grading and Roads

5.1 Site Grading

The proposed site grading balances various requirements, including but not limited to geotechnical constraints, minimum/maximum slopes, overland routing of stormwater, all to ensure the site is graded in accordance with municipal and accessibility standards.

Refer to the grading plan provided in **Appendix E**.

A retaining wall is anticipated to be required along the Northeast property line fronting Robert Grant Avenue. The wall will require a detailed design by a structural engineer prior to municipal approval. Existing overland drainage patterns have been respected in the proposed grading with the majority of post-development runoff still tributary to the Jock River. In landscape areas where typical 2-7% grading cannot be met, 3:1 maximum terracing has been utilized to tie the proposed grading into the existing.

5.2 Road Network

Two site vehicle accesses will be provided extending from Putney Crescent complete with 151 residential and 24 visitor parking stalls. A fire route has been provided through the site providing access for emergency personal vehicles. A garbage collection area is located at the north of the site.

Pedestrian access facilities are provided extending from Putney Crescent, through the site and connecting to Robert Grant Avenue. Please refer to Site Plan in **Appendix A**

6 Source Controls

6.1 General

Since an end of pipe treatment facility is already provided for the development lands, stormwater site management for the subject lands will focus on site level or source control management of runoff. Such controls or mitigative measures are proposed for this development not only for final development but also during construction and build out. Some of these measures are:

- Flat site grading where possible
- Vegetation planting
- Groundwater recharge in landscaped areas

6.2 Lot Grading

Where possible, all of the proposed blocks within the development will make use of gentle surface slopes on hard surfaces such as asphalt and concrete. In accordance with local municipal standards, all grading will be between 0.5 and 5.0 percent for hard surfaces and 2.0 and 7.0 percent for all landscaped areas. Significant grade changes will be accomplished through the use of terracing (3:1 max slope), ramps and/or retaining walls. All surface catchbasins shall be equipped with 3.0m subdrains on opposite sides of a curbside catchbasin running parallel to the curb, and with 3.0m subdrains extending out from all 4 sides of parking lot catchbasins.

6.3 Vegetation

As with most site plans, the developer will be required to complete a vegetation and planting program. Vegetation throughout the development including planting along roadsides and within the individual blocks provides opportunities to re-create lost vegetation.

7 Conveyance Controls

7.1 Generals

Besides source controls, the development also proposes to use several conveyance control measures to improve runoff quality. These will include:

- Vegetated swales
- Catchbasin sumps and manhole sumps
- Roof leaders directed to landscaped areas

7.2 Catchbasins and Maintenance Hole Sumps

All catchbasins within the development, either rear yard or street, will be constructed with minimum 600 mm deep sumps. These sumps trap pollutants, sand, grit and debris which can be mechanically removed prior to being flushed into the minor pipe system. Both rear yard and street catchbasins will be to OPSD 705.02. All storm sewer maintenance holes serving local sewers less than 900 mm diameter shall be constructed with a 300 mm sump as per City standards.

8 Sediment and Erosion Control Plan

8.1 General

During construction, existing stream and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to possibly introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These may include:

- Until the local storm sewer is constructed, groundwater in construction trenches shall be pumped into a filter mechanism prior to release to the environment
- Vegetated swale sediment capture filter socks will remain on open surface structures such as maintenance holes and catchbasins until these structures are commissioned and put into use
- Silt fence on the site perimeter will be installed

8.2 Trench Dewatering

Any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed, including sediment removal and disposal and material replacement as needed. It should be noted that that the contractor will be responsible for the design and management of the trap(s).

8.3 Seepage Barriers

In order to further reduce sediment loading to the stormwater management facility, seepage barriers will be installed on any surface water courses at appropriate locations that may become evident during construction. These barriers will be Light Duty Straw Bale Barriers per OPSD 219.100 and Heavy-Duty Silt Fence Barriers per OPSD 219.130; locations are shown on the Sediment and Erosion Control Plan included in **Appendix E**. They are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

8.4 Surface Structure Filters

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Until streets are asphalted and curbed, all catchbasins and manholes will be constructed with sediment capture inserts or equivalent located between the structure frame and cover. These will stay in place and be maintained during construction and build until it is appropriate to remove same.

9 Conclusion

This report and the accompanying working drawings demonstrate that the proposed development meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MOECP. The proposed development is in general conformance with the 2009 Master Servicing Report and current City of Ottawa design standards.

Downstream sanitary sewers were designed with the proposed development area included. There is a reliable water supply available adjacent to the proposed development.

10 Recommendations

Water, wastewater and stormwater systems required to develop the site are designed in accordance with MECP and City of Ottawa's current level of service requirements.

The use of lot level controls, conveyance controls and end of pipe controls outlined in the report will result in effective treatment of surface stormwater runoff from the site. Adherence to the proposed sediment and erosion control plan during construction will minimize harmful impacts on surface water.

It is recommended that the regulators review this submission with an aim of providing the requisite approvals to permit the owners to proceed to the development stage of the subject site.

Final detail design will be subject to governmental approval prior to construction, including but not limited to the following:

- Commence Work Notification: City of Ottawa
- ECA (sewers): MECP
- Commence Work Notification (utilities): City of Ottawa

Appendix A

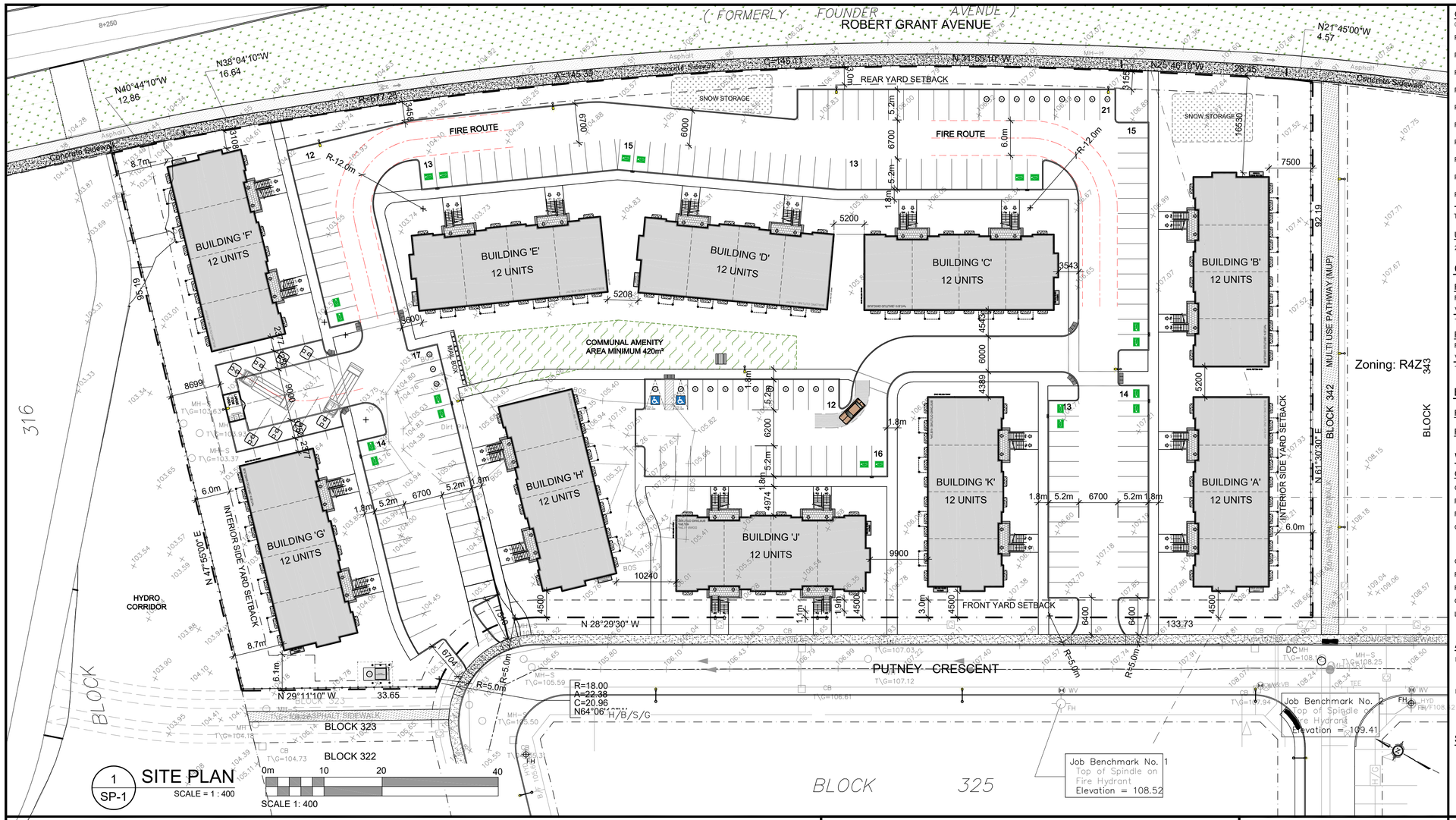
Site Plan

Site Location

Site Servicing Plan 30259740-C-001

AOV Legal Plan

Pre-Consultation City Comments



1 SP-1 **SITE PLAN**
SCALE = 1 : 400

GROSS BUILDING - AREAS
(CITY OF OTTAWA'S DEFINITION)

PROPOSED BUILDING 'A'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'B'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'C'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'D'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'E'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'F'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'G'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'H'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'J'	1,256.0 m² / 13,520 ft²
PROPOSED BUILDING 'K'	1,256.0 m² / 13,520 ft²
TOTAL PROPOSED AREA	12,560.0 m² / 135,200 ft²

UNIT STATISTICS

2 BEDROOM UNIT	120

CAR PARKING

REQUIRED by ZONING BY-LAW

RESIDENCE	- 1.2 PER UNIT	144
VISITOR	- 0.2 PER DWELLING UNIT	24
TOTAL		168

PROVIDED

RESIDENCE	- 1.26 PER UNIT	151
VISITOR	- 0.2 PER DWELLING UNIT	24
TOTAL		175

BICYCLE PARKING

REQUIRED	- 0.5 PER UNIT	60
PROVIDED		60

WASTE COLLECTION

GUIDELINES

GARBAGE	- 0.231 YARDS³ / UNIT	28 YARDS³
RECYCLING (GMP)	- 0.018 YARDS³ / UNIT	2 YARDS³
RECYCLING (FIBRE)	- 0.062 YARDS³ / UNIT	7.4 YARDS³
ORGANICS	- 240L CONTAINER / 50 UNITS	3 x 240L

	REQUIRED	PROVIDED
GARBAGE	5 EARTHBINS	5 EARTHBINS
RECYCLING (GMP)	1 EARTHBINS	1 EARTHBINS
RECYCLING (FIBRE)	2 EARTHBINS	2 EARTHBINS
ORGANICS	3 x 240L BINS	3 x 240L BINS
LARGE ITEM GARBAGE	N/A	8 m²

*EARTHBINS= (6.5 YARDS³)

AMENITY SPACE

REQUIRED AMENITY SPACE	
6.0 m² PER UNIT=	720.0 m²
50% COMMUNAL AMENITY AREA =	360.0 m²
PROVIDED AMENITY SPACE	
PRIVATE BALCONY / PATIOS =	320.0 m²
COMMUNAL EXTERIOR AREA=	420.0 m²
TOTAL =	740.0 m²

SITE COVERAGE

BUILDING FOOTPRINT =	22.2%	4,157.0 m²
DRIVING SURFACE =	26.3%	4,885.0 m²
LANDSCAPE AREA =	51.5%	10,667.0 m²
TOTAL =		

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

No.	DESCRIPTION	DATE
7		
6		
5		
4		
3	ISSUED FOR OWNER / CONSULTANT REVIEW	2026 04 07
2	ISSUED FOR OWNER / CONSULTANT REVIEW	2026 01 27
1	ISSUED FOR PRELIMINARY REVIEW	2026 02 06

REVISIONS:

ARCHITECT SEAL:

SEAL DATE: STAMP DATE

NORTH ARROW:

CLIENT:
CLARIDGE HOMES

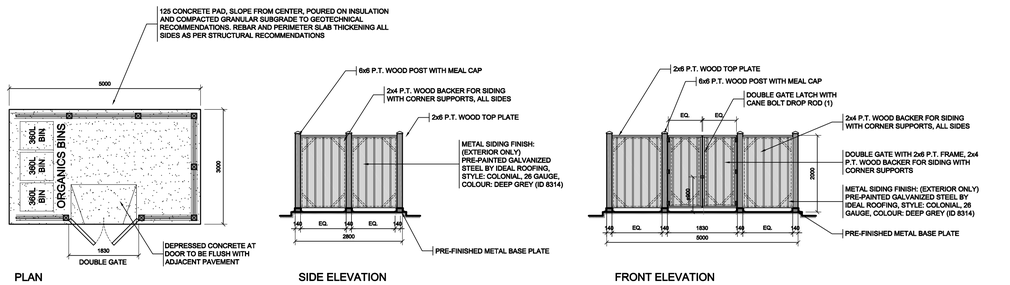
ARCHITECT:
rla/architecture
roderick lahey architect inc.
56 beech street, ottawa, ontario K1S 3J6
t. 613.724.9932 f. 613.724.1209 rlaarchitecture.ca

PROJECT TITLE:
723 PUTNEY CRESCENT
STITTSVILLE
OTTAWA ONTARIO

SHEET TITLE:
SITE PLAN

DRAWN: R.V.
CHECKED: RV
SCALE: 1:250
SHEET No. SP-1
PROJECT No. 2513

D07-12-25-00___



PLAN | SIDE ELEVATION | FRONT ELEVATION

OTHER 2 ELEVATION SIMILAR
FASTENERS AND HARDWARE TO BE EXTERIOR GRADE
EXPOSED WOOD TO BE STAINED DARK GREY
–

GARBAGE ENCLOSER DETAIL

PROJECT INFORMATION

Zoning By-law 2008-250 Consolidation R4Z | SITE AREA 1.85 ha. | 18,571.4 m² / 199,900 ft²

ZONING	REQUIRED	PROVIDED
ZONE: PLANNED UNIT DEVELOPMENT: STACKED	R4Z	R4Z
BUILDING HEIGHT	14.5m	9.3m
DENSITY - MAXIMUM FLOOR SPACE INDEX	n/a	n/a
FRONT YARD SETBACK: PUTNEY	3.0m	4.5m
INTERIOR YARD SETBACK	1.5m & 6.0m	6.1m
INTERIOR YARD SETBACK: MUP	6.0m	7.5m
INTERIOR YARD SETBACK: HYDRO CORRIDOR	6.0m	8.7m
REAR YARD SETBACK: ROBERT GRANT	3.0m	3.1m
BUILDING SETBACK TO A PRIVATE WAY	1.8m	3.0m
BUILDING SEPARATION (UNDER 14.5m HT.)	1.2m	5.2m
AMENITY AREA - TOTAL 6.0m² PER UNIT	720.0m²	740.0m²
AMENITY AREA - 50% COMMUNAL PER UNIT	360.0m²	420.0m²
VEHICLE PARKING: RESIDENTIAL - 1.2 PER UNIT	144	151
VEHICLE PARKING: VISITOR - 0.2 PER UNIT	24	24
BICYCLE PARKING - RESIDENTIAL - 0.5 PER UNIT	60	60
AISLE & DRIVEWAY MINIMUM / MAXIMUM WIDTH	6.0m / 6.7m	6.2m / 6.7m
MINIMUM WIDTH OF LANDSCAPED AREA - ABUTTING A STREET	3.0m	4.5m
MINIMUM WIDTH OF LANDSCAPED AREA - AROUND A PARKING LOT	3.0m	3.0m

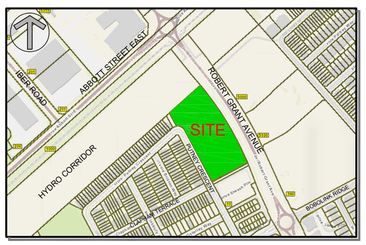
SITE PLAN SYMBOLS

- CONCRETE WALK / PATH
- SOFT LANDSCAPING
- COMMUNAL AMENITY SPACE
- ASPHALT MUP / WALK
- SNOW STORAGE
- BIKE RACK / BIKE PARKING SPOT 0.6m x 1.8m
- TWO WAY VEHICLE CIRCULATION
- MAIN ENTRANCE
- PROPERTY LINE
- ZONING SETBACKS
- STANDARD PARKING SPACE
- VISITOR PARKING SPACE
- ELECTRICAL VEHICLE READ PARKING SPACE (NO CHARGER)
- ACCESSIBLE PARKING SPACE

DRAWING NOTES

1. PROPERTY LINE
2. BUILDING SETBACKS
3. REQUIRED AMENITY AREA
4. PARKING SPACE: STANDARD SIZE 2.6 x 5.2 METRES
5. PROPOSED HYDRO TRANSFORMER
6. ASPHALT DRIVING SURFACE
7. IN GROUND WASTE BINS
8. ORGANIC WASTE / OVER SIZED GARBAGE ENCLOSER 2.0m HIGH OPAQUE SCREEN AROUND PERIMETER
9. BICYCLE PARKING SPACES 0.6m x 1.8m (6) WITH RACK
10. PROPOSED HYDRANT
11. EXISTING FIRE HYDRANT
12. SEASONAL SNOW STORAGE
13. VISITOR PARKING SPACE: 2.6 x 5.2 METRES
14. DEPRESSED STREET CURB, SIDEWALK TO BE CONTINUOUS AND DEPRESSED @ DRIVEWAY, AS PER OTTAWA DETAIL SC7.1
15. DEPRESSED CURB AND TWSI AT ALL CROSSINGS
16. 1.8m WIDE CONCRETE WALK
17. ACCESSIBLE PARKING SPACE WITH ACCESS AISLE, DEPRESSED CURB AND TWSI
18. CANADA POST MAIL BOXES
19. PROPOSED SITE LIGHTING, SEE ELECTRICAL SITE PLAN
20. ELECTRICAL VEHICLE SPACE: 2 PER BUILDING
21. FLUSH CURB @ WASTE PICK UP AREA
22. EXISTING ASPHALT MUP AND OR PATH
23. 1.5m ht. BLACK VINYL COATED CHAIN LINK FENCE
24. LOW RETAINING WALL, SEE CIVIL & LANDSCAPE

KEY PLAN



LEGAL DESCRIPTION
SKETCH TO ILLUSTRATE EXISTING CONDITIONS ON
BLOCK 324, PLAN 4M1619
CITY OF OTTAWA
Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed September 17, 2020

