



MTE Consultants

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Development Services
City of London
300 Dufferin Avenue
London, ON N6A 4L9

RE: Water Servicing Brief
New Student Residence, University Drive

This brief has been prepared to support the proposed student residence development on University Drive in the City of London in providing confirmation that the proposed watermain network will meet demands of the development.

WATER SERVICING NEW STUDENT RESIDENCE, UNIVERSITY DRIVE

The proposed development is an 8-storey student residence development with the lot area of approximately 1.4 ha. Per the preliminary site plan, there will be 259 units in the proposed 8-storey building.

Subject site is bound by existing residential developments to the north, Richmond Street to the east, University Drive to the south, and the existing Elgin Hall Residence to the west. There is an existing 300mmØ watermain on University Drive. Due to the location of the existing 300mmØ watermain, it is proposed to install and commission a new 300mmØ south of the existing main before removing the existing main and service the development with a 200mmØ watermain connecting to the proposed 300mmØ watermain. There is an existing hydrant in front of the existing Alumni Hall Residence directly across the proposed development.

Using the high-density population criteria of 1.6 people per unit, and average daily domestic demand of 255 l/cap/day per City of London Design Specifications and Requirements Manual (DSRM), the average water demand for the subject site of 1.23 l/s is expected. Detailed water supply demand calculation is attached.

WATER SUPPLY FOR FIRE PROTECTION

The proposed building will include provisions for firefighting that include the following considerations:

The building is to be protected with sprinklers and a standpipe is required and as a result the fire flow requirements are as follows:

- This development has a light hazard occupancy classification for which the acceptable flow at the base of the riser (including hose stream allowance) is 500-750 gpm (31.5 to 47.3 l/s) per NFPA 13-Table 11.2.2.1. This flow rate range is considered conservative and is intended to be higher than the actual sprinkler design requirements when they become available. Required sprinkler flow will need to be verified by the development's mechanical engineer once the information is available.
- The 8-storey building will include a standpipe system and from the provisions of OBC 3.2, 65mm hose connections will be required for which the minimum flow rate is 15.75 L/s at each of the two most remote outlets simultaneously (31.5 L/s total) per OBC-

3.2.9.7. A pump within the building will boost pressure to the remote connection locations.

The fire flow requirements (47.3 L/s) will be used to confirm the adequacy of the proposed 200mmØ water service to the building and to confirm fire protection. The distance from the existing hydrants to the fire department connection is less than 45 metres. Therefore, a new hydrant is not required per OBC, however, a new hydrant is proposed by the client in front of the proposed development.

MODEL SCENARIOS

The following summarizes the scenarios ran with WaterCAD software to analyze the sufficiency of the water supply network in the vicinity of the development site.

Average day – 1.23 l/s at the proposed 8-storey building connection (J-3 model node).

Max hour – 9.59 l/s at the proposed 8-storey building connection (J-3 model node).

An age analysis upon full occupancy was completed and there is no concern in lack of water turnover due to the high average day demand.

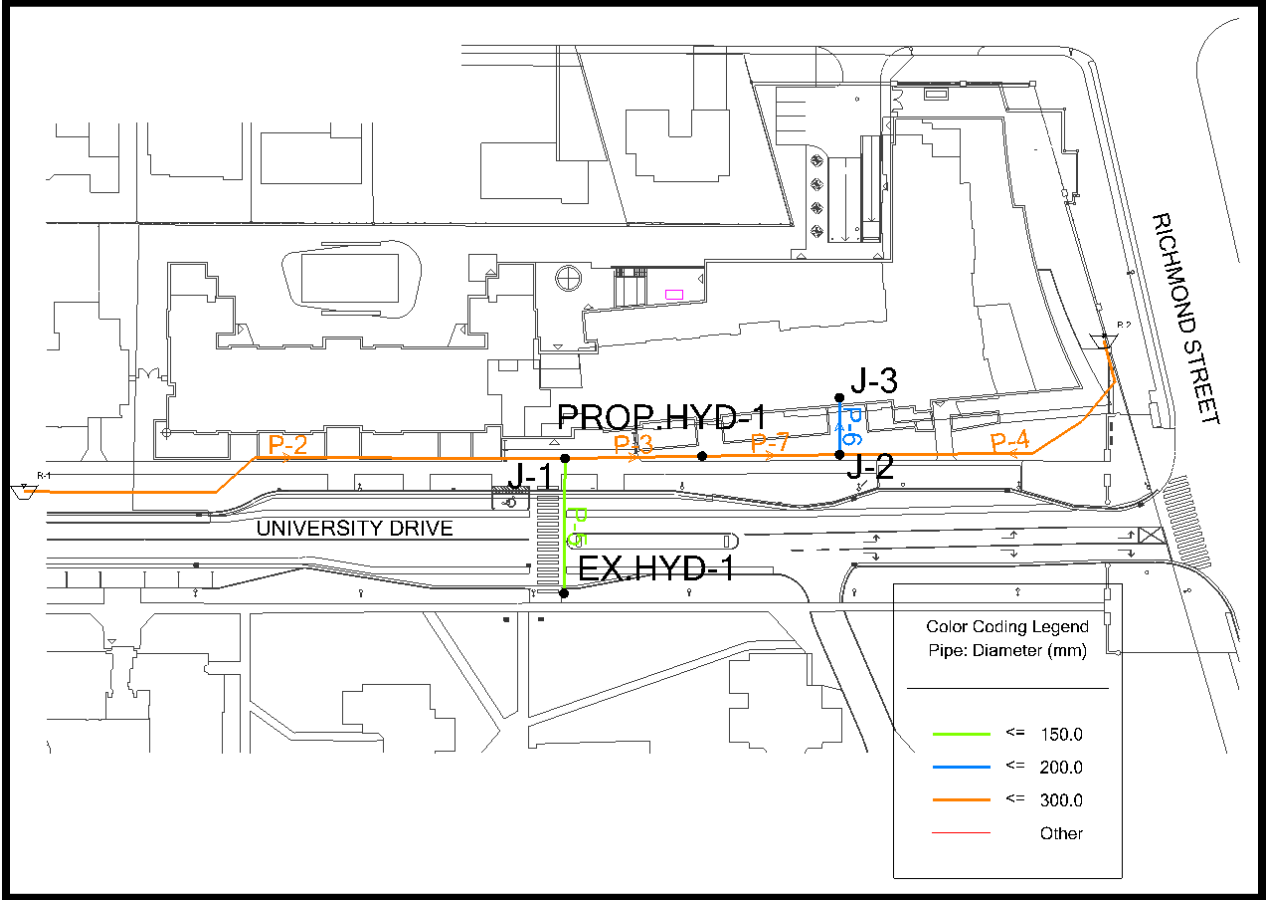
Maximum day plus fire demand – 4.31 l/s demand at the proposed 8-storey building connection (J-3 model node) as well as 47.33 l/s for fire protection. Existing fire hydrants in the vicinity of the development will provide fire protection in addition to the sprinklers and standpipe and have been considered in the modeling.

The subject site is in the Low-Level Gravity Based System with the hydraulic grade line (HGL) of 301.8m. A hydrant test was performed on the two hydrants on University Drive nearest to the proposed development in October 2023. Static pressure at the residual hydrant (across from the proposed development) was 90 psi and the static pressure at the flow hydrant (across from the existing Elgin Hall Residence) was 85. Theoretical flow at the residual pressure of 20 psi based on the hydrant test results is approximately 291 l/s. HGL based on the residual hydrant static pressure is approximately 305.3m. Therefore, the boundary condition was modelled with reservoirs located at the existing 300mmØ watermain on University Drive in the vicinity of the development with the HGL of 301.8m.

The included detailed modeling outputs confirm that the proposed watermain servicing the proposed development provides adequate fire protection. Furthermore, the City of London pressure and flow velocity requirements are met at all nodes and in all pipes respectively with the boundary condition of 301.8m.

City of London flow velocity requirements are met at all pipes with the boundary condition of 301.8m, however, the modelled pressure at the building wall (junction J-3) is approximately 585 kPa (84.8 psi) which is over the maximum residual pressure of 550 kPa (80 psi) per DSRM. The development's mechanical engineer confirms that a pressure reducing valve as part of the internal mechanical design will be included to ensure pressure is maintained below the maximum allowable pressure of 550 kPa (80 psi).

Figure 1: WaterCAD Model Layout.



RESULTS

The attached modeling and below summary of critical results confirms that the existing municipal water network and proposed watermain servicing the proposed development meet the requirements of the City of London.

Scenario		Velocity (m/s)		Pressure (kPa)		Fire Flow (L/s)	
		Maximum	Maximum Allowed	Minimum	Minimum Allowed	Available	Required
Average Day (HGL = 301.8m)	Proposed Building (Node J-3)	0.04	1.5	584	275	n/a	n/a
Max Hour (HGL = 301.8m)	Proposed Building (Node J-3)	0.31	1.5	584	275	n/a	n/a
Max Day + Fire (HGL = 301.8m)	Proposed Building (Node J-3)	2.4	2.4	579	140	71.09	47.3
		Max Pipe Water Age (hrs)			Max Junction Water Age (hrs)		
Age	Proposed Water Connection	3.49			3.59		

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

Yours Truly,

MTE Consultants Inc.



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Encl. Hydrant Test Results, Demand Summary, Modelling Results

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