

REPORT
Project: 34206-5.2.2

SITE SERVICING STUDY STORMWATER MANAGEMENT PLAN EROSION AND SEDIMENTATION CONTROL PLAN 192 BRONSON AVENUE, OTTAWA

Prepared for Bronson Inc.
by IBI Group

Revised February 2018



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1 INTRODUCTION

1.1 Development Servicing Study Checklist

The servicing Study Guideline Checklist is included in **Appendix A** for reference. The list identifies where elements in this report can be found. Some elements are not applicable and are identified accordingly. Otherwise, the checklist items are address in this report.

1.2 Purpose

The purpose of this report is to outline the required municipal services, including water supply, stormwater management and wastewater disposal, needed to support the redevelopment of the subject property. The property is approximately 0.24 hectares in area and is located at 192 Bronson Avenue in the City of Ottawa.

As requested by the City of Ottawa, this Site Servicing Study, which also includes the Stormwater Management Plan, Watermain Analysis and Erosion and Sedimentation Control Plans, is being completed in support of the Site Plan Application.

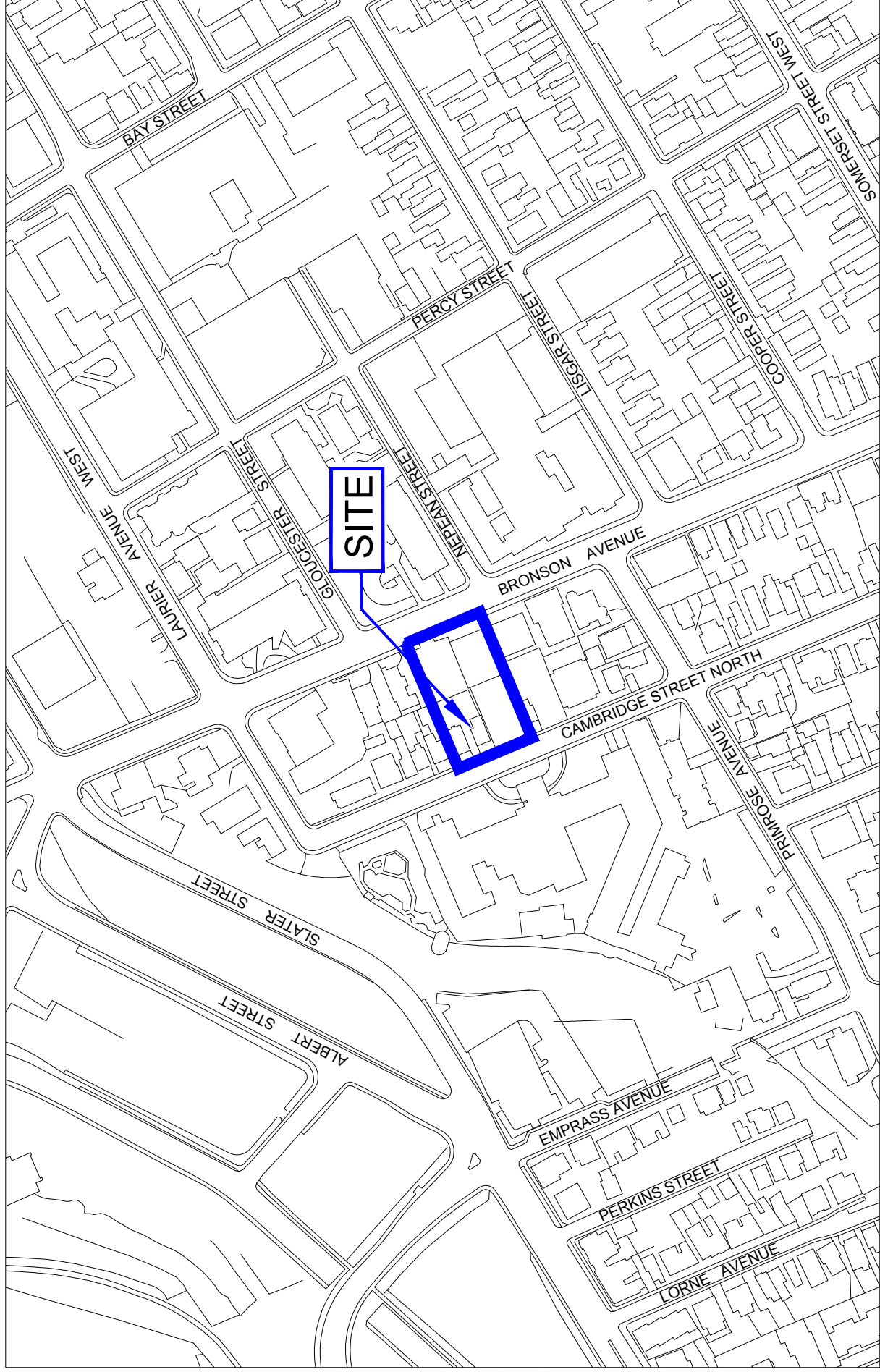
1.3 Subject Site

The subject property is located at 192 Bronson Avenue, on the west side of Bronson Avenue between Nepean Street and Laurier Avenue. The location plan is shown in **Figure 1.1**. The subject property is designated “Traditional Mainstreet” and “General Urban Area” in the City of Ottawa Official Plan (2003, Consolidated). A wide range of uses are permitted in this designation, including retail, commercial, office, residential and institutional uses. A mix of uses is encouraged, either within the same building or side by side in individual buildings.

The subject property is presently split zoned. The portion of the site adjacent to Bronson Avenue is zone “Residential Fifth Density, Subzone H, with a height limitation of 19 metres (R5H H(19))” while the portion of the property adjacent to Cambridge Street North is zoned “Residential Fourth Density, Subzone T (R4T)” in the City of Ottawa Comprehensive Zoning By-law (2008-250). The R5H zone is intended to permit a wide mix of residential building forms ranging detached to mid-high rise apartment dwellings. The current height limitation of 19 metres permits a building of approximately 6 storeys in height. The R4T zone also allows a wide mix of residential uses ranging from detached dwellings to low-rise apartment dwellings with a maximum height of 4 storeys.

The subject site is currently improved with a three-storey commercial building fronting Bronson Avenue. The remainder of the site consists of a paved surface parking lot with access from both Cambridge Street and Bronson Avenue.

The proposed development will include demolition of the existing building and surface parking lot and the construction of a new 19-storey mixed-use building. The new building is comprised of 52 studio units, 192 one and two bedroom units, six penthouse suites and 185 m² of amenity space. A total of 103 parking spaces are proposed in two levels of underground parking which will be accessed from Bronson Avenue. The proposed site plan is shown in **Figure 1.2**.



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192 BRONSON AVENUE

LOCATION PLAN

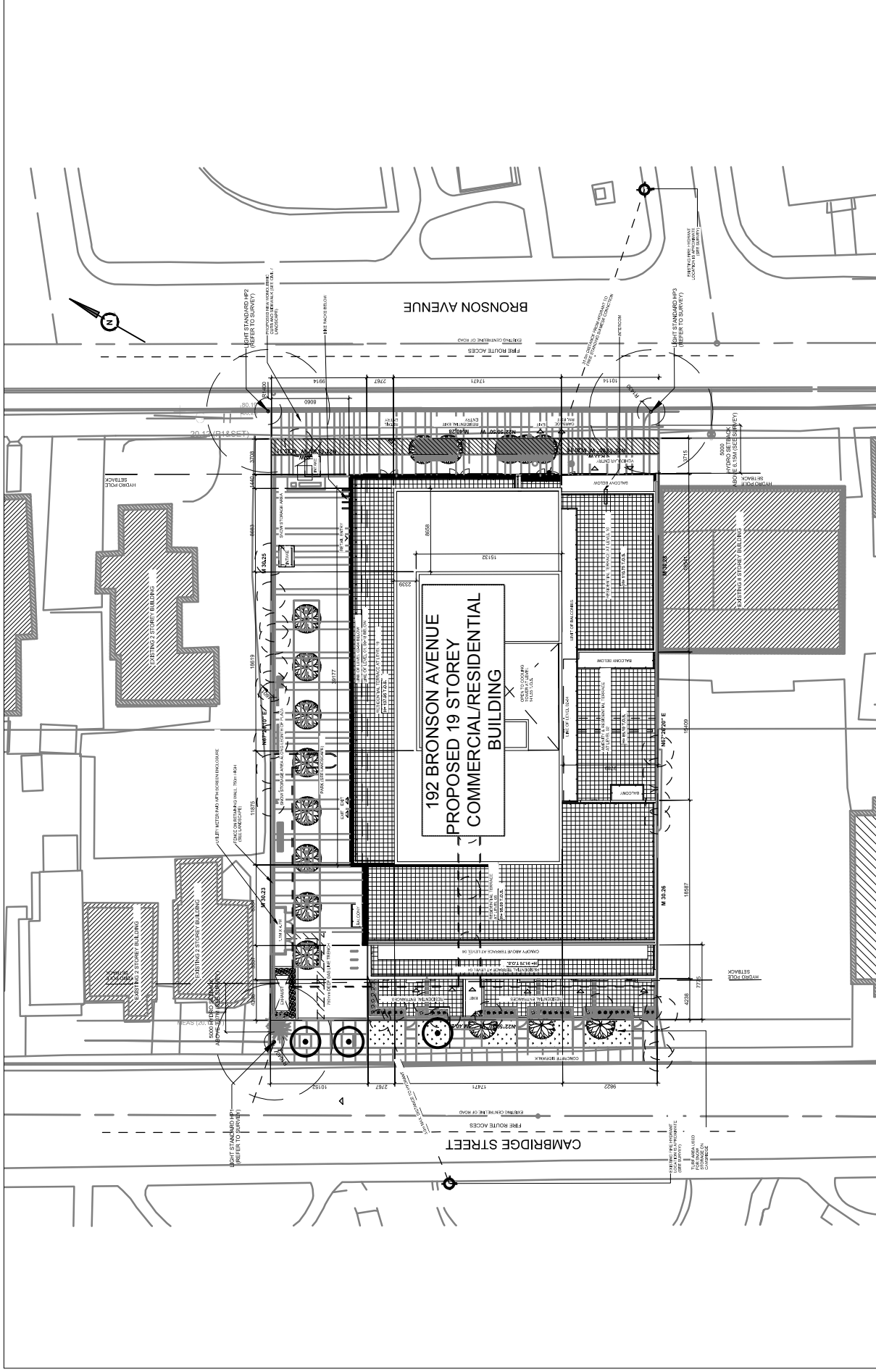
FIGURE 1.1

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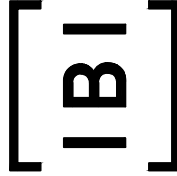
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192 BRONSON AVENUE

SITE PLAN

FIGURE 1.2

1.4 Pre-Consultation

IBI Group contacted the City of Ottawa to discuss and agree on relevant design criteria to be considered in this report. The criteria relate to water supply and sewage disposal. Attached in **Appendix B** is a copy of the e-mail correspondence.

1.5 Geotechnical Investigation

A geotechnical investigation report entitled 'Geotechnical Investigation Proposed Multi-Storey Building, 192 Bronson Avenue, Ottawa, Ontario' by Paterson Group Inc., is being prepared for the subject site.

The objectives of the investigation report will include:

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

Among other items, the report will comment on the following:

- Site grading and grade raises;
- Foundation design;
- Pavement Structure;
- Infrastructure construction
- Groundwater control;
- Contamination/corrosive environment.

2 WATER SUPPLY

2.1 Existing Conditions

The site has access to two existing watermain. There is a 400 mm watermain on Bronson Avenue and a 200 mm watermain on Cambridge Street. **Figure 2.1** shows the location of the existing watermain system adjacent to the subject property.

2.2 Design Criteria

The following design criteria, which were extracted from the City's Water Distribution Design Guidelines, were used to estimate the water demand requirements for the site:

RESIDENTIAL		RETAIL (SHOPPING CENTRES)
• Average Daily Demand (ADD)	350 l/p/d	2500 l/1000m ² /d
• Maximum Daily Demand (MDD)	875 l/p/d	3750 l/1000m ² /d
• Peak Hourly Demand	1925 l/p/d	6750 l/1000m ² /d

Hydraulic gradient targets:

- Minimum – max hour 276 kPa
- Minimum – max day and fire 140 kPa
- Maximum pressure 552 kPa

The City of Ottawa has provided hydraulic boundary conditions for both the 400 mm diameter main on Bronson Avenue and the 200 mm diameter main on Cambridge Street as follows:

	Bronson	Cambridge
• Minimum HGL	107.6 m	107.6 m
• Maximum HGL	116.4 m	116.4 m
• Max Day & Fireflow (230 l/s)	108.3 m	94.0 m

The population for the building was calculated using the City of Ottawa guidelines (1.4 ppu for one bedroom units, 2.1 ppu for 2 bedroom units and 2.7 ppu for townhouses). Based on a building of 250 units and 185 m² of amenity space, the expected water demand for the proposed development is:

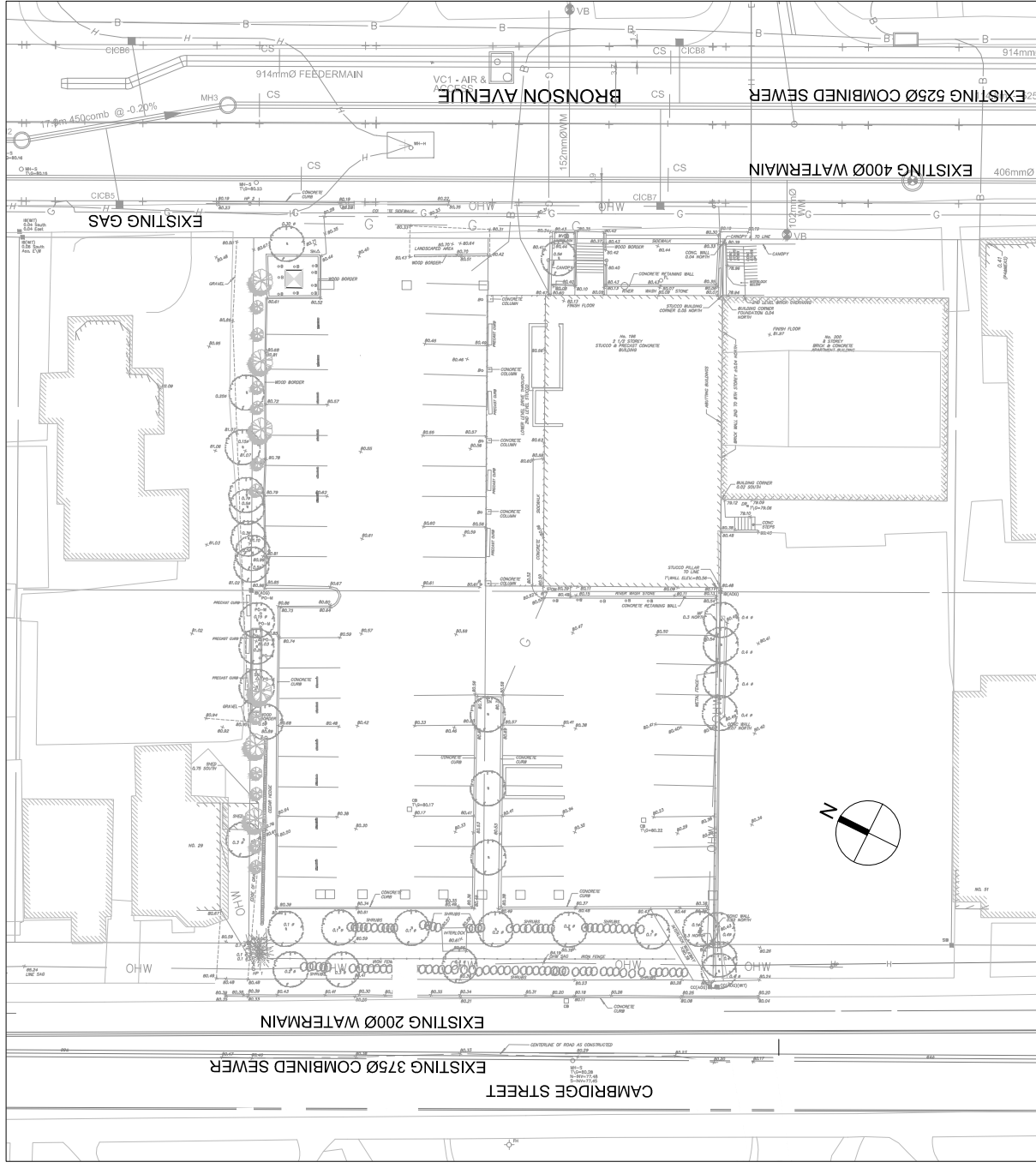
- Average Daily Demand 1.76 l/s
- Maximum Daily Demand 4.41 l/s
- Peak Hourly Demand 9.71 l/s

A copy of the water demand calculations is included in **Appendix C**.