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Ontario Land Surveyors
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Email: ml@jbla.ca
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URBAN PLANNER
Novatech Eng. Consultants Limited
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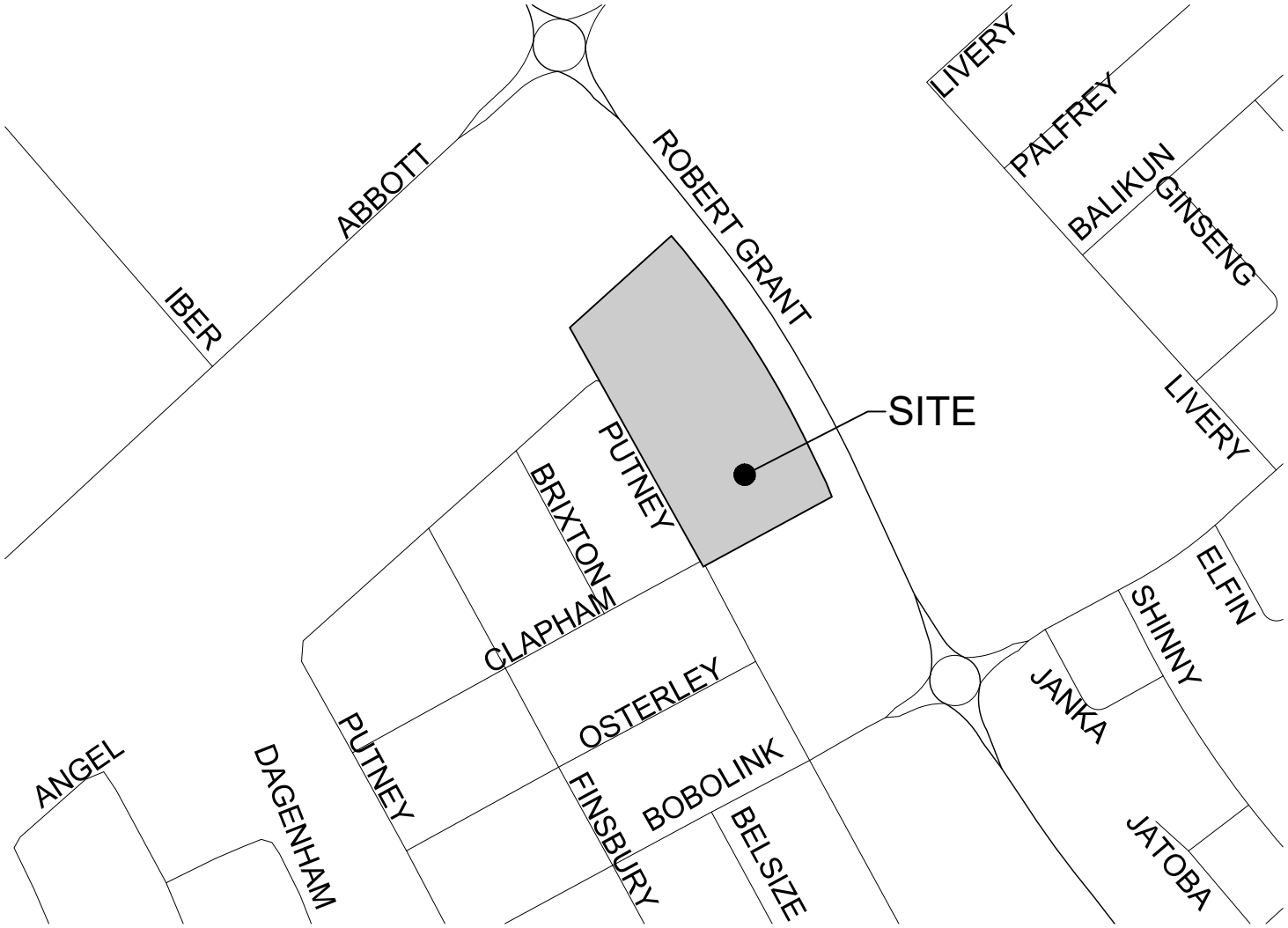
Email: r.tran@novatech-eng.com

PAPER SIZE: A1 | PLOT DATE: Wednesday, April 08, 2026 | PLOT SCALE: 1:1 | PEN STYLE: 0-RLA-MASTER-100%.ctb | F:\2026\2602 - Putney Cres Terrace Homes\01 Design Development\01 Site Plan\2602 Putney SP-1 Site Plan 2026 03 03.dwg #_____



J:\126715_CRT_Block324\7.0_Production\7.03_Design\04_Civil\Content\Figure1LocationPlan.dwg Layout Name: Layout1

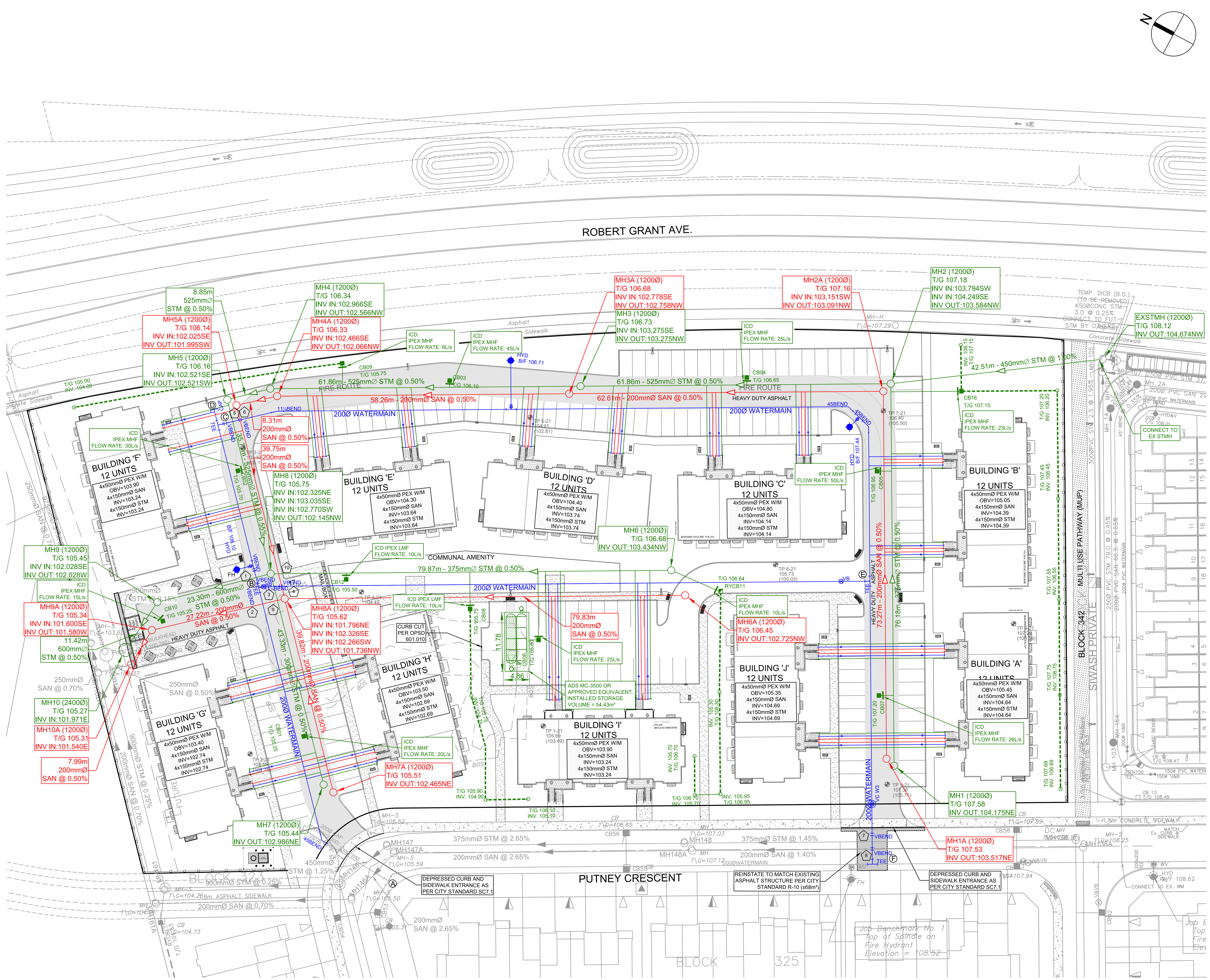
Project Title	Drawing Title	Sheet No.
CRT BLOCK 324	SITE LOCATION PLAN	FIGURE 1

ARCADIS

WATERMAIN SCHEDULE					
	Station	Description	Finished Grade	Top of Waterain	As Built Waterain
A	0+000.00	EXISTING TEE	105.45	103.05	
	0+014.50	EXISTING VB	105.61	103.21	
	0+015.48	45 BEND	105.63	103.23	
	0+028.20	SERVICE TEE	105.48	103.08	
	0+029.32	SERVICE TEE	105.47	103.07	
	0+030.64	SERVICE TEE	105.44	103.04	
	0+032.26	SERVICE TEE	105.42	103.02	
	0+046.05	SERVICE TEE	105.57	103.17	
	0+047.14	SERVICE TEE	105.57	103.17	
	0+048.42	SERVICE TEE	105.56	103.16	
	0+050.06	SERVICE TEE	105.56	103.16	
B	0+067.49	TEE	105.70	103.30	
	0+067.78	V BEND	105.71	103.31	
	0+068.28	V BEND *	105.73	103.62	
	0+070.88	V BEND *	105.81	103.62	
	0+071.38	V BEND	105.83	103.43	
	0+072.02	HYD TEE	105.86	103.46	
	0+082.25	SERVICE TEE	105.90	103.50	
	0+084.10	SERVICE TEE	105.88	103.48	
	0+098.07	SERVICE TEE	105.95	103.55	
C	0+100.90	TEE	105.97	103.57	
	0+103.63	SERVICE TEE	105.99	103.59	
D	0+104.10	CAP	106.05	103.65	
B	0+000.00	TEE	105.70	103.30	
	0+000.98	VB	105.69	103.29	
	0+001.23	11 BEND	105.69	103.29	
	0+001.40	V BEND	105.690	103.29	
	0+001.90	V BEND *	105.690	103.86	
	0+004.20	V BEND *	105.660	103.86	
	0+004.70	V BEND	105.660	103.26	
	0+057.80	SERVICE TEE	106.16	103.76	
	0+059.65	SERVICE TEE	106.17	103.77	
	0+075.60	SERVICE TEE	106.29	103.89	
	0+077.48	SERVICE TEE	106.31	103.91	
	0+116.16	VB	107.45	105.05	
E	0+121.89	TEE	107.43	105.03	
C	0+000.00	TEE	105.97	103.57	
	0+001.28	V BEND	105.99	103.59	
	0+001.78	V BEND *	106.00	103.83	
	0+004.30	V BEND *	106.04	103.83	
	0+004.80	V BEND	106.05	103.65	
	0+012.15	11 BEND	106.28	103.88	
	0+019.04	SERVICE TEE	106.42	104.02	
	0+020.89	SERVICE TEE	106.42	104.02	
	0+036.94	SERVICE TEE	106.31	103.91	
	0+038.74	SERVICE TEE	106.30	103.90	
	0+058.78	HYD TEE	106.47	104.07	
	0+061.54	SERVICE TEE	106.54	104.14	
	0+063.39	SERVICE TEE	106.59	104.19	
	0+079.40	SERVICE TEE	106.94	104.54	
	0+081.26	SERVICE TEE	106.94	104.54	
	0+098.35	SERVICE TEE	106.80	104.40	
	0+100.17	SERVICE TEE	106.79	104.39	
	0+116.14	SERVICE TEE	107.04	104.64	
	0+117.98	SERVICE TEE	107.09	104.69	
	0+126.02	45 BEND	107.19	104.79	
	0+129.04	HYD TEE	107.20	104.80	
	0+131.68	45 BEND	107.19	104.79	
	0+137.70	SERVICE TEE	107.07	104.67	
	0+139.50	SERVICE TEE	107.06	104.66	
	0+155.48	SERVICE TEE	107.38	104.98	
	0+157.29	SERVICE TEE	107.40	105.00	
E	0+162.50	TEE	107.43	105.03	
	0+175.58	SERVICE TEE	107.35	104.95	
	0+177.38	SERVICE TEE	107.34	104.94	
	0+193.37	SERVICE TEE	107.50	105.10	
	0+195.17	SERVICE TEE	107.57	105.17	
	0+206.95	VB	107.61	105.21	
	0+212.76	V BEND	107.55	105.15	
	0+213.26	V BEND *	107.57	105.44	
	0+215.64	V BEND *	107.64	105.44	
	0+216.14	V BEND	107.64	105.24	
F	0+218.95	TEE	107.56	105.16	

* INSULATE PER W22

Pipe Interference Table			
Crossing No.	PIPE 1	PIPE 2	Clearance
1	WM Bottom 103.40	STM Top 102.90	0.50
2	WM Bottom 102.97	SAN Top 101.92	1.05
3	WM Bottom 103.65	STM Top 103.15	0.50
4	WM Bottom 103.05	SAN Top 102.01	1.04
5	WM Bottom 103.61	STM Top 103.11	0.50
6	WM Bottom 103.63	SAN Top 102.19	1.45
7	WM Bottom 105.21	STM Top 104.72	0.50
8	WM Bottom 105.22	SAN Top 103.99	1.23
9	STM Bottom 102.73	SAN Top 101.93	0.79
10	STM Bottom 102.97	SAN Top 102.03	0.94



CLIENT

CLARIDGE HOMES

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Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc.

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2026:06:23
2		
3		
4		
5		

-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

SITE

CONSULTANTS

1:400

SEAL

LICENSED PROFESSIONAL ENGINEER
R. R. ROBINEAU
100611774
2026/06/23
PROVINCE OF ONTARIO

PRIME CONSULTANT

ARCADIS

333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT

CRT BLOCK 324

PROJECT NO: 30259740	
DRAWN BY: EH/MM	CHECKED BY: RR
PROJECT MGR: RM	APPROVED BY: RM

SHEET TITLE

SERVICING PLAN

SHEET NUMBER	ISSUE
C-001	1

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

File Location: C:\Users\hennie6006\DC\ACCDocs\Arcadis ACC USA\CA-30259740-CRT Ph1 Blk 324\Project Files\10_WIP\04_CIVIL\Sheets\C-001 SERVICING PLAN.dwg Last Saved: June 22, 2026 Plotted: June 22, 2026 10:37:46 AM by Hennie, Eric

SKETCH TO ILLUSTRATE EXISTING CONDITIONS ON

PUTNEY CRESCENT
CRT LANDS-PHASE 1
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed September 17, 2020

Scale 1 : 500

20 15 10 5 0 10 20 Metres

Metric

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Notes & Legend

Caution

This is NOT a Plan of Survey and shall not be used except for the purpose indicated in the title block.

BOUNDARY INFORMATION COMPILED FROM REGISTERED PLAN 4M-1619.

SITE AREA = 1.857 Ha

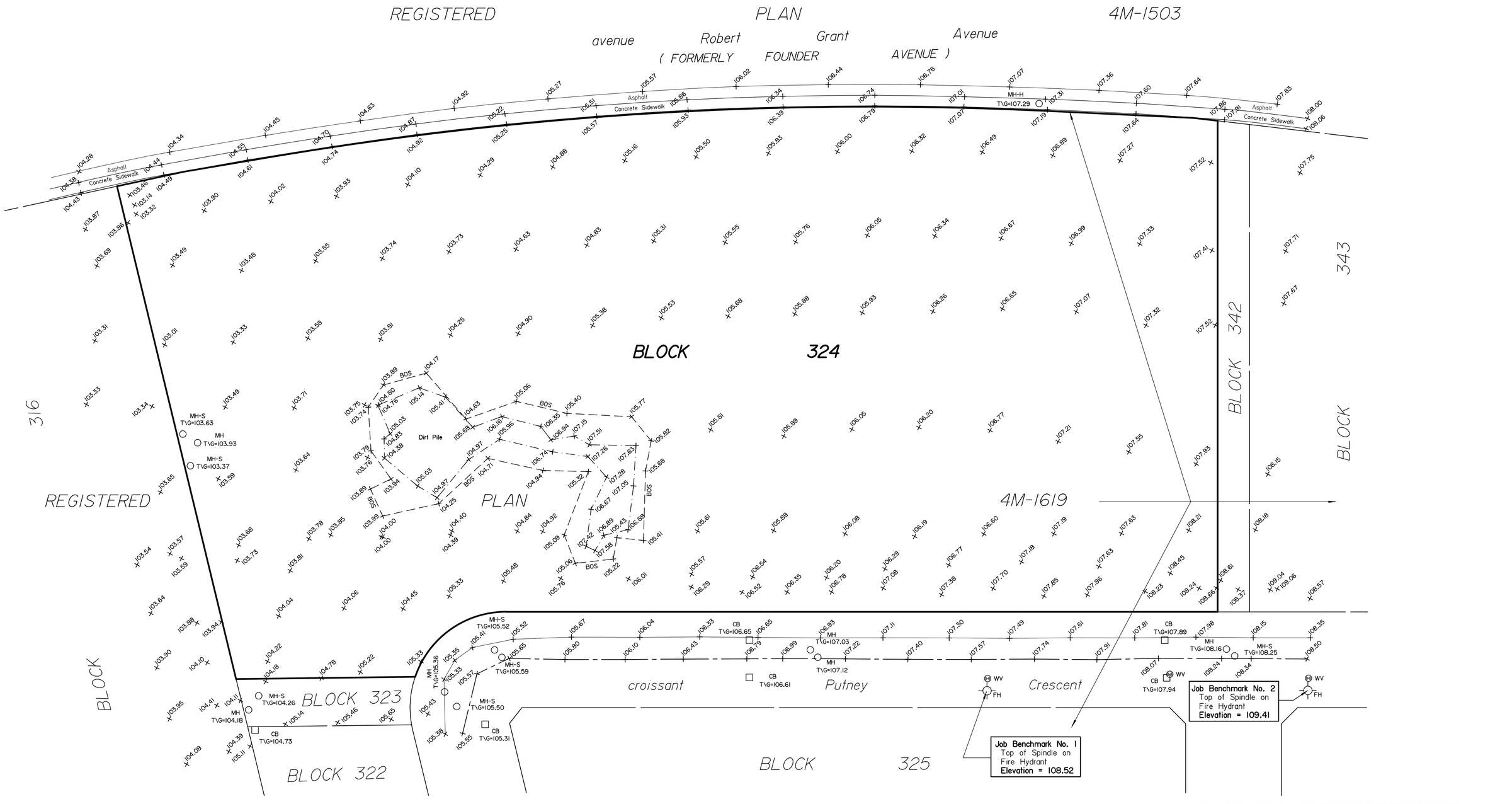
MH-ST	Denotes	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
MH-H	"	Maintenance Hole (Hydro)
MH-UI	"	Maintenance Hole (Unidentified)
	"	Catch Basin
FH	"	Fire Hydrant
WV	"	Water Valve
BOS	"	Bottom of Slope
TOS	"	Top of Slope
T/G	"	Top of Grade
+ 65.00	"	Location of Elevations
	"	Property Line

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.



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ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
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Ontario Land Surveyors

Job No. 22007-20 Claridge Blk 324 4M-1619 T F | N

\\AOVSERVER\Company\Active\2020\22007-20_Claridge_CRT Phase 2 Topo_TH\FINAL\22007-20 Claridge Blk 324 4M-1619 T F.dwg

File No.: PC2025-0240

October 22, 2025

Victoria St. Pierre
Claridge Homes (Westwood) Inc.
Via email: victoria.st.pierre@claridgehomes.com

Subject: Pre-Consultation: Meeting Feedback
Resubmission for Site Plan Control Application – 723 Putney Crescent

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on October 8, 2025.

Pre-Consultation Preliminary Assessment

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. For your next submission, please provide the revised submission to the file lead and planning support (Amanda Davidson and Kimberley Baldwin), copying planningcirculations@ottawa.ca.

2. In your subsequent application submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed is requested with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a revised application submission. Please refer to the SPIL for direction on which plans/studies must be updated for the next submission.

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

Consultation with Technical Agencies

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

Planning

Comments:

1. Within the Official Plan, the subject site is located within the Suburban Transect, designated Neighbourhood with an Evolving Neighbourhood Overlay, and abuts a Minor Corridor (Robert Grant) and Greenspace. The Official Plan directs that development within neighborhoods shall be low-rise, and predominantly ground-oriented.

    a. Pursuant to Schedule C2 of the Official Plan, the site is located approximately 120 meters south of a Protected Transportation Corridor.

    b. Robert Grant Avenue is identified as an arterial road pursuant to Schedule C4.

    c. The site is subject to Area Specific Policy 3 – Fernbank Community as per Annex 5. As a condition of site plan approval the City will require notification from the Trustee of the Fernbank Owners Group Inc confirming that the owner is party to the agreement and has paid its share of any costs pursuant to the agreements.

2. The site is subject to the Fernbank Community Design Plan, and is designated as Medium Density residential within the plan.

3. Section 4.8.2 of the Official Plan outlines the provisions pertaining to tree planting, including that development shall preserve and provide space for mature, healthy trees and accommodate space for tree planting. Please review opportunities to provide tree planting within the development, including between dwelling units and in common areas of the Planned Unit Development. Consider providing only the minimum driveway width to accommodate space between driveways for tree planting.

4. Staff have concerns with the visitor parking spaces proposed adjacent to Robert Grant Avenue. Consider whether visitor parking may be accommodated in a location internal to the PUD. Screening is encouraged. At a minimum, a landscape buffer must be provided pursuant to the zoning by-law requirements (see below for additional detail). Tree planting within this buffer is encouraged.

