NOKIA Mixed Use Development

Assessment of Adequacy of Public Services

570 & 600 March Road

City of Ottawa, Ontario

CIMA+ file number: A001218
May 9, 2022
July 28, 2022 (Revision 1)

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1. Introduction

CIMA+ was retained by Colliers Strategy and Consulting on behalf of NOKIA Canada Inc. to prepare an Assessment of Adequacy of Public Services Report for the proposed construction of 9 mixed-use buildings (ground floor retail and 1,904 residential units) located at 600 March Road, as well as a NOKIA office and laboratory building located at 570 March Road, in Ottawa, Ontario.

The purpose of this assessment is to confirm that the proposed development can be adequately serviced by the existing municipal infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA).

1.1 Site Description and Proposed Development

The site is located at the southeast quadrant of the intersection of Terry Fox Drive and March Road (refer to **Figure 1-1** below). 600 March Road is currently comprised of a NOKIA Campus containing office and laboratory buildings with surface parking lots, while 570 March Road comprises of surface parking lots owned by NOKIA. The combined site area (570 and 600 March Road) measures approximately 10.68 ha.

Generally, the site is bounded by Terry Fox Drive to the north, Leggett Drive to the east, an industrial/manufacturing building to the south, and March Road to the west.

Figure 1-1: Site Location - Plan View.

The proposed development consists of nine (9) residential buildings to the north, ranging in height from 7 to 29 storeys, with a total of 1,904 residential units, expected to include approximately 3,427 residents, and two (2) underground parking levels. Retail uses are proposed on the ground floor of three (3) of these buildings, with a total floor area of 8,250 m². The current Nokia campus will be relocated to the south end of the site, where three (3) new buildings are proposed with a total floor area of 49,100 m², which includes the laboratory, office, and parking garage, with interconnecting podium and ground floor retail of 3,100 m². Refer to **Figure 1-2** for a conceptual site plan of the proposed development (prepared by Gensler).

Figure 1-2: Conceptual Site Plan.

1.2 Conceptual Phasing

Regarding phasing, it is expected that the Nokia Site Area would be undertaken as Phase 1 and the Multi-Use Site Area would follow in Phase 2 of development.

1.3 Review of Available Background Documentation

The following design guidelines have been used to estimate the theoretical servicing requirements for the proposed development; while geoOttawa and the available utility drawings provided by the City of Ottawa Information Centre have been used to determine the existing municipal services surrounding the site. Refer to **Appendix A** for available utility plans provided by the City.

- Ottawa Sewer Design Guidelines (October 2012), as amended by all applicable Technical Bulletins.
- Ottawa Design Guidelines – Water Distribution (2010), as amended by all applicable Technical Bulletins.
- Ministry of the Environment Design Guidelines for Sewage Works (2008).
- Ministry of the Environment Stormwater Management Planning and Design Manual (2003).
- Ministry of the Environment Design Guidelines for Drinking-Water Systems (2008); and
- Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (2020).

1.4 Existing Infrastructure

As identified using geoOttawa and the available Utility Record Drawings provided by the City of Ottawa Information Centre, the following municipal infrastructure is available within the right-of-way surrounding the proposed development site (refer to **Appendix B** for Existing Conditions Plan).

Leggett Drive

- 610 mm diameter Concrete watermain.
- 250 mm diameter PVC sanitary sewer on the north end of Leggett which outlets to Terry Fox Drive.

- 250 mm diameter PVC sanitary sewer on the south end of Leggett which outlets to a 250 mm private PVC sanitary network located in 525 Leggett Drive, which outlets to a 750 mm diameter PVC sanitary sewer running along the golf course.
- 375 mm diameter Concrete storm sewer, expanding to a 525 mm diameter sewer approaching the Terry Fox intersection, which outlets to the north cell of the private stormwater management pond located behind the Brookstreet Hotel.
- 375 mm diameter PVC storm sewer, expanding to a 450 mm diameter sewer, expanding to a 900 mm diameter sewer, which outlets through a private storm sewer network and ultimately to the south cell (north side) of the private stormwater management pond located behind the Brookstreet Hotel.
- 525 mm diameter Concrete storm sewer, expanding to a 675 mm diameter sewer, expanding to an 825 mm diameter sewer, expanding to a 900 mm then 1050 mm diameter sewer which outlets through a private storm sewer network and ultimately to the south cell (south side) of the private stormwater management pond located behind the Brookstreet Hotel.

Terry Fox Drive

- 610 mm diameter Concrete watermain.
- 250 mm diameter PVC sanitary sewer.
- 450 mm diameter Concrete storm sewer, expanding to a 600 mm diameter sewer approaching Leggett intersection from the west, then expanding to a 750 mm diameter sewer east of the Leggett intersection, which outlets to the north cell of the private stormwater management pond located behind the Brookstreet Hotel.

March Road

- 300 mm diameter Concrete storm sewer running north south along March Road, which expands to a 750 mm diameter sewer, which expands to an 825 mm diameter sewer.

1.5 Consultation and Permits

In response to the pre-consultation requirements defined in the City's Development Servicing Study Checklist, the following agencies were consulted in support of the preparation of this report. The Development Servicing Study Checklist as well as all relevant correspondence with the consulted agencies can be found in **Appendix A**.

City of Ottawa

The City of Ottawa Information Centre was contacted to obtain any Reports, Studies, Engineering, and/or Utility Plans including sanitary sewer, storm sewer, watermain, gas, etc. within or adjacent to the site location. The available engineering plans and utility plans were provided. No existing reports or studies were provided through the Info Centre.

CIMA+ also contacted Julie Candow from the City of Ottawa's Planning, Real Estate and Economic Development Department to obtain any site-specific servicing and stormwater management design criteria for the proposed development, as well as any related Reports and Studies associated with the sites. The provided comments and criteria relevant to the Assessment of Adequacy of Public Services are referenced within the appropriate sections of this report, while the remaining requirements for design will be assessed and addressed at the detailed design stage (Site Plan Control).

Mississippi Valley Conservation Authority (MVCA)

The subject site falls under the jurisdiction of the Mississippi Valley Conservation Authority (MVCA). CIMA+ contacted Erica Ogden from the MVCA to identify any Natural Heritage/Hazards features that may impact the development as well as any Storm Water Management Criteria for the site and required approvals/permits. These criteria are addressed in *Section 4* of this Report.

Ministry of the Environment, Conservation and Parks (MECP)

It is expected that the proposed development will require an Environmental Compliance Approval (ECA) as the development does not meet the exemption requirements per O. Reg. 525/98, Section 3(a), (c) and (d), when considering the proposed sewage works are expected to service multiple owners. Furthermore, the existing stormwater management facilities are located on private lands and will service the industrial lands to the south (NOKIA).

CIMA+ expects that an amendment to the existing MECP Environmental Compliance Approval (ECA) will be undertaken for the proposed storm sewer and sanitary extensions to accommodate the proposed development. The amendment application will be undertaken in parallel with the Site Plan approval process.

Drainage Easements and Legal Ownership

Considering the existing site is serviced through private lands, easements, along with cost sharing and maintenance agreements exist for the sanitary and storm sewers and management facilities. Through coordination with Greg Winters of Novatech and Emma Blanchard of BLG (Borden Ladner Gervais) copies of the various drainage and registered ownership were provided and can be found in **Appendix A**.

It is expected that the required registrations to update the ownership information contained in the land titles system will be completed in parallel with the Site Plan approval process.

2. Water Servicing

2.1 Water Supply Design Criteria

The design criteria for determining the water demand requirements for the proposed development follow the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008). Namely, the following parameters have been used in determining the water demands:

Table 2-1: Water Supply Design Criteria

Design Criterion[1]	Residential Areas	Commercial Areas	Light Industrial Areas
Average Day Demand	280 L/capita/day	28,000 L/gross hectare/day	35,000 L/gross hectare/day
Maximum Daily Demand	2.0 × average daily demand[1]	1.5 × average daily demand	1.5 × average daily demand
Maximum (Peak) Hour Demand	3.0 × average daily demand[1]	1.8 × maximum daily demand	1.8 × maximum daily demand
Populations – Average Apartment	1.8 Persons Per Unit	N/A	N/A
Desired Operating Pressure under Normal Operating Conditions	50 to 70 psi		
Minimum Operating Pressure under Normal Operating Conditions	40 psi		
Maximum Operating Pressure under Normal Operating Conditions	80 psi		
Minimum Operating Pressure under Maximum Daily Demand + Fire Flow	20 psi		

In addition to those design criteria identified in **Table 2-1**, the following comments and criteria identified by the City as part of the pre-consultation and further coordination must be considered in the water supply servicing strategy:

- The subject site is located within the EMR pressure zone. A water boundary condition request is needed for any new water connection to the City main.
- Existing watermain connections may be considered for interim phasing. Further comments to be provided at the Site Plan Control stage. To be addressed as part of Site Plan approval process.
- As per Section 4.4.7.2 of the Ottawa Design Guidelines – Water Distribution, a DMA (District Metering Area) chamber will be required for private developments serviced by a connection 150mm or larger. To be addressed as part of Site Plan approval process.
- Fire flow demand requirements shall be based on the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 2020 and Technical Bulletin ISTB-2018-02.

[1] Note that residential peaking factors were selected from **Table 3-1** of the MOE Design Guidelines for Drinking-Water Systems for 3,001 to 5,000 persons.

- Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).
- Hydrant capacity shall be assessed if relying on any public hydrants to provide fire protection, particularly if high design fire flows are being proposed, to demonstrate the Required Fire Flow (RFF) can be achieved. Identification of which hydrants are being considered to meet the RFF on a fire hydrant coverage figure is required as part of the boundary conditions request.

2.2 Proposed Water Supply Servicing and Calculations

Water Demands

The water supply demands for the proposed development are presented in **Table 2-2** below. The demands were developed utilizing the development statistics (i.e., residential units and commercial/industrials gross areas) provided by Gensler and those design criteria identified in *Section 2.1*. Refer to **Appendix C** for detailed calculations.

Table 2-2: Water Demands

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
MU SITE AREA - Residential	11.11	22.21	33.32
MU SITE AREA - Commercial	0.27	0.40	0.72
NOKIA SITE AREA - Commercial	0.85	1.27	2.29
NOKIA SITE AREA - Industrial	0.78	1.16	2.09
Total	**13.01**	**25.04**	**38.42**

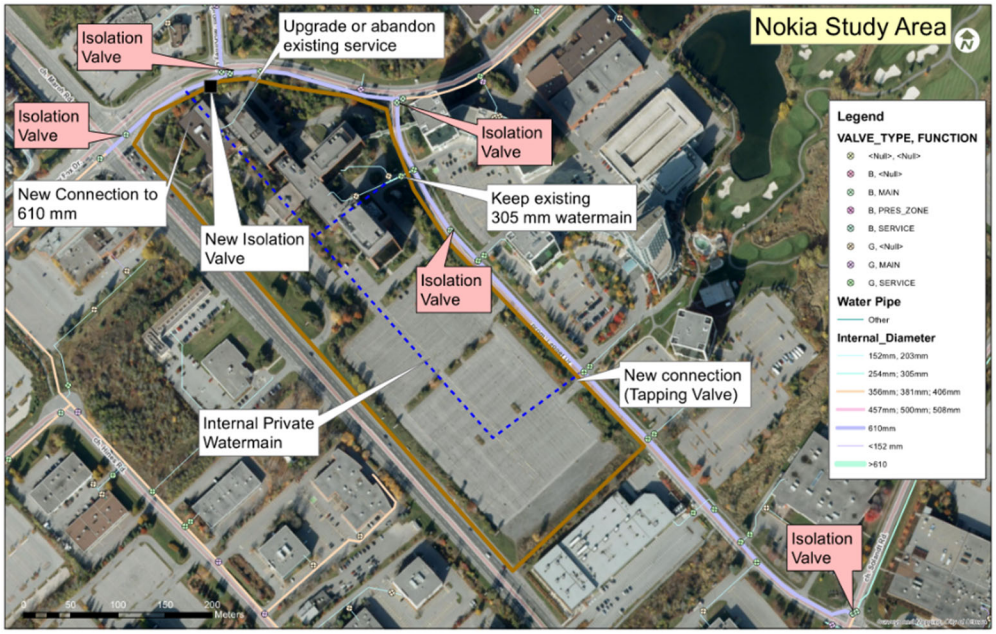
Proposed Water Supply Connection Point(s)

In following the City's requirement, three (3) connections are proposed to the 610 mm diameter watermain along Terry Fox and Legget. A new isolation valve shall also be installed east of the new watermain connection on Terry Fox. **Figure 2-1** outlines the City's preferred connection points as well as a conceptual sketch of the on-site watermain looping required to attain adequate flow and pressure for fire protection.

Furthermore, a conceptual site servicing plan has been prepared demonstrating the internal water layout as outlined in this report and in support of the master plan concept (refer to **Appendix F**).

It is important to note that prior to any development a connection to Terry Fox will be required in addition to the connection to the backbone watermain along Legget Drive. This to provide redundancy should maintenance be required on the backbone watermain.

Figure 2-1: Conceptual Watermain Looping and Proposed Connection Points



Required Fire Flow (RFF)

The required fire flow for the site was developed using the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 2020 and associated City of Ottawa Technical Bulletins.

Due to the recently updated FUS Water Supply for Public Fire Protection document, the City has updated their acceptance criteria for a construction coefficient (C) of 0.6, which has been used for RFF calculations for similar buildings according to the 1999 FUS document. Following a City internal meeting, there was a consensus that, to accept a C value of 0.6, the developer's structural engineer and architect would have to provide verification and sign-off to confirm that all buildings were designed with all structural elements, walls, arches, floors, and roofs with a minimum two (2) hour fire resistance rating, and all materials used in the construction of the structural elements, walls, arches, floors, and roofs are constructed with noncombustible materials. If these criteria cannot be met or verified at the planning stage, a C value of 0.8 shall be used in all RFF calculations submitted to the City for boundary condition request and hydrant coverage confirmation.

As a result of this decision, for the purposes of this project, the City had requested CIMA+ to provide the RFF assuming a C value of 0.6 and a C value of 0.8 such that a range of RFF can be assessed at this stage. Upon advancement of the architectural and structural plans during the Site Plan approval process the RFF will then be confirmed. The results are as follows:

- **Fire Flow Demand #1 (MU Site Area)** – Assuming a C value of 0.6, it was determined that an RFF of **9,000 L/min (150 L/s)** would be required to provide adequate protection.
- Assuming a C value of 0.8, it was determined that an RFF of **19,000 L/min (316.67 L/s)** would be required to provide adequate protection for the MU Site Area.
- **Fire Flow Demand #2 (NOKIA Site Area)** – Assuming a C value of 0.6, it was determined that an RFF of **21,000 L/min (350 L/s)** would be required to provide adequate protection.
- **Fire Flow Demand #3 (NOKIA Site Area)** – Assuming a C value of 0.8, it was determined that an RFF of **39,000 L/min (650 L/s)** would be required to provide adequate protection.

It was assumed that multiple municipal hydrants would be needed to meet the fire flow requirements and a fire hydrant coverage figure was prepared in support of the boundary conditions request from the City.

Refer to **Appendix C** for detailed calculations, including supporting figures for exposure distances and hydrant coverage. As well, refer to **Appendix A** for coordination with the City regarding the updated RFF requirements.

Hydraulic Analysis – Water Supply Adequacy

A hydraulic analysis was completed utilizing the boundary condition information provided by the City for the proposed development to confirm that there is adequate flow and pressure in the water distribution system to meet the required water demands during normal operating conditions. **Table 2-3** and **Table 2-4** summarize the available flow and pressure in the system under each demand scenario.

Table 2-3: Water Supply Adequacy - Hydraulic Analysis – Normal Operating Conditions

Flow Scenario	Proposed Demand (L/s)	Available Flow/Pressure		Desired Flow/Pressure Objective	Flow/Pressure Objective Achieved?
		Design Operating Pressure (Relative Head) (m)	Design Operating Pressure (psi)		
CONNECTION 1 – TERRY FOX DRIVE					
Maximum HGL (Average Day)	13.01	130.8	70.4	50 to 70 psi (maximum 80 psi)	YES
Peak Hour	38.42	125.2	62.4	50 to 70 psi (maximum 80 psi)	YES
Maximum Day + Fire Flow #1 (150L/s)	175.04	124.7	61.8	20 psi	YES
Maximum Day + Fire Flow #2 (350L/s)	375.04	117.6	51.7	20 psi	YES
Maximum Day + Fire Flow #3 (650L/s)	675.04	101.7	29.0	20 psi	YES

Table 2-4: Water Supply Adequacy - Hydraulic Analysis – Normal Operating Conditions

Flow Scenario	Proposed Demand (L/s)	Available Flow/Pressure		Desired Flow/Pressure Objective	Flow/Pressure Objective Achieved?
		Design Operating Pressure (m)	Design Operating Pressure (psi)		
CONNECTION 2 – LEGGET DRIVE					
Maximum HGL (Average Day)	13.01	130.8	74.1	50 to 70 psi (maximum 80 psi)	YES
Peak Hour	38.42	125.2	66.2	50 to 70 psi (maximum 80 psi)	YES
Maximum Day + Fire Flow #1 (150L/s)	175.04	124.8	65.5	20 psi	YES
Maximum Day + Fire Flow #2 (350L/s)	375.04	117.8	55.7	20 psi	YES
Maximum Day + Fire Flow #3 (650L/s)	675.04	102.1	33.3	20 psi	YES
CONNECTION 3 – LEGGET DRIVE					
Maximum HGL (Average Day)	13.01	130.8	73.4	50 to 70 psi (maximum 80 psi)	YES
Peak Hour	38.42	125.2	65.5	50 to 70 psi (maximum 80 psi)	YES
Maximum Day + Fire Flow #1 (150L/s)	175.04	124.8	64.9	20 psi	YES
Maximum Day + Fire Flow #2 (350L/s)	375.04	117.9	55.2	20 psi	YES
Maximum Day + Fire Flow #3 (650L/s)	675.04	102.4	33.1	20 psi	YES

NOTES:

1. Boundary conditions utilize the following Ground Elevations as provided by the City:
   a. Connection 1 (Terry Fox) – Ground Elevation = 81.3 m.
   b. Connection 2 (Legget) – Ground Elevation = 78.7 m.
   c. Connection 3 (Legget) – Ground Elevation = 79.1 m.

The City confirmed as part of the boundary condition request that the water analysis must include a scenario that considers a planned closure of the 610 mm Legget Drive watermain from Solandt to McKinley. Only the Terry Fox connection is available to serve the NOKIA campus under this scenario.

Table 2-5: Water Supply Adequacy - Hydraulic Analysis – Closure on Leggett

Flow Scenario	Proposed Demand (L/s)	Available Flow/Pressure		Desired Flow/Pressure Objective	Flow/Pressure Objective Achieved?
		Design Operating Pressure (Relative Head) (m)	Design Operating Pressure (psi)		
CONNECTION 1 – TERRY FOX DRIVE					
Maximum Day + Fire Flow #1 (150L/s)	175.04	122.2	58.2	20 psi	YES
Maximum Day + Fire Flow #2 (350L/s)	375.04	110.2	41.2	20 psi	YES
Maximum Day + Fire Flow #3 (650L/s)	675.04	82.6	1.9	20 psi	NO

2.3 Water Supply Summary and Conclusions

The water supply design for the proposed development follows the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008).

The important information and findings as a result of this assessment are as follows:

- The City will require three (3) connections to Terry Fox Dr. and Legget Dr. at their preferred connection points (refer to **Appendix C**).
- A new isolation valve is required east of the new watermain connection on Terry Fox Dr.
- Required fire flows exceeding 21,000 L/min are not supported by the City's Infrastructure Planning.
- Assuming a C value of 0.6 is acceptable for the NOKIA Site Area and 0.8 for the MU Site Area, there is adequate flow and pressure in the water distribution system to meet the required water demands for the proposed development.
- However, at the time of Site Plan or Subdivision application, if a C value of 0.6 cannot be adequately justified or demonstrated as per the previously outlined FUS requirements, the proposed site plan will need to be altered to respect the 21,000 L/min cap using a C value of 0.8.

- It is important to note that as part of Phase 1 a connection to Terry Fox will be required in addition to the connection to the backbone watermain along Legget Drive. This to provide redundancy should maintenance be required on the backbone watermain.

3. Sanitary Servicing

3.1 Sanitary Servicing Design Criteria

The design criteria for determining the sanitary peak flow rates for the proposed development follow the parameters outlined in the City of Ottawa Sewer Design Guidelines, 2012 and City of Ottawa Technical Bulletin ISTB-2018-01. Namely, the following parameters have been used in determining the peak sanitary flow rates:

Table 3-1: Sanitary Peak Flow Determination Design Criteria

Design Criterion	Residential Areas	Commercial Areas	Light Industrial Area
Base Flow	280 L/capita/day	28,000 L/gross hectare/day	35,000 L/gross hectare/day
Populations – Average Apartment	1.8 Persons Per Unit	N/A	N/A
Peaking Factor	Determined by Harmon Equation $P.F. = 1 + \left[\frac{1}{4 + \left(\frac{P}{1{,}000}\right)^{\frac{1}{2}}}\right] \times 0.8$ (P = population; P.F. = peaking factor) Maximum P.F. = 4.0 Minimum P.F. = 2.0	1.5 if Commercial Contribution > 20% 1.0 if Commercial Contribution < 20%	Per figure in Appendix 4-B of the Ottawa Sewer Design Guidelines
Dry Weather Infiltration Rate	0.05 L/s/effective gross hectare (for all areas)		
Wet Weather Infiltration	0.28 L/s/effective gross hectare (for all areas)		
Total Infiltration Allowance	0.33 L/s/effective gross hectare (for all areas)		

3.2 Proposed Sanitary Servicing and Calculations

Proposed Sanitary Peak Flows

The estimated peak flows from the proposed development based on the design criteria listed in **Table 3-1** are outlined in the following Table.

Table 3-2: Peak Sanitary Flows

Flow Type	MU Site Area Flow Rate (L/s)	Nokia Site Area Flow Rate (L/s)	Total Flow Rate (L/s)
Total Estimated Average Dry Weather Flow Rate	11.37	1.66	13.03
Total Estimate Peak Dry Weather Flow Rate	32.63	5.77	38.40
Total Estimate Peak Wet Weather Flow Rate	34.67	7.26	41.93

Refer to **Appendix D** for detailed calculations.

Proposed Sanitary Service Connection Point

The City confirmed as part of the pre-consultation that they would prefer a new local sanitary sewer on Legget Drive connected to the 750 mm sanitary sewer on Legget Drive, south of Solandt Road to support a development of this scale.

However, CIMA+ determined that to accommodate this extension a drop structure and lift station will be required to cross below the existing box culvert crossing along Legget at 490 March Road. Also, significant rock excavation along the length of the extension would be anticipated given the available rock profile provided on the as-built documents and geotechnical assessment for the site (Refer to **Appendix D** for preliminary alignment).

The City confirmed that they would not support a lift station within Legget Drive and requested that CIMA+ complete an assessment to explore alternative sanitary servicing options for this site. It has been determined that a City easement was taken for the existing 250mm diameter sanitary running from Legget Drive, through the golf course, to the sanitary collector. As such, this sewer is registered as public infrastructure as opposed to private infrastructure and may serve as a possible outlet for the subject property (pending confirmation of sanitary capacity). The City confirmed that servicing options may include a combination of the following, with the preferred servicing strategy outlined below as agreed upon with City staff through consultation (refer to **Appendix F**):

- *Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the southern portion of the site (outletting through the golf course).*
    - This is the preferred connection point for the Nokia Site Area as well as a portion of the flow from the MU Site Area.

      The Sanitary Sewer Design Sheet provided as part of the Sanmina Development Servicing Study and Stormwater Management Report has been revised to include the increased flow from the proposed Nokia Site Area as well as the updated flow from the more recently developed “KRP Site (Parking Structure)” area (refer to **Appendix F** for SSDS and supporting flow calculations). As demonstrated in the SSDS there is available capacity within the existing network to service the Nokia Site Area under peak flow demands.

      Furthermore, based on preliminary analysis there is additional capacity available to service a portion of the MU Site Area, with an available capacity of approximately 10.2 L/s.

- *Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the northern portion of the site.*
    - This is the preferred connection point for the northern area of the MU Site Area.

      Considering there were no existing Sanitary Sewer Design Sheets available from previous reports in the area, CIMA+ has completed an analysis of the existing network utilizing available as-built information and GeoOttawa (refer to **Appendix F** for SSDS and supporting flow calculations). Further analysis would be required at the site plan control stage to confirm connection points of abutting properties, etc. which have been assumed based on the available information as part of this analysis.

      A sanitary flow of 12.32 L/s has been determined for the Nokia Site under existing conditions and utilized in the attached SSDS. Under this scenario the downstream sewer segment between MHSA12515 and MHSA48493 along Terry Fox would just reach capacity under existing peak conditions. To accommodate the additional flow from the MU Site Area the available capacity to the south (10.2 L/s) would be utilized and the sewer segment from MHSA12515 along Terry Fox to the 750 mm Trunk Sewer would require upsizing to accommodate the additional flow of 12.15 L/s.

      For clarity the total required flow for the MU Site Area (34.67 L/s) would be accomplished by directing 10.2 L/s to the south outletting through the golf course and the remaining flow of 24.47 L/s (12.15 L/s + 12.32 L/s) to the north along Leggett Drive to Terry Fox, which outlets to the 750 mm diameter trunk sewer.

      Additional analysis such as flow monitoring of the north and south networks may provide further insight into available capacity and potentially eliminate the need for upsizing at the Site Plan Control Stage.

A conceptual site servicing plan has been prepared demonstrating the internal sewer layout as outlined in this report and in support of the master plan concept (refer to **Appendix F**).

3.3 Sanitary Servicing Summary and Conclusions

The sanitary servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, and Technical Bulletin ISTB-2018-01.

Peak wastewater demands were provided to the City, who informed CIMA+ that the required capacity is available in the 750 mm diameter trunk sewer running along the golf course.

4. Storm Servicing and Stormwater Management

For the purposes of this assignment and in keeping with the existing stormwater management criteria for the site the project area has been split between the Multi-Use (MU) area to the north and the NOKIA site area to the south. This in keeping with the current stormwater management criteria for the site when considering the north area (MU) currently outlets to the north cell of the existing stormwater management pond behind the Brookstreet Hotel, while the south area (NOKIA) outlets to the south cell of the pond, each with varying treatment capabilities.

The stormwater management approach for each site area is demonstrated as follows.

4.1 Multi-use (MU) Site Area

4.1.1 Background

As previously mentioned, the subject site currently occupies the NOKIA Campus, including office and laboratory buildings with surface parking lots. Based on available recent survey information the site is relatively flat and generally follows the gradient along March Road. The gradient is from north to south with an approximate change in gradient of 4 m across the site. The site is approximately 54% impervious. The on-site stormwater management infrastructure includes a 375 mm diameter concrete storm sewer connection from the building to the sewer along Legget Drive, as well as on-site stormwater management controls to ensure the site is compliant with the Kanata Research Park (KRP) master plan, the “Kanata Research Park Stormwater Management Report” prepared by Novatech Engineering Consultants Ltd., dated June 25, 1987. Applicable segments of this report can be found in **Appendix E**.

As outlined on Drawing 8701-STM1 from the KRP stormwater management report, the MU site area is divided primarily in two (2) major segments:

- The northernmost segment, hereafter referred to as **MU-1**, in which the minor system outlets to catch basins located on Terry Fox Drive, and major system which is graded to sheet flow overland to Terry Fox Drive; and
- The southernmost segment, hereafter referred to as **MU-2**, in which minor system connects to the storm sewer along Legget Drive, and major system which is graded to sheet flow overland to the north cell of the existing SWM Facility No. 1 (the stormwater management pond located behind the Brookstreet Hotel).

For more information regarding these existing stormwater management areas, refer to the Drawing 8701-STM1 which can be found in **Appendix E**. The respective stormwater management report has not been included but is available under separate cover upon request.

4.1.2 Storm Servicing Strategy and Design Criteria

The design of the major and minor storm systems must ensure that the following criteria are upheld under post-development conditions, in keeping with the requirements of the City and the Mississippi Valley Conservation Authority (refer to **Appendix A**).

- The allowable release rate and stormwater management controls for the site shall be based on the available Stormwater Management Master Plans for the KRP.
- If the capacity of the receiving storm sewer is in question, over-controlling may be required, in which case all runoff must be controlled to the 2-year pre-development level, and all flow depth

must be controlled on-site. In such a case the pre-development condition will be determined using the smaller of a runoff coefficient of 0.5 or the actual existing site runoff coefficient. The City confirmed during further pre-consultation that a 5-year pre-development release rate could be conveyed within the existing minor sewer system.

- As part of the Stormwater Management Master Plans for the KRP it was confirmed that the north cell of the existing pond had been sized to accept the 100-year pre-development flow for the site. In the event of the 100-year storm runoff is directed to the stormwater management pond via overland flow (refer to **Appendix E**).
- Where an underground storage tank or cistern is proposed and calculated utilizing the Modified Rational Method an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume to account for fluctuating head and release rate. To be addressed at the Site Plan approval stage.
- To address concerns about roadway drainage spilling into the underground parking, the entrance to the underground parking will be a minimum of 300 mm higher than the spill point to the street. To be addressed at the Site Plan approval stage.
- The MVCA confirmed that the subject properties are not regulated by MVCA under Ontario Regulation 153/06.
- The MVCA also confirmed that an enhanced level of water quality treatment (80% TSS Removal) is recommended for the site.

4.1.3 Proposed Storm Servicing and Stormwater Management Design and Calculations

Proposed Storm Service Connection Point

Based on communications with the City, it is understood that the preferred and anticipated approach is to extend the existing 375 mm diameter storm sewer under Legget Drive and connect the proposed multi-use development to this sewer.

Allowable Release Rates

The allowable release rates are based on a review of the stormwater management criteria used in the KRP Stormwater Management Report to maintain consistency with the stormwater management master plan.

The 5-year allowable release rates were calculated using the rational method with a runoff coefficient “C” of 0.70, as outlined on Drawing 8701-STM1 from the KRP Stormwater Management Report, and a rainfall intensity “I” of 72.12 mm/hr., based on the IDF curve coefficients from the former City of Kanata at the time the report was published (1987). The 100-year allowable release rates were calculated similarly except using a rainfall intensity of 116.19 mm/hr. Refer to **Appendix E** for Drawing 8701-STM1 and applicable sections of the KRP Stormwater Management Report.

Furthermore, in accordance with the KRP Stormwater Management Report the allowable release rates for area MU2 required a further reduction in release rates to be attenuated to pre-development levels as indicated on Drawing No. 8701-STM-1 due to an increase in site area and to maintain the design capacity of the storm sewer system.

The allowable release rates, calculated based on the criteria in the KRP stormwater management report, are summarized in the following Table:

Table 4-1: Allowable Release Rates (MU Site Area)

Design Storm (year)	Catchment ID	Area (ha)	Runoff Coefficient (C)	Time of Concentration (Tc) (minutes)	Rainfall Intensity (mm/hr)	Allowable Release Rate (L/s)
5	MU1	2.39	0.70	20	72.12	**335.5**
	MU2	2.98	-	-	-	**120.6**
100	MU1	2.39	0.70	20	116.19	**540.6**
	MU2	2.98	-	-	-	**194.3**

Post Development Flow Rates and Stormwater Quantity Control

The anticipated post-development flow rates and required storage when controlled to the allowable pre-development release rate are summarized in the following Table.

Table 4-2: Post-development Flow Rate and Storage Summary (MU Site Area)

Control Area	100-year Release Rate (L/s)	100-year Surface Storage Volume (m^3)
Areas to Terry Fox Dr. (MU1)	540.6	272.7
Areas to Legget Dr. (MU2)	194.3	1382.9
Total	734.9	1655.7

As demonstrated in **Table 4-2** an anticipated storage volume of **1655.7 m^3** shall be required on-site via surface, roof, and underground storage to restrict stormwater discharge to the allowable release rate of **734.9 L/s**. Refer to **Appendix E** for detailed stormwater storage calculations.

Actual storage volumes will be finalized at the Site Plan approval stage considering the following factors:

- Further analysis will be completed at detailed design addressing the stage-storage relationship within any proposed underground storage facility using a dynamic model.
- Hydraulic grade line (HGL) analysis along the existing municipal storm system during a surcharge event and the impacts on available storage within underground storage facilities will be considered.
- Underground storage facility (tank or cistern) details and information including detailed cross-section, HWLs, release rate, volume, location, size (dimensions), control device, emergency flow outlet and backflow protection, etc. An appropriate emergency overflow location will need to be determined and documented. Backup power supply will also be necessary if pump controlled.

- Available surface and/or roof retention will also be confirmed at the detailed design stage once grading restrictions, available ponding areas, roof drain locations, drain types and scupper locations have been addressed.

Stormwater Quality Control

Through consultation with the Mississippi Valley Conservation Authority (MVCA) (refer to **Appendix A**) and review of background information, including the available stormwater management master plan, it was confirmed that they would require water quality control of 80% TSS removal given the project scope.

Considering it was not possible to confirm the treatment level in the north cell of stormwater management pond in SWM Facility No. 1, stormwater quality control of 80% Total Suspended Solids (TSS) removal is expected to be achieved via a “treatment train”, combining raingardens, bioswales, and a mechanical separator before stormwater enters the municipal storm sewer system and ultimately outlet to the north cell of stormwater management pond in SWM Facility No. 1, where additional treatment is expected to occur.

4.1.4 Storm Servicing and Stormwater Management Summary and Conclusions

The storm servicing design for the proposed development conforms to the design criteria and methods used in the KRP Stormwater Management master plan.

An anticipated storage volume of **1655.7 m³** shall be required on-site via rooftop, surface and underground storage to restrict stormwater discharge to the allowable release rate of **734.9 L/s**.

The MVCA confirmed that they would require water quality control of 80% TSS removal given the project scope. This is expected to be achieved via a “treatment train”, combining raingardens, bioswales, and a mechanical separator to treat contaminated stormwater before additional treatment is provided at the existing pond.

Raingardens and alternative low impact development measures will be considered to meet best management practices for quality control of surface runoff.

4.2 NOKIA Site Area

4.2.1 Background

As previously mentioned, the subject site currently occupies a surface parking lot and undeveloped open space. Based on available recent survey information the site is relatively flat and generally follows the gradient along March Road and Legget Drive. The gradient is from northwest to southeast with an approximate change in elevation of 3.2 m across the site. The site is approximately 65% impervious. The on-site stormwater management infrastructure includes catch basins in the northernmost area (parking lot) which outlet into a 525 mm diameter PVC private storm sewer, which ultimately outlets into the existing south cell of SWM Facility No. 1. On-site stormwater management controls in this section of the existing site consist of surface storage in the parking lot, controlled via an ICD at the outlet, ensuring that the site is compliant with the Kanata Research Park (KRP) master plan, the “Kanata Research Park Stormwater Management Report” prepared by Novatech Engineering Consultants Ltd., dated June 25, 1987.

The southernmost area (open space) does not appear to have any existing stormwater management controls and overland flow is directed towards Legget Drive.

The report "Sanmina Development 500 March Road Development Servicing Study and Stormwater Management Report" prepared by Novatech, final submission dated November 12, 2014, includes analysis and stormwater management design criteria for the parking lot and open space, which is referred to as "Newbridge Parking" and "Newbridge Open Space", respectively. For the purposes of this report and calculations, the Newbridge Parking area will be referred to as sub-area **N1** and the Newbridge Open Space area will be referred to as sub-area **N2**.

Applicable segments of this Sanmina Development stormwater management report can be found in **Appendix E**. The entire report has not been included but is available upon request.

4.2.2 Storm Servicing Strategy and Design Criteria

The design of the major and minor storm systems must ensure that the following criteria are upheld under post-development conditions, in keeping with the requirements of the City and the Mississippi Valley Conservation Authority (refer to **Appendix A**).

- The allowable release rates for sub-areas **N1** and **N2** shall be per the Sanmina Development stormwater management report prepared by Novatech.
- Storm runoff in excess of the allowable 5-year pre-development release rate as identified in the Sanmina Report, up to and including the 100-year storm event, must be detained on site.
- Overland flow will generally be directed to Legget Drive.
- Where an underground storage tank or cistern is proposed and calculated utilizing the Modified Rational Method an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume to account for fluctuating head and release rate. To be addressed at the Site Plan approval stage.
- In order to address concerns about roadway drainage spilling into the underground parking, the entrance to the underground parking will be a minimum of 300 mm higher than the spill point to the street. To be addressed at the Site Plan approval stage.
- The MVCA confirmed that the subject properties are not regulated by MVCA under Ontario Regulation 153/06.
- The MVCA also confirmed that an enhanced level of water quality treatment (80% TSS Removal) is recommended for the site.

4.2.3 Proposed Storm Servicing and Stormwater Management Design and Calculations

Proposed Storm Service Connection Point

It is understood that the preferred and anticipated approach is to connect to the existing 525 mm diameter storm sewer along Legget Drive.

Allowable Release Rates

Based on a review of the storm sewer design sheets from the Sanmina Development stormwater management report, the allowable release rates are summarized in the following Table:

Table 4-3: Allowable Release Rates (NOKIA Site Area)

Catchment ID	Release Rate (L/s)
Existing Newbridge Parking (N1)	152.0
Existing Newbridge Open Space (N2)	83.1

The storm runoff under post-development conditions for the site area must be controlled to the above allowable release rates via on-site storage.

Post Development Flow Rates and Stormwater Quantity Control

The anticipated post-development flow rates and required storage when controlled to the allowable release rates are summarized in **Table 4-4** below.

Table 4-4: Post-development Flow Rate and Storage Summary

Control Area	5-year Release Rate (L/s)	100-year Storage Volume (m^3)
N1	152.0	1337.2
N2	83.1	339.1
Total	235.1	1676.3

As demonstrated in **Table 4-4** an anticipated storage volume of **1676.3 m^3** shall be required on-site and will be accommodated via surface, roof and underground storage to restrict stormwater discharge to the allowable release rate of **235.1 L/s**. Refer to **Appendix E** for detailed stormwater storage calculations.

Actual storage volumes will be finalized at the Site Plan approval stage considering the following factors:

- Further analysis will be completed at detailed design addressing the stage-storage relationship within any proposed underground storage facility using a dynamic model.
- Hydraulic grade line (HGL) analysis along the existing municipal storm system during a surcharge event and the impacts on available storage within underground storage facilities will be considered.
- Underground storage facility (tank or cistern) details and information including detailed cross-section, HWLs, release rate, volume, location, size (dimensions), control device, emergency flow outlet and backflow protection, etc. An appropriate emergency overflow location will need to be determined and documented. Backup power supply will also be necessary if pump controlled.
- Available surface and/or roof retention will also be confirmed at the detailed design stage once grading restrictions, available ponding areas, roof drain locations, drain types and scupper locations have been addressed.

Stormwater Quality Control

Given that stormwater will ultimately outlet to the southern cell of the existing stormwater management pond in SWM Facility No. 1 via the municipal and private storm sewer systems, and this pond can provide 80% TSS removal (refer to **Appendix E**), it is not expected that the MVCA would require additional on-site quality control.

4.2.4 Storm Servicing and Stormwater Management Summary and Conclusions

The storm servicing design for the proposed development conforms to the design criteria and methods used in the KRP Stormwater Management master plan and the Sanmina Development stormwater management report.

An anticipated storage volume of **1676.3 m³** shall be required on-site via surface, roof and underground storage to restrict stormwater discharge to the allowable release rate of **235.1 L/s**.

The MVCA confirmed that they would not require on-site quality control of stormwater due to the quality treatment provided by the south cell of the outlet pond in SWM Facility No. 1.

5. Conclusion

The purpose of this assessment is to confirm that the proposed development can be adequately serviced using the existing municipal infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA) to allow for the construction of nine (9) residential towers, some with ground floor commercial space, as well as a NOKIA office and laboratory building.

The important information and findings as a result of this assessment are as follows:

- MU Site Area - The proposed mixed-use commercial and residential buildings are expected to include 1,904 apartment units with a population of approximately 3,427 persons and have a total commercial area of approximately 8,250 m², and two (2) levels of underground parking.
- NOKIA Site Area - The proposed mixed-use commercial and industrial building is expected to include a total commercial (retail) area of approximately 3,100 m² as well as a laboratory, office, and parking garage with a total area of 49,100 m².
- The anticipated water demands for the proposed site are **13.01 L/s** (average day), **25.04 L/s** (maximum daily demand), and **38.42 L/s** (peak hour).
- CIMA+ provided the RFF assuming a C value of 0.6 and a C value of 0.8 such that a range of RFF can be assessed at this stage. Upon advancement of the architectural and structural plans during the Site Plan approval process the RFF will then be confirmed. The results are as follows:

  Fire Flow Demand #1 (MU Site Area) – Assuming a C value of 0.6, it was determined that an RFF of **9,000 L/min (150 L/s)** would be required to provide adequate protection.

  Assuming a C value of 0.8, it was determined that an RFF of **19,000 L/min (316.67 L/s)** would be required to provide adequate protection for the MU Site Area.

  Fire Flow Demand #2 (Nokia Site Area) – Assuming a C value of 0.6, it was determined that an RFF of **21,000 L/min (350 L/s)** would be required to provide adequate protection.

  Fire Flow Demand #3 (Nokia Site Area) – Assuming a C value of 0.8, it was determined that an RFF of **39,000 L/min (650 L/s)** would be required to provide adequate protection.

- The City will require three (3) connections to Terry Fox Dr. and Legget Dr. at their preferred connection points (refer to **Appendix C**).
- A new isolation valve is required east of the new watermain connection on Terry Fox Dr.
- Required fire flows exceeding 21,000 L/min are not supported by the City's Infrastructure Planning.
- Assuming a C value of 0.6 is acceptable for the Nokia Site Area and 0.8 for the MU Site Area, there is adequate flow and pressure in the water distribution system to meet the required water demands for the proposed development.
- However, at the time of Site Plan or Subdivision application, if a C value of 0.6 cannot be adequately justified or demonstrated as per the previously outlined FUS requirements, the proposed site plan will need to be altered to respect the 21,000 L/min cap using a C value of 0.8.
- As part of Phase 1 a connection to Terry Fox will be required in addition to the connection to the backbone watermain along Legget Drive. This to provide redundancy should maintenance be required on the backbone watermain.
- The estimated sanitary flow for the proposed development is **13.03 L/s** (average dry weather), **38.40 L/s** (peak dry weather), and **41.93 L/s** (peak wet weather). Peak wastewater demands were provided to the City, who informed CIMA+ that the required capacity is available in the 750 mm diameter trunk sewer running along the golf course.
- The preferred sanitary connection point for the Nokia Site Area as well as a portion of the flow from the MU Site Area is to be directed to the existing 250mm diameter sanitary sewer on Legget Drive at the southern portion of the site (outletting through the golf course) (refer to **Appendix F**).
- The preferred sanitary connection point for the northern portion of the MU Site Area is to the existing 250mm diameter sanitary sewer on Legget Drive at the northern portion of the site which is conveyed along Terry Fox (refer to **Appendix F**).
- MU Site Area - Storm runoff in excess of the allowable 100-year release rate will be detained on site via surface, roof and underground storage, prior to being discharged to the municipal storm sewer system.
- NOKIA Site Area - Storm runoff in excess of the allowable 5-year release rate, up to and including the 100-year storm event, will be detained on site via surface, roof and underground storage prior to being discharged to the municipal storm sewer system.
- MU Site Area - The allowable stormwater release rate for the proposed site is **734.9 L/s**. It is expected that this will be achieved by means of roof storage, surface storage, and underground storage. To achieve this release rate, a storage volume of **1655.7 m³** is required on-site.
- NOKIA Site Area - The allowable stormwater release rate for the proposed site is **235.1 L/s**. It is expected that this will be achieved by means of roof storage, surface storage, and underground storage. To achieve this release rate, a storage volume of **1676.3 m³** is required on-site.
- MU Site Area - Considering it was not possible to confirm the treatment level in the north cell of stormwater management pond in SWM Facility No. 1, stormwater quality control of 80% Total Suspended Solids (TSS) removal is expected to be achieved via a "treatment train", combining raingardens, bioswales, and a mechanical separator before stormwater enters the municipal storm sewer system and ultimately outlet to the north cell of stormwater management pond in SWM Facility No. 1, where additional treatment is expected to occur.

- NOKIA Site Area - Given that stormwater will ultimately outlet to the southern cell of the existing stormwater management pond in SWM Facility No. 1 via the municipal and private storm sewer systems, and this pond can provide 80% TSS removal (refer to **Appendix E**), it is not expected that the MVCA would require additional on-site quality control.
- As a result of the conclusions drawn by the previous points, it is expected that the MU Site Area and NOKIA Site Area of proposed development can be serviced by the existing municipal services network surrounding the site.

We trust this Assessment of Adequacy of Public Services Report is to your satisfaction. If you have any questions regarding this report, please do not hesitate to contact any of the signatories.

A

Appendix A
Pre-consultation Correspondence

Jaymeson Adams

From: Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Sent: March 1, 2022 8:13 AM
To: Hugues Bisson
Subject: RE: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies
Attachments: 13277plan3.pdf; 4031p&p1.pdf; 4031p&p2.pdf; 4031p&p6.pdf; 9648p&p5.pdf; 10307p&p5.pdf; 10307p&p6.pdf; 10307p&p7.pdf; 10307p&p11.pdf; 12763p&p2.pdf; 12763p&p3.pdf

EXTERNAL EMAIL

Good morning Hugues,

Attached are the as-built plan and profile information. There is a lot of surrounding infrastructure so if you notice that any information is missing, please let us know. We'll begin working on the UCC portion now and will update you as soon as we can.

Thank you,
Nick Havelock
Geospatial Analytics Technology & Solutions, Information Centre:
Phone: 613-580-2424 Ext 44455
geoinformation@ottawa.ca

CAUTION
The City of Ottawa assumes no liability for any of the attached plans or reports.
Such data is provided for reference only and the recipient accepts full responsibility for verifying the accuracy and completeness of the data. Utility locations are established using the best available information but is not guaranteed. All utility locations are to be verified in the field.

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: February 28, 2022 7:03 PM
To: Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Subject: Re: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies

A001218

Thanks Nick. Please proceed. The sooner the better. Cheers,

HUGUES BISSON, P.Eng. MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **C** 613-294-0224

110-240 Catherine Street, Ottawa, Ontario, K2P 2G8 CANADA

Le 28 févr. 2022 à 15:27, Geoinformation Centre / Centre Information <geoinformation@ottawa.ca> a écrit :

EXTERNAL EMAIL

Good afternoon Hugues,

We've finished the research for plan and profile information, there would be 11 plans included – the total estimate for the as-built plan and profile information will be: 7x $16.50.

I have attached the full request estimate for all of the plan and profile information as well as the UCC information – please let us know if you would like the plan and profile information as well as the UCC information. Also, let us know if you have any questions about the information or the estimate.

The plan and profile information can be provided immediately, the UCC information will be assigned in the next day or two and will likely take 2 weeks to create, let us know if this timeline will be an issue.

Thank you,
Nick Havelock
Geospatial Analytics Technology & Solutions, Information Centre:
Phone: 613-580-2424 Ext 44455
geoinformation@ottawa.ca

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: February 22, 2022 11:26 PM
To: Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Subject: Re: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies

A001218

Hi,

This is approved. Please proceed.

Thanks,

HUGUES BISSON, P.Eng. MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **C** 613-294-0224
110-240 Catherine Street, Ottawa, Ontario, K2P 2G8 CANADA

Le 18 févr. 2022 à 12:03, Geoinformation Centre / Centre Information <geoinformation@ottawa.ca> a écrit :

EXTERNAL EMAIL

Good morning Hugues,

Below is the estimate for UCC information in .DWG format, please let us know if you are fine with this estimate:

March Road, from Terry Fox Drive to Solandt Road. - **5 x $149.00**
Terry Fox Drive, from March Road to Shirley Creek. **– 3.5 x $149.00**
Legget Drive, from Terry Fox Drive to Solandt Road. **- 4 x $149.00**
Solandt Road, from March Road to East of Legget Drive. **3.8 x $149.00**

Thank you,
Nick Havelock

Geospatial Analytics Technology & Solutions, Information Centre:
Phone: 613-580-2424 Ext 44455
geoinformation@ottawa.ca

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: February 16, 2022 12:16 PM
To: Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies

Thanks. Much appreciated.

HUGUES BISSON, P.Eng., MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **M** 613 294-0224 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

De : Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Envoyé : 16 février 2022 11:59
À : Hugues Bisson <Hugues.Bisson@cima.ca>
Objet : RE: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies

Good afternoon Hugues,

Thank you for your request for infrastructure information.

We'll work on this request as soon as we can, we're expecting the plan and profile information to be ready early next week.

Thank you,
Nick Havelock
Geospatial Analytics Technology & Solutions, Information Centre:
Phone: 613-580-2424 Ext 44455
geoinformation@ottawa.ca

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: February 15, 2022 4:36 PM
To: Geoinformation Centre / Centre Information <geoinformation@ottawa.ca>
Cc: Candow, Julie <julie.candow@ottawa.ca>; Tim Kennedy <tim.kennedy@cima.ca>; Steven Murphy <Steven.Murphy@cima.ca>
Subject: 22-0139 - 22-0142 A001218 - 600 March Road - Request for Record Drawings and Studies

Hello,

We are working with a client on a servicing capacity assessment for zoning by-law amendment (ZBLA) at 600 March Road.

Could you please provide any additional background information for the existing services and utilities that may be present at these locations, including but not limited to watermain, storm, and sanitary sewer, gas, hydro, streetlighting, Bell, Rogers, etc.

Here are the section of roads for which we are most interested in seeing record drawings:

- March Road, from Terry Fox Drive to Solandt Road.
- Terry Fox Drive, from March Road to Shirley Creek.
- Legget Drive, from Terry Fox Drive to Solandt Road.
- Solandt Road, from March Road to East of Legget Drive.

Also, CAD files of available plans would be preferable.

If you could provide a list of any information you have on file and the associated fees for obtaining these it would be much appreciated.

Thanks,

HUGUES BISSON, P.Eng., MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **M** 613 294-0224 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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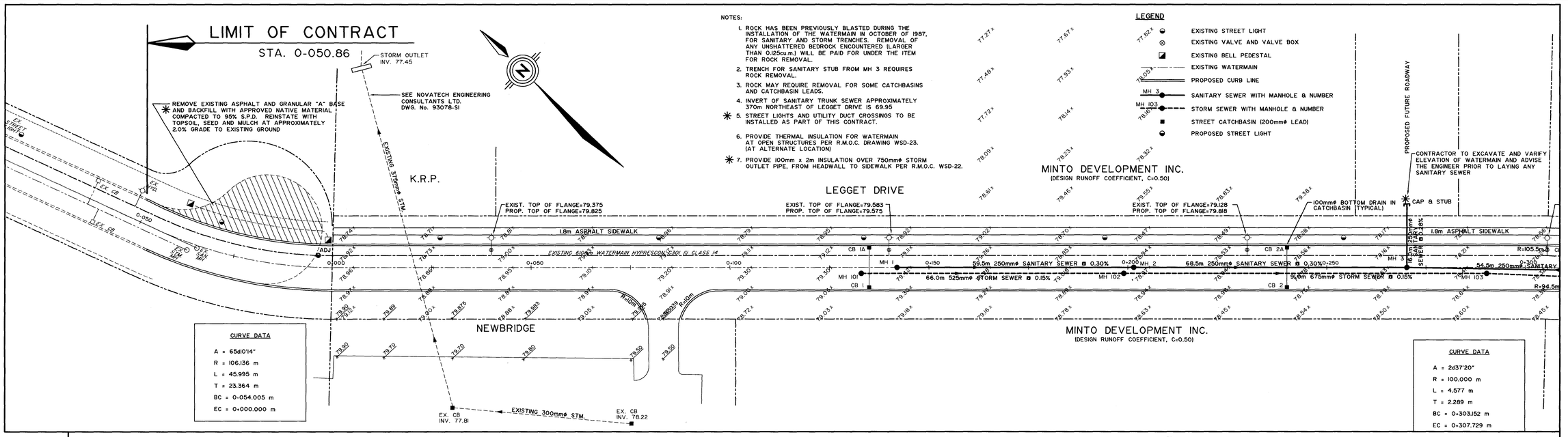
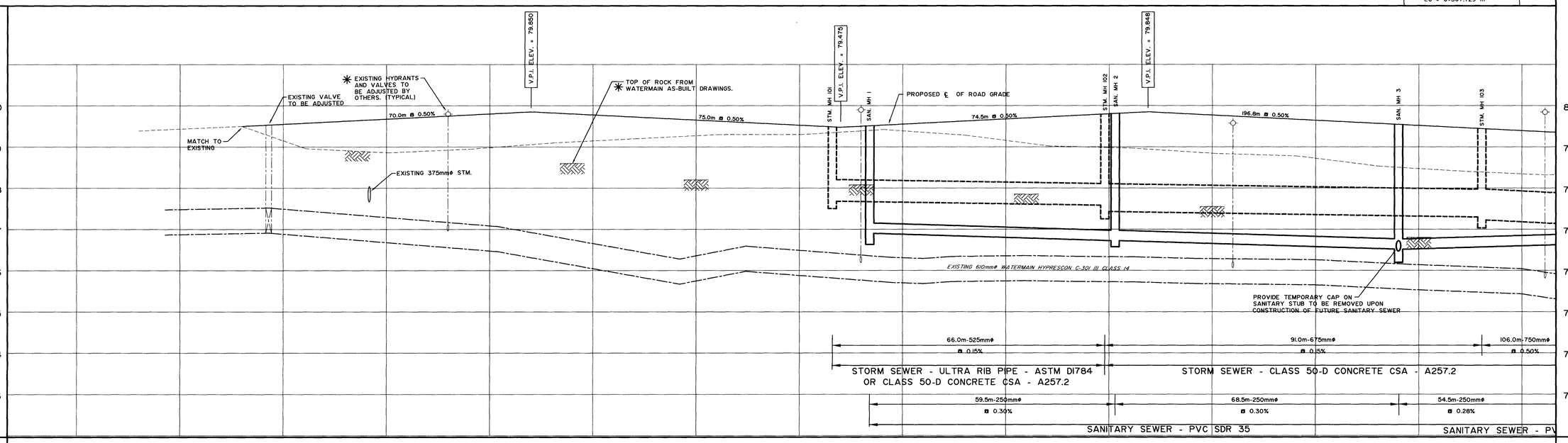




NOTES:

1. ROCK HAS BEEN PREVIOUSLY BLASTED DURING THE INSTALLATION OF THE WATERMAIN IN OCTOBER OF 1987, FOR SANITARY AND STORM TRENCHES. REMOVAL OF ANY UNSHATTERED BEDROCK ENCOUNTERED (LARGER THAN 0.125cu.m.) WILL BE PAID FOR UNDER THE ITEM FOR ROCK REMOVAL.
2. TRENCH FOR SANITARY STUB FROM MH 3 REQUIRES ROCK REMOVAL.
3. ROCK MAY REQUIRE REMOVAL FOR SOME CATCHBASINS AND CATCHBASIN LEADS.
4. INVERT OF SANITARY TRUNK SEWER APPROXIMATELY 370m NORTHEAST OF LEGGET DRIVE IS 69.95
5. ✳ STREET LIGHTS AND UTILITY DUCT CROSSINGS TO BE INSTALLED AS PART OF THIS CONTRACT.
6. PROVIDE THERMAL INSULATION FOR WATERMAIN AT OPEN STRUCTURES PER R.M.O.C. DRAWING WSD-23. (AT ALTERNATE LOCATION)
7. ✳ PROVIDE 100mm x 2m INSULATION OVER 750mmϕ STORM OUTLET PIPE, FROM HEADWALL TO SIDEWALK PER R.M.O.C. WSD-22.

LEGEND

◒	EXISTING STREET LIGHT
⊗	EXISTING VALVE AND VALVE BOX
◪	EXISTING BELL PEDESTAL
- - -	EXISTING WATERMAIN
═	PROPOSED CURB LINE
MH 3 ●	SANITARY SEWER WITH MANHOLE & NUMBER
MH 103 ●	STORM SEWER WITH MANHOLE & NUMBER
■	STREET CATCHBASIN (200mmϕ LEAD)
◒	PROPOSED STREET LIGHT

NOTE
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CITY OF KANATA

No.	REVISION	DATE	BY
8.	REVISED SANITARY OUTLET	OCT. 12/95	JDM
✳ 7.	ADDENDUM REVISIONS	JULY 17/95	AKT
6.	ISSUED FOR TENDER	JULY 14/95	AKT
5.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	JUNE 14/95	AKT
4.	REVISED FOR TENDER	MAR. 30/95	AKT
3.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	MAR. 6/95	AKT
2.	ISSUED FOR APPROVAL TO CITY AND M.O.E.E.	FEB. 22/95	AKT
1.	ISSUED FOR APPROVAL TO M.N.R. AND M.V.C.A.	FEB. 9/95	AKT

J. D. McMANUS

A.K. TITTLEY

DAVID McMANUS
ENGINEERING CONSULTANTS LTD.

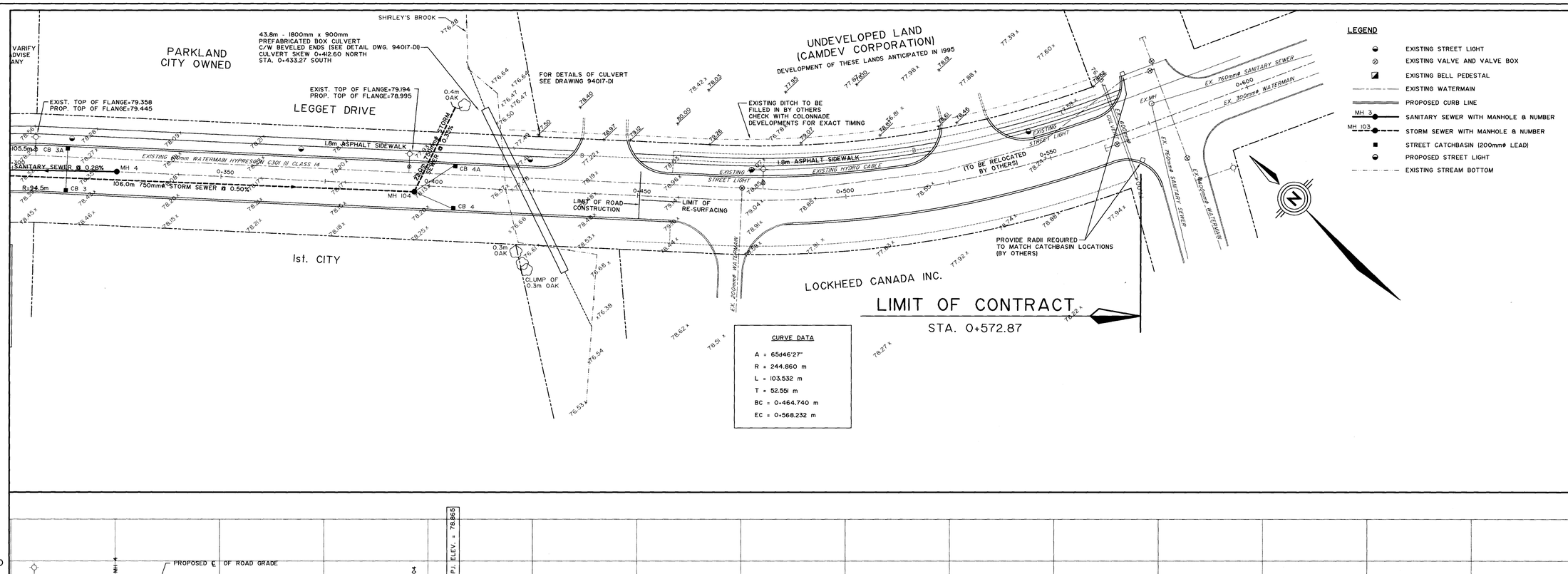
DESIGN	AKT
CHECKED	JDM
DRAWN	JHB
CHECKED	AKT
APPROVED	JDM

SCALE
1:500 HORIZONTAL
1:50 VERTICAL

MINTO DEVELOPMENTS Inc.
LEGGET DRIVE
CITY OF KANATA

PLAN AND PROFILE
LEGGET DRIVE
STA -0+050 TO STA 0+300

PROJECT No.	94017
SURVEY BY	DMECL
DATE	DECEMBER 1994
DRAWING No.	94017-P1



LEGEND

◒	EXISTING STREET LIGHT
⊗	EXISTING VALVE AND VALVE BOX
◪	EXISTING BELL PEDESTAL
— - — - —	EXISTING WATERMAIN
═══	PROPOSED CURB LINE
MH 3 —●—	SANITARY SEWER WITH MANHOLE & NUMBER
MH 103 - -●- -	STORM SEWER WITH MANHOLE & NUMBER
■	STREET CATCHBASIN (200mmø LEAD)
◓	PROPOSED STREET LIGHT
— · — · —	EXISTING STREAM BOTTOM

CURVE DATA

A = 65d46'27"
R = 244.860 m
L = 103.532 m
T = 52.551 m
BC = 0+464.740 m
EC = 0+568.232 m

NOTE
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CITY OF KANATA

No.	REVISION	DATE	BY
8.	REVISED SANITARY OUTLET	OCT. 12/95	JDM
6.	ISSUED FOR TENDER	JULY 14/95	AKT
5.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	JUNE 14/95	AKT
4.	REVISED FOR TENDER	MAR. 30/95	JDM
3.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	MAR. 6/95	AKT
2.	ISSUED FOR APPROVAL TO CITY AND M.O.E.E.	FEB. 22/95	AKT
1.	ISSUED FOR APPROVAL TO M.N.R. AND M.V.C.A.	FEB. 9/95	AKT

J. D. McMANUS

A.K. TITTLEY

DAVID McMANUS
ENGINEERING CONSULTANTS LTD.

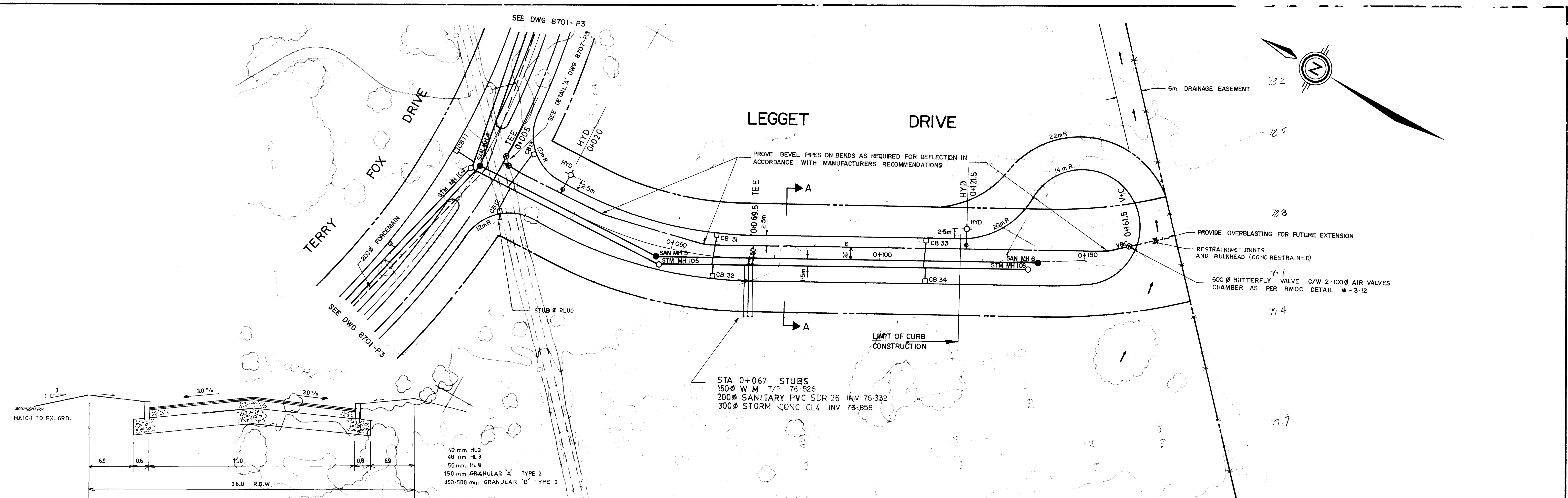
DESIGN	AKT
CHECKED	JDM
DRAWN	JHB
CHECKED	AKT
APPROVED	JDM

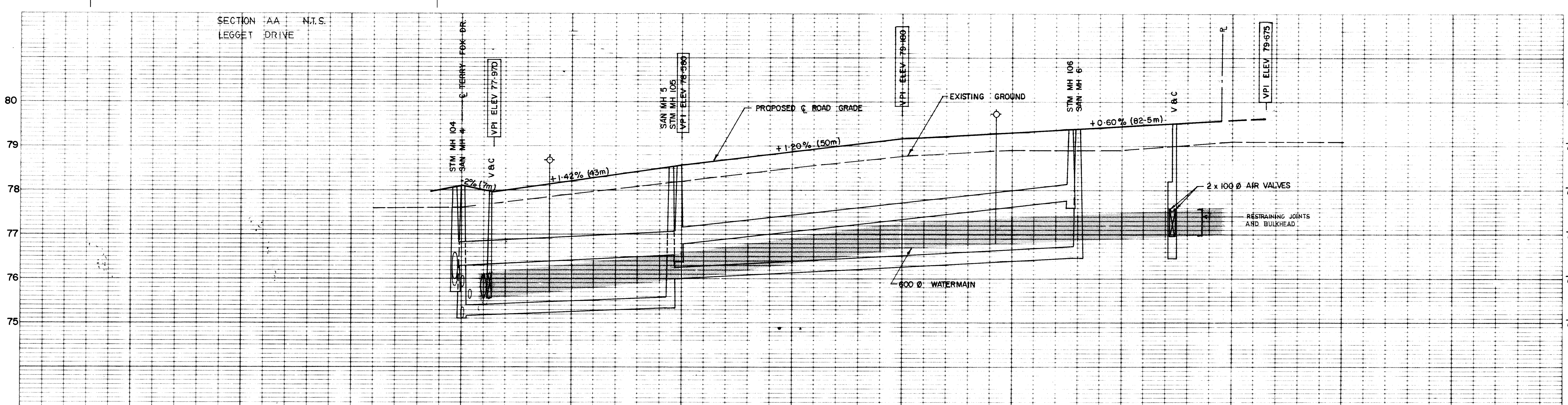
SCALE
1:500
HORIZONTAL
1:50
VERTICAL

MINTO DEVELOPMENTS Inc.
LEGGET DRIVE
CITY OF KANATA

PLAN AND PROFILE
LEGGET DRIVE
STA. 0+300 TO STA. 0+575

PROJECT No. 94017
SURVEY BY DMECL
DATE DECEMBER 1994
DRAWING No. 94017-P2





	0+000	0+005	0+020	0+025	0+050	0+069.5	0+075	0+100	0+121.5	0+125	0+150	0+161.5	0+175	
℄ ROAD ELEVATION	78.110	77.970		78.230	78.580		78.880	79.180		79.330	79.480		79.630	℄ ROAD ELEVATION
TOP OF WATERMAIN ELEVATION		~~76.10~~ TEE V&C	HYD	76.264 ~~76.33~~	76.640 ~~76.68~~	TEE	76.857 ~~76.98~~	77.229 ~~77.28~~	HYD	77.392 ~~77.39~~	77.50	V&C	77.60	TOP OF WATERMAIN ELEVATION
STORM SEWER INVERT	75.967 W ~~76.000 W~~ ~~75.850 E~~ ~~76.300 S~~ 76.224 S 75.825 E	51.0m - 525 Ø STORM SEWER @ 0.38% ~~0.45%~~ CONCRETE CLASS IV			76.418 ~~76.530~~ ~~76.800~~ 76.491		89.0m - 375 Ø STORM SEWER @ 1.17% ~~1.11%~~ CONCRETE CLASS IV			77.530 ~~77.779~~				STORM SEWER INVERT
SANITARY SEWER INVERT	75.784 W ~~75.800 W~~ ~~75.100 E~~ ~~75.150 S~~ 75.025 E 75.136 S	47.5 m - 250 Ø SANITARY SEWER @ 0.46% ~~0.42%~~ PVC SDR - 35			75.353 ~~75.350~~ ~~76.000~~ 75.956		92.0 m - 250 Ø SANITARY SEWER @ 0.62% ~~0.54%~~ PVC SDR - 35			76.522 ~~76.497~~				SANITARY SEWER INVERT
EXISTING ELEVATION	77.60			77.90	78.20		78.50	78.75		78.90	78.90		79.10	EXISTING ELEVATION
CHAINAGE	0+000	0+005	0+020	0+025	0+050	0+069.5	0+075	0+100	0+121.5	0+125	0+150	0+161.5	0+175	CHAINAGE

CITY OF KANATA
150 KATIMAVIK ROAD, KANATA, ONTARIO K2L 2N3 TELEPHONE (613) 592-4261
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

No.	REVISION	DATE	BY
3	AS BUILT	MAR 30/88	PF
2	RESTRAINING JOINTS	APRIL 16 87	UB
1	ROAD X SECTION	APRIL 14 87	UB

NOVATECH ENGINEERING CONSULTANTS LTD.
SUITE 100 • 196 BRONSON AVE. • OTTAWA, ONTARIO • K1R 6H4

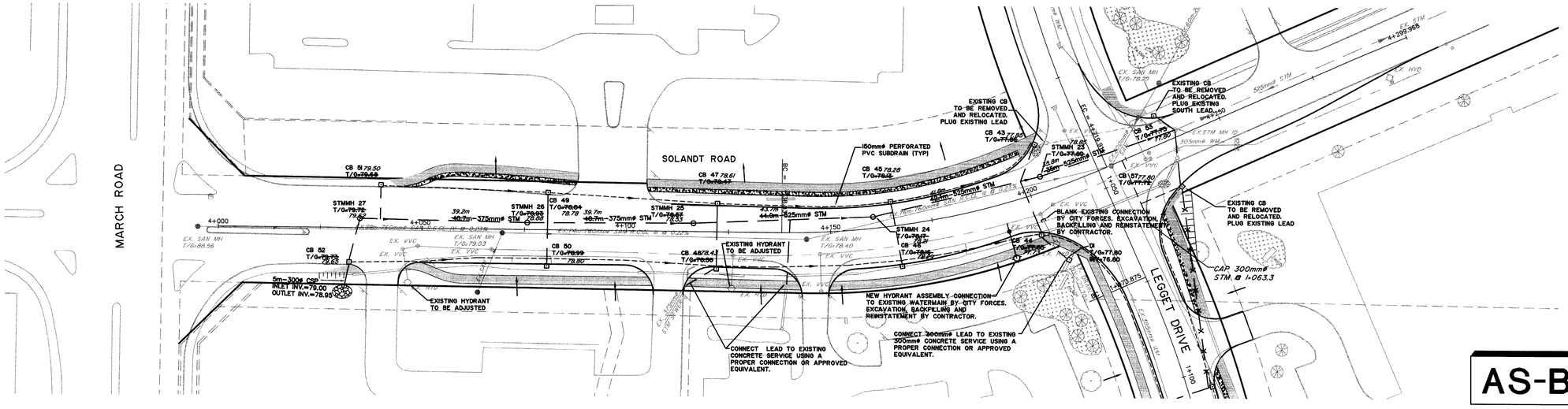
DESIGN	UB
CHECKED	BCA
DRAWN	PVF
CHECKED	UB
APPROVED	MJH

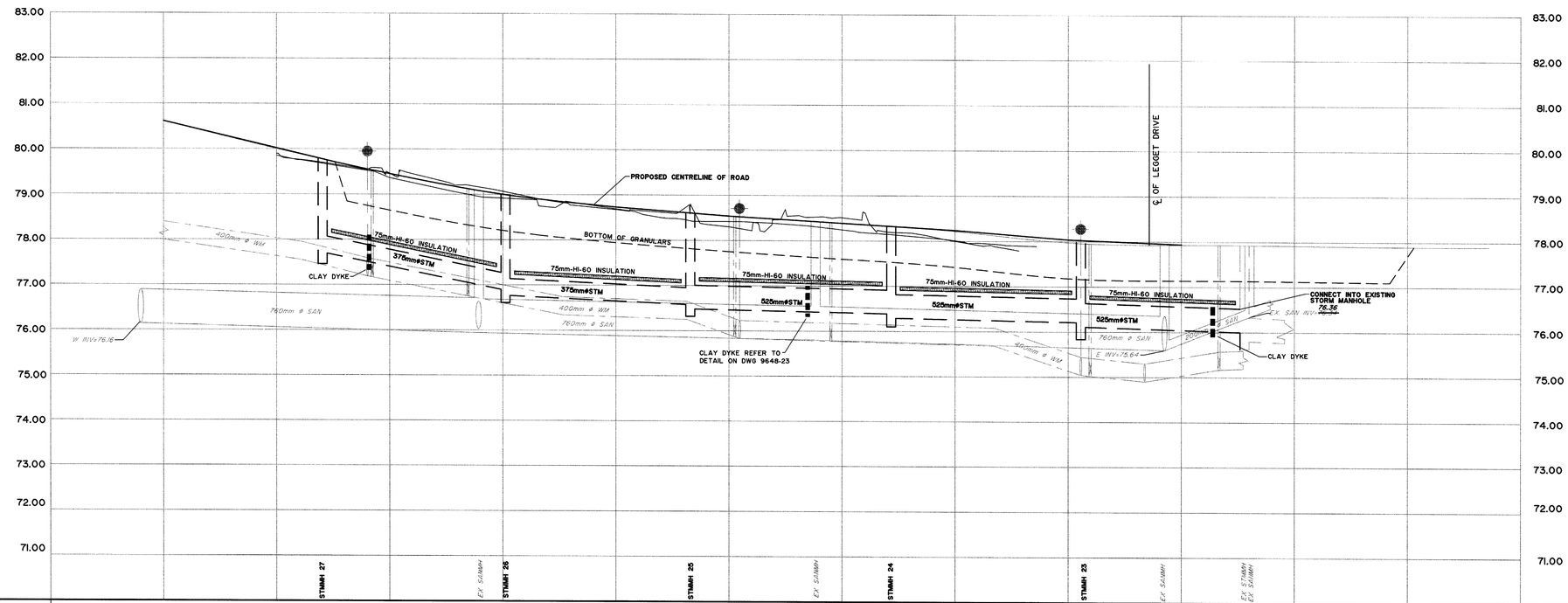
SCALE
HORIZONTAL 1:500 (0 5 10 15 20)
VERTICAL 1:50 (0 0.5 1.0 1.5 2.0)

CITY OF KANATA
KANATA RESEARCH PARK
LEGGET DRIVE
STA 0+000 TO STA. 0+175

PROJECT No. 8701
FIELD BOOK
DATE March, 1987
DRAWING No. 8701 - P6

12763





CATCHBASIN DATA				
No.	STATION	OFFSET	TYPE	
			STRUCTURE	GRATE
43	4+204.7	24.0LT	705.010	J-3.12
44	4+199.8	19.0RT	705.010	J-3.3
45	4+165.6	11.0LT	705.010	J-3.3
46	4+166.2	16.2RT	705.010	J-3.3
47	4+122.2	12.9LT	705.010	J-3.3
48	4+122.1	15.6RT	705.010	J-3.3
49	4+080.7	17.2LT	705.010	J-3.3
50	4+080.5	13.0RT	705.010	J-3.3
51	4+039.8	20.11LT	705.010	J-3.3
52	4+032.1	15.0RT	705.010	J-3.12
53	4+235.0	12.7RT	705.010	J-3.3
57	4+234.7	22.0RT	705.010	J-3.3

DICB DATA				
No.	STATION	OFFSET	TYPE	
			MANHOLE	GRATE
DI	4+204.5	14.50RT	705.030	403.010(3:1)

REGISTERED PROFESSIONAL ENGINEER
J.G. RIDDELL
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
F.R. McKINNEY
PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD
CIVIL ENGINEERS & PLANNERS
Suite 17, 77 Auriga Dr.
Nepean, Ontario K2E 7Z7
Tel:(613)727-1658 Fax:727-6972

NO.	REVISIONS	BY	DATE
7	AS-BUILT SERVICING ADDED	RSC	DEC 13/02
6	RE-ISSUED FOR CONSTRUCTION	RSC	SEPT 6/01

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

NO.	REVISIONS	BY	DATE
5	MINOR REVISIONS	FRM	AUG 30/01
4	ISSUED FOR CONSTRUCTION "SEWER WORKS ONLY"	RSC	AUG15/01
3	ADDENDUM 1	FRM	JUL23/01
2	ISSUED FOR MOE	FRM	JUL18/01
1	ISSUED FOR TENDER	FRM	JUL6/01

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

LEGGET DRIVE
URBANIZATION
SOLANDT ROAD TO HERZBERG ROAD

SOLANDT ROAD
STATION 4+000 TO 4+300

R. G. HEWITT, P.ENG.
Director Infrastructure Services

WAYNE BENNETT, P.ENG.
Manager Construction Services

Dwn: MRL Chkd: ERD
Des: DHI Chkd: ERD

Ottawa

CONTRACT NO.
ETL01-5067
DWG. NO.
9648-13
SHEET 13. OF 26
Date: JUNE 2001
Scale: 1:500 HORIZONTAL
1:50 VERTICAL

AS-BUILT

Jan 09, 2003 - 16:32:36 DWG Name: K:\1999\99147\Cad\Asbuilt\99147p8.dwg Updated By: S.Matthews

9648

R-2094

NOTE
THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE DURING CONSTRUCTION.

REGISTERED PROFESSIONAL ENGINEER J. G. LAY PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. A. RAMPERSAD PROVINCE OF ONTARIO

McNEELY ENGINEERING CONSULTANTS LTD.

NO.	REVISION	BY	DATE
1	BELL PLANT LOCATION REVISED	J.G.L.	30/7/97
2	AS-BUILT	J.G.L.	24/6/99

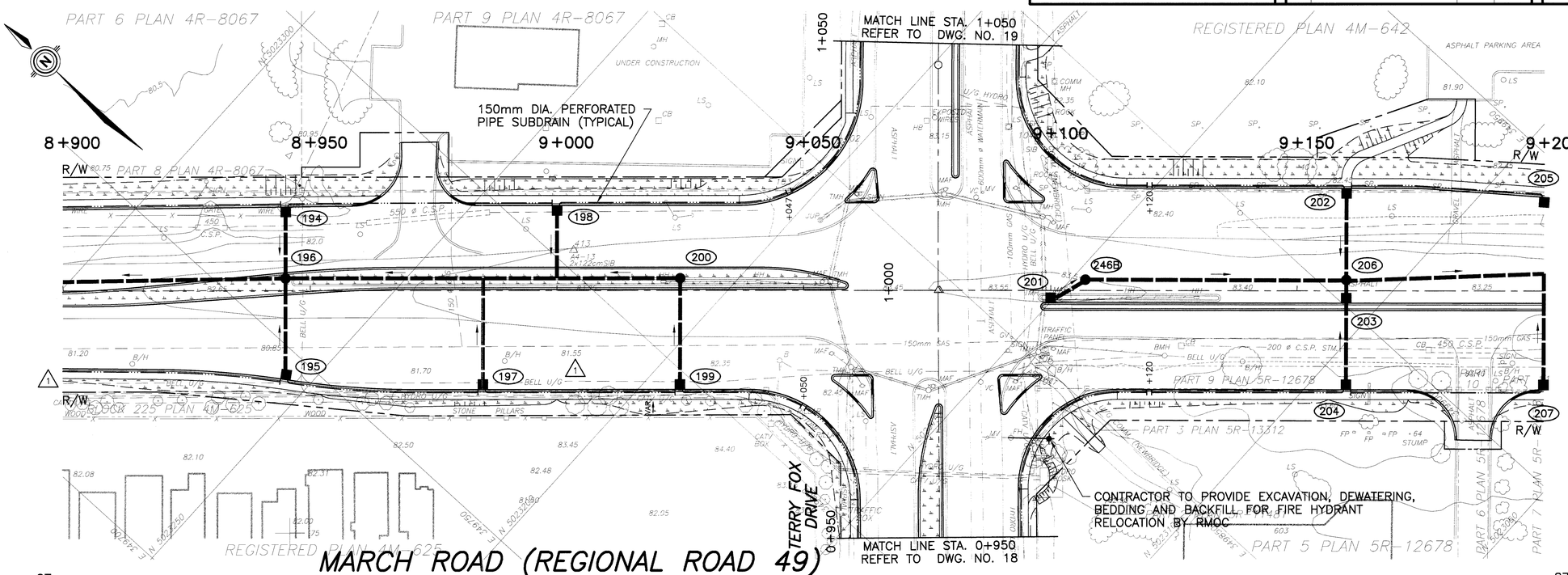
Ottawa-Carleton

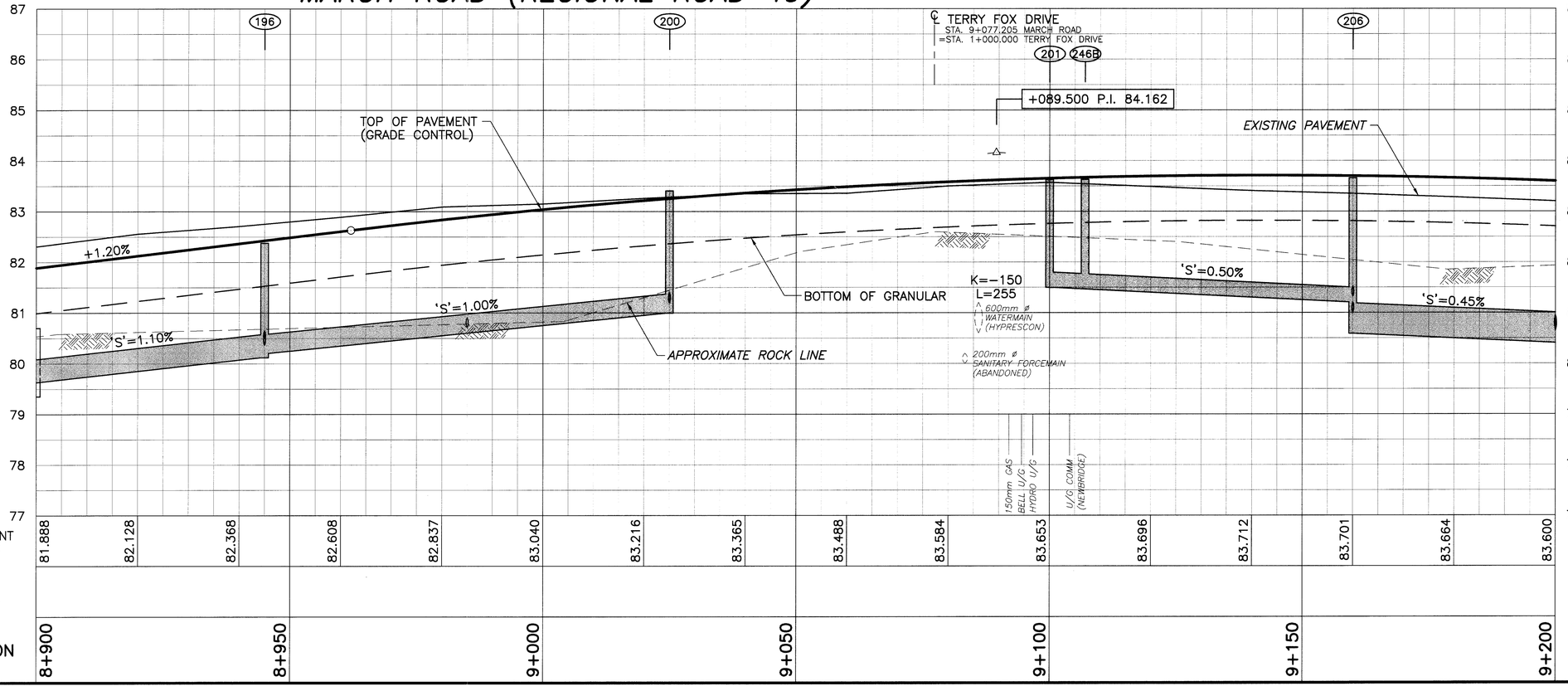
MARCH ROAD RECONSTRUCTION
SOLANDT ROAD TO KLONDIKE ROAD

GRADING AND DRAINAGE
STA. 8+900 TO STA. 9+200

J.M. MILLER, P. ENG. Director, Engineering Division
W. BENNETT, P. ENG. Manager, Transportation Projects

DWG. NO. R-2094-13
SHEET 13 OF 52
CONTRACT NO. 97-522
DATE: JUNE 1997
Scale: Horiz. 5.0 0 5.0 10.0 Vert. 0.5 0 0.5 1.0





NOTES:

1. OFFSETS AND GRATE ELEVATIONS FOR DITCH INLETS AND MANHOLES REFER TO CENTER OF GRATE.

   OFFSETS AND GRATE ELEVATIONS FOR CATCHBASINS AND CATCHBASIN MANHOLES ARE GIVEN AT EDGE OF PAVEMENT.

2. PIPE BEDDING SHALL BE CLASS 'B' AS PER OPSD-802.030 MOD. IN EARTH AND OPSD-802.033 MOD. IN ROCK. BACKFILL WITH APPROVED NATIVE FILL TO MATCH ADJACENT MATERIAL EXPOSED ON TRENCH WALL OR AS DIRECTED BY THE ENGINEER.

3. LATERAL CONNECTIONS ARE TO BE MADE USING MANUFACTURED TEES AS PER OPSD-708.01.

4. CULVERT BEDDING SHALL BE AS PER OPSD-802.010 BACKFILL WITH APPROVED NATIVE FILL.

5. PLACE STRAW BALE CHECK DAMS AS PER OPSD-219.180 IN DITCH ADJACENT TO DITCH INLETS AND HEADWALLS AND AT DITCH OUTLETS TO WATERCOURSES.

6. PROVIDE UTILITY SUPPORT AT CROSSINGS AS PER WSD-28.

CATCHBASIN & MANHOLE DATA

NO.	STATION	OFFSET (m)	TYPE		ELEVATION	
			Structure	Cover	Grate	Low Inv.
194	8+945	16.96 LT	705.010	400.060	82.089	80.560
195	8+945	17.96 RT	705.010	400.060	82.069	80.565
196	8+945	2.50 LT	701.010	401.040	82.541	80.079
197	8+985	20.00 RT	705.010	400.060	82.500	80.942
198	9+000	17.25 LT	705.010	400.060	82.747	81.128
199	9+025	20.00 RT	705.010	400.060	83.025	81.549
200	9+025	2.50 LT	701.010	401.040	83.400	80.980
246B	9+109.5	3.20 LT	701.010	401.040	83.646	80.841
201	9+100	2.50 RT	705.010	400.060	83.628	82.219
202	9+160	20.75 LT	705.010	400.060	83.355	81.674
203	9+160	2.50 RT	701.010	400.060	83.656	81.232
204	9+160	20.0 RT	705.010	400.060	83.351	81.847
205	9+200	19.0 LT	705.010	400.060	83.223	81.539
206	9+160.5	3.20 LT	701.010	401.040	83.643	80.596
207	9+200	20.0 RT	705.010	400.060	83.200	80.443

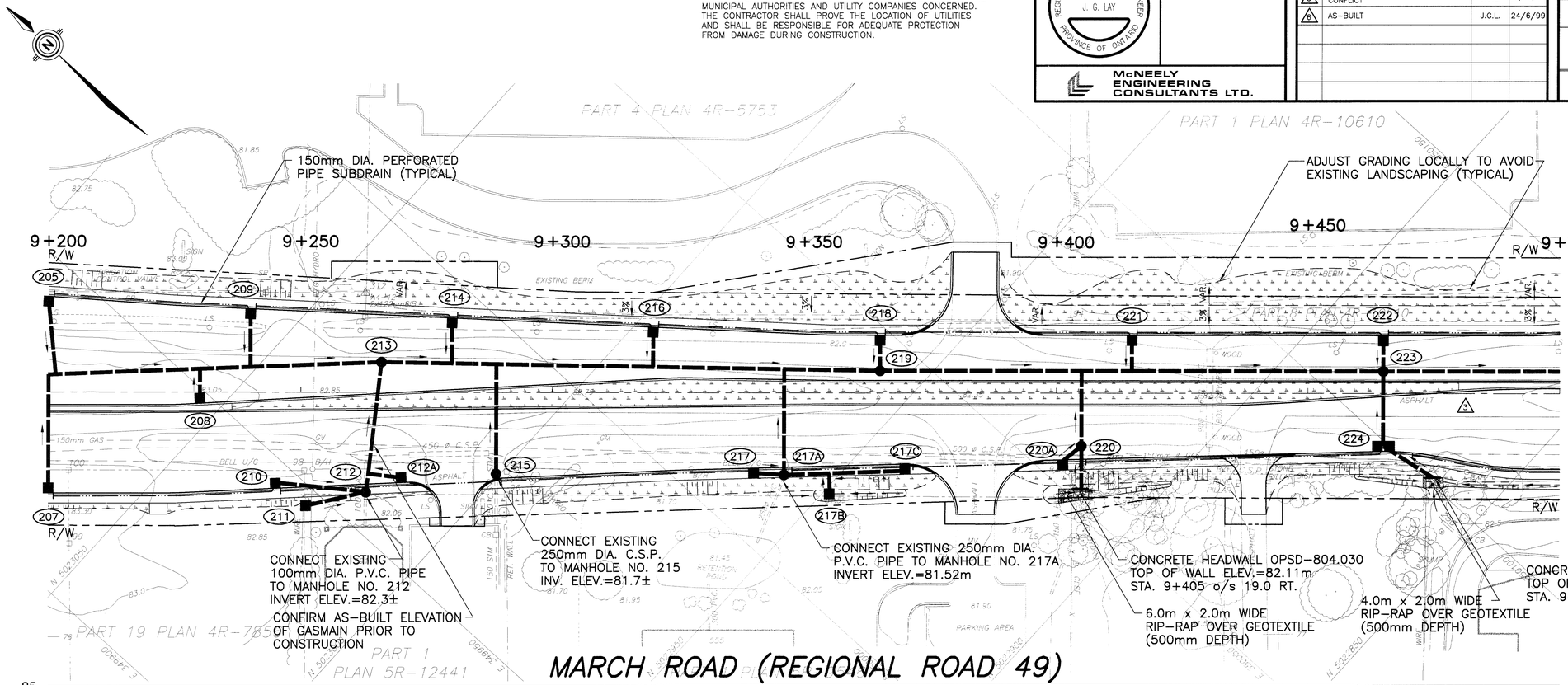
STORM SEWER DATA

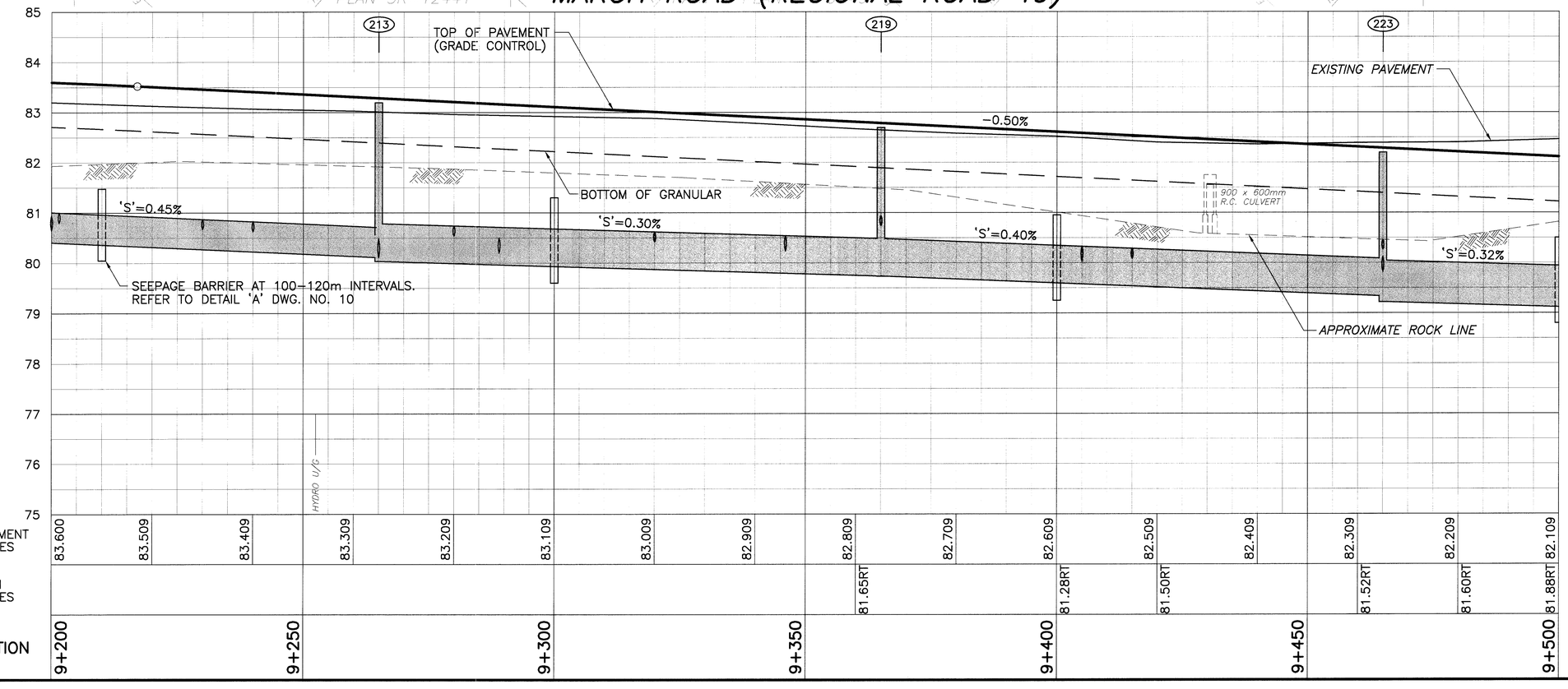
NO. to NO.		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
					Inlet	Outlet
194	196	200	14	PVC SDR35	80.560	80.388
195	196	200	20	PVC SDR35	80.569	80.389
196	191	450	105	100-D	80.079	78.954
197	ST	200	22	PVC SDR35	80.942	80.710
198	ST	200	14	PVC SDR35	81.128	80.837
199	200	200	22	PVC SDR35	81.549	81.176
200	196	375	80	140-D	80.980	80.162
201	246B	200	7	PVC SDR35	82.219	82.200
203	206	375	3	PVC SDR35	81.232	79.788
202	206	200	15	PVC SDR35	81.674	81.442
204	203	200	18	PVC SDR35	81.847	81.267
205	ST	200	14	PVC SDR35	81.539	80.653
207	ST	300	21	140-D	80.443	80.253
246B	206	300	51	140-D	81.109	80.841
206	213	600	105	100-D	80.596	80.140

AS-BUILT

10307

D:\5170\5170c13.dwg Mon Jun 28 13:20:55 1999 A S - B U I L T





R-2094

10307

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NOTE
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REGISTERED PROFESSIONAL ENGINEER
J. G. LAY
PROVINCE OF ONTARIO

McNEELY ENGINEERING CONSULTANTS LTD.

NO.	REVISION	BY	DATE
3	NEW INTERSECTION	J.G.L.	2/10/97
5	REVISE CB#217C DUE TO UTILITY CONFLICT	J.G.L.	20/10/97
6	AS-BUILT	J.G.L.	24/6/99

Ottawa-Carleton

MARCH ROAD RECONSTRUCTION
SOLANDT ROAD TO KLONDIKE ROAD

GRADING AND DRAINAGE
STA. 9+200 TO STA. 9+500

J.M. MILLER, P. ENG.
Director, Engineering Division

W. BENNETT, P. ENG.
Manager, Transportation Projects

DWG. NO.
R-2094-14
SHEET 14 OF 52
CONTRACT NO.
97-522
DATE: OCTOBER 1997
Scale:
Horiz. 5.0 0 5.0 10.0
Vert. 0.5 0 0.5 1.0

NOTES:

1. OFFSETS AND GRATE ELEVATIONS FOR DITCH INLETS AND MANHOLES REFER TO CENTER OF GRATE.

   OFFSETS AND GRATE ELEVATIONS FOR CATCHBASINS AND CATCHBASIN MANHOLES ARE GIVEN AT EDGE OF PAVEMENT.
2. PIPE BEDDING SHALL BE CLASS 'B' AS PER OPSD-802.030 MOD. IN EARTH AND OPSD-802.033 MOD. IN ROCK. BACKFILL WITH APPROVED NATIVE FILL TO MATCH ADJACENT MATERIAL EXPOSED ON TRENCH WALL OR AS DIRECTED BY THE ENGINEER.
3. LATERAL CONNECTIONS ARE TO BE MADE USING MANUFACTURED TEES AS PER OPSD-708.01.
4. CULVERT BEDDING SHALL BE AS PER OPSD-802.010 BACKFILL WITH APPROVED NATIVE FILL.
5. PLACE STRAW BALE CHECK DAMS AS PER OPSD-219.180 IN DITCH ADJACENT TO DITCH INLETS AND HEADWALLS AND AT DITCH OUTLETS TO WATERCOURSES.
6. PROVIDE UTILITY SUPPORT AT CROSSINGS AS PER WSD-28.

CATCHBASIN & MANHOLE DATA

NO.	STATION	OFFSET (m)	TYPE		ELEVATION	
			Structure	Cover	Grate	Low Inv.
208	9+230	2.22 RT	705.010	400.060	83.415	81.426
209	9+240	16.59 LT	705.010	400.060	83.078	81.371
210	9+245	19.07 RT	705.010	400.060	83.003	81.555
211	9+251	22.5 RT	705.030	403.010 (3:1)	82.750	81.370
212	9+263±	19.73 RT	701.010	401.040	83.125	81.011
212A	9+270	17.91 RT	705.010	400.060	82.901	81.405
213	9+265	6.0 LT	701.011	401.040	83.168	80.070
214	9+280	14.82 LT	705.010	400.060	82.913	81.224
215	9+289	16.50 RT	701.010	401.040	82.834	80.277
216	9+320	13.05 LT	705.010	400.060	82.748	81.021
217	9+340	14.93 RT	705.010	J-3.3/3.4	82.611	81.277
217A	9+346±	16.03 RT	701.010	401.040	82.780	81.119
217B	9+355	20.0 RT	705.030	403.010 (3:1)	81.620	81.263
217C	9+370	14.11 RT	J-3.2	J-3.3/3.4	82.477	81.232
218	9+365	11.50 LT	705.010	400.060	82.554	80.839
219	9+365	4.40 LT	701.011	401.040	82.696	79.730
220	9+405	10.5 RT	701.010	401.040	82.374	80.857
220A	9+401±	13.26 RT	J-3.2	J-3.3/3.4	82.340	81.126
221	9+415	11.50 LT	705.010	400.060	82.304	80.258
222	9+465	11.50 LT	705.010	400.060	82.054	80.306
223	9+465	4.4 LT	701.011	401.040	82.196	79.319
224	9+465	11.50 RT	701.011	400.060(2)	82.052	79.953

5

STORM SEWER DATA

NO. to NO.		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
					Inlet	Outlet
206	213	600	105	100-D	80.588	80.140
208	ST	200	6	PVC SDR35	81.426	80.472*
209	ST	200	11	PVC SDR35	81.371	80.449*
210	212	200	18	PVC SDR35	81.555	81.401
211	212	375	12	140-D	81.370	81.338
212	213	375	26	140-D	81.011	80.118
212A	ST	200	7	PVC SDR35	81.405	81.012
213	219	750	100	65-D	80.070	79.749
214	ST	200	8	PVC SDR35	81.224	80.359*
215	ST	300	22	140-D	80.277	80.200
216	ST	200	7	PVC SDR35	81.021	80.198*
217	217A	200	6	PVC SDR35	81.277	81.145
217C	217A	300	23	140-D	81.232	81.122
217B	ST	200	4	PVC SDR35	81.263	81.237
217A	ST	300	21	140-D	81.119	80.018*
218	219	200	7	PVC SDR35	80.839	80.674
219	223	750	100	65-D	79.730	79.338
INLET	220	300	7	140-D	81.214	81.127
220	ST	300	15	140-D	80.857	80.595*
220A	220	300	5	140-D	81.126	81.047
221	ST	200	6	PVC SDR35	80.258	79.879
222	223	200	6	PVC SDR35	80.306	80.222
INLET	224	200	11	PVC SDR35	81.327	81.112
224	223	300	15	140-D	79.953	79.698
223	229	825	105	65-D	79.319	78.969

* DENOTES INVERT GIVEN AT TOP OF RISER

STATION

AS-BUILT

NOTE
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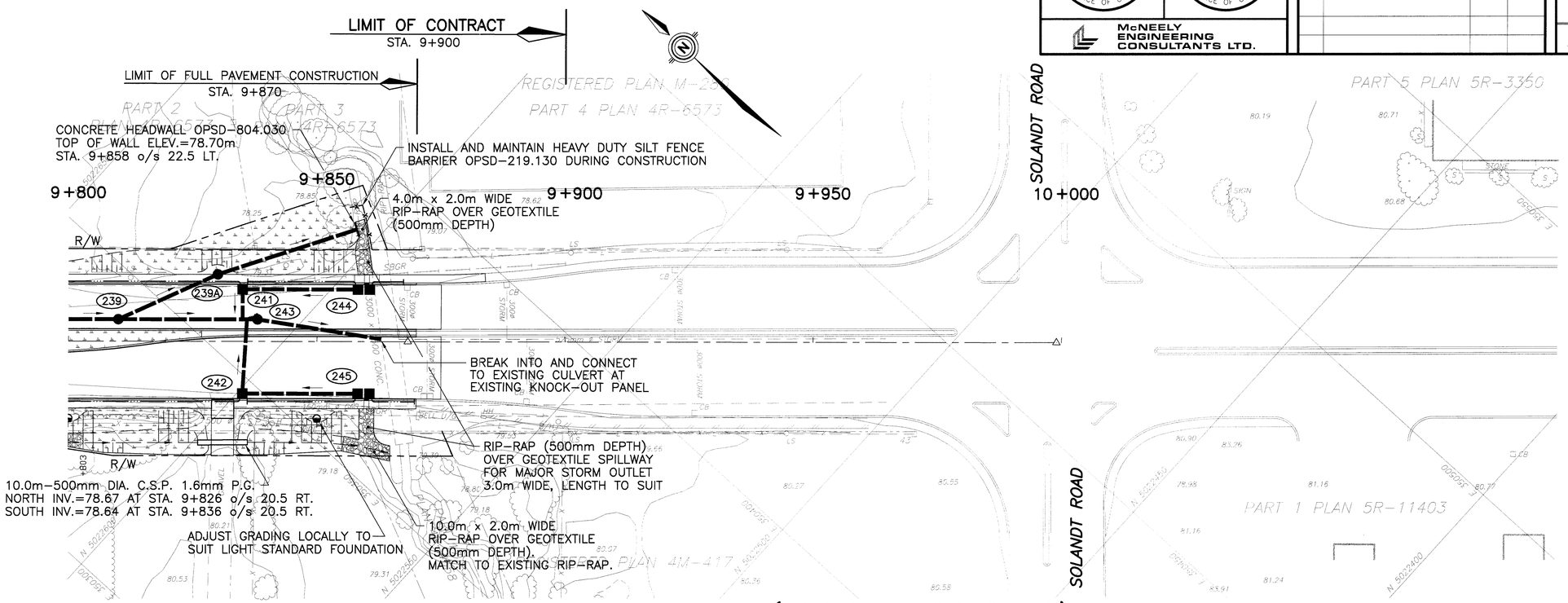
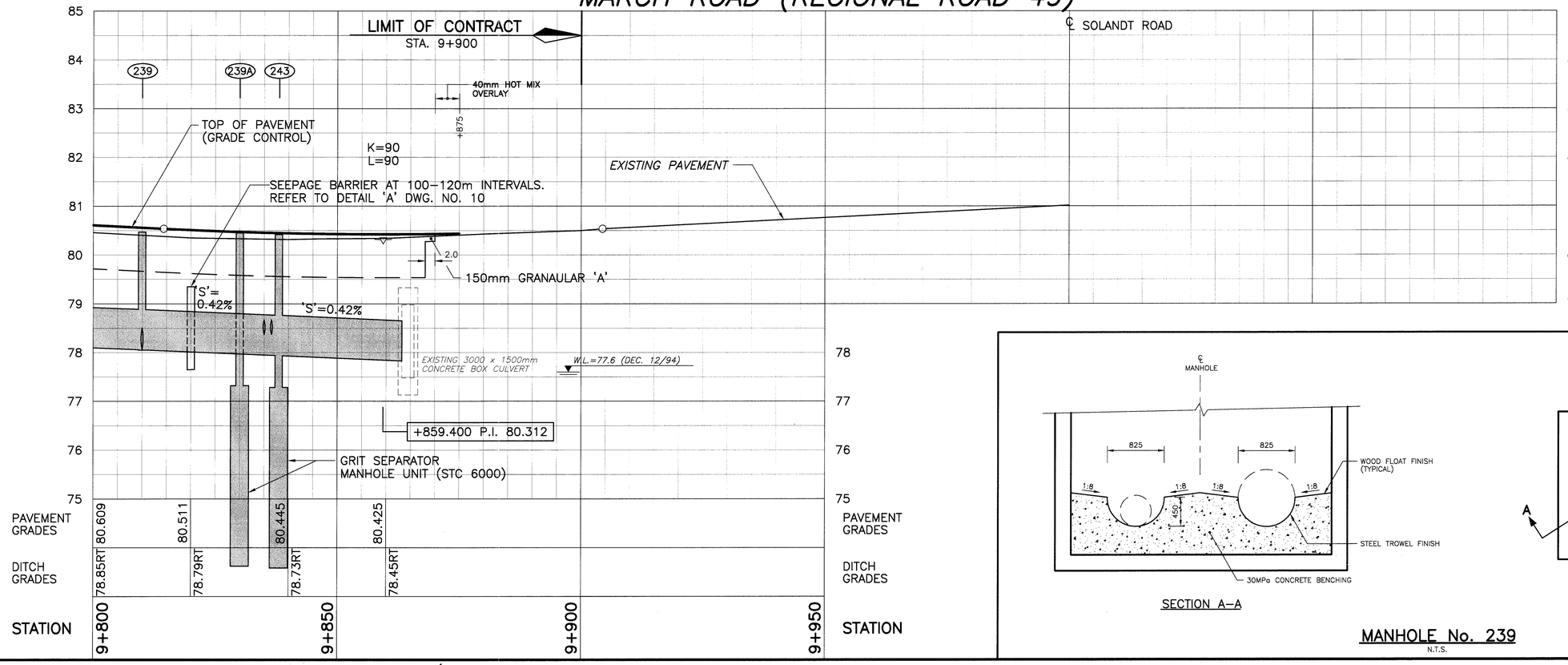


MARCH ROAD (REGIONAL ROAD 49)



NOTES:

1. OFFSETS AND GRATE ELEVATIONS FOR DITCH INLETS AND MANHOLES REFER TO CENTER OF GRATE.

   OFFSETS AND GRATE ELEVATIONS FOR CATCHBASINS AND CATCHBASIN MANHOLES ARE GIVEN AT EDGE OF PAVEMENT.

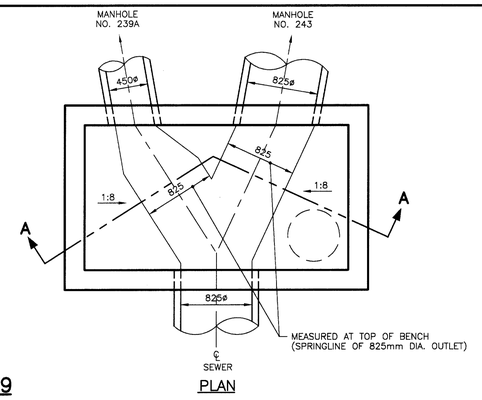
2. PIPE BEDDING SHALL BE CLASS 'B' AS PER OPSD-802.030 MOD. IN EARTH AND OPSD-802.033 MOD. IN ROCK. BACKFILL WITH APPROVED NATIVE FILL TO MATCH ADJACENT MATERIAL EXPOSED ON TRENCH WALL OR AS DIRECTED BY THE ENGINEER.
3. LATERAL CONNECTIONS ARE TO BE MADE USING MANUFACTURED TEES AS PER OPSD-708.01.
4. CULVERT BEDDING SHALL BE AS PER OPSD-802.010 BACKFILL WITH APPROVED NATIVE FILL.
5. PLACE STRAW BALE CHECK DAMS AS PER OPSD-219.180 IN DITCH ADJACENT TO DITCH INLETS AND HEADWALLS AND AT DITCH OUTLETS TO WATERCOURSES.
6. PROVIDE UTILITY SUPPORT AT CROSSINGS AS PER WSD-28.

CATCHBASIN & MANHOLE DATA						
NO.	STATION	OFFSET (m)	TYPE		ELEVATION	
			Structure	Cover	Grate	Low Inv.
239	9+810	4.4 LT	ME-23 1680x3050	401.040	80.471	78.067
239A	9+830	12.5 LT	STC6000	STC6000	80.452	77.928
241	9+035	11.50 LT	701.010	400.060	80.215	78.438
242	9+035	11.50 RT	701.010	400.060	80.215	78.535
244	9+859.4	11.50 LT	705.020	400.060(2)	80.195	78.698
243	9+838±	4.40 LT	STC6000	STC6000	80.429	77.881
245	9+859.4	11.50 RT	705.020	400.060(2)	80.195	78.717

STORM SEWER DATA						
NO. to NO.		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
					Inlet	Outlet
239	243	825	41	65-D	78.067	77.881
239	239A	450	23	100-D	78.052	77.928
239A	Outlet	450	29	100-D	77.882	77.796
243	Culvert	825	25±	65-D	77.840	77.729
244	241	300	19	140-D	78.698	78.587
245	242	300	19	140-D	78.717	78.634
241	ST	300	12	140-D	78.438	78.242
242	ST	300	12	140-D	78.535	78.350

AS-BUILT

SECTION A-A



PLAN

MANHOLE No. 239
N.T.S.

J. G. LAY — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO
C. A. RAMPERSAD — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO
McNEELY ENGINEERING CONSULTANTS LTD.

NO.	REVISION	BY	DATE
2	AS-BUILT	J.G.L.	24/6/99

Ottawa-Carleton

MARCH ROAD RECONSTRUCTION
SOLANDT ROAD TO KLONDIKE ROAD

GRADING AND DRAINAGE
STA. 9+800 TO STA. 9+900

J.M. MILLER, P. ENG. — Director, Engineering Division
W. BENNETT, P. ENG. — Manager, Transportation Projects

DWG. NO. R-2094-16
SHEET 16 OF 52
CONTRACT NO. 97-522
DATE: JUNE 1997
Scale: Horiz. 5.0 0 5.0 10.0; Vert. 0.5 0 0.5 1.0

R-2094

10307

D:\5170\51710c16.dwg Mon Jun 28 13:21:45 1999 A S - B U I L T

NOTE
THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE DURING CONSTRUCTION.

REGISTERED PROFESSIONAL ENGINEER
J. G. LAY
PROVINCE OF ONTARIO

McNEELY ENGINEERING CONSULTANTS LTD.

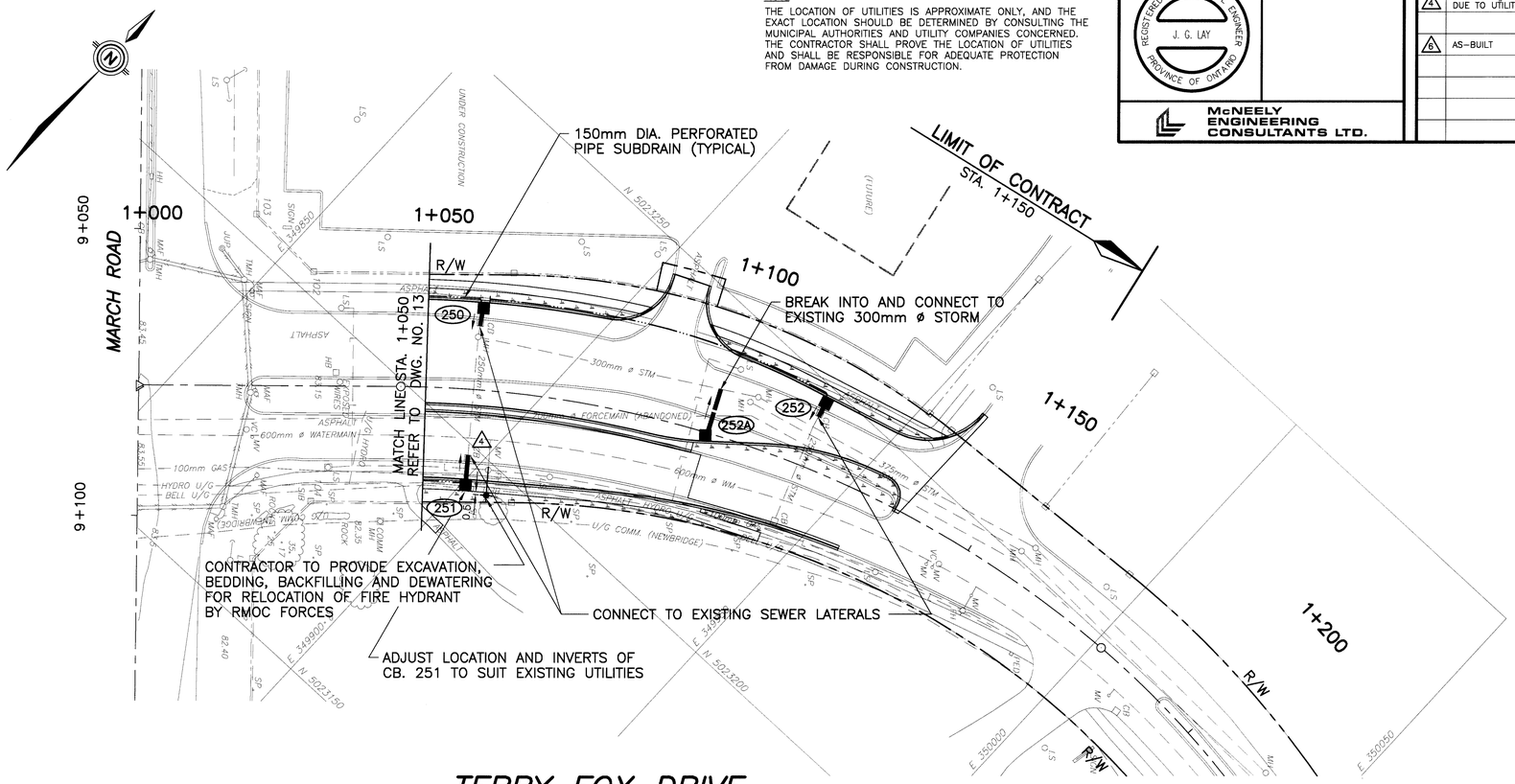
NO.	REVISION	BY	DATE
4	REVISE CB#251C TO EXISTING DUE TO UTILITY CONFLICT	J.G.L.	20/10/97
6	AS-BUILT	J.G.L.	24/6/99

Ottawa-Carleton

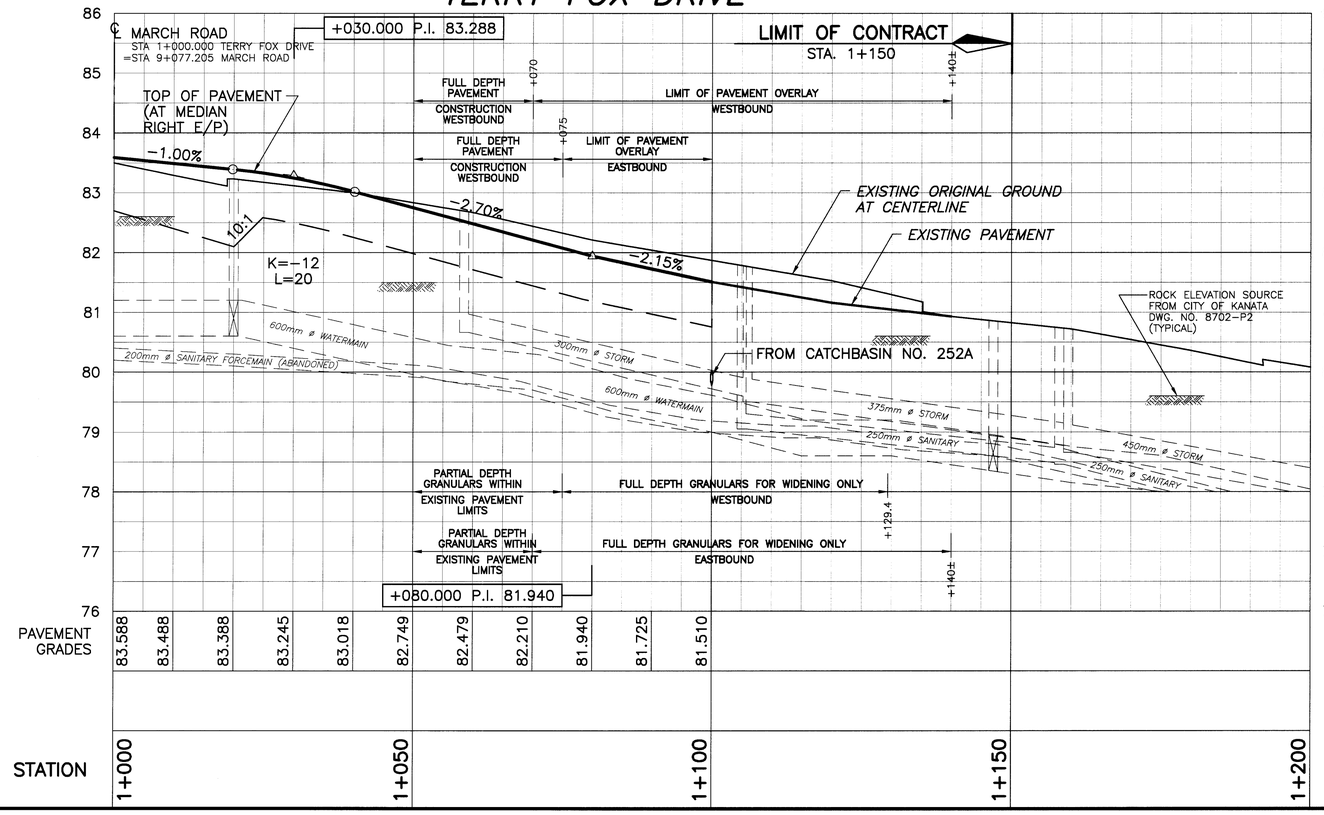
MARCH ROAD RECONSTRUCTION
SOLANDT ROAD TO KLONDIKE ROAD
GRADING AND DRAINAGE
TERRY FOX DRIVE
STA. 1+000 TO STA. 1+150

J.M. MILLER, P. ENG. — Director, Engineering Division
W. BENNETT, P. ENG. — Manager, Transportation Projects

DWG. NO. R-2094-19
SHEET 19 OF 52
CONTRACT NO. 97-522
DATE: JUNE 1997
Scale: Horiz. 5.0 0 5.0 10.0; Vert. 0.5 0 0.5 1.0



TERRY FOX DRIVE



NOTES:

1. OFFSETS AND GRATE ELEVATIONS FOR DITCH INLETS AND MANHOLES REFER TO CENTER OF GRATE.

   OFFSETS AND GRATE ELEVATIONS FOR CATCHBASINS AND CATCHBASIN MANHOLES ARE GIVEN AT EDGE OF PAVEMENT.

2. PIPE BEDDING SHALL BE CLASS 'B' AS PER OPSD-802.030 MOD. IN EARTH AND OPSD-802.033 MOD. IN ROCK. BACKFILL WITH APPROVED NATIVE FILL TO MATCH ADJACENT MATERIAL EXPOSED ON TRENCH WALL OR AS DIRECTED BY THE ENGINEER.

3. LATERAL CONNECTIONS ARE TO BE MADE USING MANUFACTURED TEES AS PER OPSD-708.01.

4. CULVERT BEDDING SHALL BE AS PER OPSD-802.010 BACKFILL WITH APPROVED NATIVE FILL.

5. PLACE STRAW BALE CHECK DAMS AS PER OPSD-219.180 IN DITCH ADJACENT TO DITCH INLETS AND HEADWALLS AND AT DITCH OUTLETS TO WATERCOURSES.

6. PROVIDE UTILITY SUPPORT AT CROSSINGS AS PER WSD-28.

CATCHBASIN & MANHOLE DATA

NO.	STATION	OFFSET (m)	TYPE		ELEVATION	
			Structure	Cover	Grate	Low Inv.
250	1+058.97	15.25 LT	705.010	400.060	82.171	80.810
251	1+058.20	15.75 RT	J-3.2	J-3.3/3.4	82.298	81.600
252	1+117.31	12.79 LT	705.010	400.060	80.931	79.452
252A	1+100.00	1.50 RT	705.010	400.060	81.489	80.281

SEWER DATA

NO. to NO.		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
					Inlet	Outlet
250	EXIST.	250	3	PVC SDR35	80.810	80.710
251	EXIST.	200	5	PVC SDR35	81.600	81.550
252	EXIST.	250	3	PVC SDR35	79.452	79.400
252A	EXIST.	250	9	PVC SDR35	80.281	79.799

AS-BUILT

D:\5170\5170c19.dwg Mon Jun 28 13:22:59 1999 A S - B U I L T

ID #77

CITY OF KANATA
Reviewed and approved for engineering related details only
Per
Date MAY 3 0 1994

℄ ROAD ELEVATION	82.800 83.505 82.935 82.435 81.935 81.435 81.235 81.085 80.835
TOP OF WATERMAIN ELEVATION	~~81.52~~ 80.468 80.313 80.973 80.653 HYD 80.246 80.143 ~~80.20~~ 80.265 80.382 80.501 ~~80.50~~ 80.601 80.706 80.878 HYD 80.871 ~~80.88~~ V&C RED. ~~81.20~~ CROSS 81.197 ~~81.20~~ V&C 81.197 ~~81.04~~ 80.787 80.473 ~~80.54~~ HYD 80.301 ~~80.04~~ 79.900 79.592 79.54 79.194 ~~79.34~~ 79.210 ~~79.19~~ 78.998 HYD ~~78.94~~ 78.780
STORM SEWER INVERT	80.680 ~~80.681~~ 47.0m - 300 Ø STORM SEWER @ 2.34% ~~2.20%~~ CONCRETE CLASS IV 79.580 ~~79.647~~ ~~79.572~~ 79.510 56.0m - 375 Ø STORM SEWER @ 1.34% ~~1.40%~~ CONCRETE CLASS IV 78.760 ~~78.788~~ ~~78.713~~ 78.672
SANITARY SEWER INVERT	79.061 53.0m - 250 Ø SANITARY SEWER @ 0.90 % PVC SDR-35 78.479 ~~78.584~~
EXISTING ELEVATION	81.28 81.85 81.25 80.60 80.70 80.60
CHAINAGE	0+250 0+275 0+300 0+310 0+325 0+350 0+375 0+391 0+400 0+402 0+415 0+421.5 0+425 0+440 0+450 0+475 0+482 0+500 0+525 0+535 0+550 0+574 0+575

CITY OF KANATA
150 KATIMAVIK ROAD, KANATA, ONTARIO K2L 2N3 TELEPHONE (613) 592 4261
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

No.	REVISION	DATE	BY
5	ISSUED FOR SIDEWALK CONTRACT	MAY 23/94	AR
4	AS BUILT	MAR 30/88	PF
3	CROSS & RED. LOCATION REVISED	MAY 8/87	U.B.
2	BLIND FLANGES ADDED	APRIL 30 87	UB
1	RELOCATE HYD	APRIL 16/87	U.B.

V. Bahn

NOVATECH ENGINEERING CONSULTANTS LTD
SUITE 100 • 196 BRONSON AVE. • OTTAWA, ONTARIO • K1R 6H4

DESIGN	UB
CHECKED	BCA
DRAWN	PVF
CHECKED	UB
APPROVED	MJH

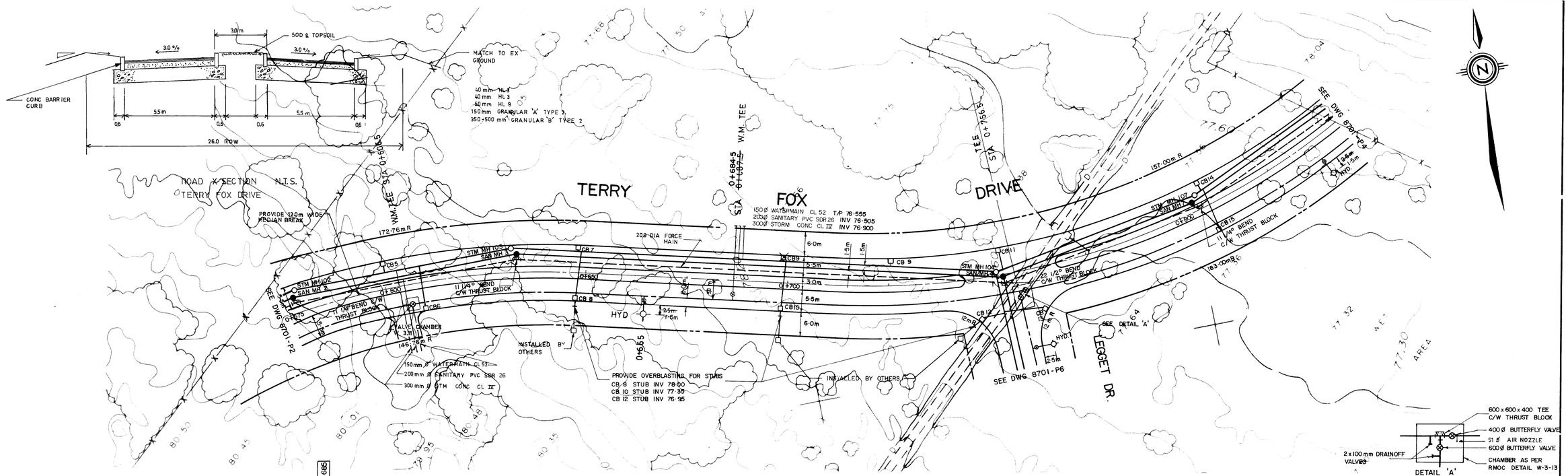
SCALE
1:500 HORIZONTAL 0 5 10 15 20
1:50 VERTICAL 0 0.5 1.0 1.5 2.0

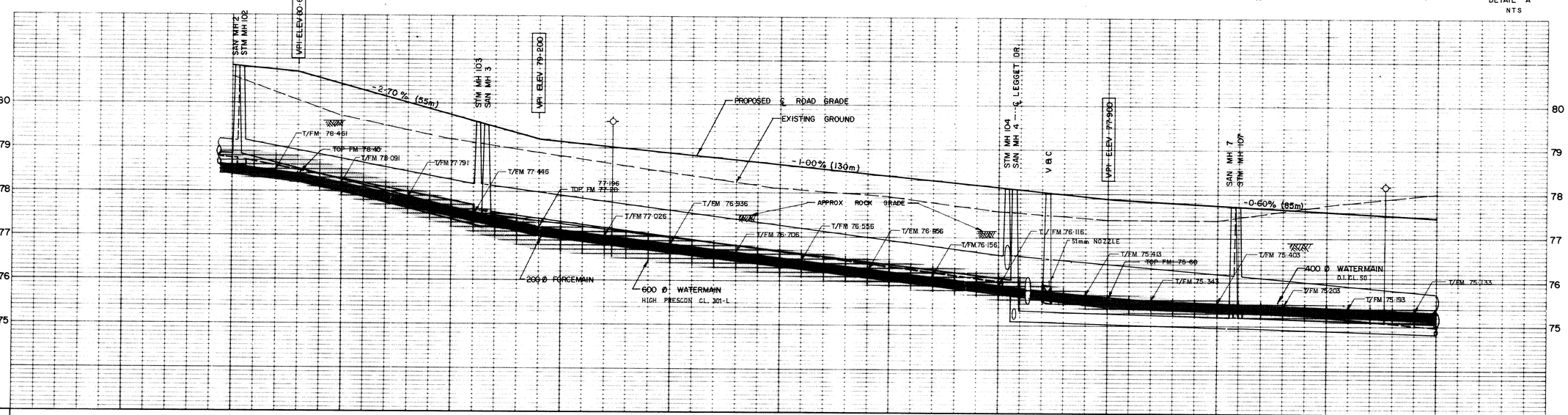
CITY OF KANATA
KANATA RESEARCH PARK
TERRY FOX DRIVE
STA. 0+250 TO STA. 0+575

DATE ISSUED MAY 23 1994

PROJECT No. 8701
FIELD BOOK
DATE March, 1987
DRAWING No. 8701 - P2

12763





℄ ROAD ELEVATION	80.835 80.415 79.740 79.200 79.150 78.900 78.650 78.400 78.150 77.900 77.750 77.600 77.450
TOP OF WATERMAIN ELEVATION	~~78.93~~ 78.780 ~~78.79~~ 78.640 ~~78.52~~ TEE 77.210 77.807 ~~77.84~~ 77.647 ~~77.30~~ 77.217 ~~77.25~~ HYD 76.996 ~~77.00~~ TEE 76.747 ~~76.75~~ 76.471 ~~76.50~~ ~~76.33~~ 76.258 TEE ~~76.10~~ ~~76.08~~ V&C 75.547 ~~75.700~~ 75.658 75.509 ~~75.55~~ 75.417 ~~75.40~~ 75.339 HYD 75.308 75.297 ~~75.25~~
STORM SEWER INVERT	78.760 ~~78.788~~ ~~78.713~~ 78.672 55.0 m - 450 Ø STORM SEWER @ 1.77 % ~~1.80 %~~ CONCRETE CLASS IV 77.700 ~~77.723~~ ~~77.575~~ 77.570 121.0 m - 600 Ø STORM SEWER @ 1.32 % ~~1.30 %~~ CONCRETE CLASS IV 75.967W ~~76.000W~~ ~~76.300S~~ ~~75.850E~~ 76.274S 75.825E 53.0 m - 750 Ø STORM SEWER @ 0.82 % ~~0.85 %~~ CONCRETE CLASS IV 75.390 ~~75.399~~ 75.373 50.0 m - 750 Ø STORM SEWER @ 0.87 % ~~0.92 %~~ CONCRETE CLASS IV
SANITARY SEWER INVERT	78.479 ~~78.584~~ 57.5 m - 250 Ø SANITARY SEWER @ 2.41 % ~~2.40 %~~ PVC SDR - 35 77.091 ~~77.204~~ 121.0 m - 250 Ø SANITARY SEWER @ 1.08 % ~~1.16 %~~ PVC SDR - 35 75.784W ~~75.800W~~ ~~75.150S~~ ~~75.100E~~ 75.136S 75.025E 50.0 m - 250 Ø SANITARY SEWER @ 0.44 % ~~0.30 %~~ PVC SDR - 35 74.803 ~~74.950~~ 74.759 52.5 m - 250 Ø SANITARY SEWER @ 0.26 % ~~0.30 %~~ PVC SDR - 35
EXISTING ELEVATION	80.60 80.05 79.70 79.20 78.88 78.80 78.45 78.10 77.91 77.60 77.40 77.40 77.75 78.00
CHAINAGE	0+575 0+590 0+600 0+606.5 0+625 0+645 0+650 0+665 0+675 0+687.5 0+700 0+725 0+750 0+753.5 0+756.5 0+775 0+800 0+825 0+838 0+850

CITY OF KANATA
150 KATIMAVIK ROAD, KANATA, ONTARIO K2L 2N3 TELEPHONE (613) 592 4261
DEPARTMENT OF ENGINEERING
AND PUBLIC WORKS

No.	REVISION	DATE	
4	AS BUILT	MAR 30/88	PF
3	ALIGNMENT REVISED	JUNE 16/87	U.B.
2	51mm NOZZLE ADDED	APRIL 16/87	U.B.
1	ROAD X SECTION AND SERVICES	APRIL 14/87	U.B.

V. Roche

NOVATECH ENGINEERING CONSULTANTS LTD.
SUITE 100 • 196 BRONSON AVE. • OTTAWA, ONTARIO • K1R 6H4

DESIGN UB
CHECKED BCA
DRAWN PVF
CHECKED UB
APPROVED MJH

SCALE
1 : 500
0 5 10 15 20
HORIZONTAL
1 : 50
0 0.5 1.0 1.5 2.0
VERTICAL

CITY OF KANATA
KANATA RESEARCH PARK

TERRY FOX DRIVE
STA. 0+575 TO STA. 0+850

PROJECT No. 8701
FIELD BOOK
DATE March, 1987
DRAWING N. 8701 - P3

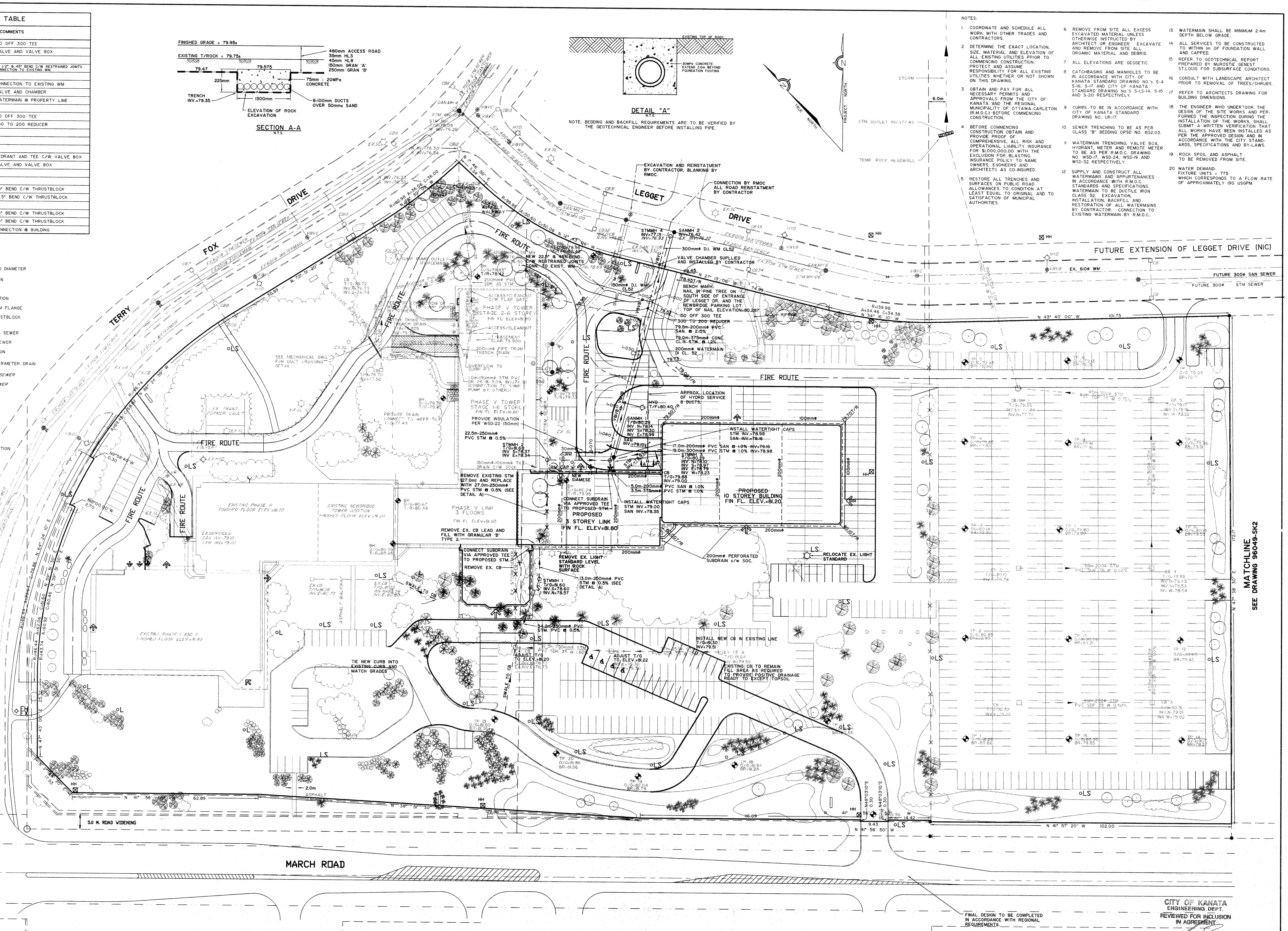
12763

WATERMAIN TABLE

STATION	SURFACE ELEVATION	T/W ELEVATION	COMMENTS
0+000	79.45	77.05	150 OFF 300 TEE
0+002.5	79.36	76.96	VALVE AND VALVE BOX
0+010	79.22	76.82	
0+015.6	79.11±	76.71	22 1/2° & 45° BEND C/W RESTRAINED JOINTS CONNECTION TO EXISTING WM
0+984	79.00±	76.60	CONNECTION TO EXISTING WM
0+999	79.12	76.72	VALVE AND CHAMBER
1+000	79.15	76.75	WATERMAIN @ PROPERTY LINE
1+010	79.42	77.02	
1+012	79.45	77.05	150 OFF 300 TEE
1+013.6	79.48	77.08	300 TO 200 REDUCER
1+020	79.59	77.19	
1+030	79.85	77.45	
1+040	79.80	77.40	
1+047.4	79.97	77.64	HYDRANT AND TEE C/W VALVE BOX
1+049.4	80.04	77.64	VALVE AND VALVE BOX
1+050	80.05	77.65	
1+060	80.29	77.89	
1+063.9	80.31	77.91	45° BEND C/W THRUSTBLOCK
1+066.7	80.33	77.93	22.5° BEND C/W THRUSTBLOCK
1+070	81.20	78.80	
1+080	81.35	78.95	45° BEND C/W THRUSTBLOCK
1+081.4	81.35	78.95	45° BEND C/W THRUSTBLOCK
1+086.9	81.65	79.25	CONNECTION @ BUILDING

LEGEND

400mmΦ	PROPOSED WATERMAIN AND DIAMETER
	PROPOSED VALVE LOCATION
V&VB	VALVE & VALVE BOX
HYD	PROPOSED HYDRANT LOCATION
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE
	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE
MH 173	PROPOSED SANITARY MH & SEWER
MH 172	PROPOSED STORM MH & SEWER
CB-2	PROPOSED ROAD CATCHBASIN
200mmΦ	PROPOSED PERFORATED PERIMETER DRAIN
	EXISTING SANITARY MH & SEWER
	EXISTING STORM MH & SEWER
	EXISTING WATERMAIN
(M)	PROPOSED WATERMETER
(RM)	PROPOSED REMOTE METER
	PROPOSED BARRIER CURB (SEE NOTE 9)
HH	PROPOSED HANDHOLE LOCATION



NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF KANATA AND THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON (R.M.O.C.) BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $1,000,000.00 WITH THE EXCLUSION FOR BLASTING. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO CONDITION AT LEAST EQUAL TO ORIGINAL AND TO SATISFACTION OF MUNICIPAL AUTHORITIES.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE INSTRUCTED BY ARCHITECT OR ENGINEER. EXCAVATE AND REMOVE FROM SITE ALL ORGANIC MATERIAL AND DEBRIS.
7. ALL ELEVATIONS ARE GEODETIC.
8. CATCHBASINS AND MANHOLES TO BE IN ACCORDANCE WITH CITY OF KANATA STANDARD DRAWING NO.'s S-4 S-16, S-17 AND CITY OF KANATA STANDARD DRAWING No.'S S-1, S-14, S-15 AND S-20 RESPECTIVELY.
9. CURBS TO BE IN ACCORDANCE WITH CITY OF KANATA STANDARD DRAWING NO. UR-17.
10. SEWER TRENCHING TO BE AS PER CLASS "B" BEDDING OPSD NO. 802.03.
11. WATERMAIN TRENCHING, VALVE BOX, HYDRANT, METER AND REMOTE METER TO BE AS PER R.M.O.C. DRAWING NO. WSD-17, WSD-24, WSD-19 AND WSD-32 RESPECTIVELY.
12. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH R.M.O.C. STANDARDS AND SPECIFICATIONS. WATERMAIN TO BE DUCTILE IRON CLASS 52. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY CONTRACTOR. CONNECTION TO EXISTING WATERMAIN BY R.M.O.C..
13. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE.
14. ALL SERVICES TO BE CONSTRUCTED TO WITHIN 1m OF FOUNDATION WALL AND CAPPED.
15. REFER TO GEOTECHNICAL REPORT PREPARED BY McROSTIE GENEST ST.LOUIS FOR SUBSURFACE CONDITIONS.
16. CONSULT WITH LANDSCAPE ARCHITECT PRIOR TO REMOVAL OF TREES/SHRUBS.
17. REFER TO ARCHITECTS DRAWING FOR BUILDING DIMENSIONS.
18. THE ENGINEER WHO UNDERTOOK THE DESIGN OF THE SITE WORKS AND PERFORMED THE INSPECTION DURING THE INSTALLATION OF THE WORKS, SHALL SUBMIT A WRITTEN VERIFICATION THAT ALL WORKS HAVE BEEN INSTALLED AS PER THE APPROVED DESIGN AND IN ACCORDANCE WITH THE CITY STANDARDS, SPECIFICATIONS AND BY-LAWS.
19. ROCK SPOIL AND ASPHALT TO BE REMOVED FROM SITE.
20. WATER DEMAND:
FIXTURE UNITS = 775
WHICH CORRESPONDS TO A FLOW RATE OF APPROXIMATELY 190 USGPM.

CITY OF KANATA
ENGINEERING DEPT.
REVIEWED FOR INCLUSION IN AGREEMENT
SIGN
DATE JAN 0 7 1998

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY	No.	REVISION	DATE	BY
				6	GENERAL REVISION	OCT 29/96	LG
				5	REVISED LOADING DOCK LOCATION	OCT 15/96	SG
				4a	REVISED AS PER RMOC COMMENTS	SEPT 19/96	UB
				4	REVISED AS PER RMOC COMMENTS	SEPT 17/96	ES
				3	GENERAL REVISION	SEPT 11/96	SG
				2	REVISED SERVICES LOCATION AND PARKING	SEPT 5/96	UB
7	REVISED LEGAL INFORMATION ADDED	SEPT. 5/97	GSH	1.	ISSUED FOR TENDER	AUG 30/96	UB

LICENSED PROFESSIONAL ENGINEER G. S. HOLOWACH PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER UDO BOEHME PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD.
OTTAWA, ONTARIO

DESIGN UB	SCALE	CITY OF KANATA		PROJECT No. 96049
CHECKED UB	1:500	NEWBRIDGE TOWER PHASE VI		
DRAWN SAB				DATE AUGUST 1996
CHECKED UB		SERVICING PLAN		DRAWING No.
APPROVED UB				96049-S1

13277

Sept 05, 1997 - 14:11:47 DWG Name: K:\NOVA\K R P\96049

LEGEND

Water Valve, Valve Chamber, Fire Hydrant	⊗ ◎ ⌖
Sewer Manhole, Catch Basin Manhole	Ⓢ ▢
Catch Basin / Drainage, Wing Wall, Head Wall	☐ ▯ ▭ ▦ ⊖ [
Pole, Pole w/ light, Decorative, Lawn Light	UP ○ H ☼ ☼ ☼
Power Supply, Panel, Pedestal, Transformer, Tower, Regulator	P/S B PED ☒ ☒ GR
Amp, Hand Hole, Vault, Gas Valve	AMP ▯ ◫ ⊘
OC Transpo: Bus Shelter-No Power, Energized, Isolated	BUS BUS BUS
Streetscape: Planter Box, Grate Square, Eng. Soil	▢ TGS ◪
Traffic Connect Box / Disconnect Box, SL Disconnect	TCB TDB SDB
Red Light Hand Hole, Red Light Camera	○ THH ▭
Scada: Handhold, Monitoring Panel	S M
Reducer	▷
Pipe, Duct, Conduit, Lateral	🟥
Culvert	🟩
Abandoned	▬
Capped	▬
Buried Cable	▬
Property Line	🟦
Install Year	(2015)

TELECOM GLOSSARY

A	Allstream	P	Primus
AT	Atria	P2P	Canadian P2P Fibre
B	Bell	R	Rogers
BH	Birch Hill	S	Sprint
F	Fibre Noir	SL	Street Lighting
G	Globility	T	Traffic
GT	Group Telecom	TO	Telecom Ottawa
H	Hydro Ottawa	TU	Telus
H1	Hydro One	V	Videotron
L / L3	Level 3	Z	Zayo

GLOSSARY - OTHER

DD	Dept. of Defence	PED	Pedestal (owner unknown)
MH	Manhole (owner unknown)	PW	Public Works
O/OC	OCTranspo	UP	Utility Pole (owner unknown)
SCD	Scada		

CAUTION/ATTENTION

Although utility locations are established using the best available informaiton, they cannot be guaranteed.
Property Lines were compiled from plans and documents recorded in the Land Registry System and are for indexing purposes only.

Bien que l'emplacement des services publics soient établis en utilisant la meilleure information disponible, ils ne peuvent pas être garantis.
Des lignes de propriété ont été compilées en utilisant des plans et des documents enregistrés dans le système de cadastre et sont pour l'indexation seulement.

Mississippi Valley Conservation Authority

Shirley's Brook 2016 Summary Report

Monitoring Activity in the City of Ottawa

In 2012, Mississippi Valley Conservation Authority (MVCA) and the Friends of the Carp River (FCR) collaborated to undertake a broad scale assessment of potential restoration and stewardship opportunities along the Carp River and to test the implementation of a citizen science based volunteer monitoring program. The following year, with funding from Shell Canada, MVCA initiated a pilot City Stream Watch Program (CSW) which uses a combination of detailed monitoring, education and outreach, and targeted rehabilitation to improve the overall understanding of and guardianship over the health of the watershed. Volunteer "citizen scientists" are trained to collect technical information on creek conditions. Volunteers also participate in special stewardship initiatives that include shoreline planting, fish habitat enhancement projects, stream clean-up and invasive species removal events.

The City Stream Watch Program has three broad goals:

- To provide long-term documentation of the aquatic and riparian conditions in our watershed
- To enhance public awareness about the condition and value of freshwater streams
- To use the information collected to encourage community driven restoration projects

Since adopting the City Stream Watch program in 2013, MVCA staff and volunteers have surveyed more than 360 sections in 10 streams. This information has fed into the planning of 13 riparian planting sites, 4 habitat improvements, a stream garbage pick-up in Poole Creek and the Carp River and invasive species removal events. This year (2016), three streams were surveyed, Shirley's Brook, Kizell Drain and Carp C Tributary, for a total of 8.4kms. Separate reports are available for each stream on our website.

MVCA will continue to expand the City Stream Watch Program by implementing a 3 year monitoring and reporting rotation on a number of main tributaries within the City.

Figure 1 shows the location of the Shirley's Brook subwatershed within MVCA's City Stream Watch program area.

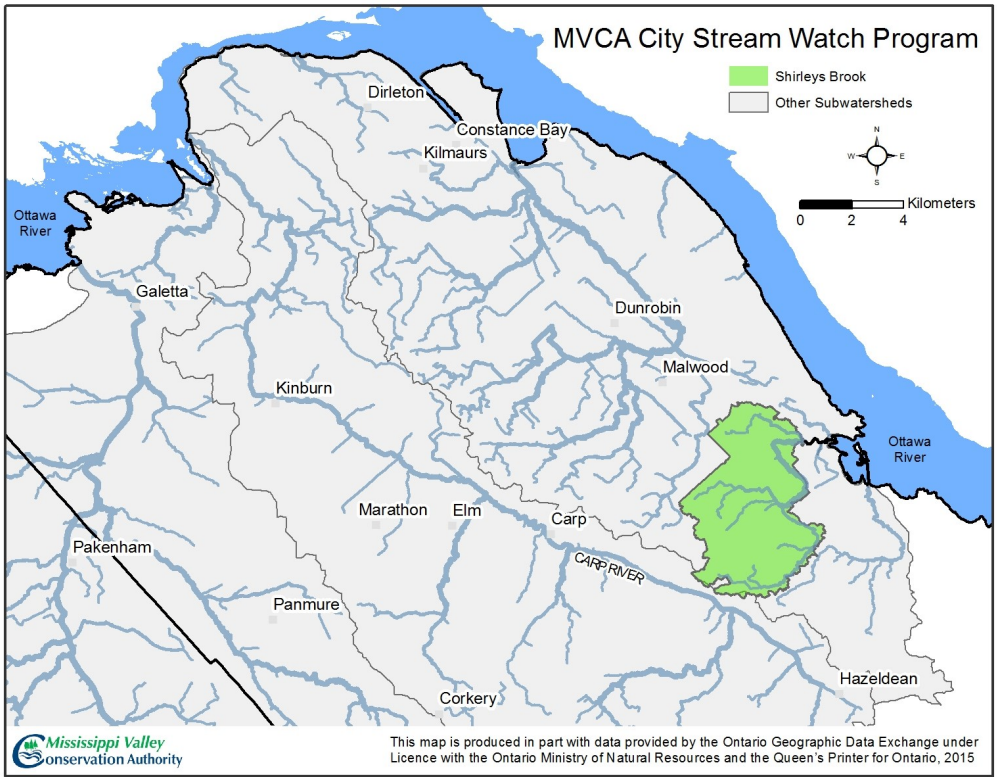


Figure 1: *MVCA's City Stream Watch area highlighting the location of the Shirley's Brook subwatershed.*

Shirley's Brook

Located in the west end of the City of Ottawa, Shirley's Brook is a tributary to the Ottawa River. It has a length of 13 kilometers (km) and drains an area of 26.2 square kilometers (km^2).

Shirley's Brook's headwaters originate in the South March Highlands west of Terry Fox Drive. From there it flows east and then north through the March Road industrial area, the Marshes Golf Club, through urban residential areas, and lastly through the Connaught Range before entering Shirley's Bay in the Ottawa River.

Table 1 presents a summary of some key features of the Shirley's Brook subwatershed.

Table 1: Subwatershed Features	
Area	26.2 square kilometers
Land Use	28.4% wooded area 26.3% agriculture 17.5% wetlands 10.4% urban land-use 7.7% roads 6.6% rural land-use 0.1% water 0% aggregate sites
Surficial Geology	52.6% bedrock 24.7% clay 11% sand 6.6% organic deposits 5.1% diamicton 0% gravel
Watercourse Length and Type	*Total Length:* 13 kilometers *Watercourse Type:* 79% natural 21% channelized *Flow Type:* Permanent

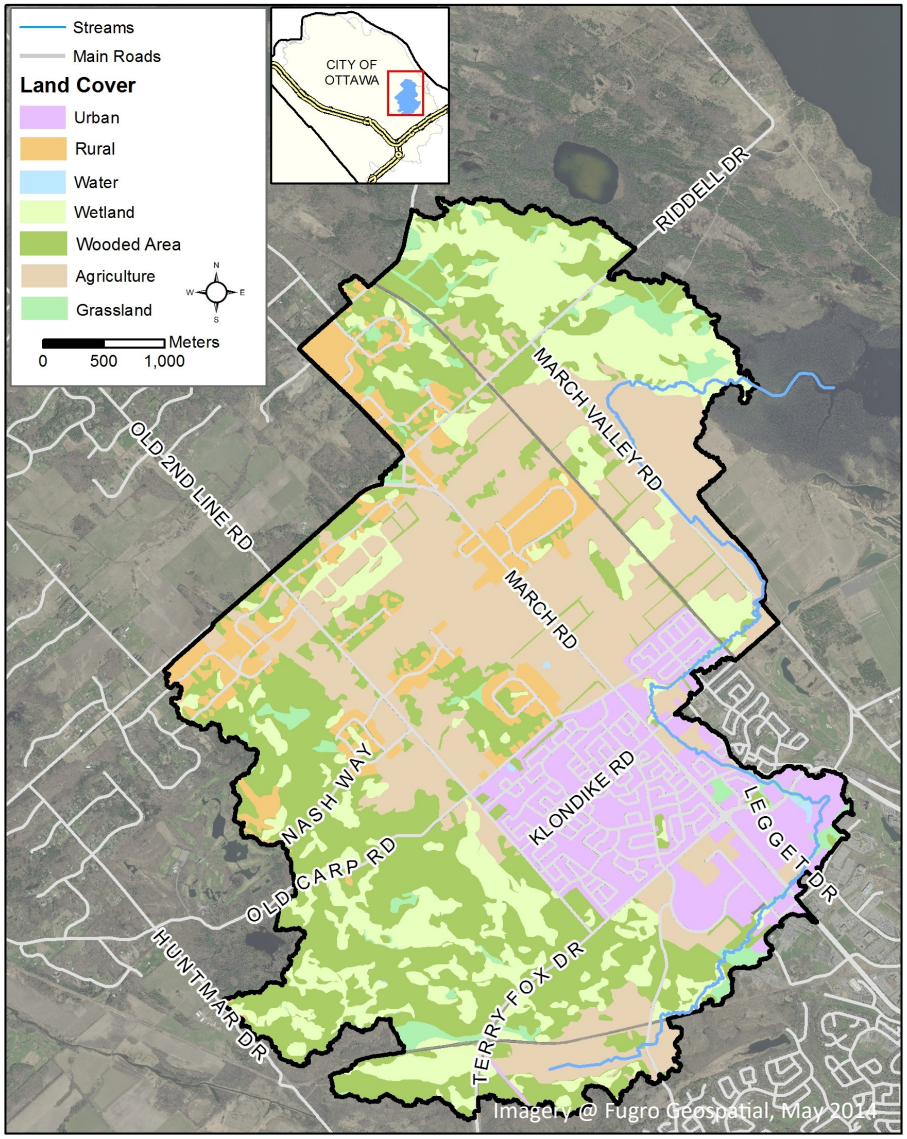


Figure 2: *Land Use in the Shirley's Brook subwatershed.*

The Shirley's Brook Subwatershed

As seen in Figure 2, the Shirley's Brook subwatershed is quite large and contains both urban and rural development. Crossing a mixture of wetland, woodland, rural and urban, residential areas, recreational areas, commercial and industrial, the brook provides a natural corridor and habitat for a range of aquatic and terrestrial species.

The main branch which primarily flows through the urban area was the focus of our study. The north branch, which flows through the rural area and joins the main branch just south of Old Carp Road, has been previously studied using other protocols.

Fish species found in Shirley's Brook: Blacknose Shiner, Brook Stickleback, Central Mudminnow, Creek Chub, Dace sp., Finescale Dace, Iowa Darter, Northern Redbelly Dace, Spottail Shiner, White Sucker, Bluntnose Minnow, Fathead Minnow.

Monitoring in Shirley's Brook

In 2016, permission was granted to survey 52 sections of Shirley's Brook, shown on Figure 3, which cover approximately 5.2 km of the main channel. The portions of the brook that were not sampled represent the wetland areas that could not be assessed using the macro stream assessment protocol, the golf course and areas where permission was not granted.

This report presents a summary of the observations made along the 45 sampled sections. While these sections provide a good representation of the overall condition of Shirley's Brook it should be noted that there are a few sections of the brook that are not represented in this assessment. These areas provide an additional diversity of habitat with valuable natural functions.

Methodology

The macro stream assessment is completed using a protocol that divides the entire length of the creek into 100 meter (m) sections. Starting at the downstream end, a monitoring crew wades the creek and completes a detailed assessment at the end of each 100 meter section. If a section of the creek is un-wadeable, that section is bypassed and the assessment is continued once the creek becomes wadeable again. The parameters that are assessed include general land use, in-stream morphology, human alterations, water chemistry, plant life, and other features presented in this report.

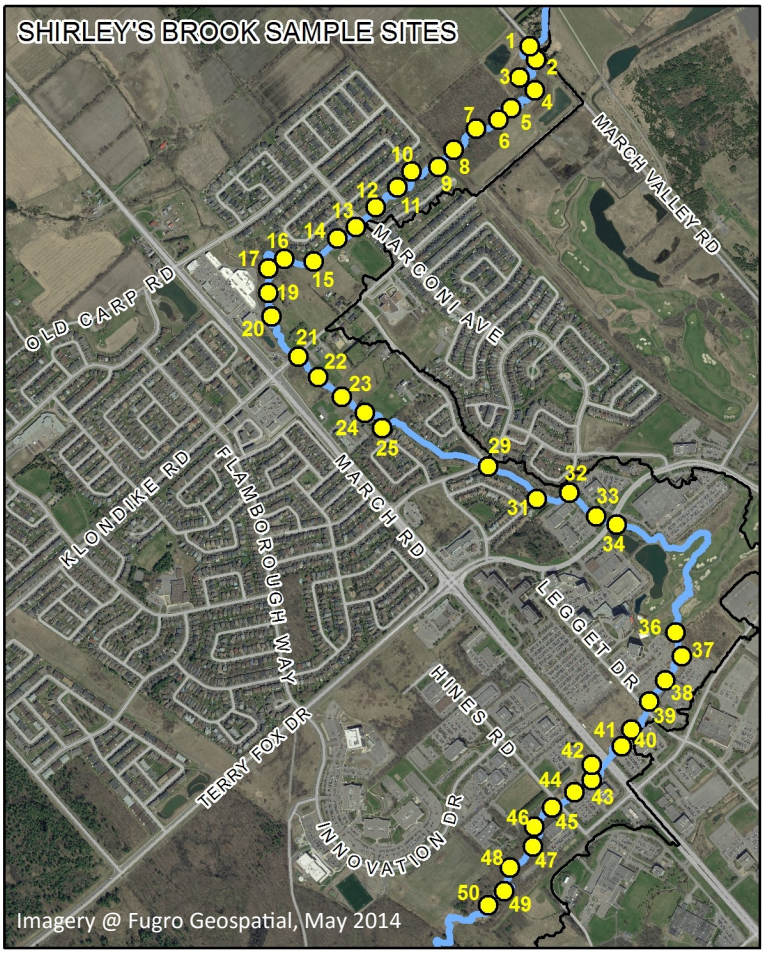


Figure 3: *Locations of the monitoring sites along Shirley's Brook.*

Table 2 shows some basic assessment measurements for Shirley's Brook. The surveyed sections had an average stream width of 2.53 m and an average depth of 0.20 m. When the field survey took place, the average water temperature was 18.2 °C.

Table 2: Shirley's Brook Assessment Facts

	Minimum	Maximum	Average
Air Temperature (°C)	15.5	30.4	22.8
Water Temperature (°C)	13.0	25.3	18.2
Wetted Width (m)	0.60	11.00	2.53
Stream Depth (m)	0.00	0.75	0.20

General Land Use Adjacent to Shirley's Brook

General land use along each surveyed section of Shirley's Brook is considered from the beginning to the end of each survey section (100 m) and extending outward 100 m on each side of the creek. Land use outside of this area is not included in the surveys but is nonetheless part of the subwatershed and will influence the creek (Castelle et al, 1994).

The categories of land use include infrastructure, active agriculture, pasture, abandoned agricultural fields, residential, forests, scrubland, meadow, and wetland. Figure 4 shows the overall percent of land use that was observed adjacent to Shirley's Brook.

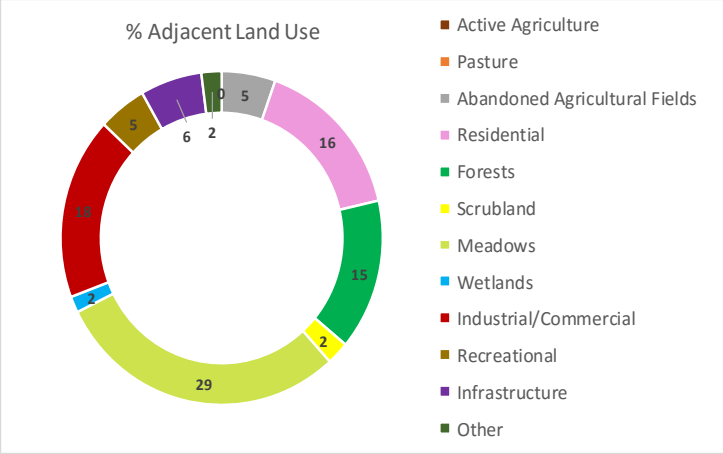


Figure 4: *Land use alongside Shirley's Brook.*

Of the eleven categories, active agriculture and pasture land were not found to be present. At 29%, meadow represents the most prominent category of land use followed by industrial at 18%, and residential at 16%.

The land use in the overall subwatershed area is a mix of urban, urban fringe, rural and natural. This results in the lands adjacent to the brook not being dominated by one type but rather distributed between residential, forest, meadow, and industrial/commercial. This is reflected well in the percentages seen in Figure 4. In particular we see a high percentage of meadow, which is a result of the tall grass riparian zones within the light industrial zone, and a high percentage of forest which is protected in the downstream City park lands. There is only one farm property remaining adjacent to the brook but the lands have been left fallow for many years.

Human Alterations to Shirley's Brook

In this assessment, human alterations refer to artificial changes to the actual channel of the watercourse either by straightening or relocation. Such alterations can be made in streams and rivers for many reasons including to accommodate development, such as road crossings and culverts, to make more land available for agriculture, to allow navigation of large boats, and to minimize natural erosion caused by the meandering pattern of flowing water. As seen in Figure 5, 69% of Shirley's Brook was found to be natural (with minor alterations), 22% was altered (with considerable human impact), and 9% was highly altered.

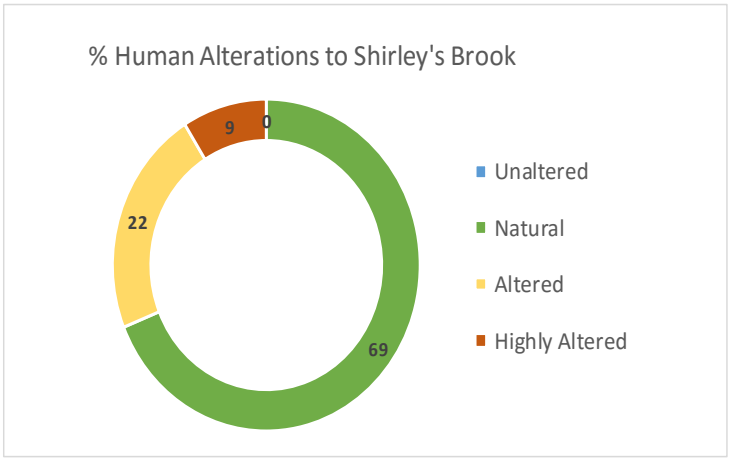


Figure 5: *Extent of human alterations to Shirley's Brook.*

It is a positive attribute that so much of the creek is natural and has not been channelized, with large parts of the stream corridor contained within City of Ottawa park lands. There are also large sections that have significant alterations. Such as numerous road crossings, parking lots with direct storm water outlets, adjacent and online storm water ponds, and a highly landscaped golf course property.

Riparian Buffer along Shirley's Brook

The riparian buffer refers to the amount of vegetated area along the edges of the stream banks. It can consist of a variety of vegetation types including trees, shrubs, grasses and other plants. Vegetated buffers are important for protecting water quality and creating healthy aquatic habitats. They intercept sediments and contaminants as well as protect the stream banks against erosion. Buffers also improve habitat for aquatic species by shading and cooling the water and providing protection for birds and other wildlife that need to be near water for feeding or rearing young. Riparian buffers along the creek corridor also provide a natural area for wildlife movement and dispersal. While riparian buffer is not the only factor affecting stream health, studies assessing adjacent land use largely show a positive relationship between buffer size and stream health (Stanfield and Kilgour, 2012).

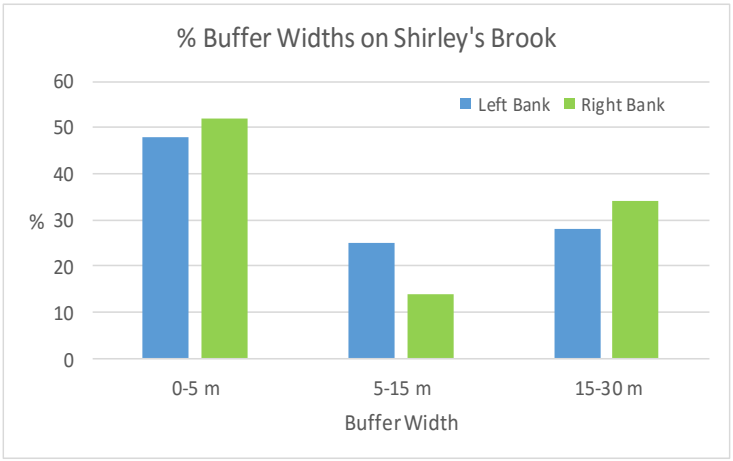


Figure 6: Riparian buffer widths along Shirley's Brook.

Environment Canada's Guideline: *How Much Habitat is Enough?* recommends a minimum 30m wide vegetated buffer along at least 75% of the length of both sides of a watercourse. Therefore, for this assessment, we record the width of the riparian buffer within 30m of either side of the watercourse. As summarized in Figure 6, we found that on the sections of Shirley`s Brook that were surveyed, 52% of the left banks and 48% of the right banks have a buffer width of 5m or greater. Conversely 48% of the left banks and 52% of the right banks have less than a 5m buffer, with two sections being mowed right to the edge, as seen in the top right photo.

Figure 7 shows the differences in riparian buffer widths along Shirley`s Brook. The best buffers were seen along the surveyed sections in the south and the north where the stream flows through forested park space. The red and orange represent reaches where the brook flows through highly landscaped business park properties.

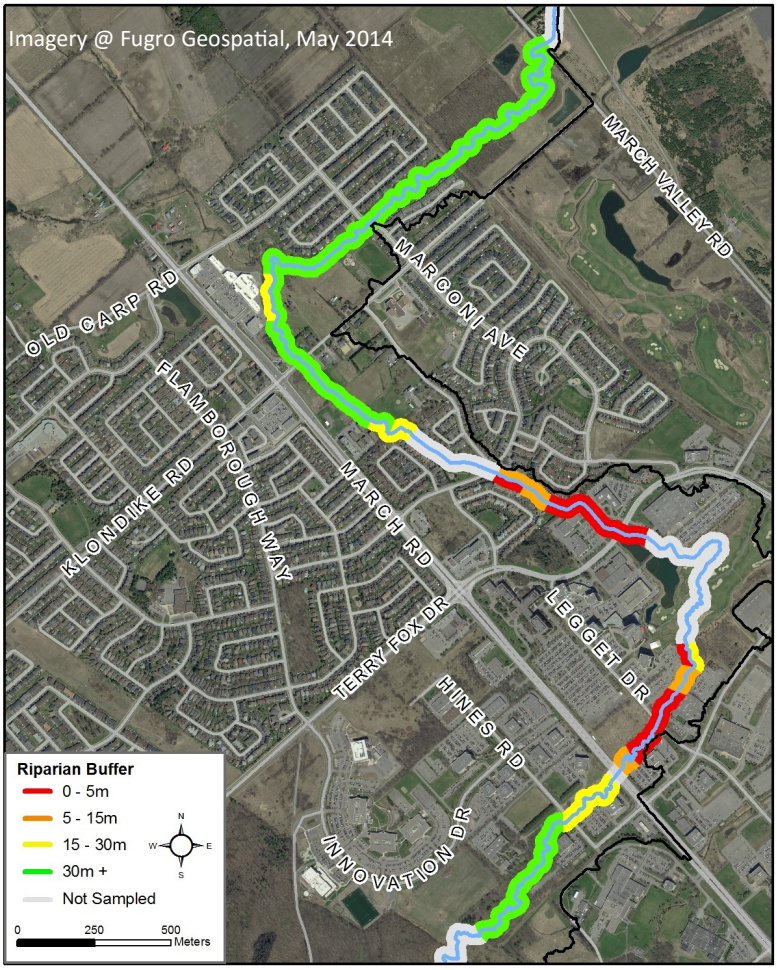


Figure 7: *Vegetated buffer width along Shirley's Brook.*

Overhanging Trees and Branches

Overhanging branches and trees, a byproduct of a good riparian buffer, provide crucial nutrients, in the form of coarse particulate organic matter (leaves, insects, seeds etc.), to small streams (Vannote et al. 1980). This organic matter is broken down and eaten by aquatic insects, phytoplankton and zooplankton, which are important prey items of fish and wildlife. Overhanging branches also provide stream shading, and fallen logs create excellent habitat for fish.

Overall, Shirley`s Brook has a broad mixture of habitats providing some degree of overhanging trees and branches, as seen in Figure 8. In some areas this reflects the surrounding natural vegetative community, where the creek passes through sections of forest, or areas dominated by ponds or tall grasses, and in some areas it reflects clearing of the vegetation close to the creek.

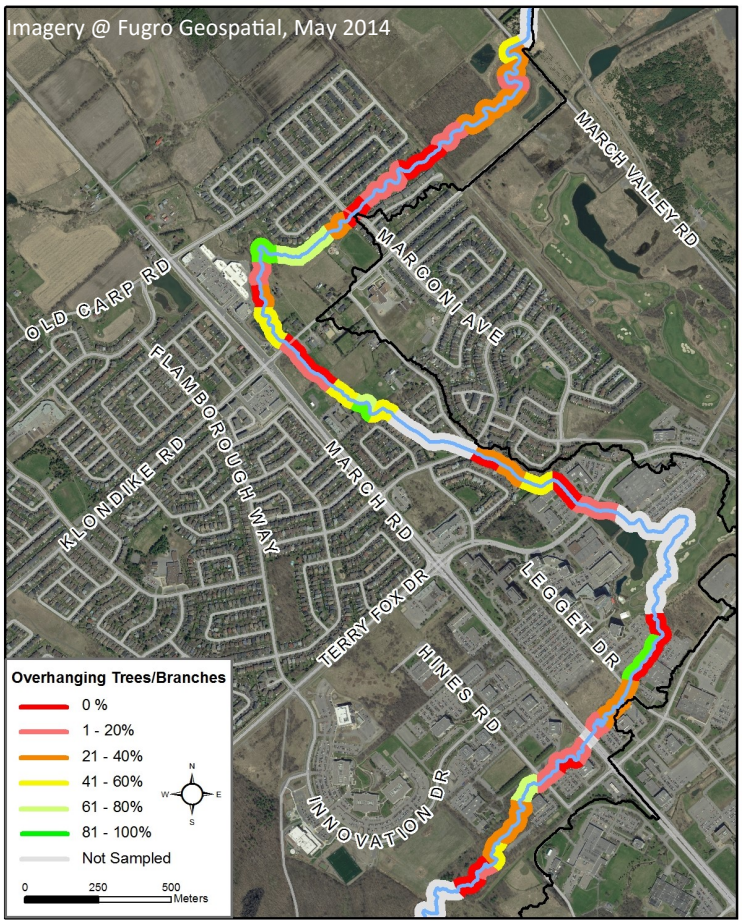


Figure 8: *Overhanging trees and branches along Shirley`s Brook.*

Figure 9 shows the data quantified as the percent of creek sections classified according to the various amounts of over-hanging trees and branches. For example, 20-24% of the 45 surveyed stream sections were classified as having zero overhanging trees and branches while the rest of the brook has a good diversity of mixed open and covered reaches.

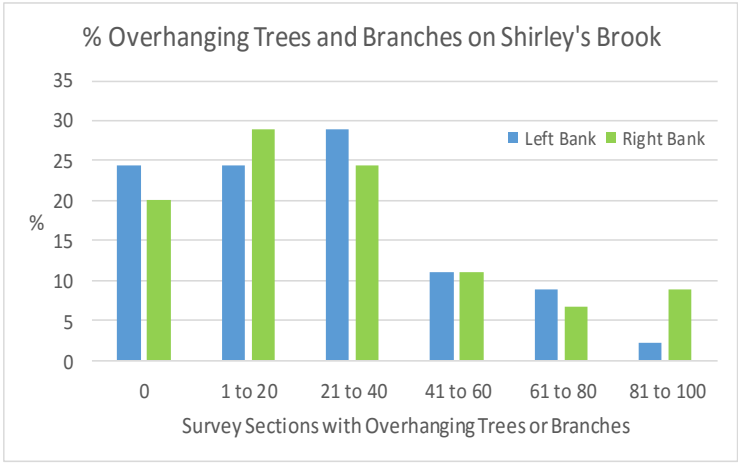


Figure 9: *Percentage of each surveyed section of Shirley`s Brook with overhanging trees and branches.*

Stream Shading

Shade is important in moderating stream temperature, contributing to food supply and helping with nutrient reduction within a stream. Grasses, shrubs and trees can all provide shading to a stream, with trees providing more full coverage and grasses providing much needed shade directly along the edges where shading from trees may not be available.

Figure 10 shows the variability in the amount of stream shading along different sections of Shirley's Brook. We can see that the shading is extremely variable. This is due to the diversity of riparian vegetation along the creek, with sections of meadow interspersed with areas of forest, a reach of highly mowed riparian grass, as well as wide unshaded pond features.

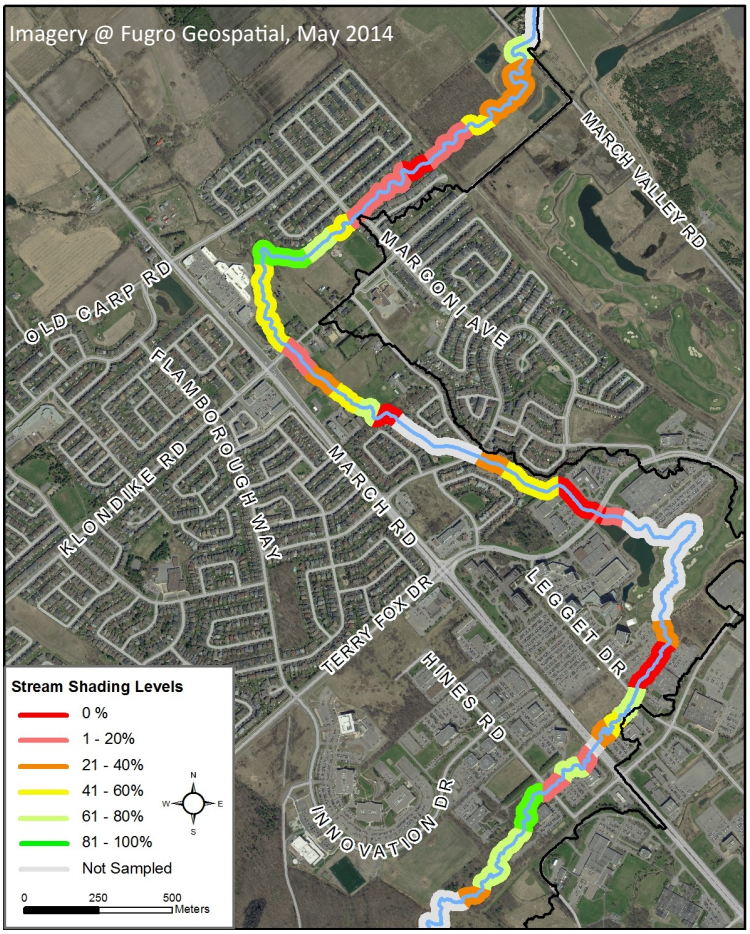


Figure 10: *Stream Shading along Shirley`s Brook.*

Figure 11 shows the data quantified as the percent of creek sections classified according to the various levels of shading. For example, 60% of the 45 stream sections that were surveyed were classified as having low to moderate amounts of shade (1 to 60% shading/ 100m section).

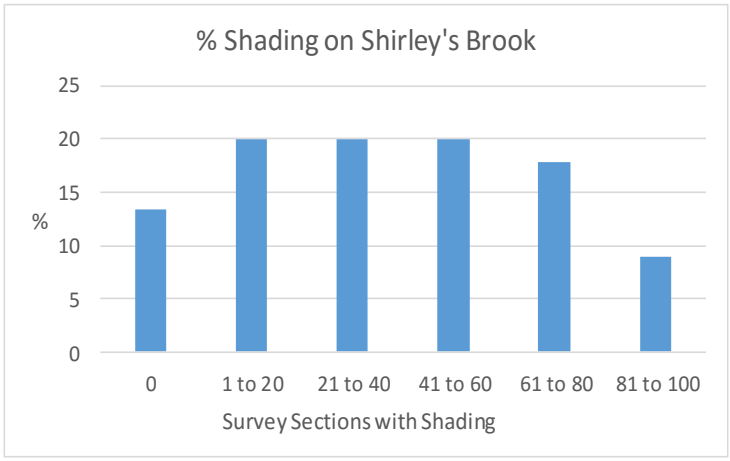


Figure 11: *Shading along Shirley`s Brook.*

Erosion and Streambank Undercutting

Rivers and streams are dynamic hydrologic systems, which are constantly changing in response to changes in the watershed. Streambank erosion is a natural process that can produce beneficial outcomes by helping to regulate flow and shape a variety of habitat features. When the natural rate of erosion is accelerated or changed through human activities, such as stream straightening and over-clearing of catchment and stream bank vegetation, the system is thrown off balance. The acceleration of the natural erosion process can lead to stream channel instability, land loss, sedimentation, habitat loss and other adverse effects that negatively impact water quality and important fish and wildlife habitat.

Erosion also has the ability to create undercut stream banks. While some undercutting of stream banks can be a normal stream function and can provide excellent refuge for fish, too much undercutting can become harmful if it is causing instability, erosion and sedimentation.

Figure 12 shows the percentage of undercut stream banks along each surveyed section of Shirley`s Brook. Overall, the sections of Shirley`s Brook that were surveyed were found to have very little undercutting, most with either less than 20% or with no undercutting at all.

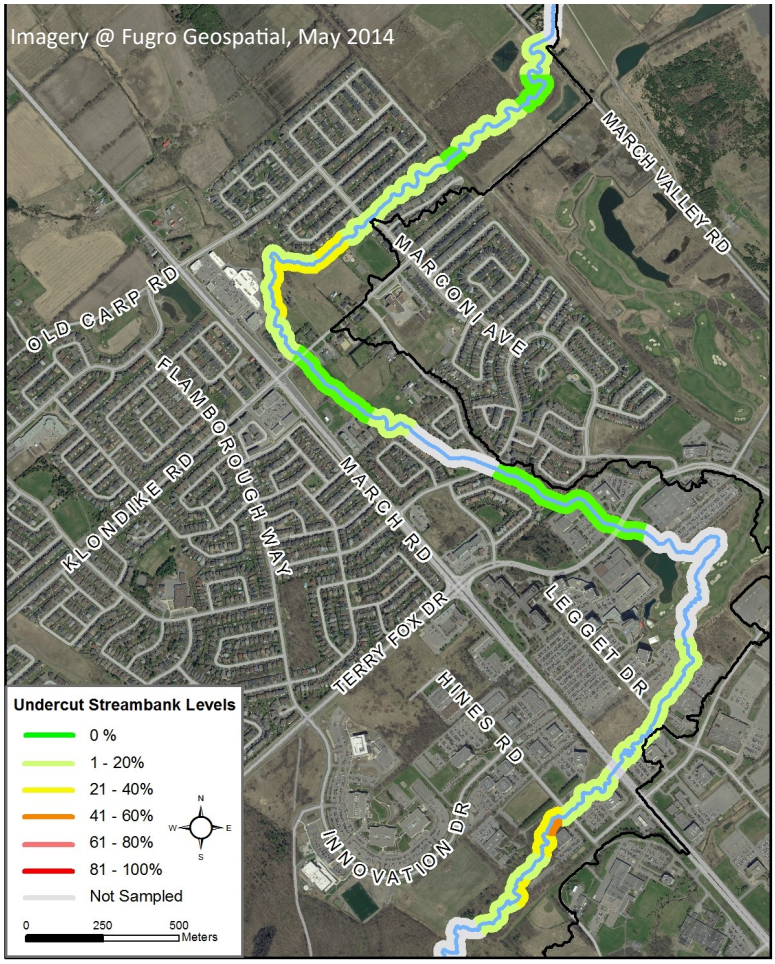


Figure 12: *Undercut stream banks along Shirley`s Brook.*

In-stream Morphology

In-stream morphology is categorized as pools, riffles, and runs. Pools and riffles are both particularly important for fish habitat. Pools, which are deeper and usually slower flowing sections in the stream, provide shelter for fish, especially when water levels drop or when water temperatures increase. Riffles are sections of agitated and fast moving water that add dissolved oxygen to the stream and provide spawning habitat for some species of fish. Runs are areas along a creek that are typically shallow and have un-agitated water surfaces. The in-stream morphology for Shirley`s Brook can be seen in Figure 13.

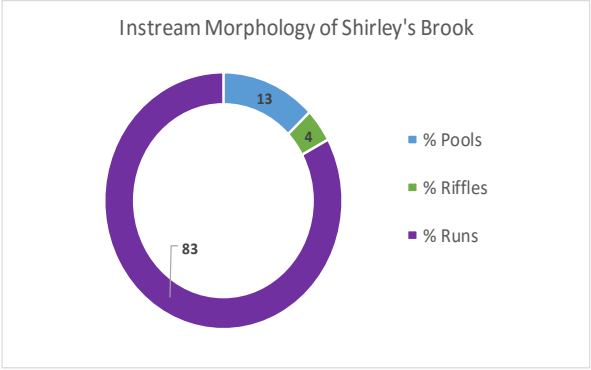


Figure 13: *In-stream morphology along Shirley`s Brook.*

It is beneficial for the health of the ecosystem if there is a variety of these in-stream features, to allow oxygen to flow through the creek, to provide habitat, and to have a well-connected watercourse. As seen in Figure 13, Shirley's Brook was found to consist of 83% runs, 4% riffles and 13% pools. Stewardship efforts could be focused at creating more in-stream pool/riffle sequences to enhance fish habitat.

In-stream Substrate

In-stream substrate describes the composition of the bed of the watercourse. A diversity of substrates is important for fish and benthic invertebrates because some species have specific habitat requirements and will only reproduce on certain types of substrate. A healthy stream will generally have a large variety of substrate types which will support a greater diversity of organisms.

Figure 14 summarizes the different types of substrate which make up the bed of Shirley's Brook.

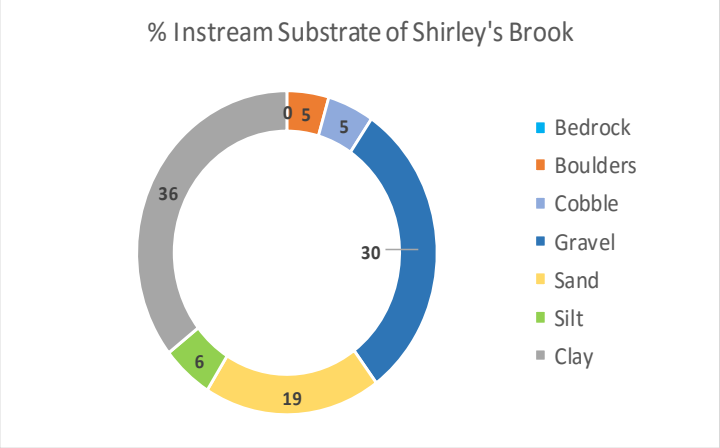


Figure 14: *Percentages of in-stream substrate types in Shirley's Brook.*

Shirley's Brook is composed of high percentages of clay, gravel and sand, with smaller percentages of silt, cobble and boulder. Cobble, which makes up 5% of the in-stream substrate, provides spawning habitat for fish and invertebrates. It also provides habitat for benthic invertebrates (organisms that live on the bottom of a water body or in the sediment) that are a key food source for many fish and wildlife species. Boulders, which make up 5% of Shirley's Brook's in-stream substrate, will create cover and back eddies for larger fish to hide and to rest out of the current.

Clay and gravel are dominant substrate types which reflect the subwatershed's surficial geology and indicate that shoreline erosion is contributing these materials to downstream habitats.

Cobble and Boulder Habitat

As discussed, cobble and boulders both provide important fish habitat. Figure 15 shows the sections of Shirley's Brook where cobble and boulders were found to either be present or not present on the stream bed and shows that the creek has a healthy distribution of cobble and boulder substrate.

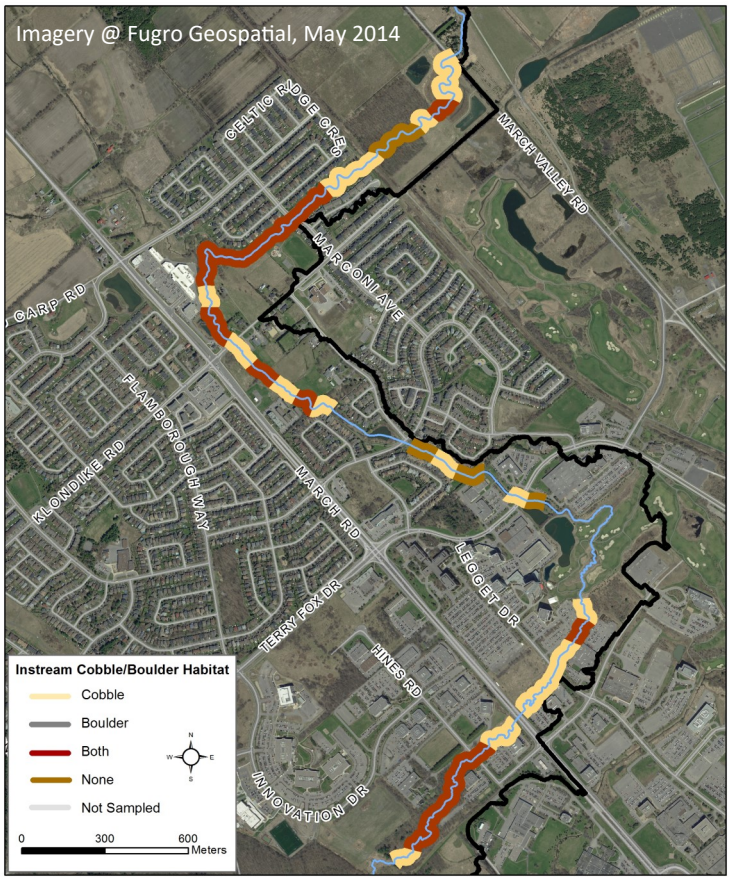


Figure 15: *Cobble and boulder habitat along Shirley's Brook.*

Type and Abundance of In-Stream Vegetation

A well-balanced amount and suitable variety of in-stream vegetation is important for a healthy stream ecosystem. Aquatic plants provide habitat for fish and wildlife, contribute oxygen to the stream, and help to remove contaminants from the water. However, too much in-stream vegetation can be detrimental and can signify an unhealthy stream. Certain types of vegetation, such as algae, can also be indicative of poor stream health, as it is often seen in streams with high nitrogen and phosphorous inputs (from runoff or wastewater).

Types of In-stream Vegetation

There are many factors that can influence the presence of aquatic plants, some of which include the substrate type, increases in air and water temperature, and the time of year the assessment was completed. As seen in Figure 16, the in-stream vegetation that was observed in each surveyed section was divided by type into eight categories; narrow-leaved emergent, broad-leaved emergent, robust emergent, free floating plants, floating plants, submerged plants, algae and no plants.

Shirley's Brook had very high proportions of submerged plants (35%), algae (26%) and areas of no vegetation (26%).

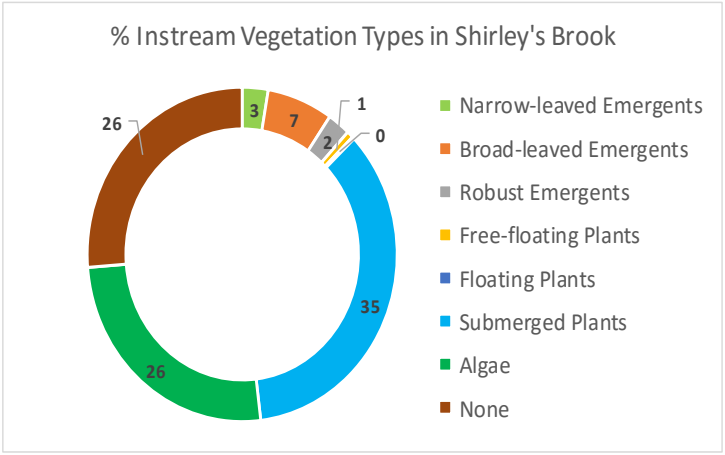


Figure 16: *Types of in-stream vegetation in Shirley's Brook.*

Amount of In-stream Vegetation

In-stream vegetation helps to remove contaminants from the water, contribute oxygen to the stream, provide habitat for fish and wildlife, and reduce current velocities, however too much vegetation can be detrimental. For this assessment, the amount of in-stream vegetation is measured according to five categories, ranging from "extensive", where the stream is choked with vegetation, to "rare", where there are very few plants.

Figure 17 shows the amount of in-stream vegetation in Shirley's Brook. The creek was found to have a good diversity of vegetation abundance with each category being represented. Overall however, the creek had more sections with low vegetation amounts, with 9% low, 41% rare, and 16% no vegetation.

Low, rare, and no in-stream vegetation levels in Shirley's Brook are likely due to substrate type. For example areas that are overloaded with silt or contain more cobble do not facilitate easy plant growth. It may also be the result of water depths or currents creating conditions that limit plant growth.

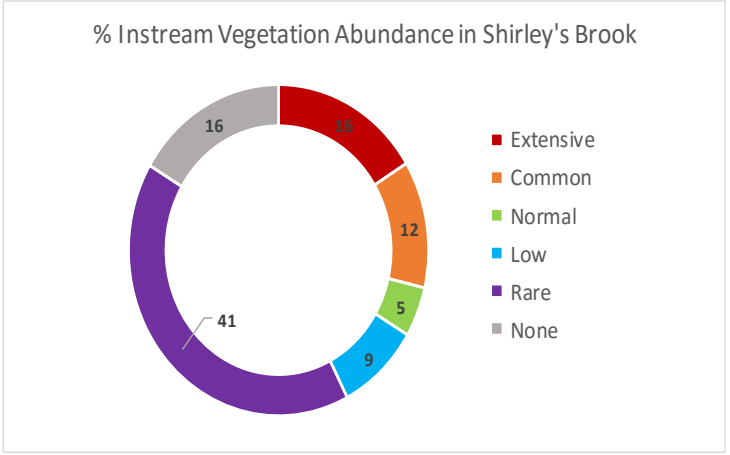


Figure 17: *Abundances of in-stream vegetation in Shirley's Brook.*

Thermal Classification

Temperature is an important parameter in streams as it influences many aspects of physical, chemical and biological health. Figure 18 shows where the temperature datalogger was deployed in Shirley`s Brook from late May to mid September 2016 to give a representative sample of how water temperature fluctuates.

Many factors can influence fluctuations in stream temperature, including springs, tributaries, precipitation runoff, discharge pipes and stream shading from riparian vegetation. Water temperature is used along with the maximum air temperature (using the revised Stoneman and Jones method by Cindy Chu *et al*) to classify a watercourse as either warm, cool-warm, cool, cold-cool, or cold water. Figure 19 shows the thermal classifications of Shirley's Brook.

Analysis of the data collected indicates that Shirley's Brook should be classified as a cool-warm stream with the downstream site being slightly warmer than the upstream location.

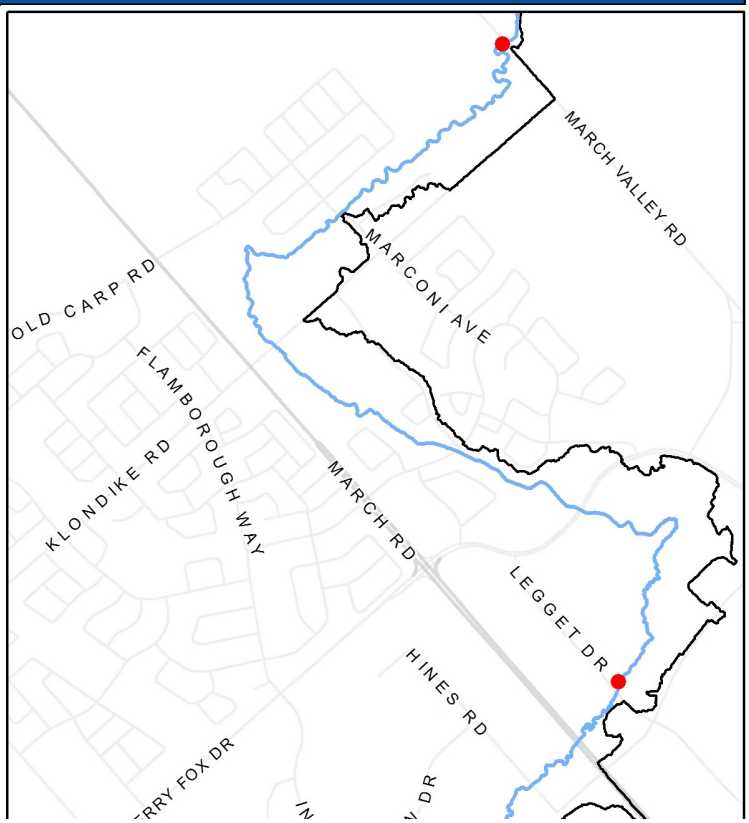


Figure 18: *Location of temperature loggers in Shirley's Brook.*

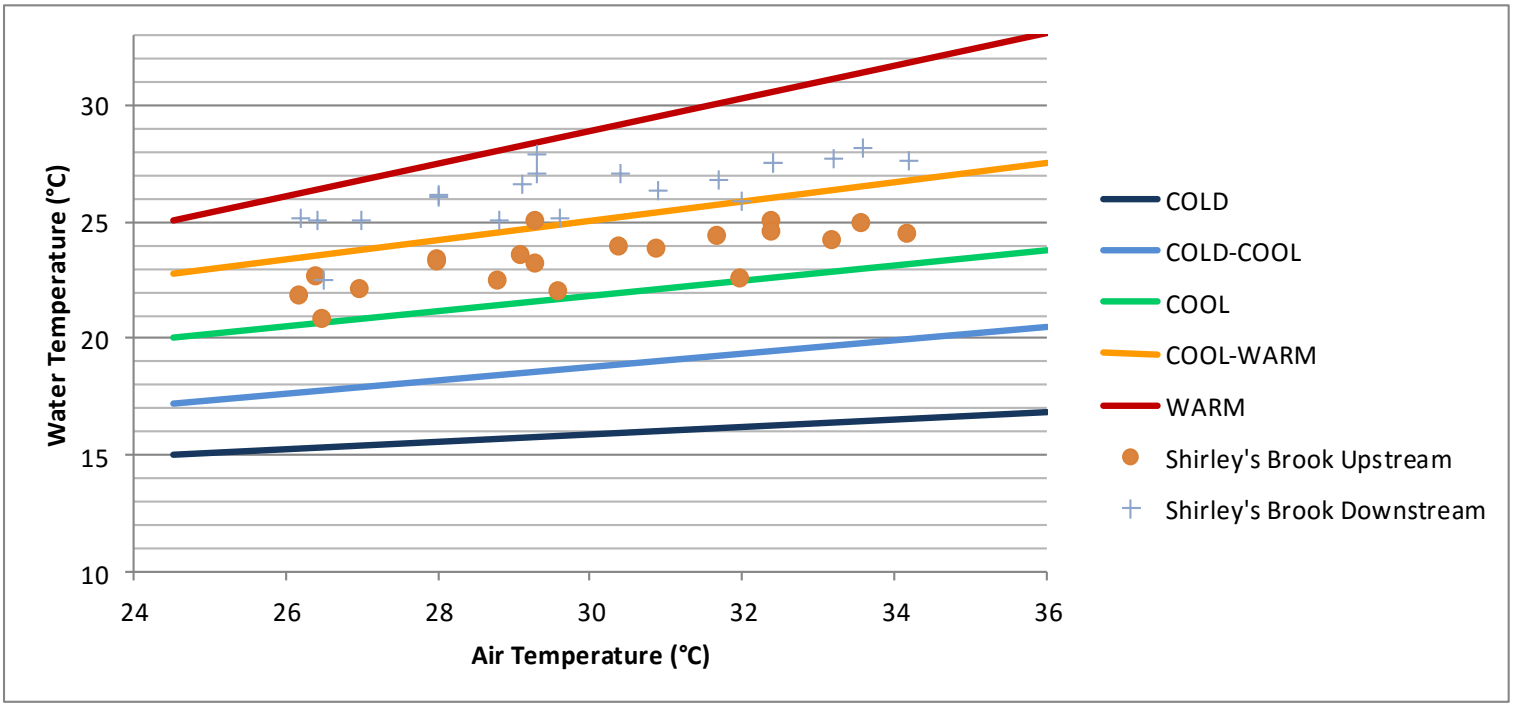


Figure 19: *Thermal classification of Shirley's Brook.*

Each point on the graph represents a water temperature that was taken under the following conditions:

- Sampling dates between July 1 and August 31.
- Sampling date has a maximum air temperature ≥ 24.5 °C and was preceded by two consecutive days with a maximum air temperature ≥ 24.5 °C during which time no precipitation occurred.
- Water temperature is taken at 4:00 pm

Wildlife Observed

There was a variety of wildlife observed during the assessment of Shirley's Brook. Many raccoon tracks were seen. Green frogs, dragonflies, damselflies, minnows, a Japanese Scarab Beetle, and various aquatic insects were also observed. A highlight was an up close sighting of a great blue heron near an office parking lot.

Water Chemistry and Quality

A YSI probe was used to collect water quality data including pH, dissolved oxygen, and conductivity, at each site assessed. The maximum, minimum and average readings for each of those parameters are presented in Table 3.

Dissolved oxygen measures the amount of available oxygen within the water that is accessible to wildlife. According to the Canadian Water Quality Guidelines for the Protection of Aquatic Life, the guideline value for the concentration of dissolved oxygen in freshwater for early life stages is 6.0 milligrams/liter (mg/L) for warm water ecosystems and 9.5 mg/L for cold water ecosystems. The average amount of dissolved oxygen in Shirley's Brook measured 8.28 mg/L, making it healthy for warm water fish, and slightly below the requirements for cold water fish.

Table 3: Shirley's Brook Water Quality Data

	Minimum	Maximum	Average
pH	7.27	8.09	7.69
Dissolved Oxygen (mg/L)	1.01	14.02	8.28
Conductivity (µS/cm)	878	1878	1424

Conductivity is defined as the ability of water to pass an electrical current, and is an indirect measure of the saltiness of the water caused by dissolved ions. Fish cannot tolerate large increases in saltiness in the water. Factors that can change the conductivity of freshwater include climate change and human activity. Warmer climate conditions increase the evaporation of water, leaving existing water with higher concentrations of dissolved ions (higher conductivity). Use of road salt in and around the stream can also elevate ion levels, along with industrial and human wastewater. Because of all these factors, conductivity of a stream can fluctuate greatly with readings between 0 and 10,000 microSiemens/centimeter (µS/cm). The United States Environmental Protection Agency notes that streams supporting good mixed fisheries generally fall between 150 and 500 µS/cm. The average conductivity of Shirley's Brook is 1424 µS/cm, putting it well above the ideal range. This can have an effect on the wildlife present. At this level of study it is hard to determine the cause of the high values . However it does help provide a benchmark value and a notice about potential stressors to the in-stream habitat.

The measurement of pH tells us the relative acidity or alkalinity of the creek. The scale ranges from 1 (most acidic) to 14 (most basic) and has 7 as the middle and most neutral point. The average pH of Shirley's Brook is 7.69, a nearly neutral condition, which is good for many species of fish to thrive.

Potential Riparian Restoration Opportunities

Naturally vegetated shorelines help reduce erosion, filter pollutants from entering the watercourse, assist in flood control and provide food and habitat for a diversity of wild-life.

Figure 20 depicts the locations identified by MVCA staff and volunteers, as areas for potential restoration activities.

The next steps will be to approach the landowners and work with them on a voluntary basis to enhance their shorelines through a number of potential activities, such as increasing the unmowed areas along the shore or agreeing to plant and maintain native shoreline species of trees or shrubs.

Other activities that would benefit Shirley's Brook include the removal of invasive species such as Yellow Iris and Dog-Strangling Vine, and garbage clean-ups near road crossings as well as behind commercial buildings.

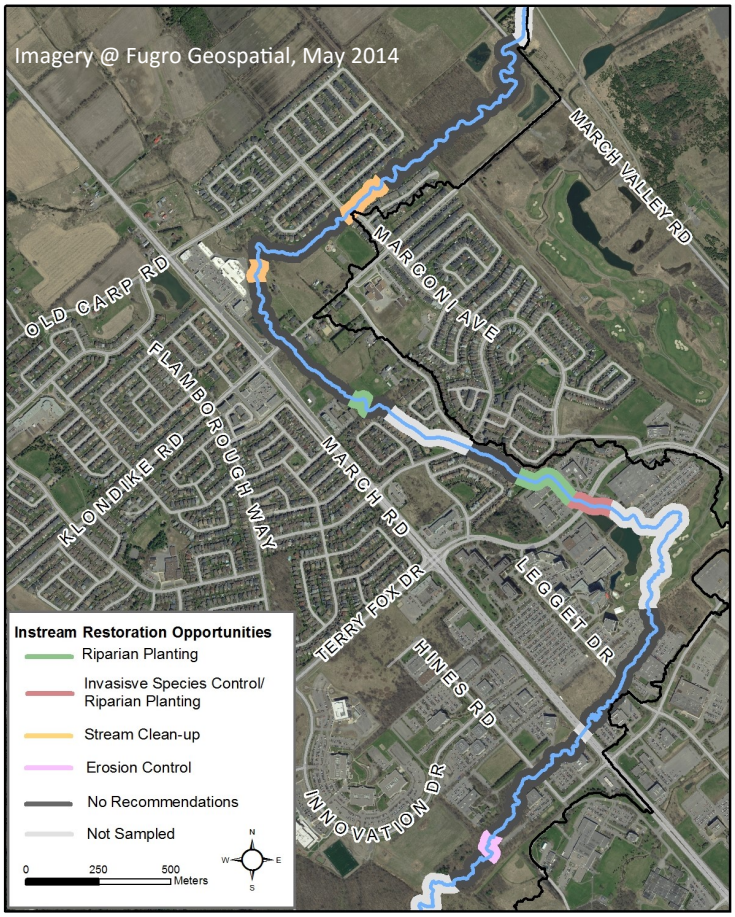
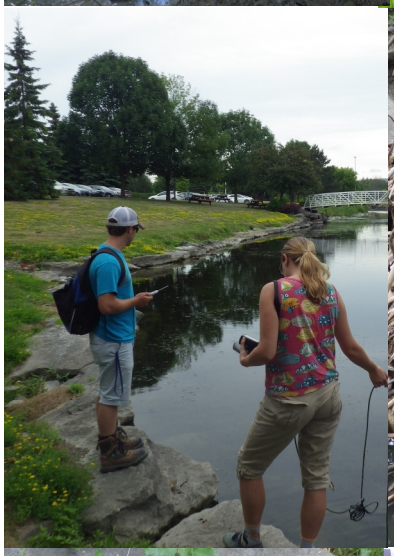


Figure 20: *Areas for potential restoration projects along Shirley`s Brook.*



How Does This Information Get Used?

The City Stream Watch Program is an excellent monitoring program that allows MVCA to assess the condition of subwatersheds over time. Stewardship activities in areas that need further work are completed and improve the health of the ecosystem.

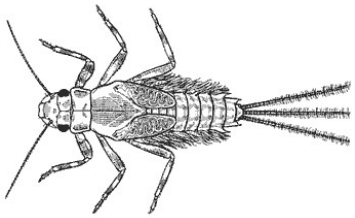
MVCA uses stream surveys to target specific areas that need restoration work. Stream garbage clean ups are carried out, blockages are removed, and shoreline planting, erosion control and habitat enhancements are organized.

MVCA is always looking for volunteers to help with monitoring and stewardship programs!

Call 613-253-0006 ext. 234, if you are interested!

Volunteer projects that are carried out as a result of the City Stream Watch Program are:

* Planting trees and shrubs along the shoreline
* Removing invasive plant species
* Stream garbage clean-ups
* Learning about and participating in monitoring the streams
* Learning about and participating in fish sampling/identification and wildlife identification
* Learning about and participating in benthic invertebrate sampling/identification
* Participating in natural photography



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Vannote, R.L., Minshall, G.W., Cummins, K.W., Sedell, J.R. and Cushing, C.E. "The River Continuum". *Canadian Journal of Fisheries and Aquatic Sciences* 37. (1980): 130-137. Print.

Jaymeson Adams

From: Tim Kennedy
Sent: April 25, 2022 10:29 AM
To: Jaymeson Adams
Cc: Gavin Joseph
Subject: FW: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

Follow Up Flag: Follow up
Flag Status: Flagged

File: A001218

Hi Jaymeson,

Please see below from MVCA and ensure one of you gets this added to the appendices and the body of the report as required.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Erica Ogden <eogden@mvc.on.ca>
Sent: Monday, April 25, 2022 9:59 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Matt Craig <mcraig@mvc.on.ca>
Subject: RE: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

EXTERNAL EMAIL

Hello Tim,

Our engineering staff would have to review the particular approach proposed, but we have previously accepted a combination of approaches to meet the water quality requirements.

Thank you,

Erica C. Ogden, MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, ON K7C 3P1
www.mvc.on.ca |c. 613 451 0463 |o. 613 253 0006 ext. 229| eogden@mvc.on.ca

---

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 25, 2022 9:50 AM
To: Erica Ogden <eogden@mvc.on.ca>
Cc: Matt Craig <mcraig@mvc.on.ca>
Subject: RE: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

Hi Erica,

Thanks for getting back to me.

We are certain the south cell of the pond can provide the 80% TSS removal from previous reports (this was built more recently).

For the area released to the north cell we would look at adding a mechanical separator (and possibly LID's) to achieve the 80% TSS removal.

Would this approach meet the requirements of the MVCA for water quality control?

Thanks again!
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Erica Ogden <eogden@mvc.on.ca>
Sent: Monday, April 25, 2022 9:28 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Matt Craig <mcraig@mvc.on.ca>
Subject: RE: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

EXTERNAL EMAIL

Good Morning Tim,

My apologies for the delay in responding. MVCA has reviewed the subject properties and offer the following comments. The subject properties are not regulated by MVCA under Ontario Regulation 153/06.

We do not have information available to confirm the water quality treatment provided by the existing pond. An enhanced level of water quality treatment (80% TSS Removal) is recommended for the site. Please review the Shirley's Brook and Watts Creek Subwatershed Study for further information regarding Shirley's Brook.

MVCA completed a Catchment Report for Shirley's Brook in 2016 as a part of the City Stream Watch program which may also provide some relevant background materials.

I also recommend you contact the City of Ottawa to discuss the proposed development, as they may have additional requirements or restrictions.

If you have any questions, please feel free to contact me.

Thank you,

Erica C. Ogden, MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, ON K7C 3P1
www.mvc.on.ca |c. 613 451 0463 |o. 613 253 0006 ext. 229| eogden@mvc.on.ca

---

From: Matt Craig <mcraig@mvc.on.ca>
Sent: April 20, 2022 3:46 PM
To: Erica Ogden <eogden@mvc.on.ca>
Subject: FW: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

---

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 20, 2022 3:05 PM
To: Matt Craig <mcraig@mvc.on.ca>
Subject: RE: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

Hi Matt,

Just wanted to follow up on the email below.

Did you get a chance to look at this one? We are hoping to wrap up our report this week. Let me know if we should have a quick meeting to discuss.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Tim Kennedy
Sent: Thursday, April 14, 2022 12:22 PM
To: mcraig@mvc.on.ca
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>
Subject: 570 & 600 March Road - MVCA Pre-Consultation - SWM Criteria

Good afternoon Matt,

We are working on a development project in the City of Ottawa and I wanted to get your input on Natural Heritage/Hazards features that may impact the development as well as any Storm Water Management Criteria for the site and required approvals/permits. Note that this file is sensitive in nature and we appreciate your discretion on this one.

The proposed development will be split into two areas as follows:

- North Site Area - Approximately 9 residential buildings are proposed to the north, ranging in height from 7 to 29 storeys. Approximately 1900 residential units are proposed. Retail uses are proposed on the ground floor of a number of the buildings, with a total floor area of approximately 8,250 m2. Approximately 1900 residential parking spaces are planned and 250 retail parking spaces. Most of the parking would be located in underground parking garage but some is also expected along the proposed private roadway.
- South Site Area - The current Nokia office/lab space will be relocated to the south end of the site. Three new buildings are proposed with a total floor area of 49,100 m2, which includes the laboratory, office and parking garage, with interconnecting podium and ground floor retail of 3,100 m2. Approximately 1344 parking spaces are planned within an above grade parking garage.

I have attached a key plan with the site location as well as the flow path for the storm sewers currently servicing the site. Currently the north site area drains to the north cell of the pond shown in the attached sketches, while the south area drains to the south cell of the pond. The ponds outlet to Shirley's Brook before making it's way to the Ottawa River, approximately 3.0 km northeast of the subject site.

Currently quality control of stormwater runoff for each site area is addressed off site in the existing ponds behind the Brook Street Hotel (see attached sketch for location) and as follows for additional information:

- North Site Area – The north site area currently flows to the north cell of the pond. Major and minor system flows will be limited to those flows currently sent to the pond. I have not been able to confirm the level of treatment in this cell of the pond from the available reports which are quite old. Can you confirm if the existing pond would still be sufficient in terms of quality control or if additional measures would be required?
- South Site Area – The south site area currently flows to the south cell of the pond. Again major and minor system flows would be limited to those flows currently sent to the pond from our site area. Section 3.0 and 3.2.2 of the attached

report identify that the south cell (Pond 1) will provide 80% TSS removal for this area of our site. I expect this would be sufficient.

Hoping to have a response rather quickly on this one in order to wrap up our report next week. Apologies for the late request.

If you need anything further please let me know. Feel free to call me on my cell if you would like to discuss or we could set up a Teams meeting.

Thanks and have a great long weekend!
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for **people**

MEMO

Date: February 2, 2022

To / Destinataire	Wendy Tse, Planner
From / Expéditeur	Julie Candow, Project Manager, Infrastructure Approvals
Subject / Objet	**Pre-Application Consultation** **600 March Road**

Please note the following information regarding the engineering design submission for the above noted site:

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, revised 2008)
   - ⇨ 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. Watermain Infrastructure:

   a) Initial comment from AMB: A new local watermain will be required on Legget Drive. Connection to the 610mm diameter transmission watermain will not be permitted. A water boundary condition request is needed for any new water connection to the City main.

   b) Existing watermain connections may be considered for interim phasing. Further comments to be provided at the Site Plan Control stage.

   c) As per Section 4.4.7.2 of the Ottawa Design Guidelines – Water Distribution, a DMA (District Metering Area) chamber will be required for private developments serviced by a connection 150mm or larger.

   d) Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide an email to Julie Candow (Julie.candow@ottawa.ca) with the following information:

      i. Location of service

      ii. Type of development and the amount of fire flow required (as per OBC Section 7.2.11 or FUS for fire flows 9,000 L/min or above – See technical bulletin ISTB 2021-03).

      iii. Average daily demand: ___ l/s.

      iv. Maximum daily demand: ___l/s.

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

5. Sanitary Infrastructure:

   a) Initial comment from AMB: A new local sanitary sewer will be required on Legget Drive. The 750 mm sanitary sewer on Legget Drive, south of Solandt Road, should have capacity to accommodate this redevelopment. Additional information on sewer capacity will be available once the Wastewater Master Plan is complete (anticipated June 2022).

   b) Existing sanitary connections may be considered for interim phasing. Further comments to be provided at the Site Plan Control stage.

   c) The City would not accept a development of this scale to outlet to the private sanitary sewer that currently exists east of Legget Drive, through the Kanata Research Park lands.

6. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   a) Please refer to following background reports:

a. Shirley's Brook and Watts Creek Subwatershed Study, prepared by Dillon Consulting Ltd., 1999

b. Kanata Research Park, Storm Water Management Report, prepared by Novatech, dated June 1987

c. Stormwater Management Plan, Kanata Research Park, City of Kanata, prepared by Novatech, dated April 2000

d. Kanata Research Park Subdivision Design Brief, prepared by Novatech, dated August 2000

The stormwater management criteria shall be in accordance with the minor and major system storm allocations presented in the above mentioned reports.

b) If the capacity of the receiving storm sewer is in question, over-controlling may be required, in which case all runoff must be controlled to the 2-year pre-development level, and all flow depth must be controlled on-site. In such a case the pre-development condition will be determined using the smaller of a runoff coefficient of 0.5 or the actual existing site runoff coefficient.

c) Quality control to be provided as specified by the MVCA.

d) Review of the existing legal agreements related to the private SWM pond outlet located to the east on KRP lands will be reviewed at the Site Plan Control stage.

Should you have any questions or require additional information, please contact me directly at Julie.Candow@ottawa.ca.

Jaymeson Adams

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: May 2, 2022 2:20 PM
To: Tim Kennedy
Cc: Clodd, Aaron; Hugues Bisson; Gavin Joseph; Jaymeson Adams
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request
Attachments: Nokia Campus_02May2022.docx; 600March_Servicing_27April2022.pdf

EXTERNAL EMAIL

Hi Tim,

Please see below and attached the watermain boundary conditions for 570 and 600 March Road. The following notes were provided by Asset Management and must be incorporated into watermain design.

- City staff recommend three connections as shown in the attached PDF. A new isolation valve is required east of the new watermain connection on Terry Fox.
- The water analysis must include a scenario that considers a planned closure of the 610 mm Leggett Drive watermain from Solandt to McKinley. Only the Terry Fox connection is available to service the Nokia Campus.
- Required fire flows exceeding 21,000 L/min are not supported by Infrastructure Planning.

There is another internal meeting this week to discuss the new FUS document. Using a coefficient of C=0.6 will be discussed further and what the City will require if pursuing a fire resistive building. At the time of Site Plan / Subdivision application, if a coefficient of C=0.6 cannot be adequately justified / demonstrated, the proposed site plan will need to be altered to respect the 21,000 L/min cap (as noted above) using a coefficient of C=0.8.

Please let me know if you require further clarity and we can set up a meeting to discuss.
Thanks.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 25, 2022 10:27 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks Julie for expediting this and yes I am in agreement with the proposed range for fire flows.

Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, April 25, 2022 10:11 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Good morning Tim,

I have submitted your boundary condition request for the following two options for each site. I disagreed with the options crossed out in red as they are not in accordance with the FUS document. That said, I believe the two options presented below will give us an acceptable range and a means to move forward with this application (assuming the fire flows can be met by the existing infrastructure).

I have a meeting scheduled at 2pm today with Water Services and Asset Management to discuss a possible connection to the 610mm feedermain. I have also requested that the boundary condition request be expedited given the delay on this file.

MU Site Area		
Scenario	C=0.6	C=0.8
Area = All Floor Areas	-	26000 L/min 433.33 L/s 6868 USGPM
Area = Two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight	-	19000 L/min 316.67 L/s 5019 USGPM
Area = The single largest floor area plus 25% of each of the two immediately adjoining floors.	9000 L/min 150 L/s 2378 USGPM	12000 L/min 200 L/s 3170 USGPM

Nokia Site Area		
Scenario	C=0.6	C=0.8
Area = All Floor Areas	-	45000 L/min 750 L/s 11888 USGPM
Area = Two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight	-	39000 L/min 650 L/s 10303 USGPM
Area = The single largest floor area plus 25% of each of the two immediately adjoining floors.	21000 L/min 350 L/s 5548 USGPM	28000 L/min 466.67 L/s 7397 USGPM

Regards,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 22, 2022 1:55 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

We have run a few scenarios for the RFF as discussed below and in accordance with the recently released FUS Document. Please see attached for a summary of each and accompanying detailed calculations.

If you are able to run each of these scenarios and provide boundary conditions I think we would have our best and worst case scenarios covered.

Let me know if you have any questions or if we should have a quick meeting to discuss.

On another note do we have confirmation on connecting to the 600 mm main as opposed to extension to Solandt?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Tim Kennedy
Sent: Thursday, April 21, 2022 3:27 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: Re: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Great thanks for confirming Julie. We will get you those numbers in the morning.

Thanks,
Tim

Sent from my iPhone

> On Apr 21, 2022, at 2:51 PM, Candow, Julie <julie.candow@ottawa.ca> wrote:
>
> EXTERNAL EMAIL
>
> Hi Tim,
>
> It is common for us to provide multiple boundary conditions based on RFF (required fire flow) “options”. I agree with your approach to submit your fire flow calculations using a C of 0.6 as well as a C of 0.8. At Site Plan Control stage, we can move forward with whatever “option” the developer chooses to proceed with.
>
> That said, please submit your calculations in accordance with the new 2020 FUS standard as this will be the standard used going forward.
>
> Thanks,
>
> **Julie Candow, P.Eng**
> Project Manager
> Planning, Real Estate and Economic Development Department - West Branch

City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 21, 2022 2:34 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for passing this along.

We are currently working towards providing a few scenarios to be run in your model, including the C=0.8 (area = total building area) as requested below for comparison as well as those outlined in the new FUS standards.

At this stage of design it seems it would not be possible to provide the structural and architectural signoff to proceed with the use of the C=0.6. In the past it has not been an issue to provide the requested letters for these types of buildings to permit the use of C=0.6, however not until the building design is advanced during site plan control and permit stages.

This being the case should we assume that only a coefficient of 0.8 would be allowable at the ZBA stage? Or would the City provide multiple boundary conditions for the different scenarios? Then as the design is progressed to site plan control and permit the appropriate letters could be provided at that time and all applicable information would be readily available in the Adequacy of Servicing Report depending on which scenario moves forward.

Please let me know your thoughts on this approach.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Thursday, April 21, 2022 9:01 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

The attached update to the FUS was just released to us this morning. Can you please update your fire flow calculations to reflect the revised 2020 FUS document. Please pay close attention to the following when determining your Total Effective Area:

<image002.png>

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Candow, Julie
Sent: April 20, 2022 3:56 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Hi Tim,

Following our internal meeting today regarding the FUS coefficient of C=0.6, there was a general consensus that in order to accept a coefficient of C=0.6 the developers Structural Engineer and Architect would have to provide verification / sign off to confirm that all buildings were designed with structural members, floors and roofs having a fire-resistance rating of 3 hours or longer, with exterior vertical communications properly protected (one hour rating).

That said, there is an additional meeting set to take place hopefully next week with Building Code Services to determine the reports / drawings that may be required to accept a coefficient of C=0.6.

In the interim, could you provide the fire flow calculations assuming a coefficient C=0.8 (area = total building area) for comparison?

Thank you,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 13, 2022 10:33 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for the update and for getting that meeting scheduled as soon as you could.

As you mentioned please provide the information on the other items as soon as you can. We will progress where we can while the fire flow coefficients are discussed and confirmed.

If changes to our required flow calculations are required we will do so in short order after receiving confirmation from your meeting on the 20th. Hopefully the City can then provide boundary conditions in short order?

Thanks again,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, April 12, 2022 2:55 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

A meeting regarding the FUS calculations isn't scheduled until April 20th. Apologies for the delay but this was the earliest we could have all parties attend. I should be able to get an answer on the other items sooner, however the Senior Engineer in AM is on vacation this week.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 11, 2022 3:47 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for the quick response. We will revise per your comments below and provide updated calculations shortly.

A connection to the 600 mm Feedermain would certainly be helpful. Please advise on this and the use of the 0.6 C value once resolved with Asset Management and Water Services.

Do you have an expected timeline for resolving these items?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, April 11, 2022 3:33 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

It is unlikely the City will be able to provide boundary conditions this week. There are internal discussions happening regarding a C value of 0.6 used within the FUS calculations. There has been input from Fire Services and Building Code Services that buildings cannot be constructed to be fire resistive (C=0.6) as defined by the FUS. We have also involved Water Services to re-evaluate whether a connection to the 610mm feedermain would be allowed, given the scale of this development.

In the meantime, the water demand calculations should be updated to reflect the residential average day demand from 350 L/c/day to 280 L/cap/day in accordance with Technical Bulletin 2021-03. In addition, the peaking factor for Maximum Hour Demand should be 3.0 x Average Daily demand (as opposed to 3.0 x Maximum Daily Demand) given that the MOE peaking factors are used for a population over 3000.

I have followed up with Asset Management and Water Services to escalate the above noted issues.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 11, 2022 9:31 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Just wanted to follow up on the water boundary conditions and sewer capacity requests.

We are hoping to finalize our Adequacy of Servicing Report this week. Any chance you can push these requests to get us a response by mid week? As I understand it this project is high priority for the City.

Thanks for your help!
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

<image001.jpg>

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, April 5, 2022 10:23 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks Tim, I have forwarded on your request to our Water Services department.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 05, 2022 9:57 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

We would like to kindly request boundary conditions for the proposed development at 570 and 600 March Rd. Please find the proposed development information below and detailed calculations and associated figures attached including: Water Demand Calculations, Required Fire Flow Calculations, Exposure Separation Distances, and Fire Hydrant Coverage, for both the Nokia and Multi-Use (MU) Site Areas.

- **Type of Development and Units:**
  Nokia Site Area - The current Nokia office/lab space will be relocated to the south end of the site. Three new buildings are proposed with a total floor area of 49,100 m2, which includes the laboratory, office and parking garage, with interconnecting podium and ground floor retail of 3,100 m2.
  Multi-Use Site Area - Approximately 9 residential buildings are proposed to the north, ranging in height from 7 to 29 storeys. Approximately 1900 residential units are proposed. Retail uses are proposed on the ground floor of a number of the buildings, with a total floor area of approximately 8,250 m2.
- **Site Address:** 570 and 600 March Rd.
- **Location of Services:** The 305 mm diameter watermain at the intersection of Legget Drive and Solandt Road must be extended to supply the MU & Nokia site.
- **Average Daily Demand:** 15.92 L/s (14.15 L/s MU Site Area + 1.77 L/s Nokia Site Area)
- **Maximum Daily Demand:** 30.83 L/s (28.17 L/s MU Site Area + 2.66 L/s Nokia Site Area)
- **Peak Hour Demand:** 88.81 L/s (84.02 L/s MU Site Area + 4.79 L/s Nokia Site Area)
- **Required Fire Flow (RFF):** Nokia Site Area - 21,000 L/min. Multi-Use Site Area - 9,000 L/min.

I understand from the pre-consult that a new local watermain is required along Leggett Drive and that the 305 mm watermain at Solandt Road should have capacity to accommodate this redevelopment. It is expected that multi-hydrant analysis will be required and that the required fire flow can be provided from the hydrants along Leggett Drive connected to the 610 mm diameter transmission watermain.

If you have any questions or concerns, please do not hesitate to contact me.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

<image001.jpg>

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Boundary Conditions
Nokia Campus

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	788	13.14
Maximum Daily Demand	1,516	25.27
Peak Hour	2,330	38.83
Fire Flow Demand #1	9,000	150.00
Fire Flow Demand #2	21,000	350.00
Fire Flow Demand #3	39,000	650.00

Location

Results during Normal Operating Conditions

Connection 1 – Terry Fox Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	70.4
Peak Hour	125.2	62.4
Max Day plus Fire 1	124.7	61.8
Max Day plus Fire 2	117.6	51.7
Max Day plus Fire 3	101.7	29.0

Ground Elevation = 81.3 m

Connection 2 – Legget Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	74.1
Peak Hour	125.2	66.2
Max Day plus Fire 1	124.8	65.5
Max Day plus Fire 2	117.8	55.7
Max Day plus Fire 3	102.1	33.3

Ground Elevation = 78.7 m

Connection 3 – Legget Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	73.4
Peak Hour	125.2	65.5
Max Day plus Fire 1	124.8	64.9
Max Day plus Fire 2	117.9	55.2
Max Day plus Fire 3	102.4	33.1

Ground Elevation = 79.1 m

Results during watermain closure on Legett from McKinley to Solandt

Connection 1 – Terry Fox Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Max Day plus Fire 1	122.2	58.2
Max Day plus Fire 2	110.2	41.2
Max Day plus Fire 3	82.6	1.9

Ground Elevation = 81.3 m

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.

Nokia Study Area

Isolation Valve

Upgrade or abandon existing service

Isolation Valve

Isolation Valve

New Connection to 610 mm

New Isolation Valve

Keep existing 305 mm watermain

Isolation Valve

New connection (Tapping Valve)

Internal Private Watermain

Isolation Valve

ch. March Rd

Fox Dr.

ch. Hines Rd.

ch. Solandt Rd.

0 50 100 150 200 Meters

Surveys and Mapping, City of Ottawa

Legend

VALVE_TYPE, FUNCTION

- <Null>, <Null>
- B, <Null>
- B, MAIN
- B, PRES_ZONE
- B, SERVICE
- G, <Null>
- G, MAIN
- G, SERVICE

Water Pipe

- Other

Internal_Diameter

- 152mm, 203mm
- 254mm; 305mm
- 356mm; 381mm; 406mm
- 457mm; 500mm; 508mm
- 610mm
- <152 mm
- >610

Jaymeson Adams

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: April 21, 2022 9:07 AM
To: Tim Kennedy
Cc: Clodd, Aaron; Hugues Bisson; Gavin Joseph; Jaymeson Adams
Subject: RE: 600 March Road - Peak Wastewater Demand - Capacity Confirmation

EXTERNAL EMAIL

Hi Tim,

I received the following from Asset Management with regards to your Peak Wastewater Demand calculations:

"For the time being, assume capacity is available in the 750mm dia. Legget Drive sewer. We are expecting to receive the WWMP future conditions wastewater trunk model by the end of May and will have more information at that time."

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: March 31, 2022 8:06 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 600 March Road - Peak Wastewater Demand - Capacity Confirmation

Good morning Julie,

The following is a summary of the anticipated sanitary demands for the proposed development at **600 March Road** (detailed calculations are attached):

1. **Type of Development and Units:**
   Nokia Site Area - The current Nokia office/lab space will be relocated to the south end of the site. Three new buildings are proposed with a total floor area of 49,100 m2, which includes the laboratory, office and parking garage, with interconnecting podium and ground floor retail of 3,100 m2.

Multi-Use Site Area - Approximately 9 residential buildings are proposed to the north, ranging in height from 7 to 29 storeys. Approximately 1900 residential units are proposed. Retail uses are proposed on the ground floor of a number of the buildings, with a total floor area of approximately 8,250 m2.

2. **Site Address:** 600 and 570 March Road.
3. **Location of Services:** Connection to existing 750 mm diameter concrete sanitary sewer at the intersection of Leggett Drive and Solandt Road.
4. **Total Estimated Average Dry Weather Flow:** 13.14 L/s (11.37 L/s MU Site Area + 1.77 L/s Nokia Site Area)
5. **Total Estimated Peak Dry Weather Flow:** 39.12 L/s (32.63 L/s MU Site Area + 6.49 L/s Nokia Site Area)
6. **Total Estimated Peak Wet Weather Flow:** 42.65 L/s (34.67 L/s MU Site Area + 7.98 L/s Nokia Site Area)

I understand from the pre-consult that the 750 mm sanitary sewer on Legget Drive, south of Solandt Road, should have capacity to accommodate this redevelopment and that additional information on sewer capacity will be available once the Wastewater Master Plan is complete.

Are you able to confirm that there is adequate capacity in the sanitary network at Solandt Road to accommodate these peak flows at this time? Alternatively, is there any update on when we can expect to receive this confirmation?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

'

'

Jaymeson Adams

From: Tim Kennedy
Sent: March 28, 2022 3:51 PM
To: Candow, Julie
Subject: Re: Candow, Julie shared the folder "02 - 600 March" with you.

Great thanks Julie.

Tim

Sent from my iPhone

> On Mar 28, 2022, at 3:25 PM, Candow, Julie <julie.candow@ottawa.ca> wrote:
>
> EXTERNAL EMAIL
>
> Hi Tim,
>
> Our Water Resources group confirmed that the 5-yr pre-development rate is acceptable.
>
> Thanks,
>
> **Julie Candow, P.Eng**
> Project Manager
> Planning, Real Estate and Economic Development Department - West Branch
> City of Ottawa
> 110 Laurier Avenue West Ottawa, ON
> 613.580.2424 ext. 13850
>
> Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.
>
> ---
>
> **From:** Tim Kennedy <Tim.Kennedy@cima.ca>
> **Sent:** March 28, 2022 1:58 PM
> **To:** Candow, Julie <julie.candow@ottawa.ca>
> **Subject:** RE: Candow, Julie shared the folder "02 - 600 March" with you.
>
> **CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.**
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> **ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.**
>
> Good afternoon Julie,

Yes it is difficult to determine the allowable release rates for our site from the provided reports to date. I will have our Client follow up with Greg Winters and hopefully he will have some information that will provide clarity.

Probably best to wait to meet and discuss our approach after obtaining this information from Greg. But at that time a quick meeting with you would be appreciated and I will reach out.

Also a confirmation on the 5-yr pre-development rate would be great.

Thanks for providing this additional information and chat soon.

Thanks again,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

<image001.jpg>

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Friday, March 25, 2022 8:36 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: RE: Candow, Julie shared the folder "02 - 600 March" with you.

EXTERNAL EMAIL

Hi Tim,

To answer your previous email, the ponds are not owned by the City, they are still privately maintained. Greg Winters of Novatech said in our pre-consult meeting that they were digging up the legal agreements with respect to those ponds as Novatech was the consultant when that land was previously developed. I would reach out to Novatech for further information on the pond ownership as well as allowable release rates to the pond.

If it can be demonstrated through the existing Reports or private agreements of the existing pond that the proposed release rates for the Nokia site are in accordance with the design criteria of the pond, this would be acceptable to the City to accept XX l/s release rate. If (due to the age of the Reports and pond) the design criteria cannot be determined or is inconclusive, the City would require the 100 year post development flows

be controlled to the 2 year pre-development flows, and all flow depth must be controlled on-site. I will reach out to our Water Recourses group in the meantime to see if a 5-yr pre-development rate would be acceptable.

The Shirley's Brooke and Watts Creek report I will send via a separate link as it is too large to attach.

If you'd like to set a meeting I am booked up for the day but am pretty open next week.
Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: March 24, 2022 1:24 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Subject: RE: Candow, Julie shared the folder "02 - 600 March" with you.

Hi Julie,

One more question for you in regards to the following from your pre-consult comments: "If the capacity of the receiving storm sewer is in question, over-controlling may be required, in which case all runoff must be controlled to the 2-year pre-development level, and all flow depth must be controlled on-site. In such a case the pre-development condition will be determined using the smaller of a runoff coefficient of 0.5 or the actual existing site runoff coefficient."

Can the City's Water Resources Unit confirm if the existing storm sewers currently surcharge during major events? The Client would prefer to complete quantity control of storm water on site, with quality control in the existing ponds. In this case it would be good to know ahead of time if we need to control to the 5-year or 2-year event considering your comment above.

Please let me know if we should have a quick meeting to discuss the approach to SWM.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Tim Kennedy
Sent: Thursday, March 24, 2022 1:10 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Subject: RE: Candow, Julie shared the folder "02 - 600 March" with you.

File: 600 March Road

Hi Julie,

I can't seem to find the following report you referred to in the pre-consult in our files: "Shirley's Brook and Watts Creek Subwatershed Study, prepared by Dillon Consulting Ltd., 1999"

Could you please provide this one?

Also are you able to confirm if the City has taken ownership and maintains the existing ponds behind the hotel or are these still privately owned?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Wednesday, February 16, 2022 10:23 AM
To: Hugues Bisson <Hugues.Bisson@cima.ca>
Cc: Laura Izzard <Laura.Izzard@cima.ca>
Subject: RE: Candow, Julie shared the folder "02 - 600 March" with you.

EXTERNAL EMAIL

No problem, just sent it.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: February 16, 2022 9:40 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Laura Izzard <Laura.Izzard@cima.ca>
Subject: RE: Candow, Julie shared the folder "02 - 600 March" with you.

A001218

Thanks Julie. Would it be possible to also share this folder with Laura Izzard?

HUGUES BISSON, P.Eng., MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

<image002.jpg>

T 613-860-2462 ext. 6660 **M** 613 294-0224 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Notice to our customers on the COVID-19

<image003.jpg>

De : Candow, Julie <julie.candow@ottawa.ca>
Envoyé : 16 février 2022 09:05
À : Hugues Bisson <Hugues.Bisson@cima.ca>
Objet : Candow, Julie shared the folder "02 - 600 March" with you.

EXTERNAL EMAIL

<image004.png>

Candow, Julie shared a folder with you

Here's the folder that Candow, Julie shared with you.

<image005.png> 02 - 600 March

<image006.png> This link only works for the direct recipients of this message.

<image007.png>

<image008.png> <image009.jpg>

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'

Jaymeson Adams

From: Tim Kennedy
Sent: March 28, 2022 10:25 PM
To: Clodd, Aaron
Cc: Hugues Bisson
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

You can find the reports received to date from the City here.

I have also included the as-builts and utility information here for your records. Not sure if these were already sent your way.

Also thanks for setting up the meeting with Novatech.

Have a good evening and chat in the morning,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Monday, March 28, 2022 4:19 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hi Tim,

Please send me the reports that Julie Candow provided. Thank you.

Aaron Clodd M.Sc.Pl
Director, Development Management
Strategy & Consulting Group
Aaron.Clodd@colliers.com | View my profile
Direct: +1 905 960 4506
181 Bay Street, Suite #1400 | Toronto, ON M5J 2V1 | Canada

collierscanada.com | View Privacy Policy

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Monday, March 28, 2022 1:52 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

After speaking with the City Engineer (Julie Candow) they have confirmed that the ponds are not owned by the City, they are still privately maintained. Julie mentioned that in the pre-consult Greg Winters of Novatech said that they were digging up the legal agreements with respect to those ponds as Novatech was the consultant when that land was previously developed. I expect you are already in discussions with Greg to obtain this information? Can you please help to fast track this?

Due to the age of the reports and the pond that we do have on hand from the City it is difficult to confirm the allowable flows to the pond from our site. Hopefully the information provided by Greg will provide clarity.

Julie did provide another report for me to review and confirmed that if it can be demonstrated through the existing reports or private agreements of the existing pond that the proposed release rates for the Nokia site are in accordance with the design criteria of the pond, this would be acceptable to the City to accept XX l/s release rate. Again hopefully this final report or information provided by Greg will provide clarity. Otherwise the City will require the 100 year post development flows be controlled to the 2 year pre-development flows, and all flow depth must be controlled on-site.

Once we have the information in hand from Greg and reviewed it I will set a quick meeting with Julie at the City to confirm our SWM approach. Did you want to attend this meeting as well or will a summary of discussions be sufficient?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Tim Kennedy
Sent: Thursday, March 24, 2022 2:49 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Everything will be through Julie Candow for us. She is the City engineer on file for the project.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Do you really need to print this email? Let's protect the environment!

CONFIDENTIALITY WARNING This email is confidential. If you are not the intended recipient, please notify the sender immediately and delete it in its entirety.

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Thursday, March 24, 2022 2:33 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Please let me know the name of the City staff member you requested the pond ownership information from. Thanks.

Aaron Clodd M.Sc.Pl
Director, Development Management
Strategy & Consulting Group
Aaron.Clodd@colliers.com | View my profile
Direct: +1 905 960 4506

181 Bay Street, Suite #1400 | Toronto, ON M5J 2V1 | Canada

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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Thursday, March 24, 2022 2:27 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

Sounds good we will copy you and appreciate you helping to expedite the process.

In regards to SWM I am awaiting confirmation on ownership of the ponds from the City. Hopefully they were transferred to the City.

Regarding capacity within the ponds for the north and south sites I can confirm that the north site area flows to the north cell through the municipal right-of-way and the south site area to the south cell through private lands. With our approach of providing quantity control on site and only releasing quality control flows to the pond I am hoping there will be capacity to convey all of our flow to the north and avoid that private sewer. In this case we may be able to get you out of that agreement (if the ponds are in fact owned by the City). I need to get further into the details and there will be some back and forth with the City engineer over the next few days to confirm the SWM approach.

I am hopeful that I can get you an answer on this as well as have the sanitary and water demands into the City by next Wednesday's coordination meeting.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Thursday, March 24, 2022 10:24 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hi Tim,

When you send your request to the City for the watermain boundary conditions and confirm storm/sanitary capacities please copy me as I will assist in expediting this information.

If the site needs to continue to use the stormwater pond on the Brook Street hotel property for quality control that is fine. Do we know if the pond is owned by the City or is private and has capacity to take our additional flows?

Aaron Clodd
Director, Development Management
Strategy & Consulting Group
Aaron.Clodd@colliers.com | View my profile
Direct: +1 647 798 9534
Colliers International
181 Bay Street, Suite #1400 | Toronto, ON M5J 2V1 | Canada
Main: +1 416 777 2200

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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Wednesday, March 23, 2022 9:17 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

Thanks for providing this information so quickly. Hugues did pass along Option 11 but I had not seen the massing. With this and the additional statistics provided by Gensler looks like we have everything we need.

It's great that the City is on board to fast track this project. We have everything we need from them in terms of information (as-builts, reports, etc.). We will need to request watermain boundary conditions and confirm storm/sanitary capacities based on our calculated demands which we can now determine with the recent information you provided. They typically request 10 business days to provide this information once we have provided our demands, however it seems based on your response below that they will move quickly on these requests. This being the case your proposed schedule should not be an issue.

Regarding the sprinklers being "fully supervised" two types of signals are required as follows (which is not common):

- "A distinctive supervisory signal to indicate conditions that could impair the operation of the sprinkler system (a fault alarm), which is to sound and be displayed, either at a location within the building that is constantly attended by qualified personnel (such as a security room), or at an approved remotely located receiving facility (such as a monitoring facility of the sprinkler system manufacturer); and
- A water flow alarm to indicate that the sprinkler system has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department."

Regarding stormwater management we will see what we can do to get you out of the existing agreement but I will need to look a little deeper into this one. Stormwater quantity control on site would likely not be an issue but quality control may be. We are confirming requirements for quality control with the conservation authority and will let you know what we find.

Thanks again and we will work on getting the demands into the City as quickly as possible.
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Wednesday, March 23, 2022 5:47 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hi Tim,

I just want to make sure you are using the attached Option 11 plans that were circulated last week.

I have asked Gensler to indicate on the plan the number of stories for each building and the foot print area for podiums and towers. Will send in a separate email.

See additional comments and answers to your questions below in red text.

Please send me a detailed list of what is still outstanding from the City and I will get it for you ASAP. The City has prioritized this project.

Aaron Clodd M.Sc.Pl
Director, Development Management
Strategy & Consulting Group
Aaron.Clodd@colliers.com | View my profile
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181 Bay Street, Suite #1400 | Toronto, ON M5J 2V1 | Canada

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Monday, March 21, 2022 2:50 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Good afternoon Aaron,

It has been awhile. Hope all is well and looking forward to working with you again.

In reviewing the latest site plan we will require some additional information as follows in order to determine sewer and water capacity requirements:

- The layout of buildings in the Nokia Site is not clear on the latest site plan. Is there to be three towers on a Podium with underground parking? In general we will need to know the building uses and number of stories for all buildings on site (for both Nokia and the multi-use area to the north) in order to complete our fire flow assessment. The gross floor area for each building and each floor would also be required. Can we expect to receive something similar to the attached for the latest site plan? The Site Plan on page 12 along with accompanying stacking and program summary at the end are great and would be very helpful in determining required demands. I HAVE ASKED GENSLER TO PROVIDE THIS INFORMATION. I WASN'T AWARE THAT YOU NEEDED AREAS OF EACH FLOOR. TO GIVE YOU A BETTER UNDERSTANDING OF THE NOKIA CAMPUS LAYOUT, FIND ATTACHED A RECENT MASSING PLAN FOR THE SITE. THIS PLAN HAS NO OFFICIAL APPROVAL STATUS SO PLEASE CONTINUE TO USE THE STATISTICS SHONW ON OPTION 11 PLAN (ATTACHED).
- In terms of required fire flow calculations we will proceed with the following assumptions. Can you please confirm that these are fair assumptions at this point?
    1. All Buildings will be of Fire Resistive Construction as follows: any structure that is considered fully protected, having at least 3-hour rated structural members and floors. For example, reinforced concrete or protected steel. CONFIRMED.
    2. Vertical openings are protected with a one-hour fire rating (i.e. stairwells). CONFIRMED
    3. Buildings will be sprinklered, but system is not supervised (i.e. continuously monitored). I DO NOT KNOW WHAT YOU MEAN BY SUPERVISED. IF THE FIRE ALARM IS TRIGGERED THE FIRE DEPARTMENT WILL BE NOTIFIED AND WILL ARRIVE AT THE SITE. THE FIRE ALARM CONTROL PANEL WILL INDICATE WHERE THE FIRE IS.
    4. Note that generally the architect will need to prepare a memo at the site plan control stage, stating that the above assumptions are accurate, while also confirming gross floor areas, commercial areas, and equivalent populations used in our calculations are accurate. We will provide our calculations for confirmation as we progress the design. CORRECT. THERE IS A GOOD CHANCE THAT THE GROSS FLOOR AREA THAT YOU WILL USE IN YOUR CALCULATIONS WILL NEED TO BE UPDATED AT SPA STAGE AS DESIGN WILL CHANGE BETWEEN NOW AND THEN. HOWEVER, IT IS UNLIKELY THAT THE OVERALL DENSITY WILL INCREASE.
- Are there any limitations to storage of stormwater on site? Will roof, surface/parking, and underground storage (tank/cistern/etc.) be permitted? YES THESE ARE ALL PERMITTED. AS YOU KNOW THE SITE RELIES ON AN AGREEMENT WITH THE BROOK STREET HOTEL PROPERTY FOR USE OF STORMWATER SWM POND. WE WOULD LIKE TO MANAGE OUR OWN SW ON SITE IS POSSIBLE AND GET OUT OF THIS EXISITING AGREEMENT IF POSSIBLE.
- Also in regards to schedule we had originally requested **6 weeks** from the time of receiving the above requested information to the preparation of the Servicing Brief for submission to the City. We can shoot for having a package ready for your review by April 18th, however with respect to obtaining required information from the City to complete our work we would expect a **minimum of 4 weeks** to account for the following.

1. Complete sanitary and water demand calculations to obtain boundary conditions and capacity confirmations from City – 1 week minimum **once we have received the information requested above** (we would generally ask for 2).
2. City provides boundary conditions and capacity confirmations – 2 weeks (City requests 10 business days to provide this information).
3. Finalize reporting based on information provided by City - 1 week minimum (we would generally ask for 2).

PLEASE LET ME KNOW ASAP WHAT YOU STILL NEED FROM THE CITY AND I WILL GET IT FOR YOU.
Let me know if you want to discuss.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: Wednesday, March 16, 2022 4:03 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: Fwd: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

HUGUES BISSON, P.Eng. MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **C** 613-294-0224
110-240 Catherine Street, Ottawa, Ontario, K2P 2G8 CANADA

Début du message transféré :

De: "Clodd, Aaron" <Aaron.Clodd@colliers.com>
Date: 15 mars 2022 à 11:08:27 HAE
À: Greg Winters <G.Winters@novatech-eng.com>, "O'Grady, Lauren" <Lauren.OGrady@stantec.com>, Hugues Bisson <Hugues.Bisson@cima.ca>, Jerrold Corush <corush@csw.ca>, Sheri Edwards <edwards@csw.ca>, James Ireland <j.ireland@novatech-eng.com>, Kim Dresdner <Kim_Dresdner@gensler.com>, Barry_Hand@gensler.com
Cc: "Murphy, Wade (Nokia - US)" <wade.murphy@nokia.com>, "Wolodarski, Margaret" <Margaret.Wolodarski@am.jll.com>, "Oakes, Chasity (EXT - US/Dallas)" <chasity.oakes.ext@nokia.com>, "Flood, Cooper" <Cooper.Flood@colliers.com>, "Bowden, David" <David.Bowden@colliers.com>, "Spillman, Lauri (Nokia - US/Dallas)" <lauri.spillman@nokia.com>
Objet: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hello,

As previously discussed, Nokia has been working on refining their campus concept which has increased the size of their parcel and reduced the size of the residential lands.

Find attached a pdf with stats and dwg file of revised and approved Master Concept Plan for you to base you final reports and plans on for the ZBA submission. Although we have lost some time, we would like to target **Monday April 15th** for everyone to have their draft deliverables completed by. Please advise if this is an issue for you. We will need the week of April 15th to review, coordinate and make any necessary changes and for Greg to finalize his Planning Rationale with information from your respective reports.

We will target a ZBA submission date of **Monday April 25th.**

I would like to coordinate a 30 mins touch point/update meeting on **Monday March 28th** and **Monday April 11th** with you. **Please advise if 1-2pm or 3-4pm EST works better for you.**

Thank you

Aaron Clodd M.Sc.Pl
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Strategy & Consulting Group
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	Name	Current Name	Corporation Number	Notes
1.	Newbridge Networks Corporation	Nokia Canada Inc.	1070808-9	Newbridge Networks Corporation was formed by amalgamation on March 31, 1991 and amalgamated on January, 1994 to form another Newbridge Networks Corporation, and amalgamated again on May 25, 2000 to form Alcatel Canada Inc.
2.	Newbridge Research Corporation	Nokia Canada Inc.	1070808-9	Newbridge Research Corporation was incorporated on April 23, 1986 as Newbridge Radio Corporation. It amended its name to Newbridge Research Corporation on April 19, 1988 and then amalgamated to form Newbridge Networks Corporation on March 31, 1991.
3.	Alcatel Canada Inc.	Nokia Canada Inc.	1070808-9	Alcatel Canada Inc. was formed by amalgamation (originally formed as Newbridge Networks Corporation) on May 25, 2000. It was renamed Alcatel Networks Corporation on the same day (May 25, 2000), and then was subsequently renamed as Alcatel Canada Inc. on September 29, 2000. It then amalgamated on January 1, 2004 to form another Alcatel Canada Inc., and then again on January 1, 2007 to form Alcatel-Lucent Canada Inc.
4.	Alcatel-Lucent Canada Inc.	Nokia Canada Inc.	1070808-9	Alcatel-Lucent Canada Inc. was formed by amalgamation on January 1, 2007 and amalgamated 4 times under the same name, until it amalgamated on April 1, 2018 to form the current active entity, Nokia Canada Inc.

Province of Ontario

Document General

Form 4 — Land Registration Reform Act

① Amended Nov. 1994

D

FOR OFFICE USE ONLY

CERTIFICATE OF RECEIPT
CERTIFICAT DE RECEPISSE
OTTAWA-CARLETON (4)

'00 JUN 13 11 43

JOHN RICHICHI
ASSISTANT DEPUTY LAND REGISTRAR

(1) Registry ☐ Land Titles ☒ (2) Page 1 of 10 pages

(3) Property Identifier(s) | Block | Property | Additional: See Schedule ☒

Block	Property
04517	0813 Firstly

(4) Nature of Document

APPLICATION TO REGISTER NOTICE OF AGREEMENT
(Section 71 of the Land Titles Act)

(5) Consideration

Dollars $

(6) Description

FIRSTLY: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735, City of Kanata, Regional Municipality of Ottawa-Carleton, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission as in LT645983, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission over Part 1 on Plan 4R-10618 as in LT936988.

Description continued on attached Schedule.

New Property Identifiers — Additional: See Schedule ☐

Executions — Additional: See Schedule ☐

(7) This Document Contains: (a) Redescription New Easement Plan/Sketch ☐ (b) Schedule for: Description ☒ Additional Parties ☐ Other ☒

(8) This Document provides as follows:

To: The Land Registrar for the Land Titles Division of Ottawa-Carleton (No. 4)

KANATA RESEARCH PARK CORPORATION has an unregistered estate, right, interest or equity in the lands registered as No.s LT591903, LT611806, LT914779, LT975384, LT1001764, LT1001764 and LT611806 in the name of Newbridge Networks Corporation in respect of the lands registered as in Box (6) and hereby applies under Section 71 of the Land Titles Act for entry of a Notice of Cost Sharing and Maintenance Agreement in the register for the said PIN No.s 04517-0813, 04517-0699, 04517-0467, 04517-0809, 04517-0543, 04517-0811 and 04517-0474.

Continued on Schedule ☒

(9) This Document relates to instrument number(s)

(10) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D
KANATA RESEARCH PARK CORPORATION	X Name: Bronwen Heins Title: President I have the authority to bind the Corporation.	2000	06	27

(11) Address for Service 206 - 555 Legget Drive, Kanata, Ontario, K2K 2X3

(12) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D

(13) Address for Service

(14) Municipal Address of Property

Multiple

(15) Document Prepared by:

KANATA RESEARCH PARK CORPORATION
206 - 555 Legget Drive
Kanata, Ontario
K2K 2X3

Bronwen Heins
BH:kb

FOR OFFICE USE ONLY

Fees and Tax	
Registration Fee	
Total	

Province of Ontario

Schedule

Form 5 — Land Registration Reform Act

Amended NOV. 1992

S

Additional Property Identifier(s) and/or Other Information

Box (6) – Description continued

SECONDLY: PIN 04517-0699

Southeast half of Lot 9, Concession 4, designated as Part 4 on Plan 4R-5753, SAVE AND EXCEPT Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

THIRDLY: PIN 04517-0467

Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1 on Plan 4R-10610 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOURTHLY: PIN 04517-0809

Part of Lot 8, Concession 4, being Part 1 on Plan 4R-7809, SAVE AND EXCEPT Parts 1 and 8 on Plan 4R-10610 and SAVE AND EXCEPT Part 1 on Plan 4R-12588 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FIFTHLY: PIN 04517-0543

Parcel 16-4, Section 4M-280, being Part of Block 16, Plan 4M-280, designated as Parts 1 and 2 on Plan 4R-6573 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SIXTHLY: PIN 04517-0811

Part of Block 17, Plan 4M-280 designated as Part 3 on Plan 4R-6573, SAVE AND EXCEPT Part 1 on Plan 4R-13304 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SEVENTHLY: PIN 04517-0474

Parcel 6-1, Section 4M-642, being Block 6, Plan 4M-642 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOR OFFICE USE ONLY

COST SHARING AND MAINTENANCE AGREEMENT

THIS AGREEMENT is made as of the 27 day of April 2000.

BETWEEN:

KANATA RESEARCH PARK CORPORATION
(hereinafter called "KRPC")

OF THE FIRST PART

AND:

NEWBRIDGE NETWORKS CORPORATION
(hereinafter called "NNC")

OF THE SECOND PART

WHEREAS:

1. KRPC is the registered owner of lands being Part Lots 8 and 9, Concession 4, in the City of Kanata (formerly the Township of March), more particularly described in Schedule "A" attached (the "**KRPC Lands**");

2. NNC is the registered owner of lands Part of the Northwest Half Lot 8, Concession 4, in the City of Kanata (formerly the Township of March) more particularly described in Schedule "B" attached (the "**NNC Lands**");

3. The NNC Lands and the KRPC Lands shall hereafter be collectively referred to as the "**Lands**".

4. KRPC has previously constructed a storm water management facility located on the KRPC Lands as shown marked on the attached Schedule "C" ("**Storm Water Management Facility No. 1**"), which serves to manage storm water from part of the KRPC Lands and part of the NNC Lands as marked on Schedule "C" and "D".

5. KRPC and NNC wish to enter into an agreement to share the maintenance costs of Storm Water Management Facility No. 1. The sharing of the construction costs of Storm Water Management Facility No. 1 have been previously dealt with by the parties to their mutual satisfaction.

NOW THEREFORE this Agreement witnesseth that in consideration of the premises and of the mutual covenants, terms and conditions herein contained the parties do hereby agree one with the other as follows:

1. **Definitions**

1.1 "**Works**" means all of the work, services and material to be performed and supplied in connection with the maintenance of Storm Water Management Facility No. 1;

1.2 "**Costs of the Works**" means all of the costs associated with such Works, including but not limited to the following:

1.2.1 all fees and the costs for design (including landscaping design for typical sewers and a typical storm water pond of the same size in a commercial office park), engineering and surveying fees associated with the Works;

1.2.2 all fees for materials and installation charged by the utility companies or any other agency;

1.2.3 all approval fees, application fees and any and all governmental or other charges associated with the Works;

1.2.4 all other professional and related fees associated with the Works;

1.2.5 the costs, fees and disbursements relating to the deposit of any security, letters of credit or cash requirement required to be given to any municipality or agency to permit the undertaking of the Works;

1.2.6 the cost of operating and maintaining the facility;

1.3 "**Engineers**" means Novatech Engineering Consultants Limited or such other engineers as may be designated, from time to time, by KRPC;

2. **Cost Sharing**

2.1 The parties hereto acknowledge and agree that the Costs of the Works shall be shared and paid for as follows:

The Costs of the Works of Storm Water Management Facility No. 1 shall be allocated to and borne by each of the parties based upon a calculation of the area of the NNC Lands and KRPC Lands served by such facility and the application of the run-off coefficient of such Lands to the area of each and shall therefore be in accordance with the calculations prepared by the Engineers as follows:

NNC - 63.5%
KRPC - 36.5%

3. **Timing of the Works**

3.1 Storm Water Management Facility No. 1

The parties acknowledge and agree that the construction of Storm Water Management Facility No. 1 has been completed to the satisfaction of and in accordance with the standards made applicable to them by the Corporation of the City of Kanata (the "City of Kanata) and the Regional Municipality of Ottawa-Carleton;

4. **Method and Timing of Payment**

4.1 The parties agree that the contribution by NNC to the Costs of the Works in accordance with the percentages established in Section 2 shall be paid to KRPC or as it may direct as follows.

KRPC shall provide NNC with an invoice of the Costs of the Works of Storm Water Management Facility No. 1 as they are incurred. NNC shall pay its proportionate share of such costs within thirty (30) days of receipt of such invoices.

5. **Notice**

5.1 KRPC agrees to keep NNC informed of the progress of all required approvals and the anticipated timing of the Works, as required from time to time.

5.2 Any notice, request or demand herein provided for or given hereunder, if given by a party, shall be in writing and shall be sufficiently given to:

5.2.1 Kanata Research Park Corporation
555 Legget Drive
Suite 206
Ottawa, Ontario
K2K 2X3

Attention: Barry Garland (General Counsel)

5.2.2 Newbridge Networks Corporation
600 March Road
Kanata, Ontario
K2K 2E6

Attention: Peter Lapins (Director of Facilities)

6. **Other Agreements**

The parties acknowledge that they shall execute such agreements with either the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton, or any utility company and any other documents which may be required to give effect to this agreement.

7. **Indemnification**

NNC hereby agrees to indemnify and save KRPC harmless its proportionate share of any and all costs associated with any relocation, removal, alteration or change to Storm Water Management Facility No. 1 as may be required by the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton or any other agency or governmental body requiring such relocation, removal, alteration or change required for any reason whatsoever.

8. **Interest on Arrears**

All amounts to be paid by NNC pursuant to this Agreement, are required to be paid when due. In the event that NNC fails to make a payment when due, all such unpaid amounts will bear interest after default at a rate equal to six percent (6%) per annum in excess of the minimum lending rate to prime commercial borrowers from time to time charged by the Royal Bank of Canada or such other chartered bank as KRPC may designate.

9. **Right to Recovery of Amounts Due**

In addition to paragraphs 8 and notwithstanding paragraph 8, if NNC fails to pay any amount(s) when due (which includes any interest payments due), such failure shall entitle KRPC to a lien against the NNC Lands which lien may be enforced by legal action against NNC and the NNC Lands.

10. **Miscellaneous**

10.1 Each of the parties hereto will, at all times, and from time to time hereafter and upon every reasonable request to do so make, do, execute, deliver or cause to be made, done, delivered, all such further acts, deeds, assurances and things that may be required for more effectual implementing and carrying out of the true intent and meaning of this agreement.

10.2 The parties hereto agree that this agreement or notice thereof will be registered against the title to the lands referred to herein. The parties further agree as quickly as possible following execution of this agreement to obtain the consent to this agreement where necessary from the holders of any charge securing payment of indebtedness registered on title to the Lands referred to herein.

10.3 If any provision of this agreement shall be found or deemed to be illegal or invalid, the remainder of the agreement shall not be affected thereby.

10.4 This agreement shall enure to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF the parties have hereto set their corporate seals, duly attested to by the hands of their proper signing officers authorized on that behalf.

DATED the 27 day of April 2000.

SIGNED, SEALED AND DELIVERED)
in the presence of)

KANATA RESEARCH PARK CORPORATION

Per: _____
Name: Bronwen A. Heins
Title: President.

NEWBRIDGE NETWORKS CORPORATION

Per: _____
Name: Don Mills
Title: V P ADMIN

Per: _____
Name:
Title:

SCHEDULE "A"

KRPC LANDS

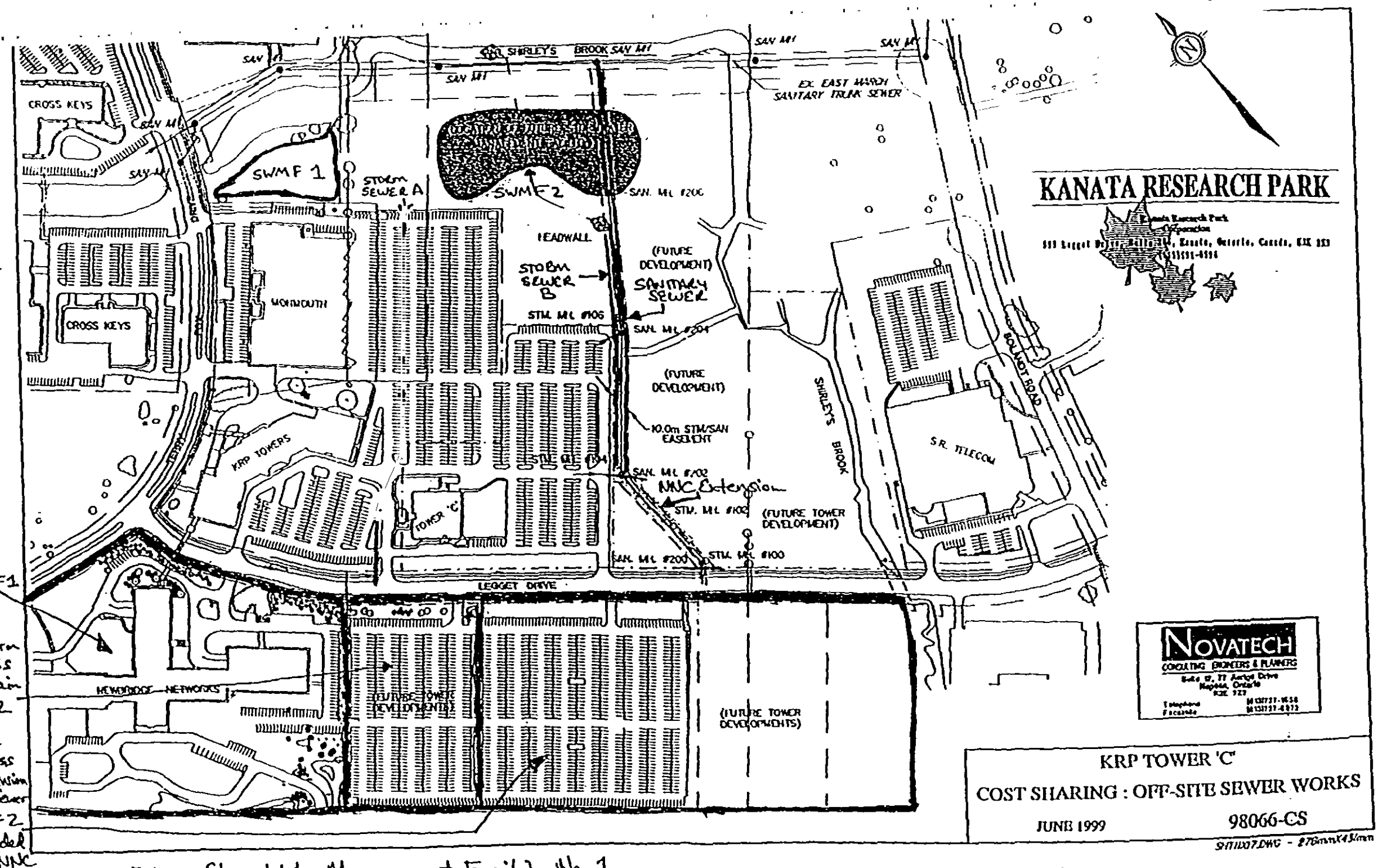
Firstly:	PIN 04517-0788: Part Block 29, Plan 4M-280, Part 1 on Plan 4R13132 in the City of Kanata
Secondly:	PIN 04517-0617: Part of Lot 8, Concession 4, Parts 3, 4, 5 and 6 on 4R-7809, save and except Parts 2, 3 and 4 on Plan 4R-10610 in the City of Kanata
Thirdly:	PIN 04517-0746: Part of Lot 8, Concession 4, Part 1 on Plan 4R12934 in the City of Kanata
Fourthly:	PIN 04517-0747: Part of Lot 8, Concession 4, Parts 2 and 3 on Plan 4R10610, save and except Part 1 on Plan 4R12934 in the City of Kanata
Fifthly:	PIN 04517-0745: Consolidation of various properties Part of Block 2 on Plan 4M-642, Parts 2 to 7 on Plan 4R12934 in the City of Kanata
Sixthly:	PIN 04517-0740: Part Block 2 on Plan 4M-642, Parts 1 and 2 on Plan 4R9971 in the City of Kanata

SCHEDULE B

NNC LANDS

Firstly:	PIN 04517-0813: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735 in the City of Kanata
Secondly:	PIN 04517-0699: Southeast half of Lot 9, Concession 4, designated as Part 4 on 4R-5753, save and except Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata
Thirdly:	PIN 04517-0467: Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1, 4R10610 in the City of Kanata
Fourthly:	PIN 04517-0809: Part of Lot 8, Concession 4, being Part 1 on Plan 4R7809, except Parts 1 and 8 on 4R10610 and except Part 1 on Plan 4R12588
Fifthly:	PIN 04517-0543: Parcel 16-4, Section 4M-280, being Part Block 16, PL 4M-280, Part 1 and 2, 4R6573 in the City of Kanata
Sixthly:	PIN 04517-0811: Part of Block 17, Plan 4M-280, being Part 3 on Plan 4R-6573, save and except Part 1 on Plan 4R-13304
Seventhly:	PIN 04517-0474: Parcel 6-1, Section 4M-642, being Block 6, PL 4M-642 in the City of Kanata

Schedule "C"



NWC Lands

- storm water drains to SWMF1
- storm water drains to Storm Sewer A and is intended to drain into SWMF 2
- storm water intended to pass through NWC Extension then into Storm Sewer B and into SWMF 2
- sanitary intended to pass through NWC Extension then into Sanitary Sewer

SWMF 1 - Storm Water Management Facility No. 1
SWMF 2 - Storm Water Management Facility No. 2

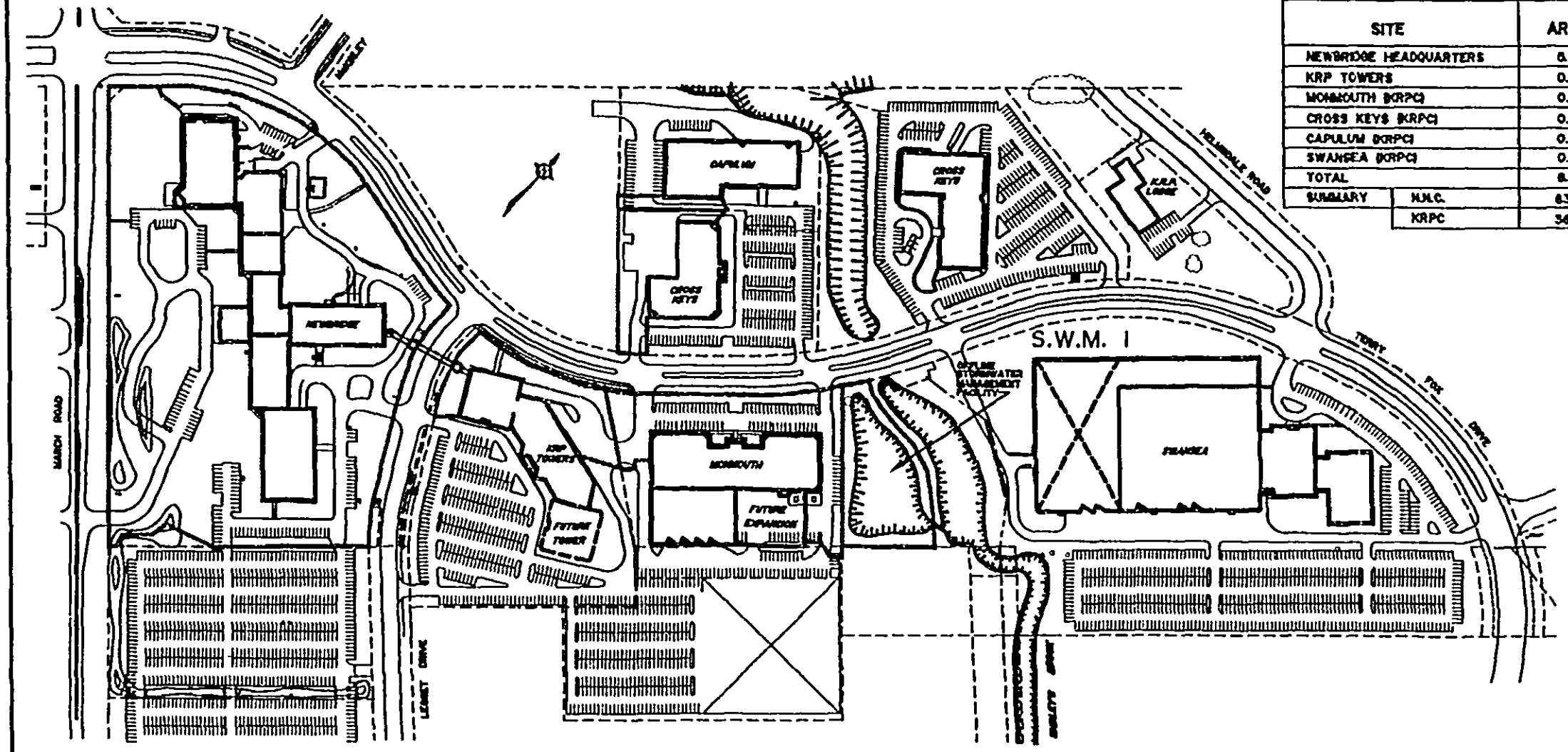
10

01

LEGEND

LANDS CONTRIBUTING TO EXISTING SWM FACILITY (PRIVATE LANDS ONLY)

SITE		AREA (ha)	% CONTRIBUTION TO SWM FACILITY
NEWBRIDGE HEADQUARTERS		5.31	63.6
KRP TOWERS		0.68	8.1
MONMOUTH (KRPC)		0.99	11.8
CROSS KEYS (KRPC)		0.52	6.2
CAPULUM (KRPC)		0.36	4.3
SWANSEA (KRPC)		0.50	6.0
TOTAL		8.36	100%
SUMMARY	N.N.C.	63.8%	
	KRPC	36.8%	



Schedule D

NOVATECH ENGINEERING CONSULTANTS LTD.
CIVIL ENGINEERING & PLANNING

NEWBRIDGE

KANATA RESEARCH PARK

KANATA RESEARCH PARK
NEWBRIDGE NETWORKS CORPORATION

STORMWATER MANAGEMENT FACILITY
COMMON ELEMENT AGREEMENT
OPERATION AND MAINTENANCE SCHEDULE

DRAWN BY: JFB
DATE: FEBRUARY 3, 1997
DRAWING: **93063-SCHI**

SHT14X8.DWG - 355mmX216mm

Province of Ontario

Document General

Form 4 — Land Registration Reform Act

(2)

Amended NOV. 1992

D

FOR OFFICE USE ONLY

1294890

CERTIFICATE OF RECEIPT
CERTIFICATE DE RECEPISSE
OTTAWA (4)

00 JUN 28 11 43

JOHN RICHICHI
ASSISTANT DEPUTY LAND REGISTRAR

(1) Registry ☐ Land Titles ☒ (2) Page 1 of 12 pages

(3) Property Identifier(s) | Block | Property | Additional: See Schedule ☒

04517 | 0813 Firstly

(4) Nature of Document

APPLICATION TO REGISTER NOTICE OF AGREEMENT
(Section 71 of the Land Titles Act)

(5) Consideration

Dollars $

(6) Description

FIRSTLY: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735, City of Kanata, Regional Municipality of Ottawa-Carleton, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission as in LT645983, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission over Part 1 on Plan 4R-10618 as in LT936988.

Description continued on attached Schedule.

New Property Identifiers — Additional: See Schedule ☐

Executions — Additional: See Schedule ☐

(7) This Document Contains: (a) Redescription New Easement Plan/Sketch ☐ (b) Schedule for: Description ☒ Additional Parties ☐ Other ☒

(8) This Document provides as follows:

To: The Land Registrar for the Land Titles Division of Ottawa-Carleton (No. 4)

KANATA RESEARCH PARK CORPORATION has an unregistered estate, right, interest or equity in the lands registered as No.s LT591903, LT611806, LT914779, LT975384, LT1001764, LT1001764 and LT611806 in the name of Newbridge Networks Corporation in respect of the lands registered as in Box (6) and hereby applies under Section 71 of the Land Titles Act for entry of a Notice of Cost Sharing and Maintenance Agreement in the register for the said PIN No.s 04517-0813, 04517-0699, 04517-0467, 04517-0809, 04517-0543, 04517-0811 and 04517-0474.

Continued on Schedule ☒

(9) This Document relates to instrument number(s)

(10) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D
KANATA RESEARCH PARK CORPORATION	X Name: Bronwen Heins Title: President I have the authority to bind the Corporation.	2000	06	27

(11) Address for Service 206 - 555 Legget Drive, Kanata, Ontario, K2K 2X3

(12) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D

(13) Address for Service

(14) Municipal Address of Property

Multiple

(15) Document Prepared by:

KANATA RESEARCH PARK CORPORATION
206 - 555 Legget Drive
Kanata, Ontario
K2K 2X3

Bronwen Heins
BH:kb

FOR OFFICE USE ONLY

Fees and Tax	
Registration Fee	
Total	

Province of Ontario

Schedule

Form 5 — Land Registration Reform Act

Amended NOV. 1992

S

Additional Property Identifier(s) and/or Other Information

Box (6) – Description continued

SECONDLY: PIN 04517-0699

Southeast half of Lot 9, Concession 4, designated as Part 4 on Plan 4R-5753, SAVE AND EXCEPT Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

THIRDLY: PIN 04517-0467

Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1 on Plan 4R-10610 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOURTHLY: PIN 04517-0809

Part of Lot 8, Concession 4, being Part 1 on Plan 4R-7809, SAVE AND EXCEPT Parts 1 and 8 on Plan 4R-10610 and SAVE AND EXCEPT Part 1 on Plan 4R-12588 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FIFTHLY: PIN 04517-0543

Parcel 16-4, Section 4M-280, being Part of Block 16, Plan 4M-280, designated as Parts 1 and 2 on Plan 4R-6573 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SIXTHLY: PIN 04517-0811

Part of Block 17, Plan 4M-280 designated as Part 3 on Plan 4R-6573, SAVE AND EXCEPT Part 1 on Plan 4R-13304 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SEVENTHLY: PIN 04517-0474

Parcel 6-1, Section 4M-642, being Block 6, Plan 4M-642 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOR OFFICE USE ONLY

COST SHARING AND MAINTENANCE AGREEMENT

THIS AGREEMENT is made as of the 27 day of April 2000.

BETWEEN:

KANATA RESEARCH PARK CORPORATION
(hereinafter called "KRPC")

OF THE FIRST PART

AND:

NEWBRIDGE NETWORKS CORPORATION
(hereinafter called "NNC")

OF THE SECOND PART

WHEREAS:

1. KRPC is the registered owner of lands being Part Lots 8 and 9, Concession 4, in the City of Kanata (formerly the Township of March), more particularly described in Schedule "A" attached (the "**KRPC Lands**");

2. NNC is the registered owner of lands Part of the Northwest Half Lot 8, Concession 4, in the City of Kanata (formerly the Township of March) more particularly described in Schedule "B" attached (the "**NNC Lands**");

3. The NNC Lands and the KRPC Lands shall hereafter be collectively referred to as the "**Lands**".

4. KRPC has previously constructed a storm sewer located on the KRPC Lands, as shown marked on the attached Schedule "C" ("**Storm Sewer A**"), which serves part of the KRPC Lands and part of the NNC Lands as marked on Schedule "C" and "D";

5. KRPC intends to construct a new storm water management facility on the KRPC Lands which shall serve to manage storm water from the KRPC Lands and the NNC Lands, which flow through Storm Sewer A ("**Storm Water Management Facility No. 2**");

6. KRPC and NNC wish to enter into an agreement to share the maintenance costs of Storm Storm Sewer A and the construction and maintenance costs of Storm Water Management Facility No. 2. The sharing of the construction costs of Storm Sewer A have been previously dealt with by the parties to their mutual satisfaction.

NOW THEREFORE this Agreement witnesseth that in consideration of the premises and of the mutual covenants, terms and conditions herein contained the parties do hereby agree one with the other as follows:

1. **Definitions**

1.1 "**Works**" means all of the work, services and material to be performed and supplied in connection with:

1.1.1 the maintenance of Storm Sewer A;

1.1.2 the construction and maintenance of Storm Water Management Facility No. 2; and

1.2 "**Costs of the Works**" means all of the costs associated with such Works, including but not limited to the following:

1.2.1 all fees and the costs for design (including landscaping design for typical sewers and a typical storm water pond of the same size in a commercial office park), engineering and surveying fees associated with the Works;

1.2.2 all fees for materials and installation charged by the utility companies or any other agency;

1.2.3 all approval fees, application fees and any and all governmental or other charges associated with the Works;

1.2.4 all other professional and related fees associated with the Works;

1.2.5 the costs, fees and disbursements relating to the deposit of any security, letters of credit or cash requirement required to be given to any municipality or agency to permit the undertaking of the Works;

1.2.6 the cost of operating and maintaining the facilities and sewers and extensions;

1.3 "**Costs of the Works**" with respect to Storm Water Management Facility No. 2 , also means the following:

1.3.1 all of the construction costs associated with such Works, including but not limited to the costs of construction of the Works as certified by the Engineers, including the costs paid under all construction contracts entered into with respect to the Works and all taxes payable thereon; and

1.3.2 the costs of restoring the KRPC Lands to the condition they were in prior to construction of the Works;

1.4 "**Engineers**" means Novatech Engineering Consultants Limited or such other engineers as may be designated, from time to time, by KRPC;

2. Cost Sharing

2.1 The parties hereto acknowledge and agree that the Costs of the Works shall be shared and paid for as follows:

2.1.2 Storm Sewer A

The Costs of the Works relating to Storm Sewer A shall be allocated to each of the parties based upon the respective acreages of the KRPC Lands and NNC Lands served by the storm sewer allocated to each component of the storm sewer between specific manholes as marked on the attached Schedule D in accordance with the percentage calculations prepared by the Engineers as follows:

Manhole	NNC	KRPC
A – B	100%	0%
B – C	90%	10%
C – D	65%	35%
D – E	60%	40%
E – F	55%	45%
F – G	41%	59%
G - H	32%	68%

2.1.2 Storm Water Management Facility No. 2

The Costs of the Works relating to Storm Water Management Facility No. 2 shall be allocated to and borne by each of the parties based upon a calculation of the area of the NNC and KRPC Lands served by such facility and the application of the run-off coefficient of such Lands to the area of each and shall therefore be in accordance with the calculations prepared by the Engineers as follows:

NNC - 41.5%
KRPC - 58.5%

3. **Estimation of Costs**

An estimate of the Costs of the Works of Storm Water Management Facility No. 2, as prepared by the Engineers, is attached as Schedule E. Schedule E is an estimate only without the benefit of full construction drawings and specifications and NNC covenants to pay its proportionate share of the actual Costs of each of the Works in accordance with the other terms and provisions of this Agreement.

4. **Timing of the Works**

4.1 Storm Sewer A

The parties acknowledge and agree that the construction of Storm Sewer A has been completed to the satisfaction of and in accordance with the standards made applicable to them by the Corporation of the City of Kanata (the "City of Kanata") and the Regional Municipality of Ottawa-Carleton;

4.1 Storm Water Management Facility No. 2

The parties agree that the exact location and configuration of Storm Water Management Facility No. 2 will be determined solely by KRPC in conjunction with the determination of the final golf course design upon the KRPC Lands and in accordance with the requirements of the City of Kanata and the Regional Municipality of Ottawa-Carleton and all approval authorities.

5. **Method and Timing of Payment**

5.1 The parties agree that the contribution by NNC to the Costs of the Works in accordance with the percentages established in Section 2 shall be paid to KRPC or as it may direct as follows.

5.1.1 Storm Sewer A

KRPC shall provide NNC with an invoice of the Costs of the Works of Storm Sewer A as they are incurred. NNC shall pay its proportionate share of such costs within thirty (30) days of receipt of such invoices.

5.1.5 Storm Water Management Facility No. 2

KRPC shall provide NNC with an invoice of the Costs of the Works of Storm Water Management Facility No. 2 after completion. NNC shall pay 9.6% of such costs within thirty (30) days of receipt of such invoice. By separate agreement, NNC has agreed to the method and timing of an additional 31.9% contribution of the Costs of the Works.

6. **Future Assumption**

Storm Water Management Facility No. 2 may in the future be assumed by and become a public facility. In such event, KRPC and NNC agree that they will execute all such easements, agreements and further assurances as may be required by any governmental authority with respect thereto.

7. **Notice**

7.1 KRPC agrees to keep NNC informed of the progress of all required approvals and the anticipated timing of the Works, as required from time to time.

7.2 Any notice, request or demand herein provided for or given hereunder, if given by a party, shall be in writing and shall be sufficiently given to:

7.2.1 Kanata Research Park Corporation
555 Legget Drive
Suite 206
Ottawa, Ontario
K2K 2X3

Attention: Barry Garland (General Counsel)

7.2.2 Newbridge Networks Corporation
600 March Road
Kanata, Ontario
K2K 2E6

Attention: Peter Lapins (Director of Facilities)

8. **Other Agreements**

The parties acknowledge that they shall execute such agreements with either the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton or any utility company and any other documents which may be required to give effect to this agreement.

9. **Indemnification**

NNC hereby agrees to indemnify and save KRPC harmless its proportionate share of any and all costs associated with any relocation, removal, alteration or change to Storm Sewer A and Storm Water Management Facility No. 2 as may be required by the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton or any other agency or governmental body requiring such relocation, removal, alteration or change required for any reason whatsoever.

10. **Interest on Arrears**

All amounts to be paid by NNC pursuant to this Agreement, are required to be paid when due. In the event that NNC fails to make a payment when due, all such unpaid amounts will bear interest after default at a rate equal to six percent (6%) per annum in excess of the minimum lending rate to prime commercial borrowers from time to time charged by the Royal Bank of Canada or such other chartered bank as KRPC may designate.

11. **Right to Recovery of Amounts Due**

In addition to paragraphs 10 and notwithstanding paragraph 10, if NNC fails to pay any amount(s) when due such failure shall entitle KRPC to a lien against the NNC Lands which lien may be enforced by legal action against NNC and the NNC Lands.

12. **Miscellaneous**

12.1 Each of the parties hereto will, at all times, and from time to time hereafter and upon every reasonable request to do so make, do, execute, deliver or cause to be made, done, delivered, all such further acts, deeds, assurances and things that may be required for more effectual implementing and carrying out of the true intent and meaning of this agreement.

12.2 The parties hereto agree that this agreement or notice thereof will be registered against the title to the lands referred to herein. The parties further agree as quickly as possible following execution of this agreement to obtain the consent to this agreement where necessary from the holders of any charge securing payment of indebtedness registered on title to the Lands referred to herein.

12.3 If any provision of this agreement shall be found or deemed to be illegal or invalid, the remainder of the agreement shall not be affected thereby.

12.4 This agreement shall enure to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF the parties have hereto set their corporate seals, duly attested to by the hands of their proper signing officers authorized on that behalf.

DATED the 27 day of April 2000.

SIGNED, SEALED AND DELIVERED in the presence of

KANATA RESEARCH PARK CORPORATION

Per: _____
Name: Brenwen A. Heins
Title: President.

NEWBRIDGE NETWORKS CORPORATION

Per: _____
Name: Don Mills
Title: VP ADMIN

Per: _____
Name:
Title:

SCHEDULE "A"

KRPC LANDS

Firstly:	PIN 04517-0788: Part Block 29, Plan 4M-280, Part 1 on Plan 4R13132 in the City of Kanata
Secondly:	PIN 04517-0617: Part of Lot 8, Concession 4, Parts 3, 4, 5 and 6 on 4R-7809, save and except Parts 2, 3 and 4 on Plan 4R-10610 in the City of Kanata
Thirdly:	PIN 04517-0746: Part of Lot 8, Concession 4, Part 1 on Plan 4R12934 in the City of Kanata
Fourthly:	PIN 04517-0747: Part of Lot 8, Concession 4, Parts 2 and 3 on Plan 4R10610, save and except Part 1 on Plan 4R12934 in the City of Kanata
Fifthly:	PIN 04517-0745: Consolidation of various properties Part of Block 2 on Plan 4M-642, Parts 2 to 7 on Plan 4R12934 in the City of Kanata
Sixthly:	PIN 04517-0740: Part Block 2 on Plan 4M-642, Parts 1 and 2 on Plan 4R9971 in the City of Kanata

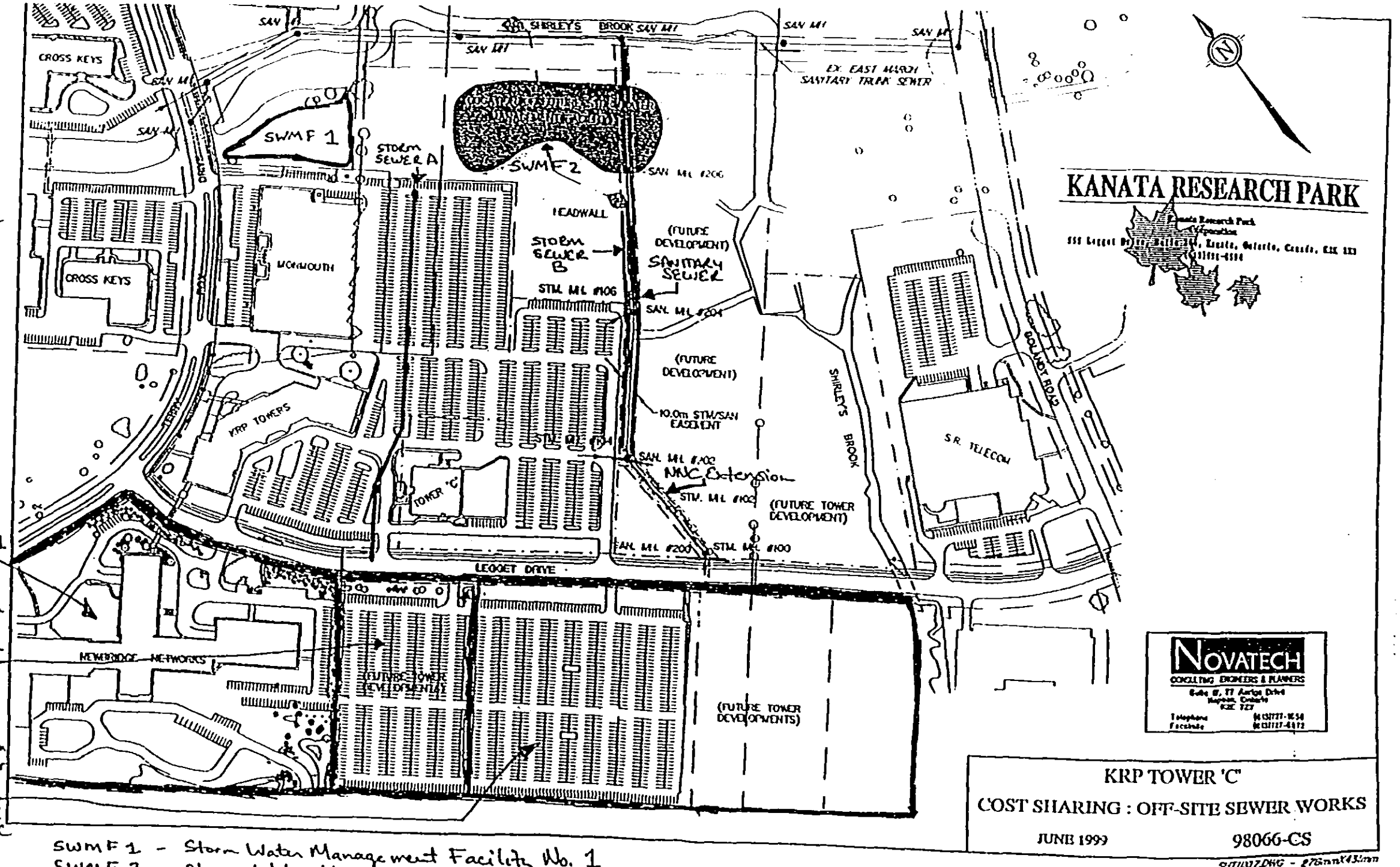
SCHEDULE B

NNC LANDS

Firstly:	PIN 04517-0813: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735 in the City of Kanata
Secondly:	PIN 04517-0699: Southeast half of Lot 9, Concession 4, designated as Part 4 on 4R-5753, save and except Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata
Thirdly:	PIN 04517-0467: Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1, 4R10610 in the City of Kanata
Fourthly:	PIN 04517-0809: Part of Lot 8, Concession 4, being Part 1 on Plan 4R7809, except Parts 1 and 8 on 4R10610 and except Part 1 on Plan 4R12588
Fifthly:	PIN 04517-0543: Parcel 16-4, Section 4M-280, being Part Block 16, PL 4M-280, Part 1 and 2, 4R6573 in the City of Kanata
Sixthly:	PIN 04517-0811: Part of Block 17, Plan 4M-280, being Part 3 on Plan 4R-6573, save and except Part 1 on Plan 4R-13304
Seventhly:	PIN 04517-0474: Parcel 6-1, Section 4M-642, being Block 6, PL 4M-642 in the City of Kanata

10

Schedule "C"



NNC Lands

- storm water drains to SWMF1
- storm water drains to Storm Sewer A and is intended to drain into SWMF 2
- storm water intended to pass through NNC Extension then into Storm Sewer B and into SWMF 2
- sanitary intended to pass through NNC Extension then into Sanitary Sewer

SWMF 1 - Storm Water Management Facility No. 1
SWMF 2 - Storm Water Management Facility No. 2

NOVATECH
CONSULTING ENGINEERS & PLANNERS

KRP TOWER 'C'
COST SHARING : OFF-SITE SEWER WORKS
JUNE 1999 98066-CS

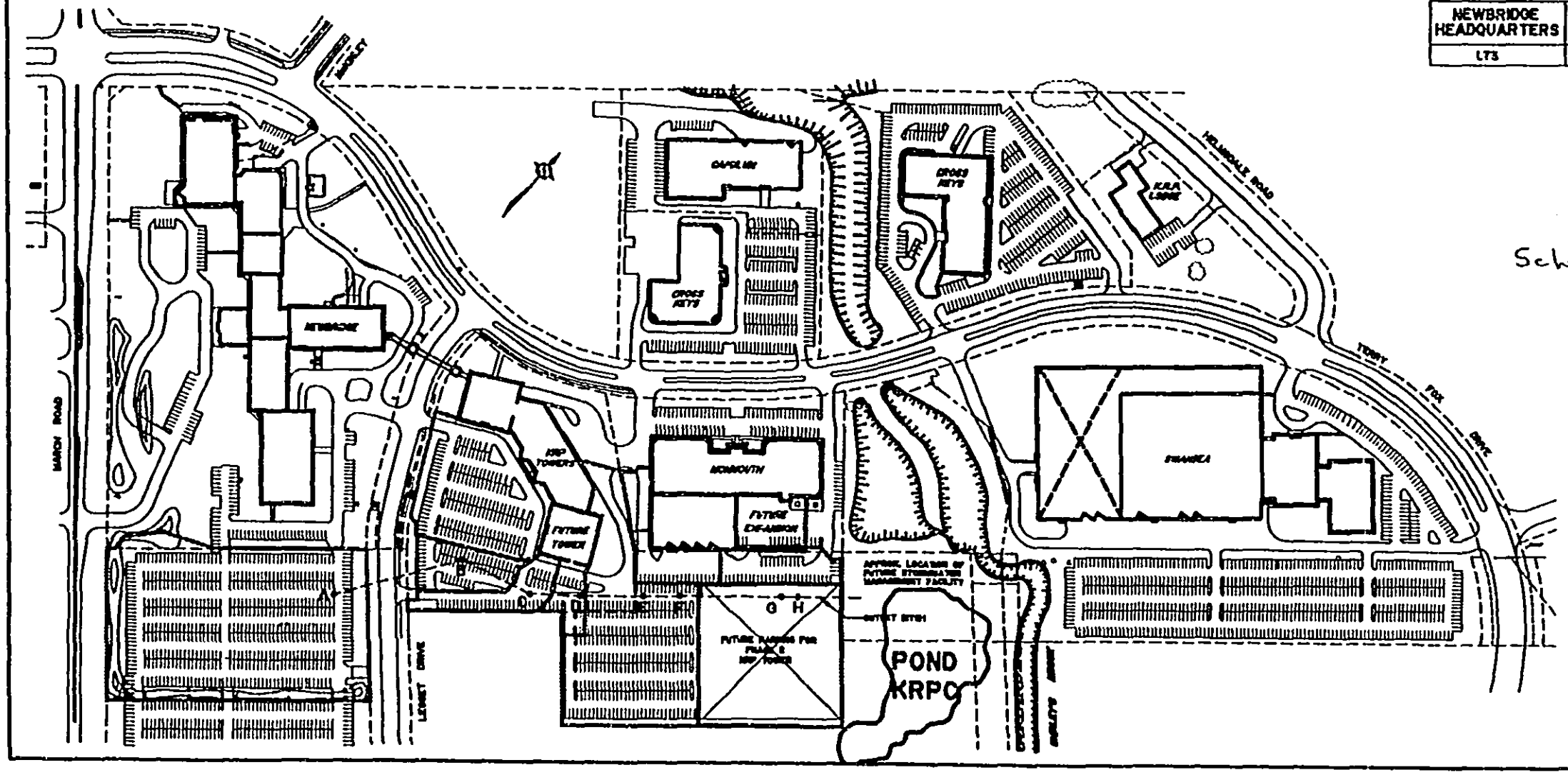
SITEU7.DWG - 279mm X 432mm

LEGEND

LANDS CONTRIBUTING TO COMMON STORM SEWER SYSTEM AND POND

NEWBRIDGE HEADQUARTERS	KRPC
LT3	4.27

Schedule D



NOVATECH
ENGINEERING CONSULTANTS LTD.
CIVIL, ENGINEERING & PLANNING

NEWBRIDGE

KANATA RESEARCH PARK

KANATA RESEARCH PARK
NEWBRIDGE NETWORKS CORPORATION

STORM 'A' SEWER SYSTEM AND POND
COMMON ELEMENT AGREEMENT
OPERATION AND MAINTENANCE SCHEDULE

DRAWN BY: JFB
DATE: FEBRUARY 3, 1997
DRAWING: 93063-SCH2

SHT14X8.DWG - 355mmX216mm

SCHEDULE "E"

Storm Water Management Facility No. 2 Costs

- Total costs of construction estimated at $ 460,000.

	Area (hs)	Percentage	Costs
Newbridge Networks Corporation	7.46	41.5%	$ 190,900
Kanata Research Park Corporation	10.53	58.5%	$ 269,100
TOTAL	17.99	100%	$ 460,000

Province of Ontario

Document General

Form 4 — Land Registration Reform Act

(3) Amended NOV. 1992 **D**

FOR OFFICE USE ONLY

CERTIFICATE OF RECEIPT
CERTIFICAT DE RECEPISSE
00 JUN 28 11 43
JOHN RICHICHI
ASSISTANT DEPUTY LAND REGISTRAR

New Property Identifiers — Additional: See Schedule ☐

Executions — Additional: See Schedule ☐

(1) Registry ☐ Land Titles ☒ (2) Page 1 of 14 pages

(3) Property Identifier(s) | Block | Property | Additional: See Schedule ☒

	Block	Property
	04517	0813 Firstly

(4) Nature of Document
APPLICATION TO REGISTER NOTICE OF AGREEMENT
(Section 71 of the Land Titles Act)

(5) Consideration
Dollars $

(6) Description

FIRSTLY: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735, City of Kanata, Regional Municipality of Ottawa-Carleton, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission as in LT645983, SUBJECT TO an easement in favour of Kanata Hydro-Electric Commission over Part 1 on Plan 4R-10618 as in LT936988.

Description continued on attached Schedule.

(7) This Document Contains: (8) Redescription New Easement Plan/Sketch ☐ (9) Schedule for: Description ☒ Additional Parties ☐ Other ☒

(8) This Document provides as follows:

To: The Land Registrar for the Land Titles Division of Ottawa-Carleton (No. 4)

KANATA RESEARCH PARK CORPORATION has an unregistered estate, right, interest or equity in the lands registered as No.s LT591903, LT611806, LT914779, LT975384, LT1001764, LT1001764 and LT611806 in the name of Newbridge Networks Corporation in respect of the lands registered as in Box (6) and hereby applies under Section 71 of the Land Titles Act for entry of a Notice of Cost Sharing and Maintenance Agreement in the register for the said PIN No.s 04517-0813, 04517-0699, 04517-0467, 04517-0809, 04517-0543, 04517-0811 and 04517-0474.

Continued on Schedule ☒

(9) This Document relates to Instrument number(s)

(10) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D
KANATA RESEARCH PARK CORPORATION	X Name: Bronwen Heins Title: President I have the authority to bind the Corporation.	2000	06	27

(11) Address for Service 206 - 555 Legget Drive, Kanata, Ontario, K2K 2X3

(12) Party(ies) (Set out Status or Interest)

Name(s)	Signature(s)	Date of Signature Y	M	D

(13) Address for Service

(14) Municipal Address of Property

Multiple

(15) Document Prepared by:

KANATA RESEARCH PARK CORPORATION
206 - 555 Legget Drive
Kanata, Ontario
K2K 2X3

Bronwen Heins
BH:kb

FOR OFFICE USE ONLY

Fees and Tax	
Registration Fee	
Total	

Province of Ontario

Schedule

Form 5 — Land Registration Reform Act

Amended NOV. 1992

S

Additional Property Identifier(s) and/or Other Information

Box (6) – Description continued

SECONDLY: PIN 04517-0699

Southeast half of Lot 9, Concession 4, designated as Part 4 on Plan 4R-5753, SAVE AND EXCEPT Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

THIRDLY: PIN 04517-0467

Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1 on Plan 4R-10610 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOURTHLY: PIN 04517-0809

Part of Lot 3, Concession 4, being Part 1 on Plan 4R-7809, SAVE AND EXCEPT Parts 1 and 8 on Plan 4R-10610 and SAVE AND EXCEPT Part 1 on Plan 4R-12588 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FIFTHLY: PIN 04517-0543

Parcel 16-4, Section 4M-280, being Part of Block 16, Plan 4M-280, designated as Parts 1 and 2 on Plan 4R-6573 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SIXTHLY: PIN 04517-0811

Part of Block 17, Plan 4M-280 designated as Part 3 on Plan 4R-6573, SAVE AND EXCEPT Part 1 on Plan 4R-13304 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

SEVENTHLY: PIN 04517-0474

Parcel 6-1, Section 4M-642, being Block 6, Plan 4M-642 in the City of Kanata, Regional Municipality of Ottawa-Carleton.

FOR OFFICE USE ONLY

COST SHARING AND MAINTENANCE AGREEMENT

THIS AGREEMENT is made as of the 27 day of April 2000.

BETWEEN:

KANATA RESEARCH PARK CORPORATION
(hereinafter called "KRPC")

OF THE FIRST PART

AND:

NEWBRIDGE NETWORKS CORPORATION
(hereinafter called "NNC")

OF THE SECOND PART

WHEREAS:

1. KRPC is the registered owner of lands being Part Lots 8 and 9, Concession 4, in the City of Kanata (formerly the Township of March), more particularly described in Schedule "A" attached (the "**KRPC Lands**");

2. NNC is the registered owner of lands Part of the Northwest Half Lot 8, Concession 4, in the City of Kanata (formerly the Township of March) more particularly described in Schedule "B" attached (the "**NNC Lands**");

3. The NNC Lands and the KRPC Lands shall hereafter be collectively referred to as the "**Lands**".

4. KRPC has previously constructed:

   a. a storm sewer located on the KRPC Lands as shown marked on Schedule "C" ("**Storm Sewer B**"), which serves part of the KRPC Lands and which is intended to serve part of the NNC Lands as marked on Schedule "C;

   b. a sanitary sewer located on the KRPC Lands as shown marked on Schedule "C" (the "**Sanitary Sewer**"), which serves part of the KRPC Lands and which is intended to serve part of the NNC Lands, as marked on Schedule "C-1";

5. KRPC intends to construct a new storm water management facility on the KRPC Lands which shall serve to manage storm water from the KRPC Lands and the NNC Lands, which flow through Storm Sewer B("**Storm Water Management Facility No. 2**");

6. KRPC on behalf of NNC intends to construct over the KRPC Lands an extension of Storm Sewer B and the Sanitary Sewer to Legget Drive (the "**NNC Storm Sewer Extension**" and the "**NNC Sanitary Sewer Extension**" collectively the "**NNC Extensions**") as marked on Schedule "C";

7. KRPC and NNC wish to enter into an agreement to share the construction and maintenance costs of Storm Water Management Facility No. 2, Storm Sewer B, the Sanitary Sewer and the NNC Extensions.

NOW THEREFORE this Agreement witnesseth that in consideration of the premises and of the mutual covenants, terms and conditions herein contained the parties do hereby agree one with the other as follows:

1. **Definitions**

1.1 "**Works**" means all of the work, services and material to be performed and supplied in connection with:

1.1.1 the construction and maintenance of Storm Water Management Facility No. 2; and

1.1.2 the construction and maintenance of Storm Sewer B, the Sanitary Sewer, the NNC Extensions and Storm Water Management Facility No. 2.

1.2 "**Costs of the Works**" means all of the costs associated with such Works, including but not limited to the following:

1.2.1 all fees and the costs for design (including landscaping design for typical sewers and a typical storm water pond of the same size in a commercial office park), engineering and surveying fees associated with the Works;

1.2.2 all fees for materials and installation charged by the utility companies or any other agency;

1.2.3 all approval fees, application fees and any and all governmental or other charges associated with the Works;

1.2.4 all other professional and related fees associated with the Works;

1.2.5 the costs, fees and disbursements relating to the deposit of any security, letters of credit or cash requirement required to be given to any municipality or agency to permit the undertaking of the Works;

1.2.6 the cost of operating and maintaining the facilities and sewers and extensions;

1.3 "**Costs of the Works**" with respect to Storm Water Management Facility No. 2 , Storm Sewer B, the Sanitary Sewer and the NNC Extensions also means the following:

1.3.1 all of the construction costs associated with such Works, including but not limited to the costs of construction of the Works as certified by the Engineers, including the costs paid under all construction contracts entered into with respect to the Works and all taxes payable thereon; and

1.3.2 the costs of restoring the KRPC Lands to the condition they were in prior to construction of the Works;

1.4 "**Engineers**" means Novatech Engineering Consultants Limited or such other engineers as may be designated, from time to time, by KRPC;

2. **Cost Sharing**

2.1 The parties hereto acknowledge and agree that the Costs of the Works shall be shared and paid for as follows:

2.1.2 Storm Water Management Facility No. 2

The Costs of the Works relating to Storm Water Management Facility No. 2 shall be allocated to and borne by each of the parties based upon a calculation of the area of the NNC and KRPC Lands served by such facility and the application of the run-off coefficient of such Lands to the

area of each and shall therefore be in accordance with the calculations prepared by the Engineers as follows:

NNC - 41.5%
KRPC - 58.5%

2.1.3 Sanitary Sewer and NNC Sanitary Sewer Extension

The Costs of the Works relating to the Sanitary Sewer and the NNC Sanitary Sewer Extension shall be allocated to and borne by each of the parties based upon the peak design flow of each component of such sanitary sewer system between the sanitary sewer manholes as marked on Schedule C in accordance with the percentage calculations prepared by the Engineers as follows:

Manhole #	NNC	KRPC
200 – 202	100%	0%
202 – 204	50.8%	49.2%
204 – 206	48.1%	51.9%
206 – Existing	48.1%	51.9%

2.1.4 Storm Sewer B and the NNC Storm Sewer Extension

The Costs of the works relating to Storm Sewer B and the NNC Storm Sewer Extension shall be allocated to each of the parties based upon the respective acreages of the KRPC Lands and NNC Lands served by the storm sewer allocated to each component of the storm sewer between specific manholes as marked on Schedule C in accordance with the percentage calculations prepared by the Engineers as follows:

Manhole #	NNC	KRPC
100 – 104	77.6%	22.4%
104 – 106	62.4%	37.6%
106 – Outlet	47.8%	52.20%

3. **Estimation of Costs**

An estimate of the Costs of the Works of Storm Water Management Facility No. 2, the Sanitary Sewer and Storm Sewer B, as prepared by the Engineers, is attached as Schedule E. Schedule E is an estimate only without the benefit of full construction drawings and specifications and NNC covenants to pay its proportionate share of the actual Costs of each of the Works in accordance with the other terms and provisions of this Agreement.

4. **Timing of the Works**

4.1 Storm Water Management Facility No. 2

The parties agree that the exact location and configuration of Storm Water Management Facility No. 2 will be determined solely by KRPC in conjunction with the determination of the final golf course design upon the KRPC Lands and in accordance with the requirements of the Corporation of the City of Kanata (the "City of Kanata") and the Regional Municipality of Ottawa-Carleton and all approval authorities.

4.2 Storm Sewer B and the Sanitary Sewer

The parties acknowledge and agree that the construction of Storm Sewer B and the Sanitary Sewer have been completed to the satisfaction of and in accordance with the standards made applicable to them by the City of Kanata and the Regional Municipality of Ottawa-Carleton.

4.3 NNC Extensions

The parties agree that the NNC Extensions shall both be constructed at the same time when NNC develops any of the Lands intended to be serviced by the NNC Extensions. For clarity, NNC covenants and agrees not to build its own separate storm water management facility to service its Lands.

5. **Method and Timing of Payment**

5.1 The parties agree that the contribution by NNC to the Costs of the Works in accordance with the percentages established in Section 2 shall be paid to KRPC or as it may direct as follows.

5.1.3 Storm Sewer B, the Sanitary Sewer

KRPC shall provide NNC with an invoice of the Costs of the Works of Storm Sewer B and the Sanitary Sewer. NNC shall pay its proportionate share of the Costs of the Works within 30 days following receipt of such invoice(s) and completion of construction of the NNC Extensions.

5.1.4 The NNC Extensions

KRPC shall provide NNC with an invoice of the Costs of the Works of the NNC Extensions after completion. NNC shall pay its proportionate share of such costs within thirty (30) days of receipt of such invoice.

5.1.5 Storm Water Management Facility No. 2

KRPC shall provide NNC with an invoice of the Costs of the Works of Storm Water Management Facility No. 2 after completion. NNC shall pay 31.9% of such costs within 30 days following completion of construction of the NNC Extensions. By separate agreement, NNC has agreed to the method and timing of an additional 9.6 % contribution of the Costs of the Works.

6. **Future Assumption**

Storm Sewer B, the Sanitary Sewer, the NNC Extensions and Storm Water Management Facility No. 2 may in the future be assumed by and become public facilities and sewers. In such event, KRPC and NNC agree that they will execute all such easements, agreements and further assurances as may be required by any governmental authority with respect thereto.

7. **Notice**

7.1 KRPC agrees to keep NNC informed of the progress of all required approvals and the anticipated timing of the Works, as required from time to time.

7.2 Any notice, request or demand herein provided for or given hereunder, if given by a party, shall be in writing and shall be sufficiently given to:

7.2.1 Kanata Research Park Corporation
555 Legget Drive
Suite 206
Ottawa, Ontario
K2K 2X3

Attention: Barry Garland (General Counsel)

7.2.2 Newbridge Networks Corporation
600 March Road
Kanata, Ontario
K2K 2E6

Attention: Peter Lapins (Director of Facilities)

8. **Other Agreements**

The parties acknowledge that they shall execute such agreements with either the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton or any utility company and any other documents which may be required to give effect to this agreement.

9. **Indemnification**

NNC hereby agrees to indemnify and save KRPC harmless its proportionate share of any and all costs associated with any relocation, removal, alteration or change to any of the facilities, sewers and extensions as may be required by the City of Kanata (or any successor municipality), the Regional Municipality of Ottawa-Carleton or any other agency or governmental body requiring such relocation, removal, alteration or change required for any reason whatsoever.

10. **Interest on Costs of the Works**

NNC agrees to pay to KRPC interest on its percentage contribution towards the Costs of the Works for Storm Sewer B, the Sanitary Sewer and Storm Water Management Facility No. 2 which are deferred until completion of the NNC Extensions from 1 September 2000 until payment thereof at a rate equal to one percent (1%) per annum in excess of the minimum lending rate to prime commercial borrowers from time to time charged by the Royal Bank of Canada or such other chartered bank as KRPC may designate but such interest costs shall be capped at 40% of the actual Costs of the Works and shall not exceed such amount.

11. **Interest on Arrears**

All amounts to be paid by NNC pursuant to this Agreement, are required to be paid when due. In the event that NNC fails to make a payment when due, all such unpaid amounts will bear interest after default at a rate equal to six percent (6%) per annum in excess of the minimum lending rate to prime commercial borrowers from time to time charged by the Royal Bank of Canada or such other chartered bank as KRPC may designate.

12. **Right to Recovery of Amounts Due**

In addition to paragraphs 10 and 11, and notwithstanding those paragraphs, if NNC fails to pay any amount(s) when due (which includes any interest payments due), such failure shall entitle KRPC to a lien against the NNC Lands which lien may be enforced by legal action against NNC and the NNC Lands.

13. **Miscellaneous**

13.1 Each of the parties hereto will, at all times, and from time to time hereafter and upon every reasonable request to do so make, do, execute, deliver or cause to be made, done, delivered, all such further acts, deeds, assurances and things that may be required for more effectual implementing and carrying out of the true intent and meaning of this agreement.

13.2 The parties hereto agree that this agreement or notice thereof will be registered against the title to the lands referred to herein. The parties further agree as quickly as possible following execution of this agreement to obtain the consent to this agreement where necessary from the holders of any charge securing payment of indebtedness registered on title to the Lands referred to herein.

13.3 If any provision of this agreement shall be found or deemed to be illegal or invalid, the remainder of the agreement shall not be affected thereby.

13.4 This agreement shall enure to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF the parties have hereto set their corporate seals, duly attested to by the hands of their proper signing officers authorized on that behalf.

DATED the 27 day of April 2000.

SIGNED, SEALED AND DELIVERED in the presence of

KANATA RESEARCH PARK CORPORATION

Per: _____
Name: Thomas A. Heins
Title: President

NEWBRIDGE NETWORKS CORPORATION

Per: _____
Name: Don Mills
Title: VP Admin.

Per: _____
Name:
Title:

SCHEDULE "A"

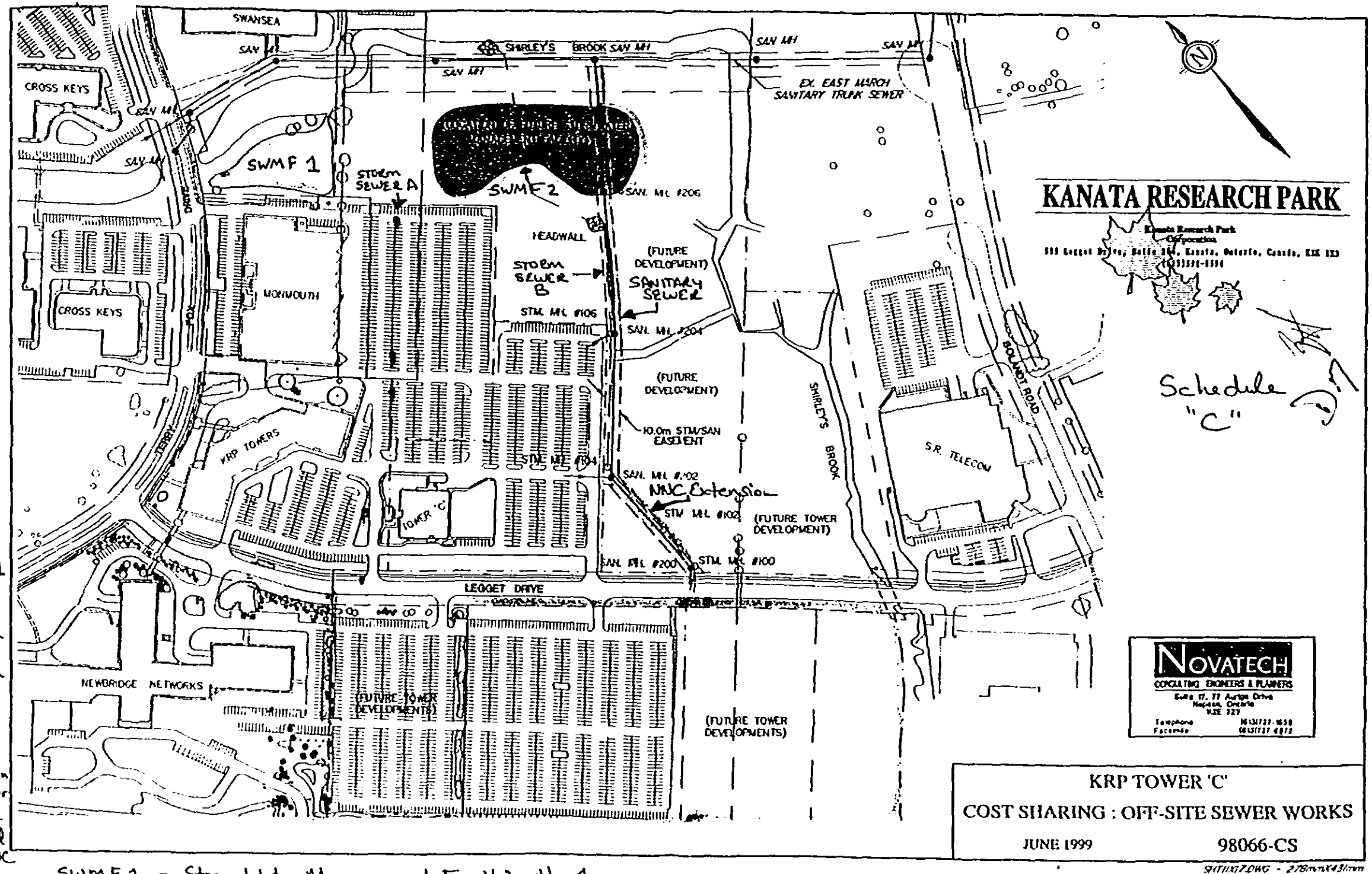
KRPC LANDS

Firstly:	PIN 04517-0788: Part Block 29, Plan 4M-280, Part 1 on Plan 4R13132 in the City of Kanata
Secondly:	PIN 04517-0617: Part of Lot 8, Concession 4, Parts 3, 4, 5 and 6 on 4R-7809, save and except Parts 2, 3 and 4 on Plan 4R-10610 in the City of Kanata
Thirdly:	PIN 04517-0746: Part of Lot 8, Concession 4, Part 1 on Plan 4R12934 in the City of Kanata
Fourthly:	PIN 04517-0747: Part of Lot 8, Concession 4, Parts 2 and 3 on Plan 4R10610, save and except Part 1 on Plan 4R12934 in the City of Kanata
Fifthly:	PIN 04517-0745: Consolidation of various properties Part of Block 2 on Plan 4M-642, Parts 2 to 7 on Plan 4R12934 in the City of Kanata
Sixthly:	PIN 04517-0740: Part Block 2 on Plan 4M-642, Parts 1 and 2 on Plan 4R9971 in the City of Kanata

SCHEDULE B

NNC LANDS

Firstly:	PIN 04517-0813: Block 1, Plan 4M-642, save and except Parts 1, 2 and 16 on Plan 4R-12735 in the City of Kanata
Secondly:	PIN 04517-0699: Southeast half of Lot 9, Concession 4, designated as Part 4 on 4R-5753, save and except Parts 1, 2 and 3 on Plan 4R-11611 in the City of Kanata
Thirdly:	PIN 04517-0467: Parcel 8-3, Section March-4, Part Lot 8, Concession 4, Part 1, 4R10610 in the City of Kanata
Fourthly:	PIN 04517-0809: Part of Lot 8, Concession 4, being Part 1 on Plan 4R7809, except Parts 1 and 8 on 4R10610 and except Part 1 on Plan 4R12588
Fifthly:	PIN 04517-0543: Parcel 16-4, Section 4M-280, being Part Block 16, PL 4M-280, Part 1 and 2, 4R6573 in the City of Kanata
Sixthly:	PIN 04517-0811: Part of Block 17, Plan 4M-280, being Part 3 on Plan 4R-6573, save and except Part 1 on Plan 4R-13304
Seventhly:	PIN 04517-0474: Parcel 6-1, Section 4M-642, being Block 6, PL 4M-642 in the City of Kanata



INC Lands

- storm water drains to SWMF 1

storm water drains to Storm Sewer A and is intended to drain into SWMF 2

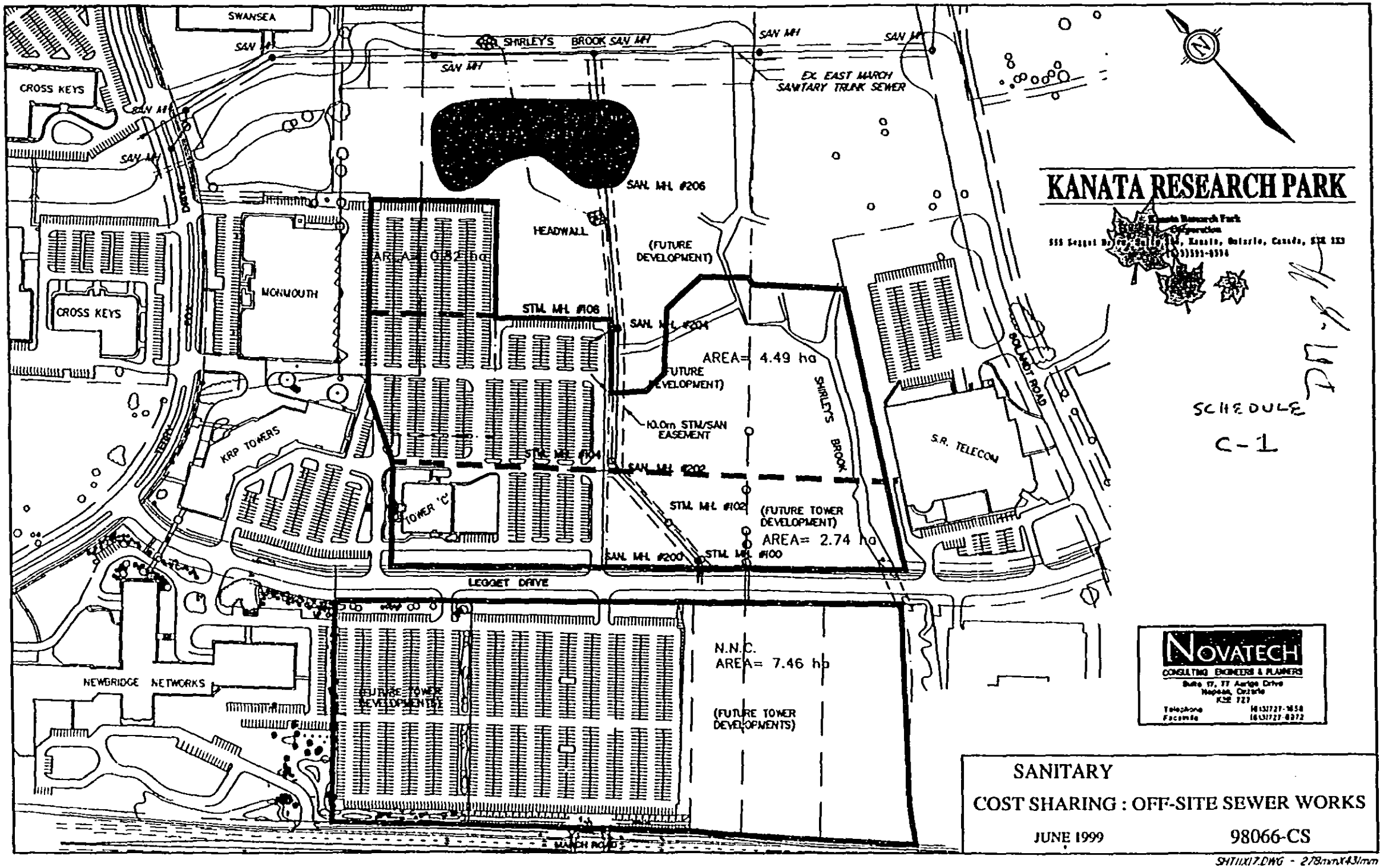
storm water intended to pass through NNC Extension then into Storm Sewer B and into SWMF 2

sanitary intended to pass through NNC Extension then into Sanitary Sewer

SWMF 1 - Storm Water Management Facility No. 1
SWMF 2 - Storm Water Management Facility No. 2

SHTIIX7.DWG - 278mmx431mm

12


SWANSEA
SAN MH
SHIRLEY'S BROOK SAN MH
SAN MH
SAN MH
SAN MH
EX. EAST MARCH SANITARY TRUNK SEWER
CROSS KEYS
SAN MH
SAN MH
SAN MH #206
HEADWALL
(FUTURE DEVELOPMENT)
AREA= 0.82 ha
MONMOUTH
CROSS KEYS
STM MH #108
SAN MH #204
AREA= 4.49 ha
FUTURE DEVELOPMENT)
10.0m STM/SAN EASEMENT
SHIRLEY'S BROOK
S.R. TELECOM
KRP TOWERS
STM MH #104
SAN MH #202
STM MH #102
(FUTURE TOWER DEVELOPMENT)
AREA= 2.74 ha
TOWER 'C'
SAN MH #200
STM MH #100
LEGGET DRIVE
N.N.C.
AREA= 7.46 ha
NEWBRIDGE NETWORKS
(FUTURE TOWER DEVELOPMENTS)
(FUTURE TOWER DEVELOPMENTS)
MARCH ROAD
KANATA RESEARCH PARK
SCHEDULE
C-1
NOVATECH
CONSULTING ENGINEERS & PLANNERS
SANITARY
COST SHARING : OFF-SITE SEWER WORKS
JUNE 1999
98066-CS
SHT11X17.DWG - 278mmX431mm

SCHEDULE "E"

Sanitary Sewer Costs

- Actual Construction costs applied from MH 202 to outlet. Costs prorated from Legget to MH 202.

Construction Costs $ 75,785.00

Cost per metre $ 251.03

ITEM DESCRIBED	NEWBRIDGE	KRPC
i) Sanitary MH #200 - #202 Total Construction (prorated)	$ 21,538.37	$ 0
ii) Sanitary MH #202 - #204 Total Construction	$ 11,706.64	$ 11,337.92
iii) Sanitary MH #204 - #206 Total Construction	$ 13,875.17	$ 12,859.26
iv) Sanitary MH #206 – Exist. Total Construction	$ 13,041.43	$ 12,086.57
Total Construction	$ 60,161.61	$ 37,102.37

Storm Sewer B Costs

STORM MH #100 - #104		
Newbridge Networks Corporation	77.6%	$ 48,165.49
Kanata Research Park	22.4%	$ 13,903.44
STORM MH #104 - #106		
Newbridge Networks Corporation	62.4%	$ 37,951.94
Kanata Research Park	37.6%	$ 22,868.48
STORM MH #1064 – OUTLET		
Newbridge Networks Corporation	47.8%	$ 23,189.52
Kanata Research Park	32.2%	$ 25,324.12
TOTALS:		$ 171,402.99

Note:

- Storm sewer from MH 100 to 104 are not installed, costs have been prorated.
- Costs per metre of storm is $ 594.53.

Storm Water Management Facility No. 2 Costs

- Total costs of construction estimated at $460,000

	Area (hs)	Percentage	Costs
Newbridge Networks Corporation	7.46	41.5%	$ 190,900
Kanata Research Park Corporation	10.53	58.5%	$ 269,100
TOTAL	17.99	100%	$ 460,000

Properties

PIN	04517 - 0902 LT	*Interest/Estate*	Easement	☑ Add Easement
Description	SERVIENT LANDS: PART BLOCK 10, PLAN 4M-1096, DESIGNATED AS PART 7 ON PLAN 4R-28555; CITY OF OTTAWA			
Address	515 LEGGET OTTAWA			
PIN	04517 - 1140 LT	*Interest/Estate*	Easement	☑ Add Easement
Description	SERVIENT LANDS: PART OF BLOCK 11, PLAN 4M-1096. DESIGNATED AS PARTS 4, 5 & 6 ON PLAN 4R-28555; CITY OF OTTAWA			
Address	320 TERRY FOX DRIVE OTTAWA			
PIN	04517 - 1135 LT	*Interest/Estate*	Easement	☑ Add Easement
Description	SERVIENT LANDS: PART OF LOT 8, CONCESSION 4 (MARCH), AND PART OF BLOCKS 10 AND 11, PLAN 4M-1096, DESIGNATED AS PARTS 1, 2 & 3 ON PLAN 4R-28555; CITY OF OTTAWA			
Address	525 LEGGET DRIVE OTTAWA			

Consideration

Consideration $ 2.00

Transferor(s)

The transferor(s) hereby transfers the easement to the transferee(s).

Name WESLEY CLOVER INTERNATIONAL CORPORATION

Address for Service 555 Legget Drive, Suite 206, Ottawa, ON K2K 2X3

I, PAUL CHIARELLI, PRESIDENT, have the authority to bind the corporation.

This document is not authorized under Power of Attorney by this party.

Name BROOKSTREET HOTEL CORPORATION

Address for Service 555 Legget Drive, Suite 206, Ottawa, ON K2K 2X3

I, PAUL CHIARELLI, PRESIDENT, have the authority to bind the corporation.

This document is not authorized under Power of Attorney by this party.

Name MARSHES GOLF CORPORATION

Address for Service 555 Legget Drive, Suite 206, Ottawa, ON K2K 2X3

I, PAUL CHIARELLI, PRESIDENT, have the authority to bind the corporation.

This document is not authorized under Power of Attorney by this party.

Transferee(s)	*Capacity*	*Share*

Name CITY OF OTTAWA

Address for Service C/O Mgr Real Estate Services
REPDO Mail Code 01-86
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

file: L0106-MARC (AB)

Statements

Schedule: See Schedules

Signed By

Karen Louise Montague	555 Legget Drive, Suite 206 Ottawa K2K 2X3	acting for Transferor(s)	Signed	2017 07 19

Tel 6135910594
Fax 6135910018

I have the authority to sign and register the document on behalf of the Transferor(s).

Steven Alexander Bannister	110 Laurier Av. W., 3rd floor Ottawa K1P 1J1	acting for Transferee(s)	Signed	2017 07 19

Tel 613-580-2400
Fax 613-560-1383

I have the authority to sign and register the document on behalf of the Transferee(s).

Submitted By

CITY OF OTTAWA	110 Laurier Av. W., 3rd floor Ottawa K1P 1J1	2017 07 19

Tel 613-580-2400
Fax 613-560-1383

Fees/Taxes/Payment

Statutory Registration Fee	$63.35
Provincial Land Transfer Tax	$0.00
Total Paid	$63.35

STORM AND SANITARY SEWER EASEMENT

SCHEDULE

EASEMENT IN GROSS

The Transferor grants, conveys and transfers to the Transferee, its successors and assigns, in perpetuity, but subject to all the terms and conditions hereinafter contained, the rights and easement to lay, construct, operate, maintain, inspect, alter, repair, replace, reconstruct and remove a Storm and Sanitary Sewer and other works appurtenant thereto (hereinafter called the "Utility"), in, over, along, across, upon and under the lands hereinbefore described, being Part of Blocks 10 and 11 on Plan 4M-1096, more particularly described as Parts 1, 2, 3, 4, 5, 6 and 7 on Plan 4R- 28555, (hereinafter called the "lands") in the City of Ottawa, Province of Ontario..

Together with the right to the Transferee, its servants, agents, contractors and sub-contractors to enter on and to pass and repass at any and all times from the date of registration of this easement document, in, over, along and upon the said lands of the Transferor with or without vehicles, supplies, machinery and equipment for all purposes necessary or convenient to the exercise and enjoyment of the rights and easement hereby granted.

The aforementioned rights and easement are herein granted on the following terms and conditions which are hereby mutually covenanted and agreed to by and between the Transferor and the Transferee.

1. The Transferor shall be responsible for any damage to the property of the Transferee on the lands, caused directly or indirectly by the acts or omissions of the Transferor or of persons acting under the authority of the Transferor.

2. The Transferee, its officers, servants, employees, agents, contractors or subcontractors, invitees and licensees shall be permitted to enter upon the lands at any time and shall, whenever possible, provide prior verbal notice to the Transferor, provided that in the case of an emergency, Transferee will endeavour to provide prior notice but shall not be obligated to do so, if it is unreasonable given the circumstances surrounding the emergency.

3. Notwithstanding any rule of law or equity, or anything herein to the contrary, the Utility and all other equipment and appurtenances installed above, brought onto, laid on or erected upon, or buried in or under the lands by the Transferor or Transferee shall become and at all times remain the property of the Transferee notwithstanding that the same may be annexed or affixed to the freehold and shall at any time and from time to time be removable in whole or in part by the Transferee or its successors and assigns.

4. The Transferee agrees that during construction, repair, maintenance or work on the Utility, and at all other times, it shall ensure, using best efforts having regard at all times to the interests of the Transferor, to the satisfaction of the Transferor preserve and protect the Transferor's property, including but not limited to; the lands, buildings, the Brookstreet Hotel, the Marshes Golf Course, office Tower D (municipally known as 515 Legget Drive), parking stalls and structures, service areas, pools, hot tubs, patios, storm water management ponds, pathways, fences, ditches, water supply, irrigation systems, drainage tiles, landscaping, including trees and hedges, golf greens, fairways and golf playing areas, fixtures ("Transferor's Property") and shall be liable for any damage to the lands, Transferor's Property and to the surrounding lands caused directly or indirectly by the by the acts or omissions of the Transferee or of persons acting under authority of the Transferee, or created by or resulting from the exercise of the rights and easement granted herein. The Transferee shall ensure that the lands shall not be obstructed so as to preclude access over the lands and that the use and enjoyment of the Transferor's Property by the Transferor, its affiliate companies shall not be substantially interfered with, as a result of any construction, repair and maintenance or other work by the Transferee to the Utility. It is acknowledged and understood that this provision applies only to buildings, structures and facilities that exist as of the date of transfer of this easement, save and except any of the Transferor's Property, including buildings, structures and facilities that may currently encroach on or impact the

easement herein described, notwithstanding anything herein to the contrary.

5. The Transferor agrees that any construction, repair, maintenance or work on the Utility, work hours shall not be restricted, save and except the Transferee agrees that any blasting, hoe ramming, excavation and rock removal on the Transferor's lands shall only be conducted between the hours of 9:00 am and 5:00 pm, EST, save and except in cases of emergency. In the event that any blasting, hoe ramming, rock removal or excavation is required by the Transferee in order to construct, repair, maintain or work on the Utility, the Transferee shall obtain and deliver to the Transferor, a professional geotechnical engineer's report ("Report") confirming no impact on any of the Transferee's buildings or structures, which Report shall outline the method for monitoring all operations during, blasting, hoe ramming, rock removal and excavation, together with a certificate stating that the works were installed in accordance with the Report and no damage to the Transferee's buildings or structures has occurred.

6. The Transferee agrees that upon completion of any work on the lands or surrounding lands in relation to the Utility the Transferee shall at its expense restore the lands, including any surrounding lands which may have been impacted, to the condition in which they existed prior to the work of the Transferee, to the satisfaction of the Transferor, acting reasonably.

7. The Transferor shall not cover over or otherwise interfere with the Utility installed, and shall not excavate, drill, install, erect, build or permit to be excavated, drilled, installed, erected or built, on, in, over, through or under the lands any pit, well, building, structure, trees, hedges, parking stalls or other obstruction of any nature without the prior written consent of the Transferee, acting reasonably, but otherwise the Transferor shall have the right to fully use and enjoy the lands, and such use and enjoyment by the Transferor or any of its affiliate companies shall not constitute interference with, nor shall such use and enjoyment thereof be deemed to interfere with the rights granted to the Transferee herein, subject always to and so as not to substantially interfere with the rights and easement hereby granted to the Transferee.

8. The Transferee shall not fell, cut, trim, log, damage, destroy or remove any trees or parts thereof, on or from the surrounding lands without the prior written consent of the Transferor, which consent will not be unreasonably withheld.

9. The Transferee shall hold and save harmless and indemnify the Transferor, together with its affiliated and associated companies from and against all liabilities, manner of actions, causes of action, claims, demands, loss, damages, costs and suits, including the full costs of resisting or defending same, that may arise, be sustained or prosecuted against the Transferor by reason of the existence, maintenance or use of the Utility in, over, along, upon or under the lands or for or by reason of any act or acts, omissions or thing or things done, alleged or ought to have been done by the Transferee or by any of its officers, servants, workers, agents, contractors, sub-contractors or persons acting under authority of the Transferee, and including, but without restricting the generality of the foregoing, any claim for nuisance made against the Transferor as owner of the said lands for or by reason of the neglect or fault of the Transferee and persons for whom it is responsible in law of the exercise of the rights herein granted to the Transferee.

10. The Transferee shall be responsible for the repair and maintenance of the Utility during its term of use, once inspection and certification of the Utility has occurred and the Transferee has accepted the Utility.

11. The Transferee shall comply with all applicable federal, provincial and municipal laws, by-laws and regulations and the Transferee shall erect suitable protective fencing and/or barricades and flashers when excavating on either the lands or the surrounding lands.

12. The Transferee shall, prior to the termination of the easement agreement for any reason whatsoever, abandon and decommission the Utility and restore the lands and improvements to the reasonable satisfaction of the Transferor. The Transferee further agrees that in the event of termination it will release its easement interest in the lands and cause to be registered a release of easement document to that effect.

13. The Transferee shall locate by legal survey any and all other easements affected by and to which this grant of easement will be subject.

14. The rights and easements hereby granted are and shall be of the same force and effect to all intents and purposes as a covenant running with the lands and this grant, including all the covenants and conditions herein contained, shall extend to, be binding upon and enure to the benefit of the heirs, executors, administrators, successors in title and assigns of the parties hereto.

LAND TRANSFER TAX STATEMENTS

In the matter of the conveyance of:

04517 - 0902	SERVIENT LANDS: PART BLOCK 10, PLAN 4M-1096, DESIGNATED AS PART 7 ON PLAN 4R-28555; CITY OF OTTAWA
04517 - 1140	SERVIENT LANDS: PART OF BLOCK 11, PLAN 4M-1096. DESIGNATED AS PARTS 4, 5 & 6 ON PLAN 4R-28555; CITY OF OTTAWA
04517 - 1135	SERVIENT LANDS: PART OF LOT 8, CONCESSION 4 (MARCH), AND PART OF BLOCKS 10 AND 11, PLAN 4M-1096, DESIGNATED AS PARTS 1, 2 & 3 ON PLAN 4R-28555; CITY OF OTTAWA

BY: WESLEY CLOVER INTERNATIONAL CORPORATION
BROOKSTREET HOTEL CORPORATION
MARSHES GOLF CORPORATION

TO: CITY OF OTTAWA %(all PINs)

1. L. CHRISTINE ENTA

I am

- ☐ (a) A person in trust for whom the land conveyed in the above-described conveyance is being conveyed;
- ☐ (b) A trustee named in the above-described conveyance to whom the land is being conveyed;
- ☐ (c) A transferee named in the above-described conveyance;
- ☑ (d) The authorized agent or solicitor acting in this transaction for CITY OF OTTAWA described in paragraph(s) (c) above.
- ☐ (e) The President, Vice-President, Manager, Secretary, Director, or Treasurer authorized to act for ____ described in paragraph(s) (_) above.
- ☐ (f) A transferee described in paragraph ( ) and am making these statements on my own behalf and on behalf of _____ who is my spouse described in paragraph (_) and as such, I have personal knowledge of the facts herein deposed to.

3. **The total consideration for this transaction is allocated as follows:**

(a) Monies paid or to be paid in cash	2.00
(b) Mortgages (i) assumed (show principal and interest to be credited against purchase price)	0.00
(ii) Given Back to Vendor	0.00
(c) Property transferred in exchange (detail below)	0.00
(d) Fair market value of the land(s)	0.00
(e) Liens, legacies, annuities and maintenance charges to which transfer is subject	0.00
(f) Other valuable consideration subject to land transfer tax (detail below)	0.00
(g) Value of land, building, fixtures and goodwill subject to land transfer tax (total of (a) to (f))	2.00
(h) VALUE OF ALL CHATTELS - items of tangible personal property	0.00
(i) Other considerations for transaction not included in (g) or (h) above	0.00
(j) Total consideration	2.00

4.

Explanation for nominal considerations:

o) Transfer of easement or right of way for no consideration.

5. The land is subject to encumbrance

6. Other remarks and explanations, if necessary.

1. The information prescribed for purposes of section 5.0.1 of the Land Transfer Tax Act is not required to be provided for this conveyance.

PROPERTY Information Record

A. Nature of Instrument: Transfer Easement

LRO 4 Registration No. OC1909585 Date: 2017/07/19

B. Property(s):

PIN 04517 - 0902	Address	515 LEGGET OTTAWA	Assessment Roll No -
PIN 04517 - 1140	Address	320 TERRY FOX DRIVE OTTAWA	Assessment Roll No -
PIN 04517 - 1135	Address	525 LEGGET DRIVE OTTAWA	Assessment Roll No -

C. Address for Service:

C/O Mgr Real Estate Services
REPDO Mail Code 01-86
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

file: L0106-MARC (AB)

D. (i) Last Conveyance(s):

PIN 04517 - 0902	Registration No.	OC155463
PIN 04517 - 1140	Registration No.	OC980126
PIN 04517 - 1135	Registration No.	OC1595063

(ii) Legal Description for Property Conveyed : Same as in last conveyance? Yes ☐ No ☑ Not known ☐

LAND TRANSFER TAX STATEMENTS

E. Tax Statements Prepared By: Steven Alexander Bannister
110 Laurier Av. W., 3rd floor
Ottawa K1P 1J1

From: Greg Winters
To: Blanchard, Emma; Clodd, Aaron; James Ireland
Cc: Hugues Bisson; Tim Kennedy
Subject: RE: Nokia Ottawa - SWM Pond Agreement [BLG-DOCUMENTS.FID8215038]
Date: Tuesday, March 29, 2022 10:24:59 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image007.png
image008.png
image009.png
image010.png
OC1909585-Storm Sanitary Sewer Easement.pdf

EXTERNAL EMAIL

Emma

We have this attached easement doc but I understand this only provides storm easement for the southern parking lot and not northern portion of the parking closest to the Nokia buildings.

We may be missing an easement for the northern parking lot. I'm working with Pat Ferris at KRP and Tim Thomas at Perley Robertson to resolve easements for the new Brookstreet Hotel property.

Pat had a copy of the attached which was the resolution of discussions with the City, KRP and Sanmina in 2017 when it was realized that there was no legal outlet to the pond or to sanitary across the KRP properties.

During COVID 19 - call me on cell phone # below as primary.
I receive voicemails on my work # but I may not respond right away.

-
Greg Winters, MCIP, RPP, Director | Planning & Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 241 | Cell: 613.261.4990

From: Greg Winters
Sent: Monday, March 28, 2022 4:33 PM
To: 'Blanchard, Emma' <EBlanchard@blg.com>; Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>; Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: RE: Nokia Ottawa - SWM Pond Agreement [BLG-DOCUMENTS.FID8215038]

Emma

See location of pond.

I've worked/working on Brookstreet so I have all the detailed engineering and legal at my fingertips.

We have an easement document on title that makes the connection to the privately owned swm pond around the south side of the Brookstreet Hotel. Hugues will confirm but this seems to cover the large southern Nokia Parking lot which appears to be sheet drained to the edges and a portion of Legget Drive (public water).
There was an agreement put in place in 2017 to resolve an issue with Sanmina connecting to the system.

There is another parking lot a bit further north, and closer to the existing Nokia building with catchbasins. We know where the pipes go, but cannot find the easement doc.

During COVID 19 - call me on cell phone # below as primary.
I receive voicemails on my work # but I may not respond right away.

-
Greg Winters, MCIP, RPP, Director | Planning & Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 241 | Cell: 613.261.4990

From: Blanchard, Emma <EBlanchard@blg.com>
Sent: Monday, March 28, 2022 4:20 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>; Greg Winters <G.Winters@novatech-eng.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>; Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: RE: Nokia Ottawa - SWM Pond Agreement [BLG-DOCUMENTS.FID8215038]

We can check if the agreement is registered on title if you can confirm the general location of the pond for us.

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: March 28, 2022 4:18 PM
To: Greg Winters <G.Winters@novatech-eng.com>; Blanchard, Emma <EBlanchard@blg.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>; Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: Nokia Ottawa - SWM Pond Agreement

[External / Externe]

Hi Greg,

I'm following up to see if you were able to obtain a copy of the private agreement pertaining to the SWM pond behind the Bookstreet hotel that the Nokia site currently drains to? We discussed this last month but do not recall receiving a copy of the agreement. I have copied Emma here as she may be able to help obtain it if you can't.

Please also see email below from Tim at CIMA who is working on the SWM report and civil plans. The City confirmed that we can continue to use the ponds if we can show they can handle the flows. Obtaining a copy of the agreement would be instrumental in our justification.

Thank you for your help.

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Colliers

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Monday, March 28, 2022 1:52 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

After speaking with the City Engineer (Julie Candow) they have confirmed that the ponds are not owned by the City, they are still privately maintained. Julie mentioned that in the pre-consult Greg Winters of Novatech said that they were digging up the legal agreements with respect to those ponds as Novatech was the consultant when that land was previously developed. I expect you are already in discussions with Greg to obtain this information? Can you please help to fast track this?

Due to the age of the reports and the pond that we do have on hand from the City it is difficult to confirm the allowable flows to the pond from our site. Hopefully the information provided by Greg will provide clarity.

Julie did provide another report for me to review and confirmed that if it can be demonstrated through the existing reports or private agreements of the existing pond that the proposed release rates for the Nokia site are in accordance with the design criteria of the pond, this would be acceptable to the City to accept XX l/s release rate. Again hopefully this final report or information provided by Greg will provide clarity. Otherwise the City will require the 100 year post development flows be controlled to the 2 year pre-development flows, and all flow depth must be controlled on-site.

Once we have the information in hand from Greg and reviewed it I will set a quick meeting with Julie at the City to confirm our SWM approach. Did you want to attend this meeting as well or will a summary of discussions be sufficient?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

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From: Tim Kennedy
Sent: Thursday, March 24, 2022 2:49 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Everything will be through Julie Candow for us. She is the City engineer on file for the project.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

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Engineering for people

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Thursday, March 24, 2022 2:33 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Please let me know the name of the City staff member you requested the pond ownership information from. Thanks.

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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Thursday, March 24, 2022 2:27 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

Sounds good we will copy you and appreciate you helping to expedite the process.

In regards to SWM I am awaiting confirmation on ownership of the ponds from the City. Hopefully they were transferred to the City.

Regarding capacity within the ponds for the north and south sites I can confirm that the north site area flows to the north cell through the municipal right-of-way and the south site area to the south cell through private lands. With our approach of providing quantity control on site and only releasing quality control flows to the pond I am hoping there will be capacity to convey all of our flow to the north and avoid that private sewer. In this case we may be able to get you out of that agreement (if the ponds are in fact owned by the City). I need to get further into the details and there will be some back and forth with the City engineer over the next few days to confirm the SWM approach.

I am hopeful that I can get you an answer on this as well as have the sanitary and water demands into the City by next Wednesday's coordination meeting.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

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From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Thursday, March 24, 2022 10:24 AM

To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hi Tim,

When you send your request to the City for the watermain boundary conditions and confirm storm/sanitary capacities please copy me as I will assist in expediting this information.

If the site needs to continue to use the stormwater pond on the Brook Street hotel property for quality control that is fine. Do we know if the pond is owned by the City or is private and has capacity to take our additional flows?

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Main: +1 416 777 2200

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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Wednesday, March 23, 2022 9:17 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Hi Aaron,

Thanks for providing this information so quickly. Hugues did pass along Option 11 but I had not seen the massing. With this and the additional statistics provided by Gensler looks like we have everything we need.

It's great that the City is on board to fast track this project. We have everything we need from them in terms of information (as-builts, reports, etc.). We will need to request watermain boundary conditions and confirm storm/sanitary capacities based on our calculated demands which we can now determine with the recent information you provided. They typically request 10 business days to provide this information once we have provided our demands, however it seems based on your response below that they will move quickly on these requests. This being the case your proposed schedule should not be an issue.

Regarding the sprinklers being "fully supervised" two types of signals are required as follows (which is not common):

- "A distinctive supervisory signal to indicate conditions that could impair the operation of the sprinkler system (a fault alarm), which is to sound and be displayed, either at a location within the building that is constantly attended by qualified personnel (such as a security room), or at an approved remotely located receiving facility (such as a monitoring facility of the sprinkler system manufacturer); and

A water flow alarm to indicate that the sprinkler system has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department."

Regarding stormwater management we will see what we can do to get you out of the existing agreement but I will need to look a little deeper into this one. Stormwater quantity control on site would likely not be an issue but quality control may be. We are confirming requirements for quality control with the conservation authority and will let you know what we find.

Thanks again and we will work on getting the demands into the City as quickly as possible.
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

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Engineering for people

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: Wednesday, March 23, 2022 5:47 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hi Tim,

I just want to make sure you are using the attached Option 11 plans that were circulated last week.

I have asked Gensler to indicate on the plan the number of stories for each building and the foot print area for podiums and towers. Will send in a separate email.

See additional comments and answers to your questions below in red text.

Please send me a detailed list of what is still outstanding from the City and I will get it for you ASAP. The City

has prioritized this project.

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Colliers

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Monday, March 21, 2022 2:50 PM
To: Clodd, Aaron <Aaron.Clodd@colliers.com>
Cc: Hugues Bisson <Hugues.Bisson@cima.ca>
Subject: RE: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

Good afternoon Aaron,

It has been awhile. Hope all is well and looking forward to working with you again.

In reviewing the latest site plan we will require some additional information as follows in order to determine sewer and water capacity requirements:

- The layout of buildings in the Nokia Site is not clear on the latest site plan. Is there to be three towers on a Podium with underground parking? In general we will need to know the building uses and number of stories for all buildings on site (for both Nokia and the multi-use area to the north) in order to complete our fire flow assessment. The gross floor area for each building and each floor would also be required. Can we expect to receive something similar to the attached for the latest site plan? The Site Plan on page 12 along with accompanying stacking and program summary at the end are great and would be very helpful in determining required demands. I HAVE ASKED GENSLER TO PROVIDE THIS INFORMATION. I WASN'T AWARE THAT YOU NEEDED AREAS OF EACH FLOOR. TO GIVE YOU A BETTER UNDERSTANDING OF THE NOKIA CAMPUS LAYOUT, FIND ATTACHED A RECENT MASSING PLAN FOR THE SITE. THIS PLAN HAS NO OFFICIAL APPROVAL STATUS SO PLEASE CONTINUE TO USE THE STATISTICS SHONW ON OPTION 11 PLAN (ATTACHED).
- In terms of required fire flow calculations we will proceed with the following assumptions. Can you please confirm that these are fair assumptions at this point?
    1. All Buildings will be of Fire Resistive Construction as follows: any structure that is considered fully protected, having at least 3-hour rated structural members and floors. For example, reinforced concrete or protected steel. CONFIRMED.
    2. Vertical openings are protected with a one-hour fire rating (i.e. stairwells). CONFIRMED
    3. Buildings will be sprinklered, but system is not supervised (i.e. continuously monitored). I DO NOT KNOW WHAT YOU MEAN BY SUPERVISED. IF THE FIRE ALARM IS TRIGGERED THE FIRE DEPARTMENT WILL BE NOTIFIED AND WILL ARRIVE AT THE SITE. THE FIRE ALARM CONTROL PANEL WILL INDICATE WHERE THE FIRE IS.
    4. Note that generally the architect will need to prepare a memo at the site plan control stage, stating that the above assumptions are accurate, while also confirming gross floor areas, commercial areas, and equivalent populations used in our calculations are accurate. We will provide our calculations for confirmation as we progress the design. CORRECT. THERE IS A GOOD CHANCE THAT THE GROSS FLOOR AREA THAT YOU WILL USE IN YOUR CALCULATIONS WILL NEED

TO BE UPDATED AT SPA STAGE AS DESIGN WILL CHANGE BETWEEN NOW AND THEN. HOWEVER, IT IS UNLIKELY THAT THE OVERALL DENSITY WILL INCREASE.

- Are there any limitations to storage of stormwater on site? Will roof, surface/parking, and underground storage (tank/cistern/etc.) be permitted? YES THESE ARE ALL PERMITTED. AS YOU KNOW THE SITE RELIES ON AN AGREEMENT WITH THE BROOK STREET HOTEL PROPERTY FOR USE OF STORMWATER SWM POND. WE WOULD LIKE TO MANAGE OUR OWN SW ON SITE IS POSSIBLE AND GET OUT OF THIS EXISITING AGREEMENT IF POSSIBLE.
- Also in regards to schedule we had originally requested **6 weeks** from the time of receiving the above requested information to the preparation of the Servicing Brief for submission to the City. We can shoot for having a package ready for your review by April 18th, however with respect to obtaining required information from the City to complete our work we would expect a **minimum of 4 weeks** to account for the following.
    1. Complete sanitary and water demand calculations to obtain boundary conditions and capacity confirmations from City – 1 week minimum **once we have received the information requested above** (we would generally ask for 2).
    2. City provides boundary conditions and capacity confirmations – 2 weeks (City requests 10 business days to provide this information).
    3. Finalize reporting based on information provided by City - 1 week minimum (we would generally ask for 2).

PLEASE LET ME KNOW ASAP WHAT YOU STILL NEED FROM THE CITY AND I WILL GET IT FOR YOU.
Let me know if you want to discuss.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

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Engineering for people

From: Hugues Bisson <Hugues.Bisson@cima.ca>
Sent: Wednesday, March 16, 2022 4:03 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Subject: Fwd: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

HUGUES BISSON, P.Eng. MBA
Partner / Senior Director / Infrastructure
Associé / Directeur Principal / Infrastructures

T 613-860-2462 ext. 6660 **C** 613-294-0224
110-240 Catherine Street, Ottawa, Ontario, K2P 2G8 CANADA

Début du message transféré :

De: "Clodd, Aaron" <Aaron.Clodd@colliers.com>
Date: 15 mars 2022 à 11:08:27 HAE
À: Greg Winters <G.Winters@novatech-eng.com>, "O'Grady, Lauren" <Lauren.OGrady@stantec.com>, Hugues Bisson <Hugues.Bisson@cima.ca>, Jerrold Corush <corush@csw.ca>, Sheri Edwards <edwards@csw.ca>, James Ireland <j.ireland@novatech-eng.com>, Kim Dresdner <Kim_Dresdner@gensler.com>, Barry_Hand@gensler.com
Cc: "Murphy, Wade (Nokia - US)" <wade.murphy@nokia.com>, "Wolodarski, Margaret" <Margaret.Wolodarski@am.jll.com>, "Oakes, Chasity (EXT - US/Dallas)" <chasity.oakes.ext@nokia.com>, "Flood, Cooper" <Cooper.Flood@colliers.com>, "Bowden, David" <David.Bowden@colliers.com>, "Spillman, Lauri (Nokia - US/Dallas)" <lauri.spillman@nokia.com>
Objet: IMPORTANT: Nokia Ottawa - Revised Concept Plan For ZBA

EXTERNAL EMAIL

Hello,

As previously discussed, Nokia has been working on refining their campus concept which has increased the size of their parcel and reduced the size of the residential lands.

Find attached a pdf with stats and dwg file of revised and approved Master Concept Plan for you to base you final reports and plans on for the ZBA submission. Although we have lost some time, we would like to target **Monday April 15th** for everyone to have their draft deliverables completed by. Please advise if this is an issue for you. We will need the week of April 15th to review, coordinate and make any necessary changes and for Greg to finalize his Planning Rationale with information from your respective reports.

We will target a ZBA submission date of **Monday April 25th.**

I would like to coordinate a 30 mins touch point/update meeting on **Monday March 28th** and

Monday April 11th with you. **Please advise if 1-2pm or 3-4pm EST works better for you.**

Thank you

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Servicing Study Guidelines for Development Applications

4. Development Servicing Study Checklist

4.1 General Content

	Required Content	Reference Location
☐	Executive Summary (for larger reports only).	N/A
☑	Date and revision number of the report.	Cover Sheet
☑	Location map and plan showing municipal address, boundary, and layout of proposed development.	Report Figures
☑	Plan showing the site and location of all existing services.	Appendix B
☑	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	Section 1.1
☑	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.4
☑	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.	Section 1.2 & 1.4
☑	Statement of objectives and servicing criteria.	Section 1.0, 2.1, 3.1 & 4.2
☑	Identification of existing and proposed infrastructure available in the immediate area.	Section 1.3 & Appendix B
☐	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).	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.	N/A
☐	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.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	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.	N/A

4.2 Development Servicing Report: Water

	Required Content	Reference Location
☐	Confirm consistency with Master Servicing Study, if available	N/A
☑	Availability of public infrastructure to service proposed development	Section 1.3 & Appendix B
☑	Identification of system constraints	Section 2.1 & 2.2
☑	Identify boundary conditions	Section 2.2
☑	Confirmation of adequate domestic supply and pressure	Section 2.2 & 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.	Section 2.2 & 2.3
☐	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.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☑	Address reliability requirements such as appropriate location of shut-off valves	Section 2.2
☐	Check on the necessity of a pressure zone boundary modification.	N/A
☑	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	Table 2-4
☐	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.	N/A
☐	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.	N/A

☑	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Required Content		Reference Location
☑	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).	Section 3.1
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☑	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.	Section 3.3, Appendix A & Appendix D
☑	Description of existing sanitary sewer available for discharge of wastewater from proposed development	Section 1.3, 3.2 & Appendix B
☑	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)	Section 3.3
☑	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 3.2 & Appendix D
☑	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 3.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Required Content		Reference Location
☑	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 4.1
☑	Analysis of available capacity in existing public infrastructure.	Section 4.1
☑	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Appendix E
☑	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.	Section 4.2
☑	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.2
☑	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3 & 4.4
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☑	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☑	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 4 & Appendix E
☑	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 4.3 & Appendix E
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☑	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.	Section 4.1, 4.3 & Appendix E
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A

☐	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.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A
☑	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.3 and 4.4
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☐	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	N/A
☐	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.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

Required Content		Reference Location
☐	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.	N/A
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

Required Content		Reference Location
☑	Clearly stated conclusions and recommendations	Section 5.0
☐	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.	N/A
☑	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Cover Sheet

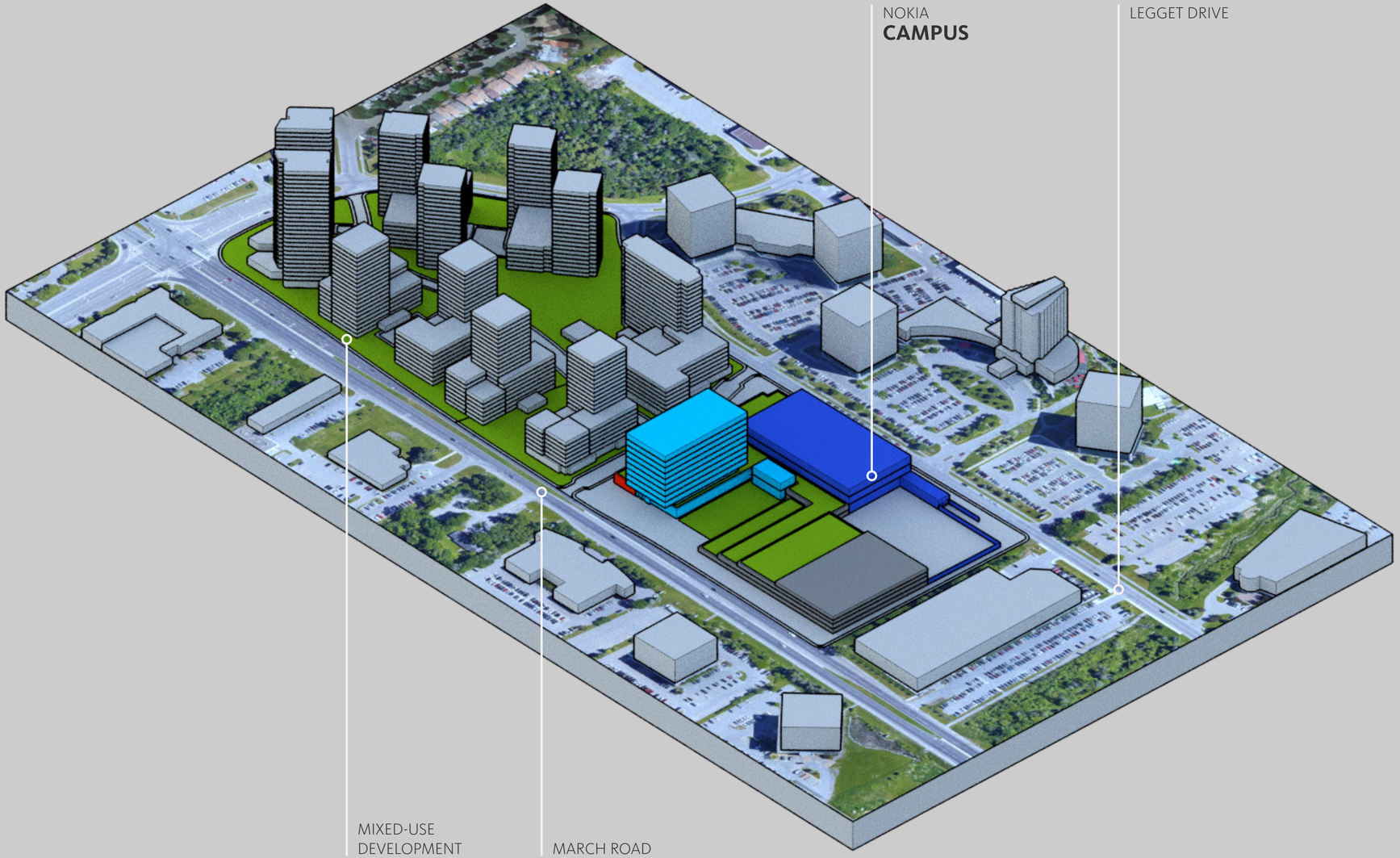
MASSING STUDIES OTTAWA

NOKIA

MARCH 18, 2022

Gensler

Contextual Massing



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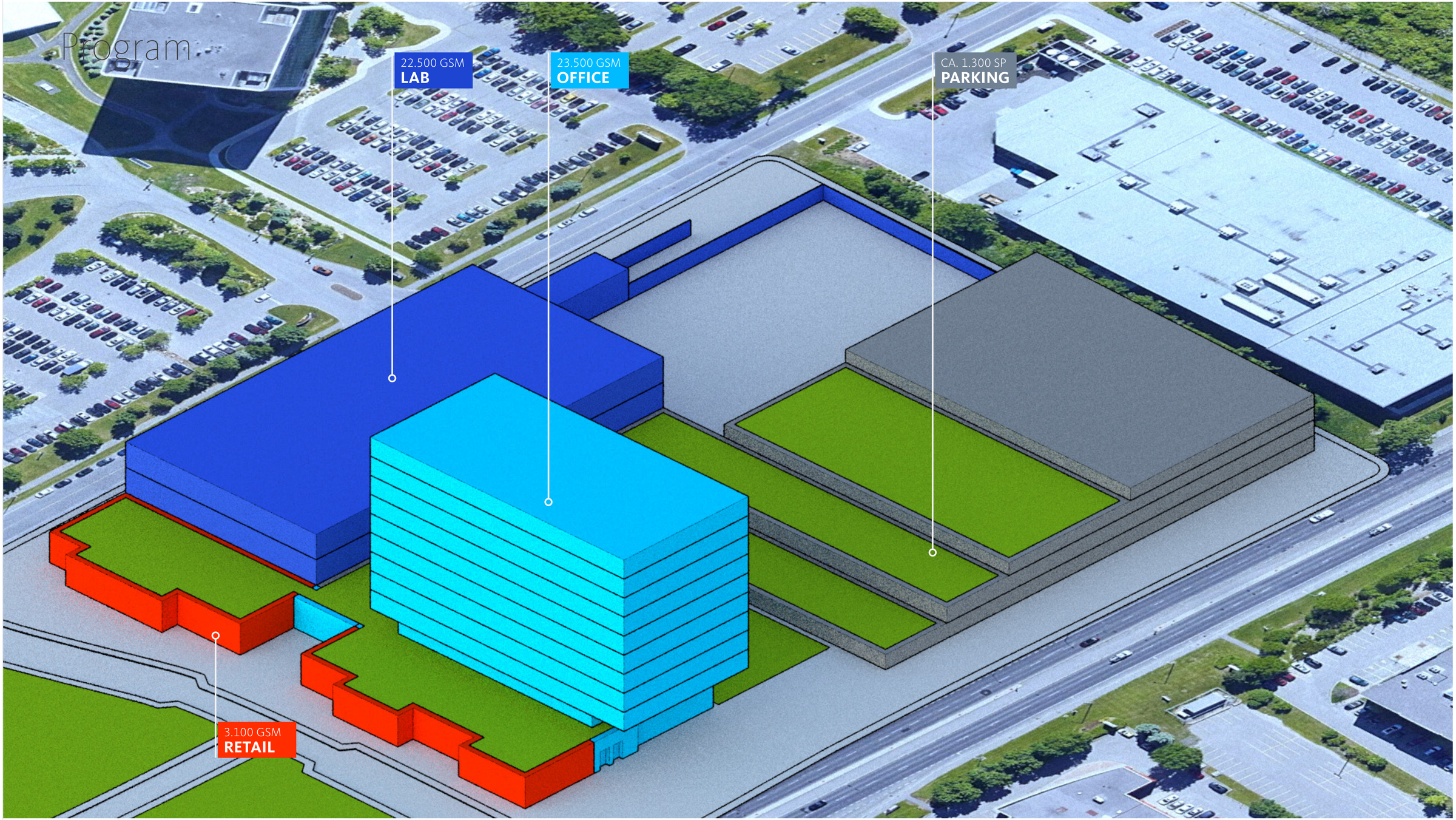
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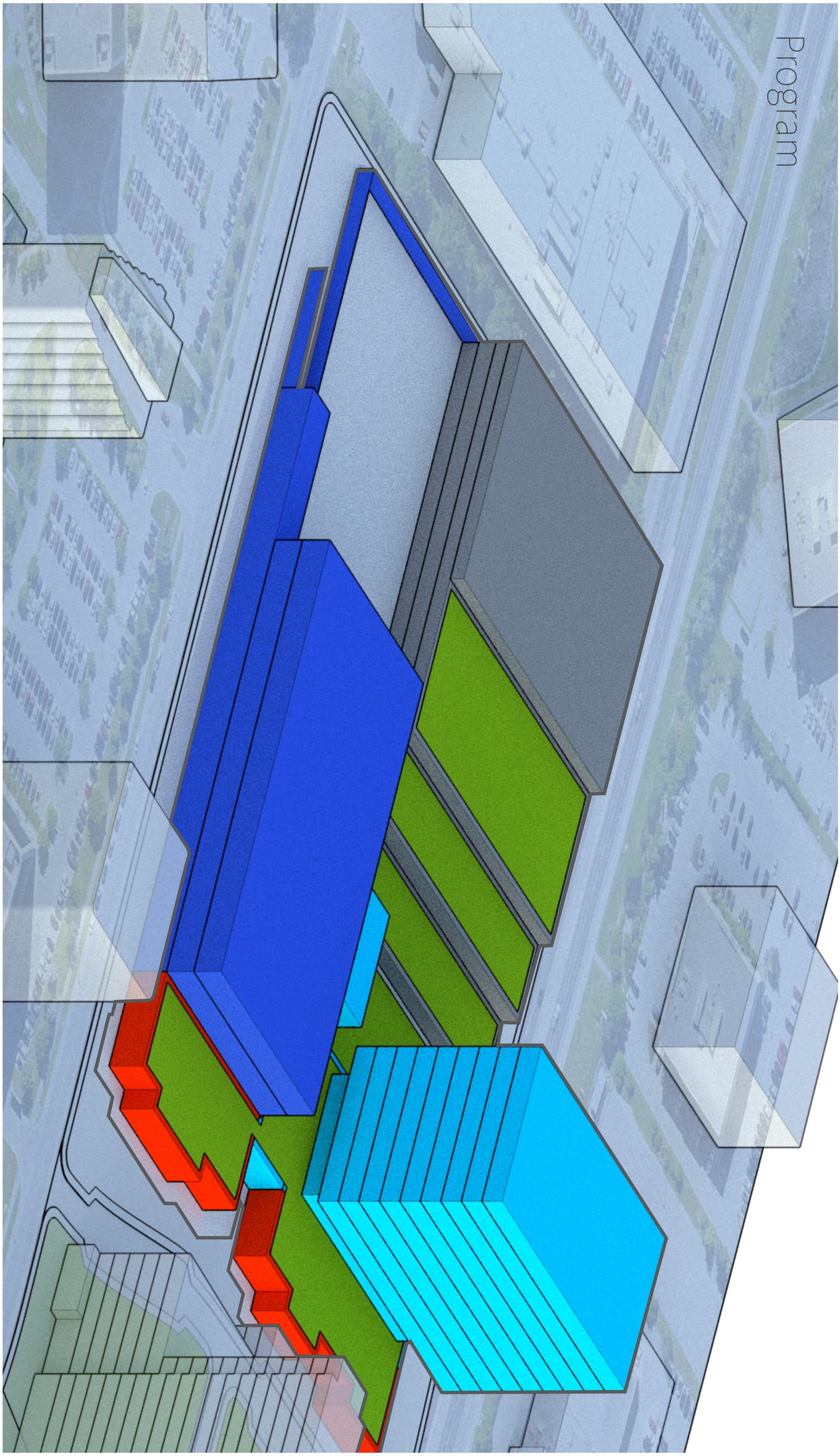
CA. 1.300 SP
PARKING
3.100 GSM
RETAIL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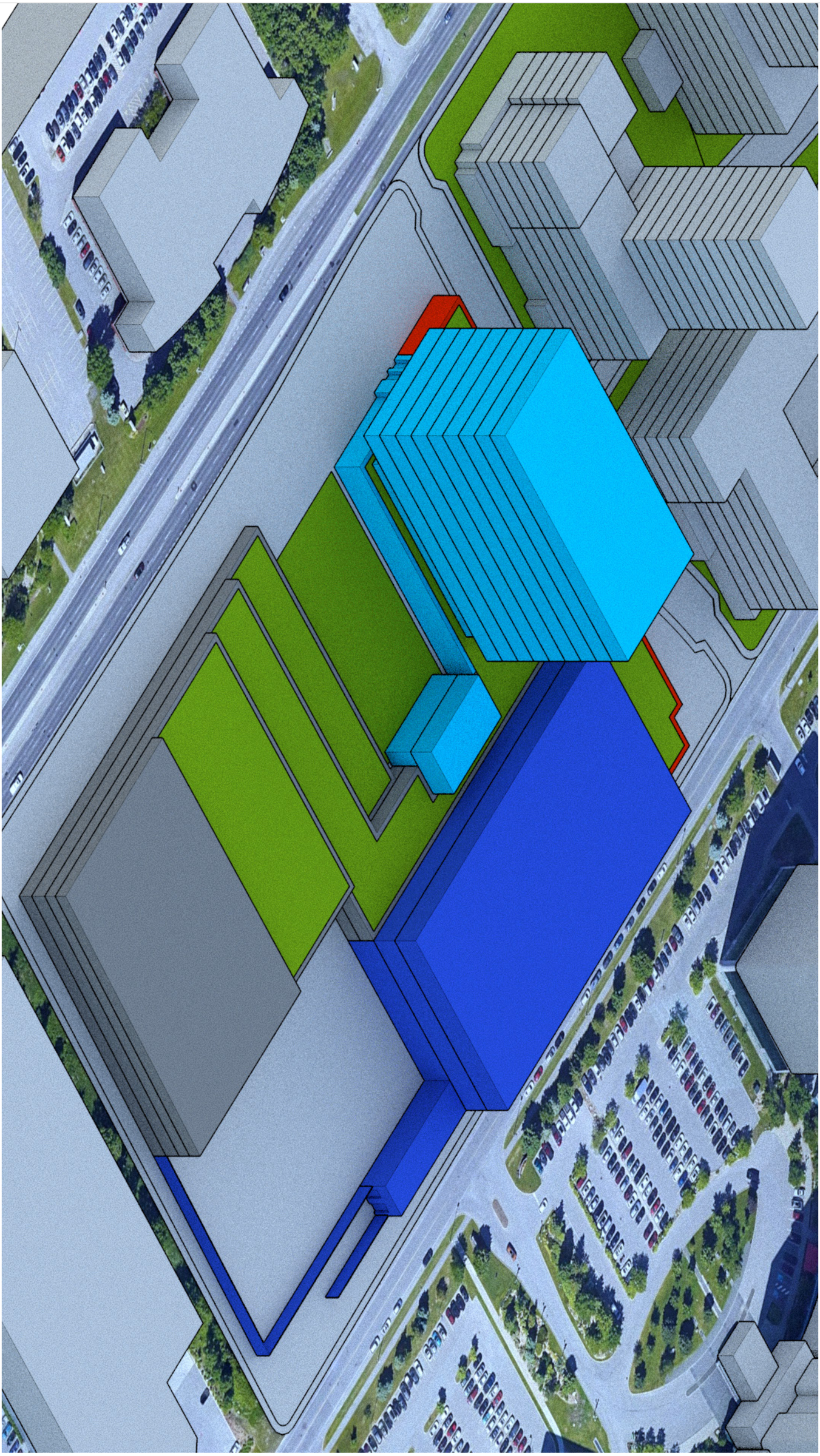
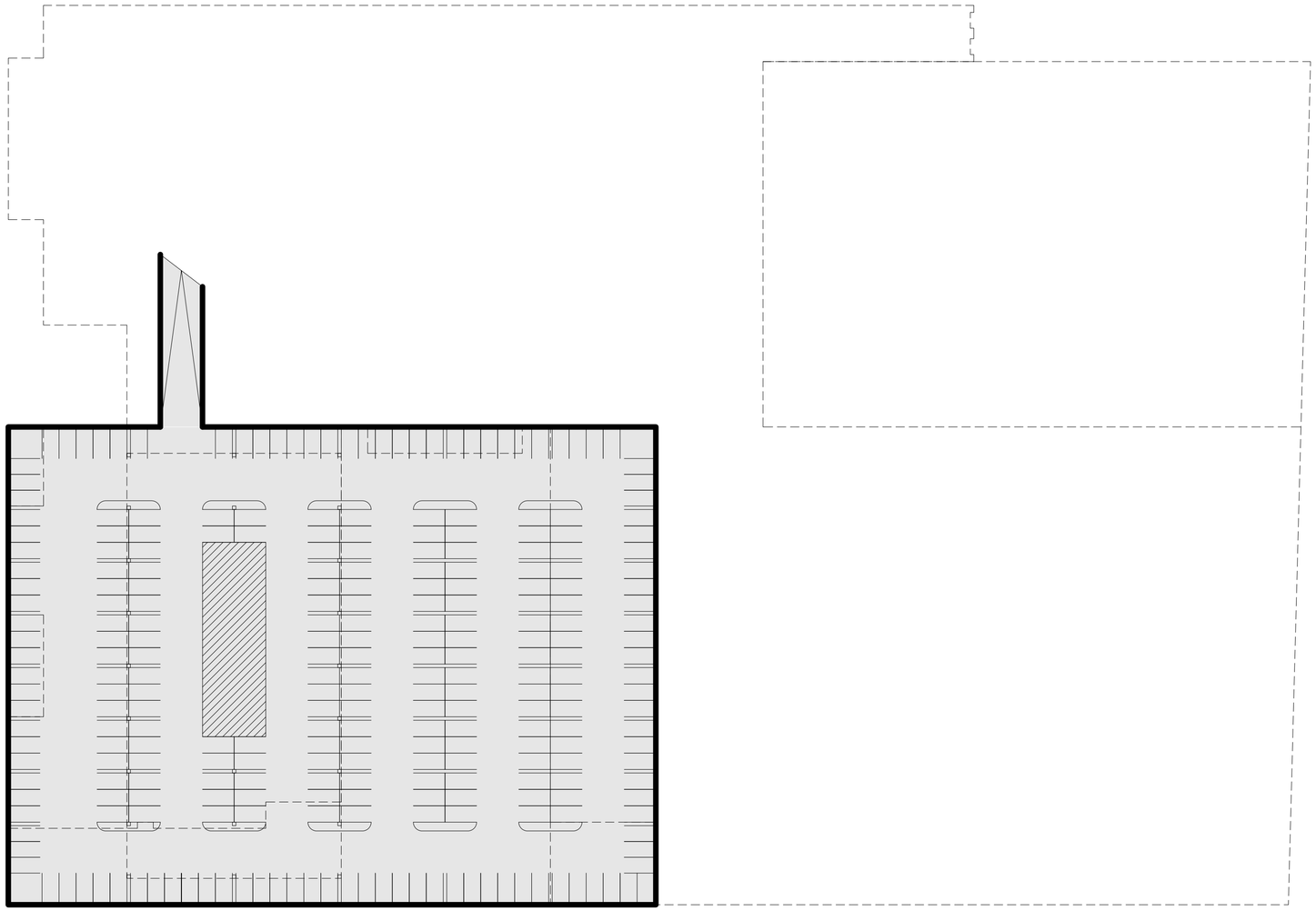
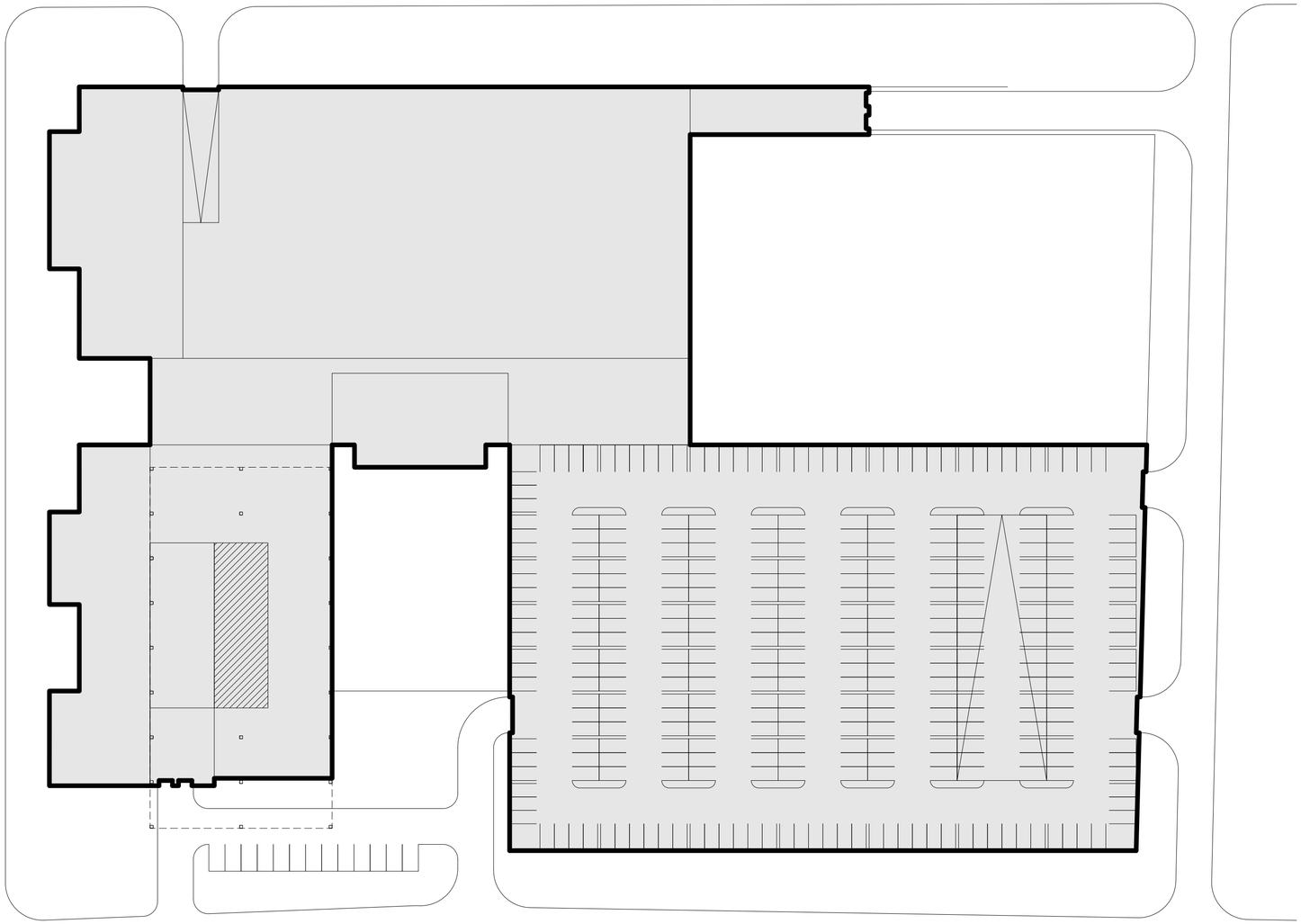


Level 0



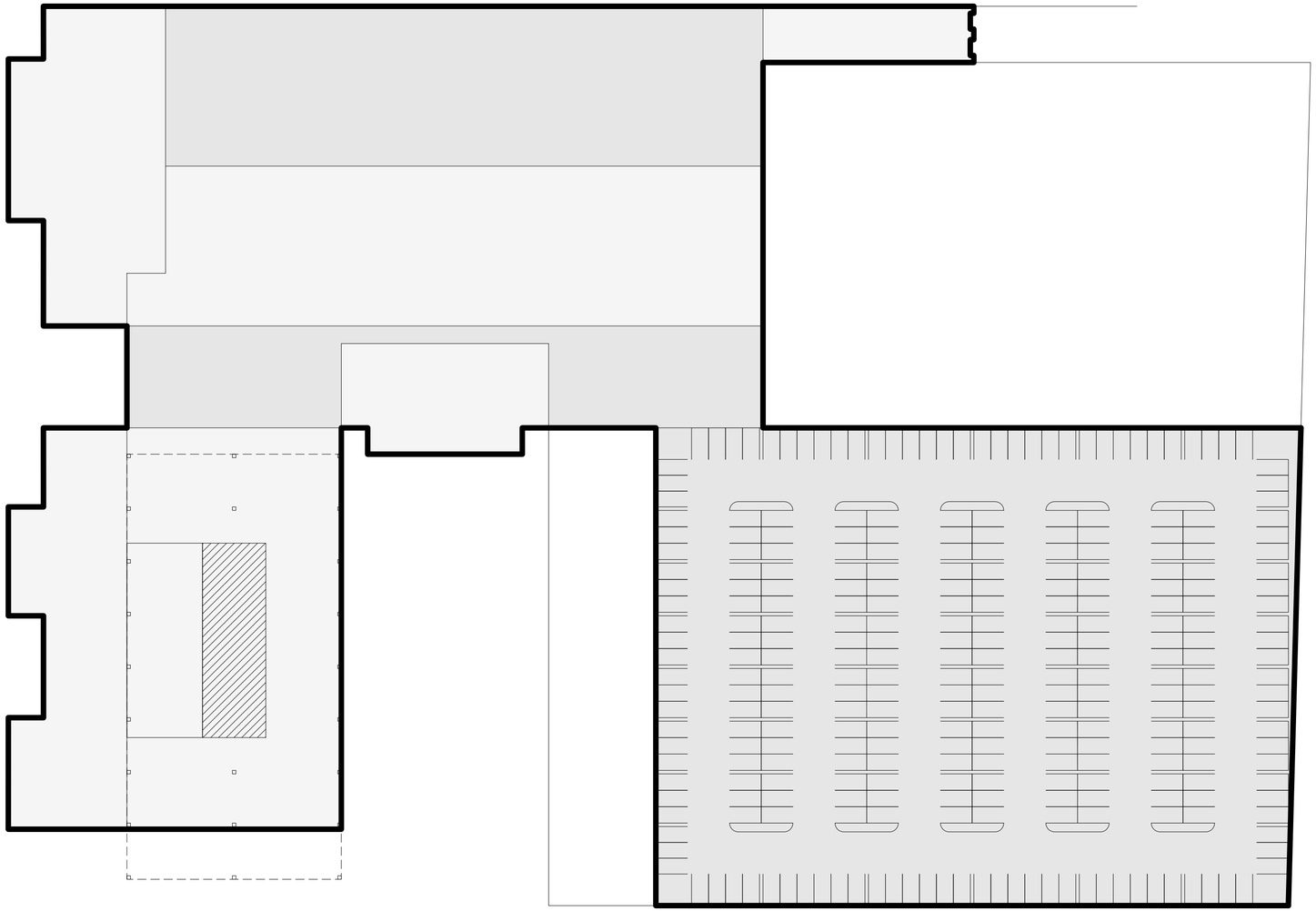
268 Spots

Level 1



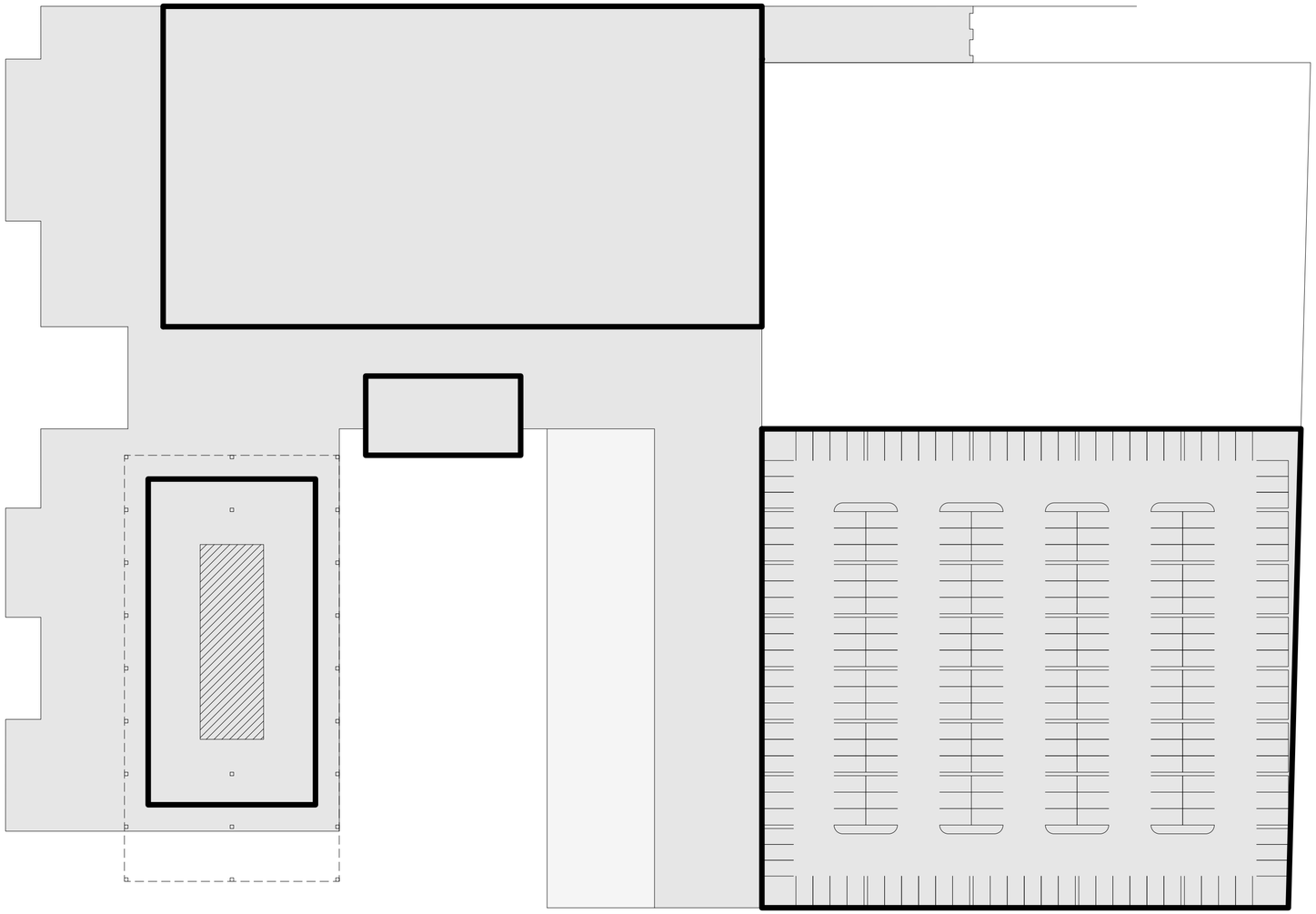
331 Spots

Level 2



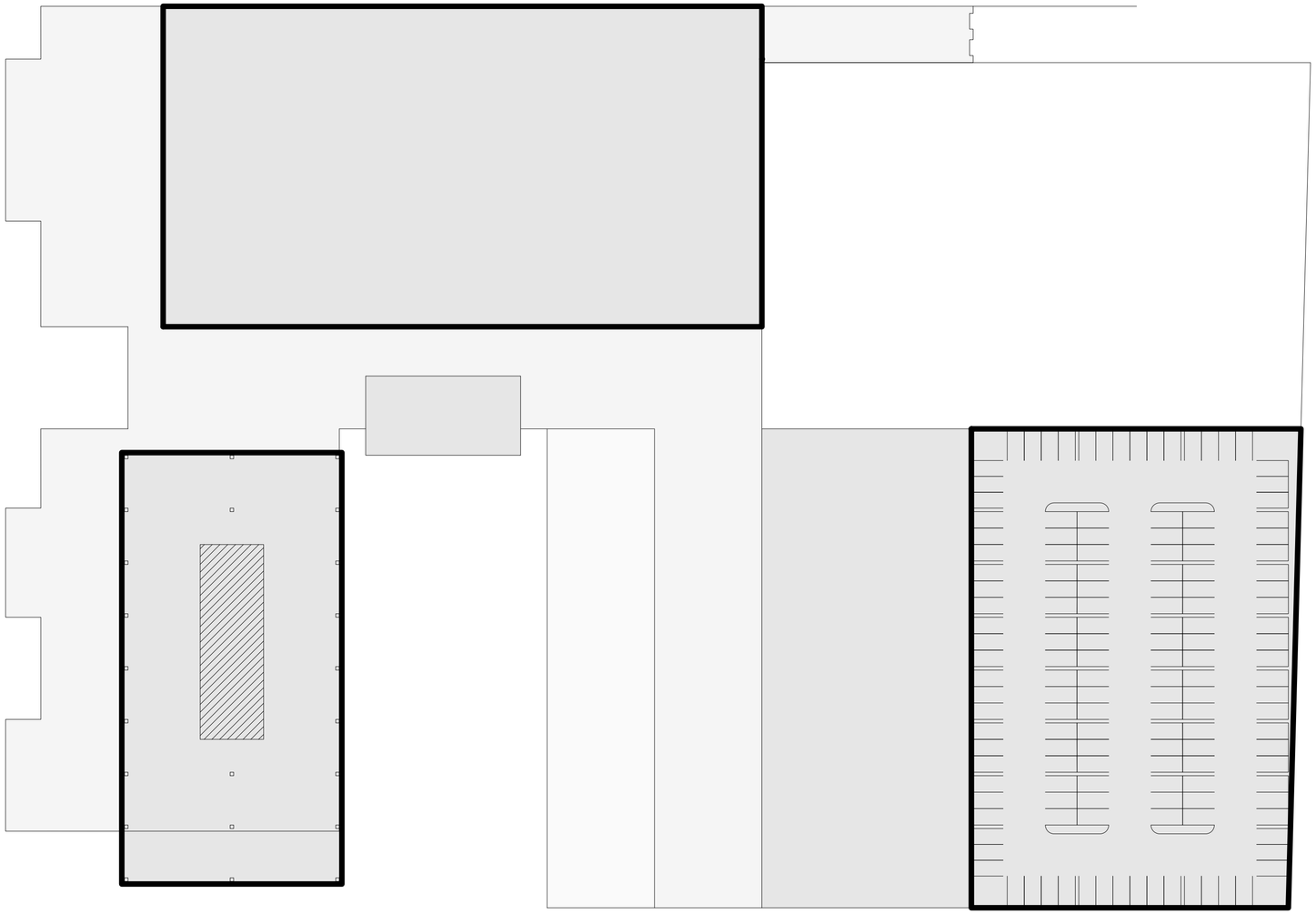
292 Spots

Level 3



244 Spots

Level 4



148 Spots

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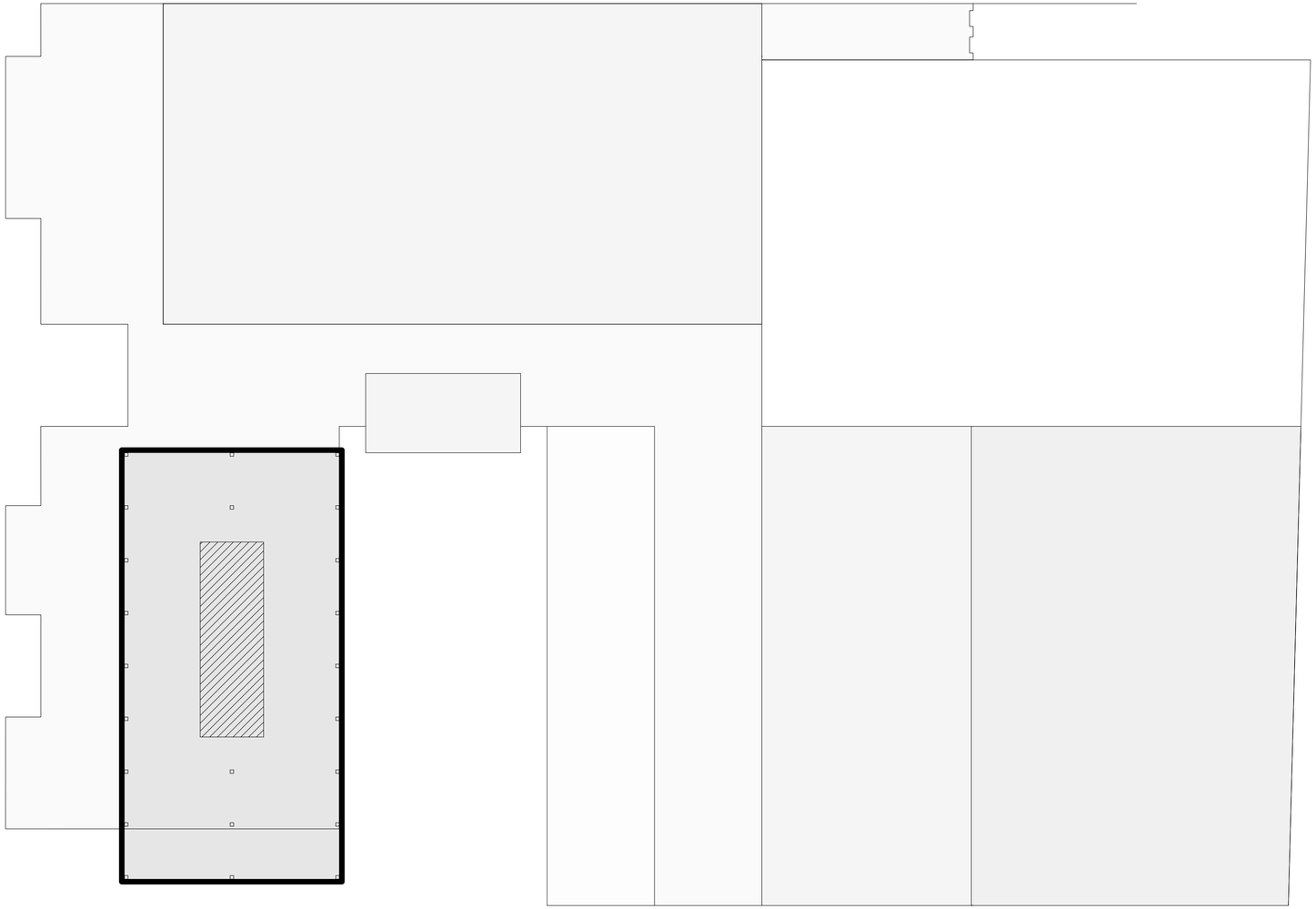
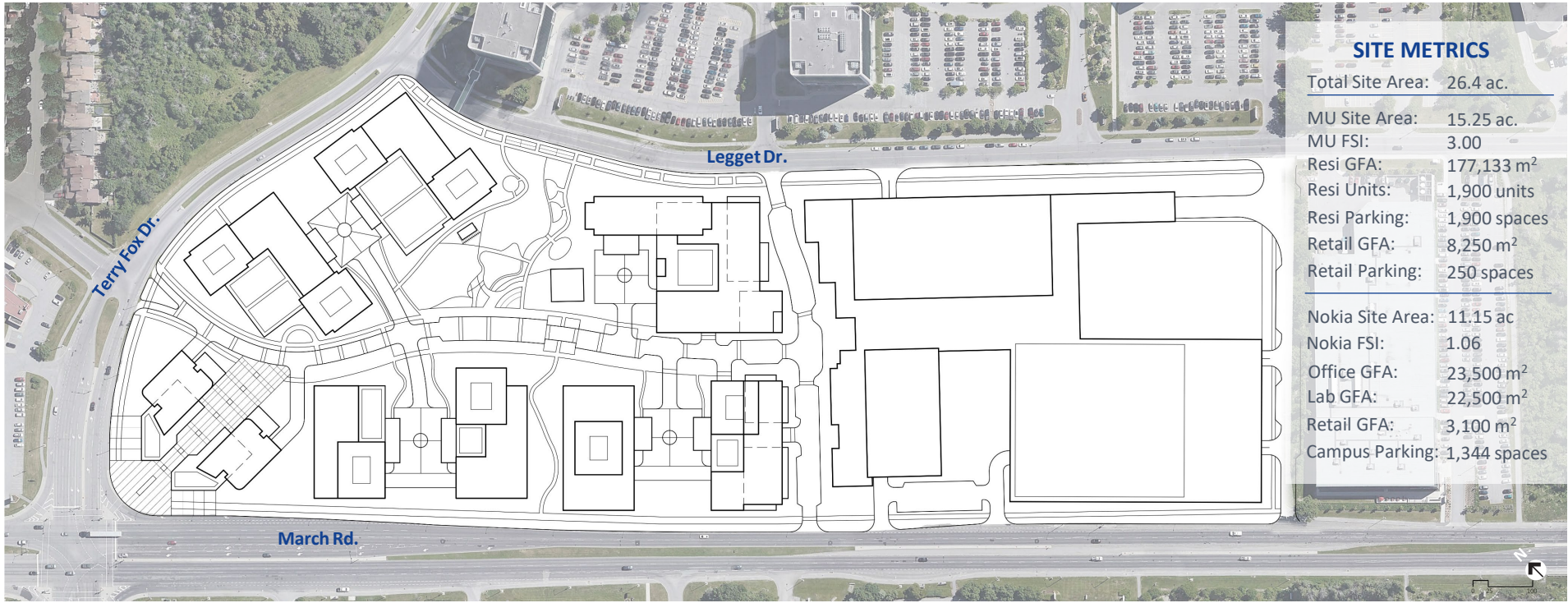


New Campus Site Plan



SITE METRICS

Total Site Area:	26.4 ac.
MU Site Area:	15.25 ac.
MU FSI:	3.00
Resi GFA:	177,133 m^2
Resi Units:	1,900 units
Resi Parking:	1,900 spaces
Retail GFA:	8,250 m^2
Retail Parking:	250 spaces
Nokia Site Area:	11.15 ac
Nokia FSI:	1.06
Office GFA:	23,500 m^2
Lab GFA:	22,500 m^2
Retail GFA:	3,100 m^2
Campus Parking:	1,344 spaces

Gensler NOKIA

B

Appendix B
Existing Conditions Plan

TOPOGRAPHIC PLAN OF SURVEY OF
BLOCK 6 AND
PART OF BLOCK 1
REGISTERED PLAN 4M-642
AND
PART OF LOTS 8 AND 9
CONCESSION 4
GEOGRAPHIC TOWNSHIP OF MARCH
CITY OF OTTAWA
Surveyed by Annis, O'Sullivan, Vollebekk Ltd.
Scale 1 : 400
16 12 8 4 0 8 16 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 18th day of February, 2022.
2022/02/20
Date
Stefan S. Bazar
Ontario Land Surveyor
SITE AREA = 105 690.2 m²
For bearing comparisons, a rotation of 1°04'10" counter-clockwise was applied to bearings on P5.
For bearing comparisons, a rotation of 1°07'10" counter-clockwise was applied to bearings on P10.
Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations, 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. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
Notes & Legend
Denotes
Survey Monument Planted
Survey Monument Found
SIB " Standard Iron Bar
SSIB " Short Standard Iron Bar
IB " Iron Bar
CC " Cut Cross
SSIB* " Short Standard Iron Bar (0.30 Long)
(WIT) " Witness
Meas. " Measured
(AOG) " Annis, O'Sullivan, Vollebekk Ltd.
(P1) " Plan 4R-6573
(P2) " Plan 4R-7809
(P3) " Plan 4R-28546
(P4) " Plan 4R-16648
(P5) " Registered Plan 4M-642
(P6) " Plan 4R-10610
(P7) " Plan 4R-17106
(P8) " Plan 4R-12588
(P9) " Plan 4R-12735
(P10) " Plan 4R-11611
(P11) " Plan 4R-14579
FH " Fire Hydrant
WV " Water Valve
SP " Water Stand Post
MH-ST " Maintenance Hole (Storm Sewer)
MH-S " Maintenance Hole (Sanitary)
MH-B " Maintenance Hole (Bell Telephone)
MH-T " Maintenance Hole (Traffic)
MH-H " Maintenance Hole (Hydro)
MH " Maintenance Hole (Unidentified)
VC " Valve Chamber (Watermain)
OHW " Overhead Wires
TB-B " Bell Terminal Box
TB-T " Traffic Terminal Box
TB " Unidentified Terminal Box
TB-C " Cable Terminal Box
SCLF " Security Fence
CLF " Chain Link Fence
EOA " Edge of Asphalt
CRW " Concrete Retaining Wall
IRW " Interlock Retaining Wall
SRW " Stone Retaining Wall
TRW " Timber Retaining Wall
H-T " Hydro Transfomer
CLF " Chain Link Fence
BOS " Bottom of Slope
TOS " Top of Slope
HH " Handhole
FP " Flag Pole
UP " Utility Pole
LS " Light Standard
BN " Basketball Net
AC " Air Conditioner
Ø " Diameter
+65.00 " Location of Elevations
+65.00 " Top of Concrete Curb Elevation
C/L " Centreline
TS " Tactile Surface
T/G " Top of Grate
B " Bollard
S " Sign
" Property Line
" Deciduous Tree
" Coniferous Tree
" Shrub
MC " Moveable Curb
CB " Catch Basin
GM " Gas Meter
NT " Non-Tangential
Acc. " Accepted
DETAIL A
Scale 1:200
DETAIL B
Scale 1:100
DETAIL C
Scale 1:100
DETAIL D
Scale 1:150
DETAIL E
Scale 1:50
BLOCK 6
REGISTERED PLAN 4M-642
LEGGET DRIVE
TERRY FOX DRIVE
McKINLEY DRIVE
MARCH ROAD (REGIONAL ROAD No.49)
CONCESSION 4
SITE BENCHMARK
Bolt on Southwest Corner of Light Standard
Elevation=81.45
SEE DETAIL D
ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-22583
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29 (3).
Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.
© Annis, O'Sullivan, Vollebekk Ltd, 2022. "THIS PLAN IS PROTECTED BY COPYRIGHT"
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors
Job No. 22398-21 Nokia 600MarchRd POS F
DG

C

Appendix C
Water Supply Design Calculations

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Multi-use Development (MU Site Area)
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

WATER CONSUMPTION CALCULATIONS - MU SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2021-03, ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

RESIDENTIAL AND COMMERCIAL WATER DEMANDS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Day Demand:	280	L/c/day
Maximum Day Peaking Factor:	2.0	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	3.0	x Average Daily Demand

Per Unit Populations:

Table 4.1 Per Unit Populations

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

EQUIVALENT POPULATION :

Building	Number of Units	Persons Per Unit	Population
Building A	184	1.8	331
Building B	184	1.8	331
Building C	312	1.8	562
Building D	298	1.8	536
Building E	218	1.8	392
Building F	137	1.8	247
Building G	163	1.8	293
Building H	206	1.8	371
Building I	202	1.8	364
Total	**1904**		**3427**

COMMERCIAL DESIGN CRITERIA:

Contributing Commercial Area:	0.825	gross ha (including commercial areas and amenity space)
Commercial Average Day Demand:	28,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	11.11	22.21	33.32
Commercial	0.27	0.40	0.72
Total	**11.37**	**22.61**	**34.04**

NOTES:

1. Maximum Day and Maximum Hour residential peaking factors determined using Table 3-1 of the MOE Design Guidelines for Drinking-Water System

Prepared by: Gavin Joseph, EIT Date: 2022-04-11

Verified by: Tim Kennedy, P.Eng. Date: 2022-04-11
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	**0.6**	**0.6**
Non-combustible Construction	0.8	
Ordinary Construction	1.0	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m^2)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m^2)
Gross Floor Area (GFA) Ground Level:	42,000	3,901	YES	YES	-
GFA Level 2:	36,000	3,344			836
GFA Level 3:	50,000	4,645			4,645
GFA Level 4:	40,000	3,716			929
GFA Level 5:	40,000	3,716			-
GFA Level 6:	40,000	3,716			-
GFA Level 7:	12,000	1,114			-
GFA Level 8:	12,000	1,114			-
GFA Level 9:	12,000	1,114			-
GFA Level 10:	12,000	1,114			-
GFA Level 11:	12,000	1,114			-
GFA Level 12:	12,000	1,114			-
GFA Level 13:	12,000	1,114			-
TOTAL FLOOR AREA (A):	**332,000**	**30,836**			**6,410**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	-
Level 2:	1	25%
Level 3:	1	100%
Level 4:	1	25%
Level 5:	1	-
Level 6:	1	-
Level 7:	1	-
Level 8:	1	-
Level 9:	1	-
Level 10:	1	-
Level 11:	1	-
Level 12:	1	-
Level 13:	1	-
HEIGHT IN STOREYS:	**13**	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) = **0.6**

Floor Area Considered (A) = **6,410 m^2**

REQUIRED (BASE) FIRE FLOW (F) =	**11000**	**L/min** (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	**1.00**	**1.00**
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) =	**11000**	**L/min** (Not rounded)

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	No	0%
TOTAL CHARGE FOR SPRINKLER SYSTEM			**-40%**

DECREASE FOR SPRINKLER PROTECTION =	**-4400**	**L/min** (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent Structure	Total Charge
North Façade	46.6	520	Fire Resistive or Ordinary with Unprotected Openings	0%
East Façade	64.0	385	Fire Resistive or Ordinary with Unprotected Openings	0%
South Façade	19.6	243	Fire Resistive or Ordinary with Unprotected Openings	15%
West Façade	24.9	436	Fire Resistive or Ordinary with Unprotected Openings	10%
TOTAL CHARGE FOR EXPOSURES				**25%**

INCREASE FOR EXPOSURES =	**2750**	**L/min** (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) =	**9000**	**L/min** (Rounded to Nearest 1,000 L/min)
	150.00	**L/s**
	2378	**USGPM**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

largest floor plus 25% of each of the two immediately adjoining floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020

2. For the purposes of the fire flow calculation, Building E was considered as it has the largest contributing fire area within the MU site.

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. Two levels of underground parking not considered as they are at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

Prepared by: Gavin Joseph, EIT Date: 2022-04-21

Verified by: Tim Kennedy, P.Eng. Date: 2022-04-21
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	0.6	**0.8**
Non-combustible Construction	**0.8**	
Ordinary Construction	1.0	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m^2)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m^2)
Gross Floor Area (GFA) Ground Level:	42,000	3,901	YES	YES	-
GFA Level 2:	36,000	3,344			-
GFA Level 3:	50,000	4,645			4,645
GFA Level 4:	40,000	3,716			3,716
GFA Level 5:	40,000	3,716			1,858
GFA Level 6:	40,000	3,716			1,858
GFA Level 7:	12,000	1,114			557
GFA Level 8:	12,000	1,114			557
GFA Level 9:	12,000	1,114			557
GFA Level 10:	12,000	1,114			557
GFA Level 11:	12,000	1,114			557
GFA Level 12:	12,000	1,114			557
GFA Level 13:	12,000	1,114			-
TOTAL FLOOR AREA (A):	**332,000**	**30,836**			**15,419**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	-
Level 2:	1	-
Level 3:	1	100%
Level 4:	1	100%
Level 5:	1	50%
Level 6:	1	50%
Level 7:	1	50%
Level 8:	1	50%
Level 9:	1	50%
Level 10:	1	50%
Level 11:	1	50%
Level 12:	1	50%
Level 13:	1	-
HEIGHT IN STOREYS:	**13**	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) = **0.8**

Floor Area Considered (A) = **15,419 m^2**

REQUIRED (BASE) FIRE FLOW (F) =	**22000**	**L/min** (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	**1.00**	**1.00**
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) =	**22000**	**L/min** (Not rounded)

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	No	0%
TOTAL CHARGE FOR SPRINKLER SYSTEM			**-40%**

DECREASE FOR SPRINKLER PROTECTION =	**-8800**	**L/min** (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent Structure	Total Charge
North Façade	46.6	520	Fire Resistive or Ordinary with Unprotected Openings	0%
East Façade	64.0	385	Fire Resistive or Ordinary with Unprotected Openings	0%
South Façade	19.6	243	Fire Resistive or Ordinary with Unprotected Openings	15%
West Façade	24.9	436	Fire Resistive or Ordinary with Unprotected Openings	10%
TOTAL CHARGE FOR EXPOSURES				**25%**

INCREASE FOR EXPOSURES =	**5500**	**L/min** (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) =	**19000**	**L/min** (Rounded to Nearest 1,000 L/min)
	316.67	**L/s**
	5019	**USGPM**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - MU SITE AREA

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

1. Assumed some vertical openings in the building are unprotected, thus only the area of the two largest adjoining floors plus 50% of all floors immediately above them to a maximum of eight (8) floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. For the purposes of the fire flow calculation, Building E was considered as it has the largest contributing fire area within the MU site.

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. Two levels of underground parking not considered as they are at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

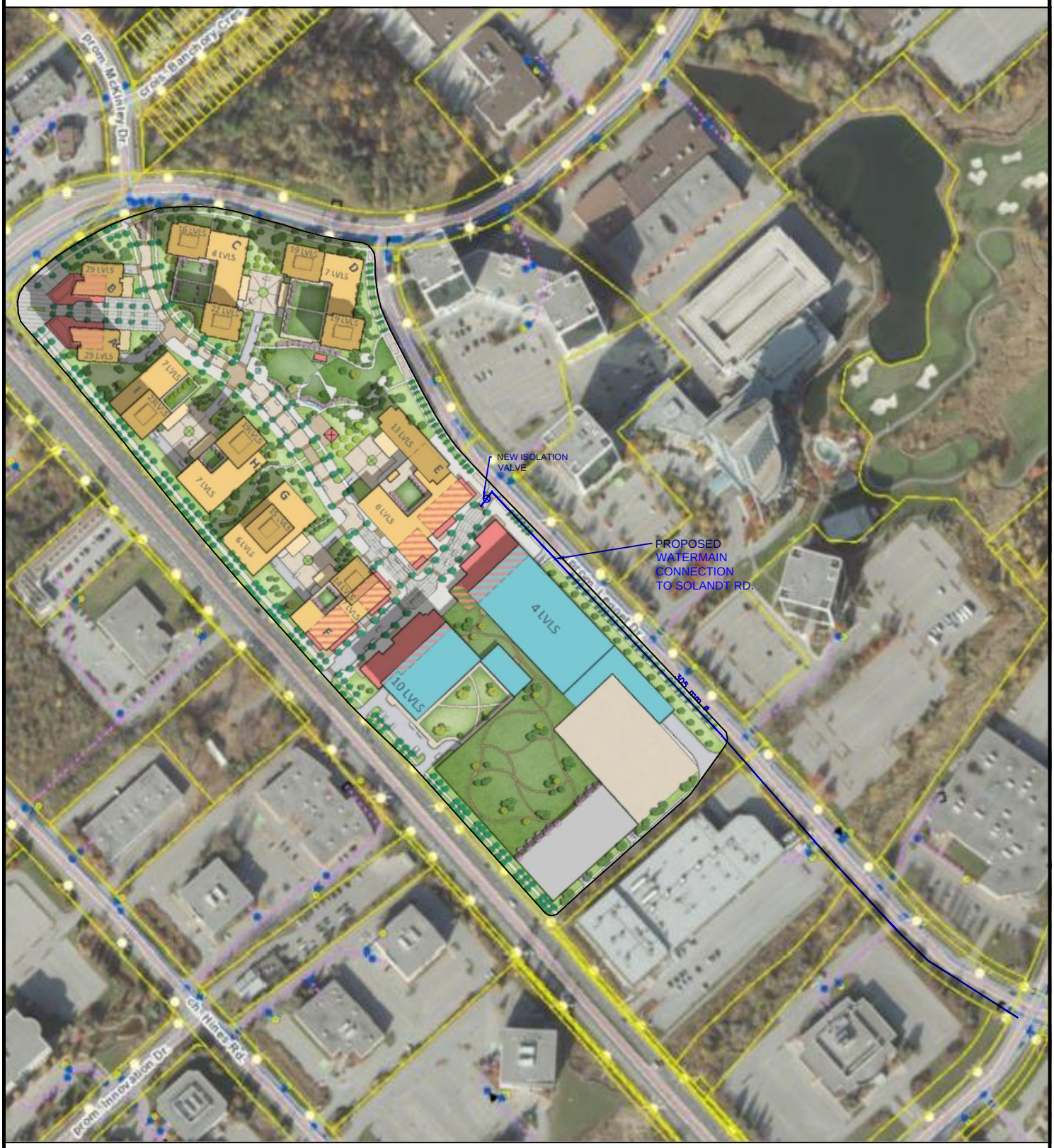
1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

Prepared by: Gavin Joseph, EIT Date: 2022-04-21

Verified by: Tim Kennedy, P.Eng. Date: 2022-04-21
PEO# 100173201



T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

PROPOSED WATER SERVICE CONNECTION LOCATION(S)

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	1

T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

EXPOSURE SEPARATION DISTANCES

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	2

T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

FIRE HYDRANT COVERAGE

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	3

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

MUNICIPAL BOUNDARY CONDITIONS

HYDRAULIC BOUNDARY CONDITIONS (PROVIDED BY THE CITY OF OTTAWA):

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m) Normal Operation Conditions			Boundary Condition Head (m) Watermain Closure from McKinley to Solandt		
	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.
Minimum HGL	125.2	125.2	125.2	-	-	-
Maximum HGL	130.8	130.8	130.8	-	-	-
Maximum Day + Fire Flow	124.7	124.8	124.8	122.2	-	-

HYDRAULIC ANALYSIS - WATER SUPPLY ADEQUACY (FLOW AND PRESSURE)

DESIGN CRITERIA - WATERMAIN PRESSURE AND DEMAND OBJECTIVES:

Demand Type	Minimum Pressure (psi)	Desired Minimum Pressure (psi)	Desired Maximum Pressure (psi)	Maximum Pressure (psi)
Average Daily Demand	40.0	50.0	70.0	80.0
Maximum Daily Demand + Fire Flow	20.0			
Maximum (Peak) Hour Demand	40.0			

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

WATERMAIN PRESSURE AND DEMAND ANALYSIS SUMMARY - PROPOSED DEVELOPMENT:

Connection Point	Proposed Demand (L/s)	Available Flow/Pressure		Flow/Pressure Objective Achieved?
		Design Operating Pressure[1] (Relative Head) (m)	Design Operating Pressure (psi)	
AVERAGE DAILY DEMAND				
Connection 1	11.37	49.5	70.4	YES
Connection 2	11.37	52.1	74.1	YES
Connection 3	11.37	51.7	73.5	YES
MAXIMUM DAILY DEMAND + FIRE FLOW				
Connection 1 – Normal Operating Conditions	172.61	43.4	61.7	YES
Connection 2 – Normal Operating Conditions	172.61	46.1	65.6	YES
Connection 3 – Normal Operating Conditions	172.61	45.7	65.0	YES
Connection 1 – Watermain Closure on Legget from McKinley to Solandt	172.61	40.9	58.2	YES
MAXIMUM (PEAK) HOUR DEMAND				
Connection 1	34.04	43.9	62.4	YES
Connection 2	34.04	46.5	66.1	YES
Connection 3	34.04	46.1	65.6	YES

1. Ground elevation for Connection 1 (m) = 81.3
   Ground elevation for Connection 2 (m) = 78.7
   Ground elevation for Connection 3 (m) = 79.1

NOTES:

Prepared by: Jaymeson Adams, EIT Date: 2022-05-04

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

MUNICIPAL BOUNDARY CONDITIONS

HYDRAULIC BOUNDARY CONDITIONS (PROVIDED BY THE CITY OF OTTAWA):

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m) Normal Operation Conditions			Boundary Condition Head (m) Watermain Closure from McKinley to Solandt		
	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.
Minimum HGL	125.2	125.2	125.2	-	-	-
Maximum HGL	130.8	130.8	130.8	-	-	-
Maximum Day + Fire Flow	117.6	117.8	117.9	110.2	-	-

HYDRAULIC ANALYSIS - WATER SUPPLY ADEQUACY (FLOW AND PRESSURE)

DESIGN CRITERIA - WATERMAIN PRESSURE AND DEMAND OBJECTIVES:

Demand Type	Minimum Pressure (psi)	Desired Minimum Pressure (psi)	Desired Maximum Pressure (psi)	Maximum Pressure (psi)
Average Daily Demand	40.0	50.0	70.0	80.0
Maximum Daily Demand + Fire Flow	20.0			
Maximum (Peak) Hour Demand	40.0			

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

WATERMAIN PRESSURE AND DEMAND ANALYSIS SUMMARY - PROPOSED DEVELOPMENT:

Connection Point	Proposed Demand (L/s)	Available Flow/Pressure		Flow/Pressure Objective Achieved?
		Design Operating Pressure[1] (Relative Head) (m)	Design Operating Pressure (psi)	
AVERAGE DAILY DEMAND				
Connection 1	11.37	49.5	70.4	YES
Connection 2	11.37	52.1	74.1	YES
Connection 3	11.37	51.7	73.5	YES
MAXIMUM DAILY DEMAND + FIRE FLOW				
Connection 1 – Normal Operating Conditions	339.28	36.3	51.6	YES
Connection 2 – Normal Operating Conditions	339.28	39.1	55.6	YES
Connection 3 – Normal Operating Conditions	339.28	38.8	55.2	YES
Connection 1 – Watermain Closure on Legget from McKinley to Solandt	339.28	28.9	41.1	YES
MAXIMUM (PEAK) HOUR DEMAND				
Connection 1	34.04	43.9	62.4	YES
Connection 2	34.04	46.5	66.1	YES
Connection 3	34.04	46.1	65.6	YES

1. Ground elevation for Connection 1 (m) = 81.3
   Ground elevation for Connection 2 (m) = 78.7
   Ground elevation for Connection 3 (m) = 79.1

NOTES:

Prepared by: Jaymeson Adams, EIT Date: 2022-05-04

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WATER CONSUMPTION CALCULATIONS - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

COMMERCIAL DESIGN CRITERIA:

Contributing Commercial Area:	2.617	gross ha (including commercial areas and amenity space)
Commercial Average Day Demand:	28,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

INDUSTRIAL (LIGHT) DESIGN CRITERIA:

Contributing Industrial Area:	1.913	gross ha (including commercial areas and amenity space)
Commercial Average Day Demand:	35,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Commercial	0.85	1.27	2.29
Industrial	0.78	1.16	2.09
Total	**1.62**	**2.43**	**4.38**

NOTES:

1. Maximum Day and Maximum Hour commercial and industrial peaking factors are determined using Table 4.2 of the Ottawa Design Guidelines - Water Distribution (2010)

Prepared by: Gavin Joseph, EIT Date: 2022-07-12

Verified by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	**0.6**	**0.6**
Non-combustible Construction	0.8	
Ordinary Construction	1.0	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m^2)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m^2)
Gross Floor Area (GFA) Ground Level:	272,556	25,321	YES	YES	25,321
GFA Level 2:	256,829	23,860			5,965
GFA Level 3:	157,989	14,678			3,669
GFA Level 4:	121,748	11,311			-
GFA Level 5:	26,875	2,497			-
GFA Level 6:	26,875	2,497			-
GFA Level 7:	26,875	2,497			-
GFA Level 8:	26,875	2,497			-
GFA Level 9:	26,875	2,497			-
GFA Level 10:	26,875	2,497			-
TOTAL FLOOR AREA (A):	**970,372**	**90,150**			**34,955**

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Nokia Site Area

CIMA+ PROJECT NUMBER: A001218

CLIENT: NOKIA

PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	100%
Level 2:	1	25%
Level 3:	1	25%
Level 4:	1	-
Level 5:	1	-
Level 6:	1	-
Level 7:	1	-
Level 8:	1	-
Level 9:	1	-
Level 10:	1	-
HEIGHT IN STOREYS:	**10**	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) = **0.6**

Floor Area Considered (A) = **34,955 m^2**

REQUIRED (BASE) FIRE FLOW (F) =	**25000**	**L/min** (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	**1.00**	**1.00**
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) =	**25000**	**L/min** (Not rounded)

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	No	0%
TOTAL CHARGE FOR SPRINKLER SYSTEM			**-40%**

DECREASE FOR SPRINKLER PROTECTION =	**-10000**	**L/min** (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent Structure	Total Charge
North Façade	19.6	420	Fire Resistive or Ordinary with Unprotected Openings	15%
East Façade	60.8	315	Fire Resistive or Ordinary with Unprotected Openings	0%
South Façade	29.9	277	Fire Resistive or Ordinary with Unprotected Openings	10%
West Façade	74.8	172	Fire Resistive or Ordinary with Unprotected Openings	0%
TOTAL CHARGE FOR EXPOSURES				**25%**

INCREASE FOR EXPOSURES =	**6250**	**L/min** (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) =	**21000**	**L/min** (Rounded to Nearest 1,000 L/min)
	350.00	**L/s**
	5548	**USGPM**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

largest floor plus 25% of each of the two immediately adjoining floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. One level of underground parking not considered at it is at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection,

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial and industrial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

Prepared by: Gavin Joseph, EIT Date: 2022-04-21

Verified by: Tim Kennedy, P.Eng. Date: 2022-04-21
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	0.6	**0.8**
Non-combustible Construction	**0.8**	
Ordinary Construction	1.0	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m²)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m²)
Gross Floor Area (GFA) Ground Level:	272,556	25,321	YES	YES	25,321
GFA Level 2:	256,829	23,860			23,860
GFA Level 3:	157,989	14,678			7,339
GFA Level 4:	121,748	11,311			5,655
GFA Level 5:	26,875	2,497			1,248
GFA Level 6:	26,875	2,497			1,248
GFA Level 7:	26,875	2,497			1,248
GFA Level 8:	26,875	2,497			1,248
GFA Level 9:	26,875	2,497			1,248
GFA Level 10:	26,875	2,497			1,248
TOTAL FLOOR AREA (A):	**970,372**	**90,150**			**69,665**

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Nokia Site Area

CIMA+ PROJECT NUMBER: A001218

CLIENT: NOKIA

PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	100%
Level 2:	1	100%
Level 3:	1	50%
Level 4:	1	50%
Level 5:	1	50%
Level 6:	1	50%
Level 7:	1	50%
Level 8:	1	50%
Level 9:	1	50%
Level 10:	1	50%
HEIGHT IN STOREYS:	**10**	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) = **0.8**

Floor Area Considered (A) = **69,665 m^2**

REQUIRED (BASE) FIRE FLOW (F) =	**46000**	**L/min** (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	**1.00**	**1.00**
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) =	**46000**	**L/min** (Not rounded)

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	No	0%
TOTAL CHARGE FOR SPRINKLER SYSTEM			**-40%**

DECREASE FOR SPRINKLER PROTECTION =	**-18400**	**L/min** (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent Structure	Total Charge
North Façade	19.6	420	Fire Resistive or Ordinary with Unprotected Openings	15%
East Façade	60.8	315	Fire Resistive or Ordinary with Unprotected Openings	0%
South Façade	29.9	277	Fire Resistive or Ordinary with Unprotected Openings	10%
West Façade	74.8	172	Fire Resistive or Ordinary with Unprotected Openings	0%
TOTAL CHARGE FOR EXPOSURES				**25%**

INCREASE FOR EXPOSURES =	**11500**	**L/min** (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) =	**39000**	**L/min** (Rounded to Nearest 1,000 L/min)
	650.00	**L/s**
	10303	**USGPM**

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT - NOKIA SITE AREA

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

1. Assumed some vertical openings in the building are unprotected, thus only the area of the two largest adjoining floors plus 50% of all floors immediately above them to a maximum of eight (8) floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. One level of underground parking not considered at it is at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection,

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial and industrial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

Prepared by: Gavin Joseph, EIT Date: 2022-04-21

Verified by: Tim Kennedy, P.Eng. Date: 2022-04-21
PEO# 100173201

DESIGNED BY

T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

PROPOSED WATER SERVICE CONNECTION LOCATION(S)

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	1

EXPOSURE SEPARATION DISTANCES

T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	2

T: 613-860-2462
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

FIRE HYDRANT COVERAGE

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
G. Joseph	----	T. Kennedy	NTS	2022/04/04	A001218	1 of 1	3

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

MUNICIPAL BOUNDARY CONDITIONS

HYDRAULIC BOUNDARY CONDITIONS (PROVIDED BY THE CITY OF OTTAWA):

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m) Normal Operation Conditions			Boundary Condition Head (m) Watermain Closure from McKinley to Solandt		
	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.
Minimum HGL	125.2	125.2	125.2	-	-	-
Maximum HGL	130.8	130.8	130.8	-	-	-
Maximum Day + Fire Flow	117.6	117.8	117.9	110.2	-	-

HYDRAULIC ANALYSIS - WATER SUPPLY ADEQUACY (FLOW AND PRESSURE)

DESIGN CRITERIA - WATERMAIN PRESSURE AND DEMAND OBJECTIVES:

Demand Type	Minimum Pressure (psi)	Desired Minimum Pressure (psi)	Desired Maximum Pressure (psi)	Maximum Pressure (psi)
Average Daily Demand	40.0	50.0	70.0	80.0
Maximum Daily Demand + Fire Flow	20.0			
Maximum (Peak) Hour Demand	40.0			

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

WATERMAIN PRESSURE AND DEMAND ANALYSIS SUMMARY - PROPOSED DEVELOPMENT:

Connection Point	Proposed Demand (L/s)	Available Flow/Pressure		Flow/Pressure Objective Achieved?
		Design Operating Pressure[1] (Relative Head) (m)	Design Operating Pressure (psi)	
AVERAGE DAILY DEMAND				
Connection 1	1.77	49.5	70.4	YES
Connection 2	1.77	52.1	74.1	YES
Connection 3	1.77	51.7	73.5	YES
MAXIMUM DAILY DEMAND + FIRE FLOW				
Connection 1 – Normal Operating Conditions	352.66	36.3	51.6	YES
Connection 2 – Normal Operating Conditions	352.66	39.1	55.6	YES
Connection 3 – Normal Operating Conditions	352.66	38.8	55.2	YES
Connection 1 – Watermain Closure on Legget from McKinley to Solandt	352.66	28.9	41.1	YES
MAXIMUM (PEAK) HOUR DEMAND				
Connection 1	4.79	43.9	62.4	YES
Connection 2	4.79	46.5	66.1	YES
Connection 3	4.79	46.1	65.6	YES

1. Ground elevation for Connection 1 (m) = 81.3
   Ground elevation for Connection 2 (m) = 78.7
   Ground elevation for Connection 3 (m) = 79.1

NOTES:

Prepared by: Jaymeson Adams, EIT Date: 2022-05-04

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

MUNICIPAL BOUNDARY CONDITIONS

HYDRAULIC BOUNDARY CONDITIONS (PROVIDED BY THE CITY OF OTTAWA):

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m) Normal Operation Conditions			Boundary Condition Head (m) Watermain Closure from McKinley to Solandt		
	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.	Connection 1 Terry Fox Dr. 610 mm dia.	Connection 2 Legget Dr. 610 mm dia.	Connection 3 Legget Dr. 610 mm dia.
Minimum HGL	125.2	125.2	125.2	-	-	-
Maximum HGL	130.8	130.8	130.8	-	-	-
Maximum Day + Fire Flow	101.7	102.1	102.4	82.6	-	-

HYDRAULIC ANALYSIS - WATER SUPPLY ADEQUACY (FLOW AND PRESSURE)

DESIGN CRITERIA - WATERMAIN PRESSURE AND DEMAND OBJECTIVES:

Demand Type	Minimum Pressure (psi)	Desired Minimum Pressure (psi)	Desired Maximum Pressure (psi)	Maximum Pressure (psi)
Average Daily Demand	40.0	50.0	70.0	80.0
Maximum Daily Demand + Fire Flow	20.0			
Maximum (Peak) Hour Demand	40.0			

WATERMAIN PRESSURE AND DEMAND ANALYSIS SUMMARY - PROPOSED DEVELOPMENT:

Connection Point	Proposed Demand (L/s)	Available Flow/Pressure		Flow/Pressure Objective Achieved?
		Design Operating Pressure[1] (Relative Head) (m)	Design Operating Pressure (psi)	
AVERAGE DAILY DEMAND				
Connection 1	1.77	49.5	70.4	YES

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

Connection 2	1.77	52.1	74.1	YES
Connection 3	1.77	51.7	73.5	YES
MAXIMUM DAILY DEMAND + FIRE FLOW				
Connection 1 – Normal Operating Conditions	652.66	20.4	29.0	YES
Connection 2 – Normal Operating Conditions	652.66	23.4	33.3	YES
Connection 3 – Normal Operating Conditions	652.66	23.3	33.1	YES
Connection 1 – Watermain Closure on Legget from McKinley to Solandt	652.66	1.3	1.8	NO
MAXIMUM (PEAK) HOUR DEMAND				
Connection 1	4.79	43.9	62.4	YES
Connection 2	4.79	46.5	66.1	YES
Connection 3	4.79	46.1	65.6	YES

1. Ground elevation for Connection 1 (m) = 81.3
   Ground elevation for Connection 2 (m) = 78.7
   Ground elevation for Connection 3 (m) = 79.1

NOTES:

Prepared by: Jaymeson Adams, EIT Date: 2022-05-04

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

Jaymeson Adams

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: May 2, 2022 2:20 PM
To: Tim Kennedy
Cc: Clodd, Aaron; Hugues Bisson; Gavin Joseph; Jaymeson Adams
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request
Attachments: Nokia Campus_02May2022.docx; 600March_Servicing_27April2022.pdf

EXTERNAL EMAIL

Hi Tim,

Please see below and attached the watermain boundary conditions for 570 and 600 March Road. The following notes were provided by Asset Management and must be incorporated into watermain design.

- City staff recommend three connections as shown in the attached PDF. A new isolation valve is required east of the new watermain connection on Terry Fox.
- The water analysis must include a scenario that considers a planned closure of the 610 mm Leggett Drive watermain from Solandt to McKinley. Only the Terry Fox connection is available to service the Nokia Campus.
- Required fire flows exceeding 21,000 L/min are not supported by Infrastructure Planning.

There is another internal meeting this week to discuss the new FUS document. Using a coefficient of C=0.6 will be discussed further and what the City will require if pursuing a fire resistive building. At the time of Site Plan / Subdivision application, if a coefficient of C=0.6 cannot be adequately justified / demonstrated, the proposed site plan will need to be altered to respect the 21,000 L/min cap (as noted above) using a coefficient of C=0.8.

Please let me know if you require further clarity and we can set up a meeting to discuss.
Thanks.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 25, 2022 10:27 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks Julie for expediting this and yes I am in agreement with the proposed range for fire flows.

Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Engineering for people

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, April 25, 2022 10:11 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Good morning Tim,

I have submitted your boundary condition request for the following two options for each site. I disagreed with the options crossed out in red as they are not in accordance with the FUS document. That said, I believe the two options presented below will give us an acceptable range and a means to move forward with this application (assuming the fire flows can be met by the existing infrastructure).

I have a meeting scheduled at 2pm today with Water Services and Asset Management to discuss a possible connection to the 610mm feedermain. I have also requested that the boundary condition request be expedited given the delay on this file.

MU Site Area		
Scenario	C=0.6	C=0.8
Area = All Floor Areas	-	26000 L/min 433.33 L/s 6868 USGPM
Area = Two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight	-	19000 L/min 316.67 L/s 5019 USGPM
Area = The single largest floor area plus 25% of each of the two immediately adjoining floors.	9000 L/min 150 L/s 2378 USGPM	12000 L/min 200 L/s 3170 USGPM

Nokia Site Area		
Scenario	C=0.6	C=0.8
Area = All Floor Areas	-	45000 L/min 750 L/s 11888 USGPM
Area = Two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight	-	39000 L/min 650 L/s 10303 USGPM
Area = The single largest floor area plus 25% of each of the two immediately adjoining floors.	21000 L/min 350 L/s 5548 USGPM	28000 L/min 466.67 L/s 7397 USGPM

Regards,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 22, 2022 1:55 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

We have run a few scenarios for the RFF as discussed below and in accordance with the recently released FUS Document. Please see attached for a summary of each and accompanying detailed calculations.

If you are able to run each of these scenarios and provide boundary conditions I think we would have our best and worst case scenarios covered.

Let me know if you have any questions or if we should have a quick meeting to discuss.

On another note do we have confirmation on connecting to the 600 mm main as opposed to extension to Solandt?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Tim Kennedy
Sent: Thursday, April 21, 2022 3:27 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: Re: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Great thanks for confirming Julie. We will get you those numbers in the morning.

Thanks,
Tim

Sent from my iPhone

> On Apr 21, 2022, at 2:51 PM, Candow, Julie <julie.candow@ottawa.ca> wrote:
>
> EXTERNAL EMAIL
>
> Hi Tim,
>
> It is common for us to provide multiple boundary conditions based on RFF (required fire flow) “options”. I agree with your approach to submit your fire flow calculations using a C of 0.6 as well as a C of 0.8. At Site Plan Control stage, we can move forward with whatever “option” the developer chooses to proceed with.
>
> That said, please submit your calculations in accordance with the new 2020 FUS standard as this will be the standard used going forward.
>
> Thanks,
>
> **Julie Candow, P.Eng**
> Project Manager
> Planning, Real Estate and Economic Development Department - West Branch

City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 21, 2022 2:34 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for passing this along.

We are currently working towards providing a few scenarios to be run in your model, including the C=0.8 (area = total building area) as requested below for comparison as well as those outlined in the new FUS standards.

At this stage of design it seems it would not be possible to provide the structural and architectural signoff to proceed with the use of the C=0.6. In the past it has not been an issue to provide the requested letters for these types of buildings to permit the use of C=0.6, however not until the building design is advanced during site plan control and permit stages.

This being the case should we assume that only a coefficient of 0.8 would be allowable at the ZBA stage? Or would the City provide multiple boundary conditions for the different scenarios? Then as the design is progressed to site plan control and permit the appropriate letters could be provided at that time and all applicable information would be readily available in the Adequacy of Servicing Report depending on which scenario moves forward.

Please let me know your thoughts on this approach.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Thursday, April 21, 2022 9:01 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

The attached update to the FUS was just released to us this morning. Can you please update your fire flow calculations to reflect the revised 2020 FUS document. Please pay close attention to the following when determining your Total Effective Area:

<image002.png>

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Candow, Julie
Sent: April 20, 2022 3:56 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Hi Tim,

Following our internal meeting today regarding the FUS coefficient of C=0.6, there was a general consensus that in order to accept a coefficient of C=0.6 the developers Structural Engineer and Architect would have to provide verification / sign off to confirm that all buildings were designed with structural members, floors and roofs having a fire-resistance rating of 3 hours or longer, with exterior vertical communications properly protected (one hour rating).

That said, there is an additional meeting set to take place hopefully next week with Building Code Services to determine the reports / drawings that may be required to accept a coefficient of C=0.6.

In the interim, could you provide the fire flow calculations assuming a coefficient C=0.8 (area = total building area) for comparison?

Thank you,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 13, 2022 10:33 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for the update and for getting that meeting scheduled as soon as you could.

As you mentioned please provide the information on the other items as soon as you can. We will progress where we can while the fire flow coefficients are discussed and confirmed.

If changes to our required flow calculations are required we will do so in short order after receiving confirmation from your meeting on the 20th. Hopefully the City can then provide boundary conditions in short order?

Thanks again,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, April 12, 2022 2:55 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

A meeting regarding the FUS calculations isn't scheduled until April 20th. Apologies for the delay but this was the earliest we could have all parties attend. I should be able to get an answer on the other items sooner, however the Senior Engineer in AM is on vacation this week.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 11, 2022 3:47 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks for the quick response. We will revise per your comments below and provide updated calculations shortly.

A connection to the 600 mm Feedermain would certainly be helpful. Please advise on this and the use of the 0.6 C value once resolved with Asset Management and Water Services.

Do you have an expected timeline for resolving these items?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Monday, April 11, 2022 3:33 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

EXTERNAL EMAIL

Hi Tim,

It is unlikely the City will be able to provide boundary conditions this week. There are internal discussions happening regarding a C value of 0.6 used within the FUS calculations. There has been input from Fire Services and Building Code Services that buildings cannot be constructed to be fire resistive (C=0.6) as defined by the FUS. We have also involved Water Services to re-evaluate whether a connection to the 610mm feedermain would be allowed, given the scale of this development.

In the meantime, the water demand calculations should be updated to reflect the residential average day demand from 350 L/c/day to 280 L/cap/day in accordance with Technical Bulletin 2021-03. In addition, the peaking factor for Maximum Hour Demand should be 3.0 x Average Daily demand (as opposed to 3.0 x Maximum Daily Demand) given that the MOE peaking factors are used for a population over 3000.

I have followed up with Asset Management and Water Services to escalate the above noted issues.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 11, 2022 9:31 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Just wanted to follow up on the water boundary conditions and sewer capacity requests.

We are hoping to finalize our Adequacy of Servicing Report this week. Any chance you can push these requests to get us a response by mid week? As I understand it this project is high priority for the City.

Thanks for your help!
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

<image001.jpg>

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Tuesday, April 5, 2022 10:23 AM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

Thanks Tim, I have forwarded on your request to our Water Services department.

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: April 05, 2022 9:57 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 570 and 600 March Rd. - Water Demands - Boundary Condition Request

We would like to kindly request boundary conditions for the proposed development at 570 and 600 March Rd. Please find the proposed development information below and detailed calculations and associated figures attached including: Water Demand Calculations, Required Fire Flow Calculations, Exposure Separation Distances, and Fire Hydrant Coverage, for both the Nokia and Multi-Use (MU) Site Areas.

- **Type of Development and Units:**
  Nokia Site Area - The current Nokia office/lab space will be relocated to the south end of the site. Three new buildings are proposed with a total floor area of 49,100 m2, which includes the laboratory, office and parking garage, with interconnecting podium and ground floor retail of 3,100 m2.
  Multi-Use Site Area - Approximately 9 residential buildings are proposed to the north, ranging in height from 7 to 29 storeys. Approximately 1900 residential units are proposed. Retail uses are proposed on the ground floor of a number of the buildings, with a total floor area of approximately 8,250 m2.
- **Site Address:** 570 and 600 March Rd.
- **Location of Services:** The 305 mm diameter watermain at the intersection of Legget Drive and Solandt Road must be extended to supply the MU & Nokia site.
- **Average Daily Demand:** 15.92 L/s (14.15 L/s MU Site Area + 1.77 L/s Nokia Site Area)
- **Maximum Daily Demand:** 30.83 L/s (28.17 L/s MU Site Area + 2.66 L/s Nokia Site Area)
- **Peak Hour Demand:** 88.81 L/s (84.02 L/s MU Site Area + 4.79 L/s Nokia Site Area)
- **Required Fire Flow (RFF):** Nokia Site Area - 21,000 L/min. Multi-Use Site Area - 9,000 L/min.

I understand from the pre-consult that a new local watermain is required along Leggett Drive and that the 305 mm watermain at Solandt Road should have capacity to accommodate this redevelopment. It is expected that multi-hydrant analysis will be required and that the required fire flow can be provided from the hydrants along Leggett Drive connected to the 610 mm diameter transmission watermain.

If you have any questions or concerns, please do not hesitate to contact me.

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

<image001.jpg>

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Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

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'

Boundary Conditions
Nokia Campus

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	788	13.14
Maximum Daily Demand	1,516	25.27
Peak Hour	2,330	38.83
Fire Flow Demand #1	9,000	150.00
Fire Flow Demand #2	21,000	350.00
Fire Flow Demand #3	39,000	650.00

Location

Results during Normal Operating Conditions

Connection 1 – Terry Fox Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	70.4
Peak Hour	125.2	62.4
Max Day plus Fire 1	124.7	61.8
Max Day plus Fire 2	117.6	51.7
Max Day plus Fire 3	101.7	29.0

Ground Elevation = 81.3 m

Connection 2 – Legget Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	74.1
Peak Hour	125.2	66.2
Max Day plus Fire 1	124.8	65.5
Max Day plus Fire 2	117.8	55.7
Max Day plus Fire 3	102.1	33.3

Ground Elevation = 78.7 m

Connection 3 – Legget Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.8	73.4
Peak Hour	125.2	65.5
Max Day plus Fire 1	124.8	64.9
Max Day plus Fire 2	117.9	55.2
Max Day plus Fire 3	102.4	33.1

Ground Elevation = 79.1 m

Results during watermain closure on Legett from McKinley to Solandt

Connection 1 – Terry Fox Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Max Day plus Fire 1	122.2	58.2
Max Day plus Fire 2	110.2	41.2
Max Day plus Fire 3	82.6	1.9

Ground Elevation = 81.3 m

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.

Nokia Study Area

Isolation Valve

Upgrade or abandon existing service

Isolation Valve

Isolation Valve

New Connection to 610 mm

New Isolation Valve

Keep existing 305 mm watermain

Isolation Valve

New connection (Tapping Valve)

Internal Private Watermain

Isolation Valve

ch. March Rd

Fox Dr.

ch. Hines Rd.

ch. Solandt Rd.

0 50 100 150 200 Meters

Surveys and Mapping, City of Ottawa

Legend

VALVE_TYPE, FUNCTION

- <Null>, <Null>
- B, <Null>
- B, MAIN
- B, PRES_ZONE
- B, SERVICE
- G, <Null>
- G, MAIN
- G, SERVICE

Water Pipe

- Other

Internal_Diameter

- 152mm, 203mm
- 254mm; 305mm
- 356mm; 381mm; 406mm
- 457mm; 500mm; 508mm
- 610mm
- <152 mm
- >610

D

Appendix D
Sanitary Servicing Design Calculations

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - MU SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

DOMESTIC CONTRIBUTIONS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Flow: (1) 280 L/c/day

Residential Peak Factor (P.F.): Harmon Equation (Min 2.0 and Max 4.0)

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000} \right)^{\frac{1}{2}}} \right) * K$$

where:
P=Population
K=Correction Factor =0.8

Per Unit Populations:

Table 4.2 Per Unit Populations

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

AVERAGE FLOW - DOMESTIC:

Building	Number of Units	Persons Per Unit	Population	Average Flow (L/s)
Building A	184	1.8	331	1.07
Building B	184	1.8	331	1.07
Building C	312	1.8	562	1.82
Building D	298	1.8	536	1.74
Building E	218	1.8	392	1.27
Building F	137	1.8	247	0.80
Building G	163	1.8	293	0.95
Building H	206	1.8	371	1.20
Building I	202	1.8	364	1.18
Total	**1904**		**3427**	**11.11**

PEAK FLOW - DOMESTIC:

Population: (2)	3,427	persons
Average Dry Weather Flow: (3) = (1) x (2)	11.11	L/s
Peaking Factor (P.F.): (4)	2.91	
Peak Domestic Flow: (5) = (3) x (4)	**32.36**	L/s

COMMERCIAL CONTRIBUTIONS:

COMMERCIAL DESIGN CRITERIA:

Commercial Average Flow: (6)	28,000	L/gross ha/d	
Commercial Peak Factor:	1.5	if commercial contribution >20%, otherwise use	1.0

AVERAGE FLOW - COMMERCIAL:

Contributing Commercial Area: (7)	0.825	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	0.27	L/s

PEAK FLOW - COMMERCIAL:

Percent Commercial Area Contribution:	4%	(GFA/Commercial Floor Area)
Peaking Factor: (9)	1.00	
Peak Commercial Flow: (10) = (8) x (9)	**0.27**	L/s

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - MU SITE AREA

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	6.17	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**2.04**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**11.37**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**32.63**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**34.67**	**L/s**

Prepared by: Gavin Joseph, EIT Date: 2022/03/25

Verified by: Tim Kennedy, P.Eng. Date: 2022/03/30
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

COMMERCIAL CONTRIBUTIONS:

COMMERCIAL DESIGN CRITERIA:

Commercial Average Flow: (6)	28,000	L/gross ha/d	
Commercial Peak Factor:	1.5	if commercial contribution >20%, otherwise use	1.0

AVERAGE FLOW - COMMERCIAL:

Contributing Commercial Area: (7)	2.617	gross ha (including office and retail spaces)
Average Dry Weather Flow: (8) = (6) x (7)	0.85	L/s

PEAK FLOW - COMMERCIAL:

Percent Commercial Area Contribution:	58%	(Commercial Area/Gross Area)
Peaking Factor: (9)	1.50	
Peak Commercial Flow: (10) = (8) x (9)	**1.27**	L/s

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	5.8	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.913	gross ha (including laboratory)
Average Dry Weather Flow: (8) = (6) x (7)	0.78	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	42%	(Industrial Area/Gross Area)
Peaking Factor: (9)	5.80	
Peak Industrial Flow: (10) = (8) x (9)	**4.50**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	4.51	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**1.49**	L/s

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - NOKIA SITE AREA

Total Estimated Avg. Dry Weather Flow Rate:	**1.62**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**5.77**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**7.26**	**L/s**

Prepared by: Gavin Joseph, EIT Date: 2022-07-12

Verified by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO# 100173201

Z:\Cima-C10\Ott_Projects\A\A001000-A001499\A001218_NOKIA_Mixed Use Development - 600 March Rd - NDA\300\360_Civil\220318_ZBA_Site Servicing\Nokia Site Area\01_SAN\[220712_Sanitary Flow_Nokia Site Area.xlsx]Sheet1

Jaymeson Adams

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: April 21, 2022 9:07 AM
To: Tim Kennedy
Cc: Clodd, Aaron; Hugues Bisson; Gavin Joseph; Jaymeson Adams
Subject: RE: 600 March Road - Peak Wastewater Demand - Capacity Confirmation

EXTERNAL EMAIL

Hi Tim,

I received the following from Asset Management with regards to your Peak Wastewater Demand calculations:

"For the time being, assume capacity is available in the 750mm dia. Legget Drive sewer. We are expecting to receive the WWMP future conditions wastewater trunk model by the end of May and will have more information at that time."

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: March 31, 2022 8:06 AM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>; Hugues Bisson <Hugues.Bisson@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 600 March Road - Peak Wastewater Demand - Capacity Confirmation

Good morning Julie,

The following is a summary of the anticipated sanitary demands for the proposed development at **600 March Road** (detailed calculations are attached):

1. **Type of Development and Units:**
   Nokia Site Area - The current Nokia office/lab space will be relocated to the south end of the site. Three new buildings are proposed with a total floor area of 49,100 m2, which includes the laboratory, office and parking garage, with interconnecting podium and ground floor retail of 3,100 m2.

Multi-Use Site Area - Approximately 9 residential buildings are proposed to the north, ranging in height from 7 to 29 storeys. Approximately 1900 residential units are proposed. Retail uses are proposed on the ground floor of a number of the buildings, with a total floor area of approximately 8,250 m2.

2. **Site Address:** 600 and 570 March Road.
3. **Location of Services:** Connection to existing 750 mm diameter concrete sanitary sewer at the intersection of Leggett Drive and Solandt Road.
4. **Total Estimated Average Dry Weather Flow:** 13.14 L/s (11.37 L/s MU Site Area + 1.77 L/s Nokia Site Area)
5. **Total Estimated Peak Dry Weather Flow:** 39.12 L/s (32.63 L/s MU Site Area + 6.49 L/s Nokia Site Area)
6. **Total Estimated Peak Wet Weather Flow:** 42.65 L/s (34.67 L/s MU Site Area + 7.98 L/s Nokia Site Area)

I understand from the pre-consult that the 750 mm sanitary sewer on Legget Drive, south of Solandt Road, should have capacity to accommodate this redevelopment and that additional information on sewer capacity will be available once the Wastewater Master Plan is complete.

Are you able to confirm that there is adequate capacity in the sanitary network at Solandt Road to accommodate these peak flows at this time? Alternatively, is there any update on when we can expect to receive this confirmation?

Thanks,
Tim

TIM KENNEDY, P.Eng.
Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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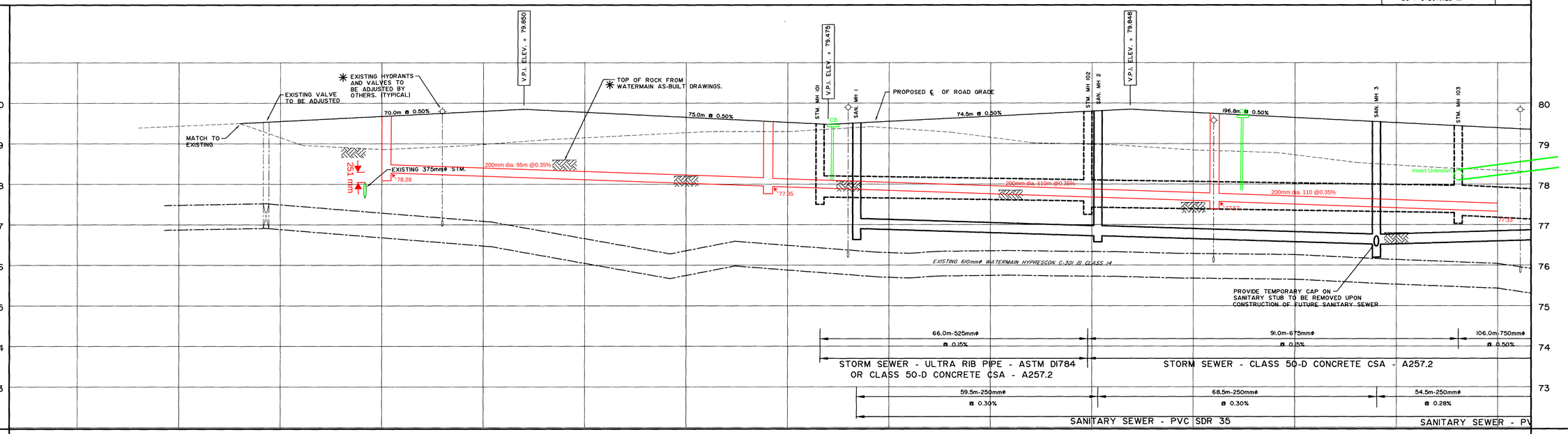


NOTES:

1. ROCK HAS BEEN PREVIOUSLY BLASTED DURING THE INSTALLATION OF THE WATERMAIN IN OCTOBER OF 1987, FOR SANITARY AND STORM TRENCHES. REMOVAL OF ANY UNSHATTERED BEDROCK ENCOUNTERED (LARGER THAN 0.125cu.m.) WILL BE PAID FOR UNDER THE ITEM FOR ROCK REMOVAL.
2. TRENCH FOR SANITARY STUB FROM MH 3 REQUIRES ROCK REMOVAL.
3. ROCK MAY REQUIRE REMOVAL FOR SOME CATCHBASINS AND CATCHBASIN LEADS.
4. INVERT OF SANITARY TRUNK SEWER APPROXIMATELY 370m NORTHEAST OF LEGGET DRIVE IS 69.95
5. ✳ STREET LIGHTS AND UTILITY DUCT CROSSINGS TO BE INSTALLED AS PART OF THIS CONTRACT.
6. PROVIDE THERMAL INSULATION FOR WATERMAIN AT OPEN STRUCTURES PER R.M.O.C. DRAWING WSD-23. (AT ALTERNATE LOCATION)
7. ✳ PROVIDE 100mm x 2m INSULATION OVER 750mmφ STORM OUTLET PIPE, FROM HEADWALL TO SIDEWALK PER R.M.O.C. WSD-22.

LEGEND

◒	EXISTING STREET LIGHT
⊗	EXISTING VALVE AND VALVE BOX
◪	EXISTING BELL PEDESTAL
— - —	EXISTING WATERMAIN
═	PROPOSED CURB LINE
MH 3 —●—	SANITARY SEWER WITH MANHOLE & NUMBER
MH 103 - -●- -	STORM SEWER WITH MANHOLE & NUMBER
■	STREET CATCHBASIN (200mmφ LEAD)
◒	PROPOSED STREET LIGHT

NOTE
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CITY OF KANATA

	No.	REVISION	DATE	BY
✳	7.	ADDENDUM REVISIONS	JULY 17/95	AKT
	6.	ISSUED FOR TENDER	JULY 14/95	AKT
	5.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	JUNE 14/95	AKT
	4.	REVISED FOR TENDER	MAR. 30/95	AKT
	3.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	MAR. 6/95	AKT
	2.	ISSUED FOR APPROVAL TO CITY AND M.O.E.E.	FEB. 22/95	AKT
	1.	ISSUED FOR APPROVAL TO M.N.R. AND M.V.C.A.	FEB. 9/95	AKT
	8.	REVISED SANITARY OUTLET	OCT. 12/95	JDM

J. D. McMANUS

A.K. TITTLEY

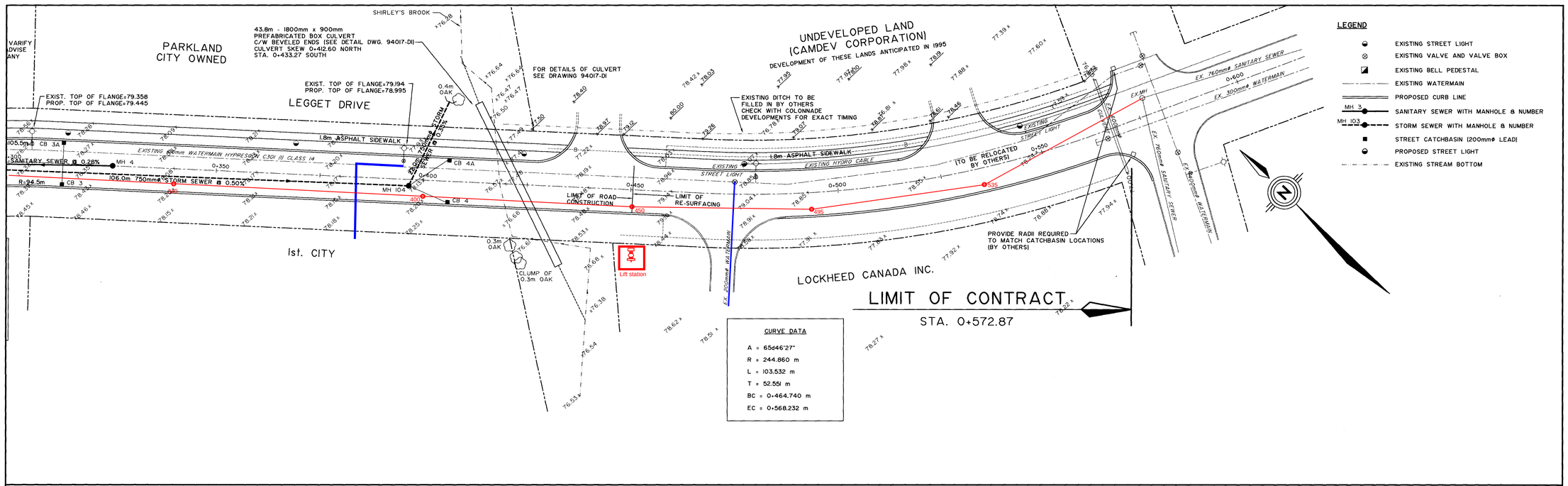
DAVID McMANUS
ENGINEERING CONSULTANTS LTD.

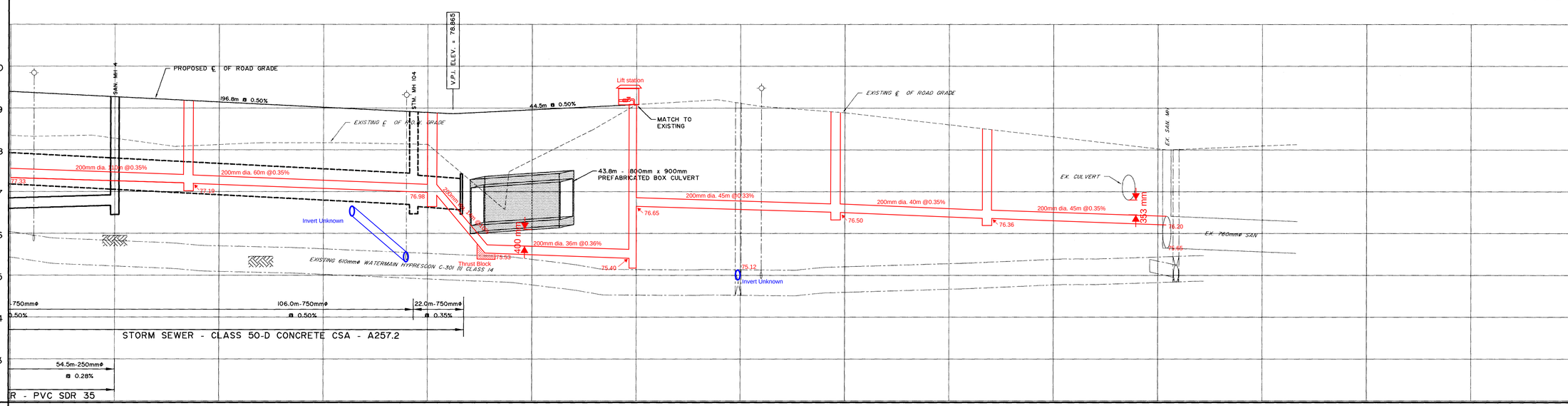
DESIGN	AKT	SCALE	
CHECKED	JDM	1:500 HORIZONTAL	
DRAWN	JHB		
CHECKED	AKT	1:50 VERTICAL	
APPROVED	JDM		

MINTO DEVELOPMENTS Inc.
LEGGET DRIVE
CITY OF KANATA

PLAN AND PROFILE
LEGGET DRIVE
STA -0+050 TO STA 0+300

PROJECT No. 94017
SURVEY BY DMECL
DATE DECEMBER 1994
DRAWING No. 94017-P1





NOTE
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CITY OF KANATA

No.	REVISION	DATE	BY
8.	REVISED SANITARY OUTLET	OCT. 12/95	JDM
6.	ISSUED FOR TENDER	JULY 14/95	AKT
5.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	JUNE 14/95	AKT
4.	REVISED FOR TENDER	MAR. 30/95	JDM
3.	REVISED FOR SUBMISSION TO CITY AND M.O.E.E.	MAR. 6/95	AKT
2.	ISSUED FOR APPROVAL TO CITY AND M.O.E.E.	FEB. 22/95	AKT
1.	ISSUED FOR APPROVAL TO M.N.R. AND M.V.C.A.	FEB. 9/95	AKT

J. D. McMANUS

A.K. TITTLEY

DAVID McMANUS
ENGINEERING CONSULTANTS LTD.

DESIGN	AKT
CHECKED	JDM
DRAWN	JHB
CHECKED	AKT
APPROVED	JDM

SCALE
1:500 HORIZONTAL
1:50 VERTICAL

MINTO DEVELOPMENTS Inc.
LEGGET DRIVE
CITY OF KANATA

PLAN AND PROFILE
LEGGET DRIVE
STA. 0+300 TO STA. 0+575

PROJECT No. 94017
SURVEY BY DMECL
DATE DECEMBER 1994
DRAWING No. 94017-P2

E

Appendix E
Storm Servicing and Stormwater Management Calculations

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
MU1	13148	0.20	11622	0.90	24770	**0.53**	**0.66**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
MU2	21795	0.20	22055	0.90	43850	**0.55**	**0.69**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE-DEVELOPMENT FLOW (AREAS TO TERRY FOX DR.)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT FLOW DETERMINATION:

ALLOWABLE RELEASE RATE - SUMMARY:

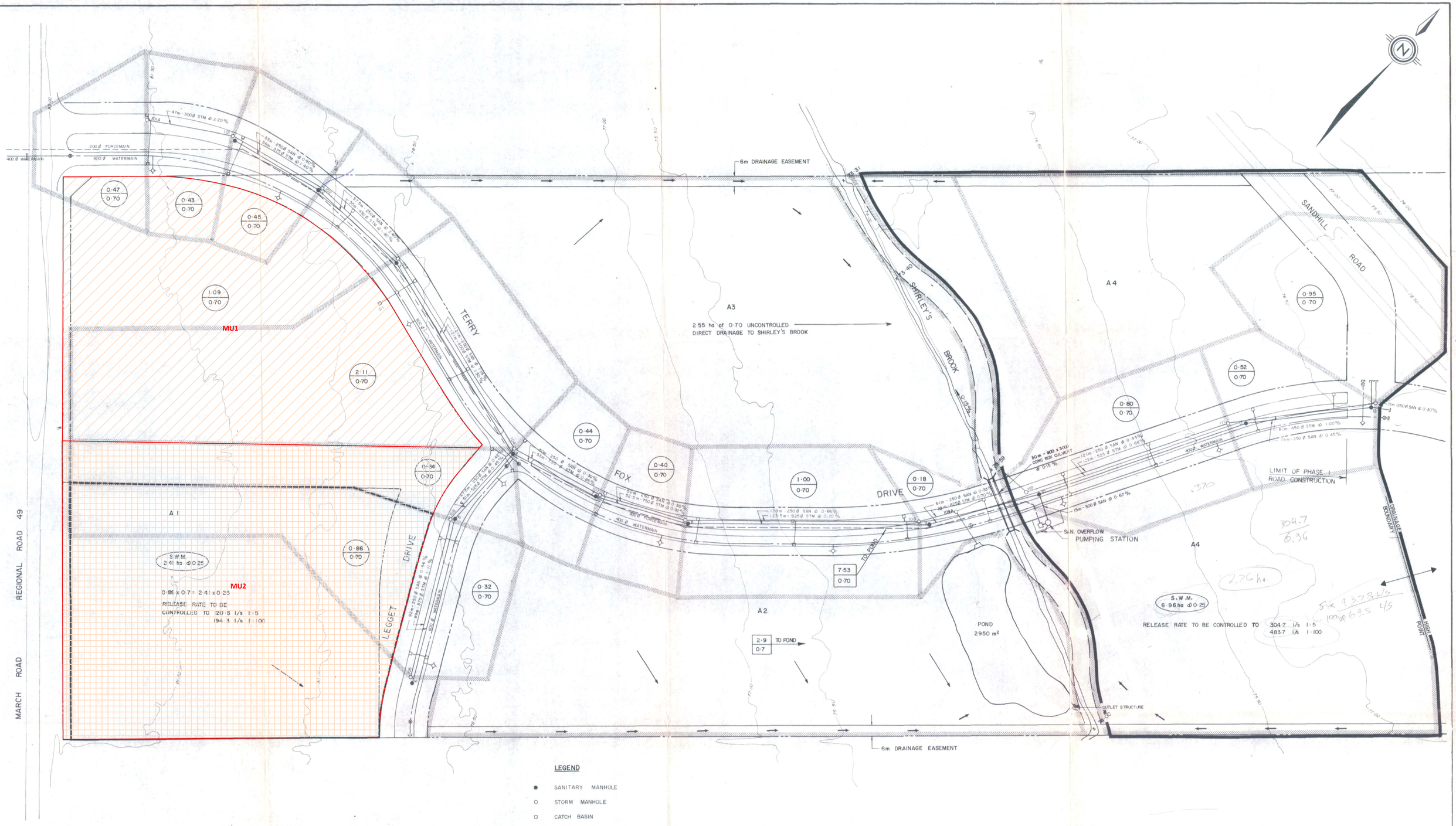
Catchment ID	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Allowable Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
MU1.1	1.34	0.70	20	116.19	**301.7**	**225.9**
MU1.2	0.74	0.70	20	116.19	**166.9**	**225.9**
MU1.3	0.08	0.70	20	116.19	**18.9**	**225.9**
MU1.4	0.12	0.70	20	116.19	**26.7**	**225.9**
MU1.5	0.12	0.70	20	116.19	**26.4**	**225.9**
Total	**2.39**				**540.6**	**225.9**

NOTES:

1. Time of Concentration (tc) of 20 minutes and IDF parameters used in accordance with the "Kanata Research Park Stormwater Management Report", prepared by Novatech Engineering Consultants Ld., June 25, 1987.

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201



LEGEND

- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- VALVE CHAMBER
- FIRE HYDRANT
- DRAINAGE AREA BOUNDARY (STORM SEWERS)
- 0.40 / 0.70 — AREA IN HECTARES / RUNOFF COEFFICIENT
- DIRECTION OF DRAINAGE
- x74.00 — PROPOSED ELEVATION
- 2.50 / 0.70 — AREA IN HECTARES (TO PONDS) / RUNOFF COEFFICIENT

STORMWATER MANAGEMENT SUB-AREAS
MULTI-USE (MU) SITE AREA

LEGEND:

MU1 = MU SITE AREA DRAINING TO TERRY FOX DR.
MU2 = MU SITE AREA DRAINING TO LEGGET DR.

Prepared by: Jaymeson Adams, EIT
Project No.: A01218
Date: 2022-04-19

No	REVISION	DATE	BY
2	POND REVISIONS	JULY 3/87	UB
1	GENERAL REVISIONS	MAY 14/87	UB

LICENSED PROFESSIONAL ENGINEER — ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD
SUITE 100 • 196 BRONSON AVE • OTTAWA, ONTARIO • K1R 6H4 •

DESIGN	U B
CHECKED	B C A
DRAWN	P V F
CHECKED	U B
APPROVED	M J H

SCALE: 0 10 20 30 40 HORIZONTAL — 1 : 1000

CITY OF KANATA
KANATA RESEARCH PARK
STORM DRAINAGE PLAN

PROJECT No.	8701
FILE CODE	
DATE	April, 1987
DRAWING No.	8701-STM1

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
MU1	9034	0.20	15737	0.90	24770	**0.64**	**0.81**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
MU2	14517	0.20	29332	0.90	43850	**0.67**	**0.84**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

STORMWATER MANAGEMENT – PRELIMINARY RETENTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

STORMWATER MANAGEMENT SUMMARY - STORAGE AND DRAWDOWN:

DESIGN CRITERIA:

Rainfall event	100.0	years
Flows to Terry Fox Drive	540.6	L/s
Flows to Legget Drive	194.3	L/s
Allowable Release Rate	734.9	L/s

Sub-Area	Total Area (m^2)	Available Storage Area (m^2)	Catchbasin/ Roof Drain Elevation (m)	Maximum Ponding Elevation (m)	Y_{max} (m)	V_{max} (m^3)	V_{rain} (m^3)	V_{acc} (m^3)	Y_{rain} (m)	$Elev_{rain}$ (m)	A_{rain} (m^2)	Q (L/s)	Drawdown Time (min)	Comments
MU1	24770	-	-	-	-	-	272.7	272.7	-	-	-	540.6	-	To Terry Fox
MU2	43850	-	-	-	-	-	1382.9	1382.9	-	-	-	194.3	-	To Legget
Total	**68620**						**1655.7**	**1655.7**				**734.9**		

DEFINITIONS OF ABBREVIATIONS USED IN CALCULATION TABLE:

NC = Area is not controlled (unattenuated)
Available Area = Area of water accumulated in sub-area at Max. Elev.
Catchbasin Elev. = Elevation of catchbasin inlet (top of grate).
Max. Elev. = Maximum elevation of water that may be accumulated within sub-area.
Y_{max} = Maximum depth of water that may be accumulated within the sub-area.
V_{max} = Maximum volume of water (capacity) that may be accumulated within the sub-area.
V_{rain} = Volume of water generated by rainfall.
V_{acc} = Total volume of water accumulated within the sub-area in the event of a specific rainfall.
Y_{rain} = Depth of water generated by rainfall.
$Elev_{rain}$ = Elevation of water generated by rainfall.
A_{rain} = Area of water generated by rainfall.
Q = Release flow rate.
Drawdown Time = Time required for the total volume of water accumulated within sub-area to subside.

Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA A1 (FLOW TO LEGGETT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	218.25 L/s/ha
Area (A):	2.4770 ha
Runoff Coefficient (C):	0.81
Rainfall Event:	100 year
Release Rate (Q):	0.5406 m³/s
Discharge Factor (K):	1

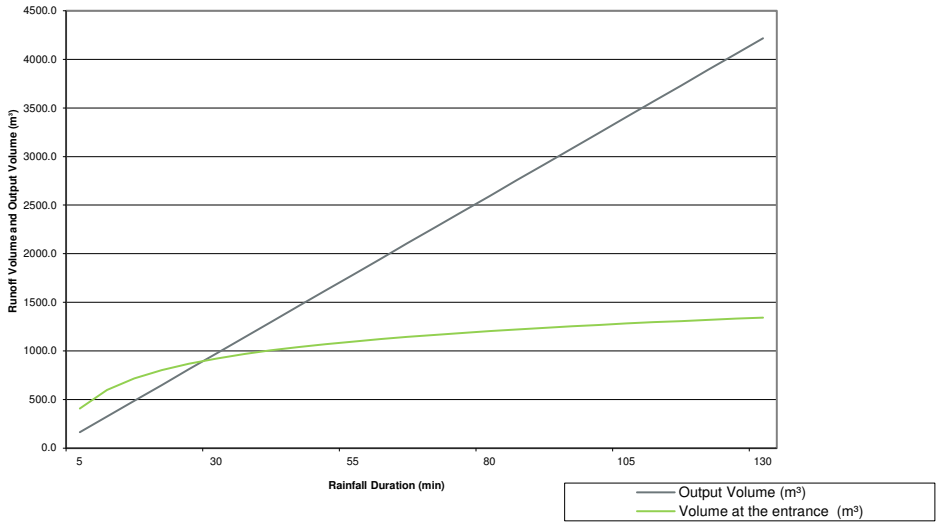
Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

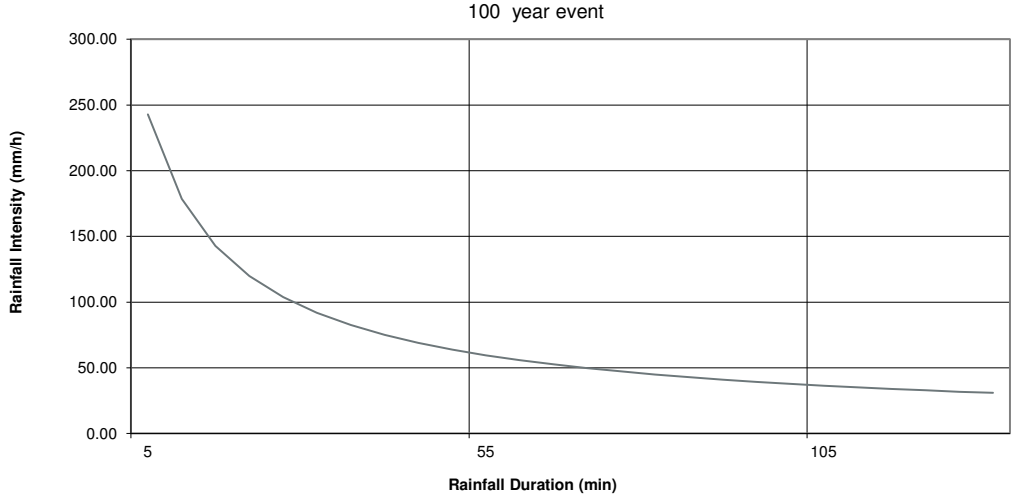
Required Retention Volume: 272.7 m³

Rainfall Duration (min) *T* (1)	Rainfall Intensity (mm/h) *I* (2)	Runoff Volume (m³) *CIAT* (3)	Output Volume (m³) *kQT* (4)	Retention Volume (m³) *(3)-(4)* (5)
5.0	242.7	405.8	162.2	243.6
10.0	**178.6**	**597.1**	**324.4**	**272.7**
15.0	142.9	716.7	486.5	230.2
20.0	120.0	802.2	648.7	153.5
25.0	103.8	868.1	810.9	57.2
30.0	91.9	921.6	973.1	-51.5
35.0	82.6	966.5	1135.3	-168.8
40.0	75.1	1005.1	1297.4	-292.3
45.0	69.1	1039.1	1459.6	-420.6
50.0	64.0	1069.3	1621.8	-552.5
55.0	59.6	1096.6	1784.0	-687.4
60.0	55.9	1121.5	1946.2	-824.7
65.0	52.6	1144.3	2108.3	-964.0
70.0	49.8	1165.5	2270.5	-1105.1
75.0	47.3	1185.2	2432.7	-1247.5
80.0	45.0	1203.6	2594.9	-1391.3
85.0	43.0	1220.9	2757.1	-1536.2
90.0	41.1	1237.3	2919.2	-1682.0
95.0	39.4	1252.7	3081.4	-1828.7
100.0	37.9	1267.5	3243.6	-1976.1
105.0	36.5	1281.5	3405.8	-2124.3
110.0	35.2	1294.9	3568.0	-2273.1
115.0	34.0	1307.7	3730.1	-2422.5
120.0	32.9	1320.0	3892.3	-2572.3
125.0	31.9	1331.8	4054.5	-2722.7
130.0	30.9	1343.2	4216.7	-2873.5
Design Volume:				**272.7**

ATTENUATED AREAS

Required Retention Determination Using the Rational Method





Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

Init._____

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Multi-Use Development (MU Site Area)
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA A2 (FLOW TO TERRY FOX)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

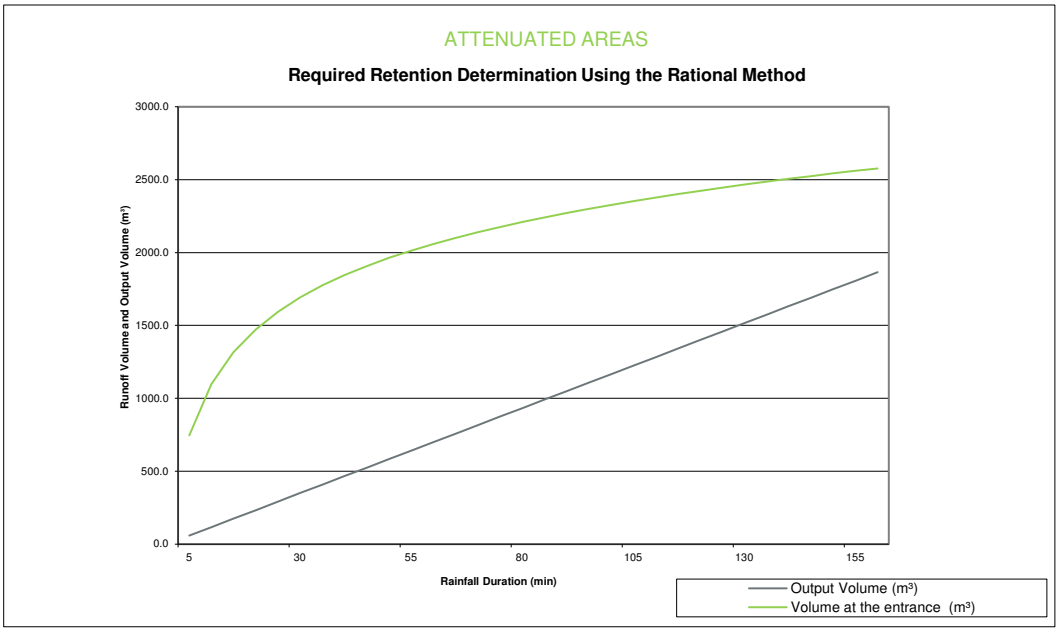
Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	44.31 L/s/ha
Area (A):	4.3850 ha
Runoff Coefficient (C):	0.84
Rainfall Event:	100 year
Release Rate (Q):	0.1943 m³/s
Discharge Factor (K):	1

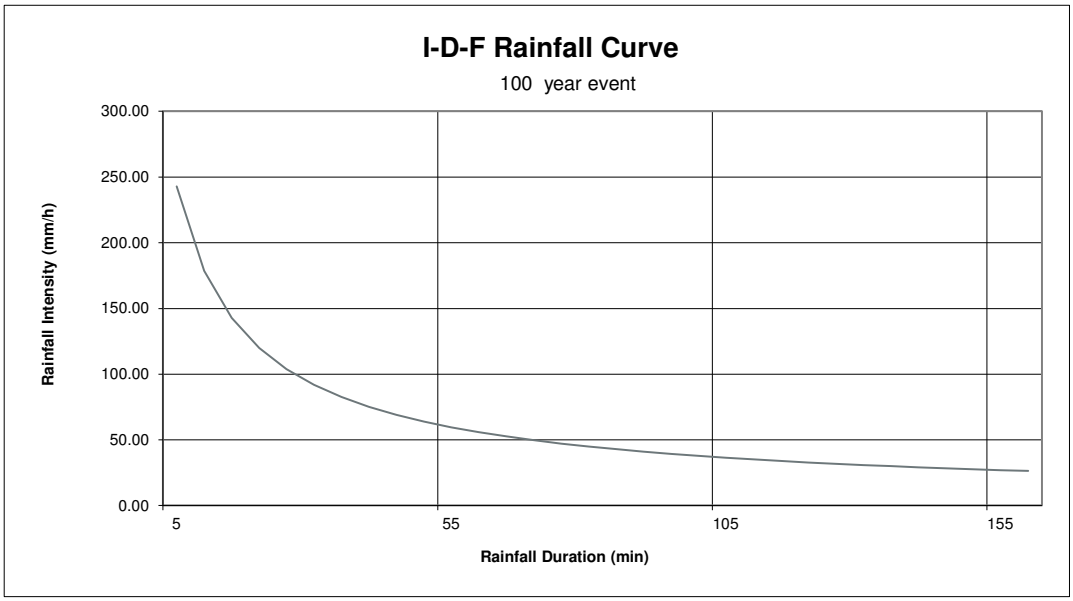
Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

Required Retention Volume: 1382.9 m³

Rainfall Duration (min) *T* (1)	Rainfall Intensity (mm/h) *I* (2)	Runoff Volume (m³) *CIAT* (3)	Output Volume (m³) *kQT* (4)	Retention Volume (m³) *(3)-(4)* (5)
5.0	242.7	745.0	58.3	686.7
10.0	178.6	1096.2	116.6	979.6
15.0	142.9	1315.8	174.9	1141.0
20.0	120.0	1472.8	233.2	1239.6
25.0	103.8	1593.8	291.5	1302.3
30.0	91.9	1691.9	349.7	1342.2
35.0	82.6	1774.3	408.0	1366.3
40.0	75.1	1845.3	466.3	1378.9
45.0	**69.1**	**1907.6**	**524.6**	**1382.9**
50.0	64.0	1963.1	582.9	1380.2
55.0	59.6	2013.2	641.2	1372.0
60.0	55.9	2058.8	699.5	1359.3
65.0	52.6	2100.8	757.8	1343.0
70.0	49.8	2139.6	816.1	1323.5
75.0	47.3	2175.8	874.4	1301.4
80.0	45.0	2209.6	932.6	1277.0
85.0	43.0	2241.4	990.9	1250.5
90.0	41.1	2271.4	1049.2	1222.2
95.0	39.4	2299.9	1107.5	1192.3
100.0	37.9	2326.9	1165.8	1161.1
105.0	36.5	2352.6	1224.1	1128.5
110.0	35.2	2377.2	1282.4	1094.8
115.0	34.0	2400.7	1340.7	1060.1
120.0	32.9	2423.3	1399.0	1024.3
125.0	31.9	2445.0	1457.3	987.7
130.0	30.9	2465.9	1515.5	950.4
135.0	30.0	2486.0	1573.8	912.2
140.0	29.2	2505.5	1632.1	873.4
145.0	28.4	2524.3	1690.4	833.9
150.0	27.6	2542.5	1748.7	793.8
155.0	26.9	2560.2	1807.0	753.2
160.0	26.2	2577.3	1865.3	712.1
Design Volume:				**1382.9**

Init._____



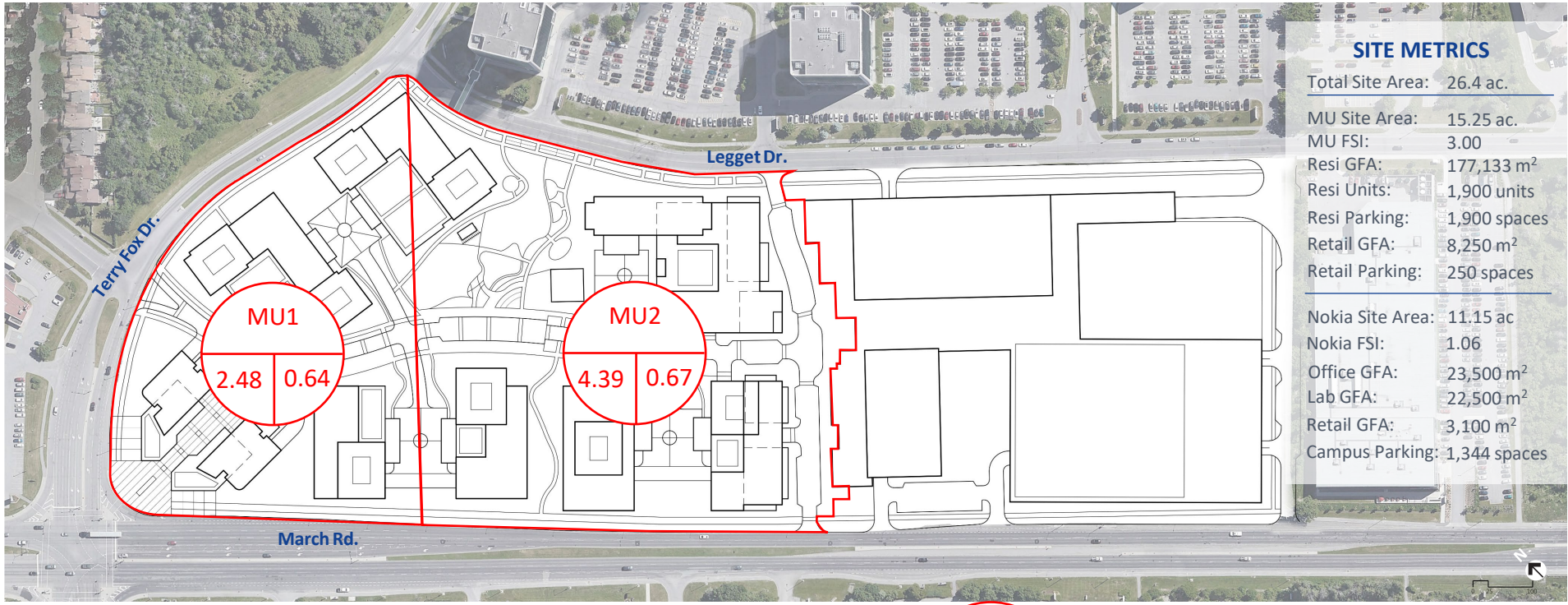


Prepared by: Jaymeson Adams, EIT Date: 2022-04-19

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

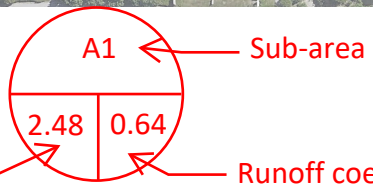
Init._____

New Campus Site Plan



Prepared by: Jaymeson Adams, EIT
Project No.: A001218
Date: 2022-05-06

Legend:



Gensler NOKIA

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
N1	9522	0.20	29294	0.90	38816	**0.73**	**0.91**
TOTAL	**9522**	**0.20**	**29294**	**0.90**	**38816**	**0.73**	**0.91**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
N2	7289	0.20	88	0.90	7376	**0.21**	**0.26**
TOTAL	**7289**	**0.20**	**88**	**0.90**	**7376**	**0.21**	**0.26**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

STORM TRUNK SEWER
1:5 Year Storm Sewer Design Sheet

PROJECT : 114060
DESIGNED BY: SM/FST
CHECKED BY: FST
DATE: Sept. 25, 2014

NOVATECH
Engineers, Planners & Landscape Architects

	AREA	FROM MH	TO MH	AREA (ha) C= 0.20	C = 0.30	C = 0.45	C = 0.55	C = 0.75	C = 0.83	C = 0.85	C = 0.90	INDIV 2.78 AC	ACCUM 2.78 AC	TIME OF CONC. (min)	RAINFALL INTENSITY (mm/hr)	CONTROLLED FLOW Q (L/s)	PEAK FLOW Q (L/s)	PROPOSED SEWER TYPE OF PIPE	PIPE SIZE (mm)	PIPE ID (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	PERCENTAGE OF CAPACITY
	Proposed 528 March Road	STM MH 5	EX STM MH	* Runoff from Area A-1 to A-4 and R-1 to R-6 to be controlled to 167.7 L/s											Controlled Flow	**167.7**	**167.7**	PVC	600	609.6	0.25	26.2	**320.3**	1.10	0.40	52%
	Legget Drive**	EX STM MH	STM MH 4													**167.7**	**167.7**									
N1 sub-area:	Newbridge Prkg**	EX. CBMH 4	EX. L1											13.11	Controlled Flow	**152.0**	**152.0**	CONC	525	533.4	0.18	44.0	**190.3**	0.85	0.86	80%
	Legget Drive**	EX. L1	EX. L2				0.350					0.54	0.54	13.97	87.04		**198.6**	CONC	525	533.4	0.20	65.6	**200.6**	0.90	1.22	99%
	Legget Drive**	EX. L2	STM MH 4				0.210					0.32	0.86	15.19	82.95		**223.0**	CONC	675	685.8	0.17	72.4	**361.6**	0.98	1.23	62%
														16.42												
N2 sub-area:	Newbridge Open Space**	Future	STM MH 4					0.690				1.44	1.44	10.00	104.19		**149.9**									
				* Runoff from Newbridge Open Space to be controlled to 83.1 L/s												**83.1**	**83.1**									
*	KRP Site	STM MH 4	STM MH 3									0.86	0.86													
	KRP Site												0.86	16.42	79.23		**67.8**									
															Controlled Flow	**167.7**										
	KRP Site														Controlled Flow	**152.0**										
*	KRP Site														Controlled Flow	**83.1**	**470.6**	CONC	825	838.2	0.50	30.0	**1058.9**	1.92	0.26	44%
*		STM MH 3	STM MH 2											16.68	78.49		**470.6**	CONC	825	838.2	0.50	50.1	**1058.9**	1.92	0.44	44%
*		STM MH 2	STM MH 1											17.12			**470.6**	CONC	825	838.2	0.50	46.8	**1058.9**	1.92	0.41	44%
*		STM MH 1	New MH 1A											17.52			**470.6**	CONC	825	838.2	1.00	12.8	**1497.5**	2.71	0.08	31%
														17.60												
*	KRP Site	New MH 1A	EX. MH 2					0.320	0.580	0.270	0.140	2.99	3.85	17.60	76.00		**292.6**									
	KRP Site (Tower C Prkg)**														Controlled Flow	**167.7**										
															Controlled Flow	**152.0**										
*															Controlled Flow	**83.1**	**695.4**	CONC	900	914.4	0.27	15.3	**981.3**	1.49	0.17	71%
														17.77												
*	KRP Site (Tower D Prkg)***	EX. MH 2	EX. MH 3					0.840				1.75	5.60	17.77	75.55		**423.2**									
															Controlled Flow	167.7										
															Controlled Flow	152.0										
*															Controlled Flow	83.1	**826.0**	CONC	900	914.4	0.20	37.5	**844.6**	1.29	0.49	98%
														18.26												
*	KRP Site (Tower D)***	EX. MH 3	EX. MH D							0.720	0.140	2.05	7.65	18.26	74.32		**568.8**									
	KRP Site (Hotel)														Controlled Flow	167.7										
															Controlled Flow	152.0										
*															Controlled Flow	83.1	**971.6**	CONC	900	914.4	0.48	64.8	**1308.4**	1.99	0.54	74%
														18.80												
*	KRP Site	EX. MH D	EX. MH 6					2.840				5.92	13.57	18.80	73.00		**990.9**									
	KRP Site (Tower D Prkg)***														Controlled Flow	167.7										
															Controlled Flow	152.0										
*															Controlled Flow	83.1	**1393.7**	CONC	975	990.6	1.20	22.5	**2561.1**	3.32	0.11	54%
														18.91												
*	KRP Site	EX. MH 6	EX. MH 4											18.91			**1393.7**	CONC	1050	1066.8	0.24	46.8	**1395.6**	1.56	0.50	100%
*	KRP Site	EX. MH 4	POND											19.41			**1393.7**	CONC	1050	1066.8	0.44	42.9	**1889.7**	2.11	0.34	74%
														19.75												

NOTES:
1) All flows are assumed to operate under non-restricted flow conditions, unless otherwise indicated.
2) Refer to Novatech DSS & SWM Report (R-2014-064) for details*
3) Refer to Novatech Engineering Dwg. No. 114060-GP for storm manhole number designation.

* Denotes sewers applicable to this C of A appplication. All other sewers shown on this design sheet are private sewers tributary to the storm trunk sewers under application for MOE approval and/or have MOE approval under an existing C of A.

Prepared by: Jaymeson Adams, EIT
Project No.: A001218
Date: 2022-05-06

SHIRLEY'S BROOK

PROPOSED OUTLET DITCH

(LOCATION OF FUTURE STORMWATER MANAGEMENT FACILITY)

PROPOSED 10.0 EASEMENT

EXISTING OUTLET DITCH

CORPORATION OF THE CITY OF KANATA

HEADWALL INVERT = 73.58m

HEADWALL INV. = 74.52

FOX DRIVE

TERRY

MONMOUTH

KRP TOWERS

NEWBRIDGE NETWORKS

LEGGET DRIVE

MARCH ROAD

(FUTURE DEVELOPMENT)

(FUTURE TOWER DEVELOPMENTS)

(FUTURE TOWER DEVELOPMENT)

PROPOSED 10 STOREY BUILDING PHASE 3 TOWER C

STM CAP INV.=76.15

STM MH #106

STM MH #104

STM MH #102

STM MH 100

CBMH #110 C/W 93mm ø ORIFICE PLATE

CBMH #112 C/W 65mm ø ORIFICE PLATE

CBMH #118 C/W 44mm ø ORIFICE PLATE

CBMH #116 C/W 97mm ø ORIFICE PLATE

CB #115 C/W 64mm ø ORIFICE PLATE

CB #119 C/W 64mm ø ORIFICE PLATE

MH #114

NOTE: APPROVAL OF STORMWATER INLET CONTROLS TO BE ADDRESSED UNDER A SEPARATE MOEE APPLICATION

CB MH 4 C/W NEW 220ø PLUG-TYPE ICD

CB MH 2 C/W NEW 161ø PLUG-TYPE ICD

CB MH 3 C/W NEW 108mm PLUG-TYPE ICD

CB MH 1 C/W NEW 113ø PLUG-TYPE ICD

PROPOSED LOCATION OF PLUG TYPE ICD

FUTURE ROAD ALLOWANCE (BROOKSTREET)

SHIRLEY'S BROOK

S.R. TELECOM

N1

N2

LEGEND

- 2.02 / 100–102 / 0.6 — DRAINAGE AREA (hectares) / MANHOLE TO MANHOLE / RUN-OFF COEFFICIENT
- STORM DRAINAGE AREA
- STORM DRAINAGE AREA BOUNDARY
- MH #100 — EXISTING STORM SEWER AND MANHOLE
- CBMH #116 — EXISTING CATCHBASIN MANHOLE
- CB #119 — EXISTING CATCHBASIN
- DIRECTION OF FLOW
- MINOR STORM SYSTEM FLOW ROUTING (UNDEVELOPED AREAS)

NOTE:

1. RUNOFF COEFFICIENTS FOR TOWER 'C' PHASE 3 DEVELOPMENT ARE AS OUTLINED IN *"KANATA RESEARCH PARK - TOWER 'C' STORMWATER MANAGEMENT REPORT"* (NECL, Dec 1998)
2. APPROVAL OF STORMWATER INLET CONTROLS FOR THE EXISTING NEWBRIDGE PARKING LOT (PLUG TYPE ICD'S) TO BE ADDRESSED UNDER A SEPARATE MOEE APPLICATION.

Prepared by: Jaymeson Adams, EIT
Project No.: A001218
Date: 2022-04-20

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

KANATA RESEARCH PARK
Kanata Research Park Corporation
555 Legget Drive, Suite 300, Kanata, Ontario, Canada, K2K 2X3
(613)591-6594

No.	REVISION	DATE	BY
2	REVISED STORM SEWER PER R.M.O.C. COMMENTS	APR. 15/99	GSH
1	ISSUED FOR COMMENTS	DEC. 11/98	GSH

LICENSED PROFESSIONAL ENGINEER — UDO BOEHME — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — G. S. HOLOWACH — PROVINCE OF ONTARIO

NOVATECH
CONSULTING ENGINEERS & PLANNERS
Suite 17, 77 Auriga Drive
Nepean, Ontario
K2E 7Z7
Telephone (613)727-1658
Facsimile (613)727-6972

		SCALE
DESIGN	GSH	1:1000
CHECKED	UB	
DRAWN	DU	
CHECKED	GSH	
APPROVED	UB	

CITY OF KANATA
KANATA RESEARCH PARK
TOWER 'C' PROJECT

STORM DRAINAGE AREA PLAN

PROJECT No. 98066
DATE SEPTEMBER 1998
DRAWING No. 98066-STM

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
N1	3679	0.20	30448	0.90	34127	**0.82**	**0.95**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (5-year)	Weighted Runoff Coefficient (100-year)
N2	2250	0.20	8948	0.90	11198	**0.76**	**0.95**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Nokia Site Area
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

STORMWATER MANAGEMENT – PRELIMINARY RETENTION CALCULATIONS – EXISTING NEWBRIDGE PARKING AREA (N1)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

STORMWATER MANAGEMENT SUMMARY - STORAGE AND DRAWDOWN:

DESIGN CRITERIA:

Rainfall event	100.0	years
Roof Retention	21.85	L/s
Underground Storage	130.15	L/s
Allowable Release Rate	152.00	L/s

Sub-Area	Total Area (m^2)	Available Storage Area (m^2)	Catchbasin/ Roof Drain Elevation (m)	Maximum Ponding Elevation (m)	Y_{max} (m)	V_{max} (m^3)	V_{rain} (m^3)	V_{acc} (m^3)	Y_{rain} (m)	$Elev_{rain}$ (m)	A_{rain} (m^2)	Q (L/s)	Drawdown Time (min)	Comments
N1.A	12234	12234	100.00	100.15	0.15	611.7	607.6	607.6	0.15	100.15	12193	21.85	463	Roof Storage
N1.B	21893	-	-	-	-	729.6	729.6	729.6	-	-	-	130.15	-	Underground tank
Total	**34127**	**12234**				**1341.3**	**1337.2**	**1337.2**				**152.00**		

DEFINITIONS OF ABBREVIATIONS USED IN CALCULATION TABLE:

NC = Area is not controlled (unattenuated)
Available Area = Area of water accumulated in sub-area at Max. Elev.
Catchbasin Elev. = Elevation of catchbasin inlet (top of grate).
Max. Elev. = Maximum elevation of water that may be accumulated within sub-area.
Y_{max} = Maximum depth of water that may be accumulated within the sub-area.
V_{max} = Maximum volume of water (capacity) that may be accumulated within the sub-area.
V_{rain} = Volume of water generated by rainfall.
V_{acc} = Total volume of water accumulated within the sub-area in the event of a specific rainfall.
Y_{rain} = Depth of water generated by rainfall.
$Elev_{rain}$ = Elevation of water generated by rainfall.
A_{rain} = Area of water generated by rainfall.
Q = Release flow rate.
Drawdown Time = Time required for the total volume of water accumulated within sub-area to subside.

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA N1.A (ROOF STORAGE)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	17.86 L/s/ha
Area (A):	1.2234 ha
Runoff Coefficient (C):	0.95
Rainfall Event:	100 year
Release Rate (Q):	0.0219 m³/s
Discharge Factor (K):	1

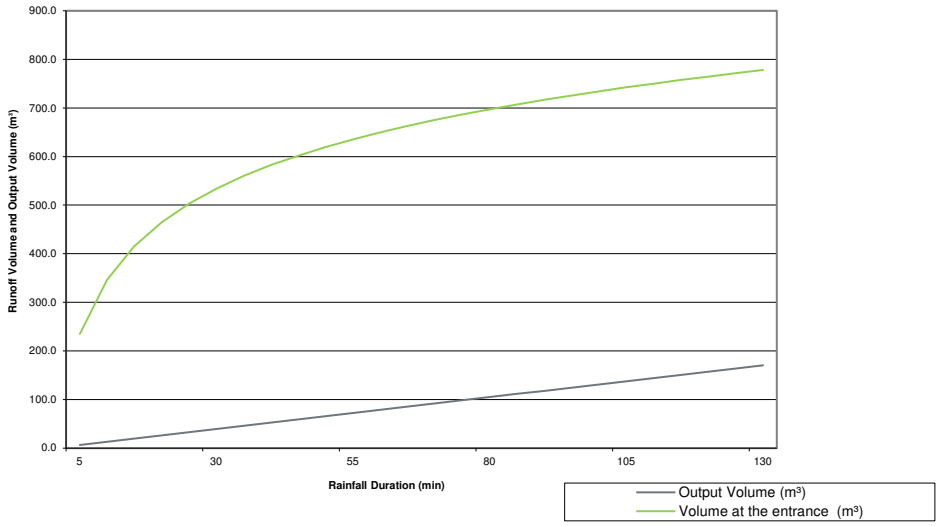
Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

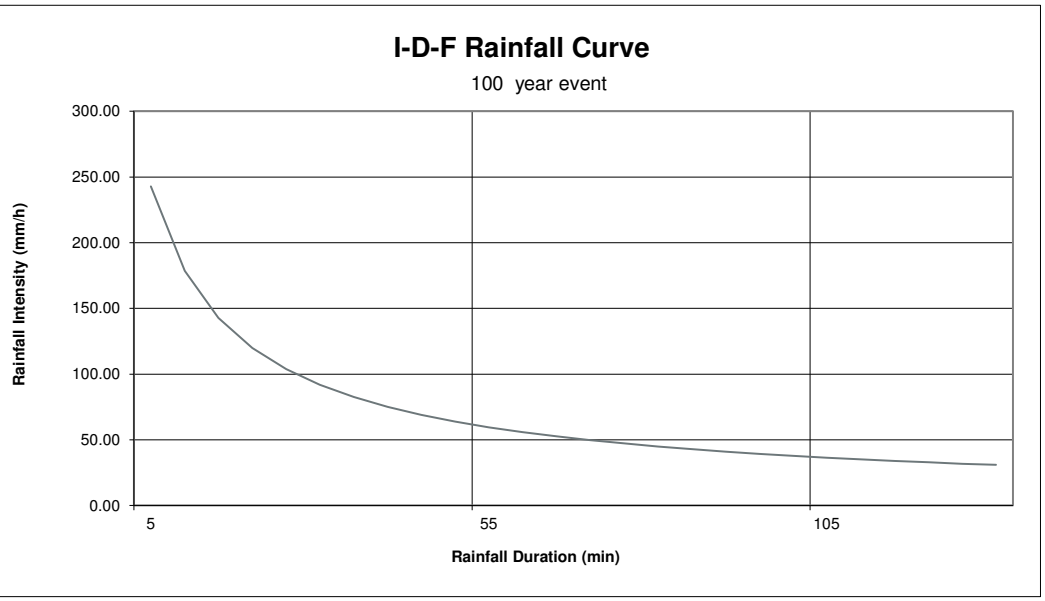
Required Retention Volume:	**607.6 m³**

Rainfall Duration (min) *T* (1)	**Rainfall Intensity** (mm/h) *I* (2)	**Runoff Volume** (m³) *CIAT* (3)	**Output Volume** (m³) *kQT* (4)	**Retention Volume** (m³) *(3)-(4)* (5)
5.0	242.7	235.1	6.6	228.5
10.0	178.6	345.9	13.1	332.8
15.0	142.9	415.2	19.7	395.5
20.0	120.0	464.7	26.2	438.5
25.0	103.8	502.9	32.8	470.1
30.0	91.9	533.9	39.3	494.5
35.0	82.6	559.9	45.9	514.0
40.0	75.1	582.2	52.4	529.8
45.0	69.1	601.9	59.0	542.9
50.0	64.0	619.4	65.6	553.9
55.0	59.6	635.2	72.1	563.1
60.0	55.9	649.6	78.7	571.0
65.0	52.6	662.9	85.2	577.6
70.0	49.8	675.1	91.8	583.3
75.0	47.3	686.5	98.3	588.2
80.0	45.0	697.2	104.9	592.3
85.0	43.0	707.2	111.4	595.8
90.0	41.1	716.7	118.0	598.7
95.0	39.4	725.7	124.5	601.1
100.0	37.9	734.2	131.1	603.1
105.0	36.5	742.3	137.7	604.7
110.0	35.2	750.1	144.2	605.9
115.0	34.0	757.5	150.8	606.7
120.0	32.9	764.6	157.3	607.3
125.0	31.9	771.5	163.9	607.6
130.0	**30.9**	**778.1**	**170.4**	**607.6**
Design Volume:				**607.6**

ATTENUATED AREAS

Required Retention Determination Using the Rational Method





Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

Init._____

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA N1.B (UNDERGROUND STORAGE)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	59.45 L/s/ha
Area (A):	2.1893 ha
Runoff Coefficient (C):	0.95
Rainfall Event:	100 year
Release Rate (Q):	0.1302 m³/s
Discharge Factor (K):	1

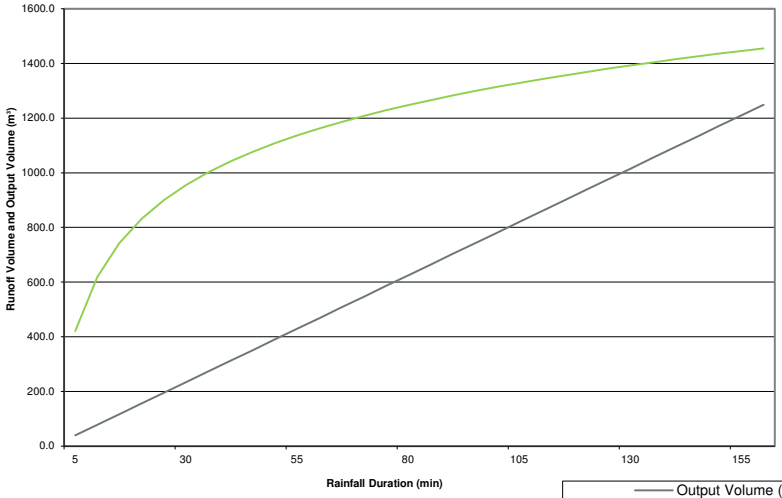
Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

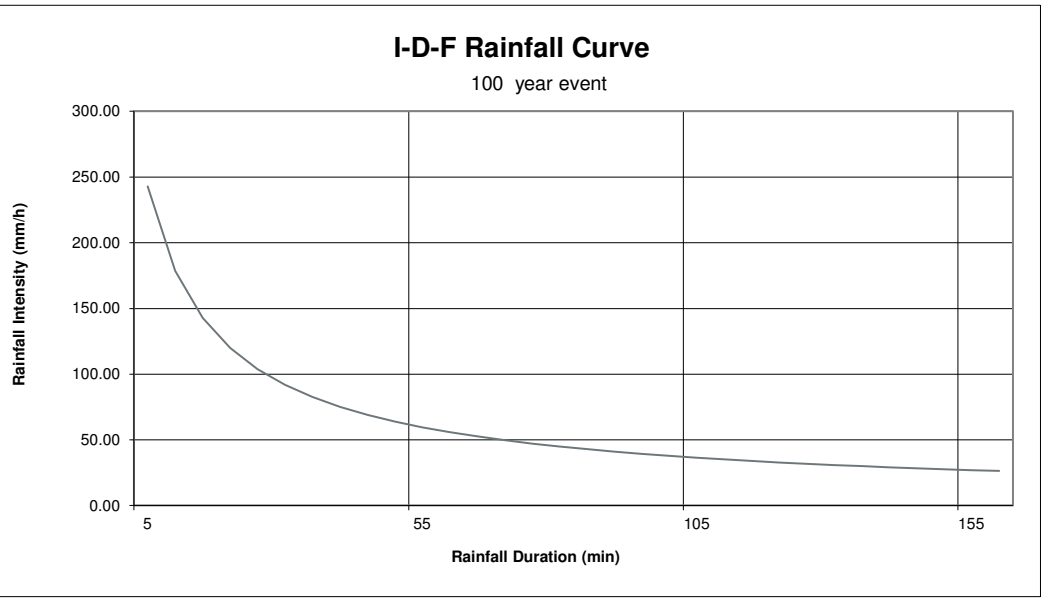
Required Retention Volume: 729.6 m³

Rainfall Duration (min) *T* (1)	Rainfall Intensity (mm/h) *I* (2)	Runoff Volume (m³) *CIAT* (3)	Output Volume (m³) *kQT* (4)	Retention Volume (m³) *(3)-(4)* (5)
5.0	242.7	420.7	39.0	381.6
10.0	178.6	619.0	78.1	540.9
15.0	142.9	743.0	117.1	625.9
20.0	120.0	831.6	156.2	675.4
25.0	103.8	899.9	195.2	704.7
30.0	91.9	955.4	234.3	721.1
35.0	82.6	1001.9	273.3	728.6
40.0	**75.1**	**1041.9**	**312.4**	**729.6**
45.0	69.1	1077.1	351.4	725.7
50.0	64.0	1108.4	390.5	718.0
55.0	59.6	1136.7	429.5	707.2
60.0	55.9	1162.5	468.5	694.0
65.0	52.6	1186.2	507.6	678.6
70.0	49.8	1208.1	546.6	661.5
75.0	47.3	1228.5	585.7	642.9
80.0	45.0	1247.6	624.7	622.9
85.0	43.0	1265.6	663.8	601.8
90.0	41.1	1282.6	702.8	579.7
95.0	39.4	1298.6	741.9	556.8
100.0	37.9	1313.9	780.9	533.0
105.0	36.5	1328.4	819.9	508.5
110.0	35.2	1342.3	859.0	483.3
115.0	34.0	1355.6	898.0	457.5
120.0	32.9	1368.3	937.1	431.2
125.0	31.9	1380.6	976.1	404.4
130.0	30.9	1392.4	1015.2	377.2
135.0	30.0	1403.7	1054.2	349.5
140.0	29.2	1414.7	1093.3	321.5
145.0	28.4	1425.4	1132.3	293.1
150.0	27.6	1435.6	1171.4	264.3
155.0	26.9	1445.6	1210.4	235.2
160.0	26.2	1455.3	1249.4	205.9
Design Volume:				**729.6**

ATTENUATED AREAS

Required Retention Determination Using the Rational Method





Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

Init._____

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
Nokia Site Area
CIMA+ PROJECT NUMBER: A001218
CLIENT: NOKIA
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

STORMWATER MANAGEMENT – PRELIMINARY RETENTION CALCULATIONS – EXISTING NEWBRIDGE OPEN SPACE (N2)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

STORMWATER MANAGEMENT SUMMARY - STORAGE AND DRAWDOWN:

DESIGN CRITERIA:

Rainfall event	100.0	years
Flows to Catch Basins	15.9	L/s
Flows to Underground Storage	67.2	L/s
Allowable Release Rate	83.1	L/s

Sub-Area	Total Area (m^2)	Available Storage Area (m^2)	Catchbasin/ Roof Drain Elevation (m)	Maximum Ponding Elevation (m)	Y_{max} (m)	V_{max} (m^3)	V_{rain} (m^3)	V_{acc} (m^3)	Y_{rain} (m)	$Elev_{rain}$ (m)	A_{rain} (m^2)	Q (L/s)	Drawdown Time (min)	Comments
N2.A	1964	1964	100.00	100.15	0.15	98.2	57.1	57.1	0.11	100.11	1498	15.9	60	To CB's
N2.B	9234	-	-	-	-	218.8	218.8	218.8	-	-	-	67.2	54	Underground tank
Total	**11198**	**1964**				**317.0**	**276.0**	**276.0**				**83.1**		

DEFINITIONS OF ABBREVIATIONS USED IN CALCULATION TABLE:

NC = Area is not controlled (unattenuated)
Available Area = Area of water accumulated in sub-area at Max. Elev.
Catchbasin Elev. = Elevation of catchbasin inlet (top of grate).
Max. Elev. = Maximum elevation of water that may be accumulated within sub-area.
Y_{max} = Maximum depth of water that may be accumulated within the sub-area.
V_{max} = Maximum volume of water (capacity) that may be accumulated within the sub-area.
V_{rain} = Volume of water generated by rainfall.
V_{acc} = Total volume of water accumulated within the sub-area in the event of a specific rainfall.
Y_{rain} = Depth of water generated by rainfall.
$Elev_{rain}$ = Elevation of water generated by rainfall.
A_{rain} = Area of water generated by rainfall.
Q = Release flow rate.
Drawdown Time = Time required for the total volume of water accumulated within sub-area to subside.

Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA A1 (BLOCK 1)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	80.81 L/s/ha
Area (A):	0.1964 ha
Runoff Coefficient (C):	0.95
Rainfall Event:	100 year
Release Rate (Q):	0.0159 m³/s
Discharge Factor (K):	1

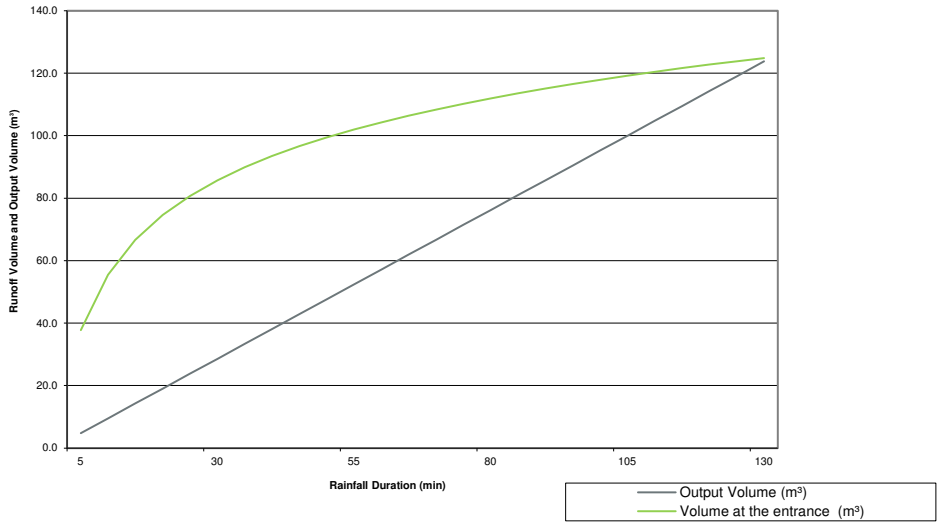
Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

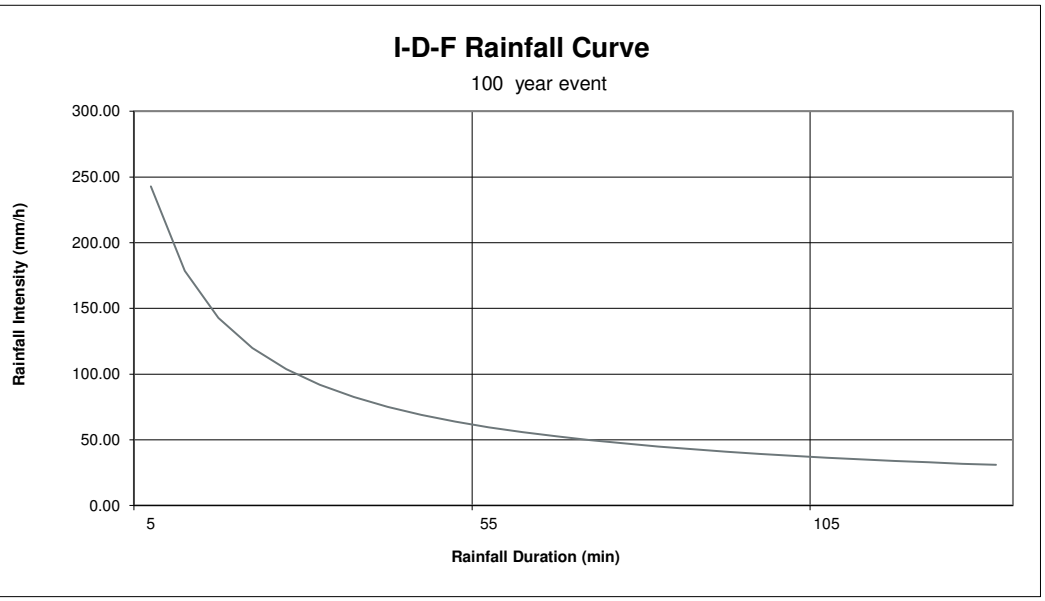
Required Retention Volume: 57.1 m³

Rainfall Duration (min) *T* (1)	Rainfall Intensity (mm/h) *I* (2)	Runoff Volume (m³) *CIAT* (3)	Output Volume (m³) *kQT* (4)	Retention Volume (m³) *(3)-(4)* (5)
5.0	242.7	37.7	4.8	33.0
10.0	178.6	55.5	9.5	46.0
15.0	142.9	66.7	14.3	52.4
20.0	120.0	74.6	19.0	55.6
25.0	103.8	80.7	23.8	56.9
30.0	**91.9**	**85.7**	**28.6**	**57.1**
35.0	82.6	89.9	33.3	56.5
40.0	75.1	93.5	38.1	55.4
45.0	69.1	96.6	42.9	53.8
50.0	64.0	99.4	47.6	51.8
55.0	59.6	102.0	52.4	49.6
60.0	55.9	104.3	57.1	47.2
65.0	52.6	106.4	61.9	44.5
70.0	49.8	108.4	66.7	41.7
75.0	47.3	110.2	71.4	38.8
80.0	45.0	111.9	76.2	35.7
85.0	43.0	113.5	80.9	32.6
90.0	41.1	115.1	85.7	29.4
95.0	39.4	116.5	90.5	26.0
100.0	37.9	117.9	95.2	22.6
105.0	36.5	119.2	100.0	19.2
110.0	35.2	120.4	104.7	15.7
115.0	34.0	121.6	109.5	12.1
120.0	32.9	122.8	114.3	8.5
125.0	31.9	123.8	119.0	4.8
130.0	30.9	124.9	123.8	1.1
Design Volume:				**57.1**

ATTENUATED AREAS

Required Retention Determination Using the Rational Method





Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

Init._____

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR FOR SUB-CATCHMENT AREA A2 (BLOCK 2)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	72.77 L/s/ha
Area (A):	0.9234 ha
Runoff Coefficient (C):	0.8
Rainfall Event:	100 year
Release Rate (Q):	0.0672 m³/s
Discharge Factor (K):	1

Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

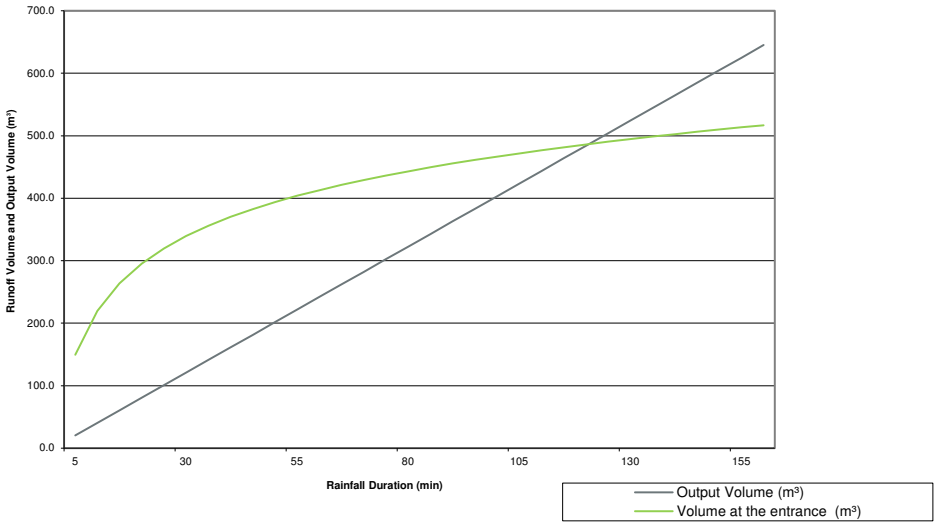
Required Retention Volume: 218.8 m³

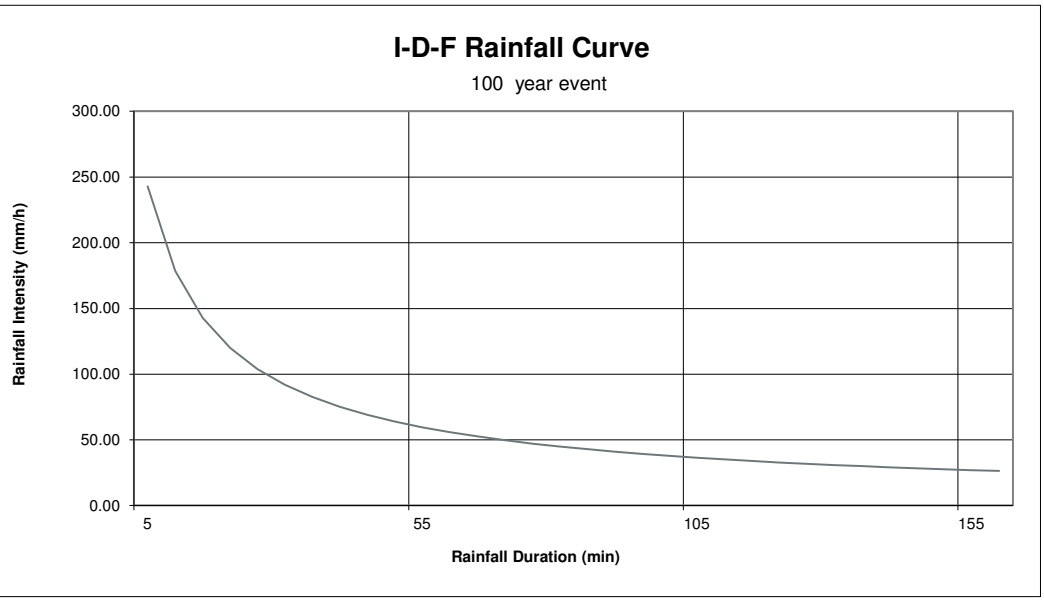
Rainfall Duration (min) *T* (1)	**Rainfall Intensity** (mm/h) *I* (2)	**Runoff Volume** (m³) *CIAT* (3)	**Output Volume** (m³) *kQT* (4)	**Retention Volume** (m³) *(3)-(4)* (5)
5.0	242.7	149.4	20.2	129.2
10.0	178.6	219.8	40.3	179.5
15.0	142.9	263.9	60.5	203.4
20.0	120.0	295.4	80.6	214.7
25.0	**103.8**	**319.6**	**100.8**	**218.8**
30.0	91.9	339.3	121.0	218.4
35.0	82.6	355.8	141.1	214.7
40.0	75.1	370.1	161.3	208.8
45.0	69.1	382.6	181.4	201.1
50.0	64.0	393.7	201.6	192.1
55.0	59.6	403.7	221.8	182.0
60.0	55.9	412.9	241.9	171.0
65.0	52.6	421.3	262.1	159.2
70.0	49.8	429.1	282.2	146.9
75.0	47.3	436.4	302.4	134.0
80.0	45.0	443.1	322.6	120.6
85.0	43.0	449.5	342.7	106.8
90.0	41.1	455.5	362.9	92.7
95.0	39.4	461.2	383.0	78.2
100.0	37.9	466.7	403.2	63.5
105.0	36.5	471.8	423.4	48.5
110.0	35.2	476.8	443.5	33.2
115.0	34.0	481.5	463.7	17.8
120.0	32.9	486.0	483.8	2.2
125.0	31.9	490.4	504.0	-13.6
130.0	30.9	494.5	524.2	-29.6
135.0	30.0	498.6	544.3	-45.7
140.0	29.2	502.5	564.5	-62.0
145.0	28.4	506.3	584.6	-78.4
150.0	27.6	509.9	604.8	-94.9
155.0	26.9	513.5	625.0	-111.5
160.0	26.2	516.9	645.1	-128.2
Design Volume:				**218.8**

Init._____

ATTENUATED AREAS

Required Retention Determination Using the Rational Method



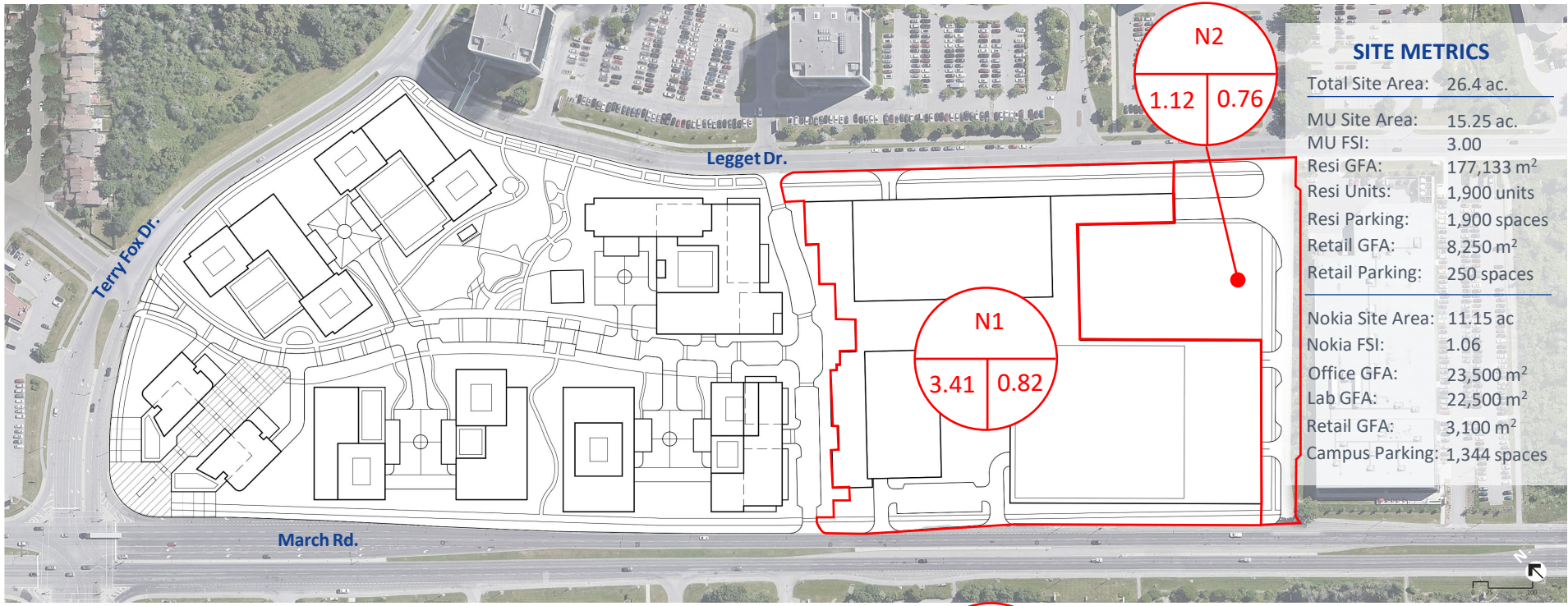


Prepared by: Jaymeson Adams, EIT Date: 2022-04-20

Verified by: Tim Kennedy, P.Eng. Date: 2022-05-06
PEO# 100173201

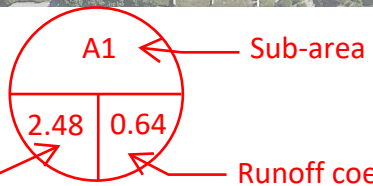
Init._____

New Campus Site Plan



Prepared by: Jaymeson Adams, EIT
Project No.: A001218
Date: 2022-05-06

Legend:



Gensler NOKIA

F

Appendix F
Response to Technical Circulation Comments

From: Candow, Julie
To: Clodd, Aaron; Tim Kennedy
Subject: RE: 570 and 600 March Rd, Nokia Site - Meeting Request to Discuss Servicing Options
Date: Monday, July 18, 2022 9:27:22 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

EXTERNAL EMAIL

Hi Aaron,

No comments were received, yes please proceed with updating the Adequacy of Public Services Report as per your draft submission.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Clodd, Aaron <Aaron.Clodd@colliers.com>
Sent: July 18, 2022 9:19 AM
To: Candow, Julie <julie.candow@ottawa.ca>; Tim Kennedy <tim.kennedy@cima.ca>
Subject: RE: 570 and 600 March Rd, Nokia Site - Meeting Request to Discuss Servicing Options

Good Morning Julie,

I assume no additional comments were received over the weekend. Can you please confirm again that CIMA's draft response letter satisfies your departments comments and concerns and we can now issues the formal response letter?

Thank you again for making this project a priority.

Aaron Clodd M.Sc.Pl
Director, Development Management
Strategy & Consulting Group
Aaron.Clodd@colliers.com | View my profile
Direct: +1 905 960 4506
181 Bay Street, Suite #1400 | Toronto, ON M5J 2V1 | Canada

collierscanada.com | View Privacy Policy

From: Candow, Julie <julie.candow@ottawa.ca>
Sent: Friday, July 15, 2022 3:41 PM
To: Tim Kennedy <tim.kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>
Subject: RE: 570 and 600 March Rd, Nokia Site - Meeting Request to Discuss Servicing Options

Hi Tim,

I haven't received any further comments from our meeting yesterday. I will let you know if any trickle in over the weekend.

Enjoy your weekend

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

From: Candow, Julie
Sent: July 14, 2022 3:21 PM
To: Tim Kennedy <tim.kennedy@cima.ca>
Cc: Clodd, Aaron <Aaron.Clodd@colliers.com>
Subject: RE: 570 and 600 March Rd, Nokia Site - Meeting Request to Discuss Servicing Options

Hi Tim,

As a follow up to our meeting today, I have requested any outstanding comments from City staff to be submitted by the end of the week. Just as a heads up, I will be asking that the comments from the

first submission and the preferred sanitary servicing strategy be incorporated into the Adequacy of Public Services Report. I personally have no further comments based on your comment response letter, only to merge your results / conclusions into the report.

I will follow up again at the end of this week with final comments, if any.

Thanks,

Julie Candow, P.Eng
Project Manager
Planning, Real Estate and Economic Development Department - West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON
613.580.2424 ext. 13850

Please take note that due to the current COVID situation, I am working remotely and phone communication may not be reliable at this time. The best way to reach me is by email.

-----Original Appointment-----
From: Candow, Julie
Sent: June 24, 2022 11:44 AM
To: Candow, Julie; Clodd, Aaron; Tim Kennedy; Alting-Mees, Birgitte; Bougadis, John; Munteanu, Adrian; Zaknoun, Hasnaa
Cc: Walker, Krishon; Hugues Bisson; Varghese, Renjit; O'Brien, Christopher; Feilders, Andrea
Subject: 570 and 600 March Rd, Nokia Site - Meeting Request to Discuss Servicing Options
When: July 14, 2022 1:00 PM-2:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting

Hello All,

Aaron Clodd (Colliers) and Tim Kennedy (CIMA+) have requested a meeting with AM staff to discuss the servicing options surrounding the Nokia site at 570 and 600 March Road. I have asked CIMA+ to provide a preliminary servicing analysis for the City's review prior to this meeting.

For reference, I have provided below the engineering comments that were provided to the applicant following the Zoning By-law Amendment review:

1. Please provide an internal water and sewer plan to support the master plan concept.
2. Please provide a conceptual phasing plan to support the master plan concept.
3. As noted in the report, Asset Management will not support the design and construction of buildings that require a fire flow exceeding 21,000 l/min (350 l/s).
4. The water demands and sanitary demands for the commercial and industrial area should be calculated using 28,000 L/gross ha/day and 35,000 L/gross ha/day, respectively. The entire hectarage of each plot shall be used in the calculation, versus the floor area of each commercial/industrial space. Alternatively, Appendix 4-A of the Sewer Design Guidelines can

be used to estimate the Daily Volume in Liters based on the use of each commercial space. Please update all calculations accordingly.

5. A sanitary lift station within Legget Drive is not acceptable to the City. Please complete an assessment to explore alternative sanitary servicing options for this site. It has been determined that a City easement was taken for the existing 250mm diameter sanitary running from Legget Drive, through the golf course, to the sanitary collector. As such, this sewer is registered as public infrastructure as opposed to private infrastructure, and may serve as a possible outlet for the subject property (pending confirmation of sanitary capacity). Sanitary servicing options may include one or a combination of the following:
    a. Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the southern portion of the site (outletting through the golf course);
    b. Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the northern portion of the site;
    c. Connecting to the existing 250mm diameter sanitary sewer on Terry Fox Drive at the north end of the site;
    d. Explore upsizing existing infrastructure, if required;
    e. Constructing a private pump station at the south end of the property c/w a private forcemain on Legget Drive. This would require a License of Occupation from the City;
    f. Install a sanitary sewer west on Terry Fox Drive to connect to the existing 600mm diameter collector sewer (west of the Terry Fox and March Road intersection).
6. Further discussion to be had at the Site Plan Control stage regarding the installation of a local watermain on Legget Drive from the subject site to Solandt Road to provide a secondary feed to the site that is not dependent on the backbone watermain. A cost sharing agreement with the City would be implemented for the construction of this watermain.

Microsoft Teams meeting

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unauthorized. Thank you.

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TO	:	Mr. Krishon Walker
PROJECT	:	**570 & 600 March Road**
FROM	:	Jaymeson Adams, P.Eng. CIMA+
DATE	:	July 13, 2022
SUBJECT	:	**Response to Technical Circulation Comments** **Municipal File No.: D-01-01-22-0006 and D02-02-22-0034 (Zoning By-law Amendment)**

Dear Mr. Walker,

This letter is in response to the **570 & 600 March Road Zoning Review Comments** provided by the City's Planning, Infrastructure and Economic Development Department and dated June 14, 2022, with responses from CIMA+ in relation to adequacy of servicing as follows.

2. Engineering

2.1 *Please provide an internal water and sewer plan to support the master plan concept.*

CIMA+ Response: Please see attached internal water and sewer plan sketch (refer to Appendix A).

2.2 *Please provide a conceptual phasing plan to support the master plan concept.*

CIMA+ Response: Regarding phasing the Nokia Site Area would be completed in Phase 1, with the Multi-Use Site Area following in Phase 2 of development.

2.3 *As noted in the report, Asset Management will not support the design and construction of buildings that require a fire flow exceeding 21,000 l/min (350 l/s).*

CIMA+ Response: Noted and identified in previously provided Assessment of Adequacy of Public Services Report.

2.4 *The water demands and sanitary demands for the commercial and industrial area should be calculated using 28,000 L/gross ha/day and 35,000 L/gross ha/day, respectively. The entire hectarage of each plot shall be used in the calculation, versus the floor area of each commercial/industrial space. Alternatively, Appendix 4-A of the*

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Ottawa ON K2P 2G8
CANADA

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F 613 860-1870
cima.ca

Sewer Design Guidelines can be used to estimate the Daily Volume in Liters based on the use of each commercial space. Please update all calculations accordingly.

CIMA+ Response: Please see attached for updated water and sanitary demands (refer to Appendix B).

2.5 *A sanitary lift station within Legget Drive is not acceptable to the City. Please complete an assessment to explore alternative sanitary servicing options for this site. It has been determined that a City easement was taken for the existing 250mm diameter sanitary running from Legget Drive, through the golf course, to the sanitary collector. As such, this sewer is registered as public infrastructure as opposed to private infrastructure, and may serve as a possible outlet for the subject property (pending confirmation of sanitary capacity). Sanitary servicing options may include one or a combination of the following:*

- *Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the southern portion of the site (outletting through the golf course);*
- **CIMA+ Response:** The Sanitary Sewer Design Sheet provided as part of the Sanmina Development Servicing Study and Stormwater Management Report has been revised to include the increased flow from the proposed Nokia Site Area as well as the updated flow from the more recently developed "KRP Site (Parking Structure)" area (refer to Appendix C for SSDS and supporting flow calculations). As demonstrated in the SSDS there is available capacity within the existing network to service the Nokia Site Area under peak flow demands.

  Furthermore, based on preliminary analysis there is additional capacity available to service a portion of the MU Site Area, with an available capacity of approximately 10.2 L/s.

- *Connecting to the existing 250mm diameter sanitary sewer on Legget Drive at the northern portion of the site;*
- **CIMA+ Response:** Considering there were no existing Sanitary Sewer Design Sheets available from previous reports in the area, CIMA+ has completed an analysis of the existing network utilizing available as-built information and GeoOttawa (refer to Appendix D for SSDS and supporting flow calculations). Further analysis would be required at the site plan control stage to confirm connection points of abutting properties, etc. which have been assumed based on the available information as part of this analysis.

A sanitary flow of 12.32 L/s has been determined for the Nokia Site under existing conditions and utilized in the attached SSDS. Under this scenario the downstream sewer segment between MHSA12515 and MHSA48493 along Terry Fox would just reach capacity under existing peak conditions. To accommodate the additional flow from the MU Site area the available capacity to the south (10.2 L/s) would be utilized and the sewer segment from MHSA12515 along Terry Fox to the 750 mm Trunk Sewer would require upsizing to accommodate the additional flow of 12.15 L/s.

For clarity the total required flow for the MU Site Area (34.67 L/s) would be accomplished by directing 10.2 L/s to the south outletting through the golf course and the remaining flow of 24.47 L/s (12.15 L/s + 12.32 L/s) to the north along Leggett Drive to Terry Fox, which outlets to the 750 mm diameter trunk sewer.

The City would need to confirm available capacity in the 750 mm trunk sewer to accommodate a total additional flow of 22.35 L/s from the MU Site area to the north and an additional flow of 13.79 L/s from the MU and Nokia Site areas to the south.

- *Connecting to the existing 250mm diameter sanitary sewer on Terry Fox Drive at the north end of the site;*
- **CIMA+ Response:** This is not preferred given existing grading and servicing constraints and is not required given the available options as noted above.

- *Explore upsizing existing infrastructure, if required;*
- **CIMA+ Response:** Based on preliminary analysis upsizing of the sewer segment from MHSA12515 along Terry Fox to the 750 mm Trunk Sewer would be required to accommodate the proposed flows. Additional analysis such as flow monitoring of the north and south networks may provide further insight into available capacity and potentially eliminate the need for upsizing at the Site Plan Control Stage.

- *Constructing a private pump station at the south end of the property c/w a private forcemain on Legget Drive. This would require a License of Occupation from the City;*

- **CIMA+ Response:** The installation of a private pump station on site with private forcemain is not preferred given the available options as noted above.

- *Install a sanitary sewer west on Terry Fox Drive to connect to the existing 600mm diameter collector sewer (west of the Terry Fox and March Road intersection).*
- **CIMA+ Response:** Considering the invert elevation at the connection point to the 600 mm diameter collector sewer, installation of a private pump station and forcemain would be required which is not preferred given the available options as noted above.

2.6 *Further discussion to be had at the Site Plan Control stage regarding the installation of a local watermain on Legget Drive from the subject site to Solandt Road to provide a secondary feed to the site that is not dependent on the backbone watermain. A cost sharing agreement with the City would be implemented for the construction of this watermain.*

CIMA+ Response: Noted, however based on previous correspondence from the City, connections to the backbone watermain were required to achieve the RFF. It does not appear that this would add value to the proposed development.

8. Conservation Authority

8.1 *Please see MVCA Comment Letter attached.*

The SWM design criteria for drainage area MU mentioned, "the north cell of the existing SWMF -1 had been sized to receive the 100-year pre-development flow for the site". Please clarify if the allowable release rate from the site is based on the 100-year pre-development conditions for a 100-year storm?

CIMA+ Response: Yes, the allowable release rate for the 100-year storm is based on the 100-year pre-development condition.

Prepared by:

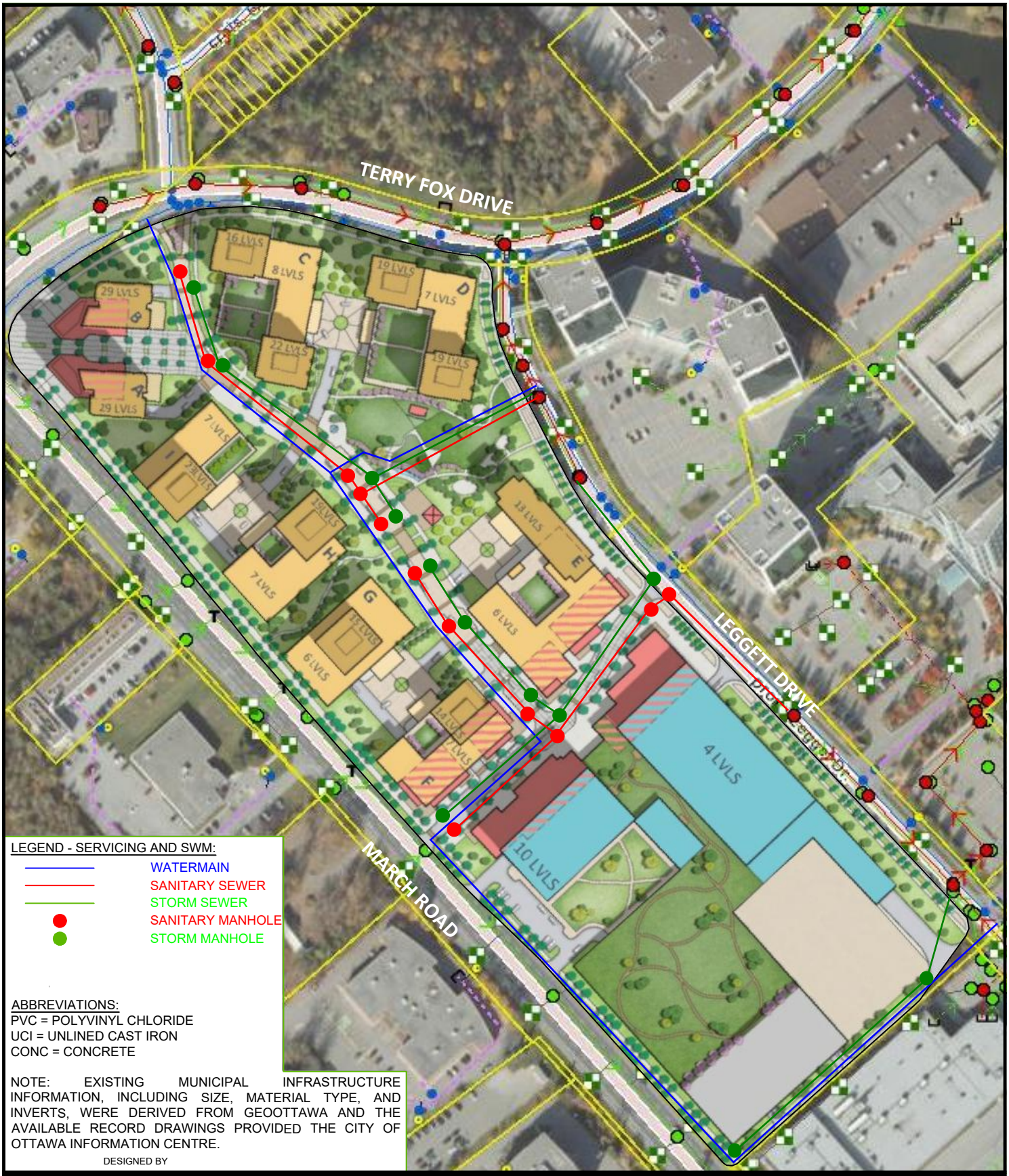
Jaymeson Adams, P.Eng.
PEO#: 100519478

Verified by:

Tim Kennedy, P.Eng.
PEO#: 10017320

A

Appendix A
Internal Water and Sewer Servicing Sketch



T: 613-580-2482
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

CONCEPTUAL SITE SERVICING PLAN

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
J. Adams	----	T. Kennedy	NTS	2022/07/13	A001218	1 of 1	1

B

Appendix B
Nokia Site Revised Water and Sewer Demands

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	NOKIA
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WATER CONSUMPTION CALCULATIONS - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

COMMERCIAL DESIGN CRITERIA:

Contributing Commercial Area:	2.617	gross ha (including commercial areas and amenity space)
Commercial Average Day Demand:	28,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

INDUSTRIAL (LIGHT) DESIGN CRITERIA:

Contributing Industrial Area:	1.913	gross ha (including commercial areas and amenity space)
Commercial Average Day Demand:	35,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Commercial	0.85	1.27	2.29
Industrial	0.78	1.16	2.09
Total	**1.62**	**2.43**	**4.38**

NOTES:

1. Maximum Day and Maximum Hour commercial and industrial peaking factors are determined using Table 4.2 of the Ottawa Design Guidelines - Water Distribution (2010)

Prepared by: Gavin Joseph, EIT Date: 2022-07-12

Verified by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - NOKIA SITE AREA

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

COMMERCIAL CONTRIBUTIONS:

COMMERCIAL DESIGN CRITERIA:

Commercial Average Flow: (6)	28,000	L/gross ha/d	
Commercial Peak Factor:	1.5	if commercial contribution >20%, otherwise use	1.0

AVERAGE FLOW - COMMERCIAL:

Contributing Commercial Area: (7)	2.617	gross ha (including office and retail spaces)
Average Dry Weather Flow: (8) = (6) x (7)	0.85	L/s

PEAK FLOW - COMMERCIAL:

Percent Commercial Area Contribution:	58%	(Commercial Area/Gross Area
Peaking Factor: (9)	1.50	
Peak Commercial Flow: (10) = (8) x (9)	**1.27**	L/s

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	5.8	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.913	gross ha (including laboratory)
Average Dry Weather Flow: (8) = (6) x (7)	0.78	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	42%	(Industrial Area/Gross Area)
Peaking Factor: (9)	5.80	
Peak Industrial Flow: (10) = (8) x (9)	**4.50**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	4.51	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**1.49**	L/s

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd Nokia Site Area
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - NOKIA SITE AREA

Total Estimated Avg. Dry Weather Flow Rate:	**1.62**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**5.77**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**7.26**	**L/s**

Prepared by: Gavin Joseph, EIT Date: 2022-07-12

Verified by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO# 100173201

Z:\Cima-C10\Ott_Projects\A\A001000-A001499\A001218_NOKIA_Mixed Use Development - 600 March Rd - NDA\300\360_Civil\220318_ZBA_Site Servicing\Nokia Site Area\01_SAN\[220712_Sanitary Flow_Nokia Site Area.xlsx]Sheet1

C

Appendix C
Sanitary Sewer Design Sheet – Legget Drive through Golf Course

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
CIMA+ PROJECT NUMBER: A001218
CLIENT: Nokia
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

SANITARY SEWER HYDRAULIC DESIGN SHEET (SSDS)

LOCATION			FLOW	SEWER DATA						
Area	From MH/CB	To MH/CB	Peak Flow (L/s)	Diameter (mm)	Material Type	Slope (%)	Length (m)	Capacity (full) (L/s)	Velocity (full) (m/s)	Ratio (%)
528 March Road Site	SAN MH4	EX. SAN MH A	2.61	250	PVC	0.50%	25.40	43.87	0.87	6%
Legget Drive	EX. SAN MHA	EX. SAN MH B	2.61	250	PVC	0.33%	55.10	35.64	0.70	7%
Legget Drive (Nokia)	EX. SAN MH	EX. SAN MH C	**7.26**	250	PVC	0.31%	60.30	34.54	0.68	21%
Legget Drive	EX. SAN MH C	EX. SAN MH B	7.26	250	PVC	0.29%	68.00	33.41	0.66	22%
Legget Drive	EX. SAN MH B	SAN MH 3	9.87	250	PVC	0.25%	26.70	31.02	0.61	32%
KRP Site	SAN MH 3	SAN MH 2	9.87	250	PVC	0.50%	50.40	43.87	0.87	22%
KRP Site	SAN MH 2	SAN MH 1	9.87	250	PVC	0.50%	44.00	43.87	0.87	22%
KRP Site	SAN MH1	EX. SAN MH D	9.87	250	PVC	1.00%	9.10	62.04	1.22	16%
KRP Site (Tower C)	TOWER C	EX. SAN MH D	1.79	250	PVC	0.40%	114.30	39.24	0.77	5%
KRP Site	EX. SAN MH D	EX. SAN MH E	11.66	250	PVC	1.00%	9.50	62.04	1.22	19%
KRP Site	EX. SAN MH E	EX. SAN MH F	11.66	250	PVC	0.67%	48.10	50.78	1.00	23%
KRP Site (Tower D)	TOWER D	EX. SAN MH F	2.39	200	PVC	1.30%	34.00	39.01	1.20	6%
KRP Site	EX. SAN MH F	EX. SAN MH G	14.05	250	PVC	0.35%	61.90	36.70	0.72	38%
KRP Site (Brookstreet Hotel)	HOTEL	EX. SAN MH G	8.33	200	PVC	0.90%	22.00	32.46	1.00	26%
KRP Site	EX. SAN MH G	EX. SAN MH H	22.38	250	PVC	0.38%	21.00	38.24	0.75	59%
KRP Site (Parking Structure)	PRKG STRUCT	EX. SAN MH H	**3.74**	250	PVC	0.40%	91.10	39.24	0.77	10%
KRP Site	EX. SAN MH H	EX. SAN MH I	26.12	250	PVC	0.38%	88.90	38.24	0.75	68%
KRP Site	EX. SAN MH I	EX. 750 TRUNK	26.12	250	PVC	0.52%	100.10	44.74	0.88	58%

Prepared by: Tim Kennedy, P.Eng. PEO #100173201 Date: 2022-07-12

Verified by: Tim Kennedy, P.Eng. PEO #100173201 Date: 2022-07-12

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd KRP Site Area - Previous Parking Structure
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - KRP Site Area - Previous Parking Structure

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	6.4	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.280	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	0.52	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	6.40	
Peak Industrial Flow: (10) = (8) x (9)	**3.32**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	1.28	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**0.42**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**0.52**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**3.32**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**3.74**	**L/s**

Prepared by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

Verified by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

SANMINA DEVELOPMENT
500 MARCH ROAD

DEVELOPMENT SERVICING STUDY
AND STORMWATER MANAGEMENT REPORT

Prepared by:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

May 28, 2014
Revised August 8, 2014
Revised September 25, 2014
Issued to MOE November 12, 2014

Ref: R-2014-064
Novatech File No. 114060

APPENDIX G

Sanitary and Storm Sewer Design Sheets

SANITARY TRUNK SEWER
Sanitary Sewer Design Sheet

PROJECT : 114060
DESIGNED BY: SM/FST
CHECKED BY: FST
DATE: 25-Sep-14

NOVATECH
Engineers, Planners & Landscape Architects

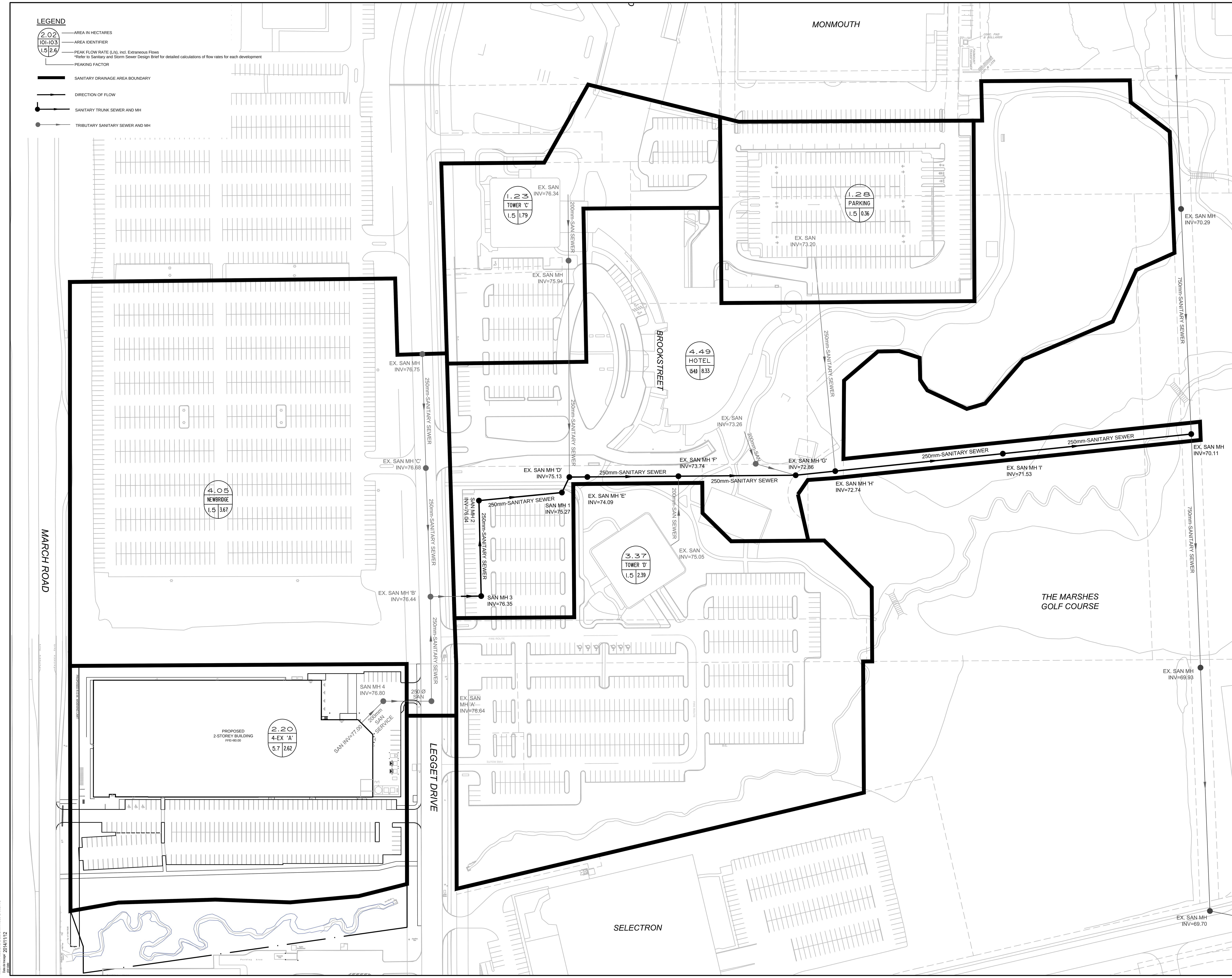
	LOCATION			INDIVIDUAL		CUMULATIVE		PEAK FLOWS					PROPOSED SEWER				
	AREA	FROM MH	TO MH	FLOW RATE (L/s)	Infiltration Area (ha)	FLOW RATE (L/s)	Infiltration Area (ha)	PEAK FACTOR M	PEAK FLOW Q (p) (L/s)	PEAK EXTRAN.FLOW Q(i) (L/s)	***PEAK DESIGN FLOW Q (d) (L/s)***	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
	528 March Road Site	SAN MH 4	EX. SAN MH A	0.35	2.20	0.35	2.20	5.7	2.00	0.62	***2.61***	25.4	250	PVC	0.50	43.87	0.87
	Legget Drive	EX. SAN MH A	EX. SAN MH B	0.00	0.00	0.35	2.20	5.7	2.00	0.62	***2.61***	55.1	250	PVC	0.33	35.64	0.70
	Legget Drive (Newbridge)	EX. SAN MH	EX. SAN MH C	1.69	4.05	1.69	4.05	1.5	2.54	1.13	***3.67***	60.3	250	PVC	0.31	34.54	0.68
	Legget Drive	EX. SAN MH C	EX. SAN MH B	0.00	0.00	1.69	4.05	1.5	2.54	1.13	***3.67***	68.0	250	PVC	0.29	33.41	0.66
**	Legget Drive	EX. SAN MH B	SAN MH 3	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	26.7	250	PVC	0.25	31.02	0.61
*	KRP Site	SAN MH 3	SAN MH 2	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	50.4	250	PVC	0.50	43.87	0.87
*	KRP Site	SAN MH 2	SAN MH 1	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	44.0	250	PVC	0.50	43.87	0.87
*	KRP Site	SAN MH 1	EX. SAN MH D	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	9.1	250	PVC	1.00	62.04	1.22
	KRP Site (Tower C)	TOWER C	EX. SAN MH D	0.96	1.23	0.96	1.23	1.5	1.44	0.34	***1.79***	114.3	250	PVC	0.40	39.24	0.77
*	KRP Site	EX. SAN MH D	EX. SAN MH E	0.00	0.00	3.00	7.48	1.5	4.50	2.09	***6.60***	9.5	250	PVC	1.00	62.04	1.22
*	KRP Site	EX. SAN MH E	EX. SAN MH F	0.00	0.00	3.00	7.48	1.5	4.50	2.09	***6.60***	48.1	250	PVC	0.67	50.78	1.00
	KRP Site (Tower D)	TOWER D	EX. SAN MH F	0.96	3.37	0.96	3.37	1.5	1.44	0.94	***2.39***	34.0	200	PVC	1.30	39.01	1.20
*	KRP Site	EX. SAN MH F	EX. SAN MH G	0.00	0.00	3.96	10.85	1.5	5.95	3.04	***8.98***	61.9	250	PVC	0.35	36.70	0.72
†	KRP Site (Brookstreet Hotel)	HOTEL	EX. SAN MH G	2.21	4.49	2.21	4.49	1.5 - 4.0	7.07	1.26	***8.33***	22.0	200	PVC	0.90	32.46	1.00
*	KRP Site	EX. SAN MH G	EX. SAN MH H	0.00	0.00	6.17	15.34	1.5	9.26	4.30	***13.56***	21.0	250	PVC	0.38	38.24	0.75
	KRP Site (Parking Structure)	PRKG STRUCT	EX. SAN MH H	0.00	1.28	0.00	1.28	1.5	0.00	0.36	***0.36***	91.1	250	PVC	0.40	39.24	0.77
*	KRP Site	EX. SAN MH H	EX. SAN MH I	0.00	0.00	6.17	16.62	1.5	9.26	4.65	***13.91***	88.9	250	PVC	0.38	38.24	0.75
*	KRP Site	EX. SAN MH I	EX. 750 TRUNK	0.00	0.00	6.17	16.62	1.5	9.26	4.65	***13.91***	100.1	250	PVC	0.52	44.74	0.88

Notes:
1. Q(d) = Q(p) + Q(i) , where
   Q(d) = Design Flow (L/sec)
   Q(p) = Population Flow (L/sec)
   Q(i) = Extraneous Flow (L/sec)
2. Q(i) = 0.28 L/sec/ha
3. Daily Sewage Flow from Office Towers = 75 L/person/day (Appendix 4-A, Ottawa Sewer Design Guidelines)
4. Commercial Peaking Factor = 1.5 (Figure 4.3 Ottawa Sewer Design Guidelines)
5. Refer to Sanitary Drainage Area Plan (114060-SAN, C200) for details of drainage areas
6. Refer to the 'Sanitary and Storm Sewer Design Brief' for a breakdown of Daily Sewage Flow components and applicable peaking factors from the Brookstreet Hotel

* Denotes sewers applicable to this MOE ECA appplication. All other sewers shown on this design sheet are private sewers tributary to the sanitary trunk sewer under application for MOE approval and/or have MOE approval under an existing C of A.
** An existing C of A covers the sanitary stub from SAN MH B north approx. 16.1m to the existing cap. The 10.7m of proposed sewer from the cap to SAN MH 3 is applicable to the new MOE ECA application.
† Total peak sanitary flow from hotel site = 8.33 L/s, including Extraneous Flows (Also refer to Note 6 above for further details)

APPENDIX H

Engineering Drawings



No	DATE	ÉMISSION POUR / OBJECT
1	2014.05.28	ISSUED WITH DSS & SWM REPORT
2	2014.08.08	ISSUED WITH REVISED DSS & SWM REPORT
3	2014.09.25	ISSUED WITH REVISED DSS & SWM REPORT
4	2014.11.12	ISSUED FOR CITY / MOE APPROVAL

CLÉ / KEY :

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

MECHANICAL, ELECTRICAL ENGINEER :

CIVIL ENGINEER :

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

MECHANICAL, ELECTRICAL ENGINEER :

STRUCTURAL ENGINEER :

CLIENT :

ARCHITECT :

Architects
190 Somerset St. W
Suite 206
Ottawa . Ontario
K2P 0J4
T.613.695.6122
F.514.861.5383
www.rubinrotman.com
Rubin & Rotman architects

SEAL :
LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
Nov. 12, 2014
PROVINCE OF ONTARIO

NOTE :
L'entrepreneur doit vérifier toutes les informations et dimension sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

PROJECT NAME :

Sanmina
500 March Rd.
Kanata, Ontario

TITLE :

SANITARY DRAINAGE AREA PLAN

ISSUE DATE :	DRAWN BY :	
2014.11.12	SM	
SCALE :	VERIFIED BY :	
1 : 750	FST	
NECL FILE :	DRAWING NO :	REVISION :
114060-SAN	C200	4

D

Appendix D
Sanitary Sewer Design Sheet – Legget Drive through Terry Fox Drive

PROJECT NAME: NOKIA Mixed Use Development - 600 March Rd
MU Site Area
CIMA+ PROJECT NUMBER: A001218
CLIENT: Nokia
PROJECT STATUS: Preliminary Design (Assessment of Adequacy of Public Services)

SANITARY SEWER HYDRAULIC DESIGN SHEET (SSDS)

LOCATION			FLOW					SEWER DATA						
Area	From MH/CB	To MH/CB	Area (ha)	Peaking Factor (ha)	Peak Flow (L/s)	Extraneous Flow (L/s)	Total Peak Flow (L/s)	Diameter (mm)	Material Type	Slope (%)	Length (m)	Capacity (full) (L/s)	Velocity (full) (m/s)	Ratio (%)
Terry Fox (West of Trunk)	MHSA12427	MHSA12428	0.138	-	-	0.045	0.045	250	PVC	1.09%	53.00	64.90	1.28	0%
	MHSA12428	MHSA12429	0.150	-	-	0.049	0.095	250	PVC	2.42%	57.50	96.46	1.90	0%
	MHSA12429	MHSA12517	0.315	-	-	0.104	0.199	250	PVC	1.08%	121.00	64.55	1.27	0%
Legget Drive	MHSA12519	MHSA12518	0.128	-	-	0.042	0.042	250	PVC	0.61%	49.40	48.35	0.95	0%
MU Site Area	MHSA76070	MHSA12518	5.370	4.850	10.55	1.770	**12.32**	200	PVC	3.52%	78.70	64.19	1.98	19%
Legget Drive	MHSA12518	MHSA45740	0.051	-	-	0.017	12.38	250	PVC	0.61%	19.80	48.30	0.95	26%
555 Legget Drive	555 Legget	MHSA45740	1.850	6.000	4.50	0.610	5.11	UNK	UNK	UNK	UNK	UNK	UNK	UNK
Legget Drive	MHSA45740	MHSA45739	0.059	-	-	0.020	17.51	250	PVC	0.61%	22.80	48.62	0.96	36%
	MHSA45739	MHSA12517	0.124	-	-	0.041	17.55	250	PVC	0.46%	47.50	42.22	0.83	42%
Terry Fox (West of Trunk)	MHSA12517	MHSA12516	0.130	-	-	0.043	17.79	250	PVC	0.44%	50.00	41.34	0.82	43%
	MHSA12516	MHSA12697	0.137	-	-	0.045	17.84	250	PVC	0.27%	52.50	32.04	0.63	56%
	MHSA12697	MHSA45747	0.197	-	-	0.065	17.90	250	PVC	0.66%	75.70	50.42	1.00	36%
360 Terry Fox Drive	360 Terry Fox	MHSA45747	3.800	5.200	8.00	1.250	9.26	UNK	UNK	UNK	UNK	UNK	UNK	UNK
362 Terry Fox Drive	362 Terry Fox	MHSA45747	1.190	6.500	3.13	0.390	3.53	UNK	UNK	UNK	UNK	UNK	UNK	UNK
Terry Fox (West of Trunk)	MHSA45747	MHSA12515	0.139	-	-	0.046	30.74	250	PVC	0.62%	53.30	48.82	0.96	63%
359 Terry Fox Drive	359 Terry Fox	MHSA12515	1.760	6.100	4.35	0.580	4.93	UNK	UNK	UNK	UNK	UNK	UNK	UNK
Terry Fox (West of Trunk)	MHSA12515	MHSA48493	0.159	-	-	0.052	35.72	**250**	**PVC**	**0.33%**	**61.00**	**35.61**	**0.70**	**100%**

Prepared by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO #100173201

Verified by: Tim Kennedy, P.Eng. Date: 2022-07-12
PEO #100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area - 359 Terry Fox Dr
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - 359 Terry Fox Dr

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	6.1	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.760	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	0.71	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	6.10	
Peak Industrial Flow: (10) = (8) x (9)	**4.35**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	1.76	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**0.58**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**0.71**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**4.35**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**4.93**	**L/s**

Prepared by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

Verified by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area - 360 Terry Fox Dr
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - 360 Terry Fox Dr

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	5.2	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	3.800	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	1.54	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	5.20	
Peak Industrial Flow: (10) = (8) x (9)	**8.00**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	3.80	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**1.25**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**1.54**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**8.00**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**9.26**	**L/s**

Prepared by: Tim Kennedy, P.Eng. PEO# 100173201 Date: 2022/07/12

Verified by: Tim Kennedy, P.Eng. PEO# 100173201 Date: 2022/07/12

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area - 362 Terry Fox Dr
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - 362 Terry Fox Dr

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	6.5	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.190	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	0.48	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	6.50	
Peak Industrial Flow: (10) = (8) x (9)	**3.13**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	1.19	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**0.39**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**0.48**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**3.13**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**3.53**	**L/s**

Prepared by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

Verified by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area - 555 Legget Drive
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - 555 Legget Drive

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	6.0	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	1.850	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	0.75	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	6.00	
Peak Industrial Flow: (10) = (8) x (9)	**4.50**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	1.85	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**0.61**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**0.75**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**4.50**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**5.11**	**L/s**

Prepared by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

Verified by: Tim Kennedy, P.Eng. Date: 2022/07/12
PEO# 100173201

PROJECT NAME:	NOKIA Mixed Use Development - 600 March Rd MU Site Area - Nokia Site Under Existing Conditions
CIMA+ PROJECT NUMBER:	A001218
CLIENT:	Nokia
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION - Nokia Site Under Existing Conditions

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

INDUSTRIAL CONTRIBUTIONS:

INDUSTRIAL DESIGN CRITERIA:

Industrial Average Flow: (6)	35,000	L/gross ha/d
Industrial Peak Factor:	4.9	Per Figure in Appendix 4-B

AVERAGE FLOW - INDUSTRIAL:

Contributing Industrial Area: (7)	5.370	gross ha
Average Dry Weather Flow: (8) = (6) x (7)	2.18	L/s

PEAK FLOW - INDUSTRIAL:

Percent Industrial Area Contribution:	100%	
Peaking Factor: (9)	4.85	
Peak Industrial Flow: (10) = (8) x (9)	**10.55**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	5.37	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12)	**1.77**	L/s

Total Estimated Avg. Dry Weather Flow Rate:	**2.18**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**10.55**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**12.32**	**L/s**

Prepared by: Tim Kennedy, P.Eng. Date: 2022/07/12
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