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1045 KILBIRNIE DRIVE, BARRHAVEN, ON

SERVICING AND STORMWATER MANAGEMENT REPORT

JULY 25, 2022

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SITE PLAN APPLICATION

PROJECT NO.: 219-00014-01
DATE: JULY 2022

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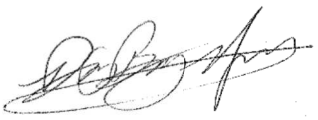

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Project Engineer

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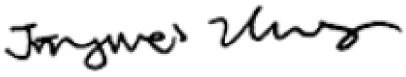

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1 GENERAL

1.1 EXECUTIVE SUMMARY

WSP was retained by Architecture | 49 to provide servicing, grading and stormwater management design services for the proposed new Barrhaven Ecole Elementarie School on a 2.40 ha site located at the southwest corner of Kilbirnie Drive and Robin Easey Ave, in the proposed Quinn's Pointe Stage 2 subdivision development within the Barrhaven South Urban Expansion Area (BSUEA), in the City of Ottawa. The construction of services and base course asphalt is complete on both Kilbirnie Drive and Robin Easey Ave, on which the school property will front. All services for the school site will be available from Kilbirnie Drive. The subjected development is bounded by the Stage 1 and Stage 2 of the Quinn's Pointe Development. The future Stage 4 subdivision development is proposed west of the school site, and this is currently under construction. This report outlines findings and calculations pertaining to the servicing of the proposed building with a gross building area of 3,803 square metres.

The proposed school building is a combination of one and two storey school building with gross floor area of 4,781 square metre and maximum building height will not be higher than 18 metres which is located at the northeast corner of the subjected site, southwest corner of the Kilbirnie Drive and Robin Easey Ave intersection. The proposed building has no basement and slab on grade. To the south of the proposed school building, there will be outdoor parking area. Once the school is going to expand, some of the green space will be converted for the future parking to the west. West of the school, there will be portable classrooms., further west of the portable classrooms, there will be playground and practise football/soccer field. Since the proposed school is located close to the Kilbirnie Drive and Robin Easey Ave R.O.W. These streets will be used as the fire route to service the school building. And portable classrooms are located adjacent to the private parking, internal fire route has been proposed via the proposed parking area.

The future additional parking lot to the west of the proposed parking areas will be constructed at a later time. The current grading and servicing design have been provided to allow for the future site plan changes with minimal changes to grading and servicing modifications only within the areas that will be impacted by the future development.

The surrounding neighbourhood is being developed by Minto Communities Inc. with the J.L. Richards & Associated Limited providing engineering design services. Information regarding the proposed municipal services was provided by J.L. Richards & Associated Limited, as described in Site Servicing Report – Quinn's Pointe Stage 2, Greenbank Road, Ottawa, ON, Project: JLR No.: 26610-001, Revision 2 dated April 9, 2019. Excerpts from the Site Servicing Report are provided in Appendix A of this report.

Currently the land proposed for the building abuts the collector road Kilbirnie Drive which is located to the north of the subject site. The natural topography of the property in the vicinity of the collector road slopes from west to east towards the Robin Easey Ave. Currently the land is vacant and primarily grass covered. The total study area was considered to be 2.4 ha in size. It is block 261, registered plan 4M-1656, Geographic City of Ottawa. Based on the topographic survey, the site is sloping from west to east and will be draining toward Kilbirnie Drive and Robin Easey Ave intersection. The existing piped stormwater system within Quinn's Pointe Stage 2 subdivision development conveys drainage to two dry ponds adjacent to

Greenbank Road along with a spill-over dry pond abutting Barnsdale Road, west of the CDP boundary to prevent major overland flow from reaching new Greenbank Road, an arterial road. Two hydrodynamic separators (HDS) were proposed, one between the dry ponds next to Greenbank Road and one unit at Kilbirnie Drive, west of Alex Polowin Ave. Both HDS were be sized to achieve an 80% TSS removal.

As per the Site Servicing Report of Quinn's Pointe Stage 2 by L.L. Richard & Associates Limited, the following criteria apply: Major system flows up to and including the 1:100-year design storm event was assumed to be self-contained for the school block. Runoff from all storm events up to and including the 1:100-year event must be restricted to a calculated rate based on an imperviousness ratio of 0.50, 5-year simulated flow of 507 l/s. The subject site must provide sufficient storage to accommodate runoff from the 1:100-year event, 300m³ storage requirement during 1:100-year storm. Stormwater quality control is not required for this site. Design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from the City of Ottawa and outlines the design for water, sanitary wastewater, and stormwater facilities, including stormwater management.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

The following municipal services are available at the north, east and west property lines as recorded from drawings received from J.L. Richards & Associated Limited:
Kilbirnie Drive:

- 675 mm storm sewer, 200mm sanitary sewer and 305mm watermain.
- 600 mm storm sewer stub, 200mm sanitary sewer stub and 203mm watermain stub (Designed and prepared for the subject site)

Robin Easey Ave:

- 525 mm storm sewer, 200mm sanitary sewer and 203mm watermain.

New Greenbank Road (west of the site):

- 305mm watermain.
- Future 1350mm storm sewer

It is proposed that:

- On-site stormwater management systems, employing surface storage and roof storage will be provided to attenuate flow rates leaving the school site. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained.

1.2 DATE AND REVISION NUMBER

This version of the report is the initial issue, dated March 04, 2022.

1.3 LOCATION MAP AND PLAN

The proposed institutional development is located at 1045 Kilbirnie Drive, Barrhaven, Ontario at the location shown in Figure 1-1 below.

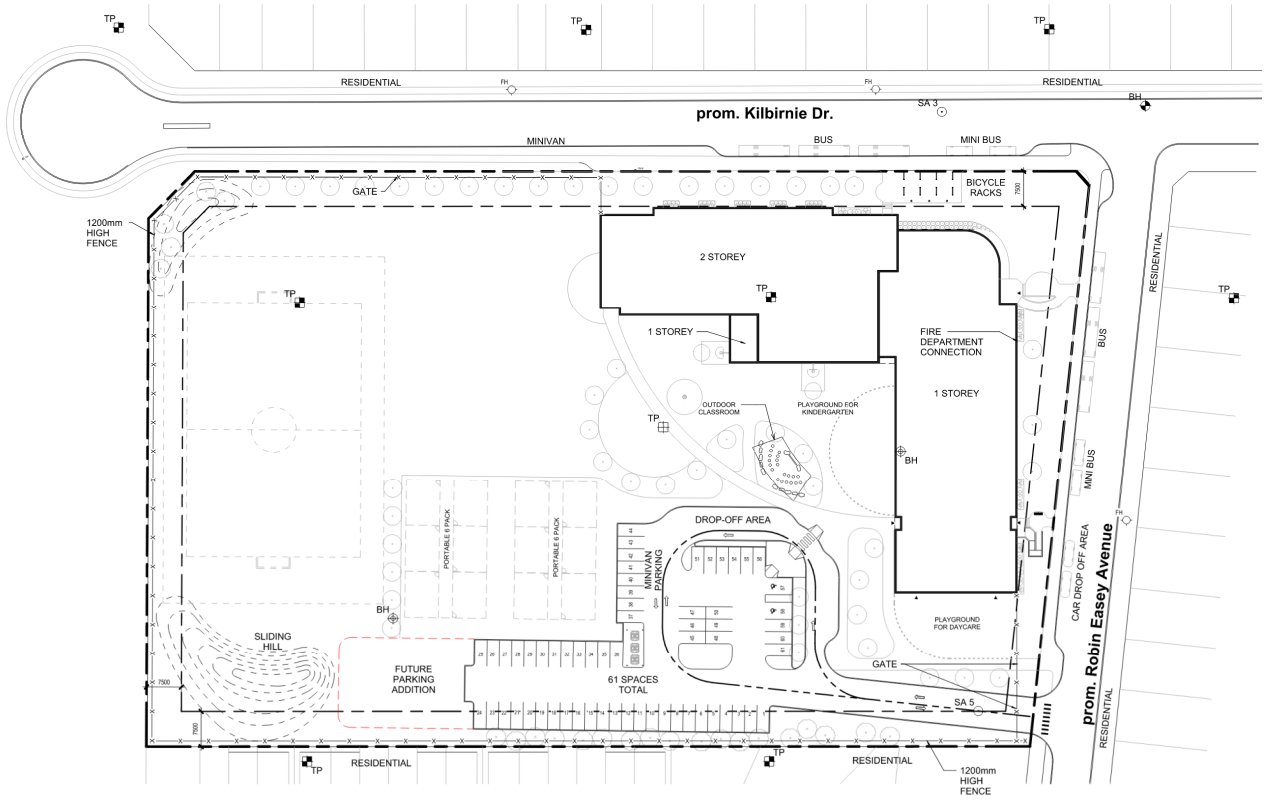


Figure 1-1 Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be in conformance with zoning and related requirements prior to approval and construction and is understood to be in conformance with current zoning.

1.5 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on August 27, 2021. Notes from this meeting are provided in Appendix A.

1.6 HIGHER LEVEL STUDIES

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (20 June 2012)
    - Technical Bulletin ISDTB-2014-01 (05 February 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (21 March 2018)
    - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
    - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
    - Technical Bulletin ISTB-2018-02 (21 March 2018)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Site Servicing Report – Quinn's Pointe Stage 2 Greenbank Road, Ottawa, ON, J.L. Richards & Associated Limited, Project 26610-001, Revision 2, dated April 9, 2019. (Includes water, sanitary and storm servicing.)
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 1999.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed modification of the site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

Existing sanitary and storm sewers, and a watermain stubs have been provided from Kilbirnie Drive to the north of frontage of the site. The sanitary sewer will extend from the existing stub to the proposed Elementary School. The storm sewer will be connected to the existing 600 mm stub and flows from south to north. Water, sanitary and storm sewer stubs have already been provided to the property boundary during the time of construction of Kilbirnie Drive. The works provided by the subdivision developer have already included the water valve and box at the property line, and all work within the right of way, excluding the driveway entrances. However, the portable classrooms are located at the middle of the site, at the back of the school building, not fronting to neither of Kilbirnie Drive or Robin Easey Ave, a private fire hydrant will be required to provide fire flow. And as requested by the city, two watermain connections are required for the proposed site. A private 150 mm – 200 mm water services will be routed from Kilbirnie Drive to Future Greenbank Road 305 watermain to provide redundancy to the site. A new 200 mm building water service will be tapped into the private water looping. The storm flows from Kilbirnie Drive (servicing the school site) will be directed to River Mist Road storm sewer which are ultimately to be

directed to the previously BSUEA design dry pond adjacent to existing Greenbank Road. The dry pond will provide quality and quantity treatment for the Quinn's Pointe Stage 2 subdivision development and including the school site. Quality control is not required on the school site, but quantity control is required to restrict the discharge for all events up to a 100-year event to the 5 year flow rate provided by J.L. Richards & Associates Limited. In 2015, storm servicing for the Quinn's Pointe Stage 1 lands was developed and subsequently approved by regulatory agencies. Storm runoff from Stage 1 and future stages (2, 3 and 4) were to be conveyed by local storm sewers, which discharged to the Corrigan SWMF via the Greenbank Road trunk storm sewer system.

Site access for vehicles will be provided from Robin Easey Ave. The driveways being provided are two-way entrances at the southeast corner of the site.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

There are no watercourses, municipal drains or environmentally significant areas on the site, but currently there are areas of environment significance on adjacent properties. The status of these areas will be changing as the area is developed. The building program proposed for the site is not subject to any restrictions associated with the surrounding lands.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

The existing and proposed grading are shown on Drawings C03 - Grading Plan. Existing grading was identified in a topographic survey and is noted in the background of Drawings C03. The proposed grading will be reviewed by the geotechnical engineer. The geotechnical investigation was completed on November 2, 2018 by Paterson Group. The grading along the site boundaries bordering Quinn's Pointe Stage 2 lands will be coordinated with Quinn's Pointe Stage 2's engineering consultant. The site topographic survey provides evidence of direction of overland flow of the site. Minor grade changes will be made to grades at the development perimeter for the proposed bus drop off lay-by location.

1.11 IMPACTS ON PRIVATE SERVICES

There are no existing domestic private services (septic system and well) located on the site. There are no neighbouring properties using private services.

1.12 DEVELOPMENT PHASING

No development phasing has been detailed for the site. The site plan does indicate possible future development of additional parking lots. The impervious area associated with the future development has been taken into account in the stormwater management calculations. The future hard surfaces take up a bit of the green space than the current condition, and therefore were conservatively used in the calculation of runoff.

1.13 GEOTECHNICAL SUTDY

A geotechnical investigation report has been prepared by Paterson Group. (Report PG4748-1, November 2, 2018), and its recommendations has been taken into account in developing the engineering specifications.

1.14 DRAWING REQUIREMENT

The engineering plans submitted for site plan approval will be in compliance with City requirements.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

There are existing 305mm diameter municipal watermain along Kilbirnie Drive and Future Greenbank Road, and 203mm diameter municipal watermain along Robin Easey Ave providing water to the property. The new elementary school will be protected with a supervised automatic fire protection sprinkler system and will require a 203mm diameter water service. The fire department connection is located at the north of the 1 storey building fronting to Kilbirnie Drive. It is 45m away from the existing municipal FH on Kilbirnie Drive. No changes are required to the existing City water distribution system to allow servicing for this property. Two connections with isolation valves will be made to the existing 305 diameter municipal watermain on Kilbirnie Drive and Future Greenbank Road from the proposed development site. The Dual 150mm - 203mm diameter private watermain looping connecting the existing 305mm municipal watermain will provide redundancy for the school building. The 203mm dia. water services from the building mechanical room will be tapped into the private watermain looping. A new private fire hydrant will be connected to the private watermain looping to provide adequate fire flow to the portable classrooms in the middle of the site.

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

Boundary conditions have been provided by the City of Ottawa at four locations with the existing stage 1 watermain distribution system during the development of the Quinn's Pointe Stage 2, 3 and 4 lands. A max fire flow of 250 L/s (15,000 L/min) was used from the hydraulic model provided by J.L. Richards. The J.L. Richards hydraulic modelling indicated the hydraulic pressure for different scenario conditions were shown below, based on fire flows and domestic demands estimated by J.L. Richards for the proposed institutional land.

Table 2-1: Boundary Conditions (J.L. Richards Site Servicing Report)

BOUNDARY CONDITIONS				
SCENARIO	Head (m) @ Connection 1	Head (m) @ Connection 2	Head (m) @ Connection 3	Head (m) @ Connection 4
Basic Day (MAX HGL)	156.8	156.8	156.7	156.7
Peak Hour (MIN HGL)	141.9	142.1	141.9	141.9
Max Day + Fire Flow	135.0	127.8	128.9	128.9

Table 2-2: J.L. Richards Hydraulic Modelling Results for Quinn's Pointe – Build-Out

Hydraulic Modelling Results @ J-2	
SCENARIO	Hydraulic Pressure (kPa)
Basic Day (MAX HGL)	425
Peak Hour (MIN HGL)	396
Available Fire Flow @ H-2, H-3, H-9	
Max Day + Fire Flow	503 L/s, 400 L/s, 249 L/s

An updated boundary condition has also been provided by the City of Ottawa at the connection location along Kilbirnie Drive. A revised fire flow of 133 l/s (8,000 l/min) was estimated for the proposed school with using the FUS calculation method.