5. Please ensure snow storage is indicated for the private roads. If snow is to be removed from site, a note must be included on the site plan.

6. Consider whether mid-block or internal pedestrian connections or facilities may be provided, to improve the pedestrian connectivity within the site.

7. Please provide turning movement analysis. Further, please ensure the turnaround proposed at the northwest corner of the site (west end of Feltham Private) is able to accommodate turning movements for refuse collection, fire trucks, etc.

Zoning

8. The subject lands are zoned R4Z. Townhouse and Planned Unit Development are permitted uses in the R4Z zone. It is understood that the proposed planned unit development has been revised from back to back townhouses to row townhouses. Staff have no concerns with the proposed use it is permitted within the R4Z zone.

9. Section 110 requires a 3 meter landscape buffer for a parking lot abutting a street. This does not appear to be achieved with the current parking configuration along the east side of the property, adjacent to Robert Grant Avenue. Please revise.

    a. It is noted Section 102 states the following: “In the case of a townhouse dwelling or stacked dwelling, where each dwelling unit has a driveway accessing a garage or carport located on the same lot as that dwelling unit, and in the case of a planned unit development, where a dwelling unit has a driveway accessing its own garage or carport; no visitor parking is required for that dwelling unit. (By law 2012-334) (OMB Order, File #PL080959 issued June 1, 2010) (OMB Order #PL080959, issued November 5, 2008) (By-law 2016-249)”

    b. As per the above, visitor parking is not required if dwelling units have a driveway accessing their own garage or carport. If parking is desired, consider whether these spaces can be provided internal to the development. If the parking is to remain along Robert Grant, the 3 meter landscape buffer will apply.

10. It is understood that the proposed development consists of 3-storey townhouse dwellings. The maximum permitted height in the R4Z zone is 11 meters. Please review to confirm the proposed built form complies with Section 162.

Block 342 (Pathway)

11. The City requests that a further meeting be held concerning the construction of the municipal pathway within Block 342, as required under subdivision application D07-16-15-0022 and the agreement registered as OC2083825.

a. The City's preferred approach is that the detailed design for the Block 342 Pathway be provided through the resubmission for 723 Putney. The design drawings must include the proposed grading, utilities (if still applicable) and lighting of the walkway block ensuring that it ties into the neighbouring lands well.

b. A timeline for the walkway block construction is requested.

Required Applications

12. A recirculation/reactivation fee will apply to the D07-12-21-0022, upon receipt of the revised submission. A recirculation of the revised concept will be undertaken.

13. The Common Elements Condominium application D07-04-24-0010 will remain on hold until such time as D07-12-21-0022 is approved; however, a revised plan may be submitted and reviewed concurrently.

14. A Lifting of Part Lot Control application will be required following approval of D07-04-24-0010.

Feel free to contact Amanda Davidson, Planner, for follow up questions.

Urban Design

Comments:

15. Urban Design Guidelines for Greenfield Neighbourhoods apply and must be addressed in the site design.

16. Staff have concern about back lotting Putney Crescent, units should be reoriented.

17. Parking should be removed from the Robert Grant ROW frontage, where parking can't be avoided, it must be well screened with landscaping.

18. Ensure that the window street is separated from Robert Grant by a landscape strip

19. Ensure that "street trees" can be provided internal to the site. Locate services under driveways to ensure that landscaping can be provided.

20. Consider a 'sidewalk' connection on a private street to provide safe connection between Putney Cres and Robert Grant.

Feel free to contact Lisa Stern, Urban Design, for any follow-up questions.

Engineering

Stormwater Management

21. For the Stormwater Management Quality and Quantity Criteria for the subject site, please refer to the Design Brief CRT Lands – Phase 1 Fernbank Community Development (IBI Group, July 2017).

22. Please note that the northern end of the adjacent Block 343 (approximately 0.47 ha) is tributary to your site.

23. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

24. In separated areas, the pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

25. A calculated time of concentration (cannot be less than 10 minutes).

26. Storm sewer outlets should not be submerged.

27. When underground storage is used for stormwater, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that when using the modified rational method an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate. The consultant may also choose to model the stormwater flows using a dynamic stormwater model.

Water

28. A revised Water Boundary condition request must be submitted for the new proposal. The request shall include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

    a. Location of service

    b. Type of development

    c. The amount of fire flow required (per OBC or FUS).

    d. Average daily demand: ___ l/s.

e. Maximum daily demand: ___l/s.

f. Maximum hourly daily demand: ___ l/s.

29. Please note that two watermain connections separated by an isolation valve are required for this site to avoid the creation of a vulnerable service area.

30. Following an internal discussion with the City's Water Metering group, it was determined that two perimeter meters (one for each site connection to the local watermain on Putney Crescent) will be required.

31. Provide a watermain system analysis demonstrating adequate pressure as per section 4.2.2 of the Water Distribution Guidelines.

32. Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I table 1 – maximum flow to be considered from a given hydrant.

Sewer (sanitary and/or storm)

33. Following a title search on the property, we could not confirm that easements exist over the 900/975 mm storm sewer and 200/250 mm sanitary sewer crossing the property behind proposed townhome units 1-6 and 7-12, and over the existing sanitary and storm sewer stubs between proposed units 6 and 7. Through this site plan application, the City will need to collect easements over these sewers and stubs as per our sewer design guidelines 3.3.1.2. Please note that per this guideline, the minimum easement width considered adequate is 6.0 m plus 2.5 m for each additional utility rounding to the nearest meter, and 9.0 m for pipes deeper than 4 m. If these minimum requirements cannot be met due to the close proximity of the proposed townhome blocks, you will need to request for a deviation. As part of the deviation, the geotechnical and civil engineers would be required to confirm through a memo that the easements widths being proposed are wide enough to accommodate future maintenance, repairs or replacement works on these sewers and stubs without impacting the adjacent building foundations. This memo would be circulated to our sewer operations team for feedback/comments.

34. Refer to the Design Brief CRT Lands – Phase 1 Fernbank Community Development (IBI Group, July 2017) for the allocated sanitary flow for this parcel.

35. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

36. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

37. Connections to trunk sewers and easement sewers are typically not permitted.

38. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

39. Sewer connections to be made above the springline of the sewermain as per:

    a. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

    b. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,

    c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,

    d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

Additional Comments

40. Please note that a MECP ECA will be required for the common private storm sewer shared by 723 Putney and 585 Bobolink.

41. Please note that a Utility Circulation will be required as part of this site plan application to extend the utilities on Putney Crescent to your site. Additional details will be provided as we approach final approval.

42. The grading for this site will need to be coordinated with 585 Bobolink, since their major overland flow is directed to your property. Their design information can be requested through geoinformation@ottawa.ca.

43. In your design drawings, please ensure that the proposed retaining wall is at least 0.15 m away from the property line.

44. Please note that a JUMA and easements will be needed for the common elements (storm sewer) shared between 723 Putney and 585 Bobolink.

45. A site lighting certificate and photometric plan are required for this application.

46. Please note that the Phase I ESA will need to be updated in a letter format if the report was published more than 18 months ago. Please consult Section 28 of the O. Reg. 153/04 for additional requirements.

Feel free to contact Jean-Miguel Roy, Project Manager, for follow-up questions.

Transportation

Comments:

47. A TIA is not required for 80 units.

48. The proposed sidewalks should be continuous and depressed through the private approaches.

49. A road noise study is required.

Feel free to contact **Mike Giampa**, Transportation Project Manager, for follow-up questions.

Environment

Comments:

50. No comments.

51. The previous subdivision was supported by an EIS and does not need to be repeated.

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

Forestry

Comments:

52. A tree conservation report is not required

53. Landscape Plan – tree planting technical requirements

    a. Please ensure all retained trees are shown on the LP
    b. Minimum Setbacks
        i. Maintain 1.5m from sidewalk, MUP/cycle track, water service laterals.
        ii. Maintain 2.5m from curb.
        iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

b. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.

c. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

d. Tree specifications

    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

e. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.

f. No root barriers, dead-man anchor systems, or planters are permitted.

g. No tree stakes unless necessary

h. Hard surface planting

    i. If there are hard surface plantings, a planting detail must be provided.

    ii. Curb style planter is highly recommended.

    iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

    iv. Trees are to be planted at grade.

i. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

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

j. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

k. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

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

m. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf . The file can be sent to the Planning Forester or Planning File Lead.

Feel free to contact Mark Richadson, Planning Forester, for follow-up questions.

Parkland

Comments:

54. The parkland dedication associated with this block of land (Block 324 4M-1619) was taken at the time of subdivision application for the Claridge Westwood Subdivision D07-16-15-0012. The conditions applicable to parks as per the Fernbank Landowners Agreement have been fulfilled with the inclusion of three parks within the Westwood Subdivision identified as Cope Park, Dagenham Park and the Park within phase 4 of Westwood in Fernbank.

Feel free to contact Diane Emmerson, Parks Planner, for follow-up questions.

Other

55. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

    a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.

b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

56. Under the Affordable Housing Community Improvement Plan, a Tax Increment Equivalent Grant (TIEG) program was created to incentivize the development of affordable rental units. It provides a yearly fixed grant for 20 years. The grant helps offset the revenue loss housing providers experience when incorporating affordable units in their developments.

    a. To be eligible for the TIEG program you must meet the following criteria:

        i. the greater of five units OR 15 per cent of the total number of units within the development must be made affordable

        ii. provide a minimum of 15 per cent of each unit type in the development as affordable

        iii. enter into an agreement with the city to ensure the units maintain affordable for a minimum period of 20 years at or below the city-wide average market rent for the entire housing stock based on building form and unit type, as defined by the Canada Mortgage and Housing Corporation

        iv. must apply after a formal Site Plan Control submission, or Building Permit submission for projects not requiring Site Plan Control, and prior to Occupancy Permit issuance

    b. Please refer to the TIEG information *at Affordable housing community improvement plan / Plan d'améliorations communautaires pour le logement abordable for more details or contact the TIEG coordinator via email at affordablehousingcip@ottawa.ca.*

Submission Requirements and Fees

1. Recirculation
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) to be updated as part of a future application resubmission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,
Amanda Davidson

Encl. Study and Plan Identification List, List of Technical Agencies

c.c. Kimberley Baldwin, Planner, Development Review West
Jean-Miguel Roy, Project Manager – Infrastructure, Development Review West
Abi Dieme, Project Manager – Infrastructure, Development Review West
Mike Giampa, Transportation Project Manager
Lisa Stern, Urban Design
Diane Emmerson, Parks Planner
Matthew Hayley, Environmental Planner
Mark Richardson, Forester

Appendix B

Watermain Boundary Conditions

Water Demand Calculations

FUS Calculations

InfoWater Pro Water Model

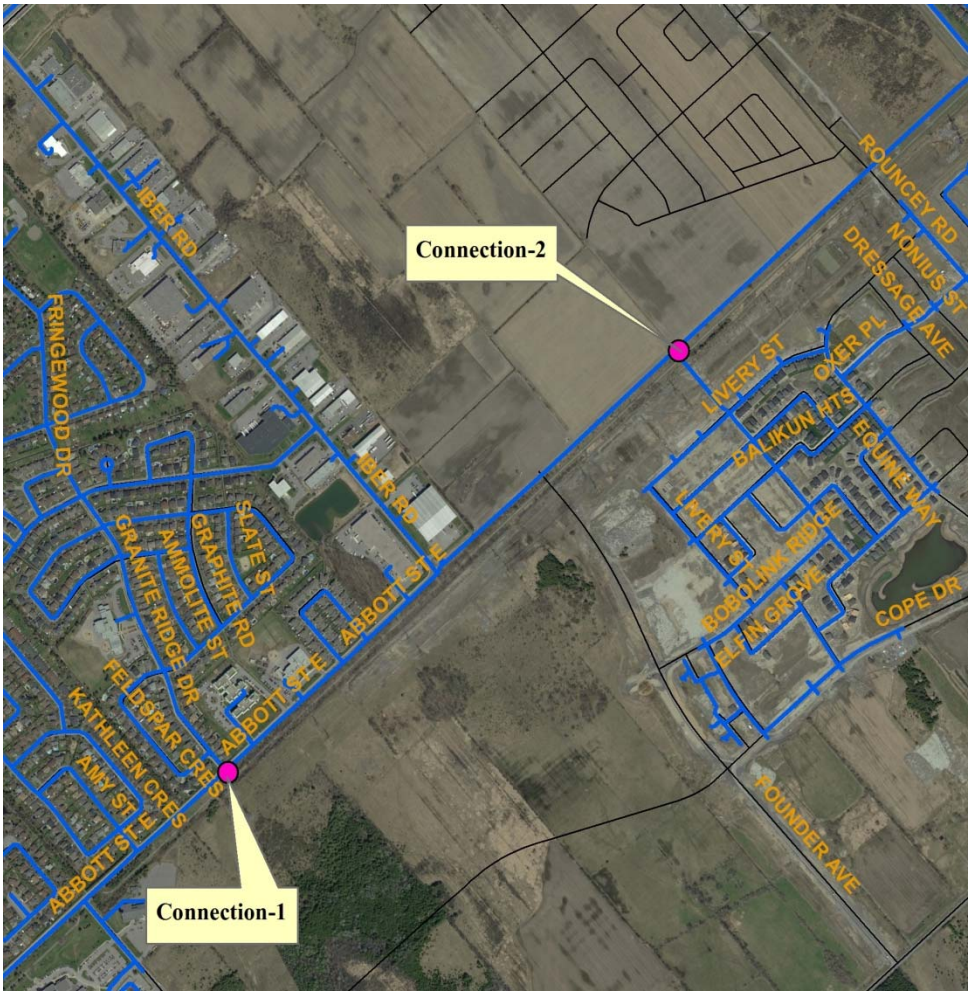
Boundary Conditions at CRT Lands

Information Provided:

Date provided: 16 Nov 2016

Criteria	Demand (L/s)
Average Demand	16.9
Maximum Daily Demand	36.9
Peak Hourly Demand	77.8
Fire Flow Demand	167
Fire Flow Demand	225
Maximum Daily + Fire Flow Demand	204 & 262

Location:



Results

Connection1:

Criteria	Head (m)	Pressure (psi)
Max HGL	161.1	75.8
PKHR	154.7	66.7
MXDY + Fire Flow (204 L/s)	152.8	64
MXDY + Fire Flow (262 L/s)	150.6	60.9

Connection2:

Criteria	Head (m)	Pressure (psi)
Max HGL	161.4	85.4
PKHR	154.8	76.0
MXDY + Fire Flow (204 L/s)	153	73.4
MXDY + Fire Flow (262 L/s)	150.9	70.5

Considerations

1. According to the City of Ottawa Water Design Guidelines as well as the Ontario Building Code, the maximum pressure at any point within a distribution system shall not exceed 80 psi in occupied areas. Measures should be taken to try to reduce the residual pressure below 80 psi without the use of special pressure control equipment. In circumstances where the residual pressure cannot be reduced below 80 psi without the use of pressure control equipment, a pressure reducing valve (**PRV**) should be installed at site.

Disclaimer

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

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

WATERMAIN DEMAND CALCULATION SHEET

CRT Block 324 - Putney Crescent | Claridge Homes
30259740 | Rev #0 | 2026-05-15
Prepared By: RRR | Checked By: RRR

NODE	RESIDENTIAL				NON-RESIDENTIAL (ICI)			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/S)
	SINGLE FAMILY UNITS	Townhouse UNITS	2 bedroom UNITS	POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
J10		24		65				0.21		0.21	0.53		0.53	1.16		1.16	133.33
J12		6		16				0.05		0.05	0.13		0.13	0.29		0.29	133.33
J14		36		97				0.32		0.32	0.79		0.79	1.73		1.73	133.33
J16		6		16				0.05		0.05	0.13		0.13	0.29		0.29	133.33
J18		12		32				0.11		0.11	0.26		0.26	0.58		0.58	133.33
J20		24		65				0.21		0.21	0.53		0.53	1.16		1.16	133.33
TOTAL		**108**		**291.60**						**0.95**			**2.36**			**5.20**	

ASSUMPTIONS

POPULATION DENSITY

Single Family	3.4 persons/unit
Townhouse	2.7 persons/unit
2 Bedroom Units	1.8 persons/unit

WATER DEMAND RATES

Residential	280 l/cap/day
Commercial Shopping Center	2,500 L/(1000m2)/day

PEAKING FACTORS

Maximum Daily		
	Residential	2.5 x avg. day
	Commercial	1.5 x avg. day
Maximum Hourly		
	Residential	2.2 x max. day
	Commercial	1.8 x max. day

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FIRE UNDERWRITERS SURVEY
CRT Block 324 -Putney Crescent | Clardige Homes
30259740 | Rev #0 | 2026-05-15
Prepared By: RRR | Checked By: RRR

STEP	Contents	Description		Adjustment Factor		Result	
1	**Building J**	1st Floor Area	419			419	m2
	(2-storey)	2nd Floor Area	419			419	m2
	Total Effective Floor Area	(Storage space exceeding 3m in height, floor area X 3)				**838**	m2
2	**Type of Construction**	**Type V** Wood Frame	1.5	Type V Wood Frame	1.5		
		Type III Ordinary Construction	1.0				
		Type II Noncombustible Construction	0.8				
		Type I Fire Resistive Construction	0.6				
3	**Required Fire Flow**	RFF = 220C√A, rounded to nearest 1000 L/min				**10000**	L/min
4	**Occupancy and Contents**	Noncombustible Contents	-25%	Limited Conbustible Contents	-15%	-1500	L/min
		Limited Conbustible Contents	-15%				
		Combustible Contents	0%				
		Free Burning Contents	15%				
		Rapid Burning Contents	25%				
	Fire Flow					**8500**	L/min
5	**Automatic Sprinkler Protection**	Automatic Sprinkler Conforming to NFPA 13	-30%	Yes	-30%	-2550	L/min
		Standard Water Supply for both the system and Fire Department Hose Lines	-10%	Yes	-10%	-850	L/min
		Fully Supervised System	-10%	No			
	Total Sprinkler Adjustment					**-3400**	L/min
6	**Exposure Adjustment**	Based on **Table 6** Exposure Adjustement Charges for Subject Building					
	North	Separation (m)	>30	With unprotected opening	0%	0	L/min
		Length X Height Factor (m.storeys)	64				
		Construction Type	Type V				
	South	Separation (m)	10	With unprotected opening	18%	1530	L/min
		Length X Height Factor (m.storeys)	64				
		Construction Type	Type V				
	East	Separation (m)	29	With unprotected opening	6%	510	L/min
		Length X Height Factor (m.storeys)	72				
		Construction Type	Type V				
	West	Separation (m)	11	With unprotected opening	13%	1105	L/min
		Length X Height Factor (m.storeys)	64				
		Construction Type	Type II				
	Total Exposure Adjustment					**3145**	L/min
7	**Total Required Fire Flow**					**8245**	L/min
		Rounded to Nearest 1000 L/min				**8000**	L/min
						133	L/s

Notes
1. Fire flow calculation are based on Fire Underwriters Survey version 2020.
2. If any vertical opening in the building are unprotected (e.g. interconnected floor spaces, elevators etc.), consider the two largest adjoining floor area plus 50% of all floors immediately above them up to a maximum of eight.

