Stantec Consulting Ltd.
400-1305 Riverbend Road, London ON N6K 0J5

November 28, 2023
File: 161414233

Attention: Michael Pease, Manager, Development Planning
Development and Compliance Services
City Hall – 6th Floor
300 Dufferin Avenue
London ON N6A 4L9

Dear Michael,

Reference: 735 Wonderland Road Apartment Building – Water Servicing Brief

This letter is written to support the residential development at 735 Wonderland Road in the City of London in providing confirmation that the existing watermain network and proposed water service will meet the demands of the development.

The proposed development consists of a 25 Storey Apartment building with 219 residential units, 4,023.1 m² of commercial space and 1,198.9 m² of office space, as per the attached site plan prepared by Stantec Consulting. This corresponds with a conservative population of 468 using the Ontario Building Code (OBC) Table 8.2.1.3B and the City of London Design Specification and Requirements Manual, supporting calculations shown in below table.

Table 1- Design Population Calculation

Description	Floor Area (m^2)	# of Units	Occupancy Load		Water Design Flow		Daily Flow (L/day)	Total Design Population
			Reference	Rate	Reference	Rate		
Residential (25-Storey)		219	C.o.L. design standards	1.6 cap/ unit	C.o.L. DSRM – Chapter 7	255 L/ cap/ day	89,505	351
Commercial Space	4,023.1				OBC 8.2.1.3.B. – retail flow	5 L/ day/1m^2	20,116	79
Office Space	1,198.9				OBC 8.2.1.3.B. – Office	75 L/ day/9.3m2	9,669	38
Total							119,290	468

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Using the average daily domestic demand of 255L/cap/day, this generates an average demand of 82.84 L/min (119,290 L/day) corresponding to Building located at 735 Wonderland Road. The proposed development will be serviced by one 200mm connection to the existing 200mm watermain on Horizon Drive.

Existing Pipe Network

The existing water infrastructure was modelled according to City of London standards where the friction factors are based on pipe size rather than material. According to 7.3.2.4 in the City of London Design Specifications and Requirements Manual, *the following Hazen-Williams "C" values shall be used for design, regardless of material:*

Pipe Diameter	*C-Factor*
100 and 150 mm	*100*
200 and 250 mm	*110*
300 to 600 mm	*120*
Over 600 mm	*130*

Furthermore, the MOECC Design Guidelines for Drinking Water Systems supports the use of the above values when estimating pressure losses in existing systems (Section 10.2.3). Recognizing the existing watermain material in this area may not be PVC, the use of these friction factors accounts for the different pipe material.

Water Supply for Fire Protection

The proposed residential building at 735 Wonderland will include provisions for firefighting that include the following considerations:

In accordance with the City of London Design standards for private sites, the proposed residential buildings will include provisions for firefighting in accordance with the Ontario Building Code(OBC). Based on the residential occupancy from the ground floor to 25th floor, the fire flow requirement is **150 L/s** (9000 L/min) at 20 psi (140 kPa).

However, the building is anticipated to be protected with sprinklers and as a result the fire flow requirements may be reduced due to following considerations.

- The residential building will be protected by an automatic sprinkler system, which as per NFPA 14 5-9.1.3 is a combined system where the standpipe inside and outside hose stream

demand will not be required to exceed 1000 gpm (3,785 L/min). Therefore, a separate sprinkler only demand is not required.

- This development has a light hazard occupancy classification for which the acceptable flow at the base of the riser (including hose stream allowance) is 750 gpm (2,840 L/min) *per NFPA 13-Table 11.2.2.1*. This flow rate is considered conservative and is intended to be higher than the actual sprinkler design requirements when they become available. This will be verified once the information is available.

- The building is anticipated to include a standpipe system. Based on the provisions of OBC section 3.2, 65mm hose connections will be required for which the minimum flow rate is 945 L/min at each of the two most remote outlets simultaneously (1890 L/min total) *per OBC-3.2.9.7*. A pump within the building will boost pressure to the remote connection locations.

