

**300 SPARKS STREET  
OTTAWA, ONTARIO**

**SITE SERVICEABILITY REPORT**

**Prepared by:**

**NOVATECH ENGINEERING CONSULTANTS LTD.  
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**File No.: 107143-1  
Report Reference No.: R-2009-173  
December 08, 2009**

**Revised:  
March 20, 2010**

March 20, 2010

City of Ottawa  
Planning and Growth Management Department  
Development Review (Urban Services)  
110 Laurier Avenue West  
Ottawa, Ontario  
K1P 1J1

**Attention: Mr. Bruce Coombe**

Dear Sir:

**Reference: 300 Sparks Street  
Site Serviceability Report  
Our File No.: 107143**

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Please find enclosed a copy of the revised Site Serviceability Report for the above-noted project.

If you require any additional information, please do not hesitate to contact the undersigned.

Yours truly,

**NOVATECH ENGINEERING CONSULTANTS LTD.**



Greg MacDonald, P. Eng.  
Senior Project Manager

GM/sb

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107143-GP	General Plan of Services
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## 1.0 INTRODUCTION

The existing property is 0.6614 hectares in area located at 300 Sparks Street in the City of Ottawa. The majority of the property is comprised of a 29-storey office building (Tower A) and 4-storey office building (Tower B). The proposed site works will involve the demolition of the existing 4-storey building above the podium level and construction of a new 19-storey office tower, with a new 2-storey level to Tower A. The existing underground parking structure will be maintained and new hard landscaped areas, and sidewalks around the property will be provided. The proposed development has frontage on Queen Street, Sparks Street and Lyon Street. Refer to the Key Plan in Figure 1.

The proposed building will be serviced by connecting to the internal existing watermain, sanitary and storm sewers services that are currently being used for the existing building. The services are connected to the existing sanitary sewers, storm sewers and watermains on Queen Street and Lyon Street.

The site location is shown in Figure 1 - Key Plan. Existing conditions and proposed site works are shown on Figures 2 and 3, respectively.

## 2.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

### 2.1 Study Objectives

The approach to the stormwater management design is not to exceed the allowable runoff for the proposed building tower B and the 2-storey link building, as specified by the City of Ottawa. Both the 1:5 year and 1:100 year design event post-development runoff will be controlled to the allowable 1:5 year design event. All post-development runoff in excess of the allowable will be stored and controlled in the building prior to being released into the existing storm sewer on Queen Street.

### 2.2 Pre-development Conditions

#### 2.2.1 The Site

The site currently consists of a 4-storey building and a 29-storey office building (Place de Ville II) on the eastern and western side of the property, respectively. Existing conditions are shown – Figure 2.

#### 2.2.2 Existing Drainage

Stormwater currently drains away from the site towards various roadway catch basins located on the existing streets (Lyon, Kent, Sparks, and Queen Street), which outlet to the existing storm sewers within these streets. Hard surfaced landscaped areas that are outside of the proposed building tower are not part of this study, since the imperviousness of these areas will not change,

and the flows will remain the same. As well, the existing western building tower (Place de Ville II) is not part of this study and is to remain with the same flow discharge as no changes are being made to the building.

### **2.2.3 Allowable Release Rate**

The approach to the stormwater management design, is to not exceed the allowable release rate as specified by the City of Ottawa for the newly developed areas. The allowable release rate will be calculated using a runoff coefficient of 0.50 and a time of concentration of 20 minutes. The allowable release rate for the proposed 0.237 ha building tower development is calculated to be 23.14L/s using the Rational Method as follows:

Drainage Area (A) = 0.237 ha  
Runoff Coefficient (C) = 0.50  
Intensity (I<sub>5</sub>) = 70.25 mm/hr

Q= 2.78 CIA  
Q= 2.78 x 0.50 x 70.25mm/hr x 0.237 ha  
Q= 23.14 L/s

## **2.3 Post-Development Conditions**

### **2.3.1 Development Proposal**

Due to the extent of hard surfaced areas and limited allowable release rate from the site, any runoff in excess of the allowable quantity will be stored on the roof of the proposed building, up to and including the 1:100 year design event.

### **2.3.2 Post-Development flow**

The post-development flow from the building consists of controlled flow from the building roof only. Refer to the attached plans for details and drainage areas.

#### **2.3.2.1 Areas R-1 to R-10**

The maximum allowable post-development flow for Area R-1 to R-10 (as shown in Figure 4) is the allowable release rate for the proposed building roof. The controlled release rate for the building roof (R-1 to R-10) for both the 1:5 year and 1:100 year design events will be controlled to 23.14 L/s.

#### **2.3.2.2 Area R-1 to Area R-10: Controlled Building Roof Flow**

The post-development flow from Area R-1 to R-10 was calculated using the Rational Method to be 61.78 L/s for the 1:5 year design event and 117.65 L/s for the 1:100 year design event. Both events exceed the maximum allowable flow. Flow from the building roof will be controlled by Zurn rooftop drains. Flow through these drains is dependent on the height of water above the drain (H-Head) and the number of notches in the drain. Flow from each rooftop area has been summarized in Table 4.1. Refer to Figure 4 for roof drain location. Detailed calculations are contained in Appendix A and B.



**Table 4.1 Rooftop Drain Peak Flows**

Area No.	Notches	ZURN ROOFDRAIN CONTROL PARAMETERS			
		1:5 YR EVENT		1:100 YR EVENT	
		Head (m)	Q (L/s)	Head (m)	Q (L/s)
R-1	1	0.088	1.33	0.116	1.75
R-2	1	0.088	1.33	0.116	1.75
R-3	1	0.090	1.35	0.117	1.77
R-4	1	0.088	1.33	0.116	1.75
R-5	1	0.088	1.33	0.116	1.75
R-6	1	0.090	1.36	0.118	1.78
R-7	1	0.092	1.39	0.120	1.81
R-8	1	0.085	1.29	0.112	1.70
R-9	1	0.082	1.23	0.109	1.64
R-10	1	0.079	1.19	0.106	1.60
Total		13.14		17.30	

The Modified Rational Method was used to determine the storage volume required for the various rooftop drainage areas. Based on a controlled flow provided via the Zurn rooftop drains, the ponding depth on the roof above the drains will be approximately 0.087m for the 1:5 year design event and approximately 0.115m for the 1:100 year design event, as determined through iteration calculations between the release rate, head and corresponding storage. Refer to the Appendix B and to the Roof Drain Table shown on 107143-GP and Figure 4 for details.

### 2.3.2.3 Proposed Flow

The following table summarizes the direct runoff from the controlled flow for Areas R-1 to R-10 for both the 1:5 year and 1:100 year design events.

**Table 4.2 Proposed Post-Development Peak Flows**

Area and Type of Control	Flow (L/s)	
	1:5 YR	1:100 YR
R-1 to R-10 Controlled	13.14	17.30
Total flow	13.14	17.30
Allowable flow	23.14	23.14

The 1:5 year design event post-development flow from the site will be controlled to 13.14 L/s, and 17.30 L/s for the 5 year and 100 year design storms, respectively. Both flows are less than the allowable flow of 23.14 L/s.

### 2.3.3 Major Overland Flow Route

In the case of a major event, stormwater located within the laneway and landscaped areas adjacent to the building will flow towards the existing roadway catchbasins.

## 2.4 Erosion and Sediment Control Measures

Temporary erosion and sediment control measures will be implemented during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites," (Government of Ontario, May 1987). These measures include:

- Placement of filter fabric under all catchbasins and maintenance hatches. The proposed erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

## 3.0 SANITARY SERVICING

The proposed building will be serviced by the existing 200mm dia. sanitary service, connected to the existing 300mm dia. sanitary mainline located on Queen Street that flows towards Kent Street. The existing Place de Ville building is serviced by a 250mm service into the existing 375mm dia. sanitary sewer on Lyon Street that flows towards Queen Street. The building modifications will result in an increase in sanitary flows but are considered negligible, when compared to the capacity of the sewers. The sanitary flows are demonstrated below::

### 3.1 Existing Flows:

Existing building uses and areas:

Office = 4951 sq.m  
Theatre = 2072 sq.m  
Retail = 752 sq.m  
Total = 7775 sq.m

Existing Flows:

Office (Occupancy Load of 9.3 - OBC Part 3.1.16) = 532 people  
Office flows per person per day = 75 L  
Total Office Flows = 39,900 L/d

Theatre (Occupancy Load of 0.75 - OBC Part 3.1.16) = 2762 people  
Theatre Flows per day = 20 L/seat

Total Retail Flows = 55,240 L/d  
Retail Flows per day = 5 L/sq.m (similar to 50,000 L/day/gha for commercial)  
Total Retail Flows = 3,760 L/d

Total Existing Flows per day = 98,900 L/day = 1.145L/s  
Peaked Existing Flows = 1.145L/s x 1.5 = 1.717L/s



### 3.2 Proposed Flows:

Proposed building uses and areas:

Office = 32110 sq.m

Retail = 355 sq.m

Total = 32465 sq.m

Proposed Flows:

Office (Load Occupancy of 9.3- OBC Part 3.1.16) = 3453 people

Office flows per person per day = 75 L

Total Office Flows = 258,975 L/d

Retail Flows per day = 5 L/sq. m (similar to 50,000 L/day/gha for commercial)

Total Retail Flows = 1,775 L/d

Total Proposed Flows per day = 260,750 L/day = 3.018L/s

Peaked Proposed Flows = 3.018L/s x 1.5 = 4.527L/s

The sanitary flows are directed via. an existing 200mm service on Queen Street. The service is connected to the existing 300mm dia. Sanitary sewer at 0.8% that flows westerly towards Kent Street. According to the asbuilts, that sewer run also includes flows from Place de Ville I. That site would have similar flows to the proposed building above which would yield a flow of around 10 L/s (Peaked). The 300mm sewer has a full flow capacity of 90.23 L/s; accordingly, the sanitary flows seem not to be an issue. From correspondences with the City, it has been concluded that the receiving sanitary sewer does have spare capacity.

### 4.0 WATER SUPPLY

The existing 4-storey building is serviced by a pair of 150mm watermain services, which is connected to the existing 300mm dia. watermain located on Queen Street. The building modifications will have no detrimental impact on the existing watermain infrastructure. The existing Place de Ville II building is serviced by the another existing watermain service, connected to the existing 300mm dia. watermain located on Queen Street (service size unknown, refer to 107143-GP). Estimated domestic water demands for the development are roughly the same as the proposed development sanitary flows listed above.

$$\begin{aligned} Q_{\text{WATER}} &= 260,750 \text{ L/day} \\ &= 3.018\text{L/s} \end{aligned}$$

The internal fire protection system (sprinkler and standpipe) will be connected to the existing fire pump servicing the proposed building Tower and 2-link storey building, according to correspondence with the Mechanical Engineer. The pump has a capacity of 750usgpm at 200psi. The available supply at 20psi is in the neighborhood of 1800igpm around the site, based on the hydrant data supplied by the City. The boundary conditions provided by the City shall be forwarded to the Mechanical Engineer so it can be incorporated into their design.



## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, development of the site will be supported by the following:

- With regards to stormwater management, the modifications to the building will not result in an increase of hard surface areas, and therefore the post-development runoff flows will not exceed pre-development levels.
- Stormwater from the patios, laneway and ramp to the underground parking levels will be directed to the internal storm service.
- The 1:5 year design event post-development flow from the proposed building tower will be controlled to 13.14 L/s, while the 1:100 year design event post-development flow will be controlled to 17.30 L/s, both less than the allowable flow of 23.14 L/s. Water quantity control will be achieved by rooftop storage.
- Temporary erosion and sediment control measures will be implemented during construction.
- The building modifications will have no detrimental impact on the existing sanitary and water infrastructure.

It is recommended that the proposed stormwater management system be approved for implementation. Adequate sanitary, storm and water capacity are available to service the site.

### NOVATECH ENGINEERING CONSULTANTS LTD.

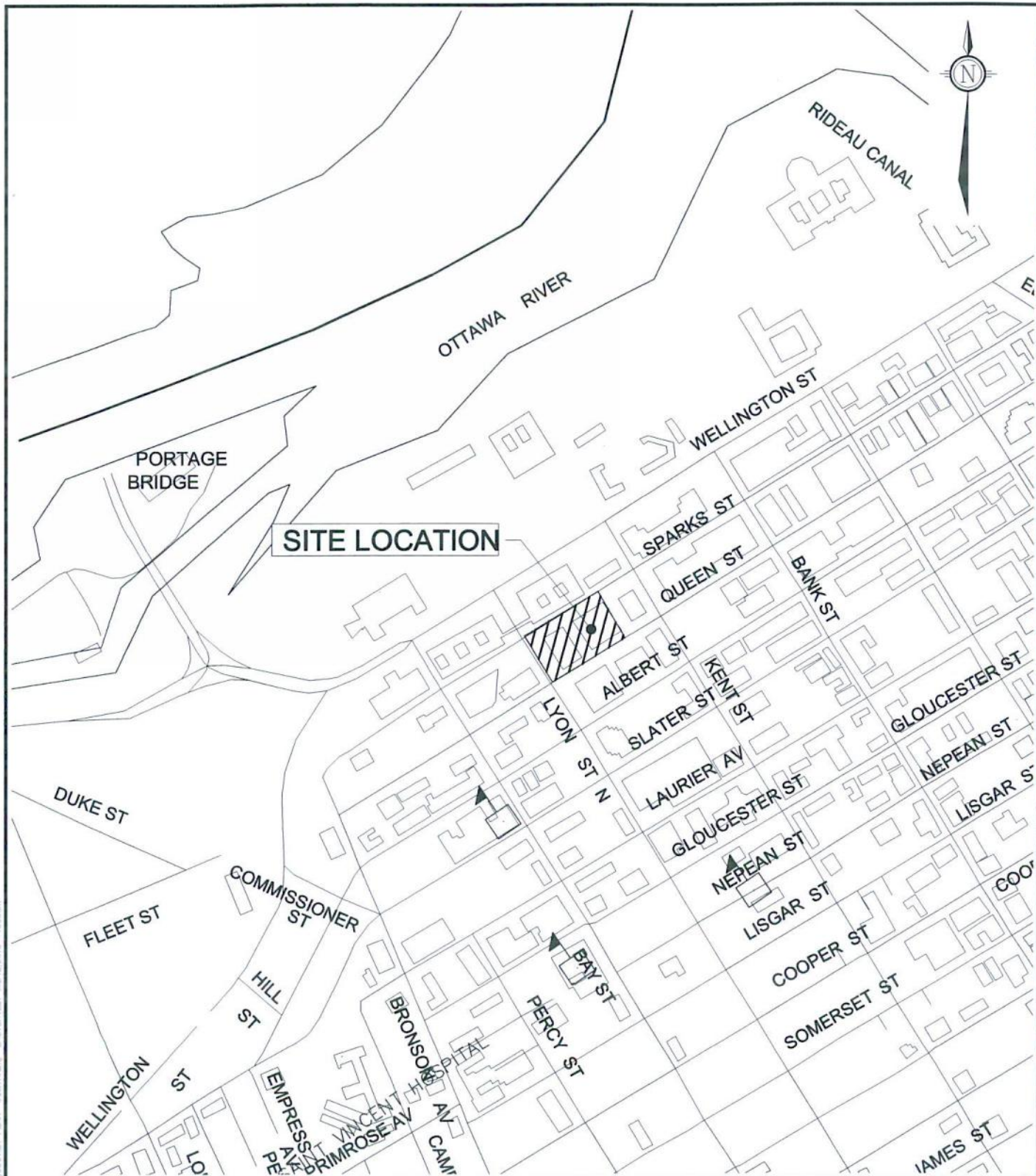
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CITY OF OTTAWA

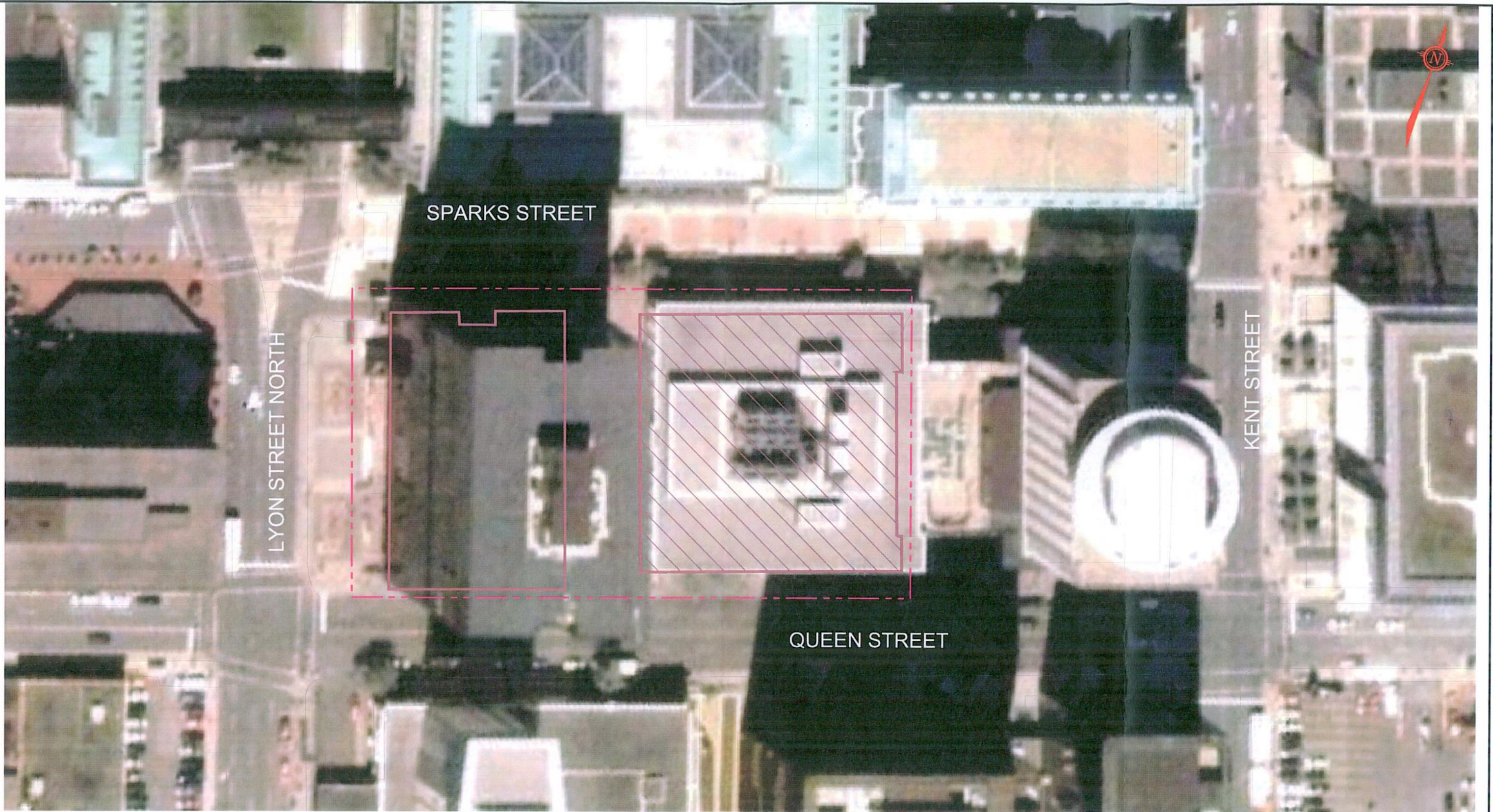
300 SPARKS STREET  
BROOKFIELD PROPERTIES

## KEY PLAN

DEC 2009 107143 FIGURE 1

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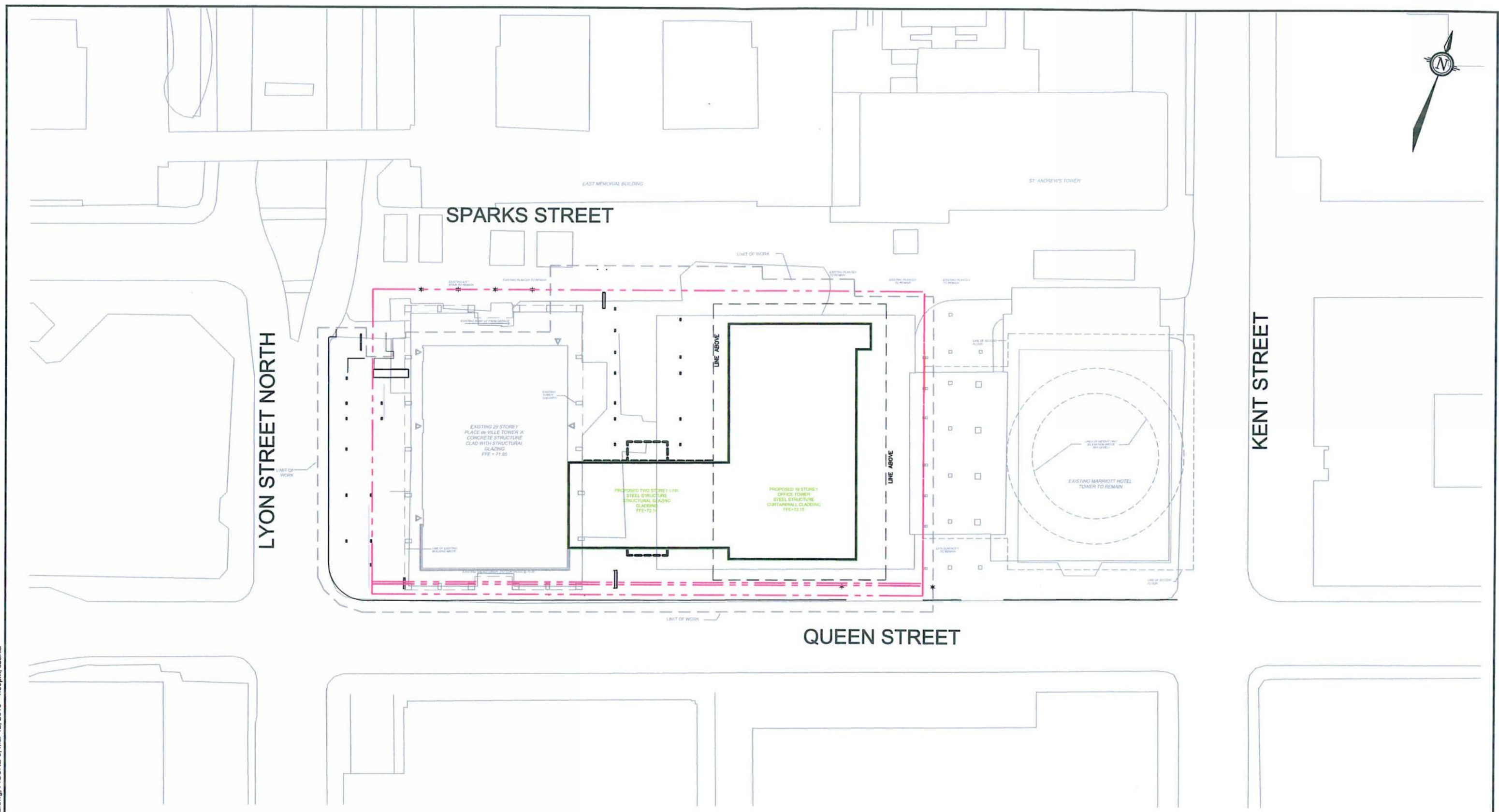
- PROPOERTY BOUNDARY
- EXISTING BUILDING
- EXISTING BUILDING TO BE MODIFIED
- EXISITNG CURB

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**CITY OF OTTAWA**  
**300 SPARKS STREET**  
**BROOKFIELD PROPERTIES**  
**EXISTING CONDITIONS**  
 1:750      107143      **FIGURE 2**

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SPARKS STREET

LYON STREET NORTH

KENT STREET

QUEEN STREET






EXISTING 29 STOREY PLACE DU VILLE TOWER A CONCRETE STRUCTURE CLAD WITH STRUCTURAL GLAZING FFE = 71.85

PROPOSED TWO STOREY LINK STEEL STRUCTURE STRUCTURAL GLAZING CLADDING FFE = 72.1

PROPOSED 19 STOREY OFFICE TOWER STEEL STRUCTURE CURTAINWALL CLADDING FFE = 72.15

EXISTING MARRIOTT HOTEL TOWER TO REMAIN

**LEGEND**

-  PROPOERTY BOUNDARY
-  EXISTING BUILDING
-  PROPOSED BUILDING
-  EXISITNG CURB
-  LIMIT OF WORK

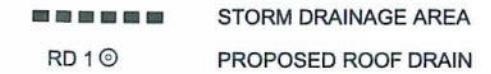
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CITY OF OTTAWA  
 300 SPARKS STREET  
 BROOKFIELD PROPERTIES  
**SITE PLAN**  
 1:750      107143      **FIGURE 3**

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Area No.	Area (ha)	Notches	ZURN ROOF DRAIN CONTROL PARAMETERS			
			1:5 YR EVENT		1:100 YR EVENT	
			Head (m)	Q(L/s)	Head (m)	Q(L/s)
R-01	0.0247	1	0.088	1.33	0.116	1.75
R-02	0.0247	1	0.088	1.33	0.116	1.75
R-03	0.0274	1	0.090	1.35	0.117	1.77
R-04	0.0250	1	0.088	1.33	0.116	1.75
R-05	0.0250	1	0.088	1.33	0.116	1.75
R-06	0.0292	1	0.090	1.36	0.118	1.78
R-07	0.0328	1	0.092	1.39	0.120	1.81
R-08	0.0196	1	0.085	1.29	0.112	1.70
R-09	0.0156	1	0.082	1.23	0.109	1.64
R-10	0.0130	1	0.079	1.19	0.106	1.60

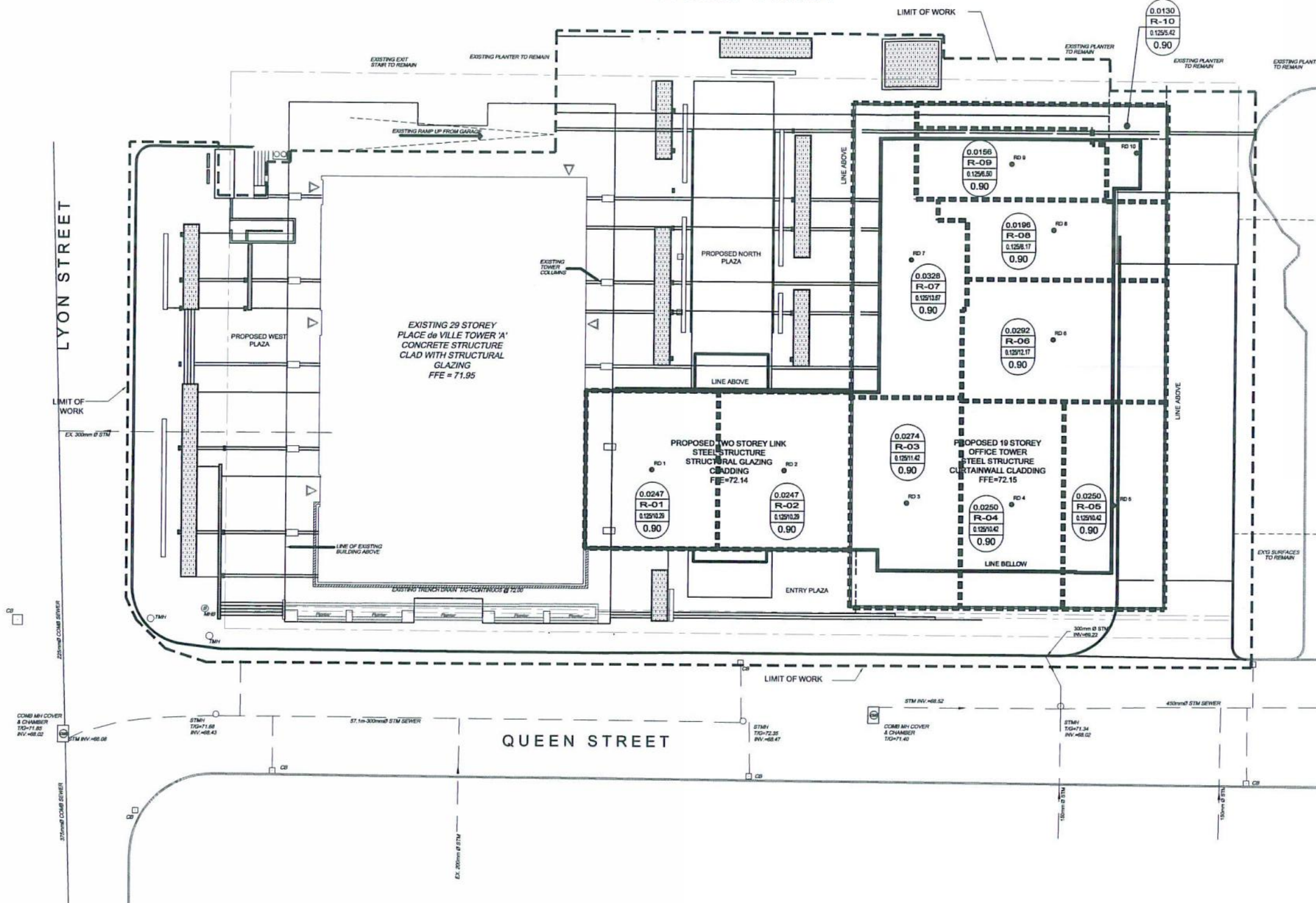
**ROOF DRAINS:**

1. PROVIDE ZURN ROOF DRAINS AS PER TABLE.
2. ROOF DRAINS ARE TO HAVE OUTLETS CONTROLLED TO 23L/MIN/INCH OF HEAD PER NOTCH. REFER TO SPECIFICATIONS FOR FURTHER DETAILS.

SPARKS STREET

LYON STREET

QUEEN STREET



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No.	REVISION	DATE	BY
1.	ISSUED WITH SITE SERVICEABILITY REPORT	MAR 17/2010	GJM

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**300 SPARKS STREET**  
**STORM WATER  
MANAGEMENT PLAN**

1:500 107143 FIGURE 4