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

Robert Grant Ave

J16

J14

200 mm

J12

200 mm

200 mm

J18

J10

CONN01

J20

CONN02

Connection 1:
Putney Crescent

Connection 2:
Putney Crescent

Putney Crescent

Putney Cres

Putney Cres

Putney Cres

Putney Cres

Putney Cres

Putney Cres

Putney Cres

Siwash Pvt

Siwash Pvt

Siwash Pvt

Siwash Pvt

Rawash Pvt

Rawash Pvt

Clapham

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J10	0.21	105.45	161.11	545.42
2	☐	J12	0.05	105.70	161.11	542.97
3	☐	J14	0.32	105.97	161.11	540.33
4	☐	J16	0.05	106.05	161.11	539.54
5	☐	J18	0.11	107.43	161.11	526.02
6	☐	J20	0.21	107.56	161.11	524.75

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J10	0.53	105.45	152.80	463.99
2	☐	J12	0.13	105.70	152.80	461.54
3	☐	J14	0.79	105.97	152.80	458.89
4	☐	J16	0.13	106.05	152.80	458.11
5	☐	J18	0.26	107.43	152.80	444.59
6	☐	J20	0.53	107.56	152.80	443.32

Max Day Plus Fire Flow - Hydrant Flow Available

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Hydrant Available Flow (L/s)
1	☐	J12	0.13	461.54	152.80	133.33	433.85	493.06
2	☐	J14	0.79	458.89	152.80	133.33	414.66	384.98
3	☐	J18	0.26	444.59	152.80	133.33	416.42	474.54

		ID	Hydrant Pressure at Available Flow (kPa)
1	☐	J12	137.96
2	☐	J14	137.96
3	☐	J18	137.96

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J10	1.16	105.45	154.70	482.61
2	☐	J12	0.29	105.70	154.70	480.14
3	☐	J14	1.73	105.97	154.70	477.49
4	☐	J16	0.29	106.05	154.70	476.71
5	☐	J18	0.58	107.43	154.70	463.19
6	☐	J20	1.16	107.56	154.70	461.93

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	☐	P15	CONN01	J10	1.00	200.00	110.00	2.65	0.08	0.00	0.07	Open	0
2	☐	P17	J10	J12	52.96	200.00	110.00	1.49	0.05	0.00	0.03	Open	0
3	☐	P19	J12	J14	33.46	200.00	110.00	1.39	0.04	0.00	0.02	Open	0
4	☐	P21	J14	J16	3.20	200.00	110.00	0.29	0.01	0.00	0.00	Open	0
5	☐	P23	J14	J18	162.53	200.00	110.00	-0.63	0.02	0.00	0.01	Open	0
6	☐	P25	J18	J12	121.90	200.00	110.00	0.20	0.01	0.00	0.00	Open	0
7	☐	P27	J18	J20	56.44	200.00	110.00	-1.40	0.04	0.00	0.03	Open	0
8	☐	P29	CONN02	J20	1.00	200.00	110.00	2.56	0.08	0.00	0.07	Open	0

Appendix C

Sanitary Drainage Area Plan 30259740-C-400

Sanitary Design Sheet

CRT Phase 1 – Drainage Area Plan

CRT Phase 1 – Sanitary Sewer Design Sheet

LEGEND :

AREA NUMBER
POPULATION
AREA IN HECTARES

N

ROBERT GRANT AVE.

MH4A
MH5A
MH3A
MH2A
MH8A
MH9A
MH10A
MH7A
MH6A
MH1A

200mmØ
HEAVY DUTY ASPHALT
ASPHALT

BUILDING 'F' 12 UNITS
BUILDING 'E' 12 UNITS
BUILDING 'D' 12 UNITS
BUILDING 'C' 12 UNITS
BUILDING 'B' 12 UNITS
BUILDING 'A' 12 UNITS
BUILDING 'G' 12 UNITS
BUILDING 'H' 12 UNITS
BUILDING 'J' 12 UNITS
BUILDING 'K' 12 UNITS

S105A 0.17 32
S103A 0.22 49
S102A 0.27 46
S101A 0.49 97
S109A 0.06
S106A 0.35 32
S107A 0.29 65

COMMUNAL AMENITY

BLOCK 342
SIWASH PRIVATE
MULTI USE PATHWAY (MUP)
1.8m CONCRETE SIDEWALK
1.8m ASPHALT SIDEWALK

BLOCK 325
BLOCK 326
PUTNEY CRESCENT

DEPRESSED CURB AND SIDEWALK ENTRANCE AS PER CITY STANDARD SC7.1

REINSTATE TO MATCH EXISTING ASPHALT STRUCTURE PER CITY STANDARD R-10 (±68m²)

DEPRESSED CURB AND SIDEWALK ENTRANCE AS PER CITY STANDARD SC7.1

CLIENT

CLARIDGE HOMES

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formerly IBI Group Professional Services (Canada) Inc

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No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2026:05:26
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-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

1:400 0 4 12 20m

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
JR. (R.) ROBINEAU
100611774
2026/05/26
PROVINCE OF ONTARIO

PRIME CONSULTANT

ARCADIS
333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT
CRT BLOCK 324

PROJECT NO: 30259740
DRAWN BY: **EH/MM**
CHECKED BY: **RR**
PROJECT MGR: **RM**
APPROVED BY: **RM**

SHEET TITLE
SANITARY DRAINAGE AREA PLAN

SHEET NUMBER **C-400**
ISSUE **1**

SCALE CHECK 50mm 1 in

File Location: C:\Users\hennie6006\DCA\CCDocs\Arcadis ACC USA\CA-30259740-CRT Ph1 Blk 324\Project Files\10_WIP\04_CIVIL\Sheets\C-400 SANITARY DRAINAGE AREA PLAN.dwg Last Saved: May 22, 2026, by hennie6006 Plotted: May 26, 2026 10:50:49 AM by Hennie, Eric

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

SANITARY SEWER DESIGN SHEET

CRT Block 324 - Pulney Crescent
Claridge Homes
City of Ottawa

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN							
				AREA	UNIT TYPES				AREA	POPULATION		RES	PEAK	AREA (Ha)						INS+COM	PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	TH/SD	1 Bed APT	2 Bed APT	w/o Units (Ha)	IND	CUM	PEAK FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	PEAK FACTOR	FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	FLOW (L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
	S101A	MH1A	MH2A	0.49		36				97	97	3.60	1.13							1.00	0.00	0.49	0.5	0.16	0.00	0.0	1.30	24.19	73.27	200	0.50	0.746	22.90	94.65%
	S102A	MH2A	MH3A	0.27		18				49	146	3.56	1.68							1.00	0.00	0.27	0.8	0.25	0.00	0.0	1.93	24.19	62.61	200	0.50	0.746	22.26	92.02%
	S103A	MH3A	MH4A	0.22		18				49	194	3.52	2.22							1.00	0.00	0.22	1.0	0.32	0.00	0.0	2.54	24.19	58.26	200	0.50	0.746	21.65	89.49%
		MH4A	MH5A							0	194	3.52	2.22							1.00	0.00	0.00	1.0	0.32	0.00	0.0	2.54	24.19	8.31	200	0.50	0.746	21.65	89.49%
	S105A	MH5A	MH8A	0.17		12				32	227	3.50	2.57							1.00	0.00	0.17	1.2	0.38	0.00	0.0	2.95	24.19	39.75	200	0.50	0.746	21.24	87.79%
	S106A	MH6A	MH8A	0.35		12				32	32	3.68	0.39							1.00	0.00	0.35	0.4	0.12	0.00	0.0	0.50	24.19	79.83	200	0.50	0.746	23.69	97.92%
	S107A	MH7A	MH8A	0.29		24				65	65	3.63	0.76							1.00	0.00	0.29	0.3	0.10	0.00	0.0	0.86	24.19	39.82	200	0.50	0.746	23.34	96.45%
	S108A	MH8A	MH9A						0.06	4	328	3.45	3.66							1.00	0.00	0.06	1.9	0.61	0.00	0.0	4.28	24.19	27.22	200	0.50	0.746	19.92	82.32%
	S109A	MH9A	MH10A							0	328	3.45	3.66							1.00	0.00	0.00	1.9	0.61	0.00	0.0	4.28	24.19	7.99	200	0.50	0.746	19.92	82.32%
		MH10A	EX.SANMH																															

Design Parameters:

Residential			ICI Areas			
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day	
1 Bed	1.4	p/p/u	COM	28,000	L/Ha/day	
2 Bed	2.1	p/p/u	IND	35,000	L/Ha/day	MOE Chart
Other	60	p/p/Ha		17000	L/Ha/day	

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 200 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
   where K = 0.8 Correction Factor
5. Commercial and Institutional Peak Factors based on total area,
   1.5 if greater than 20%, otherwise 1.0 IND Peak per MOE = 2.40

Designed: ABC
Checked: DEF
Dwg. Reference: 123456-400

No.	Revision	Date
1.	Report Name (Master Servicing Study, Adequacy of Public Services, Servicing Brief, ect) - Submission No. 1	2022-XX-XX

File Reference: 123456-6.04.04
Date: 2022-XX-XX
Sheet No: 1 of 1

LEGEND :

AREA NUMBER
POPULATION
AREA IN HECTARES

N

ROBERT GRANT AVE.

MH4A
MH5A
MH3A
MH2A
MH8A
MH9A
MH10A
MH7A
MH6A
MH1A

200mmØ

CB09 T/G 105.75
CB03 T/G 106.10
HYD B/F 106.71
CB04 T/G 106.65
CB16 T/G 107.15
CB02 T/G 105.25
CB12 T/G 105.50
CB06 T/G 105.90
CB01 T/G 105.25
CB07 T/G 107.20
CB05 T/G 106.95

T/G 105.00 INV. 104.00
T/G 105.21 INV. 104.21
T/G 107.20 INV. 106.20
T/G 107.45 INV. 106.45
T/G 107.55 INV. 106.55
T/G 107.75 INV. 106.75
T/G 107.69 INV. 106.69
T/G 106.64 RY CB11
T/G 106.90 INV. 104.90
T/G 106.10 INV. 105.10
T/G 106.70 INV. 105.70
INV. 105.95 T/G 106.95
INV. 105.30 T/G 106.30

TP 5-21 104.91 (102.81)
TP 7-21 106.40 (105.50)
TP 6-21 105.73 (105.03)
TP 1-21 105.69 (103.49)
TP 2-21 104.55 (103.75)
TP 8-21 107.36 (105.71)

S103A 0.22 49
S102A 0.27 46
S101A 0.49 97
S105A 0.17 32
S109A 0.06
S106A 0.35 32
S107A 0.29 65

BUILDING 'E' 12 UNITS
BUILDING 'D' 12 UNITS
BUILDING 'C' 12 UNITS
BUILDING 'B' 12 UNITS
BUILDING 'F' 12 UNITS
BUILDING 'H' 12 UNITS
BUILDING 'J' 12 UNITS
BUILDING 'A' 12 UNITS
BUILDING 'G' 12 UNITS
BUILDING 'I' 12 UNITS

COMMUNAL AMENITY
HEAVY DUTY ASPHALT
MULTI USE PATHWAY (MUP)
BLOCK 342
SIWASH PRIVATE
1.8m CONCRETE SIDEWALK
1.8m ASPHALT SIDEWALK
BLOCK 323
BLOCK 325
PUTNEY CRESCENT

DEPRESSED CURB AND SIDEWALK ENTRANCE AS PER CITY STANDARD SC7.1

REINSTATE TO MATCH EXISTING ASPHALT STRUCTURE PER CITY STANDARD R-10 (±68m²)

DEPRESSED CURB AND SIDEWALK ENTRANCE AS PER CITY STANDARD SC7.1

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

CLIENT
CLARIDGE HOMES

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3		
4		
5		

-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
JR. RYAN ROBINEAU
100611774
2026/06/23
PROVINCE OF ONTARIO

PRIME CONSULTANT
ARCADIS
333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT
CRT BLOCK 324

PROJECT NO: 30259740	
DRAWN BY: **EH/MM**	CHECKED BY: **RR**
PROJECT MGR: **RM**	APPROVED BY: **RM**

SHEET TITLE
SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-400	1

SCALE CHECK 50mm 1 in

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IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: CRT DEVELOPMENT
LOCATION: CITY OF OTTAWA
CLIENT: CRT DEVELOPMENT INC.

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL FLOW	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK FACTOR	PEAK FLOW	AREA (Ha)						PEAK FLOW	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM		(L/s)	INSTITUTIONAL		COMMERCIAL		INDUSTRIAL		(L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
													IND	CUM	IND	CUM	IND	CUM												
PUTNEY CRESCENT	141A	141A	142A			1		0.06	2.5	2.5	4.00	0.04		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.06	24.19	9.07	200	0.50	0.746	24.14	99.76
PUTNEY CRESCENT	142A	142A	143A			11		0.35	27.5	30.0	4.00	0.49		0.00		0.00		0.00	0.00	0.35	0.41	0.11	0.60	47.16	55.56	200	1.90	1.454	46.56	98.73
PUTNEY CRESCENT	143A	143A	144A			17		0.49	42.5	72.5	4.00	1.17		0.00		0.00		0.00	0.00	0.49	0.90	0.25	1.43	41.91	64.86	200	1.50	1.292	40.48	96.60
FINSBURY AVENUE	136AA	136A	144A			21		0.65	52.5	52.5	4.00	0.85		0.00		0.00		0.00	0.00	0.65	0.65	0.18	1.03	53.56	110.44	200	2.45	1.652	52.52	98.07
PUTNEY CRESCENT	144A	144A	145A			10		0.36	25.0	150.0	4.00	2.43		0.00		0.00		0.00	0.00	0.36	1.91	0.53	2.97	32.46	80.25	200	0.90	1.001	29.50	90.86
CLAPHAM TERRACE	136AB	136A	137A			10		0.37	25.0	25.0	4.00	0.41		0.00		0.00		0.00	0.00	0.37	0.37	0.10	0.51	24.19	78.00	200	0.50	0.746	23.69	97.90
BRIXTON WAY	137AA	137A	160A			12		0.35	30.0	55.0	4.00	0.89		0.00		0.00		0.00	0.00	0.35	0.72	0.20	1.09	41.91	50.77	200	1.50	1.292	40.81	97.39
BRIXTON WAY	160A	160A	145A			18		0.54	45.0	100.0	4.00	1.62		0.00		0.00		0.00	0.00	0.54	1.26	0.35	1.97	52.45	78.53	200	2.35	1.617	50.48	96.24
PUTNEY CRESCENT	145A	145A	146A			11		0.34	27.5	277.5	4.00	4.50		0.00		0.00		0.00	0.00	0.34	3.51	0.98	5.48	39.76	70.87	200	1.35	1.226	34.28	86.22
CLAPHAM WAY	137AB	137A	138A			9		0.38	22.5	22.5	4.00	0.36		0.00		0.00		0.00	0.00	0.38	0.38	0.11	0.47	37.48	78.00	200	1.20	1.156	37.01	98.74
PUTNEY CRESCENT	138A	138A	148A			10		0.35	25.0	47.5	4.00	0.77		0.00		0.00		0.00	0.00	0.35	0.73	0.20	0.97	40.49	77.95	200	1.40	1.248	39.51	97.59
PUTNEY CRESCENT	148A	148A	147A			7		0.26	17.5	65.0	4.00	1.05		0.00		0.00		0.00	0.00	0.26	0.99	0.28	1.33	55.70	59.50	200	2.65	1.718	54.37	97.61
PUTNEY CRESCENT	147A	147A	146A			0		0.03	0.0	65.0	4.00	1.05		0.00		0.00		0.00	0.00	0.03	1.02	0.29	1.34	55.70	12.47	200	2.65	1.718	54.36	97.60
BLOCK 323	146A	146A	161A			0		0.03	0.0	342.5	4.00	5.55		0.00		0.00		0.00	0.00	0.03	4.56	1.28	6.83	28.63	38.97	200	0.70	0.883	21.80	76.15
BLOCK 316	HYD. 2	161A	*Ex.209*			0		5.12	0.0	342.5	4.00	5.55		0.00		0.00		0.00	0.00	5.12	9.68	2.71	8.26	28.63	53.67	200	0.70	0.883	20.37	71.15
BLOCK 324	RES.1	BULKHEAD	*Ex.209*					1.89	170.1	170.1	4.00	2.76		0.00		0.00		0.00	0.00	1.89	1.89	0.53	3.29	43.87	8.00	250	0.50	0.866	40.58	92.51
				Refer to ECA No. 9079-9LNNZC dated July 9, 2014 for description of existing sewers.																											

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.3	p/p/u				
TH/SD	2.5	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000	L/Ha/day	1.5
Low	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
Med	75	p/p/Ha				
High	90	p/p/Ha				

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

Designed: J.I.M.

Checked: P.K.

Dwg. Reference: 27970 - 501, 501A, 501B

No.	Revision	Date
1.	Submission No. 1 to City of Ottawa	2013-08-29
2.	Submission No. 2 to City of Ottawa	2014-01-22
3.	Submission No. 3 to City of Ottawa	2014-08-22
4.	Submission No. 4 to City of Ottawa	2015-06-15
5.	Submission No. 5 to City of Ottawa	2016-11-10
6.	Submission for MOE Approval	2017-02-10
7.	Resubmission for MOE Approval	2017-07-14

File Reference:	Date:	Sheet No:
27970.5.7.1	2017-07-14	1 of 4

Appendix D

Storm Drainage Area Plan 30259740-C-500

Storm Design Sheet

CRT Phase 1 – Storm Drainage Area Plan

CRT Phase 1 - Storm Sewer Design Sheet

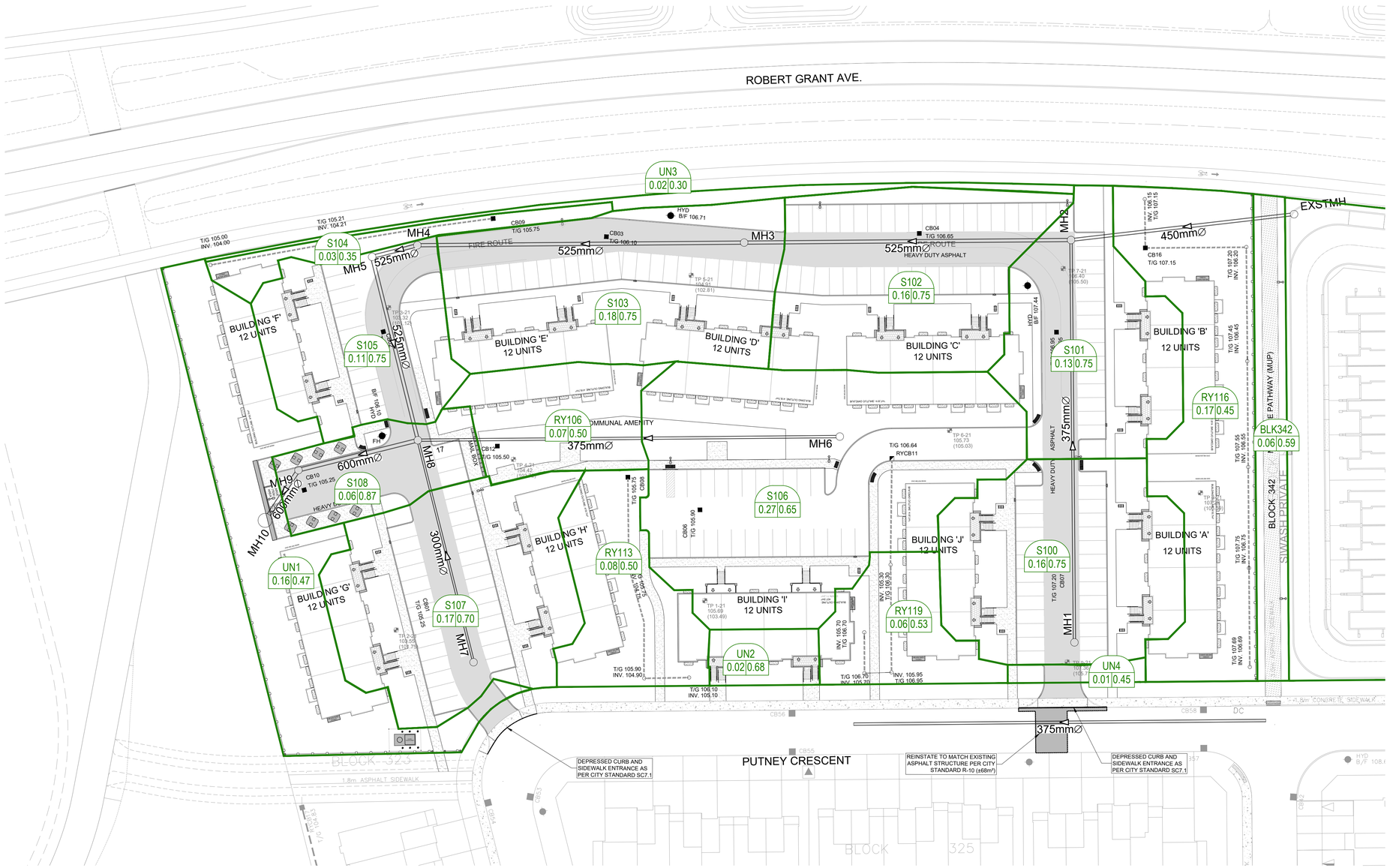
CRT Phase 1 – SWM Excerpt

Storm Water Management Calculations

Overflow Depth Calculations

Ponding Plan 30259740-C-600

ADS Tank Sizing Report



CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

CLIENT

CLARIDGE HOMES

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Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc

ISSUES

No.	DESCRIPTION	DATE
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3		
4		
5		

-SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
-SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

1:400 0 4 12 20m

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
JR. (Ryan) ROBINEAU
100611774
2026/06/23
PROVINCE OF ONTARIO

PRIME CONSULTANT
ARCADIS
333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT
CRT BLOCK 324

PROJECT NO: 30259740

DRAWN BY:	CHECKED BY:
EH/MM	**RR**
PROJECT MGR:	APPROVED BY:
RM	**RM**

SHEET TITLE
STORM DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-500	1

SCALE CHECK 50mm 1 in

File Location: C:\Users\hennie6906\DCA\CCDocs\Arcadis ACC US\ACA-30259740-CRT Ph1 Blk 324\Project Files\10_WIP\04_CIVIL\Sheets\C-500 STORM DRAINAGE AREA PLAN.dwg Last Saved: June 22, 2026, by hennie6906 Plotted: June 22, 2026 10:38:05 AM by Hennie, Eric

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.
500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

OVERFLOW DEPTH CALCULATIONS

CRT - Block 342 - Putney Crescent | Claridge Homes
30259740 | Rev #1 | 2026-05-20
Prepared By: RRR | Checked By: RRR

Overflow Area S100 (CB07)

New Flow Section Required 1:100 year flow =			**13.47**	l/s	or	**0.013**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**24.77**	l/s	or	**0.025**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**24.00**	m	Side Slope 1 =	**1.00**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**107.40**	m	Side Slope 2 =	**3.00**	%						
Down Stream Ground Elev =	**106.95**	m	Bottom Width =	**0.00**	m				100 Year Q =	**0.014**	Cu M/sec
Difference =	0.45	m		100 Year		100 Year + 20%			100 Year Velocity =	0.21	M/s
Ditch Slope =	1.88	%	Water depth =	**0.031**	m	**0.040**	m				
			X-Sect. Area =	0.06	m^2	0.11	m^2		100 Y +20% Q =	**0.027**	Cu M/sec
			Wetted Per. =	4.13	m	5.33	m		100 Y + 20% Velocity =	0.25	M/s

Overflow Area RY116/BLK342 (CB16)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**1.99**	l/s	or	**0.002**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**10.70**	m	Side Slope 1 =	**0.20**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**107.43**	m	Side Slope 2 =	**1.40**	%						
Down Stream Ground Elev =	**106.95**	m	Bottom Width =	**18.00**	m				100 Year Q =		Cu M/sec
Difference =	0.48	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.70	%	Water depth =	**0.000**	m	**0.005**	m				
			X-Sect. Area =	0.00	m^2	0.10	m^2		100 Y +20% Q =	**0.009**	Cu M/sec
			Wetted Per. =	0.00	m	20.86	m		100 Y + 20% Velocity =	0.09	M/s

Overflow Area S101 (CB05)

New Flow Section Required 1:100 year flow =			**19.5**	l/s	or	**0.020**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**48.03**	l/s	or	**0.048**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**37.00**	m	Side Slope 1 =	**2.64**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**107.15**	m	Side Slope 2 =	**0.60**	%						
Down Stream Ground Elev =	**106.65**	m	Bottom Width =	**0.00**	m				100 Year Q =	**0.021**	Cu M/sec
Difference =	0.50	m		100 Year		100 Year + 20%			100 Year Velocity =	0.21	M/s
Ditch Slope =	1.35	%	Water depth =	**0.031**	m	**0.046**	m				
			X-Sect. Area =	0.10	m^2	0.22	m^2		100 Y +20% Q =	**0.051**	Cu M/sec
			Wetted Per. =	6.34	m	9.41	m		100 Y + 20% Velocity =	0.23	M/s

Overflow Area S102(CB04)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**31.48**	l/s	or	**0.031**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**58.83**	m	Side Slope 1 =	**0.10**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.90**	m	Side Slope 2 =	**0.10**	%						
Down Stream Ground Elev =	**106.10**	m	Bottom Width =	**18.00**	m				100 Year Q =		Cu M/sec
Difference =	0.80	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.34	%	Water depth =	**0.010**	m	**0.012**	m				
			X-Sect. Area =	0.28	m^2	0.36	m^2		100 Y +20% Q =	**0.044**	Cu M/sec
			Wetted Per. =	38.00	m	42.00	m		100 Y + 20% Velocity =	0.12	M/s

Overflow Area S103(CB03)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**17.76**	l/s	or	**0.018**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**20.55**	m	Side Slope 1 =	**1.50**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.40**	m	Side Slope 2 =	**0.02**	%						
Down Stream Ground Elev =	**105.70**	m	Bottom Width =	**6.82**	m				100 Year Q =		Cu M/sec
Difference =	0.70	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	3.60	%	Water depth =	**0.000**	m	**0.007**	m				
			X-Sect. Area =	0.00	m^2	0.17	m^2		100 Y +20% Q =	**0.021**	Cu M/sec
			Wetted Per. =	6.82	m	42.29	m		100 Y + 20% Velocity =	0.12	M/s

Overflow Area S105 (CB02)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**17.19**	l/s	or	**0.017**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**30.00**	m	Side Slope 1 =	**1.60**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.45**	m	Side Slope 2 =	**1.80**	%						
Down Stream Ground Elev =	**105.90**	m	Bottom Width =	**23.00**	m				100 Year Q =		Cu M/sec
Difference =	0.55	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.50	%	Water depth =	**0.000**	m	**0.010**	m				
			X-Sect. Area =	0.00	m^2	0.24	m^2		100 Y +20% Q =	**0.033**	Cu M/sec
			Wetted Per. =	23.00	m	24.18	m		100 Y + 20% Velocity =	0.14	M/s

Overflow Area RY119(RYCB11)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**1.58**	l/s	or	**0.002**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**10.30**	m	Side Slope 1 =	**1.00**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.09**	m	Side Slope 2 =	**1.00**	%						
Down Stream Ground Elev =	**105.90**	m	Bottom Width =	**0.00**	m				100 Year Q =		Cu M/sec
Difference =	0.19	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.84	%	Water depth =	**0.000**	m	**0.023**	m				
			X-Sect. Area =	0.00	m^2	0.05	m^2		100 Y +20% Q =	**0.009**	Cu M/sec
			Wetted Per. =	10.00	m	4.60	m		100 Y + 20% Velocity =	0.17	M/s

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OVERFLOW DEPTH CALCULATIONS

CRT - Block 342 - Putney Crescent | Claridge Homes
30259740 | Rev #1 | 2026-05-20
Prepared By: RRR | Checked By: RRR

Overflow Area S106 (CB06)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**8.4**	l/s	or	**0.008**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**10.30**	m	Side Slope 1 =	**1.00**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.09**	m	Side Slope 2 =	**1.00**	%						
Down Stream Ground Elev =	**105.90**	m	Bottom Width =	**0.00**	m				100 Year Q =		Cu M/sec
Difference =	0.19	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.84	%	Water depth =	**0.000**	m	**0.023**	m				
			X-Sect. Area =	0.00	m^2	0.05	m^2		100 Y +20% Q =	**0.009**	Cu M/sec
			Wetted Per. =	10.00	m	4.60	m		100 Y + 20% Velocity =	0.17	M/s

Overflow Area RY113 (CB08)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**6.09**	l/s	or	**0.006**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**9.20**	m	Side Slope 1 =	**25.00**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**106.15**	m	Side Slope 2 =	**0.98**	%						
Down Stream Ground Elev =	**105.25**	m	Bottom Width =	**0.00**	m				100 Year Q =		Cu M/sec
Difference =	0.90	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	3.00	%	Water depth =	**0.000**	m	**0.035**	m				
			X-Sect. Area =	0.00	m^2	0.06	m^2		100 Y +20% Q =	**0.007**	Cu M/sec
			Wetted Per. =	0.00	m	15.00	m		100 Y + 20% Velocity =	0.12	M/s

Overflow Area RY106 (CB12)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**9.19**	l/s	or	**0.009**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**30.00**	m	Side Slope 1 =	**1.50**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**107.40**	m	Side Slope 2 =	**0.50**	%						
Down Stream Ground Elev =	**106.95**	m	Bottom Width =	**11.65**	m				100 Year Q =		Cu M/sec
Difference =	0.45	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.70	%	Water depth =	**0.000**	m	**0.007**	m				
			X-Sect. Area =	0.00	m^2	0.09	m^2		100 Y +20% Q =	**0.010**	Cu M/sec
			Wetted Per. =	11.65	m	13.52	m		100 Y + 20% Velocity =	0.11	M/s

Overflow Area S107 (CB01)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**9.33**	l/s	or	**0.009**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**25.00**	m	Side Slope 1 =	**0.50**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**105.50**	m	Side Slope 2 =	**2.30**	%						
Down Stream Ground Elev =	**105.25**	m	Bottom Width =	**0.00**	m				100 Year Q =		Cu M/sec
Difference =	0.25	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	1.70	%	Water depth =	**0.000**	m	**0.024**	m				
			X-Sect. Area =	0.00	m^2	0.07	m^2		100 Y +20% Q =	**0.012**	Cu M/sec
			Wetted Per. =	0.00	m	5.84	m		100 Y + 20% Velocity =	0.17	M/s

Overflow Area S108 (CB10)

New Flow Section Required 1:100 year flow =			**0**	l/s	or	**0.000**	Cu m/sec				
New Flow Section Required 1:100 year + 20% flow			**35.29**	l/s	or	**0.035**	Cu m/sec				
Overflow Slope			Overflow X-Section						Overflow Capacity - Q		
Length =	**6.58**	m	Side Slope 1 =	**0.50**	%				From Seelye n =	0.040	(Channels)
Up Stream Ground Elev =	**105.50**	m	Side Slope 2 =	**2.30**	%						
Down Stream Ground Elev =	**105.25**	m	Bottom Width =	**9.00**	m				100 Year Q =		Cu M/sec
Difference =	0.25	m		100 Year		100 Year + 20%			100 Year Velocity =		M/s
Ditch Slope =	3.79	%	Water depth =	**0.000**	m	**0.015**	m				
			X-Sect. Area =	0.00	m^2	0.16	m^2		100 Y +20% Q =	**0.043**	Cu M/sec
			Wetted Per. =	9.00	m	12.65	m		100 Y + 20% Velocity =	0.27	M/s

Q = A*(1.0/n)*R^2/3*S^1/2

where:

A = cross sectional area in Sq. m
n = friction coefficient
R = hydraulic radius = A/wetted perimetre (wp) in m

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STORM SEWER DESIGN SHEET

CRT Block 324 - Putney Crescent
Claridge Homes
City of Ottawa

LOCATION				AREA (Ha)											RATIONAL DESIGN FLOW													FIXED FLOW		DESIGN	SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.35	C= 0.45	C= 0.50	C= 0.53	C= 0.59	C= 0.65	C= 0.70	C= 0.75	C= 0.80	C= 0.87	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	IND	CUM	FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
	S100, S101, RY116,BLK342	MH1	MH2		0.16			0.06			0.30			0.92	0.92	10.00	1.12	11.12	76.81	104.19	122.14	178.56		96.28			0.00	0.00	96.28	129.34	76.18	375			0.50	1.134	33.06	25.56%
	RES.2	EXSTMH	MH2									0.58		1.29	1.29	11.12	0.39	11.51	72.76	98.63	115.59	168.94		127.23			1.00	1.00	127.23	297.43	42.51	450			1.00	1.812	170.21	57.23%
	S102	MH2	MH3								0.15			0.31	2.53	11.51	0.73	12.24	71.45	96.84	113.48	165.84		244.69			2.00	3.00	244.69	317.25	61.86	525			0.50	1.420	72.56	22.87%
	S103, S104	MH3	MH4	0.03				0.17						0.31	2.83	12.24	0.73	12.96	69.17	93.70	109.78	160.41		265.34			3.00	6.00	265.34	317.25	61.86	525			0.50	1.420	51.91	16.36%
		MH4	MH5											0.00	2.83	12.96	0.10	13.07	67.04	90.77	106.34	155.36		257.06			4.00	10.00	257.06	317.25	8.85	525			0.50	1.420	60.19	18.97%
	S105	MH5	MH8								0.11			0.23	3.06	13.07	0.40	13.47	66.74	90.37	105.87	154.66		276.65			5.00	15.00	276.65	332.73	35.77	525			0.55	1.489	56.08	16.86%
	S106, RY106, RY113, RY119,	MH6	MH8			0.08			0.16			0.21		0.87	0.87	10.00	1.17	11.17	76.81	104.19	122.14	178.56		90.37			6.00	21.00	90.37	129.34	79.87	375			0.50	1.134	38.96	30.13%
	S107	MH7	MH8							0.18				0.35	0.35	10.00	0.74	10.74	76.81	104.19	122.14	178.56		36.50			7.00	28.00	36.50	71.33	43.33	300			0.50	0.978	34.84	48.84%
		MH8	MH9											0.00	4.28	13.47	0.23	13.70	65.64	88.86	104.09	152.05		380.22			8.00	36.00	380.22	620.09	23.30	675			0.50	1.679	239.86	38.68%
	S108	MH9	MH10										0.05	0.12	4.40	13.70	0.11	13.81	65.02	88.01	103.09	150.59		387.24			9.00	45.00	387.24	620.09	11.42	675			0.50	1.679	232.85	37.55%
		MH10	*EXSTMH2*																											*731.45*		*900*			*0.15*	*1.114*		
																																0						

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 = 732.951 / (TC+6.199)^0.810] 2 YEAR
[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: RRR
Checked: RRR
Dwg. Reference: 3025974-500

No.	Revision	Date
1.	Issued for Site Plan Approval	2026-05-22

File Reference: 30259740.00
Date: 2026-05-22
Sheet No: 1 of 1

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arcadis.com

STORM SEWER DESIGN SHEET

CRT Block 324 - Putney Crescent
Claridge Homes
City of Ottawa

LOCATION				AREA (Ha)											RATIONAL DESIGN FLOW												FIXED FLOW		DESIGN	SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.35	C= 0.45	C= 0.50	C= 0.53	C= 0.59	C= 0.65	C= 0.70	C= 0.75	C= 0.80	C= 0.87	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	IND	CUM	FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
	S100, S101, RY116,BLK342	MH1	MH2		0.16			0.06			0.30			0.92	0.92	10.00	1.12	11.12	76.81	104.19	122.14	178.56		96.28			0.00	0.00	96.28	129.34	76.18	375			0.50	1.134	33.06	25.56%
	RES.2	EXSTMH	MH2									0.58		1.29	1.29	11.12	0.39	11.51	72.76	98.63	115.59	168.94		127.23			1.00	1.00	127.23	297.43	42.51	450			1.00	1.812	170.21	57.23%
	S102	MH2	MH3								0.16			0.33	2.55	11.51	0.73	12.24	71.45	96.84	113.48	165.84		246.71			2.00	3.00	246.71	317.25	61.86	525			0.50	1.420	70.54	22.24%
	S103, S104	MH3	MH4	0.03							0.18			0.40	2.95	12.24	0.61	12.85	69.17	93.70	109.78	160.41		276.33			3.00	6.00	276.33	375.37	61.86	525			0.70	1.680	99.04	26.39%
		MH4	MH5											0.00	2.95	12.85	0.09	12.94	67.36	91.21	106.86	156.12		269.00			4.00	10.00	269.00	375.37	8.85	525			0.70	1.680	106.37	28.34%
	S105	MH5	MH8								0.11			0.23	3.18	12.94	0.35	13.29	67.11	90.87	106.46	155.52		288.83			5.00	15.00	288.83	375.37	35.77	525			0.70	1.680	86.54	23.05%
	S106, RY106, RY113, RY119,	MH6	MH8			0.15	0.06		0.27					0.78	0.78	10.00	1.17	11.17	76.81	104.19	122.14	178.56		81.77			6.00	21.00	81.77	129.34	79.87	375			0.50	1.134	47.57	36.78%
	S107	MH7	MH8							0.17				0.33	0.33	10.00	0.74	10.74	76.81	104.19	122.14	178.56		34.47			7.00	28.00	34.47	71.33	43.33	300			0.50	0.978	36.87	51.68%
		MH8	MH9											0.00	4.29	13.29	0.23	13.52	66.11	89.51	104.86	153.17		384.37			8.00	36.00	384.37	620.09	23.30	675			0.50	1.679	235.71	38.01%
	S108	MH9	MH10										0.06	0.15	4.44	13.52	0.11	13.64	65.49	88.65	103.84	151.69		393.54			9.00	45.00	393.54	620.09	11.42	675			0.50	1.679	226.55	36.54%
		MH10	*EXSTMH2*																											*731.45*		*900*			*0.15*	*1.114*		

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
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[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: RRR
Checked: RRR
Dwg. Reference: 3025974-500

No.	Revision	Date
1.	Issued for Site Plan Approval	2026-05-22

File Reference: 30259740.00
Date: 2026-05-22
Sheet No: 1 of 1

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STORM SEWER DESIGN SHEET

CRT Block 324 - Putney Crescent
Claridge Homes
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LOCATION				AREA (Ha)											RATIONAL DESIGN FLOW												FIXED FLOW		DESIGN	SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.35	C= 0.45	C= 0.50	C= 0.53	C= 0.59	C= 0.65	C= 0.70	C= 0.75	C= 0.80	C= 0.87	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	IND	CUM	FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
	S100, S101, RY116,BLK342	MH1	MH2		0.16			0.06			0.30			0.92	0.92	10.00	1.12	11.12	76.81	104.19	122.14	178.56		96.28			0.00	0.00	96.28	129.34	76.18	375			0.50	1.134	33.06	25.56%
	RES.2	EXSTMH	MH2									0.58		1.29	1.29	11.12	0.39	11.51	72.76	98.63	115.59	168.94		127.23			1.00	1.00	127.23	297.43	42.51	450			1.00	1.812	170.21	57.23%
	S102	MH2	MH3								0.16			0.33	2.55	11.51	0.73	12.24	71.45	96.84	113.48	165.84		246.71			2.00	3.00	246.71	317.25	61.86	525			0.50	1.420	70.54	22.24%
	S103, S104	MH3	MH4	0.03							0.18			0.40	2.95	12.24	0.61	12.85	69.17	93.70	109.78	160.41		276.33			3.00	6.00	276.33	375.37	61.86	525			0.70	1.680	99.04	26.39%
		MH4	MH5											0.00	2.95	12.85	0.09	12.94	67.36	91.21	106.86	156.12		269.00			4.00	10.00	269.00	375.37	8.85	525			0.70	1.680	106.37	28.34%
	S105	MH5	MH8								0.11			0.23	3.18	12.94	0.35	13.29	67.11	90.87	106.46	155.52		288.83			5.00	15.00	288.83	375.37	35.77	525			0.70	1.680	86.54	23.05%
	S106, RY106, RY113, RY119,	MH6	MH8			0.15	0.06		0.27					0.78	0.78	10.00	1.17	11.17	76.81	104.19	122.14	178.56		81.77			6.00	21.00	81.77	129.34	79.87	375			0.50	1.134	47.57	36.78%
	S107	MH7	MH8							0.17				0.33	0.33	10.00	0.74	10.74	76.81	104.19	122.14	178.56		34.47			7.00	28.00	34.47	71.33	43.33	300			0.50	0.978	36.87	51.68%
		MH8	MH9											0.00	4.29	13.29	0.23	13.52	66.11	89.51	104.86	153.17		384.37			8.00	36.00	384.37	620.09	23.30	675			0.50	1.679	235.71	38.01%
	S108	MH9	MH10										0.06	0.15	4.44	13.52	0.11	13.64	65.49	88.65	103.84	151.69		393.54			9.00	45.00	393.54	620.09	11.42	675			0.50	1.679	226.55	36.54%
		MH10	*EXSTMH2*																											*731.45*		*900*			*0.15*	*1.114*		
																																0						