The fire flow requirements (3,785 L/min) will be used to confirm the adequacy of the proposed 200mm water service to the building.

Model Scenarios

The following summarizes the scenarios ran with WaterCAD software to analyze the sufficiency of the existing municipal water supply network in the vicinity of the 735 Wonderland Road site.

- Average day– 82.84 L/min at the proposed building connection (J-2).

- Maximum hour – 646.15 L/min at the proposed building connection (J-2), using the City peaking factor of 7.8.

- Maximum day plus fire demand – 289.94 L/min of domestic demand (J-2) and 3,785 L/min for a conservative supply for fire protection via sprinkler system

- An age analysis was completed to confirm no water is stagnant beyond 72 hours per City of London Design Standards.

Additionally, two existing hydrants within close proximity to the proposed development are deemed adequate for use for additional fire protection. One hydrant is located within the site (north-east) serviced by the 250mm watermain on Beaverbrook Avenue, this hydrant will be relocated but will remain within close proximity to the development. The second hydrant is located east of the site along Horizon Drive serviced by the existing 200mm watermain. Based on the City of London Locates City map, both existing hydrants (Object ID 13883 & 10320) have a blue marker Colour. Therefore, the hydrants are of Class AA with a rated capacity of 1500 usgpm (5,680 L/min) or greater.

Reference: 735 Wonderland Road Apartment Building – Water Servicing Brief

The attached modeling and below summary of critical results confirms that the existing municipal water network and the proposed watermain servicing the proposed development at 735 Wonderland Road Site meets the requirements of the City of London and the Ontario Building Code.

Table 2 - Summary of Results

Scenario	Velocity (m/s)		Pressure (psi)		Fire Flow (L/min)	
		Required Maximum		Required Minimum	Available	Required Per OBC/NFPA
Average Day (J-2)	0.04	1.5	62.2	40	n/a	n/a
Max Hour (J-2)	0.34	1.5	62.1	40	n/a	n/a
Max Day plus Fire (Sprinkler)	2.16	2.4	60.9	20	3,785	3,785

Reference: 735 Wonderland Road Apartment Building – Water Servicing Brief

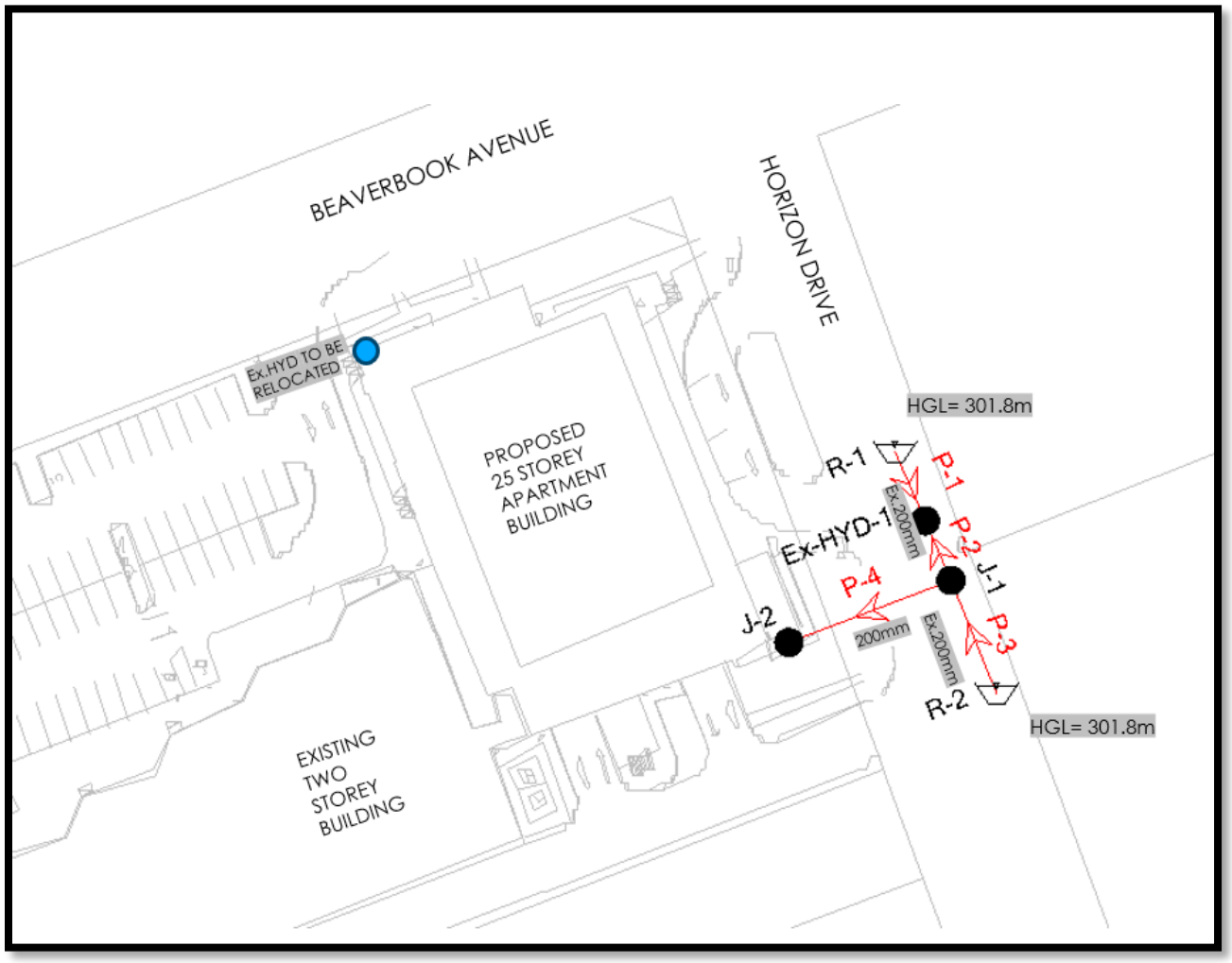

Figure 1. Water Network Model Schematic

Note: This model uses the boundary condition HGL of 301.8m with reservoirs located at 2 locations to reflect the well-looped supply network that exists in this area.

Reference: 735 Wonderland Road Apartment Building – Water Servicing Brief

We trust this meets your requirements. Should you have any questions or require anything further, please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