Table 2-3: Boundary Conditions (New)

BOUNDARY CONDITIONS AT KILBIRNIE DR	
SCENARIO	Head (m) @ Connection
Basic Day (MAX HGL)	157.2
Peak Hour (MIN HGL)	140.8
Max Day + Fire Flow (ICI)	145.9

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as institutional development, consisting of classroom, gymnasium and kitchen. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

	WSP (2018 Bulletin)	J.L.Richards
Average Day	0.79 L/s	0.79 L/s
Maximum Day	1.18 L/s	1.18 L/s
Peak Hour	2.13 L/s	2.13 L/s

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in 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 — Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

A water model software, WaterCAD was used to perform the water distribution analysis for the proposed development including proposed the proposal elementary school building and portable classroom. The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 356 kPa for the school building which exceed the minimum requirement of 276 kPa per the guidelines. Refer to Appendix B for detail water distribution analyze output.

Table 2-4: Summary of the minimum water pressure under peak hour scenario

Peak Hour @ 140.8m	
ID	Pressure (kPa)
J-1	356.5
J-2	349.7
J-3	359.4
J-4	353.6
J-5	337.9
J-6	324.9
J-7	330.7
J-10	353.6

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures. Assuming fire resistive construction and a fully supervised sprinkler system, a fire flow demand of 8,000 L/min (133 L/s) for the new elementary school has been calculated. The fire flow rate of 6,000 l/min (100 L/s) is calculated for the future portable classrooms. Copy of the FUS calculations are included in Appendix B.

The demand of 8,000 L/min can be delivered through two existing municipal fire hydrants. The existing two public hydrants are located at the north of the proposed building on Kilbirnie Drive. One is within 85 m of the FDC and is rated at 3800 l/min each. The other one is within 45 m of the building FDC, and is rated at 5700 L/min. The two hydrants have a combined total of 9,500 L/min.

The demand of 6,000 L/min from the portable classrooms can also be met through the combination of two fire hydrant, one proposed private fire hydrant and one existing public fire hydrant on Kilbirnie Drive. The two hydrants have a combined total of 9,500 L/min.

The proposed building on site will be serviced by 203 mm services off the existing 305 mm watermain from Kilbirnie Drive. The services will run into the water entry room. The proposed building will be fully sprinklered and fire protection will be provided with the fire department Siamese connection within 45 m of the existing public fire hydrant from Kilbirnie Drive. The Siamese connection is located on the north side of the building.

The boundary condition for Maximum Day and Fire Flow results the available fire flows of 211.8 L/s and 163.5 L/s at J-1 and J-10. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As the available demand fire flow is achieved, the fire flow requirement is exceeded.

Table 2-5: Summary of the available fire flow under Max Day + Fire scenario

Max Day + Fire @ 133 L/s	
ID	Available Fire Flow (L/s)
J-1	211.8
J-10	163.5

2.5 CHECK OF HIGH PRESSURE

High pressure is not a concern. The maximum water pressure inside the building at the connection is determined with the maximum HGL condition, resulting in a pressure of 514.3 kPa which is less than the 552 kPa threshold in the guideline in which pressure control is required. Based on this result, pressure control is not required for this building.

2.6 PHASING CONSTRAINTS

No development phasing has been detailed for the site. The site plan does indicate possible future development of additional parking lots. The projected occupancy load has been taken into account in the fire demand and water demand calculations. No phasing constraints exist.

2.7 RELIABILITY REQUIREMENTS

Two shut off valves are provided for the private watermain at the study boundary from Kilbirnie Drive and Future Greenbank Road. And two shut off valves are provided for the services connection before connecting to the building internal water system. Water can be supplied both sides of the Kilbirnie Drive and Future Greenbank Road, west and north and can be isolated.

2.8 NEED FOR PRESSURE ZONE BOUNDARY MODIFICATION

There is no need for a pressure zone boundary modification.

2.9 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The current infrastructure is capable of meeting the domestic demand based on City requirements and fire demand as determined by FUS requirements for the proposed building.

2.10 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

A 150 - 203 mm private watermain looping is proposed to be provided into the proposed elementary school. The two 203 mm private water services will be merge inside the building before connecting to the water meter. One private hydrant is required for this site.

2.11 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feedermains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent developments.

2.12 CALCULATION OF WATER DEMANDS

Water demands were calculated as described in Sections 2.3 and 2.4 above.

2.13 MODEL SCHEMATIC

The water works consist of a private watermain looping, dual building services, and one new private fire hydrant. A model schematic is provided with WaterCAD for this development.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design;

- Minimum Velocity 0.6 m/s
- Maximum Velocity 3.0 m/s
- Manning Roughness Coefficient 0.013
- Total est. hectares institutional use 2.40
- Average sanitary flow for institutional use 28,000 L/Ha/day
- Commercial/Institutional Peaking Factor 1.5
- Infiltration Allowance (Total) 0.33 L/Ha/s
- Minimum Sewer Slopes – 200 mm diameter 0.32%

The area of 2.40 ha represents the lot area of the new building and immediate surrounding area to the sides of the new building. This is the sanitary collection area that is being considered to contribute to the new 200mm sanitary service extending from the existing 200mm sanitary sewer stub provided at the south side of the Kilbirnie Drive to the new building.

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the sanitary service from the proposed building is the 200 mm diameter municipal sewer on Kilbirnie Drive.

The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on institutional development.

The criteria to determine anticipated actual peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are as follows;

- Institutional 28000 L/Ha/day = 0.324 L/Ha/s
- Peak flow = (0.324 L/Ha/s x 2.40 ha x 1.5 peaking factor) + 0.33 l/Ha/s x 2.40 ha = 1.96 L/s

The on-site sanitary sewer network has been designed in accordance with 1.96 L/s as described above.

3.3 REVIEW OF SOIL CONDITIONS

There are no specific local subsurface conditions that suggest the need for a higher extraneous flow allowance.

3.4 DESCRIPTION OF EXISTING SANITARY SEWER

The outlet sanitary sewer is the existing 200 mm diameter sewer on Kilbirnie Drive. This local sewer will outlet to existing gravity sanitary sewers which all eventually outlet to the Greenbank Road 900 mm diameter trunk sanitary sewer. The Greenbank Road trunk sanitary sewer ultimately discharges to the South Nepean Collector (SNC) and to the West Rideau Collector (WRC) which, in turn, outlets to the Robert O. Pickard Environmental Centre (ROPEC) where wastewater is processed and treated prior to discharge into the Ottawa River.

3.5 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The capacity of the existing 200 mm diameter sanitary sewer stub at 0.99% slope is 32.63 L/s, which is adequate for the flow assumptions from the proposed site as noted above. This existing sanitary sewer stub was designed by J.L. Richards to service the proposed 2.40 ha of institutional land.

3.6 CALCULATIONS FOR NEW SANITARY SEWER

The 200 mm diameter sanitary service from the sanitary monitoring manhole 1 to the building will have a slope of 8.0 %, and a capacity of 92.77 L/s, with a velocity of 2.95 m/s. The 200 mm diameter sanitary service from the sanitary monitoring manhole 1 to the existing sanitary manhole on Kilbirnie Drive have a slope of 1.00 %, and a capacity of 32.80 L/s with a velocity of 1.04 m/s. The servicing pipe capacity exceeds the estimated peak sanitary flow rate of 1.96 L/s for the proposed development site.

3.7 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed sanitary sewer network on site will consist of a 200 mm diameter building service, and one new 1200 mm diameter manholes.

3.8 ENVIRONMENTAL CONSTRAINTS

There are no previously identified environmental constraints that impact the sanitary servicing design in order to preserve the physical condition of watercourses, vegetation, or soil cover, or to manage water quantity or quality.

3.9 PUMPING REQUIREMENTS

The proposed development will have no impact on existing pumping stations and will not require new pumping facilities.

3.10 FORCE-MAINS

No force-mains are required specifically for this development.

3.11 EMERGENCY OVERFLOWS FROM SANITARY PUMPING STATIONS

No pumping stations are required for this site, except as required internally for the plumbing design to service the lower area of the building.

3.12 SPECIAL CONSIDERATIONS

There is no known need for special considerations for sanitary sewer design related to existing site conditions.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The subjected property is located within the Quinn's Pointe Stage 2 Development area west of Robin Easey Ave and South of Kilbirnie Drive. Most runoff from the institutional land is ultimately directed to a 675 mm diameter storm sewer on Kilbirnie Drive which runs west to east toward existing Greenbank Road. The existing piped stormwater system within Quinn's Pointe Stage 2 subdivision development conveys drainage to two dry ponds adjacent to existing Greenbank Road along with a spill-over dry pond abutting Barnsdale Road, west of the CDP boundary to prevent major overland flow from reaching new Greenbank Road, an arterial road.

The available drainage outlet from the school site is the existing 600 mm diameter concrete storm sewer, located in south side of the Kilbirnie Drive.

Based on the J.L. Richards servicing report, drainage released from the site to the City storm sewer is limited to 507 l/s. Flow exceeding this amount up to the 100-year storm have to be retained on the site. Drainage in excess of the minor system capacity currently flows overland to the Kilbirnie Drive and Robin Easey Ave R.O.W.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

Using the Rational Method, with coefficient of 0.25 for pervious areas, 0.40 for playground, 0.75 for gravel areas and 0.9 for impervious areas, and a 10-minute time of concentration, results in an estimated 2-year flow of 286.7 l/s from this area. The receiving 600 mm diameter storm sewer has been designed with the capacity to accept 614 l/s from the school site. Capacity in the minor system is not a concern.

4.3 DRAINAGE DRAWING

Drawing C04 shows the detail site sewer network. Drawings C03 provides proposed grading and drainage, and include existing grading information. Drawing C05 provides a post-construction drainage sub-area plan. Site sub-area information is also provided on the storm sewer design sheet attached in Appendix C. An overall grading plan and Servicing plan have also been attached to Appendix C for reference.

4.4 WATER QUANTITY CONTROL OBJECTIVE

The water quantity objective for the site is to limit the flow release to 507 L/s. Excess flows above this limit for the school site up to those generated by the 100 year storm event from drainage on the school site are temporarily stored on site.

No provision is required on the school's site to accommodate any flow from the adjacent lands. All flows exceeding the defined minor system capacity and on-site storage capability will enter the major system, with overflow to the City right of way, on the north and east boundaries of the site.

The maximum overland runoff spill elevations for this site are 104.14 to the southeast and 104.20 to the north, and one 400 mm dia. circular plate ICDs is proposed to be used on the outlet inside CBMH5 to restrict the flow rate leaving the site to 255 L/s at 3.54 m head, based on the maximum ponding elevation of 104.10. In theory, the runoff water will be detained on site up to the 100-yr rainfall event, and for those scenarios exceeding 100-yr rainfall event, the runoff water will be discharged

offsite once all the available storage areas have reached their maximum capacities. The school site can provide a total of 237.65 m^3 of surface storage volume, but the required storage for 100-yr will be only 160.62 m^3. The ponded water will not reach the spill elevation under 100 year and lesser events. The site has more storage capacity than required as a result of the grading design. This will allow extra detention of water on the site during extreme events and will reduce stress on the downstream stormwater management dry pond. If rain falls at a rate higher than the soccer field soil can absorb, then the runoff will be directed to the downstream designated locations shown on the drawings. If the soccer field and landscaped areas allow for infiltration, the available surface storage volume will be further increased. In theory, the use of higher runoff coefficients C=0.25 for landscaped surfaces already accounts for a certain degree of absorption in these areas.

4.5 WATER QUALITY CONTROL OBJECTIVE

The site is not required to achieve water quality objectives. Water quality objectives are achieved through downstream works as noted in the J.L. Richards Servicing Report.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.

Some of the key criteria include the following:

- Design Storm (minor system) — 1:2 year return (Ottawa)
- Rational Method Sewer Sizing
- Initial Time of Concentration — 10 minutes
- Runoff Coefficients
    - Landscaped Areas — C = 0.25
    - Playground Mulch Areas — C = 0.40
    - Gravel Areas — C = 0.75
    - Asphalt/Concrete — C = 0.90
    - Traditional Roof — C = 0.90
- Pipe Velocities — 0.80 m/s to 6.0 m/s
- Minimum Pipe Size — 250 mm diameter (200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

The detailed design for this site will maintain the existing storm sewer network to Kilbirnie Drive of the development site. The drainage system consists of a series of manholes, catchbasins and storm sewers leading to the outlet manhole STM MH2 at the west of the site. All drainage areas on the site are collected in the site piped drainage system.

It is also customary for larger buildings to be provided with piped storm services for roof drainage. There are no downspouts proposed. Separate outlet pipes are provided for foundation drains and roof drains, and therefore roof drainage will not negatively impact the foundation. The storm services are connected to the storm sewer downstream of CBMH5 which is downstream of the controlled flow point, ensuring an unobstructed flow for these areas.

Using the above noted criteria, the existing on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated post development storm sewer drainage area plan are included in Appendix C.

4.8 STORMWATER MANAGEMENT

The subject site will be limited to a release rate of 507 L/s established by J.L. Richards, this will be achieved through the inlet control devices at the downstream of CBMH5.

Flows generated that are in excess of the site's allowable release rate will be stored on site in surface storage areas or by the use of roof top storage and gradually released into the minor system so as not to exceed the site's allocation.

The maximum surface retention depth of the developed areas will be limited to 200mm during a 1:100 year event. Maximum ponding levels are 240mm prior to spill over. The maximum ponding elevation is 104.14m, which is well below the building ground floor level of 104.55m.

No surface ponding will occur during a 2 year event, and only minimal ponding will occur during a 5 year event.

Overland flow routes will be provided in the grading to permit emergency overland flow from the site. The overflow routes will eliminate any increase in ponding depth for events exceeding 100 years.

At certain locations within the site, the opportunity to store runoff is limited due to grading constraints and building geometry. These locations are located at the perimeter of the site where it is necessary to tie into public boulevards, and it is not always feasible to capture or store stormwater runoff.

The site grading and ponding has been designed to control water generated during the 1:100-year event, with no overflow leaving the site at this control level. Please refer to the SWM Calculations in Appendix C.

4.9 INLET CONTROLS

According the J.L. Richards Servicing Report, the maximum allowable release rate for the 2.40 ha site is 507 L/s.
As noted in Section 4.8, portions of the site including the roof runoff will be left to discharge directly to the right of way and piped system at an uncontrolled rate.

$$Q_{(uncontrolled)} = 2.78 \times C \times I_{100yr} \times A$$

Therefore, the combined uncontrolled release can be determined as:

$$= 252 \text{ L/s}$$

The maximum allowable release rate from the remainder of the site can then be determined as:

$$Q_{(controlled)} = Q_{(total\ allowable)} - Q_{(uncontrolled)}$$
$$= 507 \text{ L/s} - 252 \text{ L/s}$$
$$= \mathbf{255\ L/s}$$

Based on the flow allowance at the outlet location, CBMH5, inlet control device (ICD) was chosen in the design. The design of the inlet control device is unique to the associated drainage areas and is determined based on a number of factors, including hydraulic head and allowable release rate. The inlet control device will be designed according to the manufacturer's design charts. The restrictions will cause the on-site catchbasins and manholes to surcharge, generating surface ponding in the parking and landscaped areas. Ponding locations and elevations are summarized on the drainage areas plan C05.