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 = 732.951 / (TC+6.199)^0.810] 2 YEAR
[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: RRR
Checked: RRR
Dwg. Reference: 3025974-500

No.	Revision	Date
1.	Issued for Site Plan Approval	2026-05-22

File Reference: 30259740.00
Date: 2026-05-22
Sheet No: 1 of 1

AREA ID	AREA (HA)	MH	D/S SEGMENT	IMP RATIO	LENGTH (M)	WIDTH (M)	AVAIL. STORAGE (CU-M)	5 YEAR SIMULATED FLOW (L/S) *07-PH1-5CH.OUT & 07-PH1A-5CH.OUT*	ICD RESTRICTION (L/S)
R103A	0.34	MH103	R104A	0.50	77	154	N/A	45.14	45.14
S103	0.34	MH103	S104	0.79	81	162	55.49	69	77.01(4)
R104A	0.23	MH104	S105A	0.50	57	114	N/A	30.73	30.73
S104	0.30	MH104	S105A	0.79	80	160	11.06	61	68.60(4)
R122	0.07	MH122	R121	0.50	35	35	N/A	9.36	9.36
R121	0.13	MH121	R105	0.50	60	60	N/A	17.27	17.27
R105	0.13	MH105	S105A	0.50	65	65	N/A	17.37	17.37
S105A	0.4	MH105	S105B	0.79	65	65	16	72	110.18(4)
S105B	0.51	MH105	S107	0.79	70	70	15.71	89	129.60(4)
S107	0.61	MH107	S109	0.79	80	80	29.42	106	141.24(3)
S109	0.52	MH109	EXT110	0.79	79	79	4.18	92	103.19(4)
S170B	0.06	MH170	EXT110	0.79	40	40	0.3(6)	13	13.99(4)
EXT110	0.47	MH110	PH1OVF	0.79	53	106	9.6	88	98.49(4)
Phase 1A Minor system tributary to Pond 6									
R142B	0.19	MH142	R143	0.50	75	150	N/A	26.13	26.13
R136A	0.27	MH136	S136E	0.50	128	256	N/A	37.39	37.39
S143	0.32	MH143	S136E	0.79	93	186	N/A	66	41.87(1)
S136E	0.17	MH136C	S144	0.79	55	55	N/A	30.48	30.48(1)
S136B	0.27	MH136C	S144	0.79	80	160	N/A	56	36.99(1)
S144	0.25	MH144	S145A	0.79	80	80	N/A	49	45.32(1)
R137A	0.11	MH137A	R144C	0.50	28	56	N/A	14.73	14.73
R144C	0.26	MH144	S160B	0.50	65	130	N/A	34.74	34.74
S160B	0.13	MH160	S145A	0.79	50	50	N/A	26	14.77(1)
S136D	0.07	MH136B	S160A	0.79	48	48	N/A	15	9.58(1)
S160A	0.3	MH160	S145A	0.79	86	172	N/A	62	36.92(1)
S145A	0.27	MH145	S145B	0.79	80	80	N/A	51	51(1)
S136C	0.11	MH136B	S137A	0.79	77	77	N/A	23	13.42(1)
R136B	0.23	MH136B	R137B	0.50	52	104	N/A	30.53	30.53
R137B	0.3	MH137A	S137A	0.50	72	144	N/A	39.97	39.97
S137A	0.14	MH137A	S137B	0.79	67	67	N/A	28	22.8(1)
S137B	0.13	MH137A	S138	0.79	90	90	1.1	27	61.15(4)
S138	0.15	MH138	S148	0.79	120	120	N/A	32	18.01(1)
S148	0.22	MH148	S145B	0.79	72	144	N/A	45	35.33(1)
R138	0.14	MH138	R145	0.50	35	70	N/A	18.72	18.72
R145	0.3	MH145	S145B	0.50	75	150	N/A	40.09	40.09
S145B	0.28	MH145	BLK335	0.79	60	120	35.13	55	90(5)
R142A	0.14	MH142	R143A	0.50	70	70	N/A	18.7	18.7
R143A	0.16	MH143	R144A	0.50	75	75	N/A	21.27	21.27
R144A	0.15	MH144	R146	0.50	63	63	N/A	19.79	19.79
R146	0.14	MH146	BLK335	0.50	63	63	N/A	18.57	18.57
RES1	1.89	MH162	DP	0.86	212.5	425	233(2)	381.83	381.83
HYD2	5.12	N/A	DP	0.00	576	1152	N/A	N/A	N/A

(1) Continuous grade, ICD set to correspond to lower of the 5 year simulated flow and the maximum capture during unrestricted 100 year flow conditions
(2) Assumed ponding volume. Assumes that on-site storage will be provided up to the 100 year 3 hour Chicago event
(3) Minor flow restrictions have been increased based on optimization of the system
(4) The minor flow restriction has been increased in sags to allow full capture of overflow from upstream segments on continuous grade during the 5 year storm event without ponding and/or to maintain ponding depths within the maximum depth during the 100 year storm event.
(5) Over-controlled to meet allowable release rate to existing receiving storm trunk
(6) Due to the limitation of the DDSWMM modeling software (specifically the allowable number of storage-release curves) the ponding was either discounted or merged to that of an adjacent drainage area.
(7) Assumed ponding volume.

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Formulas and Descriptions

i_{2yr} = 1:2 year Intensity = 732.951 / $(T_c+6.199)^{0.810}$
i_{5yr} = 1:5 year Intensity = 998.071 / $(T_c+6.053)^{0.814}$
i_{100yr} = 1:100 year Intensity = 1735.688 / $(T_c+6.014)^{0.820}$
T_c = Time of Concentration (min)
C = Average Runoff Coefficient
A = Area (Ha)
Q = Flow = 2.78CiA (L/s)

Maximum Allowable Release Rate (Site)

Flowrate Site(Q_{Site} =381.83L/s per CRT Phase 1 Design for Area "RES1")

Q_{site} =	381.83 L/s

Site Uncontrolled Release Rate ($Q_{uncontrolled}$ = 2.78*1.25*C*i_{100yr} *$A_{uncontrolled}$)

C =	0.47	
T_c =	10 min	
i_{100yr} =	178.56 mm/hr	
$A_{uncontrolled}$ =	0.21 Ha	UN1, UN2, UN3, UN4

$Q_{uncontrolled}$ =	61.24 L/s

Max Allowable Release Rate (Q_{max} = Q_{site} -$Q_{uncontrolled}$)

Q_{max} =	320.59 L/s

SWM Statistics of Modified Site Areas

Controlled	Area	ICD Flow
S100	0.16	26.00
S101	0.14	50.00
S102	0.15	25.00
S103	0.18	45.00
S104	0.03	6.00
S105	0.11	30.00
S106	0.27	25.00
RY106	0.07	10.00
S107	0.18	20.00
S108	0.06	15.00
RY113	0.08	10.00
RY116 & BLK342	0.22	23.00
RY119	0.06	10.00
Sum	**1.70**	**295.00**
Uncontrolled	**Area**	**Flow**
UN1, UN2, UN3, UN4	0.21	61.24
Sum	**0.21**	**61.24**
Total Sum	**1.91**	**356.243**
Allowable (Qsite)		**381.83**
		TRUE

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MODIFIED RATIONAL METHOD (100-Year & 2-Year Ponding)

Drainage Area	S100		
Area (Ha)	0.16	Restricted Flow ICD $_{Actual}$ (L/s)=	26.00
C =	0.94	Restricted Flow $Q_{r\ for\ storm\ calc}$ (L/s)=	26.00

50% reduction if sub-surface storage

100-Year Ponding

T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)
6	226.01	92.80	26.00	66.80	24.05
11	169.91	69.77	26.00	43.77	28.89
16	137.55	56.48	26.00	30.48	**29.26**
21	116.30	47.75	26.00	21.75	27.41
26	101.18	41.55	26.00	15.55	24.25

100-Year +20% Ponding

$100YRQ_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
67.78	41.78	**40.11**

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface*	Balance	Overflow	Required	Balance
0.00	29.26	16.33	0	12.93	0.00	40.11	23.78
		convert to flow with peak Tc (L/s)		13.47	convert to flow with peak Tc (L/s)		24.77

overflows to: S101

Drainage Area	S100		
Area (Ha)	0.16		
C =	0.75	Restricted Flow Q_r (L/s)=	26.00

2-Year Ponding

T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	25.23	26.00	0.00	0.00
11	73.17	24.04	26.00	0.00	0.00
12	69.89	22.96	26.00	0.00	**0.00**
13	66.93	21.99	26.00	0.00	0.00
14	64.23	21.10	26.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	16.33	0	0.00

overflows to: S101

Drainage Area	RY116 & BLK342		
Area (Ha)	0.22	Restricted Flow ICD $_{Actual}$ (L/s)=	23.00
C =	0.60	Restricted Flow $Q_{r\ for\ storm\ calc}$ (L/s)=	11.50

50% reduction if sub-surface storage

100-Year Ponding

T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)
20	119.95	44.02	11.50	32.52	39.02
25	103.85	38.11	11.50	26.61	39.91
30	91.87	33.71	11.50	22.21	**39.98**
35	82.58	30.30	11.50	18.80	39.49
40	75.15	27.58	11.50	16.08	38.58

100-Year +20% Ponding

$100YRQ_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
40.45	28.95	**52.12**

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface*	Balance	Overflow	Required	Balance
0.00	39.98	8.43	40.11	0.00	0.00	52.12	3.57
					convert to flow with peak Tc (L/s)		1.99

overflows to: S101

Drainage Area	RY116 & BLK342		
Area (Ha)	0.22		
C =	0.48	Restricted Flow Q_r (L/s)=	11.50

2-Year Ponding

T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	22.55	11.50	11.05	**6.63**
11	73.17	21.48	11.50	9.98	6.59
12	69.89	20.52	11.50	9.02	6.49
13	66.93	19.65	11.50	8.15	6.36
14	64.23	18.86	11.50	7.36	6.18

Storage (m^3)				
Overflow	Required	Surface	Sub-surface*	Balance
0.00	6.63	8.43	40.11	0.00

overflows to: S101

Clearstone Tench Storage Sample Calculation

$V = (At - Ap) \cdot Vf \cdot L + Ap \cdot L$

$A_t = W \times H$= trench cross-sectional area; $A_p = \frac{\pi D^2}{4}$= pipe cross-sectional area

Given:
$Trench\ Length, L = 103.0m$
$Void\ Fraction, Vf = 0.40$
$Pipe\ Diameter, D = 0.25\ m$
$Trench\ Height, H = 1.00\ m$
$Trench\ Width, W = 0.90\ m$

$\boldsymbol{V = 40.11m^3}$

Drainage Area	S101		
Area (Ha)	0.14	Restricted Flow ICD $_{Actual}$ (L/s)=	50.00
C =	0.94	Restricted Flow $Q_{r\ for\ storm\ calc}$ (L/s)=	50.00

50% reduction if sub-surface storage

100-Year Ponding

T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)
1	351.38	128.21	50.00	78.21	4.69
6	226.01	82.47	50.00	32.47	**11.69**
11	169.91	61.99	50.00	11.99	7.92
16	137.55	50.19	50.00	0.19	0.18
21	116.30	42.43	50.00	0.00	0.00

100-Year +20% Ponding

$100YRQ_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
74.39	24.39	**16.10**

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface*	Balance	Overflow	Required	Balance
12.93	24.62	11.75	0	12.87	27.35	43.45	31.70
		convert to flow with peak Tc (L/s)		19.50	convert to flow with peak Tc (L/s)		48.03

overflows to: S102

*Sub-surface Storage Tank

Drainage Area	S101		
Area (Ha)	0.14		
C =	0.75	Restricted Flow Q_r (L/s)=	50.00

2-Year Ponding

T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
8	85.46	24.94	50.00	0.00	0.00
9	80.87	23.61	50.00	0.00	0.00
10	76.81	22.42	50.00	0.00	**0.00**
11	73.17	21.36	50.00	0.00	0.00
12	69.89	20.40	50.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	11.75	0	0.00

overflows to: S102

Drainage Area	S102		
Area (Ha)	0.15	Restricted Flow ICD $_{Actual}$ (L/s)=	25.00
C =	0.94	Restricted Flow $Q_{r\ for\ storm\ calc}$ (L/s)=	25.00

50% reduction if sub-surface storage

100-Year Ponding

T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)
5	242.70	95.12	25.00	70.12	21.04
10	178.56	69.98	25.00	44.98	26.99
15	142.89	56.00	25.00	31.00	**27.90**
20	119.95	47.01	25.00	22.01	26.41
25	103.85	40.70	25.00	15.70	23.55

100-Year +20% Ponding

$100YRQ_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
67.20	42.20	**37.98**

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
12.87	40.77	41.35	0	0.00	31.70	69.68	28.33
					convert to flow with peak Tc (L/s)		31.48

overflows to: S103

Drainage Area	S102		
Area (Ha)	0.15		
C =	0.75	Restricted Flow Q_r (L/s)=	25.00

2-Year Ponding

T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	24.08	25.00	0.00	0.00
11	73.17	22.94	25.00	0.00	0.00
12	69.89	21.91	25.00	0.00	**0.00**
13	66.93	20.98	25.00	0.00	0.00
14	64.23	20.14	25.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	41.35	0	0.00

overflows to: S103

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Drainage Area	S103		
Area (Ha)	0.18	Restricted Flow ICD $_{Actual}$ (L/s)=	45.00
C =	0.94	Restricted Flow Q_r $_{for\ ssm\ calc}$ (L/s)=	45.00

50% reduction if sub-surface storage

	100-Year Ponding					100-Year +20% Ponding		
T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)	100YRQ$_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
1	351.38	164.84	45.00	119.84	7.19			
6	226.01	106.03	45.00	61.03	21.97			
11	169.91	79.71	45.00	34.71	**22.91**	95.65	50.65	**33.43**
16	137.55	64.53	45.00	19.53	18.75			
21	116.30	54.56	45.00	9.56	12.04			

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	22.91	50.04	0	0.00	28.33	61.76	11.72
					convert to flow with peak Tc (L/s)		17.76

overflows to: S105

Drainage Area	S103		
Area (Ha)	0.18		
C =	0.75	Restricted Flow Q_r (L/s)=	45.00

2-Year Ponding					
T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	28.82	45.00	0.00	0.00
11	73.17	27.46	45.00	0.00	0.00
12	69.89	26.23	45.00	0.00	**0.00**
13	66.93	25.12	45.00	0.00	0.00
14	64.23	24.11	45.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	50.04	0	0.00

overflows to: S105

Drainage Area	S104		
Area (Ha)	0.03	Restricted Flow ICD $_{Actual}$ (L/s)=	6.00
C =	0.44	Restricted Flow Q_r $_{for\ ssm\ calc}$ (L/s)=	3.00

50% reduction if sub-surface storage

	100-Year Ponding					100-Year +20% Ponding		
T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)	100YRQ$_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
1	351.38	11.88	3.00	8.88	0.53			
6	226.01	7.64	3.00	4.64	**1.67**	9.17	6.17	**2.22**
11	169.91	5.75	3.00	2.75	1.81			
16	137.55	4.65	3.00	1.65	1.59			
21	116.30	3.93	3.00	0.93	1.18			

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface	Balance	Overflow	Required	Balance
0.00	1.67	0.15	20.45	0.00	0.00	2.22	0.00
					convert to flow with peak Tc (L/s)		0.00

overflows to: Offsite

Drainage Area	S104		
Area (Ha)	0.03		
C =	0.35	Restricted Flow Q_r (L/s)=	3.00

2-Year Ponding					
T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	2.08	3.00	0.00	0.00
11	73.17	1.98	3.00	0.00	0.00
12	69.89	1.89	3.00	0.00	**0.00**
13	66.93	1.81	3.00	0.00	0.00
14	64.23	1.74	3.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	0.15	20.4	0.00

overflows to: Offsite

$V = (At - Ap) \cdot Vf \cdot L + Ap \cdot L$
Given:
$Trench\ Length, L = 52.5\ m$
$Void\ Fraction, Vf = 0.40$
$Pipe\ Diameter, D = 0.25\ m$
$Trench\ Height, H = 1.00\ m$
$Trench\ Width, W = 0.90\ m$
$\boldsymbol{V = 20.40 m^3}$

Drainage Area	S105		
Area (Ha)	0.11	Restricted Flow ICD $_{Actual}$ (L/s)=	30.00
C =	0.94	Restricted Flow Q_r $_{for\ ssm\ calc}$ (L/s)=	30.00

50% reduction if sub-surface storage

	100-Year Ponding					100-Year +20% Ponding		
T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)	100YRQ$_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^2)
0	398.62	116.03	30.00	86.03	0.00			
5	242.70	70.65	30.00	40.65	12.19			
10	178.56	51.98	30.00	21.98	**13.19**	62.37	32.37	**19.42**
15	142.89	41.60	30.00	11.60	10.44			
20	119.95	34.92	30.00	4.92	5.90			

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface*	Balance	Overflow	Required	Balance
0.00	13.19	20.83	0	0.00	11.72	31.14	10.31
					convert to flow with peak Tc (L/s)		17.19

overflows to: S108

Drainage Area	S105		
Area (Ha)	0.11		
C =	0.75	Restricted Flow Q_r (L/s)=	30.00

2-Year Ponding					
T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
10	76.81	17.89	30.00	0.00	0.00
11	73.17	17.04	30.00	0.00	**0.00**
12	69.89	16.28	30.00	0.00	0.00
13	66.93	15.59	30.00	0.00	0.00
14	64.23	14.96	30.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface	Balance
0.00	0.00	20.83	0	0.00

overflows to: S108

Drainage Area	RY119		
Area (Ha)	0.06	Restricted Flow ICD $_{Actual}$ (L/s)=	10.00
C =	0.66	Restricted Flow Q_r $_{for\ ssm\ calc}$ (L/s)=	5.00

50% reduction if sub-surface storage

	100-Year Ponding					100-Year +20% Ponding		
T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)	100YRQ$_p$ 20% (L/s)	Qp - Qr (L/s)	Volume 100+20 (m^3)
10	178.56	19.17	5.00	14.17	8.50			
15	142.89	15.34	5.00	10.34	9.30			
20	119.95	12.88	5.00	7.88	**9.45**	15.45	10.45	**12.54**
25	103.85	11.15	5.00	6.15	9.22			
30	91.87	9.86	5.00	4.86	8.75			

Storage (m^3)					100+20		
Overflow	Required	Surface	Sub-surface*	Balance	Overflow	Required	Balance
0.00	9.45	0.13	10.52	0.00	0.00	12.54	1.90
					convert to flow with peak Tc (L/s)		1.58

overflows to: S106

Drainage Area	RY119		
Area (Ha)	0.06		
C =	0.53	Restricted Flow Q_r (L/s)=	5.00

2-Year Ponding					
T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p=2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
20	52.03	4.47	5.00	0.00	0.00
21	50.48	4.33	5.00	0.00	0.00
22	49.02	4.21	5.00	0.00	**0.00**
23	47.66	4.09	5.00	0.00	0.00
24	46.37	3.98	5.00	0.00	0.00

Storage (m^3)				
Overflow	Required	Surface	Sub-surface*	Balance
0.00	0.00	0.13	10.52	0.00

overflows to: S106

***Clearstone Trench Storage**

Clearstone Tench Storage Sample Calculation
$V = (At - Ap) \cdot Vf \cdot L + Ap \cdot L$
$A_t = W \times H$= trench cross-sectional area; $A_p = \frac{\pi D^2}{4}$ = pipe cross-sectional area
Given:
$Trench\ Length, L = 27.00 m$
$Void\ Fraction, Vf = 0.40$
$Pipe\ Diameter, D = 0.25\ m$
$Trench\ Height, H = 1.00\ m$
$Trench\ Width, W = 0.90\ m$
$\boldsymbol{V = 10.52 m^3}$