2.3 Hydraulic Analysis

At the ground floor elevation of 80.80 m, the minimum water pressure available based on the hydraulic boundary conditions is 262.6 kPa from both the Bronson Avenue watermain and Cambridge Street watermain. In both cases the pressure is less than 276 kPa at ground level and will be lower at the higher floors. An internal pumping system will be required to maintain pressures throughout the building. Details of this system will be designed by the mechanical engineer. The maximum pressure at the P2 parking level is 444.4 kPa from both the Bronson Avenue and Cambridge Street. Since these pressures are well below 552 kPa, pressure reducing valves are not required for this building.

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LEGEND

- EXISTING UNDERGROUND HYDRO
- EXISTING OVERHEAD HYDRO
- EXISTING HYDRO MANHOLE
- EXISTING HYDRO AND LIGHT POLE
- EXISTING GAS MAIN
- EXISTING BELL
- EXISTING BELL MANHOLE
- EXISTING TRAFFIC MANHOLE
- EXISTING TRAFFIC LIGHT
- EXISTING TRAFFIC SIGN
- EXISTING CATCH BASIN
- EXISTING COMBINED MANHOLE
- EXISTING COMBINED SEWER
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING SIGN
- EXISTING WATER VALVE
- EXISTING WATER SERVICE STANDPOST
- EXISTING VALVE BOX

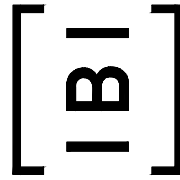
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192 BRONSON AVENUE

EXISTING SERVICES

FIGURE 2.1

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A required fire flow rate of 230 l/s has been determined using the methodology from the Fire Underwriters Survey (FUS) 1999, a copy of the calculation is included in **Appendix C**. The 230 l/s fire flow was provided to the City in order to determine the HGL condition for the maximum day plus fire condition as shown in **Section 2.2**. At the ground floor level the residual pressure from the Bronson Avenue watermain is 274.4 kPa and 134.4 kPa from the Cambridge Street main. The residual pressure during the maximum day plus fire flow condition exceeds 140 kPa in Bronson Avenue only.

The site survey identified a water standpost on Bronson Avenue which services the existing building. During construction it is anticipated that the City will be notified to decommission the existing water service as per City regulations.

2.4 Proposed Water Plan

As the total basic day demand for this building exceeds 50 cubic meters/day the building will be provided with two 200 mm diameter laterals from both Bronson Avenue and Cambridge Street in accordance with Section 4.3.1. of the City of Ottawa Water Distribution Design Guidelines. Each lateral will have a shut off valve located at the property line. The two laterals will be connected via a tee in the building mechanical room from where a single 200 mm diameter service pipe will supply water to the building. The water meter will be installed on the single water service line in the mechanical room. The proposed watermain locations and sizes are shown on the site servicing plan, drawing **C-100** which is located in **Appendix D**.

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

There is an existing 375 mm diameter combined sewer on Cambridge Street which currently receives surface drainage from the west half of the site via two interconnected catchbasins.

Based on the flow estimates there is a total surface runoff during the 1:5 yr. event to the Cambridge combined sewer of about 21 l/s and a total combined flow during the 1:5 yr. event of about 21 l/s to the Bronson Avenue sewer. The sanitary sewer design sheet, which shows existing flow conditions, is included in **Appendix E**.

3.2 Design Criteria

As previously mentioned, the current proposal is to improve the existing site with a 19 storey mixed use building containing 52 studio units, 192 one and two bedroom units, six penthouse suites and 185 m² of amenity space. Parking will be provided on two underground levels. IBI estimates that the peak wastewater flow from the proposed development will be 7.10 l/s. This is based on the following criteria:

Total # of studio units	52
Total # of one bedroom units	85
Total # of two bedroom units	107
Total # of penthouse units	6
Population density	
- Studio	1.4 ppu
- One bedroom	1.4 ppu
- Two bedroom	2.1 ppu
- Penthouse	2.7 ppu
Average Residential Flow	350 l/p/d
Residential Peaking Factor	Harmon Formula [max = 4.0, min. = 2.0]
Retail Area	2400 m ² (Site Area)
ICI Peaking Factor	1.5
Infiltration Allowance	0.28 l/s/ha

The sanitary drainage area plan, **Figure E1**, and the detailed sanitary sewer calculations are included in **Appendix E**.

3.3 Sewer Capacity Analysis

There is currently no wastewater discharge from the subject site to the existing 375 mm diameter combined sewer in Cambridge Street.

It is proposed to remove the two existing catchbasins which are located on private property as part of the redevelopment of the site. However, it is anticipated that there will be some uncontrolled runoff along the west portion of the redeveloped site. It is estimated that the 1:100 year uncontrolled flow to the Cambridge Street sewer will be about 5 l/s which is significantly less than the existing conditions. Therefore there is sufficient capacity in the Cambridge Street sewer.

It is estimated that the total flow from the existing site tributary to the Bronson Avenue combined sewer is 21.41 l/s during the 1:5 yr. event. This is based on an estimated wastewater flow of 0.28 l/s and a stormwater component of 21.13 l/s. Although the estimated wastewater runoff from the proposed redevelopment will increase from 0.28 l/s to 7.10 l/s, the stormwater rate will be restricted to the point that the total combined flow from the proposed development to the Bronson Avenue sewer will be about 6.2 l/s less than the current flow estimate (15.19 l/s vs. 21.41 l/s).

The 525 mm diameter Bronson Avenue combined sewer was constructed at a design slope of 0.60%, with a full flow capacity of 336 l/s. The capacity of the Bronson Avenue sewer is significantly larger than the estimated combined flows from the proposed development.

3.4 Proposed Wastewater Plan

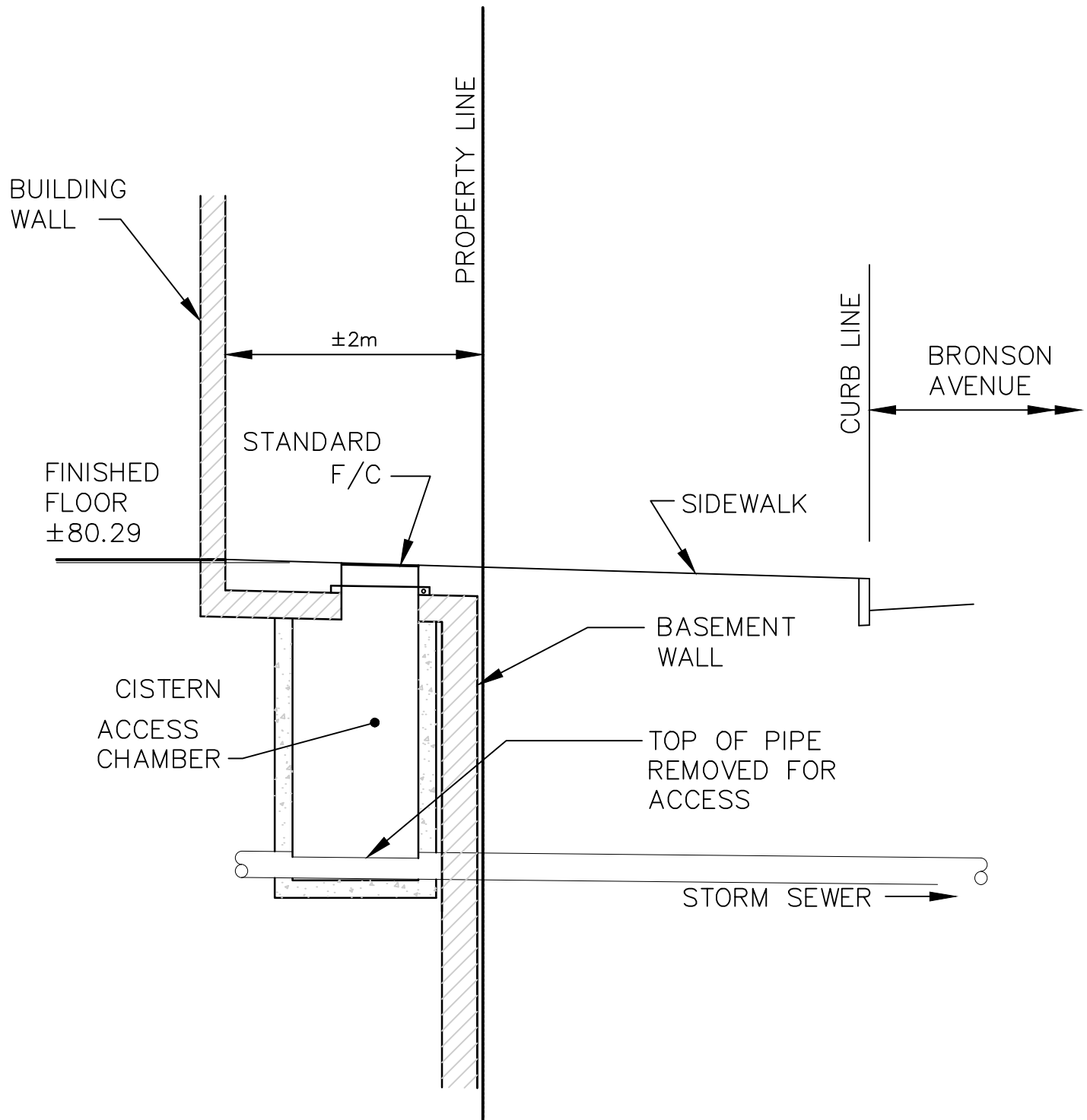
It is proposed to connect a new 200 mm diameter sanitary service connection is proposed to be connected to the existing 525 mm diameter combined sewer in Bronson Avenue. The service will enter the building near the northeast corner. The location details are included on the site servicing plan which, together with the site grading and drainage plan, is included in **Appendix D**.

The City of Ottawa requires the installation of a manhole on all outgoing sewer pipes in similar situations. Typically, the manholes are installed near the property line but on private property. The purpose of the manhole is to provide City staff access to the sewer lateral for monitoring purposes.

The proposed building has 0m set back to the future property line so there is no location to install a typical manhole structure on the private side of the site. The City has therefore asked that a monitoring manhole be incorporated on the outgoing service pipe inside the building. In this instance, the underground portion of the building is adjacent to the property line, but the first floor is set back about two meters from the property line. It is therefore proposed to construct a manhole, or access chamber to act as a monitoring port over the outgoing sanitary sewer. The top of the structure will be fitted with a standard City sanitary sewer frame and cover and will be accessible from the sidewalk.

Figure 3.1 provides a general idea of how the access chamber can work. Final design of the feature will be completed by the architect.

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4 MINOR STORM SYSTEM

4.1 Existing Conditions

The site is relatively flat with existing site grades all within the 80.15 to 80.80 m range. The site is also self-contained, capturing runoff only from the property and not from neighbouring sites. Drainage from the adjacent sites to the north and south is also self-contained. **Figure E2**, located in **Appendix F** shows the existing site conditions.

There is an existing 375 mm combined sewer in Cambridge Street to which surface runoff from about half of the existing site outlets via a series of two catchbasins. There is also a 525 mm diameter combined sewer in Bronson Avenue to which combined flows from the balance of the site outlet.

Based on the flow estimates contained on the Sewer Calculation Sheet located in **Appendix E**, there is a total surface runoff of about 21 l/s during the 1:5 yr. event to the Cambridge Street sewer and a total combined flow during the 1:5 yr. event of about 21 l/s to the Bronson Avenue sewer.

4.2 Design Criteria

The City of Ottawa has advised that the following stormwater criteria must be used to calculate the allowance release rate from the site:

Time of Concentration	20 min.
Average Runoff Coefficient:	0.40
Storm Event	1:2 yr. ($i = 732.951 / (TC + 6.199)^{0.81}$)

Based on these criteria, the restricted release rate from the site is 13.69 l/s. The allowable release rate calculation for the site is included in **Appendix F**.

4.3 Sewer Capacity Analysis

With the exception of 5.6 l/s draining from the west portion of the redeveloped site, all flows from the proposed redeveloped site are proposed to be tributary to the 525 mm combined sewer in Bronson Avenue. The detailed analysis of the outlet sewer capacity is included in **Section 3.3**. The following is a summary of that analysis.

• Current estimated combined flow to the Bronson sewer	=	21.41 l/s
• Proposed total flow to the Bronson sewer	=	15.19 l/s
• Estimated capacity of the Bronson sewer	=	336 l/s

As also concluded in **Section 3.3**, there appears to be significant available capacity in the 525 mm diameter Bronson Avenue combined sewer to accommodate proposed sewage flows from the subject site. The storm drainage area plan, **Figure E3**, and the sewer calculation sheet, which are both included in **Appendix E**, show the detailed calculation of the flow and capacity estimates.

4.4 Proposed Stormwater Plan

The design criteria for this site requires that post-development runoff not exceed the 1:2 year event based on an average runoff coefficient of 0.40 and a time of concentration of 20 minutes. Based on the total site area of 0.24 ha, the estimated allowable release rate is 13.69 l/s. The detailed calculation is included in the Sewer Calculation Sheet included in **Appendix E**. Based on the 100 year uncontrolled post-development flows, the City of Ottawa's requirements cannot be met by the proposed development unless on-site storage is provided.

In an effort to determine the amount of required on-site storage, the site has been divided into 4 drainage areas (Areas A-D). The location of the 4 drainage areas is illustrated in **Figure 4.1**. The following sections provide a brief summary of the proposed quantity stormwater management plan for the site. Detailed calculations of the runoff rates for the various sub-catchment areas and the stormwater schematic, **Figure G**, are included in **Appendix G**.

4.5 Area A – Uncontrolled Grounds to Cambridge Street

Runoff from Area A will be released uncontrolled and captured by the existing combined sewer adjacent to the site on Cambridge Street. Area A covers 168 m² and the estimated uncontrolled 100 year release rate (Q_A) is 5.60 l/s at a runoff coefficient of 1.00.

4.6 Area B – Uncontrolled Grounds to Bronson Avenue

Runoff from Area B will be released uncontrolled and captured by the existing combined sewer adjacent to the site on Bronson Avenue. Area B covers 82 m² and the estimated uncontrolled 100 year release rate (Q_B) is 2.73 l/s at a runoff coefficient of 1.00.

4.7 Area C – Pedestrian Promenade

Runoff generated by Area C will be collected from an area drain, located in the pedestrian promenade and routed uncontrolled to a cistern which is proposed to be located inside the proposed mix use building. The estimated uncontrolled release rate for the 587 m² Area C is 19.57 l/s at a runoff coefficient of 1.00.