4.10 ON-SITE DETENTION

Any excess storm water up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided in parking and landscape areas and building rooftops, where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area. It should be noted that greater than 0.30 m of vertical separation has been provided from all maximum ponding elevations to lowest building openings.

The following Table summarizes the on site storage requirements during the 1:100-year events.

Table 4-1: On-Site Storage Requirements

Total Area (Ha)	Location	Controlled/ Uncontrolled	Runoff Coefficient		Outlet Location	Total Storage Provided (m^3)	100-Year Controlled/Uncontrolled	
			2 & 5 Year	100 Year			Restricted Flow (L/s)	Required Storage (m^3)
1.755	Surface	Controlled	0.53	0.60	CBMH5	237.65	255.00	160.62
0.389	Building Roof	Uncontrolled	0.90	0.99	STM MH2	0	191.20	0
0.154	Robin Easey Ave	Uncontrolled	0.47	0.54	R.O.W.	0	41.30	0
0.098	Kilbirnie Drive	Uncontrolled	0.33	0.40	R.O.W.	0	19.50	0
TOTAL						**237.65**	**507**	**160.62**

In all instances the required storage is met with surface ponds which retain the stormwater and discharge at the restricted flow rate to the sewer system. Refer to the grading plan for storage information.

The following Table summarizes the inlet control device to be utilized on the site.

Table 4-2: ICD Type

Structure ID	PROPOSED ICD			
	100-YR Head	Flow (L/s)	Type	OUTLET DIA.
CBMH5	3.54	255	250 mm Dia. Circular ICD	525 mm Dia. CONC.

As demonstrated above, the site uses new inlet control device to restrict the 100 year storm event to the criteria approved by the City of Ottawa. Restricted stormwater will be contained onsite by utilizing surface ponding storage. In the 100 year event, there will be no overflow off-site from restricted areas.

The sum of controlled and uncontrolled release rates on the site is 507 L/s, which is the same as the maximum allowable release of 507 L/s noted in Section 4.9.

4.11 WATERCOURSES

The minor flow will be directed to the previous design dry pond adjacent to existing Greenbank Road via the piped system for Quinn's Pointe Stage 1 and 2 development areas.

4.12 PRE AND POST DEVELOPMENT PEAK FLOW RATES

Pre and post development peak flow rates for the impacted areas of the site have been noted in storm sewer design sheet.

4.13 DIVERSION OF DRAINAGE CATCHMENT AREAS

There will be no diversion of existing drainage catchment areas arising from the proposed work described in this report.

4.14 DOWNSTREAM CAPACITY WHERE QUANTITY CONTROL IS NOT PROPOSED

This checklist item is not applicable to this development as quantity control is provided.

4.15 IMPACTS TO RECEIVING WATERCOURSES

No significant negative impact is anticipated to downstream receiving watercourses due to proposed quantity and quality control measures, the separation of the site from the eventual receiving watercourse as a result of discharge through City owned sewers, and the planned stormwater management dry ponds adjacent to the existing Greenbank Road.

4.16 MUNICIPAL DRAINS AND RELATED APPROVALS

There are no municipal drains on the site or associated with the drainage from the site.

4.17 MEANS OF CONVEYANCE AND STORAGE CAPACITY

The means of flow conveyance and storage capacity are described in Sections 4.7, 4.8, 4.9 and 4.10 above.

4.18 HYDRAULIC ANALYSIS

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet.

4.19 IDENTIFICATION OF FLOODPLAINS

There are no designated floodplains on the site of this development.

4.20 FILL CONSTRAINTS

There are no known fill constraints applicable to this site related to any floodplain. The site is generally being raised higher relative to existing conditions. No fill constraints related to soil conditions are anticipated, as confirmed in the geotechnical report.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings will be used including;

- Filter cloths will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use;
- Installation of silt fence, where applicable, around the perimeter of the proposed work area;
- The installation of straw bales within existing drainage features surround the site;
- Bulkhead barriers will be installed in the outlet pipes;

During construction of the services, any trench dewatering using pumps will be fitted with a “filter sock.” Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan C06 provided in Appendix D.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval and building permit approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

This is a first submission; no comment is available.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- SURVEY TOPO
- SERVICING REPORT BY J.L. RICHARDS (EXCERPTS ATTACHED)

Yang, Winston

From: MacDonald, Jill
Sent: September 22, 2021 3:27 PM
To: Yang, Winston
Cc: Zhang, Jingwei; Gauthier, Marc; Garbos, Justyna
Subject: FW: Pre-con Follow-up - 1045 Kilbirnie
Attachments: Landscape Plan Quinn'sPointeStg2A-Rev03-approved.pdf; Pre-con Applicant's Study and Plan Identification List 1045 Kilbirnie.pdf

Hi Winston,

As requested, please see below. The Engineering notes are highlighted in yellow for your reference.

- File Lead: Mélanie Gervais, Planner III (A), Development Review, Phone: 613-580-2424 ext. 2405, email: Melanie.Gervais@ottawa.ca
- Engineering Contact: Sharif Sharif, Project Manager, email: Sharif.Sharif@ottawa.ca

Kindly copy myself and @Garbos, Justyna on any correspondence with the City.

Thank you,

Jill MacDonald, BES
Planner
Planning, Landscape Architecture and Urban Design
(she/her)

T+ 1 613-690-3936
Ottawa, ON

From: Gervais, Melanie <Melanie.Gervais@ottawa.ca>
Sent: Thursday, September 9, 2021 3:21 PM
To: MacDonald, Jill <Jill.MacDonald@wsp.com>
Subject: Pre-con Follow-up - 1045 Kilbirnie

Hello Jill,

Please refer to the below notes regarding the Pre-Application Consultation (pre-con) Meeting held on August 27th for the property at 1045 Kilbirnie for a Site Plan in order to allow the development of a school. I have also attached the required Plans & Study List for application submission.

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

Planning

- Policies and provisions :
  - ZBL: I1A/R3YY[2527] – Please ensure Site Plan has a chart listing all applicable provisions.

        - Barrhaven South Expansion Area CDP: land use designation is “school”, please review Section 7.3.8 Policies for School Sites and ensure the Planning Rationale goes through these requirements.
        - OP : General Urban Area
        - New OP: Suburban Transect with evolving neighborhood overlay
    - Ensure appropriate connection to the two existing walkway blocks connecting to sidewalks.
    - Barrier Free parking spaces (Type A and Type B) are required as per section 3.1.2 table 3 of the Accessibility Design Standards (link).
    - The Landscape Plan must be stamped by a Landscape Architect.
    - The approved Landscape Plan for the subdivision showed only one bus lay-by, see attached. Please ensure no net loss of approved street trees.
    - Include additional landscaping along the southern boundary, especially between the parking area/bus loop and the residential.
    - The bus lay-bys are recommended but should be all within the City ROW.
    - 2021 Fees:
        - If over 1860 sq.m. it will trigger a Site Plan – Complex (Manager approval): $48,298.80 plus engineering review fees ($1000 to $10,000) plus conservation authority fee ($1,040)
        - If less then (or equal to) 1860 sq.m. it will trigger a Site Plan – Standard: $18,780.86 plus engineering review fees ($1000 to $10,000) plus conservation authority fee ($1,040)

Urban Design

- Further thought must be given to future Greenbank Rd and how to address the corner, portables at this location are not acceptable. There are various options that could be discussed, i.e. a linear building, reorienting the soccer pitch north-south along Greenbank… We are open to discussing options prior to Site Plan submission.
- Please ensure adequate buffering between the parking and the residential, i.e. coniferous trees.
- The current configuration of the lay-bys creates issues as it’s pushing the sidewalk onto private land, please review.

Feel free to contact the Urban Design Planner, Mark Young, at Mark.Young@ottawa.ca, for follow-up questions.

Engineering

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications
2. Servicing and site works shall be in accordance with the following documents:
    - ⇨ Ottawa Sewer Design Guidelines (October 2012)
    - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
    - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
    - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
    - ⇨ City of Ottawa Accessibility Design Standards (2012)
    - ⇨ Ottawa Standard Tender Documents (latest version)
    - ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. The Stormwater Management Criteria (general), for the subject site, is to be based on the following:
   i. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
   ii. For separated sewer system built pre-1970 the design of the storm sewers are based on a 2 year storm.
   iii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
   iv. A calculated time of concentration (Cannot be less than 10 minutes).
   v. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.

Existing Services:
Water:
Kilbirnie: 200 mm (STUB).
Sanitary:
Kilbirnie: 200 mm (STUB).

Storm:
Kilbirnie: 600 mm (STUB).

5. Deep Services (Storm, Sanitary & Water Supply)

i. *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.*
ii. *Connections to trunk sewers and easement sewers are typically not permitted.*
iii. *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).*
iv. *Review provision of a high-level sewer.*
v. *Provide information on the type of connection permitted*

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.
e. *No submerged outlet connections.*

6. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
   i. Location of service
   ii. Type of development and the amount of fire flow required (as per FUS, 1999).
   iii. Average daily demand: ___ l/s.
   iv. Maximum daily demand: ___l/s.
   v. Maximum hourly daily demand: ___ l/s.
7. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
8. Site Specific Comments –
   i. SWM criteria (major & minor system) should be as per Quinn's Point Stage 2 subdivision design.
   ii. Water supply redundancy will be required for more than 50 m3/day water demand.
   iii. Site-specific Geotechnical study/ brief is required.
   iv. Provide a Stormwater quality control discussion in the report and it is recommended to consult with Rideau Valley Conservation Authority (RVCA).

Feel free to contact the Infrastructure Project Manager, Sharif Sharif, at Sharif.Sharif@ottawa.ca, for follow-up questions.

Transportation

- A TIA is warranted, proceed to scoping.
- The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package.
- Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
- Synchro files are required at Step 4.

- To decrease review turnaround time, steps 3 and 4 may be combined.
- Modifications (laybys) to existing roads require an RMA report.
- No ROW protection.
- Corner sight triangle: 5m x 5m
- A Road Noise Impact Study is not required.

Feel free to contact the Transportation Project Manager, Mike Giampa, at Mike.Giampa@ottawa.ca, for follow-up questions.

Environmental

- Bird-safe Design
- Given the scale of the proposal (mid to high rise) the proposal will need to review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

- Landscaping - the OP Section 4.9 has some policies addressing energy conservation through design - in particular for this site, I would recommend considering shading of outdoor space to combat urban heat island and to provide some opportunities for shaded outdoor amenities like outdoor classrooms and limiting the use of black asphalt. Try to maximize tree planting to provide shade.

- Street trees are also important and should be provided.

- Location of the playgrounds adjacent to drop-offs is not ideal due to vehicle idling and air pollution. Please look at this and find options to either increase separation between the two or mitigate. More information available from Birgit Isernhagen birgit.isernhagen@ottawa.ca

Trees

Landscape Plan tree planting requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
- Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.

- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

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

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

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

Parkland

Parkland Dedication:

The Parkland Dedication requirement is to be calculated as per the City of Ottawa Parkland Dedication By-law No 2009-95. Section 14 (1)(f) stipulates that "no conveyance of land or payment of money in-lieu under this by-law is required in the case of the development or redevelopment of a college or university or a school as defined by subsection 1(1) of the Education Act, where the school provides for the students' outdoor recreational needs on-site at the time of development.

The preliminary Site Plan shows the following outdoor recreational facilities that are currently proposed (confirmation is requested):

- Soccer field
- Play equipment for Kindergarten-aged students
- Play equipment for Daycare

Please confirm the above, and also whether play equipment will be provided for children above Kindergarten-age. Also please confirm whether any other recreation facilities will be provided on the grounds of the proposed school.

At this time, Parks & Facilities Planning considers this proposal exempt from parkland dedication. The application will be reviewed again during the Site Plan Control approval process.

Feel free to contact the Parks Planner, Jeannette Krabicka, at Jeannette.Krabicka@ottawa.ca, for follow-up questions.

City Surveyor

- The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at

the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
- Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Conservation Authority

- The RVCA has no concerns. The only comment is as part of the stormwater report provide confirmation that the site will tie into the downstream stormwater facility and will achieve water quality protection through downstream facilities prior to out letting to a natural watercourse.

Other

- Plans are to be standard A1 size (594 mm x 841 mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.
- For sites containing an educational institution with more than 350 students :
  - A Waste Reduction Workplan Summary is required for the construction project as required by O.Reg. 102/94, being "Waste Audits and Waste Reduction Work Plans" made under the Environmental Protection Act, RSO 1990, c E.19, as amended.
- You are encouraged to contact the Ward Councillor, Councillor Scott Moffatt, about the proposal.

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

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

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

Regards,

***Mélanie Gervais** MCIP, RPP*
Planner III (A) / Urbaniste III (i)
Development Review /
Examen des demandes d'aménagement
Planning, Infrastructure and Economic Development Department /
Services de la planification, de l'infrastructure et du développement économique
City of / Ville d'Ottawa
110, avenue Laurier Avenue West / Ouest,
4th Floor / 4ième étage
Ottawa, ON K1P 1J1
Tel. : 613-580-2424 ext. 24025
E-mail / Courriel : Melanie.Gervais@ottawa.ca
Mail Code: 01-14

Please note that I'm working from home during the COVID-19 pandemic.

'

'

TOPOGRAPHICAL PLAN OF SURVEY OF

BLOCK 261
REGISTERED PLAN 4M-1656
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 250

10 7.5 5.0 2.5 0 5 10 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT:

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 5th day of July, 2021.

Date

T. Hartwick
Ontario Land Surveyor

Notes & Legend

		Denotes
—○—	-	Survey Monument Planted
—■—	-	Survey Monument Found
SIB	-	Standard Iron Bar
SSIB	-	Short Standard Iron Bar
IB	-	Iron Bar
CC	-	Cut Cross
CP	-	Concrete Pin
IB#	-	Round Iron Bar
S&W	-	Spike & Washer
SSIB*	-	Short Standard Iron Bar
IB*	-	Iron Bar
(WIT)	-	Witness
Meas.	-	Measured
(AOG)	-	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	-	Plan 4M-1656
(P2)	-	(SG) Plan dated June 4th, 2020
(P3)	-	(SG) Plan dated June 15th, 2020
(P4)	-	(SG) Plan dated July 2nd, 2020
(P5)	-	(SG) Plan dated November 6th, 2020
(P6)	-	(SG) Plan dated December 1st, 2020
(P7)	-	(SG) Plan dated November 16th, 2020
(P8)	-	(SG) Plan dated May 28th, 2020
(P9)	-	(SG) Plan dated June 15th, 2020
(P10)	-	(SG) Plan dated June 22, 2020
(P11)	-	(SG) Plan dated June 16th, 2020
O_{FH}	-	Fire Hydrant
○ MH-ST	-	Maintenance Hole (Storm Sewer)
○ MH-S	-	Maintenance Hole (Sanitary)
—— ST ——	-	Underground Storm Sewer
—— S ——	-	Underground Sanitary Sewer
—— W ——	-	Underground Water
—— P ——	-	Underground Power
—— G ——	-	Underground Gas
—— FO ——	-	Underground Fibre Optic
—— OHW ——	-	Overhead Wires
□ CB	-	Catch Basin
CCP	-	Concrete Pipe
CPP	-	Corrugated Plastic Pipe
BOS	-	Bottom of Slope
TOS	-	Top of Slope
T/G	-	Top of Grate
T/P	-	Top of Pipe
INV	-	Invert
○ M-W	-	Monitoring Well
⊕ TB-B	-	Bell Terminal Box
○ UP	-	Utility Pole
+ 65.00	-	Location of Elevations
+ 65.00	-	Top of Concrete Curb Elevation
C/L	-	Centreline
	-	Property Line

SITE AREA = 24318.3 m²

Bearings are grid, derived from Registered Plan 4M-1656 and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

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. Sanitary and storm sewer inverts were derived from J.L Richards Job 26610-001.1 (drawing No.s 1 and 2).
4. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-11810
THIS PLAN IS NOT VALID UNLESS IT IS AN ORIGINAL COPY OR IT CONFORMS WITH THE EXCEPTIONS in accordance with Regulation 1026, Section 29 (5).