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arcadis.com

Drainage Area	***S106***		
Area (Ha)	0.27	Restricted Flow ICD $_{Actual}$ (L/s)=	25.00
C =	0.81	Restricted Flow Q_r $_{for\ swm\ calc}$ (L/s)=	12.50

50% reduction if sub-surface storage

100-Year Ponding						**100-Year +20% Ponding**		
T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***	***100YRQ_p 20% (L/s)***	***Qp - Qr (L/s)***	***Volume 100+20 (m^3)***
30	91.87	58.03	12.50	43.53	78.35			
35	82.58	50.36	12.50	37.86	79.51			
40	75.15	45.83	12.50	33.33	**79.99**	54.99	42.49	**101.99**
45	69.05	42.11	12.50	29.61	79.95			
50	63.95	39.00	12.50	26.50	79.51			

Storage (m^3)					100+20		
Overflow	**Required**	**Surface**	**Sub-surface***	**Balance**	**Overflow**	**Required**	**Balance**
0.00	79.99	30.39	53.34	0.00	1.90	103.88	20.15
					convert to flow with peak Tc (L/s)		8.40

***Sub-surface Storage Tank**

overflows to: RY113

Drainage Area	***S106***		
Area (Ha)	0.27		
C =	0.65	Restricted Flow Q_r (L/s)=	12.50

2-Year Ponding					
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
10	76.81	37.47	12.50	24.97	14.98
11	73.17	35.70	12.50	23.20	15.31
12	69.89	34.10	12.50	21.60	**15.55**
13	66.93	32.65	12.50	20.15	15.72
14	64.23	31.34	12.50	18.84	15.82

Storage (m^3)				
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**
0.00	15.55	30.39	53.34	0.00

overflows to: RY113

Drainage Area	***RY113***		
Area (Ha)	0.08	Restricted Flow ICD $_{Actual}$ (L/s)=	10.00
C =	0.63	Restricted Flow Q_r $_{for\ swm\ calc}$ (L/s)=	5.00

50% reduction if sub-surface storage

100-Year Ponding						**100-Year +20% Ponding**		
T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***	***100YRQ_p 20% (L/s)***	***Qp - Qr (L/s)***	***Volume 100+20 (m^3)***
15	142.89	19.86	5.00	14.86	13.38			
20	119.95	16.67	5.00	11.67	14.01			
25	103.85	14.43	5.00	9.43	**14.15**	17.32	12.32	**18.48**
30	91.87	12.77	5.00	7.77	13.99			
35	82.58	11.48	5.00	6.48	13.60			

Storage (m^3)					100+20		
Overflow	**Required**	**Surface**	**Sub-surface***	**Balance**	**Overflow**	**Required**	**Balance**
0.00	14.15	6.64	21.97	0.00	20.15	38.63	10.03
					convert to flow with peak Tc (L/s)		6.69

***Clearstone Trench Storage**

overflows to: RY106

Clearstone Tench Storage Sample Calculation

$V = (At - Ap) \cdot Vf \cdot L + Ap \cdot L$

$A_t = W \times H$= trench cross-sectional area; $A_p = \frac{\pi D^2}{4}$ = pipe cross-sectional area

Given:

$Trench\ Length, L = 56.40m$

$Void\ Fraction, Vf = 0.40$

$Pipe\ Diameter, D = 0.25\ m$

$Trench\ Height, H = 1.00\ m$

$Trench\ Width, W = 0.90\ m$

$\boldsymbol{V = 21.96m^3}$

Drainage Area	***RY113***		
Area (Ha)	0.08		
C =	0.50	Restricted Flow Q_r (L/s)=	5.00

2-Year Ponding					
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
10	76.81	8.54	5.00	3.54	**2.12**
11	73.17	8.14	5.00	3.14	2.07
12	69.89	7.77	5.00	2.77	2.00
13	66.93	7.44	5.00	2.44	1.91
14	64.23	7.14	5.00	2.14	1.80

Storage (m^3)				
Overflow	**Required**	**Surface**	**Sub-surface***	**Balance**
0.00	2.12	6.64	21.97	0.00

overflows to: RY106

Drainage Area	***RY106***		
Area (Ha)	0.07	Restricted Flow ICD $_{Actual}$ (L/s)=	10.00
C =	0.63	Restricted Flow Q_r $_{for\ swm\ calc}$ (L/s)=	10.00

50% reduction if sub-surface storage

100-Year Ponding						**100-Year +20% Ponding**		
T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***	***100YRQ_p 20% (L/s)***	***Qp - Qr (L/s)***	***Volume 100+20 (m^3)***
5	242.70	29.52	10.00	19.52	5.86			
10	178.56	21.72	10.00	11.72	7.03			
15	142.89	17.38	10.00	7.38	**6.64**	20.86	10.86	**9.77**
20	119.95	14.59	10.00	4.59	5.51			
25	103.85	12.63	10.00	2.63	3.95			

Storage (m^3)					100+20		
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**	**Overflow**	**Required**	**Balance**
0.00	6.64	11.53	0.00	0.00	10.03	19.80	8.27
					convert to flow with peak Tc (L/s)		9.19

Drainage Area	***RY106***		
Area (Ha)	0.07		
C =	0.50	Restricted Flow Q_r (L/s)=	10.00

2-Year Ponding					
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
2	133.33	12.97	10.00	2.97	0.36
3	121.46	11.82	10.00	1.82	0.33
4	111.72	10.87	10.00	0.87	**0.21**
5	103.57	10.08	10.00	0.08	0.02
6	96.64	9.40	10.00	0.00	0.00

Storage (m^3)				
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**
0.00	0.21	11.53	0.00	0.00

Drainage Area	***S107***		
Area (Ha)	0.18	Restricted Flow ICD $_{Actual}$ (L/s)=	20.00
C =	0.88	Restricted Flow Q_r $_{for\ swm\ calc}$ (L/s)=	20.00

50% reduction if sub-surface storage

100-Year Ponding						**100-Year +20% Ponding**		
T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***	***100YRQ_p 20% (L/s)***	***Qp - Qr (L/s)***	***Volume 100+20 (m^3)***
10	178.56	76.62	20.00	56.62	33.97			
15	142.89	61.32	20.00	41.32	37.18			
20	119.95	51.47	20.00	31.47	**37.76**	61.76	41.76	**50.12**
25	103.85	44.56	20.00	24.56	36.84			
30	91.87	39.42	20.00	19.42	34.96			

Storage (m^3)					100+20		
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**	**Overflow**	**Required**	**Balance**
0.00	37.76	38.92	0	0.00	0.00	50.12	11.20
					convert to flow with peak Tc (L/s)		9.33

overflows to: offsite

Drainage Area	***S107***		
Area (Ha)	0.18		
C =	0.70	Restricted Flow Q_r (L/s)=	20.00

2-Year Ponding					
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow Q_p=2.78x$Ci_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
4	111.72	38.35	20.00	18.35	4.40
5	103.57	35.55	20.00	15.55	4.67
6	96.64	33.17	20.00	13.17	**4.74**
7	90.66	31.12	20.00	11.12	4.67
8	85.46	29.34	20.00	9.34	4.48

Storage (m^3)				
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**
0.00	4.74	38.92	0	0.00

overflows to: offsite

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Drainage Area	***S108***		
Area (Ha)	0.06	Restricted Flow ICD $_{Actual}$ (L/s)=	15.00
C =	1.00	Restricted Flow $Q_{r\ for\ sewm\ calc}$ (L/s)=	15.00

50% reduction if sub-surface storage

100-Year Ponding						**100-Year +20% Ponding**		
T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow Q_P=2.78xCxi_{100yr}xA (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***	***100YRQ_p 20% (L/s)***	***Qp - Qr (L/s)***	***Volume 100+20 (m^3)***
1	361.38	58.61	15.00	43.61	2.62			
6	226.01	37.70	15.00	22.70	**8.17**	45.24	30.24	**10.89**
11	169.91	28.34	15.00	13.34	8.80			
16	137.55	22.94	15.00	7.94	7.63			
21	116.30	19.40	15.00	4.40	5.54			

Storage (m^3)					100+20		
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**	**Overflow**	**Required**	**Balance**
0.00	8.17	17.37	0	0.00	29.78	40.66	23.29
					convert to flow with peak Tc (L/s)		35.29

overflows to: offsite

Drainage Area	***S108***		
Area (Ha)	0.06		
C =	0.87	Restricted Flow Q_r (L/s)=	15.00

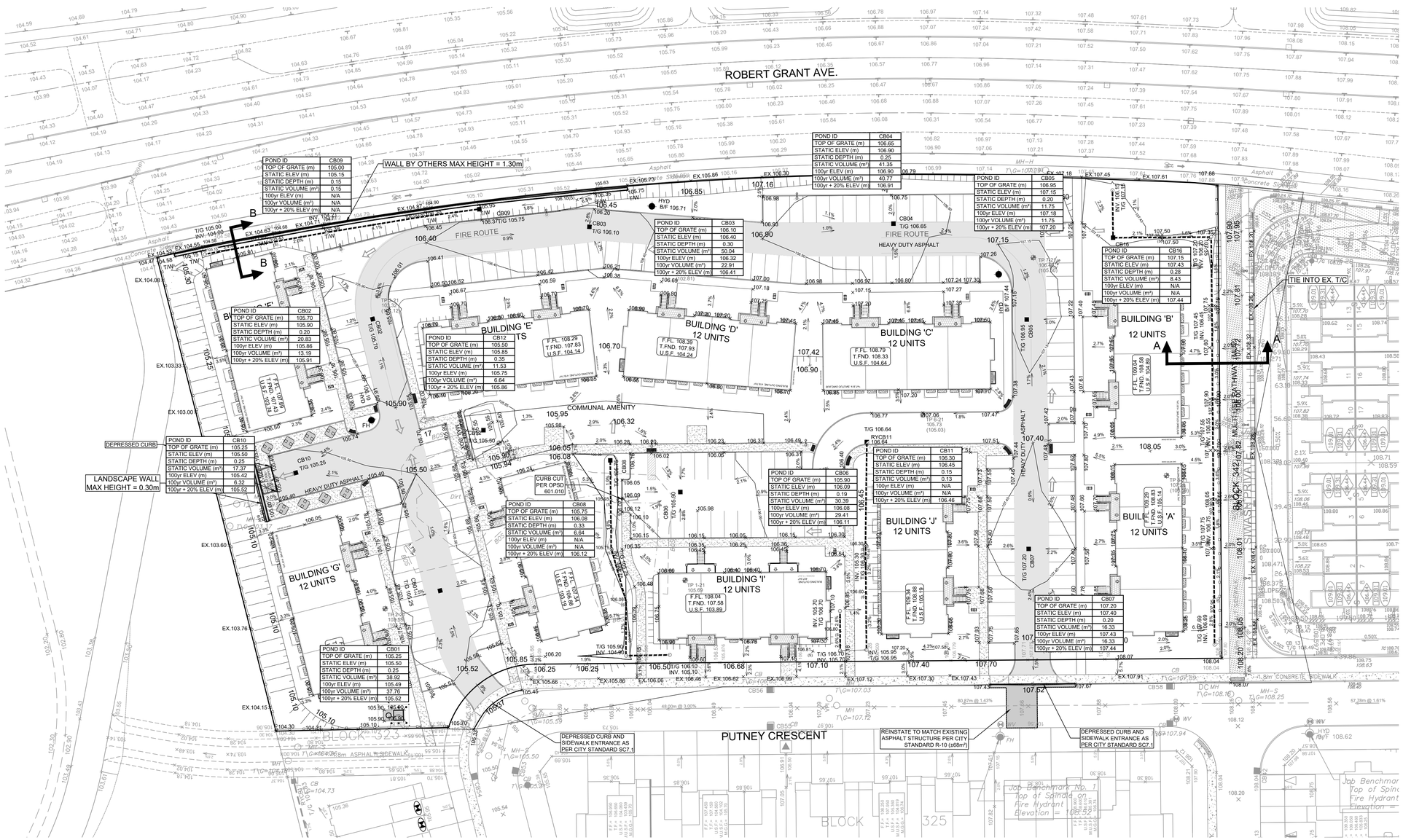
2-Year Ponding					
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow Q_P=2.78xCxi_{2yr}xA (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
10	76.81	11.15	15.00	0.00	**0.00**
11	73.17	10.62	15.00	0.00	0.00
12	69.89	10.14	15.00	0.00	0.00
13	66.93	9.71	15.00	0.00	0.00
14	64.23	9.32	15.00	0.00	0.00

Storage (m^3)				
Overflow	**Required**	**Surface**	**Sub-surface**	**Balance**
0.00	0.00	17.37	0	0.00

overflows to: offsite

PONDING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- FULL STATIC PONDING GRADE
- RETAINING WALL C/W TOP OF WALL
- TERRACING 3:1 MAXIMUM UNLESS NOTED OTHERWISE



POND ID	CB01
TOP OF GRATE (m)	105.25
STATIC ELEV (m)	105.50
STATIC DEPTH (m)	0.25
STATIC VOLUME (m³)	38.92
100yr ELEV (m)	105.49
100yr VOLUME (m³)	37.76
100yr + 20% ELEV (m)	105.52

POND ID	CB02
TOP OF GRATE (m)	105.70
STATIC ELEV (m)	105.90
STATIC DEPTH (m)	0.20
STATIC VOLUME (m³)	20.83
100yr ELEV (m)	105.86
100yr VOLUME (m³)	13.19
100yr + 20% ELEV (m)	105.91

POND ID	CB03
TOP OF GRATE (m)	106.10
STATIC ELEV (m)	106.40
STATIC DEPTH (m)	0.30
STATIC VOLUME (m³)	50.04
100yr ELEV (m)	106.32
100yr VOLUME (m³)	22.91
100yr + 20% ELEV (m)	106.41

POND ID	CB04
TOP OF GRATE (m)	106.65
STATIC ELEV (m)	106.90
STATIC DEPTH (m)	0.25
STATIC VOLUME (m³)	41.35
100yr ELEV (m)	106.90
100yr VOLUME (m³)	40.77
100yr + 20% ELEV (m)	106.91

POND ID	CB05
TOP OF GRATE (m)	106.95
STATIC ELEV (m)	107.15
STATIC DEPTH (m)	0.20
STATIC VOLUME (m³)	11.75
100yr ELEV (m)	107.18
100yr VOLUME (m³)	11.75
100yr + 20% ELEV (m)	107.20

POND ID	CB06
TOP OF GRATE (m)	105.90
STATIC ELEV (m)	106.09
STATIC DEPTH (m)	0.19
STATIC VOLUME (m³)	30.39
100yr ELEV (m)	106.08
100yr VOLUME (m³)	29.41
100yr + 20% ELEV (m)	106.11

POND ID	CB07
TOP OF GRATE (m)	107.20
STATIC ELEV (m)	107.40
STATIC DEPTH (m)	0.20
STATIC VOLUME (m³)	16.33
100yr ELEV (m)	107.43
100yr VOLUME (m³)	16.33
100yr + 20% ELEV (m)	107.44

POND ID	CB08
TOP OF GRATE (m)	105.75
STATIC ELEV (m)	106.08
STATIC DEPTH (m)	0.33
STATIC VOLUME (m³)	6.64
100yr ELEV (m)	N/A
100yr VOLUME (m³)	N/A
100yr + 20% ELEV (m)	106.12

POND ID	CB09
TOP OF GRATE (m)	105.00
STATIC ELEV (m)	105.15
STATIC DEPTH (m)	0.15
STATIC VOLUME (m³)	0.15
100yr ELEV (m)	N/A
100yr VOLUME (m³)	N/A
100yr + 20% ELEV (m)	N/A

POND ID	CB10
TOP OF GRATE (m)	105.25
STATIC ELEV (m)	105.50
STATIC DEPTH (m)	0.25
STATIC VOLUME (m³)	17.37
100yr ELEV (m)	105.42
100yr VOLUME (m³)	6.32
100yr + 20% ELEV (m)	105.52

POND ID	CB11
TOP OF GRATE (m)	106.30
STATIC ELEV (m)	106.45
STATIC DEPTH (m)	0.15
STATIC VOLUME (m³)	0.13
100yr ELEV (m)	N/A
100yr VOLUME (m³)	N/A
100yr + 20% ELEV (m)	106.46

POND ID	CB12
TOP OF GRATE (m)	105.50
STATIC ELEV (m)	105.85
STATIC DEPTH (m)	0.35
STATIC VOLUME (m³)	11.53
100yr ELEV (m)	105.75
100yr VOLUME (m³)	6.64
100yr + 20% ELEV (m)	105.86

POND ID	CB16
TOP OF GRATE (m)	107.15
STATIC ELEV (m)	107.43
STATIC DEPTH (m)	0.28
STATIC VOLUME (m³)	8.43
100yr ELEV (m)	N/A
100yr VOLUME (m³)	N/A
100yr + 20% ELEV (m)	107.44

CLIENT

CLARIDGE HOMES

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Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2026:06:23
2		
3		
4		
5		

- SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
- SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

CONSULTANTS

1:400 0 4 12 20m

SEAL

LICENSED PROFESSIONAL ENGINEER
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2026/06/23
PROVINCE OF ONTARIO

PRIME CONSULTANT

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PROJECT

CRT BLOCK 324

PROJECT NO: 30259740	
DRAWN BY: **EH/MM**	CHECKED BY: **RR**
PROJECT MGR: **RM**	APPROVED BY: **RM**

SHEET TITLE

PONDING PLAN

SHEET NUMBER	ISSUE
C-600	1

SCALE CHECK | 10mm | 1 in

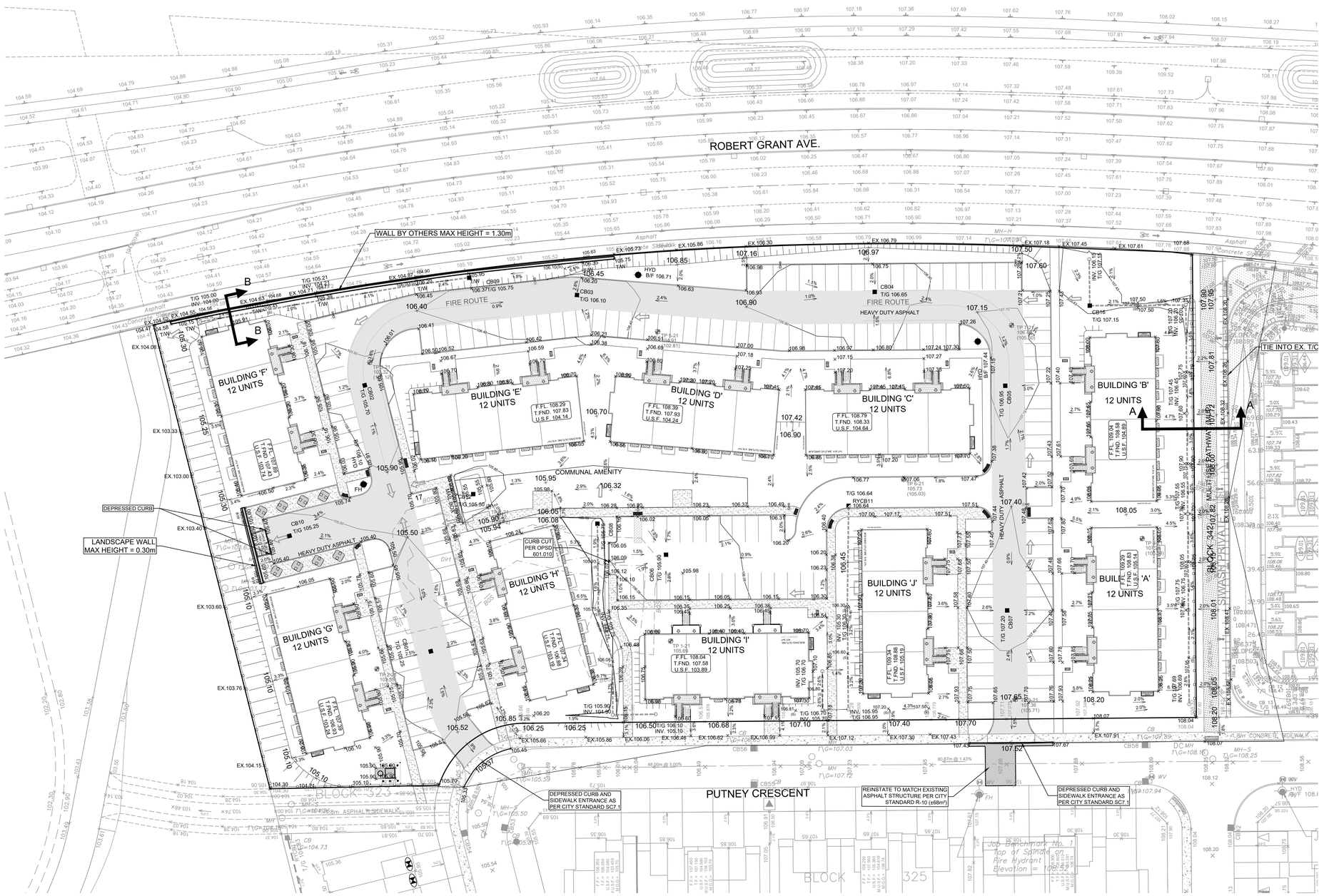
File Location: C:\Users\hennee6006\DCA\CCDocs\Arcadis ACC US\ACA-30259740-CRT Ph1 Blk 324\Project Files\10_WIP\04_CIVIL\Sheets\C-600 PONDING PLAN.dwg Last Saved: June 16, 2026, by hennee6006 Plotted: June 22, 2026 10:38:13 AM by Hennie, Eric

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

Appendix E

Grading Plan 30259740-C-200

Sediment and Erosion Plan 30259740-C-900



CLIENT

CLARIDGE HOMES

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ISSUES

No.	DESCRIPTION	DATE
1	ISSUED TO CITY FOR REVIEW	2026:06:23
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4		
5		

- SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS
- SITE BENCHMARK TO BE OBTAINED FROM LEGAL SURVEYOR AOV.

KEY PLAN

SEAL

LICENSED PROFESSIONAL ENGINEER
Ryan Robineau
R. R. ROBINEAU
100611774
2026/06/23
PROVINCE OF ONTARIO

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SHEET TITLE

GRADING PLAN

SHEET NUMBER	ISSUE
C-200	1

SCALE CHECK 1:400

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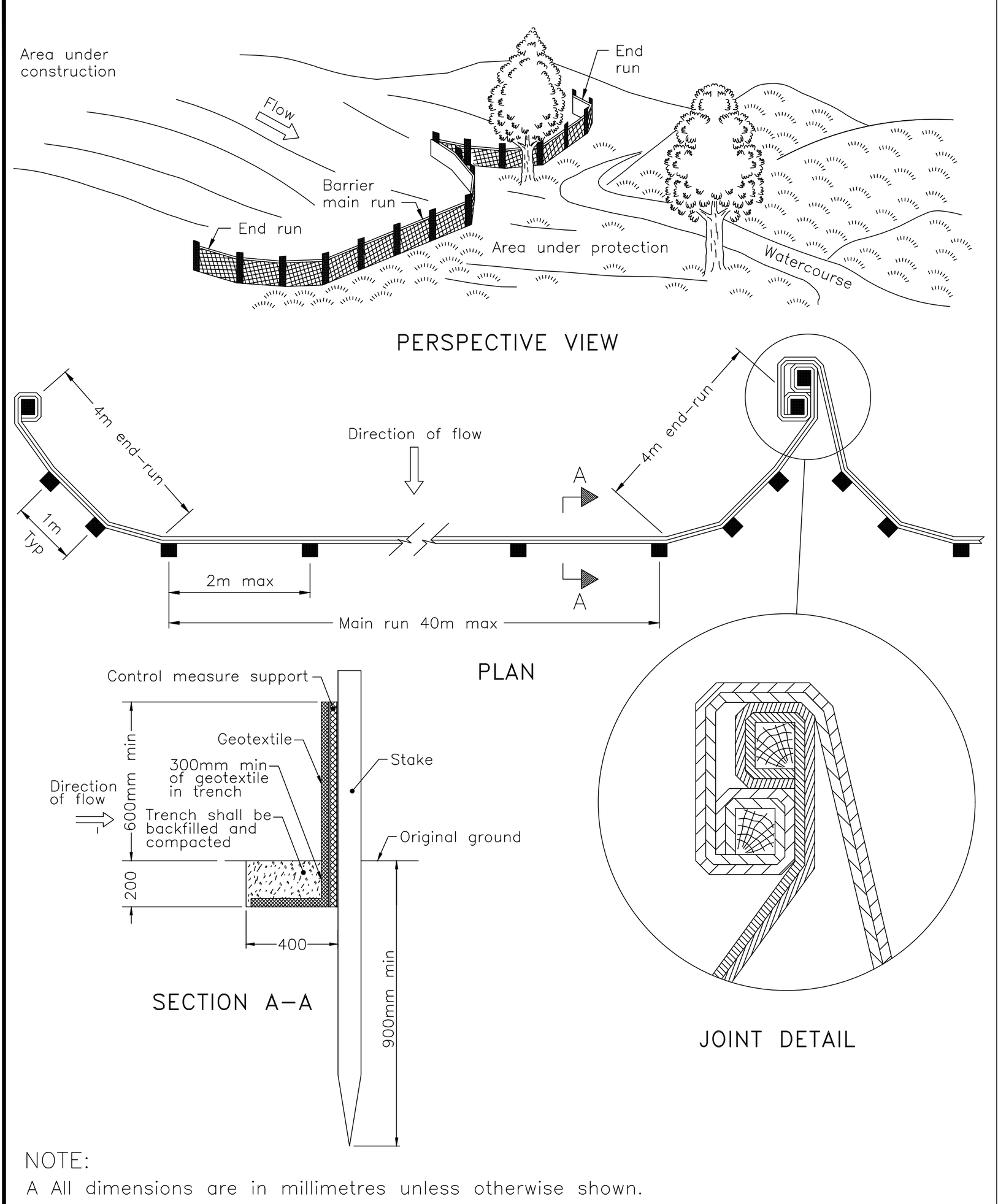
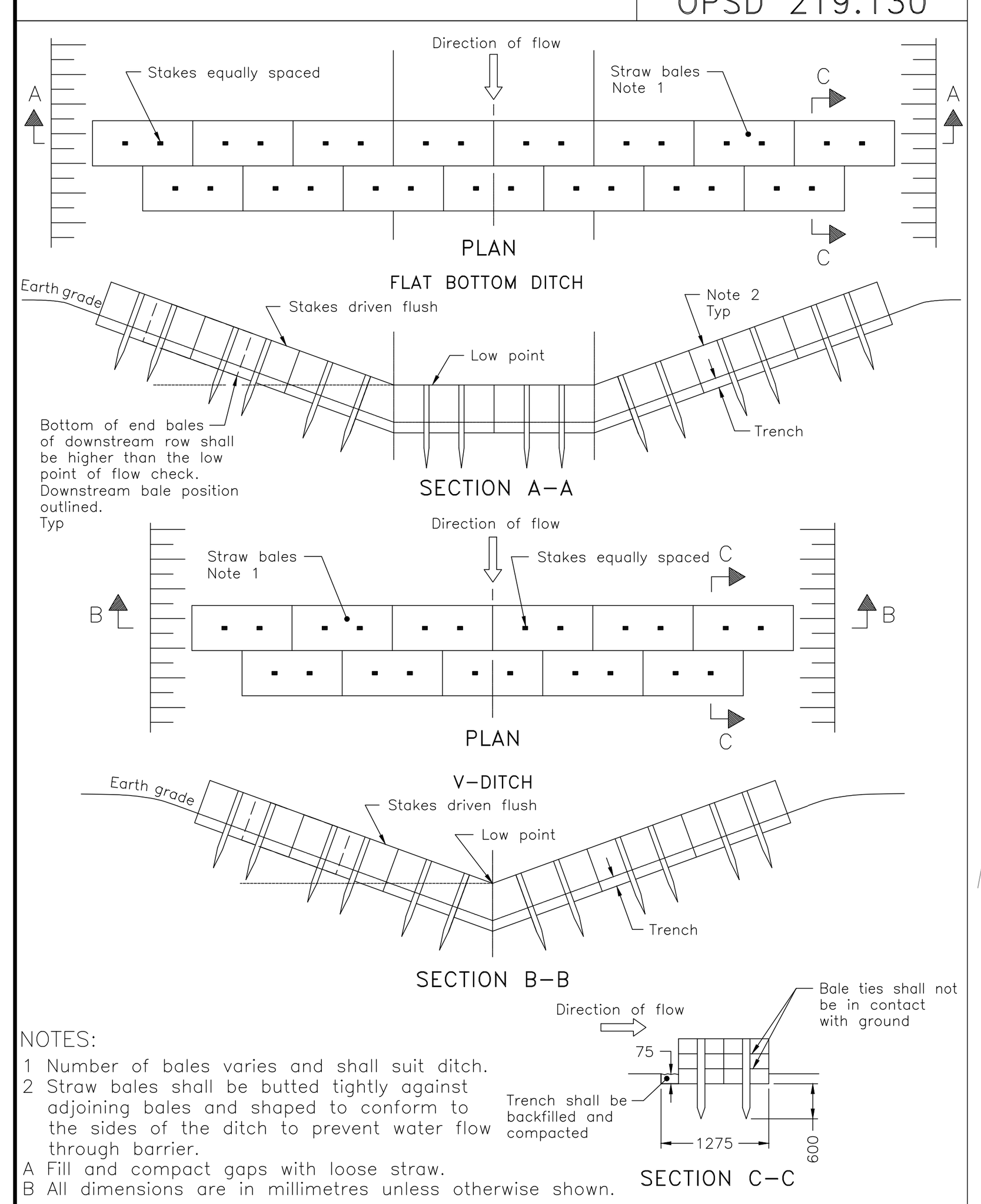
CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2021 | Rev 3

HEAVY-DUTY SILT FENCE BARRIER

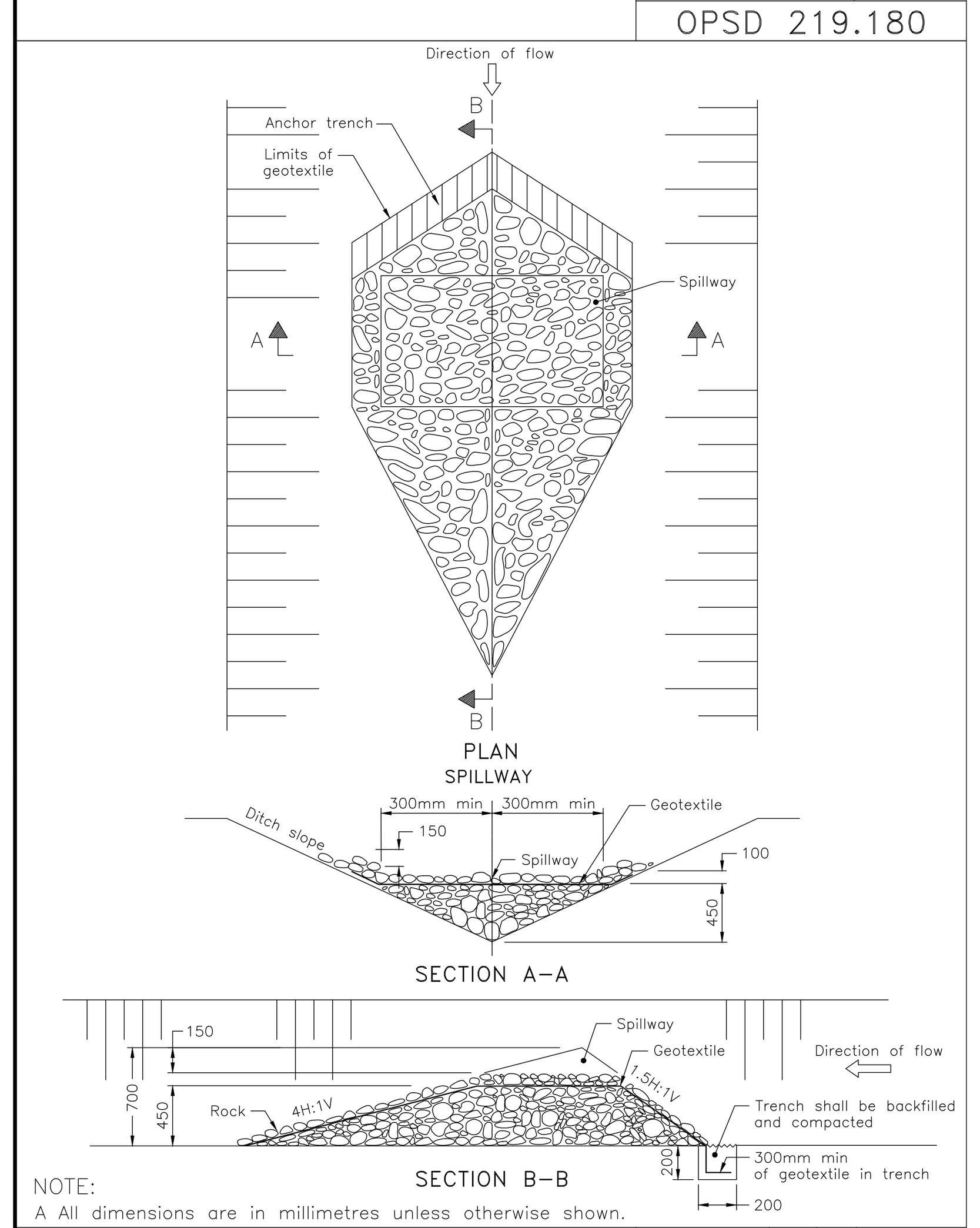
OPSD 219.130



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2021 | Rev 3

STRAW BALE FLOW CHECK DAM

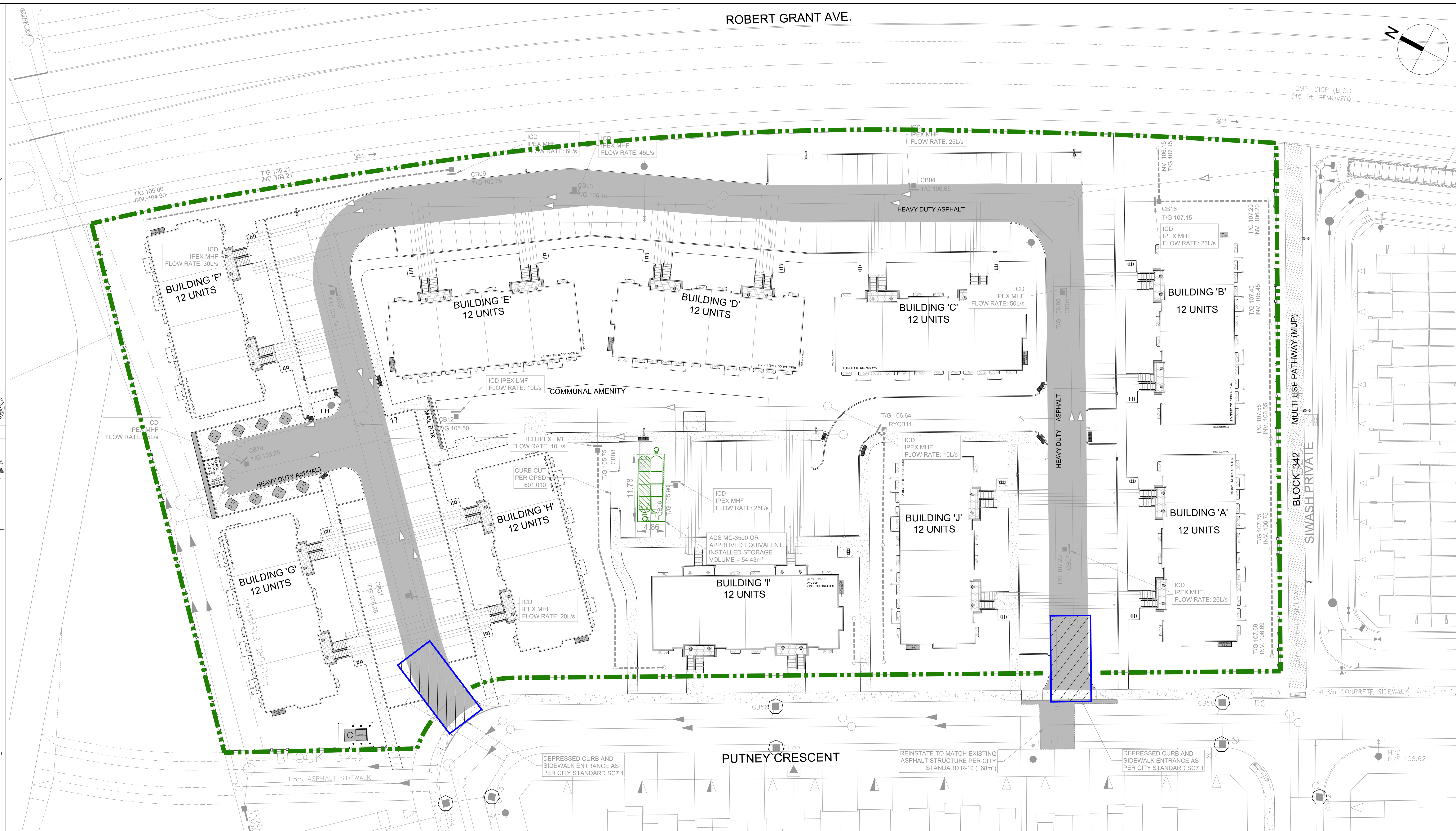
OPSD 219.180



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2022 | Rev 3

TEMPORARY ROCK FLOW CHECK DAM V-DITCH

OPSD 219.210



LEGEND:

- HEAVY DUTY SILT FENCE AS PER OPSD-219.130
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- FILTER CLOTH PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH

NOTES:

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
3. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
4. FILTER CLOTH TO BE PLACED AND MAINTAINED UNDER COVER OF ALL PROPOSED CATCHBASINS AFTER BASE COURSE, AND EXISTING CATHBASINS IDENTIFIED OUTSIDE OF CONSTRUCTION LIMIT. FILTER CLOTH IN STREET CB'S TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. FILTER CLOTH IN RYCB'S TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATHCBASINS TO BE REGULARLY INSPECTED AND CLEANED AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
5. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
6. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
7. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT.

CLIENT

CLARIDGE HOMES

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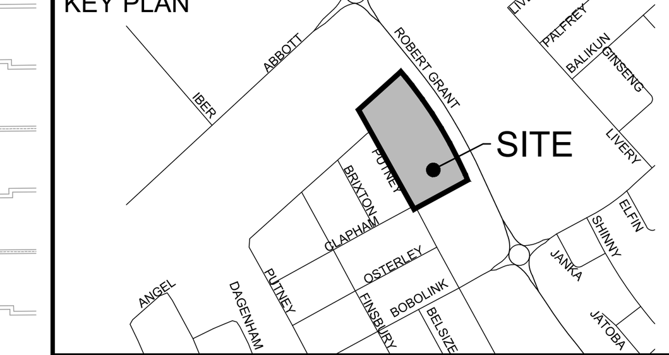
KEY PLAN



CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER R. R. ROBINEAU 100611774 2026/06/23 PROVINCE OF ONTARIO

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PROJECT

CRT BLOCK 324

PROJECT NO: 30259740	
DRAWN BY: EH/MM	CHECKED BY: RR
PROJECT MGR: RM	APPROVED BY: RM

SHEET TITLE

EROSION - SEDIMENTATION PLAN

SHEET NUMBER: C-900 | ISSUE: 1

File Location: C:\Users\henriee6006\DC\ACCDocs\Arcadis ACC USACA-30259740-CRT Ph1 Blk 324\Project Files\10_WIP\04_CIVIL\Sheets\C-900 SEDIMENT AND EROSION CONTROL PLAN.dwg Last Saved: May 22, 2026, by henriee6006 Plotted: June 22, 2026 10:38:12 AM by Henrie, Eric

CITY FILE No. D07-12-21-0022 CITY PLAN No. 18416

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