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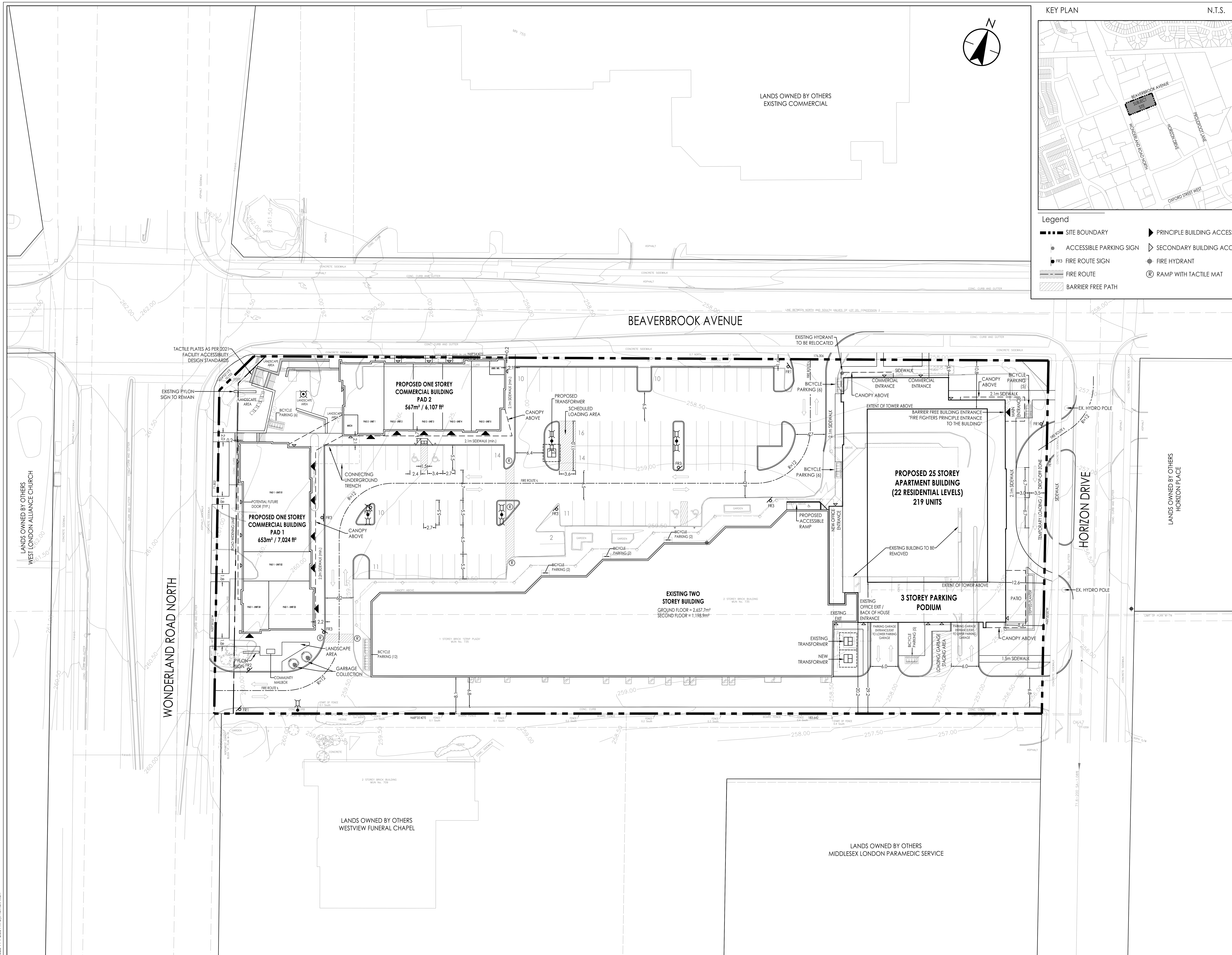
Attachment:
- Site Plan
- OBC Fire Flow Calculations
- Modeling Results



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Liability Note

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

Design Data

Zone:	ASA1, ASA2, ASA3, ASA5, ASA6	
Proposed Use:	Commercial, Office & Residential	
Site Area (m²)	14,461.8 m² / 1.446 ha (incl. road widening - 322.6m²)	
Gross Floor Area (Commercial & Office) (m²)	5,222.0 m² (Commercial - 4,023.1m², Office - 1,198.9m²)	
Total Units	219 residential units + 5,222.0 m² Commercial & Office (53 units) = 272 Total Units	
Regulation	**Requirement**	**As Shown on Plan**
Lot Frontage Minimum (m)	30.0 m	71.8 m - Wonderland Rd
Lot Depth Minimum (m)	50.0 m	183.6 m
Front & Exterior Side Yard Depth (m) minimum	0.0 m	Front - Pad 1 0.2m Exterior - Pad 2 0.2 m
Interior Side & Rear Yard Depth (m) minimum	3.0 m from any other zone boundary and 0.0 m with the same ASA zone.	South limit - 8.1m (interior) East limit - Podium - 8.4 m (rear) East limit - Tower - 12.6 m (rear)
Landscaped Open Space (%) Minimum	15 %	23.5 %
Lot Coverage Maximum (%)	30 %	40.2 % *
Height Maximum (m)	12.0 m	86 m *
Density	t.b.d.	189 uph *
Gross Floor Area (m²) Maximum (Commercial & Office)	6,000	5,222.0 m²
Parking	N/A in Transit Village land use area	Surface = 98 Underground/Podium = 188 Total - 286
Accessible Parking	2 + 2% of total parking = 8 Spaces	Type A = 4 Type B = 4 Total = 8 Spaces (4 surface)
Bicycle Parking	Residential: 0.9 long-term bicycle parking spaces per residential unit and 0.1 short-term bicycle space per unit = 197 long-term & 22 short-term Commercial: 3 spaces plus 0.3 spaces for each 100m² GFA = 16 Office: 3 spaces plus 0.2 spaces for each 100m² GFA = 6	Residential: 200 long-term 22 short-term Commercial: 18 Office: 6