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: theam@aovltd.com

Ontario Land Surveyors

Job No. 21607-2L (DEF 8b26) 4M-1656 T. F. — 06

STAGE 4
FUTURE

STAGE 1
EXISTING

STAGE 2

STAGE 3
FUTURE

STAGE 4
FUTURE

KILBIRNIE DRIVE

BELLEEK LANE

LAURALEAF CRESCENT

RAMSGRANGE STREET

BRECKENRIDGE ROAD

KNOCKADERRY CRESCENT

GUINNESS CRESCENT

CLONFADDA TERRACE

RODDINGTON STREET

ROBINLEASE AVENUE

RIVER MIST ROAD

GALWAY STREET

TIBLIN STREET

GALTRA STREET

RALPH ERELE WAY

CAPPAMORE STREET

TEMPORARY JERSEY BARRIER

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

50m³ STORAGE REQUIREMENT DURING 1:100yr STORM
507 L/s RELEASE RATE DURING 1:5yr STORM

EXISTING BERM WITHIN LOTS TO REMAIN DURING SERVICING CONSTRUCTION, TO BE REMOVED BY OTHERS.

BLOCK 351
SCHOOL
2.43 Ha / 6.01 ac

BLOCK 353
PARKETTE
0.34 Ha / 0.85 ac

50m³ STORAGE REQUIREMENT DURING 1:100yr STORM
31 L/s RELEASE RATE DURING 1:5 YEAR STORM

300m³ STORAGE REQUIREMENT DURING 1:100yr STORM
497 L/s RELEASE RATE DURING 1:5yr STORM

BLOCK 352
SCHOOL
2.36 Ha / 5.83 ac

BLOCK 354
PARK
3.19 Ha / 7.88 ac

BLOCK 355
0.97 Ha
2.39Ha / 5.92 ac

40 STORAGE REQUIREMENT DURING 1:100yr STORM
1:100yr EVENT TO BE DIRECTED TO SOUTH POND
105 L/s RELEASE RATE DURING 1:5 YEAR STORM

CAMBRIAN RD
RENAUD CRESCENT
GREENBANK RD
TRANSCANADA HWY
STAGE 2
BORRISOKANE RD
BARNDALE AVE
QUINN'S POINTE STAGES 2, 3 & 4
HORNET AVE

KEYPLAN

LEGEND:

- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED STORM SEWER & MANHOLE

EXISTING TOPOGRAPHIC INFORMATION FROM CITY AND SUPPLEMENTED BY FIELD SURVEY (BY STANTEC JULY 2018)

UNITS REQUIRING PRESSURE REGULATING VALVES:
LOTS 197-200, 206-212, AND 221-224
TOTAL OF 16 LOTS.

REVIEWED BY DEVELOPMENT REVIEW BRANCH

Signed

Date 20-Jun-2019

Plan Number 16989

No.	ISSUE / REVISION	DD/MM/YY
06	ISSUED FOR EARLY COMMENCE WORK NOTIFICATION	19/JUN/19
05	ISSUED FOR CONSTRUCTION	13/MAY/19
04	ISSUED TO CITY FOR REVIEW - 3rd SUBMISSION ISSUED FOR TENDER ADDENDA	05/APR/19
03	ISSUED FOR TENDER	19/MAR/19
02	ISSUED TO CITY FOR REVIEW - 2nd SUBMISSION	14/FEB/19
01	ISSUED TO CITY FOR REVIEW - 1st SUBMISSION	07/NOV/18

VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:1500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER M. N. L. DALRYMPLE June 19/19 PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

MINTO COMMUNITIES INC.
QUINN'S POINTE STAGE 2

3960 GREENBANK ROAD

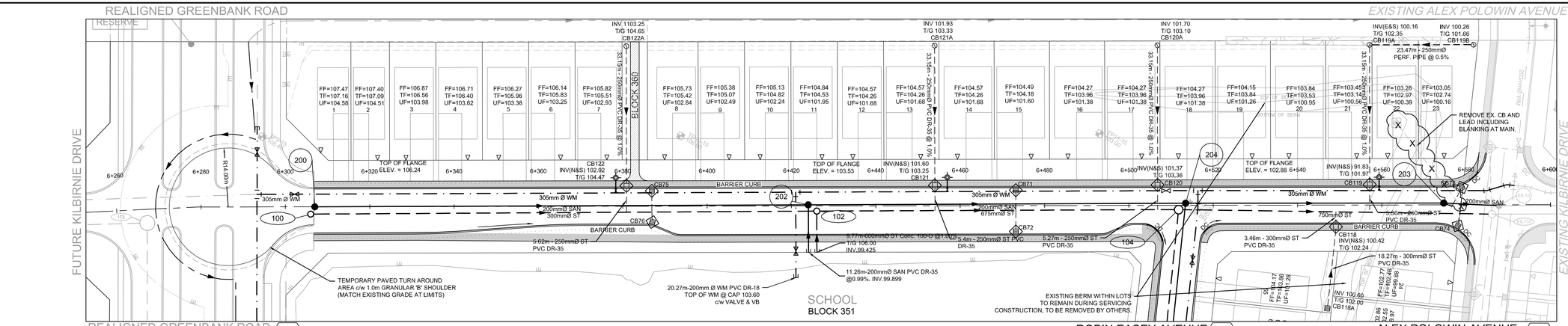
DRAWING:

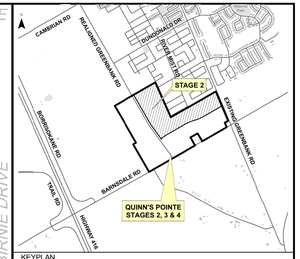
OVERALL SITE PLAN

DESIGN: AT	
DRAWN: CJM	DRAWING #:
CHECKED: LD	OS
JLR #: 26610-001.1	

PLOT DATE: Wednesday, June 19, 2019 3:24:44 PM

File Location: v:\26\000\26619 - barrhaven expansion - minto brazeau mattamy\26619-001.1 quinn's pointe phase 2\3-lf dwg\1-Civil\26619-001 C S1.dwg

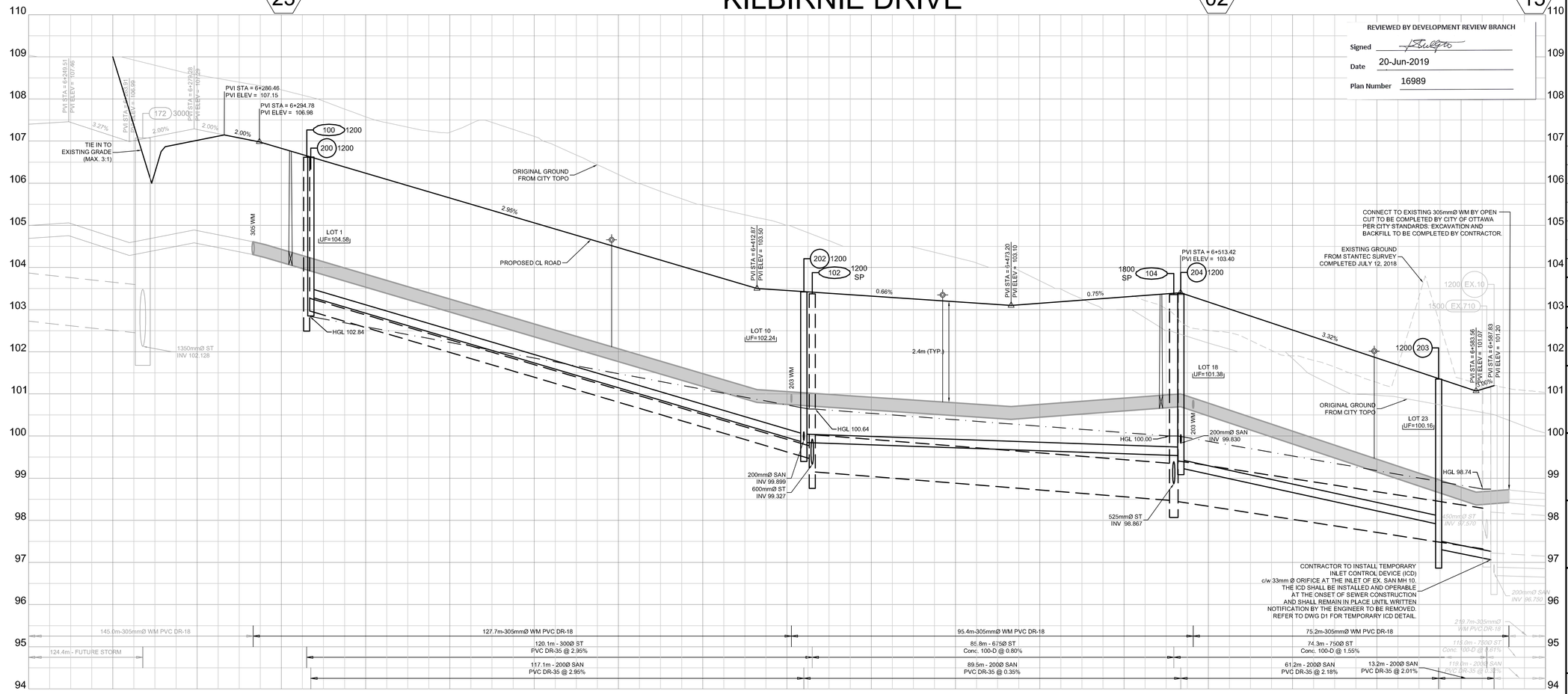




KEYPLAN

LEGEND:

- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN c/w ICD
- PROPOSED CLOSED COVER CATCH BASIN c/w ICD
- PROPOSED CATCH BASIN & LEAD
- PROPOSED ELBOW CATCHBASIN
- PROPOSED TEE CATCHBASIN
- PROPOSED 3-WAY CATCHBASIN
- 250mmØ PERFORATED PIPE AS PER CITY OF OTTAWA STANDARD DRAWING S29
- PROPOSED WATERMAIN, VALVE & HYDRANT
- PROPOSED WATERMAIN REDUCER
- EXISTING WATERMAIN, VALVE & HYDRANT
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED STORM SEWER & MANHOLE
- MANHOLE NUMBER AND SIZE (mm) C/W SAFETY PLATFORM PER OPSD 404.020
- HYDRODYNAMIC SEPARATOR
- SINGLE SERVICE CONNECTION (STORM, SANITARY AND WATER)
- DOUBLE SERVICE CONNECTION (STORM, SANITARY AND WATER)
- CONC. SIDEWALK
- ASPHALT SIDEWALK
- ASSUMED WATER TABLE DERIVED FROM THE PATERSON GROUP "GROUND WATER CONTOURS AND FLOW DIRECTION DRAWING PG-3757-1 REV.3 – HYDROGEOLOGICAL EXISTING CONDITIONS REPORT – PROPOSED BARRHAVEN SOUTH URBAN EXPANSION AREA COMMUNITY DESIGN PLAN DATED JULY 5, 2017 (NOT FOR CONSTRUCTION)"
- FW DENOTES FIRE WALL IN UNIT



DESIGN PROFILE ELEVATIONS	107.588	107.717	107.879	107.012	106.764	106.239	105.649	105.059	104.817	104.469	103.879	103.453	103.320	103.208	103.188	103.151	103.300	103.365	103.301	103.181	102.517	101.873	101.562	101.188	101.110	101.162	101.127	100.977
W.M. TOP ELEVATIONS				104.612 300x305 TEE	104.428	104.296 VALVE & VB		103.839		103.249		102.659	102.117 HYDRANT VALVE & VB	102.069		101.479	101.046	300x203 TEE	100.920	100.808 HYDRANT VALVE & VB	100.788		100.751		100.900	100.765 VALVE & VB	300x203 TEE	100.781		100.117		99.413 HYDRANT VALVE & VB	99.452		98.788	98.670 11.25° HORIZONTAL BEND	98.213 11.25° HORIZONTAL BEND	98.176 300x305 TEE TO EXISTING	
STORM SEWER INV. ELEVATION	103.900		102.453						102.989									98.568	98.568						97.416	97.340								
SANITARY SEWER INV. ELEVATION						103.299						99.948	99.446	99.255				99.335	99.239					97.905	97.315								
C.L. ROADWAY STATION	6+240.00	6+260.00	6+267.10	6+280.00	6+293.29	6+300.00	6+302.17	6+306.00	6+306.89	6+320.00	6+340.00	6+360.00	6+378.37	6+380.00	6+400.00	6+420.00	6+421.03	6+424.00	6+426.00	6+440.00	6+458.95	6+460.00	6+480.00	6+500.00	6+508.78	6+513.81	6+516.40	6+520.00	6+540.00	6+559.37	6+560.00	6+574.66	6+580.00	6+584.01	6+587.81	6+589.60	6+591.36	6+600.00

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REVIEWED BY DEVELOPMENT REVIEW BRANCH

Signed

Date 20-Jun-2019

Plan Number 16989

VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:500H, 1:50V

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER M. N. L. DALRYMPLE PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

MINTO COMMUNITIES INC.
QUINN'S POINTE STAGE 2

3960 GREENBANK ROAD

DRAWING:

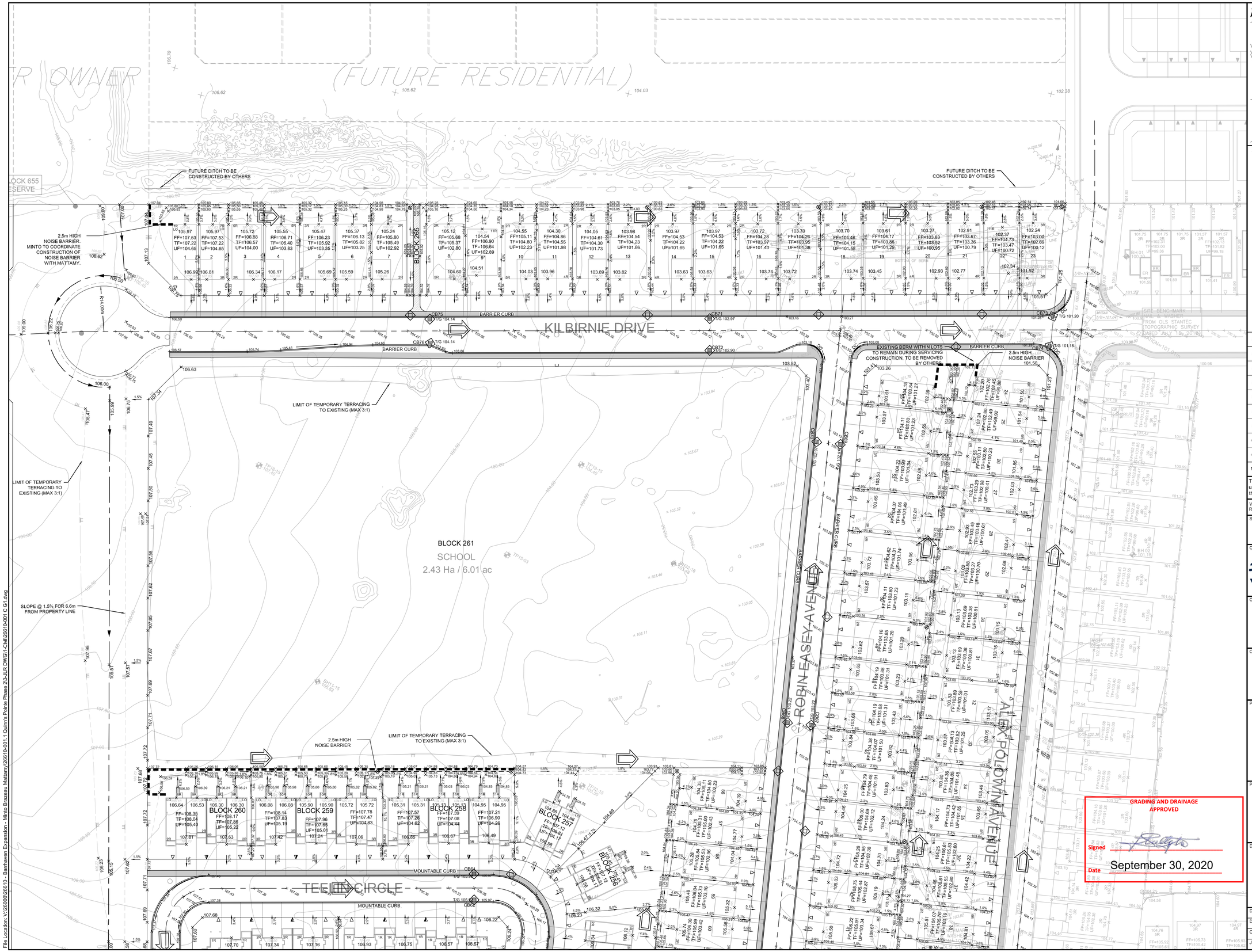
PLAN & PROFILE
KILBIRNIE DRIVE
STA. 6+240 TO 6+600

DESIGN:	AT
DRAWN:	CJM
CHECKED:	LD
JLR #:	26610-001.1

DRAWING #: 01

File Location: v:\2610\0\26610 - barrhaven expansion - minto brazeau mattamy\26610-001 quinn's pointe phase 2\3 # dwg\1-Civil\26610-001 C P&P 01 KILBIRNIE.dwg

PLOT DATE: Wednesday, June 19, 2019 3:26:43 PM



KEYPLAN

LEGEND:

- CONTOUR
- PROPOSED ELEVATION
- ORIGINAL GROUND ELEVATION FROM CITY TOPO
- EXISTING ELEVATION FROM STANTEC SURVEYS COMPLETED JULY 12, 2018 AND OCTOBER 2015
- PROPOSED CL ROAD HIGH/LOW POINT
- SURFACE SLOPE
- FLOW DIRECTION
- MAJOR OVERLAND FLOW DIRECTION (1:100 YR)
- FF = 93.00 FINISHED FLOOR ELEVATION
- TF = 93.20 TOP OF FOUNDATION ELEVATION
- UF = 90.85 UNDERSIDE OF FOOTING ELEVATION
- TERRACING (MAX. 3:1)
- SWALE
- DITCH CENTERLINE
- DITCH CENTERLINE (FUTURE)
- 36* LOT NUMBERS WITH KILLARNEY TYPE SINGLE UNIT AND REDUCED BUILDING FOOTPRINT
- NOISE FENCE

No.	ISSUE / REVISION	DD/MM/YY
16	REVISED GRADING FOR PARKETTE BLOCK 168 PER CITY COMMENTS AND REISSUED FOR CITY REVIEW	29/SEPT/20
15	REVISED PARKETTE BLOCK 168 TIE-IN GRADE REISSUED TO CITY FOR RE-APPROVAL	1/SEPT/20
14	REVISED GRADING FOR BLOCKS 256-260 REISSUED TO CITY FOR REVIEW	15/JAN/20
13	ADDED NOISE WALLS AND REISSUED FOR CITY REVIEW	01/NOV/19
12	REISSUED TO CITY FOR REVIEW	09/OCT/19
11	REISSUED TO CITY FOR REVIEW	07/OCT/19
10	REVISED PER CITY COMMENTS	24/SEPT/19
09	REVISED POND DRAINAGE PIPE PER CITY COMMENTS	09/SEPT/19
08	ISSUED GRADING TO CITY FOR REVIEW	05/SEPT/19

VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:500

CLIENT: minto Communities

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP: LICENSED PROFESSIONAL ENGINEER, M. K. L. DALRYMPLE, 2020-10-01, PROVINCE OF ONTARIO

PROJECT NORTH

PROJECT:

MINTO COMMUNITIES INC.
QUINN'S POINTE STAGE 2

3960 GREENBANK ROAD

DRAWING:

GRADING PLAN

GRADING AND DRAINAGE APPROVED

Signed

Date September 30, 2020

DESIGN:	AT
DRAWN:	CJM
CHECKED:	LD
JLR #:	26610-001.1

DRAWING #: G5

File Location: V:\2660\0\26610 - Barrhaven Expansion - Minto Brazeau Mattamy\26610-001.1 Quinn's Pointe Phase 2\3-JLR DWG\1-Civil\26610-001 C G1.dwg

PLOT DATE: Tuesday, September 29, 2020 8:03:11 AM

JLR No.: 26610-001
Revision: 2

April 9, 2019

Prepared for:

MINTO COMMUNITIES INC.
200-180 Kent Street
Ottawa, ON
K1P 0B6

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
1565 Carling Avenue
Ottawa, ON
K1Z 8R1

Site Servicing Report

Quinn's Pointe Stage 2
Greenbank Road, Ottawa, Ontario

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

1.0 Introduction

1.1 General

Minto Communities Inc. (Minto) has retained the services of J.L. Richards & Associates Limited (JLR) to proceed with detailed design of municipal infrastructure for their proposed mixed-use development referred to as the Quinn's Pointe Stage 2 lands, located in the Barrhaven South Urban Expansion Area (BSUEA), in the City of Ottawa. The legal description of the subject property is all of Blocks 253, 254 and 255, Part of Block 252 Registered Plan 4M-1552 and Part of Lots 6 and 7, Concession 3 (Rideau Front) Geographic Township of Nepean, City of Ottawa.

This Site Servicing Report outlines the design objectives and criteria, servicing constraints and strategies for developing the subject lands with water, wastewater, storm and stormwater management services in accordance with previous servicing studies developed for the subject area (presented in Section 1.5 of this Report) and the November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa. This report also includes strategies and solutions for implementing erosion and sedimentation control measures throughout construction.

1.2 Site Description

The proposed Quinn's Pointe 2, 3 & 4 development is situated on a ±65 ha parcel of land. The land parcel is bounded by existing Greenbank Road to the east, Barnsdale Road and the new City of Ottawa (City) urban boundary to the south; the new City urban boundary to the west (approximately 900 m from Borrisokane Road) and by additional development lands to the north owned by others (refer to Figure 1-1 for Location Plan).

Minto wishes to develop the Quinn's Pointe development into three (3) successive phases; Quinn's Pointe Stage 2 followed by future Stages 3 and 4 (refer to Figure 1-2: Phasing Plan). This Site Servicing Report was prepared in support of the infrastructure proposed for Stage 2, which has been sized in consideration of future Stages 3 and 4.

The Stage 2 lands currently consist of an undeveloped mix of former agricultural land and forested areas. The topography across the subject site has significant undulations, and there is a knoll located approximately 1 km north of Barnsdale Road towards the western limit of Stage 2 lands.

1.3 Proposed Development

Minto's proposed Quinn's Pointe Stage 2 (refer to Appendix A1 for copy of Plan 4M and Draft Plan of Subdivision) consists of:

- 329 single family dwellings;
- 82 executive townhouses;
- 50 avenue townhouses;
- Two (2) school blocks (Blocks 351 and 352);
- One (1) park block (Block 354) as well as a Parkette (Block 353);

- Two (2) blocks devoted to stormwater management (Blocks 355 and 356).

As shown on the Draft Plan of Subdivision, the future realigned Greenbank Road, herein referred to as New Greenbank Road, bisects the Quinn's Pointe development near its western perimeter and forms the western limit of Stage.

1.4 Consultation and Permits

During the course of the Master Site Servicing Study (MSS), which spanned up to May 2018, a number of meetings and/or discussions were held with various staff from either the City or the Rideau Valley Conservation Authority (RVCA). Meetings included Public Consultation, Core Project Team (CPT) meetings, Technical Advisory Meetings (TAC) and meetings with staff from the Operation group to discuss the EES. A pre-consultation meeting was held on December 4, 2017 to discuss future study requirements and servicing issues. A copy of the E-Mail correspondence from the City summarizing the December 4, 2017 meeting is included in Appendix A2.

A working meeting was held on October 1, 2018 with various City staff to discuss a number of elements of the EES; flow monitoring, design intricacies of the system sumps, drop structures, etc.), approvals with the Ministry of the Environment, Conservation and Parks (MECP). A copy of the October 1, 2018 meeting notes is included in Appendix A2.

In addition, the City of Ottawa Development Servicing Study Checklist has been included in this Report (Appendix A3), which provides all the details associated with this development and the approval and permit requirements.

1.5 Background Documentation

The servicing proposed for Quinn's Pointe Stage 2 was designed in accordance with the following background reports:

- The Site Servicing Brief prepared by JLR (revised February, 2019);
- The recently approved BSUEA Master Servicing Study (MSS) prepared by JLR (dated May 2018); and,
- All Reports relevant to the MSS. A synopsis of the Background Reports that were reviewed as part of the MSS and this Site Servicing Report is included in Appendix A4.

A short summary of the MSS is provided below:

Master Servicing Study (May 2018)

In 2014, JLR was retained by Minto and Mattamy Homes Ltd. (Mattamy) to undertake the Master Servicing Study (MSS) Class Environmental Assessment (Class EA) that would outline high-level water, wastewater, storm and stormwater management servicing strategies that would support the BSUEA Community Design Plan (CDP). The MSS prepared by JLR provided functional design solutions for on-site storm drainage, wastewater collection and water distribution servicing in the BSUEA and was completed to meet the requirements of the Provincial Planning and Class Environmental Act (Class EA) processes. The MSS first identified a series of constraints and opportunities that were documented in an Existing Condition Report (JLR, September 2017) from which a series of alternative servicing options

were developed and evaluated as part of the MSS using a set of criteria that accounted for environmental, social and economic impacts. High level servicing strategies for storm, sanitary and water infrastructure systems were subsequently developed and presented in the MSS document (May 2018). The servicing strategies recommended are summarized below:

Water

- The overall BSUEA including the Quinn's Pointe Stage 2 lands can be serviced under existing conditions from the BARR Pressure Zone with watermain extensions from the surrounding existing watermains. Under build-out conditions, a third connection will provide additional supply, which would occur from the new connector link along Regional Road 19.
- The analysis confirmed that there are no watermain upgrades to the planned distribution network identified in the City's 2013 Infrastructure Master Plan (IMP) other than the connector link.

Wastewater

- The residual capacities in the surrounding wastewater services were assessed to determine viable servicing outlets for wastewater generated within the BSUEA.
- Based on the assessment of the surrounding wastewater services, the existing constructed and planned wastewater system network can provide servicing for the overall BSUEA, including the Quinn's Pointe Stage 2 lands.
- The upsizing of some planned (but currently unconstructed) wastewater infrastructure was recommended as part of the wastewater servicing strategy.

Storm and Stormwater Management

- The design of the storm drainage system is to be undertaken at detailed design using the dual-drainage approach.
- Two (2) separate storm servicing solutions were developed as part of the MSS; one conventional servicing strategy that relied on wet ponds to fulfill both water quality and quantity control and an alternate servicing strategy that relied on the Etobicoke Exfiltration System (EES) along local roads to maintain pre-infiltration levels. The latter servicing solution with the integration of an EES was recommended by staff and supported by council over the traditional servicing solution.
- In support of the Quinn's Pointe Stage 2 lands, the recommended stormwater management solution incorporated two (2) dry ponds adjacent to Greenbank Road along with a spill-over dry pond abutting Barnsdale Road, west of the CDP boundary to prevent major overland flow from reaching New Greenbank Road, an arterial road.
- Two (2) hydrodynamic separators (HDS) were proposed, one between the dry ponds next to Greenbank Road and one unit at Kilbirnie Drive, west of Alex Polowin Avenue. Both HDS were be sized to achieve an 80% TSS removal.
- The combined release rate from the two (2) dry ponds is to meet the maximum prescribed flow rate along the Greenbank Road trunk storm sewer.

The MSS was prepared to set out the design criteria for future draft plan of subdivisions and site plan applications within the BSUEA. The design criteria for storm, wastewater and water was developed based on current municipal and provincial design standards in effect in May 2018. The MSS has demonstrated that the development associated with the proposed CDP can be accommodated by extending existing municipal water and wastewater infrastructure; upsizing planned future wastewater infrastructure, and constructing stormwater management facilities.

1.6 Existing Infrastructure

Proposed infrastructure part of the Quinn's Pointe Stage 2 will connect to the following existing infrastructure as per Figure CS1 (Appendix A5):

Water

- 400 mm diameter trunk watermain along Greenbank Road, currently capped at Knockaderry Crescent;
- 300 mm diameter trunk watermain along River Mist Road, currently capped at northern limit of the Rivermist Road extension (Street No. 11);
- 300 mm diameter trunk watermain along Kilbirnie Drive, currently capped at its intersection with Alex Polowin Avenue; and
- 200 mm diameter watermain along Alex Polowin Avenue, currently capped at northern end of the Alex Polowin Avenue extension (Street No. 10).

Wastewater

- 600 mm diameter trunk sanitary sewer along Greenbank Road, currently capped at existing MH120, south of Knockaderry Crescent;
- 200 mm diameter sanitary sewer along Kilbirnie Drive, currently capped at its intersection with Alex Polowin Avenue.

Storm

- 750 mm diameter trunk storm sewer along Kilbirnie Drive, currently capped at its intersection with Alex Polowin Avenue;
- 375 mm diameter storm sewer along Alex Polowin Avenue, currently capped at Clonfadda Terrace (Street No. 4); and
- 1800 mm diameter trunk storm sewer along Greenbank Road, currently capped at existing MH 822, south of Knockaderry Crescent.