4.8 Area D – Building Roofs

Runoff from Area D would be released uncontrolled and captured and routed uncontrolled to a cistern which is proposed to be located inside the proposed mix use building. Area D covers 1546 m² and the estimated uncontrolled 100 year release rate (Q_C) is 51.02 l/s at a runoff coefficient of 1.00.

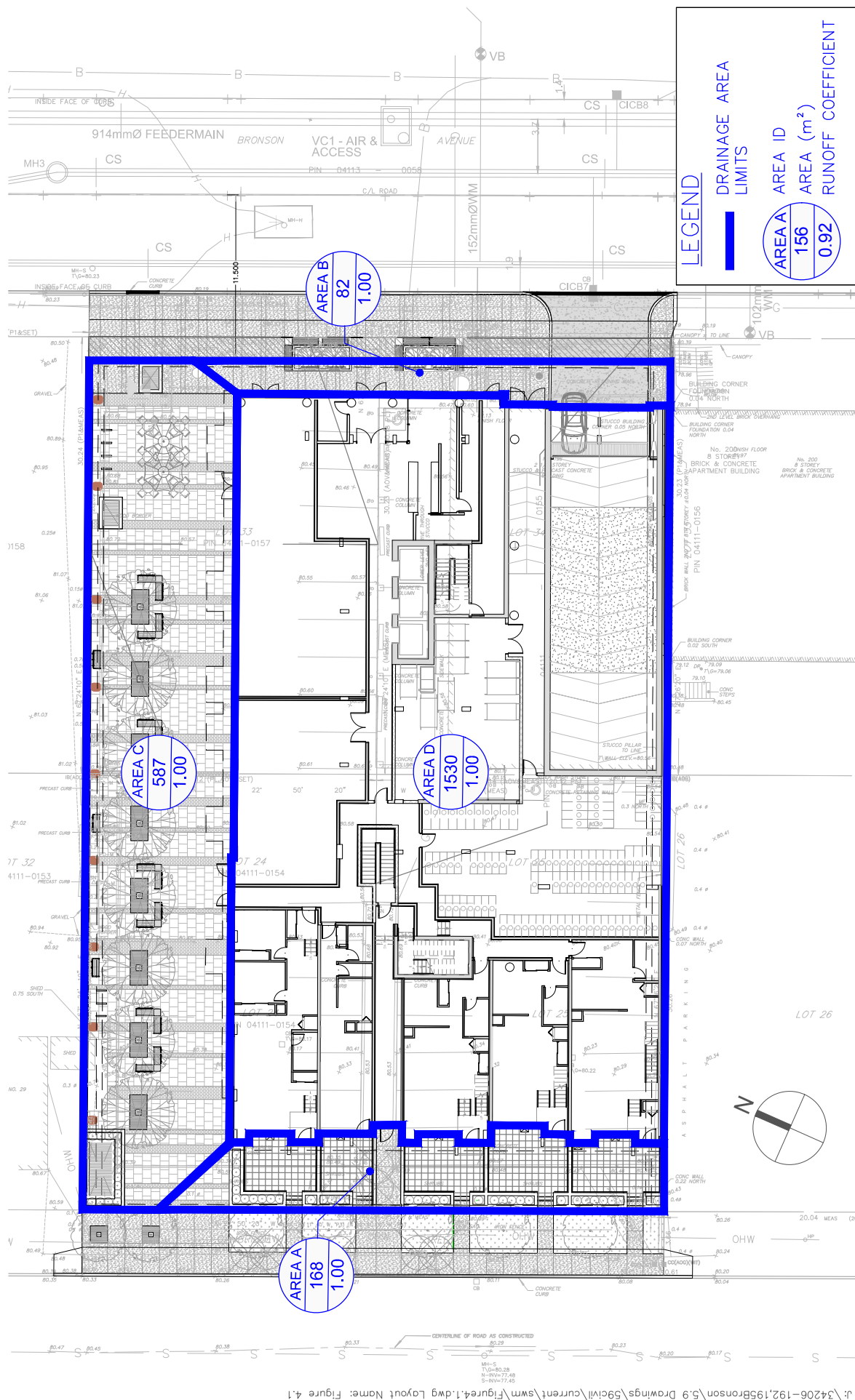
4.9 Area D – Cistern Storage

The runoff generated by Areas C and D (total area 2117 m²) is proposed to be discharged into and attenuated in an under-ground cistern. Outflow from the cistern would be controlled with an orifice. The cistern release rate was calculated by determining the remaining allowable flow from the site using the following equation:

- $Q_{\text{Cistern pipe}} = Q_{\text{max}} - (Q_A + Q_B)$
- $Q_{\text{Cistern pipe}} = 13.69 \text{ l/s} - (5.60 \text{ l/s} + 2.73 \text{ l/s}) = 5.36 \text{ l/s}$

To meet the allowable release rate of 13.69 l/s, the required cistern volume for the 100 year storm event was determined to be 101.76 m³. Detailed calculations are presented in **Appendix G**. The cistern orifice will be designed to restrict the release rate to 5.36 l/s. The attenuated flow will be discharged directly into the existing combined sewer system on Bronson Avenue via a 200 mm diameter service lateral pipe.

The detailed minor stormwater plan for the subject site is indicated on the site servicing plan, drawing **C-100**. The plan shows a floor drain located in the pedestrian promenade area. A 250 mm diameter outlet pipe from the floor drain is proposed to be directed internally to the P1 parking level where the mechanical designer will complete the drainage pipe routing to the building cistern. The outlet from the cistern is proposed to be a 200 mm diameter service pipe at a 1.0% slope.



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DRAINAGE AREAS

FIGURE 4.1

192 BRONSON AVENUE

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The final details of the cistern will be confirmed by the building's mechanical designer. However, the designer has confirmed that the cistern will operate by gravity with a direct piped connection from the bottom of the cistern to the existing combined sewer in Bronson Avenue. There are no pumps proposed for the cistern so power is not a requirement for the cistern operation. The cistern will most likely be fitted with an overflow mechanism to be routed to surface where water will eventually be captured by the street drainage system.

There are no other practical options for cistern overflows other than to surface. The overflow is designed as a second level of redundancy which is expected to happen less than every 100 years since the cistern is sized for the equivalent storm event. Routing the overflow to an infiltration pit comes with the possibility of the pipe backing up and flooding the garage. The best solution is to outlet to the surface. During colder months there is very little rainfall so the cistern is not likely to overflow and cause icing problems in winter. The risk to pedestrians dealing with ice potential is minimal, while the risk to building flooding is much more likely. Therefore a surface overflow outlet is recommended.

As per City of Ottawa requirements, an access structure, or monitoring port, is to be fitted on the outgoing storm service pipe. A second structure, similar to that identified in **Figure 3.1** and as discussed in the previous report **Section 3.4**, is proposed for the storm service pipe.

5 EROSION AND SEDIMENTATION CONTROL

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

- In-trench groundwater will be pumped into a filter mechanism prior to release to the environment. Pumping in excess of 50,000 l/day will require a Permit To Take Water from the provincial Ministry of Environment. The geotechnical report will review this issue.
- Silt sacks will be placed on open structures such as catchbasins and manhole covers, and will remain in place until the project is completed. Regular monitoring and cleaning will be required to ensure proper function of the cloth including replacement as required.
- Existing catchbasins on the streets adjacent to the streets are to be monitored and cleaned as required to ensure that their sumps remain clean.
- Silt fence on the perimeter of the site as per OPSD Standard 219.110 is to be erected.
- Another method the contractor should try to utilize on site during construction is to maintain an artificial low spot which would include a settling bay to collect silt material. This could reduce the amount of silt material being pumped to the filter mechanism.

The proposed sediment and erosion control plan, drawing **C-900** is included in **Appendix H**.

6 APPROVALS AND PERMIT REQUIREMENTS

6.1 City of Ottawa

The City of Ottawa reviews all development documents including this report. Upon completion, the City will approve the service connections and eventually issue a Commence Work Notification.

6.2 Province of Ontario

Since the proposed sewer discharge from the site will be directed to a combined sewer, a Environmental Compliance Approval certificate will be required. That certificate is issued by the provincial Ministry of Environment.

6.3 Conservation Authority

There are no approvals required from any Conservation Authority for this project.

6.4 Federal Government

There are no approvals required from Federal Government agencies for this project.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The existing municipal services, a 400 mm diameter watermain and a 525 mm diameter combined sewer in Bronson Avenue, and a 200 mm diameter watermain and a 375 mm diameter combined sewer in Cambridge Street, provide the site with the necessary capacity to support the proposed development. Appropriate connections to the existing infrastructure are needed to properly service the subject development.

7.2 Recommendations

Based on the findings and conclusions of our investigation, IBI recommends that the Site Plan Approval not be withheld because of inadequacy of existing major municipal services. The proposed development will be adequately serviced once connected to existing infrastructure in Bronson Avenue and Cambridge Street.



James I. Moffatt, P.Eng.
Associate



Michael Black, B.Eng.
E.I.T

APPENDIX A

SERVICING STUDY GUIDELINE CHECKLIST

General Content

ITEM DESCRIPTION		LOCATION
	Executive Summary (for larger reports only)	N/A
√	Date and revision number of the report	Front Cover
√	Location Map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1 and 2
√	Plan showing the site and location of all existing services.	Drawing C-100
√	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.3, 2.2, 3.2
√	Summary of Pre-consultation Meeting with City and other approval agencies.	Appendix C
	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 defensible design criteria.	N/A
	Statement of objectives and servicing criteria	N/A
√	Identification of existing and proposed infrastructure available in the immediate area.	Section 2.1, 3.1, 4.1 Drawing C-100
	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
	<u>Concept level master grading plan</u> 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.	Section 1.5
√	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	Report Drawings

Development Servicing Report: Water

ITEM DESCRIPTION		LOCATION
	Confirm consistency with Master Servicing Study, if available	N/A
√	Availability of public infrastructure to service proposed development	Section 2.4.
	Identification of system constraints – external water needed	N/A
√	Identify boundary conditions	Section 2.2
√	Confirmation of adequate domestic supply and pressure	Section 2.4
√	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
√	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.	Section 2.3
	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defining phases of the project including the ultimate design.	N/A
	Address reliability requirements such as appropriate location of shut-off valves.	N/A
	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.	Section 2.3
	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 feeder mains, 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 2.2
	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

Development Servicing Report: Wastewater

ITEM DESCRIPTION		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 3.2 and Appendix E
	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 condition of sewers.	N/A
√	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.1
√	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 3.2
√	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix "C") format.	Appendix E
√	Description of proposed sewer network including sewers, pumping stations and forcemains.	Section 3.3
	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, check soils, etc.	Section 1.5

Development Servicing Report: Stormwater Checklist

ITEM DESCRIPTION		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, 4.2
√	Analysis of available capacity in existing public infrastructure.	Section 4.1, 4.2
	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	N/A
	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 5
	Water quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	N/A
	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 5
	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.	N/A
	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
√	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.1
	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 5.1, 5.2
	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 5.1, 5.2
	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Section 5.1
	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.	Section 6
	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

Approval and Permit Requirements: Checklist

ITEM DESCRIPTION		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 Certification of Approval (CofA) under the Ontario Water resources Act.	Section 7.2
	Changes to Municipal Drains	N/A
	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 7.4

Conclusion Checklist

ITEM DESCRIPTION		LOCATION
√	Clearly stated conclusions and recommendations	Section 8
	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 professional Engineer registered in Ontario.	Done

APPENDIX B

PRE-CONSULTATION RECORDS

Boundary Condition for 192-196 Bronson

Legend

Pipe Ownership

Private

Public



NOTE: Boundary condition request numbers are slightly lower than the numbers in the final report (based on 5 fewer units than the final report), and the fire flow request is higher than in the report, but the City has confirmed that these boundary condition HGLs are fine to use because of the prescence of the 400mm diameter watermain in Bronson Avenue.

Michael Black

From: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Sent: Monday, January 29, 2018 9:01 AM
To: Michael Black
Cc: Mottalib, Abdul
Subject: FW: 192, 196 Bronson Avenue, 31 Cambridge Street
Attachments: 192-196 Bronson Jan 2018.pdf

Hi Michael,

Please see the water boundary conditions below as requested by you.

Thanks,

Abdul Mottalib, P. Eng.

From:
Sent: January 26, 2018 8:23 AM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 192, 196 Bronson Avenue, 31 Cambridge Street

The following are boundary conditions, HGL, for hydraulic analysis at 192-196 Bronson (zone 1W) assumed to be connected to the 203mm on Cambridge and 406mm on Bronson (see attached PDF for location).

Minimum HGL = 107.6m, same at both locations

Maximum HGL = 116.4m, same at both locations

Max Day + Fire Flow (250 L/s) = 94.0m, at Cambridge connection

Max Day + Fire Flow (250 L/s) = 108.3m, at Bronson connection

These are for current conditions and are based on computer model simulation.

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.

From: Michael Black [<mailto:Michael.Black@ibigroup.com>]
Sent: January 22, 2018 4:25 PM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 192, 196 Bronson Avenue, 31 Cambridge Street

Hi Abdul,

My apologies - here's the remaining info.

1. Location of Services **(See attached image)**
 - a. **Approximately 60 Cambridge St. North**
 - b. **Slightly north of Nepean St. on Bronson Ave**
2. Street Number **(192 Bronson Ave)**
3. Type of development and units **(Residential – 245 Units)**
4. The amount of fire flow required for the proposed development **(250 l/s)**
5. Average daily demand:-l/s **(1.72 l/s)**
6. Maximum daily demand:-l/s **(4.30 l/s)**
7. Maximum hourly daily demand :-l/s **(9.48 l/s)**

Also,

Are you able to reconfirm the capacity of the sewers in Bronson and Cambridge? Please let me know if you require anything else for this.

Thanks,

Michael

From: Mottalib, Abdul [<mailto:Abdul.Mottalib@ottawa.ca>]
Sent: Monday, January 22, 2018 3:52 PM
To: Michael Black <Michael.Black@ibigroup.com>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 192, 196 Bronson Avenue, 31 Cambridge Street

Hi Michael,

You have updated demands in red, but is not sufficient enough for sending the request. Please see my email below and send a new email containing the information as requested. If you need more clarifications, please call me at my extension 27798.

Thanks,

Abdul Mottalib, P. Eng.

From: Michael Black [<mailto:Michael.Black@ibigroup.com>]
Sent: January 22, 2018 2:45 PM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: 192, 196 Bronson Avenue, 31 Cambridge Street

Hi Abdul,

The 192 Bronson project is moving forward again after being on hold for a few years. Could you please reconfirm the water boundary conditions and also the available capacity in the sewers on Bronson and Cambridge?

I've added the updated demands in **red** in Jim's original email below.

Thanks very much,

Michael

From: Mottalib, Abdul [<mailto:Abdul.Mottalib@ottawa.ca>]
Sent: Wednesday, April 10, 2013 3:15 PM

To: Jim Moffatt <jmoffatt@IBIGroup.com>

Cc: hieu nguyen (hien.nguyen@ottawa.ca) <hien.nguyen@ottawa.ca>; Katherine Grechuta <grechuta@fotenn.com>;

Michel Beauchemin <mbeauchemin@IBIGroup.com>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>

Subject: RE: 192, 196 Bronson Avenue, 31 Cambridge Street

Hi Jim,

Please see the email below and send the revised information for water boundary conditions. Please call me if you want to discuss.

Required information for Water boundary conditions

Please use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons.

1. Location of Service
2. Street Number
3. Type of development and units
4. The amount of fire flow required for the proposed development
5. Average daily demand:-l/s
6. Maximum daily demand:-l/s
7. Maximum hourly daily demand :-l/s

Please note Service areas with a basic day demand greater than 50m³/day shall be connected with a minimum of two feeder mains to avoid the creation of a vulnerable service area

Thanks,

Abdul Mottalib, P. Eng.

From: Jim Moffatt [<mailto:jmoffatt@IBIGroup.com>]

Sent: April 10, 2013 2:18 PM

To: Mottalib, Abdul

Cc: hieu nguyen (hien.nguyen@ottawa.ca); Katherine Grechuta; Michel Beauchemin

Subject: 192, 196 Bronson Avenue, 31 Cambridge Street

IBI Group is currently providing civil input in support of an imminent site plan application for a proposed high rise development at 192, 196 Bronson Avenue. Please refer to the attached sketches. We understand the proposed development will include up to 13 storeys residential condominium and ground floor retail. We will complete the Conceptual Site Services report in support of the application. To that end we would like to confirm with the City some relevant design criteria as it relates to sewer and watermain capacities and/or any restrictions. To help we provide some preliminary calculations for wastewater flows and water demand:

Wastewater peak flow = 7.23 l/s **(6.93 l/s)**

Average Daily water Demand = 1.81 l/s **(1.72 l/s)**

Maximum day water Demand = 4.50 l/s **(4.30 l/s)**

Peak Hour water Demand = 8.99 l/s and **(9.48 l/s)**

Estimated Fire Demand (FUS) = 250 l/s. **(250 l/s)**

The hydrant H085 marked on the attached watermain plan is on a 610mm dia main so it will probably be the selected main to which the new development will connect. We also understand that runoff criteria were previously provided.

Based on this information could you please provide the water boundary conditions for this proposal?

Thanks

Jim Moffatt

Associate

IBI Group
400-333 Preston Street
Ottawa ON K1S 5N4 Canada

tel 613 225 1311
fax 613 225 9868
email jmoffatt@IBIGroup.com
web www.ibigroup.com

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APPENDIX C

WATER DEMAND CALCULATIONS



IBI GROUP
333 PRESTON STREET
OTTAWA, ONTARIO
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : 192 BRONSON
CLIENT : PRINCE DEY

FILE: 34206-5.7
DATE PRINTED: 2018-01-12
DESIGN: MB
PAGE: 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL (ICI)			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	1BD & STUDIO UNITS	2BD UNITS	PH UNITS	POPULATION	INDUST. (ha)	COMM. (ha)	INSTT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
	192 BRONSON	137	107	6	432.70		0.02		1.75	0.01	1.76	4.38	0.03	4.41	9.64	0.07	9.71

POPULATION DENSITY				WATER DEMAND RATES				PEAKING FACTORS			FIRE DEMANDS		
1BD & STUDIC	1.4 persons/unit	Residential	350 l/cap/day	Maximum Daily Residential	2.5 x avg. day	Single Family	10,000 l/min (166.7 l/s)						
2BD	2.1 persons/unit	Commercial	50,000 l/ha/day	Maximum Hourly Residential	2.2 x max. day	Semi Detached & Townhouse	10,000 l/min (166.7 l/s)						
PH	2.7 persons/unit					Medium Density	15,000 l/min (250 l/s)						

Fire Flow Requirement for 192 Bronson Avenue from Fire Underwriters Survey

Building Floor Area = 8,600 m²

(based on 2 largest floors + 50% of floors above up to a maximum of 8, per FUS)

1. $F = 220C\sqrt{A}$

C	0.6	C =	1.5 wood frame
A	6,960 m ²		1.0 ordinary
			0.8 non-combustible
F	11,012 l/min		0.6 fire-resistive
use	11,500 l/min		

2. Occupancy Adjustment

		-25% non-combustible
		-15% limited combustible
Use	-15%	0% combustible
		+15% free burning
Adjustment	-1725 l/min	+25% rapid burning
Fire flow	9,775 l/min	

3. Sprinkler Adjustment

Assume	30% reduction
Adjustment	2,933 l/min

4. Exposure Adjustment

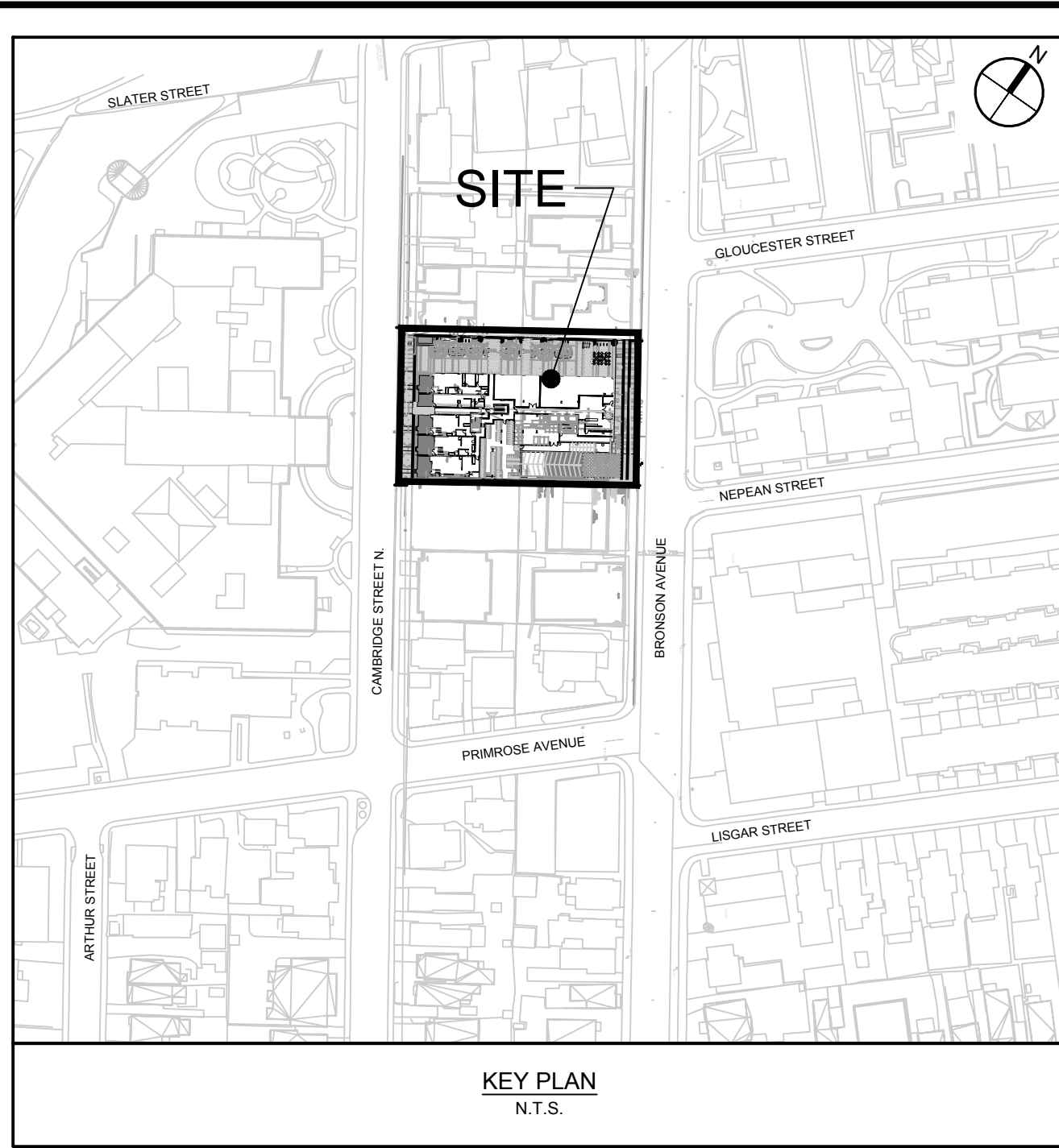
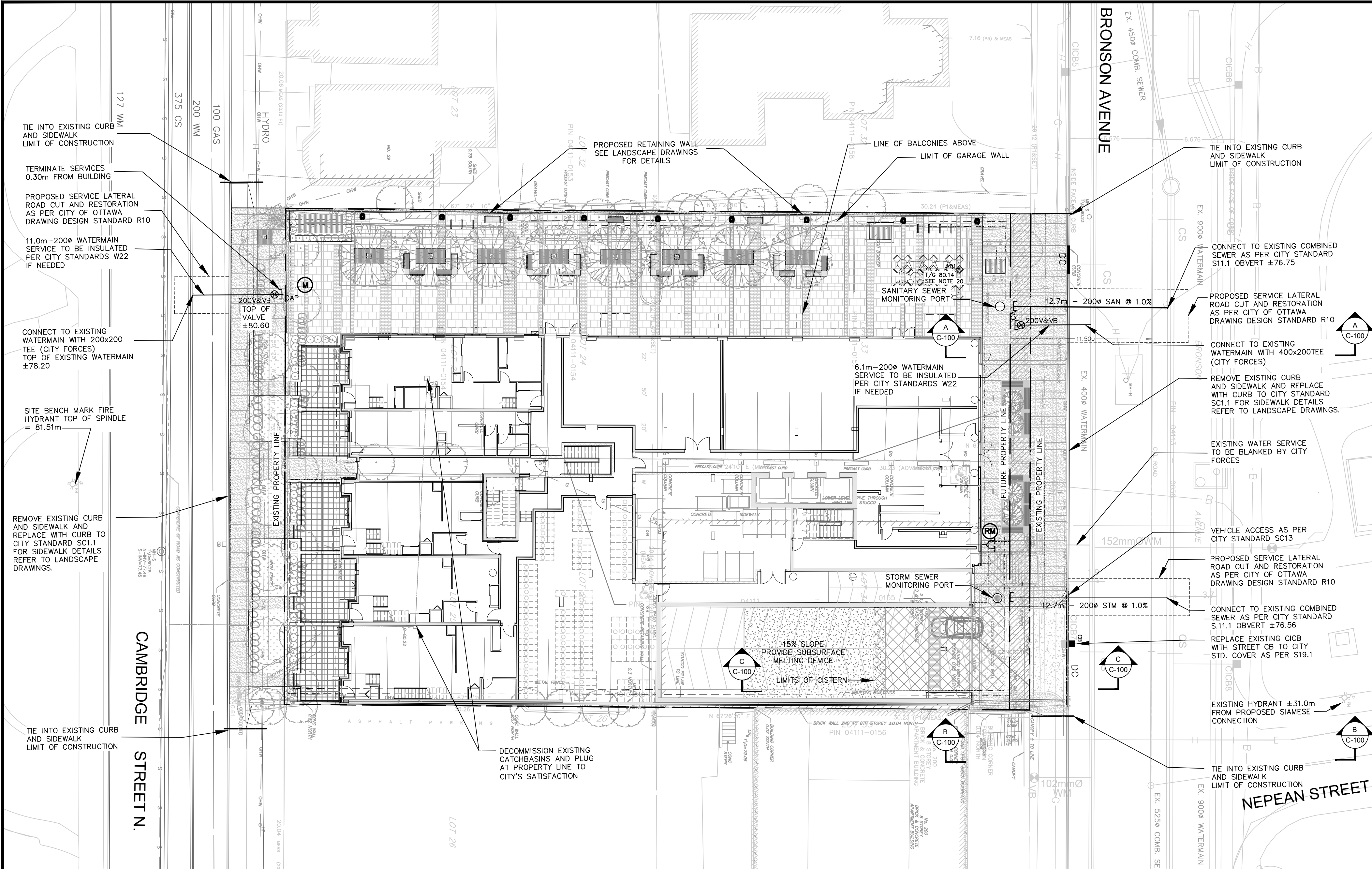
		Separation Charge	
		0 to 3m	+25%
		3.1 to 10m	+20%
		10.1 to 20m	+15%
		20.1 to 30m	+10%
		30.1 to 45m	+5%
Building Face	Separation	Charge	
north	<3	25%	
east	25	10%	
south	<3	25%	
west	25	10%	
Total		70%	
Adjustment		6,843	

Summary

Fire Flow from 2.	9,775 l/min
Add Exposure Adjustment	6,843
Less Sprinkler Adjustment	<u>2,933</u>
Total Fire Flow	13,685 l/min
Use	13,700 l/min
	228.3 l/s

APPENDIX D

**C-100 SITE SERVICING PLAN
C-200 SITE GRADING AND DRAINAGE PLAN**



LEGEND	
	PROPERTY LINE
	FINISHED FLOOR ELEVATION
	DEPRESSED CURB
	CURB TAPER
	WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
	REMOTE WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
	SIAMESE CONNECTIONS (SEE MECH. DRWG. FOR EXACT LOCATION)
	PROPOSED GAS SERVICE
	EXISTING UNDERGROUND HYDRO
	EXISTING OVERHEAD HYDRO
	EXISTING HYDRO MANHOLE
	EXISTING HYDRO AND LIGHT POLE
	EXISTING GAS MAIN
	EXISTING BELL
	EXISTING BELL MANHOLE
	EXISTING TRAFFIC MANHOLE
	EXISTING TRAFFIC LIGHT
	PROPOSED CONCRETE SIDEWALK
	EXISTING TRAFFIC SIGN
	EXISTING CATCH BASIN
	EXISTING COMBINED MANHOLE
	EXISTING COMBINED SEWER
	PROPOSED STORM WATERMAIN
	EXISTING WATERMAIN
	PROPOSED SANITARY SEWER
	PROPOSED WATERMAIN
	PROPOSED VALVE AND VALVE BOX
	PROPOSED REDUCER
	EXISTING FIRE HYDRANT
	EXISTING SIGN
	EXISTING WATER VALVE
	EXISTING WATER SERVICE STANDPOST
	EXISTING VALVE BOX

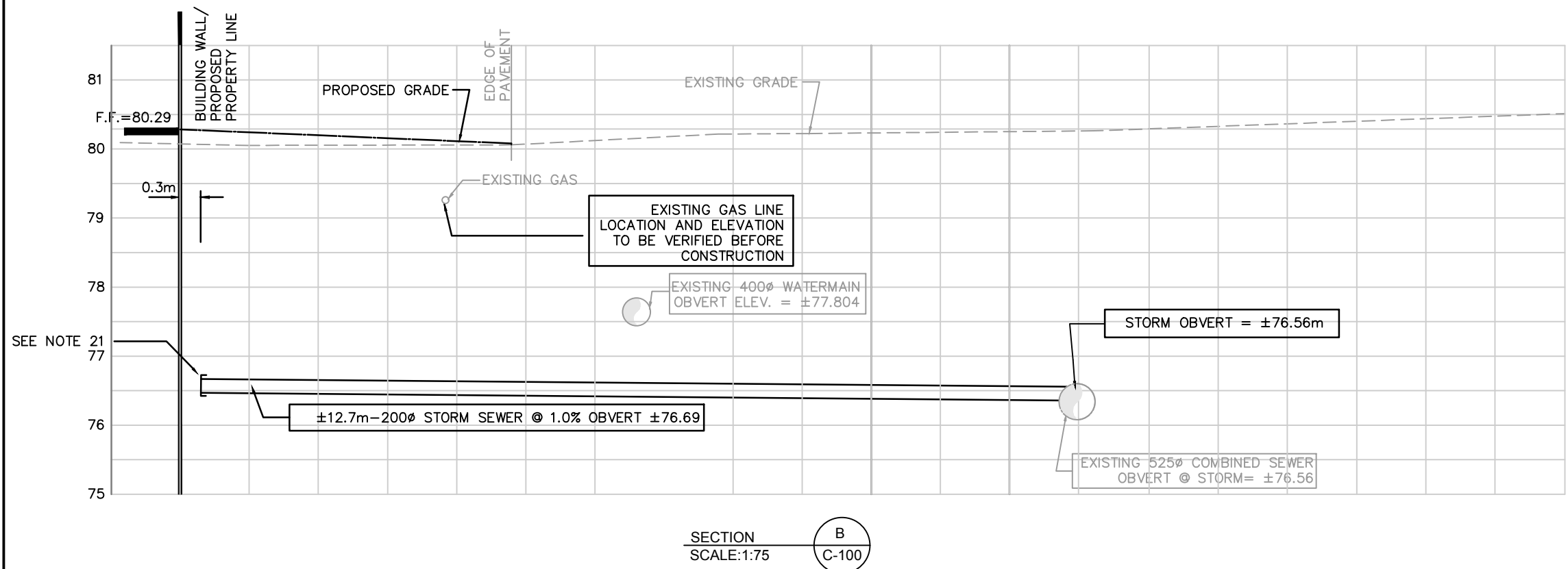
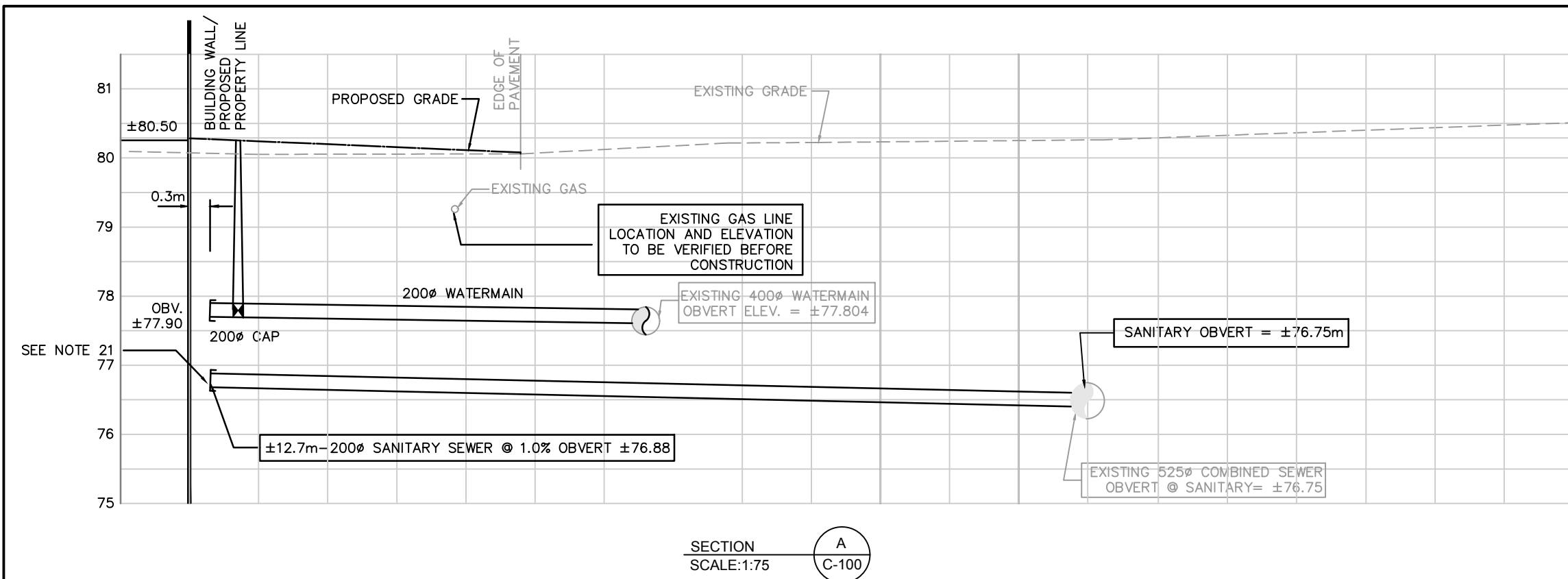
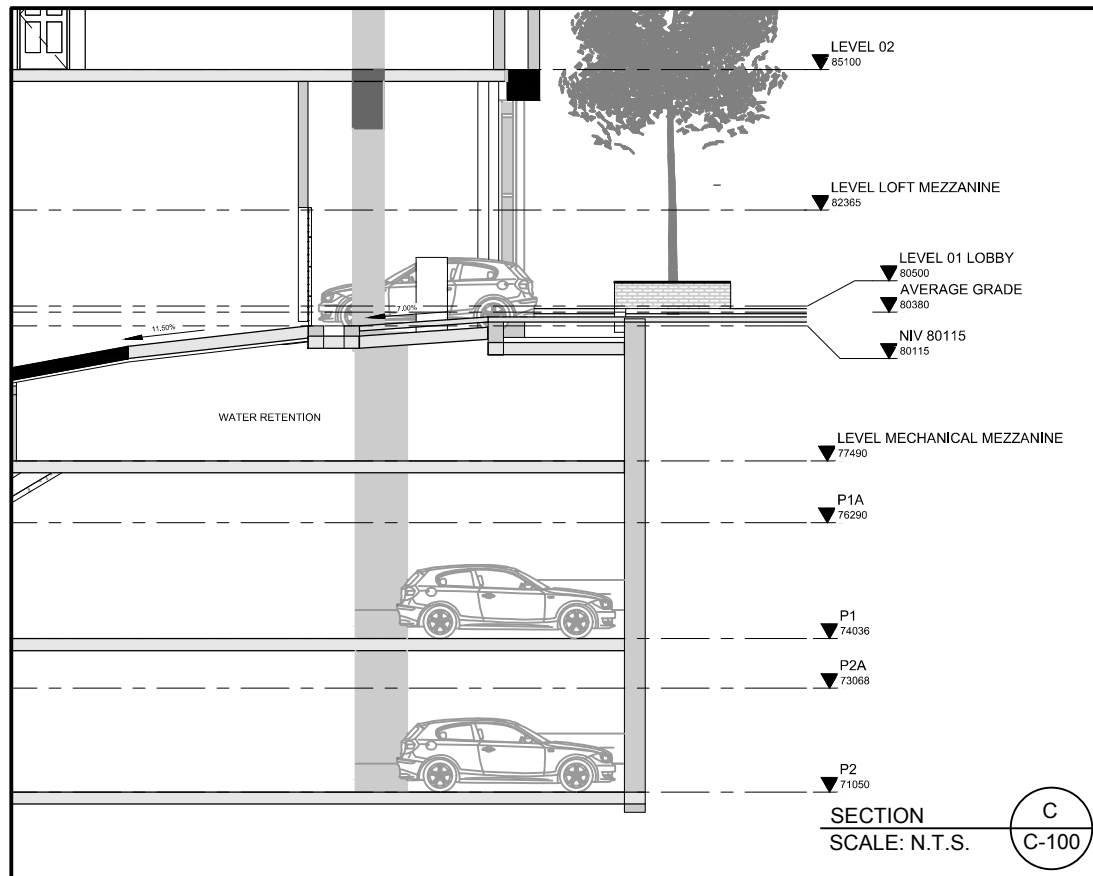
- NOTES:
- ALL WORKS TO BE COMPLETED AS PER CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
 - SEWER LATERALS TO BE PVC DR 35.
 - USE TRENCH FOR ALL SERVICE LATERALS.
 - WATER SERVICES TO BE PVC, DR 18 CL150. MINIMUM COVER OF 2.4m FOR WATER SERVICE IS REQUIRED, USE THERMAL INSULATION AS PER CITY STANDARDS WHEN COVER IS LESS THAN 2.4m.
 - ALL SERVICE LATERAL AND SURFACE RESTORATION WORK IN ACCORDANCE WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
 - FULL PORT BACKWATER VALVE IS REQUIRED ON BOTH THE SANITARY AND STORM SERVICE CONNECTIONS.
 - WATER SERVICE CHLORINATION AND TESTING TO BE COMPLETED BY CITY FORCES.
 - PROPOSED BUILDING INFORMATION TAKEN FROM CORE ARCHITECTS INC. DRAWINGS.
 - AN EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED ON THIS SITE. AS A MINIMUM THAT PLAN WILL INCLUDE A LIGHT DUTY SILT FENCE BARRIER TO OPSD STANDARD 219.110 SURROUNDING THE SITE WHERE PRACTICAL AND SILT SACKS FITTED UNDER EXISTING STREET CATCH BASINS.
 - ALL SHOWN UTILITIES ARE APPROXIMATE AND ARE TO BE FIELD VERIFIED BY CONTRACTOR. ANY DISCREPANCIES ARE TO BE REPORTED TO IBI GROUP PRIOR TO CONTRACTOR MOBILIZING TO SITE.
 - CONTRACTOR RESPONSIBLE TO SUPPORT EXISTING UTILITIES THAT MAY BE AFFECTED DURING CONSTRUCTION
 - EXISTING CURBS AND SIDEWALKS ARE TO BE REMOVED AND REPLACED WITH 2.0m WIDE CURB AND SIDEWALKS TO CITY STANDARD SC7.1.
 - THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, USING FILTER CLOTH UNDER THE GRATES OF CATCHBASINS AND MANHOLES AND INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCIES.
 - BEARINGS SHOWN HEREON AND ELEVATIONS ARE INDICATED ON THE LOT SURVEY BY STANTEC GEOMATICS LTD, DATED MAY 2, 2013
 - FOR GEOTECHNICAL INFORMATION SEE MULTI-STORY BUILDING, 192 BRONSON AVENUE, OTTAWA, ONTARIO BY PATERSON GROUP INC
 - CLAY SEAL TO BE INSTALLED IN SERVICE TRENCHES BETWEEN CONNECTION POINT AND CAP.
 - LANDSCAPING PLAN COMPLETED BY FOTENN PLANNING + DESIGN INC. REFER TO LANDSCAPE PLANS FOR SURFACE FINISH BETWEEN CONCRETE SIDEWALK AND BUILDING.
 - THE EXISTING BUILDING AT 192 BRONSON AVENUE IS TO BE DEMOLISHED. PRIOR TO DEMOLITION THE EXISTING BUILDING SERVICES ARE TO BE FIELD LOCATED AND DECOMMISSIONED AS PER CITY STANDARDS. THE WATER SERVICES ARE TO BE BLANKED AT THE WATERMAIN BY CITY FORCES AS PART OF THE WATER PERMIT.
 - EXISTING SEWERS ARE TO BE CAPPED AT THE PROPERTY LINE BY THE CONTRACTOR TO THE SATISFACTION OF THE CITY'S SEWER OPERATIONS STAFF.
 - PROPOSED SIAMESE CONNECTION IS ±31m FROM EXISTING HYDRANT
 - OUTLET PIPE FROM THE SITE AREA DRAIN TO BE DIRECTED INTO THE PARKING LEVEL. MECHANICAL DESIGNER TO DESIGN THE INTERNAL DRAINAGE PIPES TO THE CISTERN LOCATION. THE DRAIN IS TO BE EQUIVALENT TO HEAVY DUTY FLOOR DRAIN FIG. 2290 BY JAY R. SMITH MFG.CO.
 - MONITORING PORTS ARE TO BE INSTALLED ON THE SANITARY AND STORM SEWERS INSIDE THE PROPERTY LINE.
 - THE MECHANICAL ENGINEER IS TO CONNECT BOTH WATERMANS IN THE MECHANICAL ROOM WITH A TEE AND CREATE ONE WATER SERVICE DESIGNED TO SERVICE THE BUILDING.
 - FOR SECTION C DETAILS REFER TO DRAWING A300, PREPARED BY GEIGER HUOT ARCHITECTS.

GROUND LEVEL STORMWATER MANAGEMENT		
	100YR STORAGE VOLUME REQUIRED (m³)	MAX RELEASE RATE (L/s)
* CISTERN	101.76	5.36
* CISTERN LOCATION & DESIGN BY OTHERS.		

APPROVED ☐ REFUSED ☐

THIS _____ DAY OF _____, 20____

DOUGLAS JAMES, MCIP, RPP, MANAGER
DEVELOPMENT REVIEW CENTRAL
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



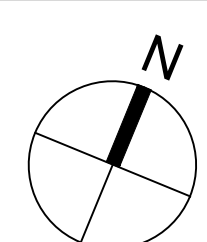
14			
13			
12			
11			
10			
9			
8	RE-ISSUED FOR SPA	JIM	18.02.07
7	RE-ISSUED FOR SPA	JIM	14.11.07
6	ISSUED FOR SPA 2ND SUBMISSION	JIM	14.08.14
5	REVISED AS PER NEW SITE AND LANDSCAPE PLANS AUGUST 2014	JIM	14.08.13
4	ISSUED FOR SECOND CITY SUBMISSION	JIM	14.06.06
3	REVISED AS PER CITY COMMENTS AND NEW SITE PLAN	JIM	14.05.29
2	REVISED FOR SITE PLAN APPROVAL	JIM	26.09.13
1	ISSUED FOR SITE PLAN APPROVAL	JIM	13.09.13
No.	REVISIONS	By	Date

PRINCE DEVELOPMENTS

IBI GROUP
400 - 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title
192 BRONSON AVENUE

OTTAWA, ONTARIO, CANADA



Drawing Title
SITE SERVICING

Scale
1:200

Design
M.B.

Date
SEPTEMBER 2013

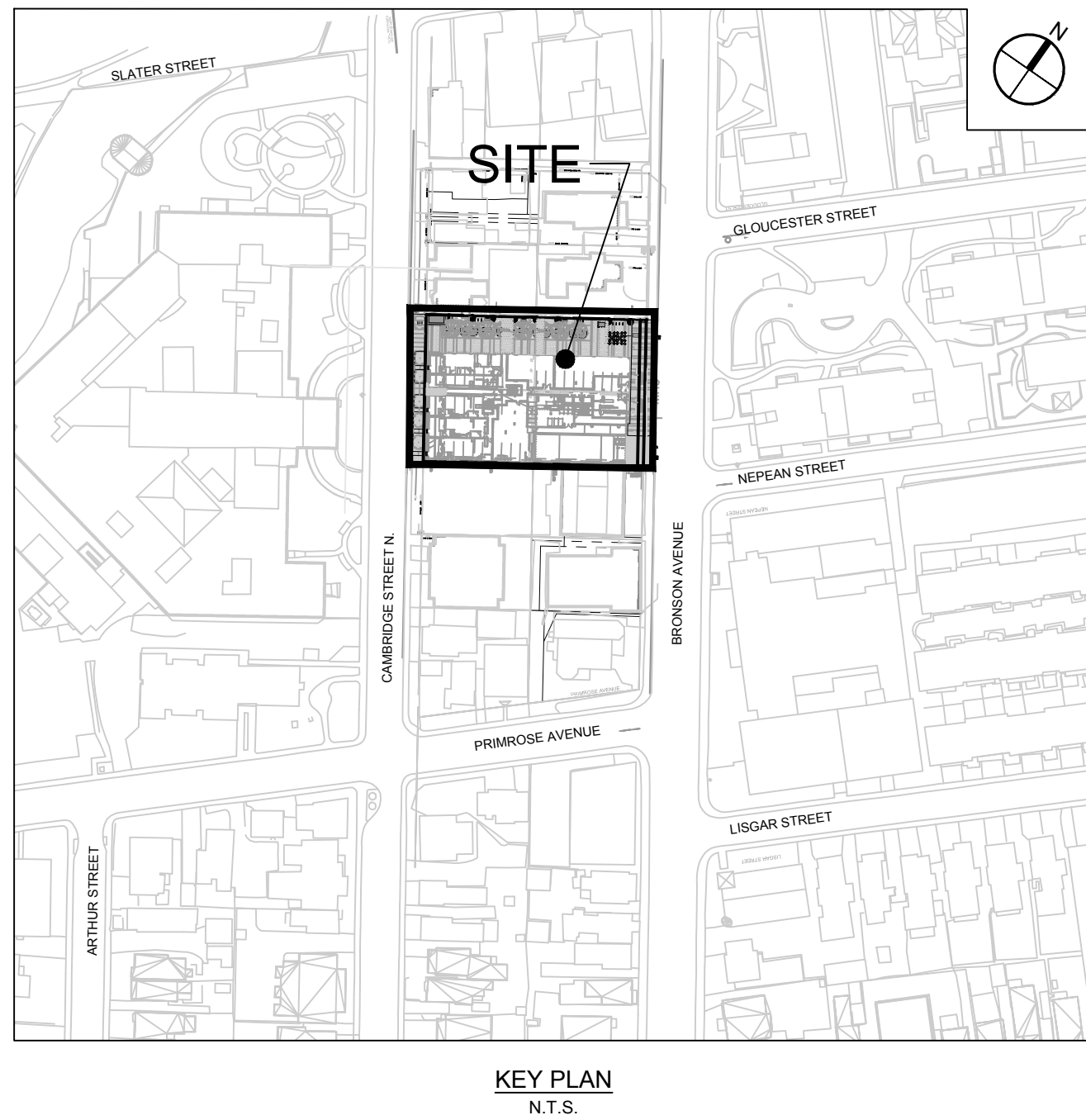
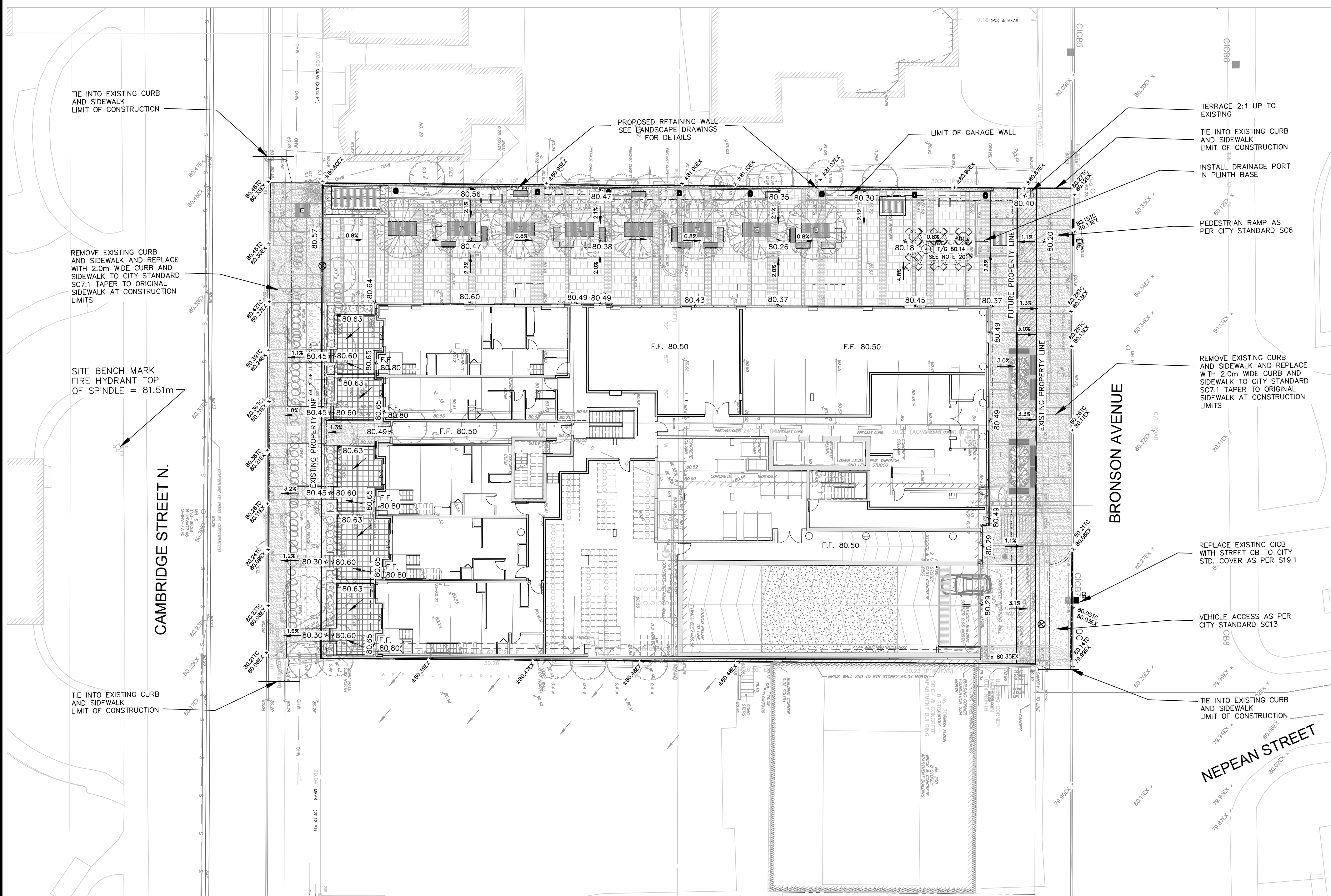
Drawn
M.B.

Checked
J.I.M.

Project No.
34206

Drawing No.
C-100

D07-12-13-0171



NOTES:

- ALL WORKS TO BE COMPLETED AS PER CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
- SEWER LATERALS TO BE PVC DR 35.
- WATER SERVICES TO BE PVC, DR 18 CL150. MINIMUM COVER OF 2.4m. FOR WATER SERVICE IS REQUIRED, USE THERMAL INSULATION AS PER CITY STANDARDS WHEN COVER IS LESS THAN 2.4m.
- ALL SERVICE LATERAL AND SURFACE RESTORATION WORK IN ACCORDANCE WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
- FULL PORT BACKWATER VALVE IS REQUIRED ON BOTH THE SANITARY AND STORM SERVICE CONNECTIONS.
- WATER SERVICE CHLORINATION AND TESTING TO BE COMPLETED BY CITY FORCES.
- PROPOSED BUILDING INFORMATION TAKEN FROM GEIGER HUOT ARCHITECTS INC. DRAWINGS.
- AN EROSION AND SEDIMENTATION

CONTROL PLAN WILL BE IMPLEMENTED ON THIS SITE. AS A MINIMUM THAT PLAN WILL INCLUDE A LIGHT DUTY SILT FENCE BARRIER TO OPSD STANDARD 218.110 SURROUNDING THE SITE WHERE PRACTICAL AND SILT SACKS FITTED UNDER EXISTING STREET CATCH BASINS.

9. ALL SHOWN UTILITIES ARE APPROXIMATE AND ARE TO BE FIELD VERIFIED BY CONTRACTOR, ANY DISCREPANCIES ARE TO BE REPORTED TO IBI GROUP PRIOR TO CONTRACTOR MOBILIZING TO SITE.

10. CONTRACTOR RESPONSIBLE TO SUPPORT EXISTING UTILITIES THAT MAY BE AFFECTED DURING CONSTRUCTION

11. A) SOME EXISTING CURBS TO BE REPLACED, ALL NEW CURBS TO BE AS PER CITY STANDARD SC1.1 TIEING INTO TOP/BOTTOM OF CURB ELEVATIONS. B) ALL RECONSTRUCTED SIDEWALKS AS PER CITY STANDARD SC1.4.

12. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, USING SILT SACKS IN THE GRATES OF CATCHBASINS AND MANHOLES AND INSTALLING SILT

FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY APPLICABLE REGULATORY AGENCIES.

13. BEARINGS SHOWN HEREON AND ELEVATIONS ARE INDICATED ON THE LOT SURVEY BY STANTEC GEOMATICS LTD. DATED MAY 2, 2013

14. FOR GEOTECHNICAL INFORMATION SEE MULTI-STORY BUILDING, 192 BRONSON AVENUE, OTTAWA, ONTARIO BY PATERSON GROUP INC

15. CLAY SEAL TO BE INSTALLED IN SERVICE TRENCHES BETWEEN CONNECTION POINT AND CAP.

16. LANDSCAPING PLAN COMPLETED BY FOTENN - REFER TO LANDSCAPE PLANS FOR SURFACE FINISH BETWEEN CONCRETE SIDEWALK AND BUILDING.

17. THE EXISTING BUILDING AT 192 BRONSON AVENUE IS TO BE DEMOLISHED. PRIOR TO DEMOLITION THE EXISTING BUILDING SERVICES ARE TO BE FIELD LOCATED AND DECOMMISSIONED AS PER CITY STANDARDS. THE WATER SERVICES ARE TO BE BLANKED AT THE WATERMAIN BY CITY

FORCES AS PART OF THE WATER PERMIT.

19. PROPOSED SIAMESE CONNECTION IS ±31m FROM EXISTING HYDRANT

20. OUTLET PIPES FROM THE SITE AREA DRAIN TO BE DIRECTED INTO THE PARKING LEVEL. MECHANICAL DESIGNER TO DESIGN THE INTERNAL DRAINAGE PIPES TO THE CISTERN LOCATION. THE DRAIN IS TO BE EQUIVALENT TO HEAVY DUTY FLOOR DRAIN FIG. 2290 BY JAY R. SMITH MFG.CO.

21. MONITORING PORTS ARE TO BE INSTALLED ON THE SANITARY AND STORM SEWERS INSIDE THE PROPERTY LINE.

22. THE MECHANICAL ENGINEER IS TO CONNECT BUT WATERMAINS IN THE MECHANICAL ROOM WITH A TEE AND CREATE ONE WATER SERVICE DESIGNED TO SERVICE THE BUILDING.

23. FOR RETAINING WALL FINAL DETAILS REFER TO STRUCTURAL/ARCHITECTURAL DRAWINGS.

APPROVED ☐ REFUSED ☐

THIS ___ DAY OF ___, 20__

DOUGLAS JAMES, MCIP, RPP, MANAGER
DEVELOPMENT REVIEW CENTRAL
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

LEGEND

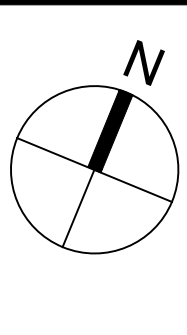
—	PROPERTY LINE		
FF 80.50	FINISHED FLOOR ELEVATION		
DC	DEPRESSED CURB		EXISTING TRAFFIC SIGN
—	CURB TAPER	□ CB	EXISTING CATCH BASIN
(M)	WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)	○ MH	EXISTING COMBINED MANHOLE
(RM)	REMOTE WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)	300# COMBINED	EXISTING COMBINED SEWER
—	SIAMESE CONNECTIONS (SEE MECH. DRWG. FOR EXACT LOCATION)	200# STORM	PROPOSED STORM SEWER
—	PROPOSED GAS SERVICE	405# WATERMAIN	EXISTING WATERMAIN
—	EXISTING UNDERGROUND HYDRO	200# SANITARY	PROPOSED SANITARY SEWER
—	EXISTING OVERHEAD HYDRO	200# WATERMAIN	PROPOSED WATERMAIN
○ HMH	EXISTING HYDRO MANHOLE	200V&VB	PROPOSED VALVE AND VALVE BOX
○ H/SL	EXISTING HYDRO AND LIGHT POLE	200x150REDUCER	PROPOSED REDUCER
— G —	EXISTING GAS MAIN	○ FH	EXISTING FIRE HYDRANT
— B —	EXISTING BELL	— SN	EXISTING SIGN
○ BMH	EXISTING BELL MAN HOLE	○ SP	EXISTING WATER VALVE
○ TMH	EXISTING TRAFFIC MANHOLE	○ VB	EXISTING WATER SERVICE STANDPOST
○ TL	EXISTING TRAFFIC LIGHT		EXISTING VALVE BOX
—	PROPOSED CONCRETE SIDEWALK		

14			
13			
12			
11			
10			
9			
8			
7	RE-ISSUED FOR SPA	JIM	18-02-07
6	RE-ISSUED FOR SPA	JIM	14-11-07
5	ISSUED FOR SPA 2ND SUBMISSION	JIM	14-08-14
4	REVISED AS PER NEW SITE AND LANDSCAPE PLANS AUGUST 2014	JIM	14-08-13
3	ISSUED FOR SECOND CITY SUBMISSION	JIM	14-06-06
2	REVISED AS PER CITY COMMENTS AND NEW SITE PLAN	JIM	14-05-29
1	ISSUED FOR SITE PLAN APPROVAL	JIM	13-09-13
No.	REVISIONS	By	Date

PRINCE DEVELOPMENTS



Project Title
192 BRONSON AVENUE
OTTAWA, ONTARIO, CANADA



Drawing Title
GRADING PLAN

Scale
1:200

Design	M.B.	Date	SEPTEMBER 2013
Drawn	M.B.	Checked	J.I.M.
Project No.	34206	Drawing No.	C-200

APPENDIX E

SEWER DESIGN SHEET

FIGURE E1 – SANITARY DRAINAGE AREA PLAN

FIGURE E2 – STORM DRAINAGE AREA PLAN EXISTING CONDITIONS

FIGURE E3 – STORM DRAINAGE AREA PLAN PROPOSED CONDITIONS

Pre and post development total flow review
192 Bronson Avenue

[illegible]

Plot Style: --- Plot Scale: 1:1 Plotted At: Feb. 5, 18 11:14 AM Printed By: DON SIURNA Last Saved By: DSIURNA Last Saved At: Feb. 5, 18

Scale

Project Title

Drawing Title

Sheet No.

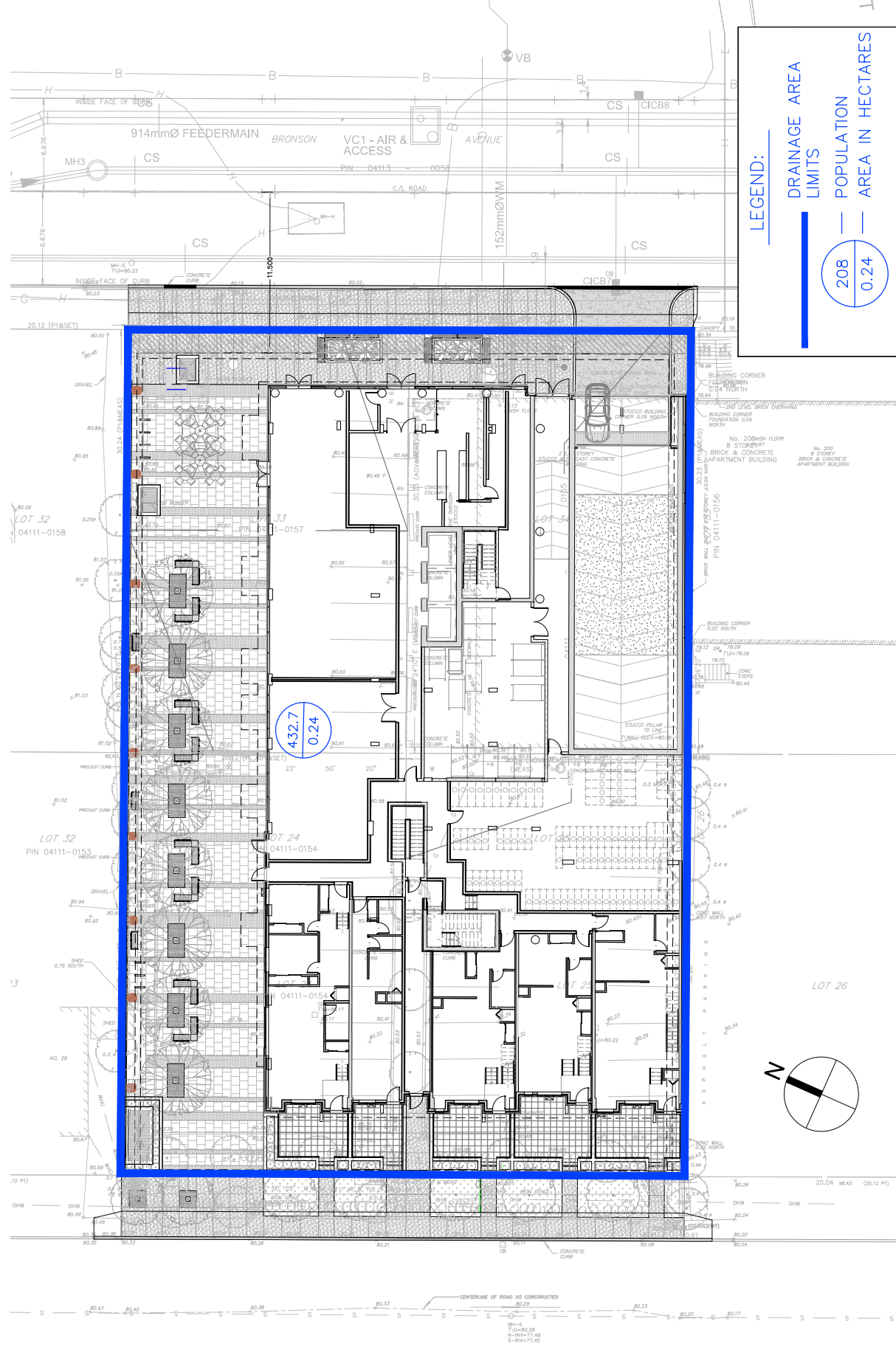


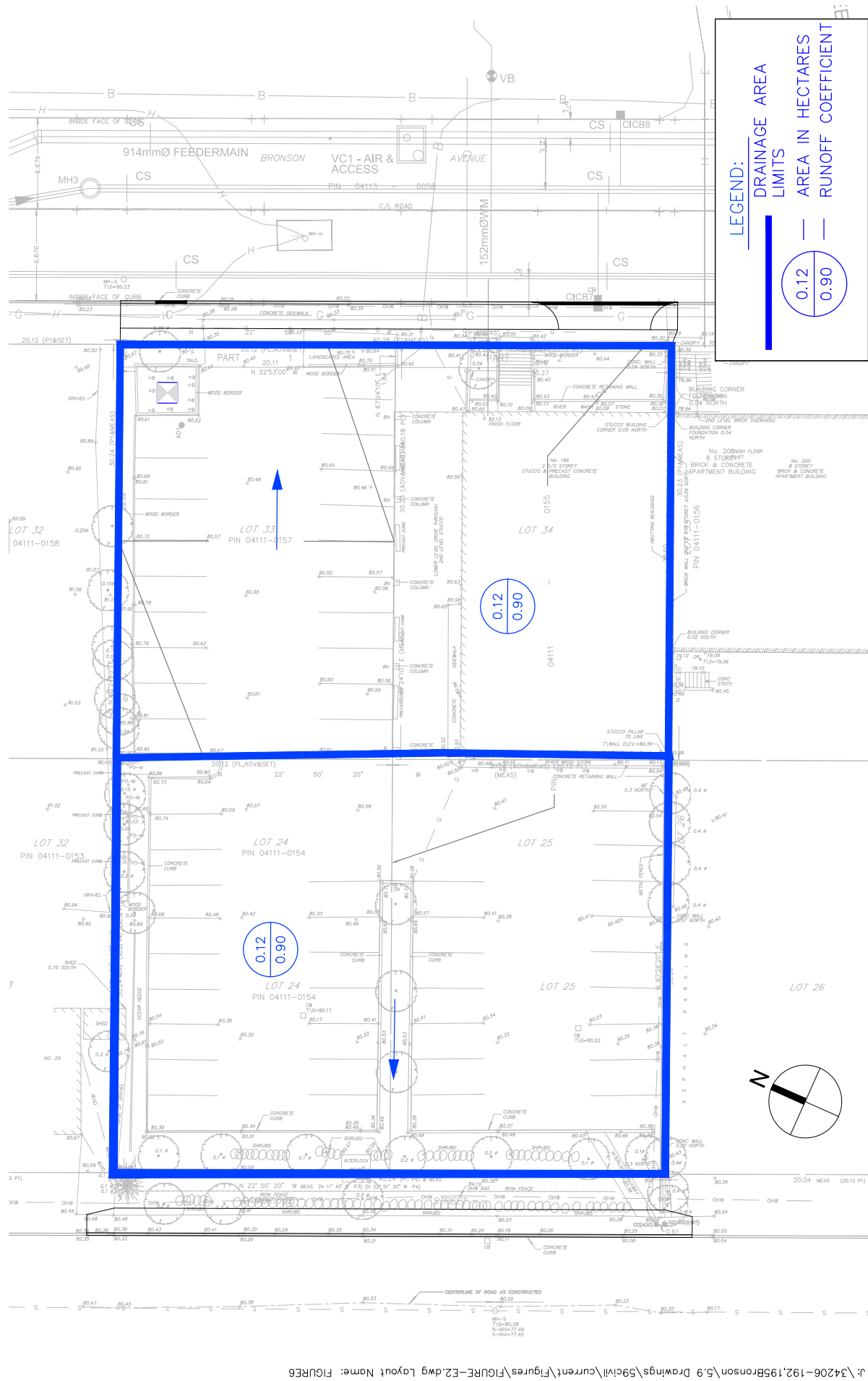
N.T.S.

192 BRONSON AVENUE

SANITARY DRAINAGE
AREA PLAN

FIGURE E1





Plot Style: ----- Plot Scale: 1:1 Plotted At: Feb. 5, 18 11:14 AM Printed By: DON SIURNA Last Saved By: DON SIURNA Last Saved At: Feb. 5, 18

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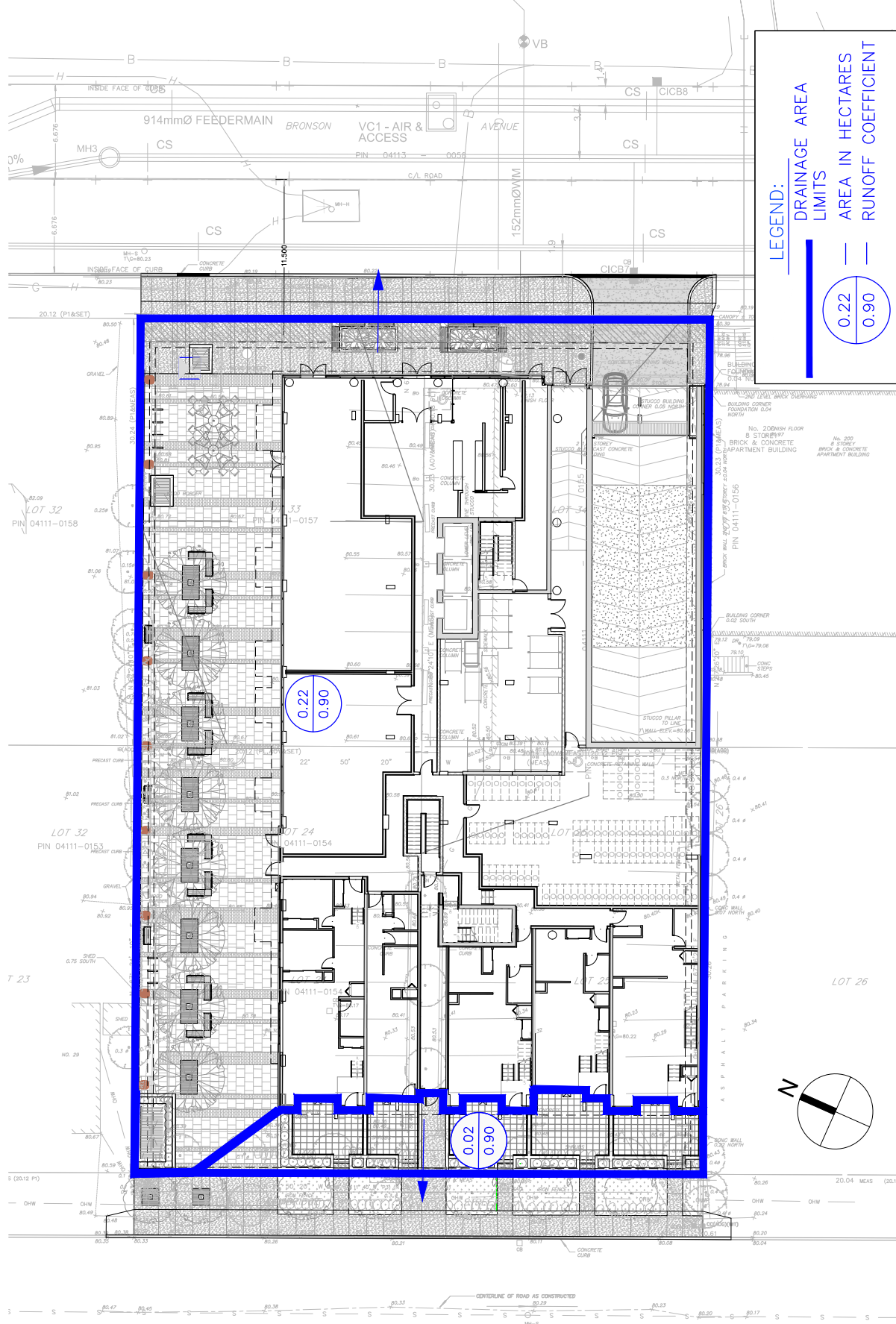
192 BRONSON AVENUE

STORM DRAINAGE AREA PLAN EXISTING CONDITIONS

N.T.S.

FIGURE E2

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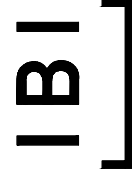


Scale

Project Title

Drawing Title

Sheet No.



N.T.S.

192 BRONSON AVENUE

STORM DRAINAGE AREA PLAN
PROPOSED CONDITIONS

FIGURE E3

APPENDIX F

ALLOWABLE RELEASE RATE CALCULATION

Maximum Allowable Flow - Flow Restricted to C=0.4

Time of Concentration = 20 min
Area = 2367 m²
Runoff Coefficient (C) = 0.40

2 Year Storm Event, Tc=20min

Intensity, $i_{2yr} = 732.951/(Tc+6.199)^{0.81}$
= 52.03 mm/hr

Restricted Flowrate (Q2)

$Q_{\text{max allowable}} = 2.78CiA = 13.69 \text{ L/s}$

Stormwater Management - Total Site Post-development Uncontrolled 100 Year Flow

Time of Concentration = 20 min
Area = 2366.5 m²
Runoff Coefficient - Post-development (C) = 0.90

100 Year Storm Event, Tc=20min

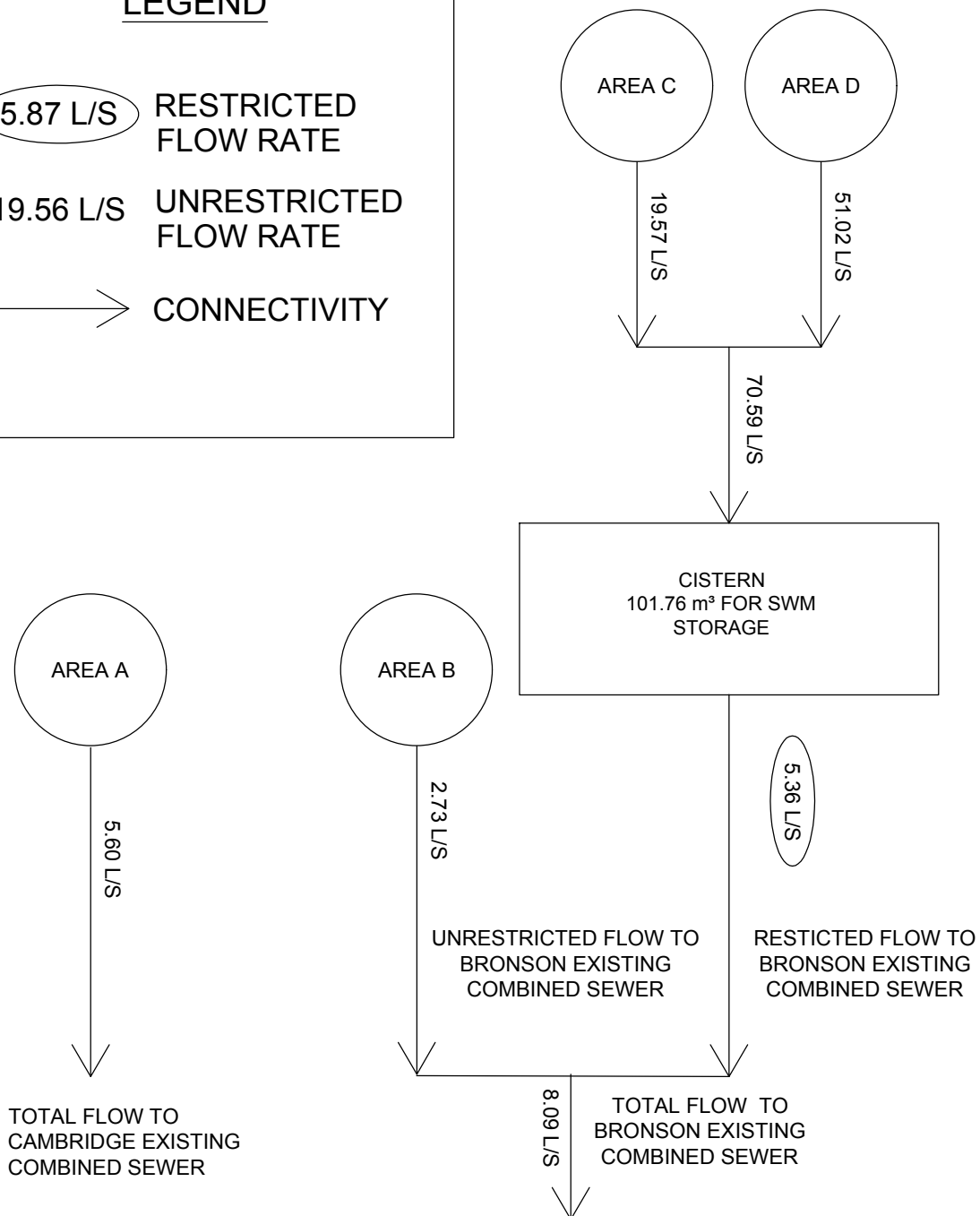
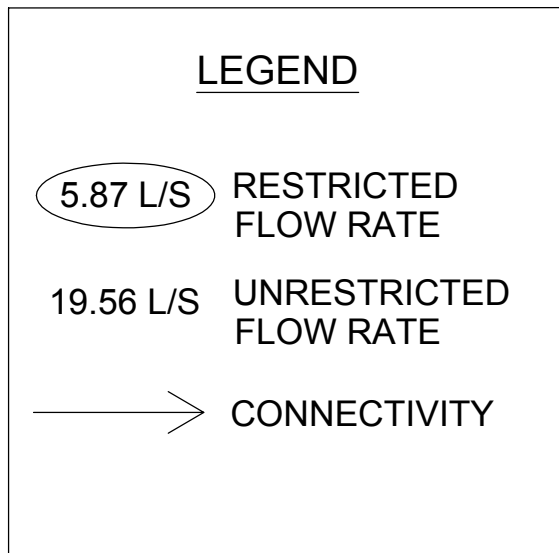
Intensity, $i_{100yr} = 1735.688/(Tc+6.014)^{0.82}$
= 119.95 mm/hr

Post Development Uncontrolled

$Q_{100 \text{ u/c}} = 2.78CiA = 71.02 \text{ L/s}$

APPENDIX G

**FIGURE G – SWM SCHEMATIC
STORMWATER MANAGEMENT CALCULATIONS
SUMMARY OF STORMWATER MANAGEMENT RESULTS**



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Plot Style: 02_B+W_2010.CTB Plot Scale: 7.6516:1 Plotted At: Feb. 5, 18 2:00 PM Printed By: DON SIURNA Last Saved By: DSIURNA Last Saved At: Feb. 5, 18



192 BRONSON AVENUE

SWM DRAINAGE
SCHEMATIC

FIGURE G

Stormwater Management - Post-development Area A (Uncontrolled Grounds to Cambridge Street)

Time of Concentration (Tc) = 20 min

Area (A) = 168 m²

Grass Area = 0.0 m² C= 0.20

Shrub Area = 30 m² C= 0.40

Asphalt Area = 138.0 m² C= 0.90

Total = 168.0 m²

Runoff Coefficient (C) = $\frac{[(30.0 \times 0.40) + (138.0 \times 0.90)]}{168.0}$

= 0.82

Runoff Coefficient (C) x 25% (Max 1.00) = 1.00

100 Year Storm Event, Tc=20min

Intensity, $i_{100yr} = 1735.688 / (Tc + 6.014)^{0.82}$

= 119.95 mm/hr

Post Development Uncontrolled

$Q_{100yr\ u/c} = 2.78 C i_{100yr} A$

= 5.60 L/s

Stormwater Management - Post-development Area B (Uncontrolled Grounds to Bronson Avenue)

Time of Concentration (Tc) = 20 min
Area (A) = 82 m²

Grass Area =	0.0 m ²	C= 0.20
Shrub Area =	15.0 m ²	C= 0.40
Asphalt Area =	67.0 m ²	C= 0.90
Total =	82.0 m²	

Runoff Coefficient (C) = $\frac{[(15.0 \times 0.40) + (67.0 \times 0.90)]}{82.0}$

= 0.81

Runoff Coefficient (C) x 25% (Max 1.00) = 1.00

100 Year Storm Event, Tc=20min

Intensity, $i_{100\text{yr}} = 1735.688 / (Tc + 6.014)^{0.82}$
= 119.95 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}} = 2.78 C i_{100\text{yr}} A$
= 2.73 L/s

Stormwater Management - Post-development Area C (Main Entrance)

Time of Concentration (Tc) = 20 min
 Area (A) = 587 m²

Grass Area =	0.0 m ²	C= 0.20
Shrub Area =	0.0 m ²	C= 0.40
Asphalt Area =	587.0 m ²	C= 0.90
Total =	587.0 m²	

Runoff Coefficient (C) = $\frac{[587.0 \times 0.90]}{587.0}$
= 0.90

Runoff Coefficient (C) x 25% (Max 1.00) = 1.00

100 Year Storm Event, Tc=20min

Intensity, $i_{100\text{yr}} = 1735.688 / (Tc + 6.014)^{0.82}$
 = 119.95 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}} = 2.78 C i_{100\text{yr}} A$
= 19.57 L/s

Stormwater Management - Post-development Area D (All Roofs)

Time of Concentration (Tc) = 20 min
 Area (A) = 1530 m²

Grass Area =	0.0 m ²	C= 0.20
Shrub Area =	0.0 m ²	C= 0.40
Asphalt Area =	1530.0 m ²	C= 0.90
Total =	1530.0 m²	

Runoff Coefficient (C) = $\frac{[587.0 \times 0.90]}{1530.0}$
= 0.90

Runoff Coefficient (C) x 25% (Max 1.00) = 1.00

100 Year Storm Event, Tc=20min

Intensity, $i_{100\text{yr}} = 1735.688 / (Tc + 6.014)^{0.82}$
 = 119.95 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}} = 2.78 C i_{100\text{yr}} A$
= 51.02 L/s

Stormwater Management - Area D (Upper Roof) Post-development Controlled 100 Year Flow

Controlled 100 year flow

$$\begin{aligned}\text{Total Area (Area C + Area D)} &= 2117 \text{ m}^2 \\ &= 0.2117 \text{ ha}\end{aligned}$$

$$\begin{aligned}\text{Runoff Coefficient (C)} &= \frac{(587.0 \times 1.00) + (1530.0 \times 1.00)}{2117} \\ &= 1.00\end{aligned}$$

$$\text{Restricted Release Rate} = 5.36 \text{ L/s}$$

<i>Tc</i> Variable (min)	<i>i</i> (mm/hour)	<i>Qp</i> <i>Qp</i> =2.78 <i>CiA</i> (L/s)	<i>Qm</i> (L/s)	<i>Qp-Qm</i> (L/s)	Volume (m ³)
5	242.70	142.84	5.36	137.48	41.24
10	178.56	105.09	5.36	99.73	59.84
15	142.89	84.10	5.36	78.74	70.87
20	119.95	70.59	5.36	65.24	78.29
25	103.85	61.12	5.36	55.76	83.64
30	91.87	54.07	5.36	48.71	87.68
35	82.58	48.60	5.36	43.24	90.81
40	75.15	44.22	5.36	38.87	93.29
45	69.05	40.64	5.36	35.28	95.26
50	63.95	37.64	5.36	32.28	96.85
55	59.62	35.09	5.36	29.73	98.12
60	55.89	32.90	5.36	27.54	99.14
65	52.65	30.98	5.36	25.63	99.95
70	49.79	29.30	5.36	23.95	100.58
75	47.26	27.81	5.36	22.46	101.05
80	44.99	26.48	5.36	21.12	101.39
85	42.95	25.28	5.36	19.92	101.61
90	41.11	24.19	5.36	18.84	101.73
95	39.43	23.21	5.36	17.85	101.76
100	37.90	22.31	5.36	16.95	101.71
105	36.50	21.48	5.36	16.12	101.58
110	35.20	20.72	5.36	15.36	101.39

$$\text{Cistern Volume} = 101.76 \text{ m}^3$$

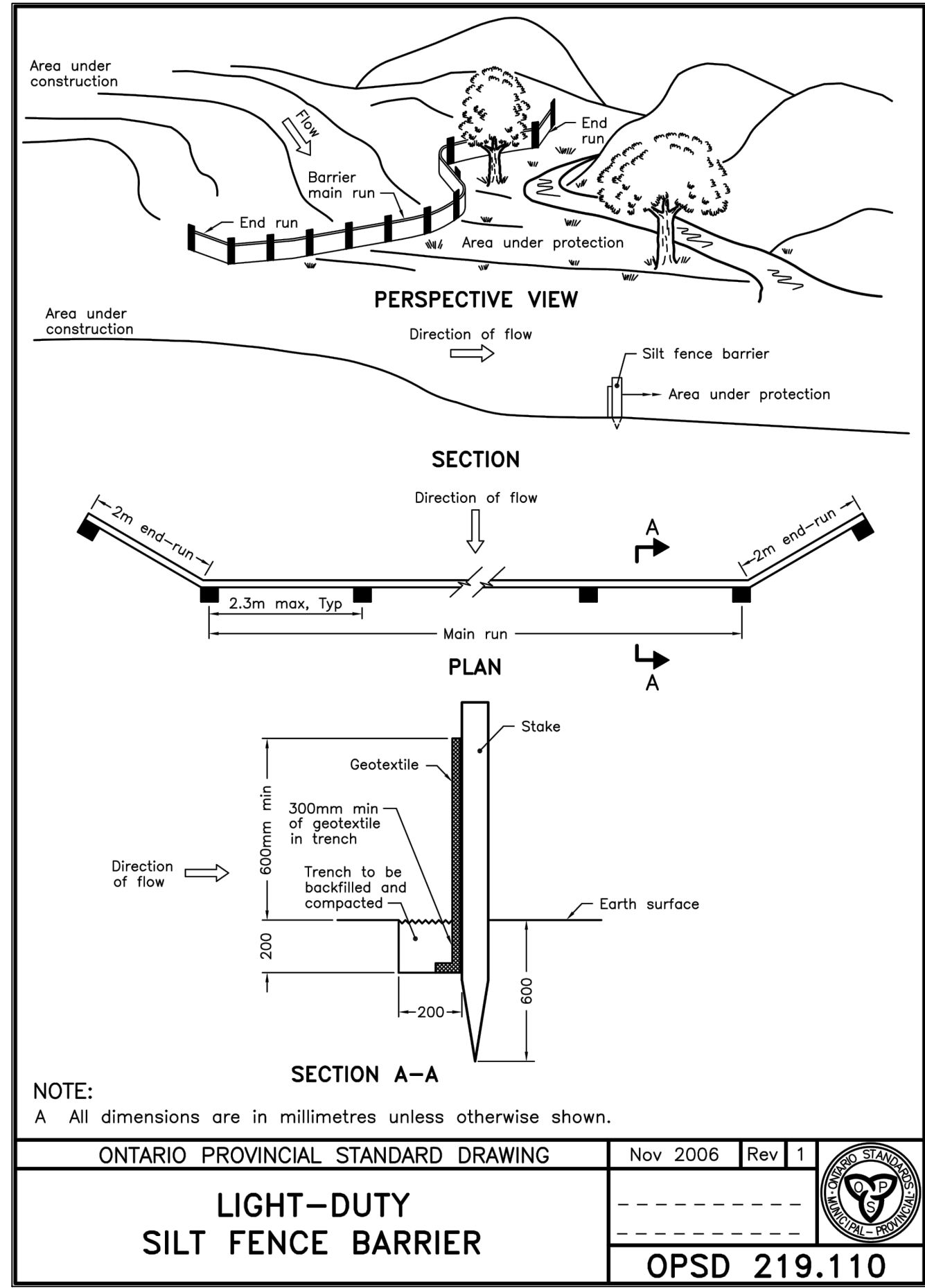
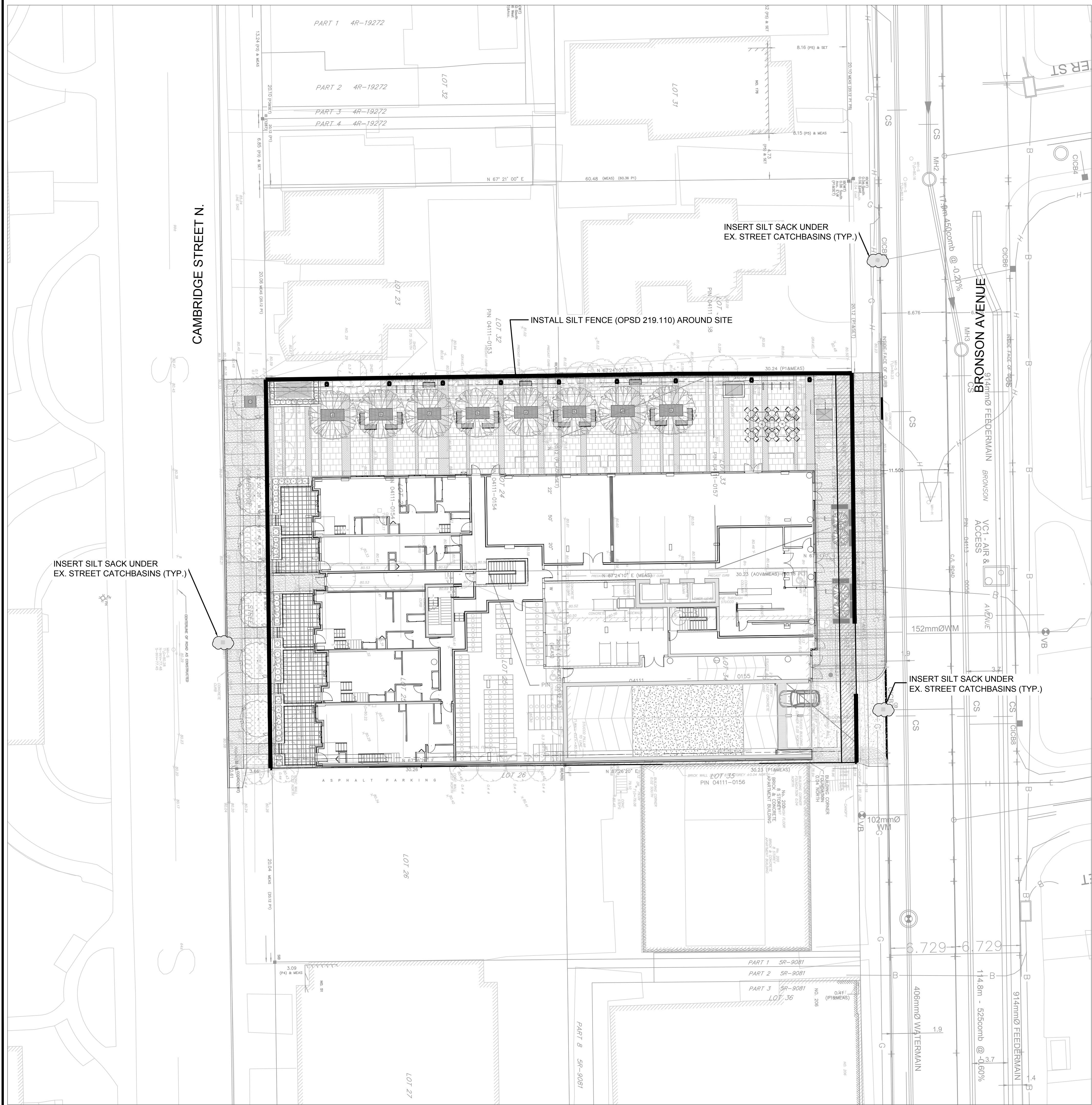
SUMMARY OF THE SWM DESIGN CALCULATIONS

- The maximum allowable release rate is 13.69 l/s based on existing conditions. Cistern storage would be provided to meet the City of Ottawa requirement.
- The flow from Area A would discharge into the existing combined sewer in Cambridge Street at a flow rate of 5.60 l/s.
- The flow from Area B would discharge into the existing combined sewer in Bronson Avenue at a flow rate of 2.73 l/s
- The flow from Area C would discharge into the proposed cistern at a flow rate of 19.57 l/s.
- The flow from Area D would discharge into the proposed cistern at a flow rate of 51.02 l/s.
- The proposed cistern would provide 101.76 m³ of storage and discharge into the existing combined sewer in Bronson Avenue at a restricted flow rate of 5.36l/s.

APPENDIX H

C-900 SEDIMENT AND EROSION CONTROL PLAN

\\34206-192\1958\bronson\5.9 Drawings\34206-0900-2014.dwg Layout Name: Layout1 Plot Style: ----- Plot Scale: 1:2,584.9 Plotted At: 2/10/2018 1:25 PM Last Saved By: dslomo Last Saved At: Feb. 6, 18



LEGEND:

— LIGHT DUTY SILT FENCE PER OPSD 219.110

☁ INSTALL SILT SACK UNDER EXISTING CB COVERS

APPROVED	☐	REFUSED	☐
THIS ____ DAY OF _____, 20__			
DOUGLAS JAMES, MCIP, RPP, MANAGER DEVELOPMENT REVIEW CENTRAL PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA			

NOTES:

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

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6	RE-ISSUED FOR SPA	JIM	18.02.07
5	RE-ISSUED FOR SPA	JIM	14.11.07
4	ISSUED FOR SPA 2ND SUBMISSION	JIM	14.08.14
3	REVISED AS PER NEW SITE AND LANDSCAPE PLANS AUGUST 2014	JIM	14.08.13
2	ISSUED FOR SECOND CITY SUBMISSION	JIM	14.06.06
1	ISSUED FOR SITE PLAN APPROVAL	JIM	13.09.13
No.	REVISIONS	By	Date

PRINCE DEVELOPMENTS

IBI GROUP

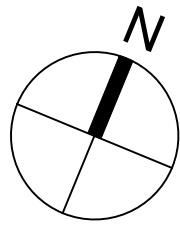
400 – 333 Preston Street

Ottawa ON K1S 5N4 Canada

tel 613 225 1311 fax 613 225 9868

ibigroup.com

Project Title
192 BRONSON AVENUE
OTTAWA, ONTARIO, CANADA



Drawing Title
SEDIMENT AND EROSION CONTROL PLAN

Scale
1:200

Design	M.B.	Date	SEPTEMBER 2013
Drawn	M.B.	Checked	J.I.M.
Project No.	34206	Drawing No.	C-900

D07-12-13-0171