* ACHIEVED THROUGH ZBA
SNOW TO BE TRUCKED OFF SITE
GARBAGE STORED INTERNALLY AND BROUGHT OUT TO STAGING AREA ON PICK-UP DAY

Revision	By	Appd.	YY.MM.DD
1. FOR ZBA APPROVAL	RT	DH	23.02.24

Issued	By	Appd.	YY.MM.DD

File Name: 161414233_r-sp	RT	DH	RT	23.11.08
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
YORK DEVELOPMENTS

735 WONDERLAND ROAD NORTH

London, ON Canada

Title
SITE PLAN

Project No. 161414233
Scale HORZ – 1 : 400 (4 0 8m)

Drawing No. 1
Sheet 1 of 2
Revision 0

Stantec

Subject: FIRE FLOW CALCULATIONS AS PER OBC REQUIREMENTS
Project: 735 Wonderland Road - Residential Apartment
Project No.: 161414233
Client: York Developments
Date: 28-Nov-23

AVAILABLE FLOW ON Oxford Street West

This site will be serviced from the low level 200mm watermain located at Horizon Drive which has a hydraulic grade of 301.8m.

ONTARIO BUILDING CODE CLAUSE A-3.2.5.7.

$$Q = K\,x\,V\,x\,S_{Tot}$$

Q = MINIMUM SUPPLY OF WATER (L)
K = WATER SUPPLY COEFFICIENT
V = BUILDING VOLUME (m^3)
S_{Tot} = TOTAL OF SPATIAL COEFFICIENT VALUES FROM PROPERTY LINE EXPOSURES ON ALL SIDES AS OBTAINED FROM THE FORMULA:

where:

$$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + \cdots etc)$$

values are obtained from Figure 1 A-3.2.5.7, OBC, as modified by Sections 6.3 (e) and 6.3 (f) of this guideline, and

$$S_{Tot} = need\ not\ exceed\ 2.0$$

As per Table 2, Section A-3.2.5.7, OBC

OBC Part 3 Buildings under Building Code	Required Minimum Water Supply Flow Rate (L/min)
One-storey building with area ≤ 600 m2	1800
All other buildings	2700 (if Q ≤ 108,000 L)
	3600 (if Q >108,000 L and ≤ 135,000 L)
	4500 (if Q >135,000 L and ≤ 162,000 L)
	5400 (if Q >162,000 L and ≤ 190,000 L)
	6300 (if Q >190,000 L and ≤ 270,000 L)
	9000 (if Q >270,000 L)

Major Occupancy Classification

Group C Residential Occuppancies

Water Supply Coefficient - K

As per Table 1, Section A-3.2.5.7, OBC	K= 10

*Assuming Building is of noncombustible construction with fire speration and resistance ratings

Total Building Volume

Floor	Area (m^2)	Flr Height (m)	Volume (m^3)
Ground to Third Storey Podium	1944	11	21384
4th Floor to Mech Penthouse Roof	1025	74	75850
Total			97234

**Floor areas & heights based on Architectural drawings prepared by Matter Architectural Studio, Nov.24 2023*

Exposures

	Separation (m)	Spatial Coeff
North	50	0.00
South	45	0.00
East	35	0.00
West	0	1.00
S_{tot}		2.00

**Approximate distances in vicinity of proposed tower.*

Minimum Water Supply

$$Q = K\,x\,V\,x\,S_{Tot}$$

Q = 10 x #### x 2.00 = 1,944,680 L

9000 (if Q >270,000 L)

Required Fire Flow = 9000 L/min
= 150 L/s

735 Wonderland Road - Residential Building

Active Scenario: Average Day

Label	Length (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (L/min)	Velocity (m/s)
P-1	10	R-1	Ex-HYD-1	200.0	110.0	44.59	0.02
P-2	8	Ex-HYD-1	J-1	200.0	110.0	44.59	0.02
P-3	24	R-2	J-1	200.0	110.0	38.25	0.02
P-4	22	J-1	J-2	200.0	110.0	82.84	0.04

735 Wonderland Road - Residential Building

Active Scenario: Average Day

Label	Elevation (m)	Demand (L/min)	Pressure (psi)
Ex-HYD-1	256.48	0.00	64.3
J-1	256.20	0.00	64.7
J-2	258.00	82.84	62.2

735 Wonderland Road - Residential Building

Active Scenario: Max Hour

Label	Length (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (L/min)	Velocity (m/s)
P-1	10	R-1	Ex-HYD-1	200.0	110.0	347.81	0.18
P-2	8	Ex-HYD-1	J-1	200.0	110.0	347.81	0.18
P-3	24	R-2	J-1	200.0	110.0	298.34	0.16
P-4	22	J-1	J-2	200.0	110.0	646.15	0.34

735 Wonderland Road - Residential Building

Active Scenario: Max Hour

Label	Elevation (m)	Demand (L/min)	Pressure (psi)
Ex-HYD-1	256.48	0.00	64.3
J-1	256.20	0.00	64.7
J-2	258.00	646.15	62.1

735 Wonderland Road - Residential Building

Active Scenario: Age Analysis

Current Time: 336.00 hours

Label	Length (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (L/min)	Velocity (m/s)	Age (Calculated) (hours)
P-1	10	R-1	Ex-HYD-1	200.0	110.0	44.59	0.02	0.012
P-2	8	Ex-HYD-1	J-1	200.0	110.0	44.59	0.02	0.113
P-3	24	R-2	J-1	200.0	110.0	38.25	0.02	0.117
P-4	22	J-1	J-2	200.0	110.0	82.84	0.04	0.295

735 Wonderland Road - Residential Building

Active Scenario: Age Analysis

Current Time: 336.00 hours

Label	Elevation (m)	Demand (L/min)	Pressure (psi)
Ex-HYD-1	256.48	0.00	64.3
J-1	256.20	0.00	64.7
J-2	258.00	82.84	62.2

735 Wonderland Road - Residential Building

Active Scenario: Max Day+Fire @Ex-HYD-1

Label	Length (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (L/min)	Velocity (m/s)
P-1	10	R-1	Ex-HYD-1	200.0	110.0	2,632.33	1.40
P-2	8	Ex-HYD-1	J-1	200.0	110.0	-1,152.67	0.61
P-3	24	R-2	J-1	200.0	110.0	1,442.61	0.77
P-4	22	J-1	J-2	200.0	110.0	289.94	0.15

735 Wonderland Road - Residential Building

Active Scenario: Max Day+Fire @Ex-HYD-1

Label	Elevation (m)	Demand (L/min)	Pressure (psi)
Ex-HYD-1	256.48	3,785.00	64.1
J-1	256.20	0.00	64.6
J-2	258.00	289.94	62.0

735 Wonderland Road - Residential Building

Active Scenario: Max Day + Fire (Sprinkler Demand)

Label	Length (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (L/min)	Velocity (m/s)
P-1	10	R-1	Ex-HYD-1	200.0	110.0	2,193.47	1.16
P-2	8	Ex-HYD-1	J-1	200.0	110.0	2,193.47	1.16
P-3	24	R-2	J-1	200.0	110.0	1,881.47	1.00
P-4	22	J-1	J-2	200.0	110.0	4,074.94	2.16

735 Wonderland Road - Residential Building

Active Scenario: Max Day + Fire (Sprinkler Demand)

Label	Elevation (m)	Demand (L/min)	Pressure (psi)
Ex-HYD-1	256.48	0.00	64.2
J-1	256.20	0.00	64.5
J-2	258.00	4,074.94	60.9