APPENDIX

B

- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR BUILDING
- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION FOR PORTABLE CLASSROOM
- WATER DEMAND CALCULATION
- UPDATED BOUNDARY CONDITION
- WATER MODEL OUTPUT

Fire Flow Design Sheet (FUS)
Barrhaven Manotick Elementary School
Kilbirnie at Robin Easley
Barrhaven, ON
WSP Project No. 219-00014-01

Date: 18-Feb-22

New Elementary School
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\ C\ \sqrt{A}$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for wood construction (structure essentially combustible)
- 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
- 0.8 for noncombustible construction (unprotected metal structural components, masonry or metal walls)
- 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = total floor area in square metres (including all storeys, but excluding basements at least 50% below grade)

A = 5231 m^2 5231
C = 0.8
F = 12729.3 L/min

rounded off to 13,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 13,000 = 11,050 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -40% x 11,050 = -4,420 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Side 1	39.4	5%	north side
Side 2	37.5	5%	east side
Side 3	53.5	0%	south side
Side 4	35.6	5%	west side
		15%	(Total shall not exceed 75%)

Increase due to separation 15% x 11,050 = 1,658 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)
or **133 L/sec**
or 2,113 gpm (us)
or 1,760 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 1991
by Fire Underwriters Survey

New Elementary School Portable Classroom
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 1999

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\ C\ \sqrt{A}$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
- 1.5 for wood construction (structure essentially combustible)
- 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
- 0.8 for noncombustible construction (unprotected metal structural components, masonry or metal walls)
- 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = total floor area in square metres (including all storeys, but excluding basements at least 50% below grade)

A = 216 m^2
C = 1.5
F = 4844.4 L/min

rounded off to 5,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 5,000 = 4,250 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	0%
Water supply common for sprinklers & fire hoses	0%
Fully supervised system	0%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 4,250 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Side 1	3	25%	north side
Side 2	35.3	5%	east side
Side 3	50	0%	south side
Side 4	40	5%	west side
		35%	(Total shall not exceed 75%)

Increase due to separation 35% x 4,250 = 1,488 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 6,000 L/min (Rounded to nearest 1000 L/min)
or **100 L/sec**
or 1,585 gpm (us)
or 1,320 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 1991
by Fire Underwriters Survey

Water Demand Calculation Sheet

Project:	**Barrhaven Manotick Elementary School**	**Date:**	**2022-02-18**
Location:	**Kilbirnie at Robin Easley, Barrhaven, ON**	**Design:**	**JZ**
WSP Project No.	**219-00014-01**	**Page:**	**1 of 1**

Proposed Buildings	Residential				Non-Residentail			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			Beds	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	(l/min)
New Barrhaven ES						2.43			0.79	0.788		1.18	1.18		2.13	2.13	8,000

Population Densities

Single Family	3.4	person/unit
Semi-Detached	2.7	person/unit
Duplex	2.3	person/unit
Townhome (Row)	2.7	person/unit
Bachelor Apartment	1.4	person/unit
1 Bedroom Apartment	1.4	person/unit
2 Bedroom Apartment	2.1	person/unit
3 Bedroom Apartment	3.1	person/unit
4 Bedroom Apartment	4.1	person/unit
Avg. Apartment	1.8	person/unit

Average Daily Demand

Residentail	280	l/cap/day
Industrial	35000	l/ha/day
Institutional	28000	l/ha/day
Commercial	28000	l/ha/day

Maximum Daily Demand

Residential	2.5	x avg. day
Industrial	1.5	x avg. day
Institutional	1.5	x avg. day
Commercial	1.5	x avg. day

Maximum Hourly Demand

Residential	2.2	x max. day
Industrial	1.8	x max. day
Institutional	1.8	x max. day
Commercial	1.8	x max. day

Boundary Conditions
1045 Kilbirnie Drive

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	47	0.79
Maximum Daily Demand	71	1.18
Peak Hour	128	2.13
Fire Flow Demand #1	8,000	133.33

Location

Results – Existing Conditions

Connection 1 – Kilbirnie Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	157.2	74.1
Peak Hour	140.8	50.8
Max Day plus Fire 1	145.9	58.1

Ground Elevation = 105.1 m

Results – SUC Zone Reconfiguration

Connection 1 – Kilbirnie Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	157.2	74.1
Peak Hour	140.8	50.8
Max Day plus Fire 1	145.9	58.1

Ground Elevation = 105.1 m

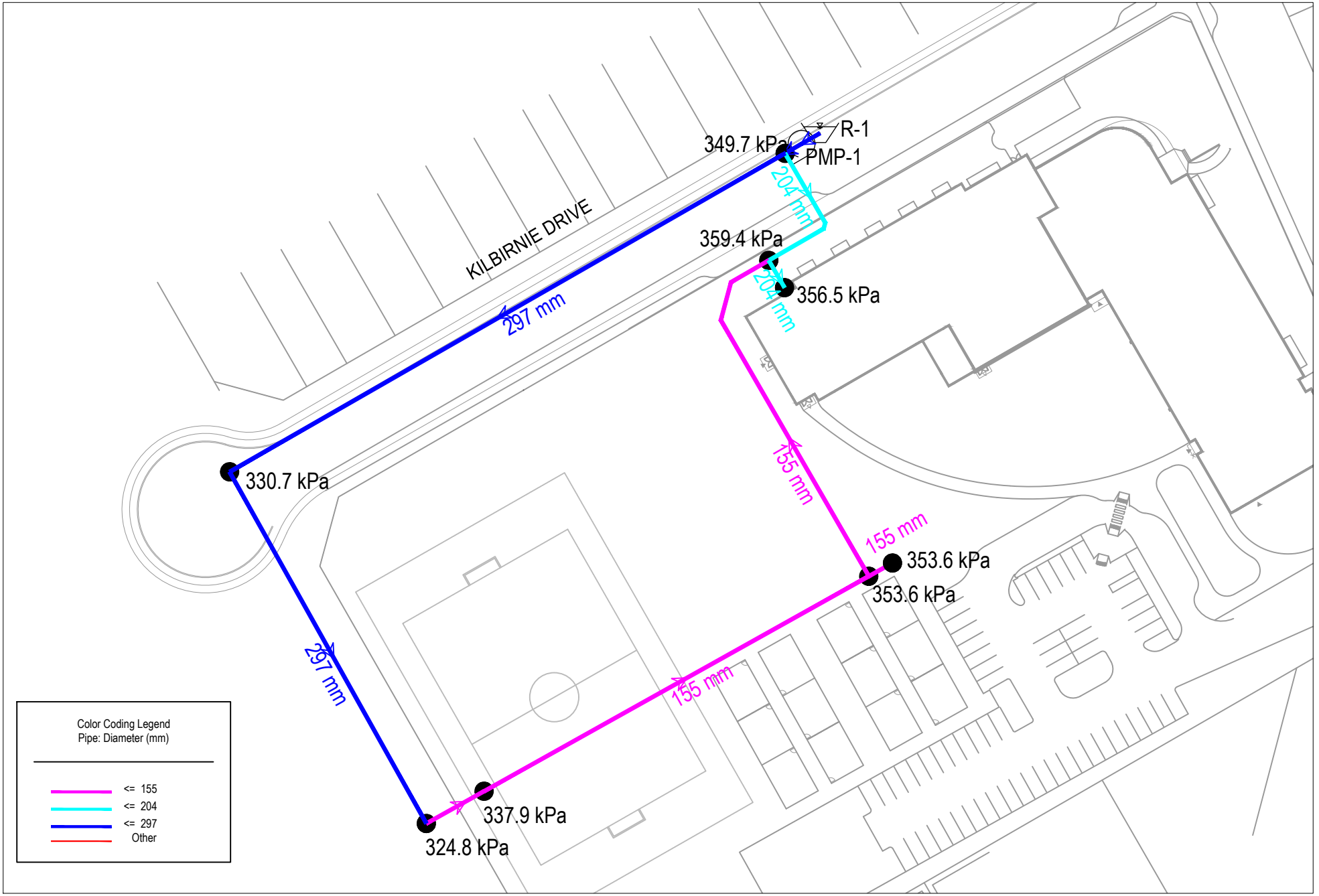
Notes

1. A second connection to the watermain is required to decrease vulnerability of the water system in case of breaks.

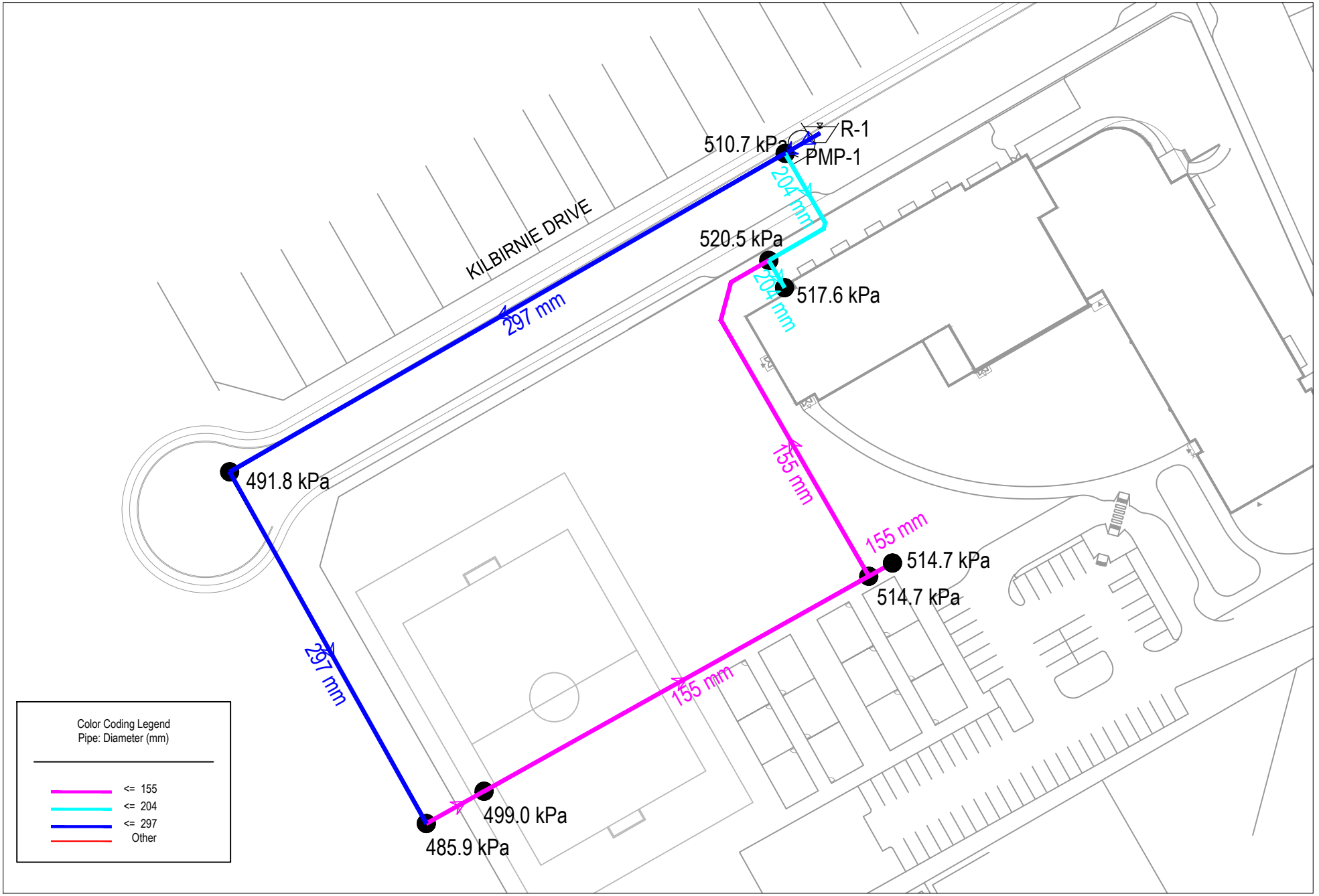
Disclaimer

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.

Scenario: Peak Hour



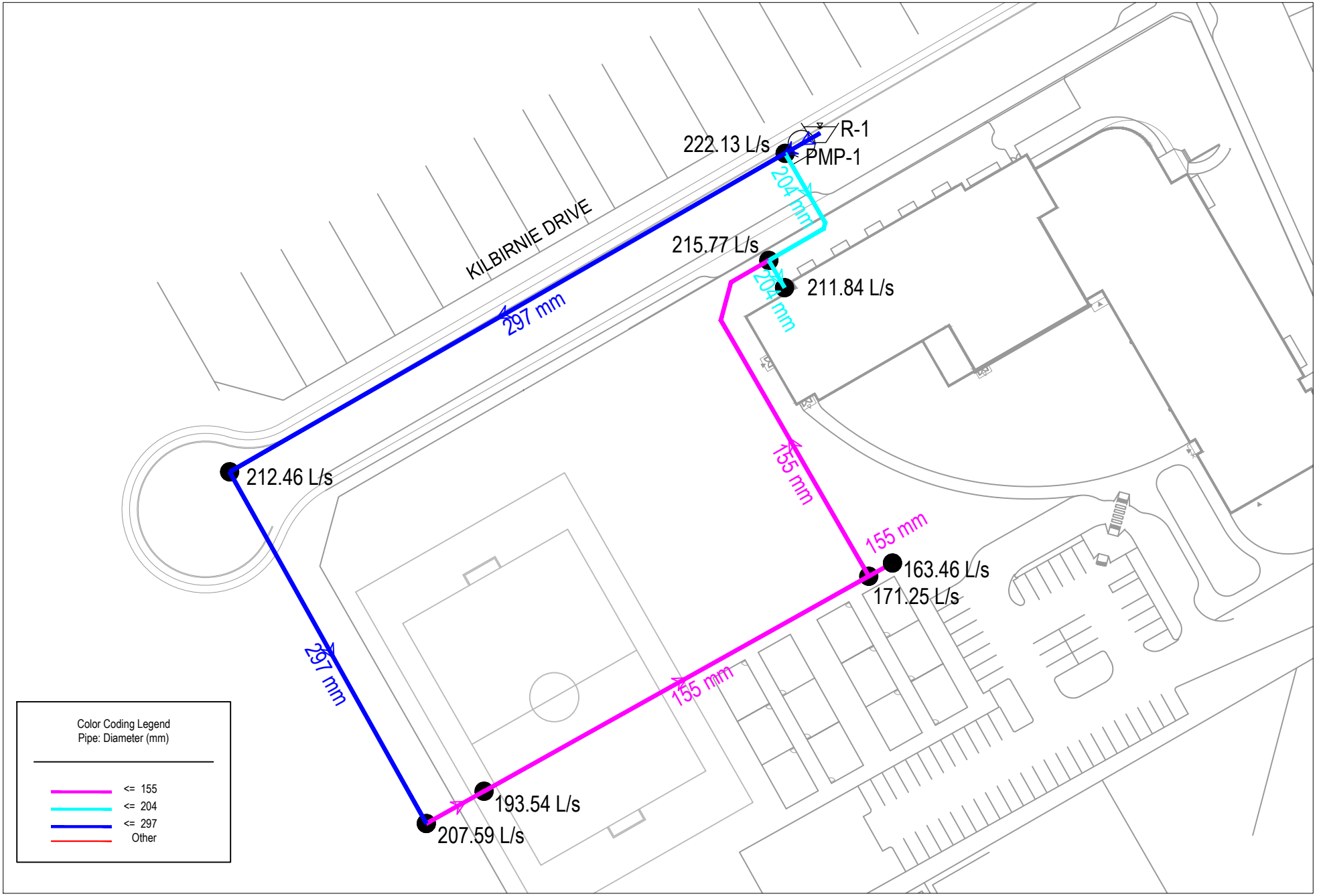
Scenario: Average Day Water Demand



WaterCAD Hydraulic Model
Average Day Scenario Junction Export

Label	Elevation (m)	Demand Collection	Demand (L/s)	Pressure (kPa)
J-2	105.1	<Collection: 0 items>	0	510.7
J-3	104.1	<Collection: 0 items>	0	520.5
J-4	104.7	<Collection: 0 items>	0	514.7
J-5	106.3	<Collection: 0 items>	0	499
J-6	107.64	<Collection: 0 items>	0	485.9
J-7	107.04	<Collection: 0 items>	0	491.8
J-1	104.4	<Collection: 1 item>	0.79	517.6
J-10	104.7	<Collection: 0 items>	0	514.7

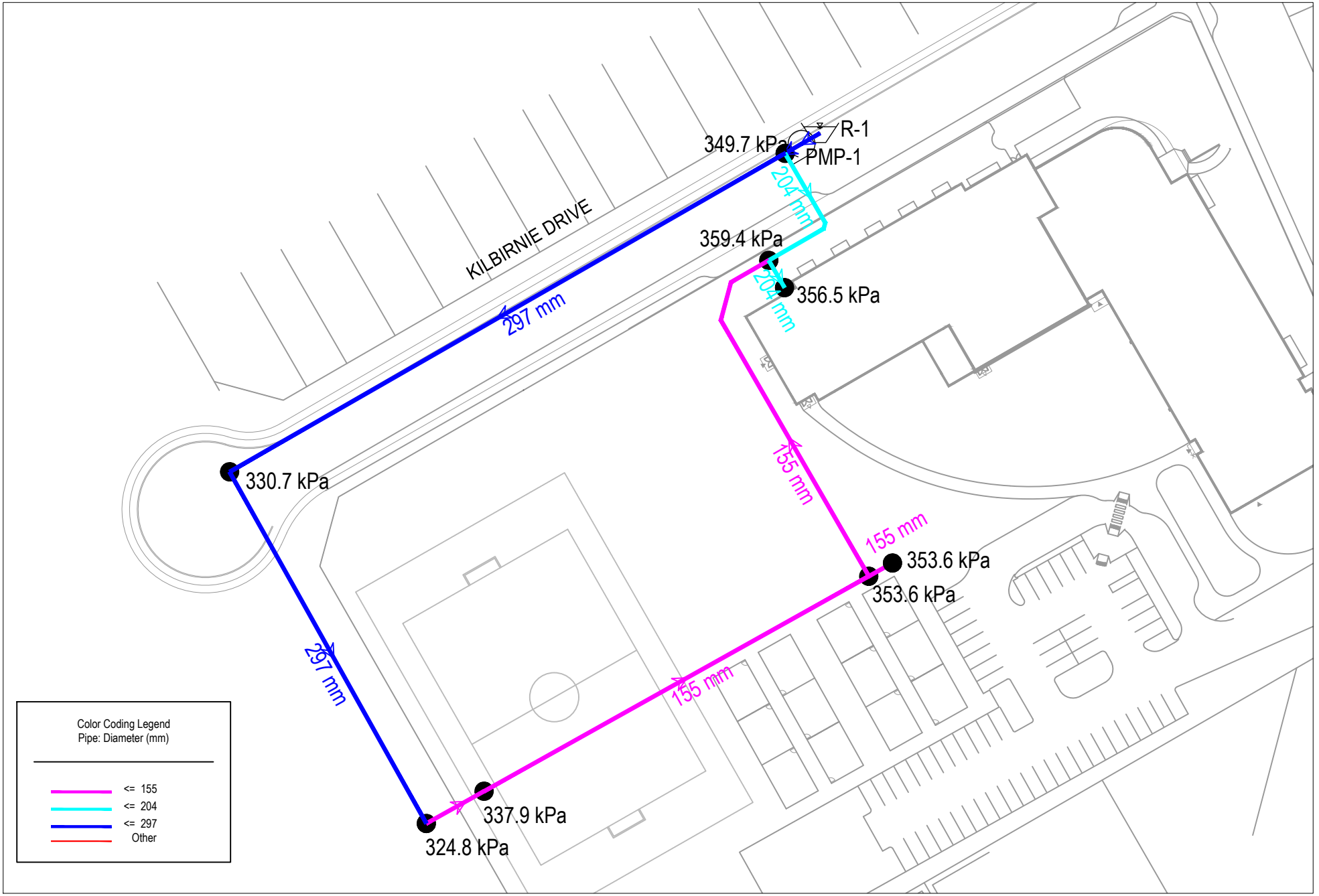
Scenario: Maximum Day + Fire Flow



WaterCAD Hydraulic Model
Maximum Day + Fire Scenario Junction Export

Label	Elevation (m)	Demand Collection	Demand (L/s)	Fire Flow (Available) (L/s)
J-2	105.1	<Collection: 0 items>	0	222.13
J-3	104.1	<Collection: 0 items>	0	215.77
J-4	104.7	<Collection: 0 items>	0	171.25
J-5	103.7	<Collection: 0 items>	0	193.54
J-6	104.78	<Collection: 0 items>	0	207.59
J-7	104.42	<Collection: 0 items>	0	212.46
J-1	104.4	<Collection: 1 item>	1.18	211.84
J-10	104.7	<Collection: 0 items>	0	163.46

Scenario: Peak Hour



WaterCAD Hydraulic Model
Peak Hour Scenario Junction Export

Label	Elevation (m)	Demand Collection	Demand (L/s)	Pressure (kPa)
J-2	105.1	<Collection: 0 items>	0	349.7
J-3	104.1	<Collection: 0 items>	0	359.4
J-4	104.7	<Collection: 0 items>	0	353.6
J-5	103.7	<Collection: 0 items>	0	337.9
J-6	104.78	<Collection: 0 items>	0	324.8
J-7	104.42	<Collection: 0 items>	0	330.7
J-1	104.4	<Collection: 1 item>	2.13	356.5
J-10	104.7	<Collection: 0 items>	0	353.6

WaterCAD Hydraulic Model Peak Hour Scenario Pipe Export

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Velocity (m/s)	Has User Defined Length?	Length (User Defined) (m)
P-2	P-2	3.8	PMP-1	J-2	297	PVC	120	2.13	0	TRUE	1
P-3	P-3	29.6	J-2	J-3	204	PVC	110	1.82	0.1	FALSE	0
P-4	P-4	74.8	J-3	J-4	155	PVC	100	-0.3	0	FALSE	0
P-5	P-5	87	J-4	J-5	155	PVC	100	-0.3	0	FALSE	0
P-6	P-6	13.1	J-5	J-6	155	PVC	100	-0.3	0	FALSE	0
P-7	P-7	79.6	J-6	J-7	297	PVC	120	-0.3	0	FALSE	0
P-8	P-8	126.5	J-7	J-2	297	PVC	120	-0.3	0	FALSE	0
P-9	P-9	5.4	J-10	J-4	155	PVC	100	0	0	FALSE	0
P-10	P-10	6.2	J-1	J-3	204	PVC	110	-2.13	0.1	FALSE	0
P-11	P-11	4.2	R-1	PMP-1	297	PVC	120	2.13	0	TRUE	1

APPENDIX

C

- STORM SEWER DESIGN SHEET
- STORM DRAINAGE AREA PLAN C05
- STORMWATER MANAGEMENT CALCULATIONS
- DWG C03 – GRADING PLAN
- DWG C04 - SERVICING PLAN

STORM SEWER CALCULATION SPREADSHEET

Job Name: Barrhaven School Site
Kilbirnie Drive & Robin Easey Avenue
Job Number: 219-00014-01
Date: 24-Jul-2022

Design Storm: City of Ottawa 2 year Design Storm
Calculation Method: Rational Method

U/S MH	D/S MH	Catchment ID	C=0.25 Catchment Area (m^2)	Grass C=0.25	C=0.9 Catchment Area (m^2)	Pavement C=0.9	C x Area (m^2)	U/S Total C x Area (m^2)	Time of Concentration (min)	Total Time (min)	Rainfall Intensity (mm/hr)	Peak Flow (m^3/s)	Pipe Diameter (mm)	Pipe Length (m)	Pipe Slope (%)	Manning's "n"	Capacity (m^3/s)	Velocity (m/s)	Travel Time (min)	Invert U/S MH (m)	Invert D/S MH (m)	Manhole Drop (m)	Ground U/S MH (m)	Bury Depth U/S MH (m)	Q/Q full Ratio %
CB1	CBMH1	S-3	276	0.25	0	0.90	69	69	10.00	10.00	76.81	0.0015	200	9.7	1.08%	0.013	0.0341	1.08	0.15	101.470	101.365	0.18	103.75	2.28	4.3%
CBMH1	Main 1	S-4	220	0.25	37	0.90	88	157	10.00	10.15	76.24	0.0033	375	6.7	0.42%	0.013	0.1136	1.03	0.11	101.190	101.162	0.00	103.84	2.65	2.9%
CB2	Main 1	S-5	114	0.25	733	0.90	688	688	10.00	10.00	76.81	0.0147	200	17.9	1.83%	0.013	0.0443	1.41	0.21	101.670	101.342	0.23	103.95	2.28	33.1%
Main 1	Main 2		0	0.25	0	0.90	0	846	10.26	10.26	75.83	0.0178	375	11.8	0.42%	0.013	0.1136	1.03	0.19	101.162	101.112	0.00	103.90	2.74	15.7%
CB 3	Main 2	S-6	2013	0.25	1916	0.90	2,228	2228	10.00	10.00	76.81	0.0475	250	15.5	2.21%	0.013	0.0884	1.80	0.14	101.490	101.147	0.04	103.84	2.35	53.8%
Main 2	CBMH2		0	0.25	0	0.90	0	3073	10.45	10.45	75.12	0.0641	375	13.7	0.42%	0.013	0.1136	1.03	0.22	101.112	101.055	0.08	104.00	2.89	56.4%
CBMH2	Main 3	S-7	0	0.25	908	0.90	817	3890	10.67	10.67	74.32	0.0803	450	14.2	0.42%	0.013	0.1837	1.15	0.20	100.980	100.921	0.00	103.84	2.86	43.7%
CB4	Main 3	S-8	68	0.25	919	0.90	844	844	10.00	10.00	76.81	0.0180	200	5.3	3.40%	0.013	0.0605	1.93	0.05	101.401	101.221	0.30	103.90	2.50	29.8%
Main 3	CBMH3		0	0.25	0	0.90	0	4734	10.88	10.88	73.60	0.0968	450	23.1	0.42%	0.013	0.1837	1.15	0.33	100.921	100.825	0.08	104.00	3.08	52.7%
CB5	CBMH3	S-9	0	0.25	675	0.90	608	608	10.00	10.00	76.81	0.0130	200	21.9	2.05%	0.013	0.0470	1.50	0.24	101.899	101.450	0.70	104.20	2.30	27.6%
CBMH3	CBMH4	S-10	130	0.25	1013	0.90	944	6286	11.21	11.21	72.46	0.1265	525	42.3	0.38%	0.013	0.2644	1.22	0.58	100.750	100.590	0.04	104.20	3.45	47.8%
CBMH4	CBMH5	S-11	3113	0.25	1287	0.90	1,937	8223	11.79	11.79	70.57	0.1612	525	30.0	0.50%	0.013	0.3041	1.40	0.00	100.550	100.400	0.04	103.90	3.35	53.0%
ECB1	TCB2	S-12	910	0.25	0	0.90	228	228	10.00	10.00	76.81	0.0049	250	31.0	1.00%	0.013	0.0595	1.21	0.43	105.299	104.989	0.00	106.35	1.05	8.2%
TCB2	CB6	S-13	791	0.25	0	0.90	198	425	10.00	10.43	75.21	0.0089	250	28.5	1.02%	0.013	0.0599	1.22	0.39	104.989	104.700	0.70	106.35	1.36	14.8%
CB6	CBMH5		0	0.25	0	0.90	0	653	10.82	10.82	73.81	0.0134	250	74.0	3.65%	0.013	0.1136	2.31	0.53	104.000	101.300	1.50	106.35	2.35	11.8%
CBMH5	MH1	S-14	2345	0.25	82	0.90	660	9536	11.35	11.35	71.99	0.1907	525	13.3	0.68%	0.013	0.3533	1.63	0.00	100.360	100.270	0.47	103.90	3.54	54.0%
MH1	MH2		0	0.25	0	0.90	0	10188	11.35	11.35	71.99	0.2037	525	38.0	0.66%	0.013	0.3491	1.61	0.39	99.800	99.550	0.08	104.10	4.30	58.4%
Building	MH2	S-15	0	0.25	3886	0.90	3,497	4150	10.00	10.00	76.81	0.0885	450	1.7	5.00%	0.013	0.6375	4.01	0.01	101.56	101.48	2.00	103.78	2.22	13.9%
MH2	EX PLUG		0	0.25	0	0.90	0	14338	11.74	11.35	71.99	0.2867	600	5.0	1.00%	0.013	0.6140	2.17	0.04	99.475	99.43	0.00	104.11	4.64	46.7%

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LICENSED PROFESSIONAL ENGINEER
J. W. ZHANG
100155766
2022-07-25
PROVINCE OF ONTARIO

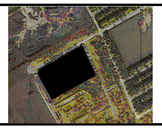
NORTH

CLIENT:
Conseil des écoles publiques de l'Est de l'Ontario

CLIENT REF. #:

PROJECT:
CEPEO BARRHAVEN
MANOTICK ELEMENTARY SCHOOL

KEY PLAN:



ISSUED FOR - REVISION:

NO.	RE.	DATE	DESCRIPTION
3		25 JULY 2022	REVISED AS PER CITY COMMENTS
2	--	13 APR 2022	ISSUED FOR SPA
1		21 MAR 2022	ISSUED FOR BID AND PERMIT

PROJECT NO: 219-00014-01
DATE: JULY 2022
ORIGINAL SCALE: 1:400
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: JZ
DRAWN BY: JT
CHECKED BY: JZ
25mm

DISCIPLINE: CIVIL

TITLE: DRAINAGE AREA PLAN

SHEET NUMBER: C05
SHEET #: 5 OF 6

ISSUE: ISSUED FOR SPA
REV #: 0
DATE OF: 2022-07-25

D07-XX-XX-XXXX

#XXXXX

P:\Ottawa_Infrastructure\10-13 ME 2021 Projects\219-00014-01 Barrhaven SubD\3. Drawings\Working drawings\219-00014-01_C_20220721.dwg, Jul 25, 2022-3:02pm BY: JZhang [Jing]

Barrhaven School Site
Kilbirnie Drive, Nepean, ON
Project: 219-00014-01
Date: July 24, 2022

Storage Required for Barrhaven School Site

Maximum Allowable Release Rate to the Existing Storm System on Kilbirbie Drive:
507.00 l/s

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Roof	0.000	0.90	**0.53**	0.99	**0.60**
1.755	Pavement	0.756	0.90		0.99	
	Grass	0.999	0.25		0.31	

*Areas are approximate based on Architectural site plan and Storm Draiange Area Plan

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

QUANTITY STORAGE REQUIREMENTS - 5 Year

1.755 = Area(ha)
0.53 = C
507.0 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**104.19**	**269.42**	**255.00**	**14.42**	**8.65**	**237.65**
	20	70.25	181.66	255.00	-73.34	-88.01	237.65
	30	53.93	139.45	255.00	-115.55	-208.00	237.65
5 YEAR	40	44.18	114.25	255.00	-140.75	-337.79	237.65
	50	37.65	97.36	255.00	-157.64	-472.91	237.65
	60	32.94	85.19	255.00	-169.81	-611.33	237.65

Orifice Sizing
CBMH101

Event	Flow (L/s)	Head (m)	ORIFICE AREA(m^2)	SQUARE (1-side mm)	CIRC (mmØ)
5 Year	241.08	3.42	0.049	222	250
100 Year	248.04	3.61	0.049	222	250

Orifice Control Sizing
$Q = 0.6 \times A \times (2gh)1/2$
Where:
Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, $9.81 m/s^2$
h is the head of water above the orifice centre in m
d is the diameter of the orifice in m

QUANTITY STORAGE REQUIREMENTS - 100 Year

1.755 = Area(ha)
0.60 = *C
507.0 l/s = max allowable release rate

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Runoff (L/s)	Net Runoff To Be Stored (L/s)	Storage Req'd m^3	Storage Avail m^3
	10	**178.56**	**522.70**	**255.00**	**267.70**	**160.62**	**237.65**
	20	119.95	351.14	255.00	96.14	115.36	237.65
100 YEAR	30	91.87	268.93	255.00	13.93	25.07	237.65
	40	75.15	219.98	255.00	-35.02	-84.06	237.65
	50	63.95	187.22	255.00	-67.78	-203.35	237.65
	60	55.89	163.62	255.00	-91.38	-328.96	237.65
	70	49.79	145.75	255.00	-109.25	-458.85	237.65

Orifice Invert =	100.360	m	
Ponding Elevation =	104.100	m	
Top of CB Elevation =	103.900	m	3.740

Note: Orifice is located on the downstream invert of CBMH5

Equations:

Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the intensity of rainfall, City of Ottawa IDF
A is the total drainage area

Barrhaven School Site
Kilbirnie Drive, Nepean, ON
Project: 219-00014-01
Date: July 24, 2022

Uncontrolled Surface Flow to Robin Easey Ave

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Asphalt	0.052	0.90	**0.47**	0.99	**0.54**
0.154	Roof	0.000	0.90		0.99	
	Grass	0.102	0.25		0.31	

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.47	104.19	0.154
2.78CIA=	20.97		
21.00	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.54	178.56	0.154
2.78CIA=	41.28		
41.30	L/S		

**Use a 10 minute time of concentration for 100 year

Uncontrolled Surface Flow to Kilbirnie Drive

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Asphalt	0.013	0.90	**0.33**	0.99	**0.40**
0.098	Roof	0.000	0.90		0.99	
	Grass	0.085	0.25		0.31	

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.33	104.19	0.098
2.78CIA=	9.37		
9.40	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.40	178.56	0.098
2.78CIA=	19.46		
19.50	L/S		

**Use a 10 minute time of concentration for 100 year

Uncontrolled Flow to Kilbirnie Drive from Roof

Post Dev run-off Coefficient "C"

			2 & 5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"+25%**	***C_{avg}**
Total	Asphalt	0.000	0.90	**0.90**	0.99	**0.99**
0.389	Roof	0.389	0.90		0.99	
	Grass	0.000	0.25		0.31	

Runoff Coefficient Equation
$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{tot}$
$*C = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{tot}$

*Runoff coefficients increased by 25% up to a maximum value of 0.99 for the 100-Year event

Post Dev Free Flow

5 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.90	104.19	0.389
2.78CIA=	101.41		
101.40	L/S		

**Use a 10 minute time of concentration for 5 year

100 Year Event

Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.99	178.56	0.389
2.78CIA=	191.17		
191.20	L/S		

**Use a 10 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

Controlled Flow to Kilbirnie Drive Storm System

507.00	Total
41.30	Uncontrolled
19.50	Uncontrolled
191.20	Uncontrolled from Roof
255.00	Controlled Onsite LDS

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2022-07-25
PROVINCE OF ONTARIO

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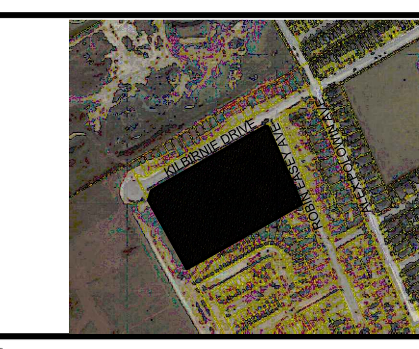

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3		25 JULY 2022	REVISED AS PER CITY COMMENTS
2		13 APR 2022	ISSUED FOR SPA
1		21 MAR 2022	ISSUED FOR BID AND PERMIT

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DISCIPLINE: CIVIL

TITLE:

GRADING PLAN

SHEET NUMBER: C03
SHEET #: 3 OF 6

ISSUE: ISSUED FOR SPA
DATE OF: 2022-07-25
REV #: 0

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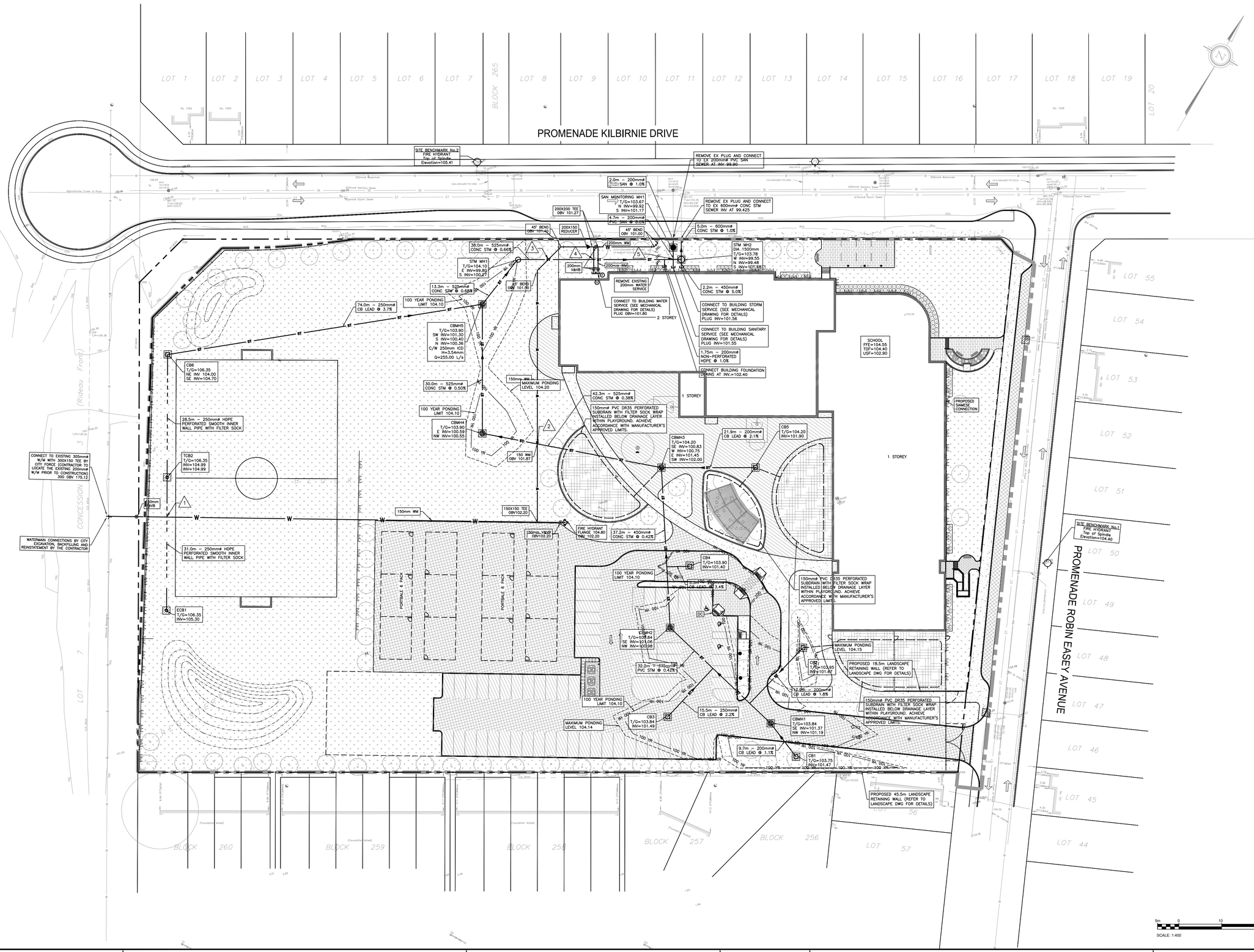

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ID	RE	DATE	DESCRIPTION

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TITLE: SERVICING PLAN

SHEET NUMBER: C04
SHEET #: 4 OF 6

ISSUE: ISSUED FOR SPA
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APPENDIX

D

- EROSION AND SEDIMENTATION CONTROL PLAN C06

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TITLE: EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C06
SHEET #: 5 OF 6

ISSUE: ISSUED FOR SPA
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APPENDIX

E

- SUBMISSION CHECK LIST

4.1 General Content

☒ Executive Summary (for larger reports only).

Comments: Refer to Servicing Report Section 1.1

☒ Date and revision number of the report.

Comments: *Refer to front page of the Report*

☒ Location map and plan showing municipal address, boundary, and layout of proposed development.

Comments: *Refer to Figure 1.1 Site Location for Location Map and Plan*

☒ Plan showing the site and location of all existing services.

Comments: *Refer to drawing C04*

☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.

Comments: *Refer to Architectural Site Plan*

☒ Summary of Pre-consultation Meetings with City and other approval agencies.

Comments: Refer to Appendix A for Pre-Consultation Meeting Notes

☒ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.

Comments: *N/A*

☒ Statement of objectives and servicing criteria.

Comments: Refer to Servicing Report Section 1.7

☒ Identification of existing and proposed infrastructure available in the immediate area.

Comments: *Refer to drawing C04*

☒ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).

Comments: *N/A*

☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.

Comments: *Refer to drawing C03*

☒ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.

Comments: *N/A*

☒ Proposed phasing of the development, if applicable.

Comments: *N/A*

☒ Reference to geotechnical studies and recommendations concerning servicing.

Comments: *N/A*

☒ All preliminary and formal site plan submissions should have the following information:

- ☒ Metric scale
- ☒ North arrow (including construction North)
- ☒ Key plan
- ☒ Name and contact information of applicant and property owner
- ☒ Property limits including bearings and dimensions
- ☒ Existing and proposed structures and parking areas
- ☒ Easements, road widening and rights-of-way
- ☒ Adjacent street names

Comments: *Refer to drawing C03 to C06*

4.2 Development Servicing Report: Water

☒ Confirm consistency with Master Servicing Study, if available

Comments: *Refer to Servicing Report Section 2.1*

☒ Availability of public infrastructure to service proposed development

Comments: Refer to Servicing Report Section 2.1

☒ Identification of system constraints

Comments: N/A

☒ Identify boundary conditions

Comments: *Refer to Servicing Report Section 2.2*

☒ Confirmation of adequate domestic supply and pressure

Comments: *Refer to Servicing Report Section 2.3*

☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.

Comments: *Refer to Servicing Report Section 2.4*

☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.

Comments: *Refer to Servicing Report Section 2.5*

☒ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

Comments: *Refer to Servicing Report Section 2.6*

☒ Address reliability requirements such as appropriate location of shut-off valves

Comments: *Refer to Servicing Report Section 2.7*

☒ Check on the necessity of a pressure zone boundary modification.

Comments: *Refer to Servicing Report Section 2.8*

☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

Comments: *Refer to Servicing Report Section 2.9*

☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.

Comments: *Refer to Servicing Report Section 2.10*

☒ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.

Comments: *Refer to Servicing Report Section 2.11*

☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

Comments: *Refer to Servicing Report Section 2.12*

☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

Comments: *Refer to Servicing Report Section 2.13*

4.3 Development Servicing Report: Wastewater

☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).

Comments: *Refer to Servicing Report Section 3.1*

☒ Confirm consistency with Master Servicing Study and/or justifications for deviations.

Comments: *Refer to Servicing Report Section 3.2*

☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.

Comments: *Refer to Servicing Report Section 3.3*

☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.

Comments: *Refer to Servicing Report Section 3.4*

☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)

Comments: *Refer to Servicing Report Section 3.5*

☒ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.

Comments: Refer to Servicing Report Section 3.9 and 3.11

☒ Special considerations such as contamination, corrosive environment etc.

Comments: *Refer to Servicing Report Section 3.8*

4.4 Development Servicing Report: Stormwater

☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)

Comments: *Refer to Servicing Report Section 4.1*

☒ Analysis of available capacity in existing public infrastructure.

Comments: *Refer to Servicing Report Section 4.2*

☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.

Comments: *Refer to drawing C03*

☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.

Comments: *Refer to Servicing Report Section 4.4*

☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.

Comments: *Refer to Servicing Report Section 4.5*

☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.

Comments: *Refer to Servicing Report Section 4.6-4.10*

☒ Set-back from private sewage disposal systems.

Comments: *N/A*

☒ Watercourse and hazard lands setbacks.

Comments: N/A

☒ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.

Comments: N/A

☒ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

Comments: *N/A*

☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).

Comments: *Refer to Servicing Report Section 4.6-4.10 and Appendix C*

☒ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.

Comments: *Refer to Servicing Report Section 4.11*

☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.

Comments: *Refer to Servicing Report Section 4.12*

☒ Any proposed diversion of drainage catchment areas from one outlet to another.

Comments: *Refer to Servicing Report Section 4.13*

☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.

Comments: Refer to Servicing Report Section 4.6-4.10, Appendix C and drawing C05

☒ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.

Comments: Refer to Servicing Report Section 4.6-4.10 and Appendix C

☒ Identification of potential impacts to receiving watercourses

Comments: *Refer to Servicing Report Section 4.15*

☒ Identification of municipal drains and related approval requirements.

Comments: *Refer to Servicing Report Section 4.16*

☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.

Comments: *Refer to Servicing Report Section 4.17*

☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

Comments: Refer to drawings C03 and C05

☒ Inclusion of hydraulic analysis including hydraulic grade line elevations.

Comments: *Refer to Servicing Report Section 4.18*

☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.

Comments: *Refer to Servicing Report Section 5.0*

☒ Identification of floodplains - proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.

Comments: *N/A*

☒ Identification of fill constraints related to floodplain and geotechnical investigation.

Comments: *N/A*

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.

Comments: Not applicable.

☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

Comments: Not applicable.

☐ Changes to Municipal Drains.

Comments: *Not applicable.*

☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

Comments: *Not applicable.*

4.6 Conclusion Checklist

☒ Clearly stated conclusions and recommendations

Comments:

☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.

Comments: *Further comments to be added following site plan application review.*

☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

Comments: