

## 4 SANITARY SEWAGE SYSTEM

This section provides an analysis of the existing sanitary sewer system and proposed sanitary servicing strategy. It will demonstrate that the proposed development can be adequately serviced and identifies required external system improvements.

---

### 4.1 EXISTING SANITARY SEWAGE SYSTEM

The existing sanitary drainage system around the Site consists of several local sanitary sewers which discharge to a trunk combined sewer located in Eastern Avenue. This 1650mm diameter trunk sewer in Eastern Avenue is called the Low-Level Interceptor (LLI) and conveys combined sewer flows from a large portion of downtown Toronto east along Eastern Avenue to the Ashbridges Bay wastewater treatment plant. The existing local sanitary sewers immediately adjacent to the Site are as follows:

- ▶ 300-450mm diameter sanitary sewer on The Don Roadway flowing north and connecting to the LLI at Sunlight Park Road;
- ▶ 300mm and 600-675mm diameter sanitary sewers on Lake Shore Boulevard flowing east to Logan Avenue;
- ▶ 675mm diameter sanitary sewer on Logan Avenue flowing north and connecting to the LLI at Eastern Avenue; and
- ▶ 300mm diameter sanitary sewer on Booth Avenue flowing north and connecting to the LLI at Eastern Avenue.

Although these sewers are noted as sanitary sewers, they generally discharge to the LLI and therefore are to be treated as combined sewers. A subsurface utility investigation for the Subject Site has been completed to confirm the configuration of the onsite sanitary sewers. The existing Site has sanitary outlets to both the existing 300mm diameter sewer in The Don Roadway and the existing 300mm diameter sanitary sewer on the north side of Lake Shore Boulevard East.

---

### 4.2 PROPOSED SANITARY DRAINAGE

The City of Toronto completed the Waterfront Sanitary Servicing Master Plan study in 2013. The preferred strategy for sanitary service to the waterfront was concluded as option 2B. This option includes a new gravity sewer along Carlaw Avenue that connects to the existing interconnecting sewer just north of Eastern Avenue. This interconnecting sewer drains north along Carlaw Avenue and outlets to the Mid-Toronto Interceptor (MTI) at Gerrard Street. Please note that the gate on this interconnecting sewer is currently closed at the LLI. The MTI sewer conveys drainage to the Ashbridges Bay treatment plant and terminates at the T-Building. In discussions with Toronto Water, both the M-Building and T-Building at Ashbridges Bay are anticipated for upgrades.

The City recently completed an update to the Waterfront Sanitary Servicing Master Plan EA. As part of this update, a municipal sanitary pump station is proposed for the Port Lands area of the Waterfront. A new gravity sanitary sewer will be constructed along Commissioners Street outletting to this new pump station at Leslie Street. From the sanitary pump station, the sanitary effluent will outlet via a new sanitary forcemain to

the interconnecting sewer at the intersection of Eastern Avenue and Carlaw Avenue and ultimately discharge to the MTI. The Subject Site is tributary to this new Toronto Waterfront sanitary system.

The new sanitary pump station and associated forcemain will be sized for the development flows from the Lower Don Lands, Port Lands and the Unilever Precinct. With the funding in place for the Don River Flood Protection and Enabling Infrastructure project, the design and implementation of components of the Waterfront sanitary system including the pump station and forcemain have been initiated. The sanitary drainage from the Subject Site is ultimately intended to outlet to the Waterfront Master Plan sanitary system, and the servicing intent would be a new gravity system from East Harbour to the new waterfront sanitary system on Commissioners Street. WSP will continue to coordinate with Toronto Water and Waterfront Toronto as it relates to the preferred option for the Waterfront Sanitary Servicing Master Plan.

The City of Toronto has released the Port Lands and South of Eastern Transportation and Servicing Master Plan EA. The Unilever Precinct is within the study area for this report. The municipal servicing strategy that has been presented as part of this report is generally consistent with the Port Lands EA. There are slight modifications due to the fact that the East Harbour plan has an alternate roadway layout and there is also an alternate flood protection proposal. The time frame for implementation will be a critical factor in evaluating servicing strategies. The preferred sanitary servicing option for the Port Lands EA is consistent with the Waterfront Sanitary Servicing Master Plan, which is also the preferred sanitary servicing option identified in this report. Based on our understanding of the current PLFPEI detailed design, there is an interim sanitary servicing strategy to convey flows to the existing combined sewer on Lakeshore Boulevard West via a temporary pumping station and forcemain on Commissioners Street and Saulter Street, in advance of the complete construction of the Commissioners Street gravity sewer to the ultimate pumping station. It is expected that the initial phases of development on the Subject Site will advance prior to the full construction of the gravity trunk sewer on Commissioners Street, and an interim sanitary servicing solution for the Subject Site may also be required.

Sanitary drainage for the Subject Site will be provided via new municipal sanitary sewers within the proposed public ROW's. The Site will drain towards the Broadview Avenue Extension and south to Lake Shore Boulevard East. Individual service connections will be extended from the municipal sewers to each building within a development block. In accordance with the City of Toronto's servicing by-law, additional service connections will also be provided for each point tower attached to a joint podium.

It is expected that external sanitary sewer improvements will be required to service the development. These improvements are dependent on the resolution of the studies identified above. The ultimate goal would be to align the servicing strategy for the Unilever Precinct with the recommendations from these studies. Based on the uncertainty of the recommendations and the timing of the implementation of the required infrastructure, three (3) options for external sanitary servicing of the Site have been developed as described below.

- ▶ **Option 1:** This option is based on our understanding of the current preferred solution in the Waterfront Sanitary Servicing Master Plan. In this option, a new gravity sewer would be constructed to convey flows from the Subject Site to the proposed municipal pumping station. The Waterfront Sanitary Servicing Master Plan preferred option shows the proposed pumping station on the south side of Commissioners Street east of the turning basin and indicates the sanitary sewer connection from the Subject Site along the future alignment of the Broadview Avenue Extension. The extension of Broadview Avenue south of Lakeshore will not be in place in time for the construction of the sanitary sewer from the Subject Site. Similarly, Bouchette Street is expected to be realigned, which will not occur in advance of development

on the Subject Site. As such, the alignment of the sanitary sewer from the Subject Site to Commissioners Street is shown along the Saulter Street South alignment, which we understand will remain. As the pumping station and associated linear infrastructure is expected to be significantly deep, there would be minimal concern with conflicts between the new sewer and existing utilities. This option also eliminates the existing constraints on the LLI and is consistent with the ultimate servicing vision for the Subject Site. Similar to the PLFPEI sanitary drainage strategy, this may require an interim solution in advance of the complete construction of the Commissioners Street gravity sewer to the ultimate pumping station in order to accommodate the initial development within the East Harbour Lands. This would involve a temporary pumping station located in the vicinity of Lakeshore Boulevard West and Saulter Street to convey flows to the existing combined sewer on Lakeshore Boulevard West.

- ▶ **Option 2:** In the event that the waterfront municipal sanitary pumping station is not in place in time to service the Subject Site, a new gravity sewer would be constructed along Lake Shore Boulevard East and Carlaw Avenue to outlet to the Carlaw interconnecting sewer at Eastern Avenue. Similar to Option 1, this option eliminates the existing constraints on the LLI. The design of the new gravity sewer would conform to City of Toronto standards and include all existing and proposed tributary flows. A route analysis would be completed as part of detailed design.
- ▶ **Option 3:** This option considers servicing the Subject Site via existing infrastructure in the event of the Subject Site proceeding with development in advance of the resolution of the other studies and implementation of the recommended infrastructure. The proposed internal sewer network would connect to the existing 675mm diameter sanitary sewer on Lake Shore Boulevard East. This sewer drains east to Logan Avenue and then north to a connection to the LLI at Eastern Avenue. In order to implement this solution, upgrades to the existing sewers will be required. It is also understood that there are currently capacity restrictions in the LLI. A static sewer model for this option has been included as part of this report.

Refer to Figures 4.1, 4.2 and 4.3 for an illustration of the sanitary servicing options. For further details refer to the Site Servicing Plans in Appendix E.

---

## 4.3 SANITARY FLOWS

An estimate of the sanitary sewage flows from the Site has been calculated based on the current development statistics. To calculate the approximate peak sanitary flows, the following City of Toronto design criteria have been utilized:

- ▶ Average Sanitary Flow Generation Rate:
  - 250 L/cap/day for existing commercial / industrial;
  - 240 L/cap/day for existing residential;
  - 450 L/cap/day for new development;
- ▶ Peaking Factor: Harmon Formula (no peaking factor applied to commercial / industrial flows); and
- ▶ Infiltration: 0.26 L/ha/s.

The resulting sanitary flows for the existing and proposed conditions for the Subject Site and the overall Unilever Precinct are summarized in Table 3.1 and Table 3.2, respectively.

**Table 4.1 Sanitary Design Flows – Subject Site**

<b>Condition</b>	<b>Average day flow (L/s)</b>	<b>Peak Flow (L/s)</b>	<b>Infiltration (L/s)</b>	<b>Design flow (L/s)</b>
Existing	5.4	5.4	3.6	9.0
Proposed	201.2	293.2	3.6	296.8
<b>Difference</b>	<b>195.8</b>	<b>287.8</b>	<b>0.0</b>	<b>287.8</b>

**Table 4.2 Sanitary Design Flows – Entire Unilever Precinct**

<b>Condition</b>	<b>Average day flow (L/s)</b>	<b>Peak Flow (L/s)</b>	<b>Infiltration (L/s)</b>	<b>Design flow (L/s)</b>
Existing	9.6	9.6	6.3	15.9
Proposed	323.8	415.8	6.3	422.1
<b>Difference</b>	<b>314.2</b>	<b>406.2</b>	<b>0.0</b>	<b>406.2</b>

As illustrated above, the proposed development of the Subject Site, and ultimately the entire Unilever Precinct will result in an increase in sanitary flows. As noted previously, there is an equivalent population figure of 62,167 for the entire Unilever Precinct. This population would generate average day, peak flows and design flows of 323.8 L/s, 415.8L/s and 422.1 L/s, respectively.

## 4.4 EXTERNAL SANITARY SEWER ANALYSIS

Detailed design and sizing of the proposed internal municipal sanitary sewer system within the Subject Lands will be completed at the subdivision registration stage. Similarly, where new external infrastructure is required to service the Site (Options 1 and 2), this infrastructure will be designed in the future to accommodate the Subject Site and any other tributary lands. However, an analysis of the external sanitary drainage system was prepared to estimate the impacts of the development on the existing municipal downstream system. This analysis has been prepared for the potential interim scenario in which the Site would drain to the existing 675mm diameter sewer on Lake Shore Boulevard East – 675mm diameter sewer on Logan Avenue outletting to the LLI. There may be opportunities for an upgrade of this existing municipal system as part of the Port Lands EA initiative, but this requires further coordination and analysis with the Port Lands study. The review of the existing system utilized the parameters established above and applied an average sanitary flow generation rate of 240 L/cap/day for residential uses. The City's HVM modelling has been used for pipe information only (size, slope, inverts) and design flows have been established from first principles. For the external drainage areas where GFA statistics were not readily available, the following population densities were applied in accordance with the City of Toronto's design criteria:

- ▶ Industrial: 136 persons / ha; and
- ▶ Residential (medium density): 270 persons / ha.

Based on these assumed parameters, the external sanitary sewers south of the site are generally shown to be operating within capacity under existing dry weather conditions. The majority of the sewers are shown to be under 50% full; however, there are a few segments of sewer that are shown to be over capacity due to extremely shallow pipe slopes. The most notable are three (3) sections of 675mm diameter sewer in the



vicinity of the Lake Shore Boulevard East and Logan Avenue intersection. Per the City's HVM modelling, these pipes are effectively flat. Under the proposed dry weather conditions there is an increase in flows in the 675mm diameter sewer on Lake Shore Boulevard East and the 300mm diameter sewer on Booth Avenue; however no additional pipes are shown to exceed capacity. The majority of the pipes on Lake Shore Boulevard East and Logan Avenue are shown to be under 90%, while the pipes on Booth Avenue are under 40%. As a result of the redirection of flows from the site to the 675mm diameter sewer, there is a significant decrease in flows in the 300mm diameter sewer on Lake Shore Boulevard East. Refer to the preliminary sanitary drainage plans and design sheets located in Appendix C for further details.

The Unilever Precinct is within a basement flooding area as defined by the City of Toronto. Consequently, an analysis of the wet weather flow scenario is required. Based on a comparison of the basement flooding study modelling for the dry weather and wet weather scenarios, an I/I value of 0.8 L/s/ha has been determined for the wet weather scenario. Under the existing wet weather condition, the majority of the sewers on Lake Shore Boulevard East and Logan Avenue are shown to be under capacity. Similar to the dry weather scenario there are a few pipes that are shown to be over capacity due to very shallow pipes slopes. The 300mm diameter sewer on Booth Avenue is shown to be under capacity with a maximum of 15%. Under the proposed wet weather condition there is an increase in flows to the 675mm diameter sewer on Lake Shore Boulevard East and Logan Avenue and to the 300mm diameter sewer on Booth Avenue. As a result, there are a few additional sewer segments on Lake Shore Avenue and Logan Avenue that are nearing or exceeding capacity (95-117%). The sewers on Booth Avenue are shown to remain under capacity with a maximum of 39%. The decrease in flows to the 300mm diameter sewer on Lake Shore Boulevard East results in the majority of these sewers being well under capacity. It should be noted that in the proposed wet weather scenario, the I/I value of 0.8 L/s/ha has been maintained for the proposed development as an allowance for potential permanent dewatering flows to the sanitary sewer system.

In order to determine the impact of potential surcharging of the sanitary sewer system under wet weather conditions, a hydraulic grade line (HGL) analysis has been prepared for the systems that have pipes that are shown to be over 100% full. The largest concern is the sewers on Logan Avenue where there are residential buildings that would presumably have basements and are therefore susceptible to flooding. The remainder of the upstream tributary area is predominantly industrial uses. Typically surcharging of sanitary sewers is of concern when the HGL is shown to be within 1.8m of the surface elevation. Under the existing wet weather scenario, the HGL is shown to be below 1.8m for the Logan Avenue system, with a minimum depth of 2.5m on Lake Shore Boulevard East and 2.8m on Logan Avenue. In the proposed wet weather scenario, the HGL remains below 1.8m for the Logan Avenue system. The minimum depth on Lake Shore Boulevard East and Logan Avenue decreases to 2.2m and 2.5m, respectively. As such, the wet weather HGL is not a concern. For further details on the capacity analysis for Option 3 refer to Appendix D.

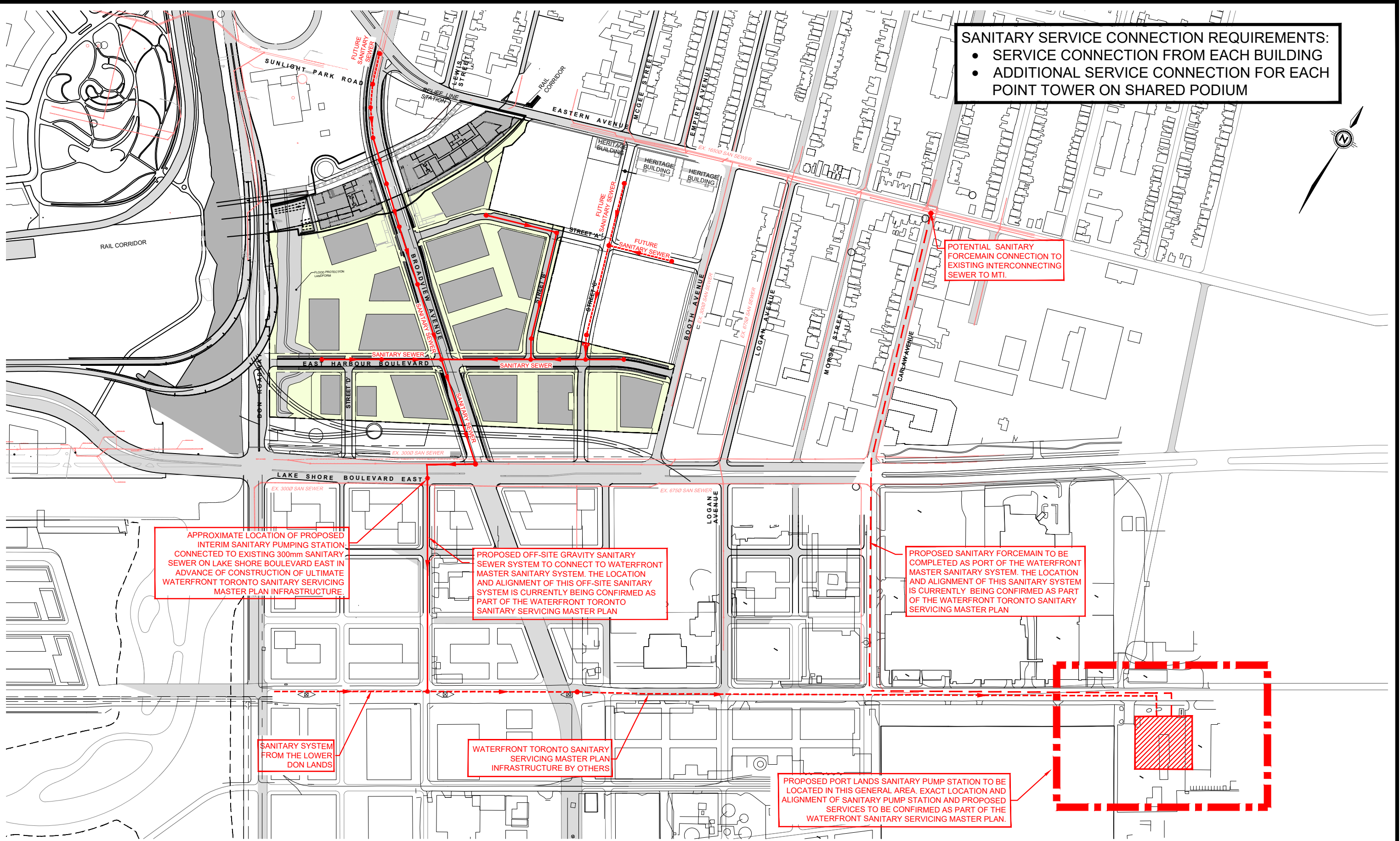
As identified above, the proposed development will result in an increase in sanitary flows. A capacity analysis has been completed for the potential scenario in which the Site drains to existing local sewers. With the exception of four sewer segments, the existing system is shown to have sufficient capacity to accommodate proposed dry weather flows. Under the wet weather flow scenario, the existing sewers on Booth Avenue are shown to remain under capacity. Under existing wet weather flow conditions, the majority of the sewers on Lake Shore Boulevard East and Logan Avenue are shown to be under capacity, with the exception of the same four (4) sewer segments. Under proposed wet weather conditions, six (6) additional pipes are shown to be over capacity. An HGL analysis of the wet weather flow conditions indicates that the HGL in the Logan Avenue system is at least 1.8m below the surface for both existing and proposed wet weather scenarios.

The analysis of the existing municipal sanitary sewer system was completed to understand the impacts the proposed development would have on this infrastructure. There are a number of constraints on this system as generally summarized below;

- ▶ There are sections of the existing municipal system that would surcharge under dry weather flows. These sections of sewer would require upgrades;
- ▶ The existing system that has been analyzed outlets to the LLI. It is understood that the LLI has surcharging issues and the Waterfront sanitary servicing master plan indicates that the LLI will surcharge under a one-year storm event; and
- ▶ The Waterfront sanitary servicing master plan identifies both the Lake Shore Boulevard East and Logan Avenue sewers as bottlenecks with the projected flows to 2031.

If a connection to the existing system is pursued further, we recommend a flow monitoring analysis to confirm existing flows and system capacity.

X:\DIV10\20M-00294 East Harbour\MUN\Figure4.1 - Internal Sanitary Servicing Plan.dwg Jan 06, 2021 - 11:05pm



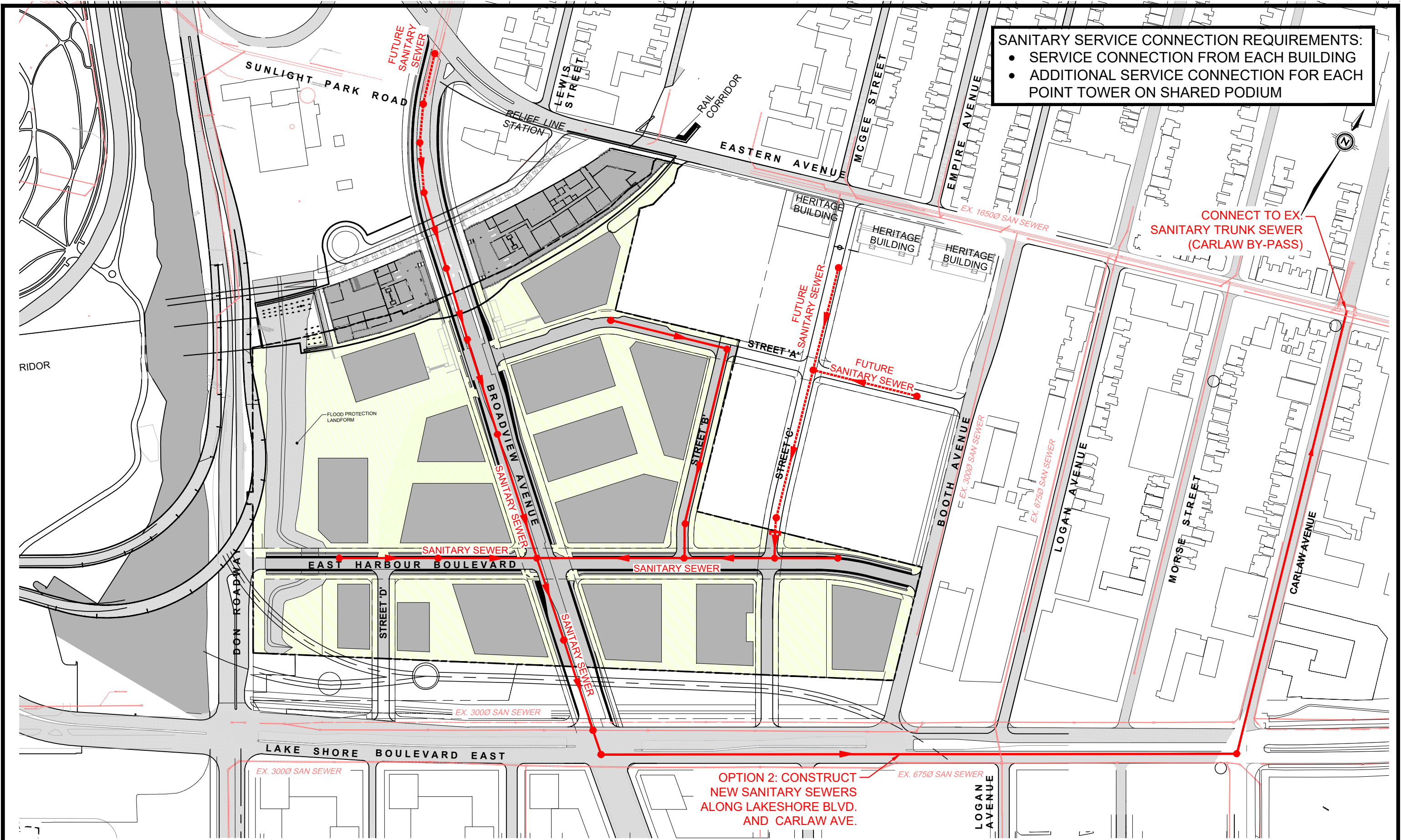
CLIENT  
**CADILLAC FAIRVIEW**

TITLE  
**SANITARY SERVICING PLAN  
OPTION 1**

Checked	S.W.	Drawn	10/12 Cad
Date	JANUARY 2021	Proj. No.	20M-00294
Scale	N.T.S.	Figure No.	FIG 4.1



X:\DIV10\20M-00294 East Harbour\MUN\Figure4.1 - Internal Sanitary Servicing Plan.dwg Jan 06, 2021 - 11:02pm



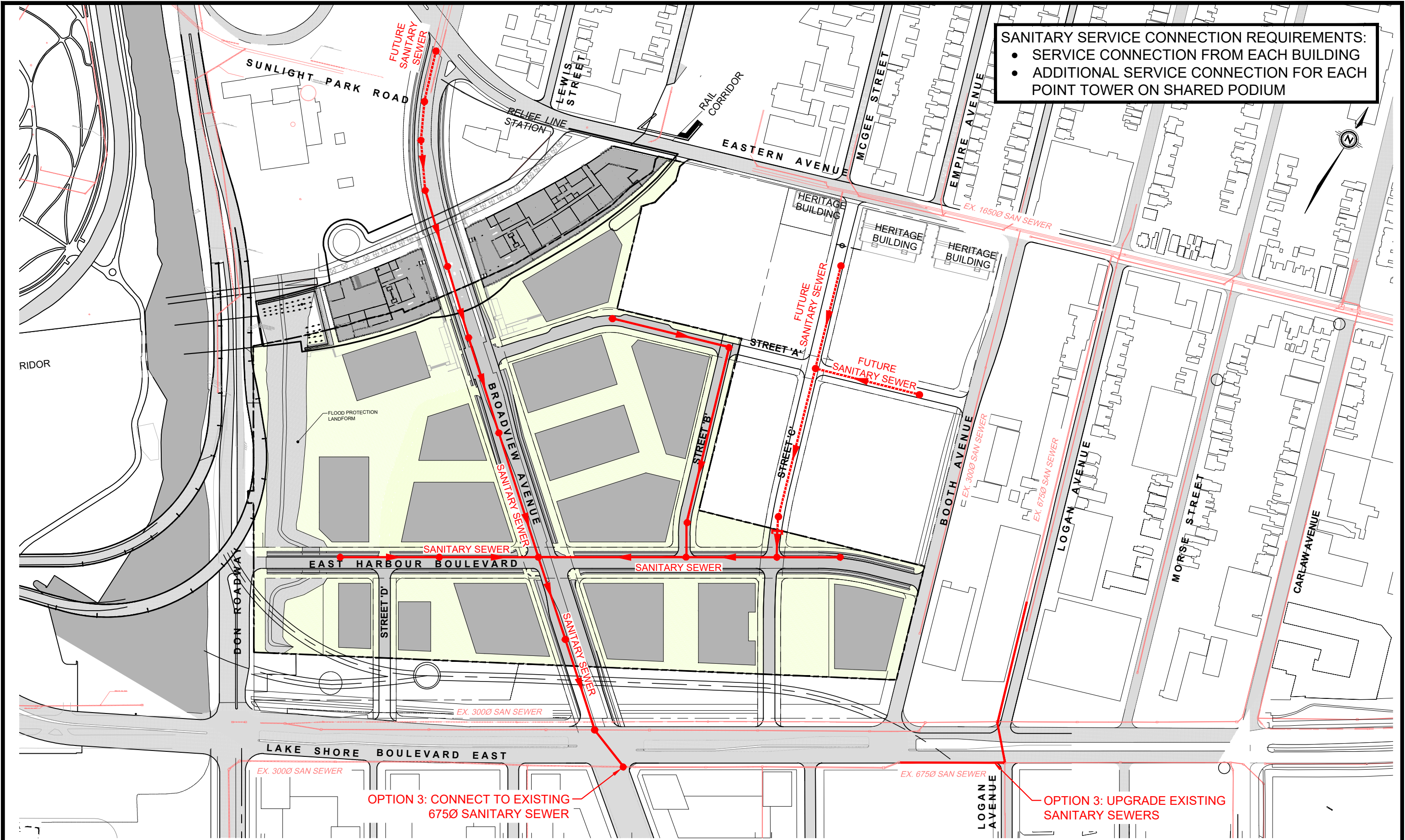
CLIENT  
**CADILLAC FAIRVIEW**

TITLE  
**SANITARY SERVICING PLAN  
OPTION 2**

Checked	S.W.	Drawn	10/12 Cad
Date	JANUARY 2021	Proj. No.	20M-00294
Scale	N.T.S.	Figure No.	FIG 4.2



X:\DIV1\020M-00294 East Harbour\MUN\Figure4.1 - Internal Sanitary Servicing Plan.dwg Jan 06, 2021 - 11:12pm



CLIENT  
**CADILLAC FAIRVIEW**

TITLE  
**SANITARY SERVICING PLAN  
OPTION 3**

Checked	S.W.	Drawn	10/12 Cad
Date	JANUARY 2021	Proj. No.	20M-00294
Scale	N.T.S.	Figure No.	FIG 4.3

## 5 STORM SEWAGE SYSTEM

This section provides an analysis of the existing storm sewer system and proposed servicing strategy. It will demonstrate that the proposed development can be adequately serviced and identifies required external system improvements.

A Stormwater Management Report for this development has been prepared under separate cover. It identifies the stormwater quantity and quality controls under which this Site will operate to comply with the City's Wet Weather Flow Management Guidelines.

---

### 5.1 EXISTING STORM SEWAGE SYSTEM

The Site is currently occupied by several large buildings with a significant amount of paved roadways and parking. As such the majority of the Site is considered impervious with only minor landscaped areas. It is currently understood that there are no means of stormwater quantity or quality mitigation and flows from the Site runoff untreated and uncontrolled to the receiving storm sewers.

External to the Site there are several storm sewer systems that convey runoff to various outlets. The existing storm sewers immediately adjacent to the Site are as follows:

- ▶ 600 x 900mm to 1350mm diameter storm sewer on Eastern Avenue from McGee Street flowing west to the Don River;
- ▶ 300 - 900mm diameter storm sewer on Eastern Avenue and Booth Avenue flowing south to Lake Shore Boulevard East;
- ▶ 300 - 750mm diameter storm sewers on Lake Shore Boulevard East from Bouchette Street flowing west to the Don River;
- ▶ 900 - 1200mm diameter storm sewers on Lake Shore Boulevard East, flowing east from Booth Avenue connecting to an existing 1950 x 1225mm twin culvert trunk sewer at Morse Street; and
- ▶ 300 - 600mm diameter storm sewers on Don Roadway, which outlet to the Don River.

The topographic survey for the Site indicates a number of catchbasins which collect minor storm runoff. It is expected that the majority of the Site drains to the west, ultimately outletting to the Don River, while a small portion in the southeast corner of the Site drains to the trunk storm sewer on Lake Shore Boulevard East at Morse Street. A subsurface utility investigation for the Subject Site was completed for the majority of the property which generally confirms the above. Major storm drainage on the Site generally flows overland from north to south towards Lake Shore Boulevard East.

---

### 5.2 PROPOSED MINOR STORM DRAINAGE SYSTEM

Storm runoff from the Subject Site will be diverted to the southeast towards the Ship Channel Turning Basin. From initial discussion with the City as it relates to the Port Lands EA, it is anticipated that there will be new storm drainage and Stormwater Management infrastructure constructed in the vicinity of Commissioners Street and Carlaw Avenue. The subject lands will ultimately be tributary to this infrastructure when the Port Lands work proceeds and this infrastructure can be implemented. For the current Site development, it is

proposed that storm drainage from the Site be conveyed to the existing trunk sewer on Lake Shore Boulevard East at Morse Street. This sewer drains east to Carlaw Avenue and then south to the outlet at the Turning Basin.

Internal to the Site, new storm sewers will be constructed within the proposed public road allowances. The majority of the Site will drain towards the Broadview Avenue Extension and south to Lake Shore Boulevard East. The southeast corner of the Site will drain east along East Harbour Boulevard to Booth Avenue. The proposed underpass of Broadview Avenue Extension under the Metrolinx rail corridor will create a low point that cannot be drained by gravity. As such, storm flows from this localized area will be collected and pumped to the proposed storm sewer on the Broadview Avenue Extension north of East Harbour Boulevard. Refer to Figure 5.1 for the Storm Servicing Plan. For further details refer to the Public Utility Plan in Appendix E.

---

### 5.3 MAJOR STORM DRAINAGE SYSTEM

The major storm system is a conveyance system for flows in excess of the minor system flows. The grading design for the Site will direct surface (i.e. roads and landscaped areas) drainage away from the buildings to approved outlets, such as the adjoining public rights-of-way. Major storm drainage will continue to be conveyed overland towards Lake Shore Boulevard East. The low point on Broadview Avenue Extension identified above will not have an overland flow route. As such, the gravity storm sewer will be designed to convey the 100-year flow from this area to the proposed storm pump station. The pump station will be designed with sufficient storage to pump at the 2-year rate (approximately 900m<sup>3</sup> as indicated in the SWM Report). Please note that the 100-year flow from these lands will be controlled on Site to comply with the City of Toronto Wet Weather Flow Master Plan Guidelines.

---

### 5.4 STORM FLOWS

Based on the City of Toronto requirements for redevelopment, storm flows on the Site will be controlled to the 2-year pre-development levels (with a maximum runoff co-efficient of 0.5). This will be accomplished through a series of Stormwater Management approaches and Low Impact Development (LID) techniques. For further information please refer to the Stormwater Management Report provided under separate cover. The gravity sewer system within the Site will be sized to accommodate the controlled flows from the Site. It is expected that sufficient storage will be provided at the storm pumping station to control the 100-year flow from the tributary area to the 2-year pre-development level prior to discharging to the gravity sewer system.

---

### 5.5 EXTERNAL STORM SEWER ANALYSIS

Detailed design and sizing of the proposed internal storm sewer system will be completed at the detailed design stage. However, an analysis of the external storm drainage system was completed to estimate the impacts of the development on the downstream system. This analysis utilized the City's HVM model data for the existing storm sewer flows, and the estimate-controlled flows from the Subject Site.

Through on-site control, the overall rate of storm runoff from the Subject Site to the storm sewer system will be significantly reduced. However, only a portion of the Site is currently tributary to the sewers on Lake Shore Boulevard East flowing towards Carlaw Avenue. As such the development of the Site will result in an increase of storm flows to this system. Based on the analysis, the external storm sewers downstream of the Site are



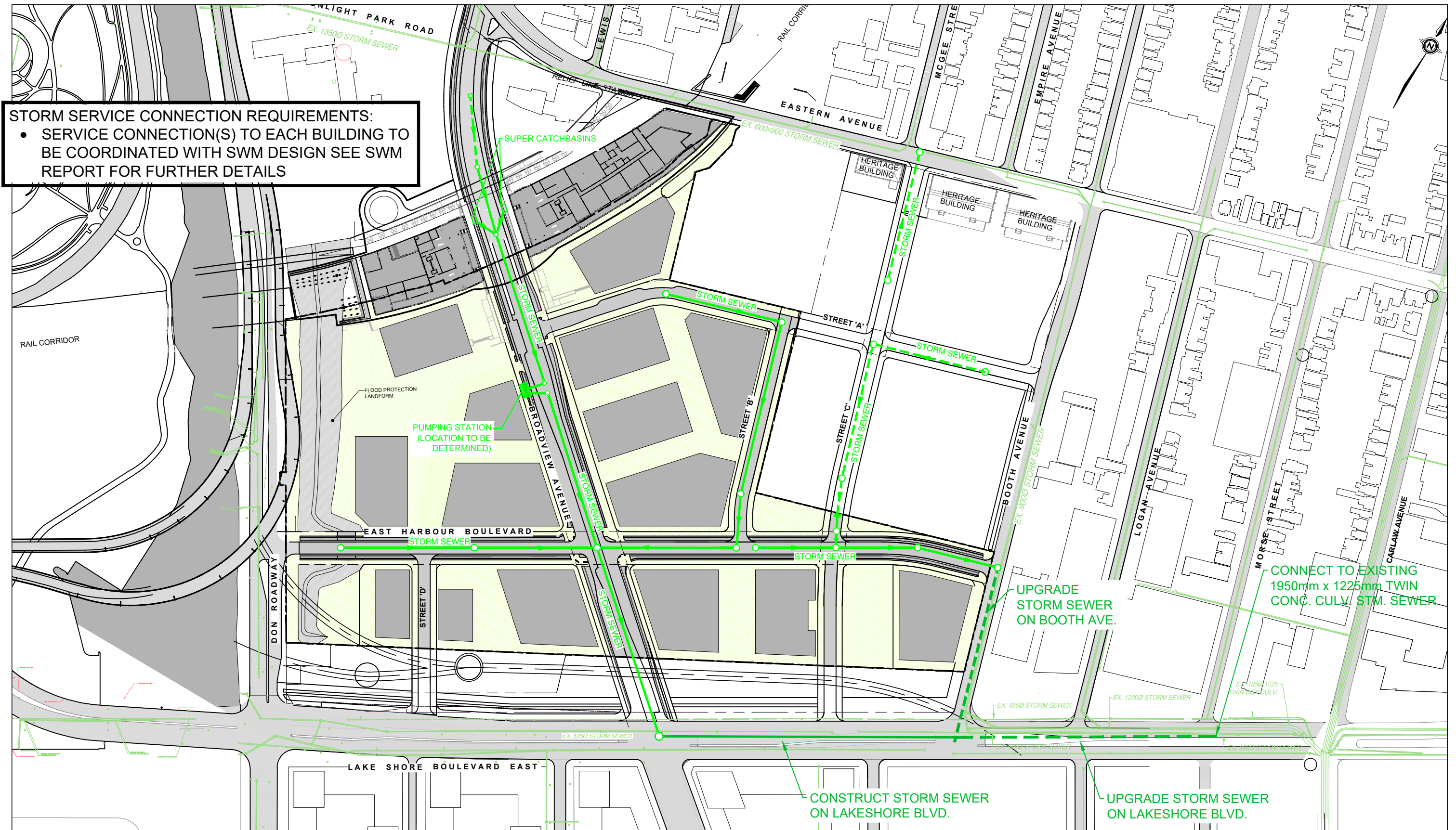
generally shown to be operating over capacity under existing conditions during a 2-year storm event, up to the trunk storm sewer on Lake Shore Boulevard East at Morse Street. The twin culvert trunk sewer east of Morse is shown to be at approximately 32-38% capacity under existing conditions and increases to 72-78% capacity in the post-development condition. This analysis simply adds the controlled flows from the subject Site to the HVM flows, with no reduction for the existing flows from the Site to this system. As such, the analysis can be considered to be conservative.

In addition to the analysis based on HVM data WSP has analyzed the storm sewer hydraulic model prepared for the Basement Flooding Study for Area 32 which includes the Site. This analysis includes a comparison of capacities in the existing sewer system for the pre- and post-development scenarios in the 2-year and 100-year storm events. For the post-development scenario, the area of the Site that is currently tributary to these sewers was removed from the model and the anticipated controlled flow rates were added to the system at the appropriate nodes. The 2-year post-development analysis is consistent with the analysis described above; it demonstrates that the twin culvert trunk sewer (Link 3471417718.1) has sufficient capacity to accommodate the proposed flows from the Site, but that the sewers upstream of this are over capacity. In the 100-year post-development analysis, the twin culvert trunk sewer is over capacity but the HGL is beneath the ground surface. Upstream of this point the HGL is above the ground.

Refer to Figure 5.1 for the Storm Servicing Plan. For further details refer to the storm drainage plans, preliminary design sheets and model output located in Appendix D.

Based on this analysis, external storm sewer upgrades will be required to facilitate redevelopment of the Site. These storm sewer improvements will convey storm flows from the Site to the existing twin culvert trunk sewer, which is shown to have sufficient capacity to accommodate the Site. A new storm sewer will be constructed on Lake Shore Boulevard East from Broadview Avenue Extension to Booth Avenue. Existing storm sewers on Booth Avenue from East Harbour Boulevard to Lake Shore Boulevard East and on Lake Shore Boulevard East from Booth Avenue to Morse Street will be replaced and upsized as required. The design of these sewer improvements will account for the full build-out of the Unilever Precinct, and existing external drainage areas, and will need to be coordinated with the City to accommodate local drainage of Lake Shore Boulevard East as part of the reconstruction of the road.

X:\DIV\10\20M-00294 East Harbour\MUN\Figure\FSR\Figure 5.1 - Internal Storm Servicing Plan.dwg Jan 06, 2021 - 11:08pm



CLIENT  
**CADILLAC FAIRVIEW**

TITLE  
**STORM SERVICING PLAN**

Checked	S.W.	Drawn	10/12 Cad
Date	JANUARY 2021	Proj. No.	20M-00294
Scale	N.T.S.	Figure No.	FIG 5.1

## 6 GROUNDWATER

A Hydrogeological Investigation for the Subject Site has been completed by Terraprobe Inc. and an updated report is currently being completed by Golder Associates. Initial analysis indicates that the groundwater levels onsite are at approximately 76.3m which is relatively shallow compared to surface grades (existing and proposed) and the proposed building structures. As such, there are several different options for addressing groundwater levels for the proposed development:

- ▶ The first option is a water-tight design of the below grade structure so that groundwater collection and discharge are not required. A business case will be developed as it relates to long term cost of groundwater discharge in relation to the capital cost for a hydrostatic structural design. It is expected that this is the approach that will be pursued;
- ▶ The second option is to outlet to the sanitary sewer system with a long-term groundwater discharge permit and associated on-going costs. The anticipated rate of groundwater flow would then have to be included in the sanitary sewer capacity analysis. As noted in Section 4.4 the I/I value of 0.8 L/s/ha has been maintained for the Subject Site in the proposed wet weather flow analysis. This is intended to be an allowance of 0.54 L/s/ha for potential permanent dewatering flows to the sanitary sewer system beyond the dry weather I/I value of 0.26 L/s/ha; and
- ▶ The third option is to outlet to the storm sewer system if water quality permits. Treatment of the groundwater to meet the municipal storm sewer requirements may be an option. A long-term groundwater discharge permit would also be required for an outlet to the storm sewer system. Under this scenario, it may be possible to over control the storm runoff from the Site such that the total discharge to the storm sewer (storm runoff and groundwater) does not exceed the allowable release rate.

The hydrogeological report indicates that water quality exceeds the limits for a number of parameters for discharge to both the storm and sanitary / combined sewer systems. As such, treatment would likely be required in order to discharge groundwater to the City's sewer system. As noted above, it is expected that the buildings will be constructed water-tight below grade, such that permanent discharge to the City's sewer system would not be required. Based on this, the Hydrogeological Investigation did not calculate long-term dewatering rates for the development.

Preliminary estimates are provided for construction dewatering and would have to be confirmed at the Site Plan stage for specific buildings. If the construction dewatering is to be discharged to the City's sewer system, it would likely have to be treated to meet the City's Sewer Use Bylaw, and the capacity of the receiving sewer system would have to be reviewed.

## 7 SITE GRADING

The existing Site is relatively flat and generally drains south towards Lake Shore Boulevard East. Elevations on the Site range from 76.45m to 79.50m. The at-grade areas within the block (which include private driveway and pedestrian plazas) generally grade away from the buildings to localized low points at catchbasins.

The proposed redevelopment will result in some significant changes to the existing Site grading in order to facilitate the flood protection and the Broadview Avenue Extension underpass. As the majority of the Site will be excavated for underground structure, it is not expected that the Site will balance from a cut / fill perspective. It will comply with City of Toronto Standards and will be designed to achieve the following:

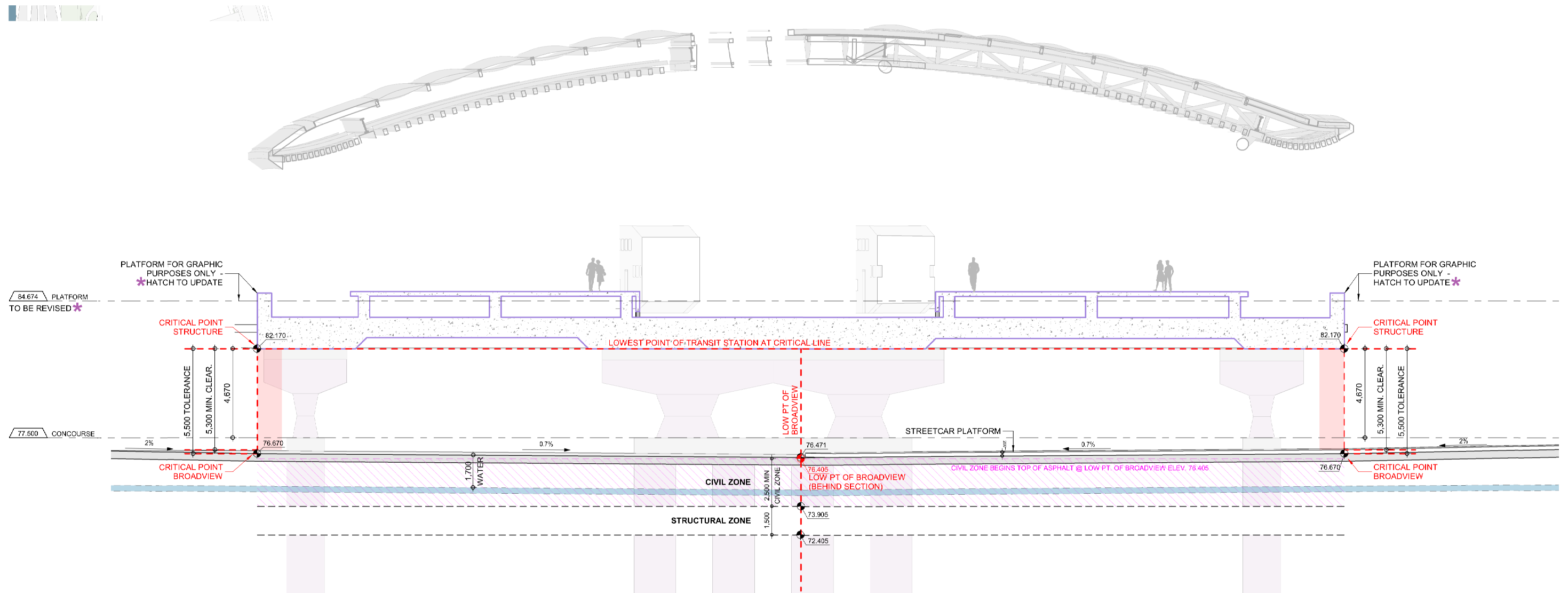
- ▶ Site grades between 0.5% and 5.0% (optimally 2%);
- ▶ Match perimeter grades;
- ▶ Direct storm runoff away from buildings;
- ▶ Convey overland flow to approved outlets;
- ▶ Minimize impact on building construction;
- ▶ Provide adequate cover for underground services;
- ▶ Accommodate Stormwater Management requirements such as surface storage; and
- ▶ Building floor elevations and openings will have to be coordinated with the flood protection requirements for the Site. This will be confirmed as part of the detailed design for the Site.

For an illustration of the functional Site Grading Plan, refer to Appendix F.

The grading and clearance design for the Broadview Underpass will be coordinated with the internal design team and Metrolinx's design team. Please refer to Figure 7.1 for a conceptual section that illustrates the preliminary grading and clearance for the underpass. Please note that this design is still progressing and will be refined going forward.



X:\DIV10\20M-00294 - East Harbour\MUN\Figure\FSR\Figure 7.1 - Broadview Underpass.dwg Jan 07, 2021 - 5:30pm



SOURCE: ADAMSON ASSOCIATES ARCHITECTS



CLIENT  
CADILLAC FAIRVIEW

TITLE  
PRELIMINARY BROADVIEW UNDERPASS  
GRADING AND CLEARANCE

Checked	S.W.	Drawn	10/12 Cad
Date	JANUARY 2021	Proj. No.	20M-00294
Scale	N.T.S.	Figure No.	FIG 7.1

# 8 UTILITIES

---

## 8.1 EXISTING CONDITIONS

A subsurface utility investigation was completed for the Site. There are various existing utilities throughout the Site that will need to be protected, removed or replaced to facilitate the redevelopment.

---

## 8.2 DESIGN CONSIDERATIONS

It is anticipated that new utility services will be extended into the Site to service the new development. The utility stakeholders will provide the design of their required services for this proposed development. The building mechanical and electrical consultants will provide the utility companies with the proposed building load requirements to facilitate their designs. Composite utility plans will be prepared during the detailed design process to ensure that all of the services and utilities within the Site are coordinated and have an adequate corridor. As part of the Port Lands Flood Protection and Naturalization due diligence study, Hydro One (HONI) prepared a feasibility study for transmission line relocations / modifications. A general overview of this study is identified below.

### HONI Transmission System

There are both overhead and underground circuits coming north along the Don Roadway which will be impacted by the Don Mouth Naturalization and Flood Protection project and the reconstruction of the Don Roadway. The HONI study undertaken on behalf of Waterfront Toronto outlines the steps potentially needed to resolve these conflicts. Based on very preliminary design criteria, HONI estimated the costs to raise a number of impacted towers and relocate the underground circuits to a new alignment. The actual work required will be driven by the detail design of the flood protection features.

The relocation of the underground circuits will be a complex project requiring 18 months minimum of design and construction time. The implementation approach and timing is to be determined between HONI and Waterfront Toronto as part of the Don Mouth Naturalization and Flood Protection project.

The intent of the design for the Subject Site is to avoid conflicts with the existing HONI lines, such that they do not need to be relocated to facilitate the proposed development.

### THESL Distribution Network

Toronto Hydro Electric System Limited ("THESL") currently has assets on the north boulevard of Lake Shore Road on the south limits of the Site. These assets cross over the Don River just north of the pedestrian bridge at the Don Roadway intersection. They also have a high voltage line at the north portion of the site, south of the rail corridor that feeds power to the existing buildings. The assets at the Don Roadway intersection may be impacted the construction work in this area. The existing servicing to the north will be decommissioned as part of the demolition stage of the project. In the event of a staged demolition, it will have to be ensured that the line can remain in-service during the early stages of construction.

### Future Utility Servicing

Preliminary review of the area suggests that all dry utility service providers will need to undertake an expansion of their capacity to support the overall development. From a point of access, the preferred routes for new connections will be focused on the east and north sides of the Site. The south and west boundaries are greatly influenced by other projects not under the full control of the Client. In the event solutions can be identified which can be implemented from a timing perspective and are more cost effective, then connection points from these areas will be considered. The new connection points will also be influenced by the construction sequencing of the Site.

It is not expected that there will be any technical limitations that would prevent the Site from being serviced by any of the providers. We do suggest a timeline of 18 months to design and build the necessary expansion facilities to bring capacity to the Site. The one issue that will have a significant impact on overall utility servicing will be the sustainability plan for the development. The plan will impact the overall utility servicing and will need to be shared with the impacted utilities at the start of their planning work. It is important that this plan be sufficiently developed to allow the utilities to properly plan their expansion works.



## 9 PHASING CONSIDERATIONS

The development of the Subject Site is currently anticipated to be implemented in four (4) phases. It is understood that the transit hub will be constructed in conjunction with the first phase of development. In addition, the remainder of the Unilever Precinct (owned by others) will be developed in subsequent phases, some of which may be concurrent with the Cadillac Fairview development. This report has been prepared to analyze the ultimate development scenario for the Cadillac Fairview lands in order to confirm the existing municipal infrastructure has capacity to accommodate the requested subdivision proposal and identify infrastructure upgrades required. In doing so, consideration has been given to the phasing of the subject lands, as well as the ultimate development scenario for the Unilever Precinct.

The first phase of infrastructure will be constructed to provide a complete system in the interim scenario and allow for future extension to service future phases. The watermain system will be fully looped to provide redundancy, where possible. Depending on the nature and progression of the phasing strategy, this may require the construction of interim private watermain.

An infrastructure phasing memo has been provided under separate cover to discuss phasing in more detail.

# 10 CONCLUSIONS

---

## 10.1 FLOOD PROTECTION

Flood protection is required to remove the Unilever Precinct from the regulatory floodplain. On the East Harbour lands, the primary measure proposed in the EA is an FPL running east of and parallel to the Don Roadway tying into the CNR embankment and proposed transit hub at its north end. An independent Flood Study has been submitted to the City and TRCA under separate cover to support this planning application based on updated flood modelling from the TRCA.

---

## 10.2 WATER DISTRIBUTION

Water servicing for the development will be provided via new municipal watermain within the proposed public road allowances connecting to the existing mains on Eastern Avenue, Booth Avenue and Lake Shore Boulevard East. Separate domestic and fire water connections will be provided from the municipal watermain to individual buildings. Additional domestic and fire services will be provided as necessary to comply with the City's servicing by-law and the building code. The proposed development will result in an increase in domestic water demands and fire flow requirements. Based on hydrant flow tests and water model for the proposed system, the existing water distribution network has sufficient capacity to accommodate the proposed development. No external improvements are anticipated.

---

## 10.3 SANITARY SEWAGE

A new municipal gravity sanitary sewer system will be constructed within the proposed public road allowances to convey sanitary drainage offsite. Separate sanitary connections will be provided from the municipal sewers to individual buildings. Additional services will be provided as necessary to comply with the City's servicing by-law. The proposed development will result in an increase in sanitary flows compared to existing conditions. The City recently completed an update of the Waterfront Sanitary Servicing Master Plan. The preferred option now includes a municipal sanitary pump station for the Port Lands area of the Waterfront. A new gravity sewer would convey flows from the Subject Site to the new Waterfront municipal sanitary infrastructure and a new forcemain would convey flows to the Carlaw Avenue interconnecting sewer. However, in the event that the new gravity sewer and municipal pump station are not in place in time for the initial development of the Subject Site, interim sanitary servicing options are available. These include construction of new sewers on Lake Shore Boulevard East and Carlaw Avenue to outlet to the Carlaw interconnecting sewer at Eastern Avenue or servicing the Site via existing sanitary sewers in the interim condition. A capacity analysis has been completed for this scenario in which the Site drains to existing local sewers. The analysis indicates that the existing sanitary sewers generally have capacity under the dry weather condition to accommodate the additional flows from the Site, however the increase in flow results in additional surcharging under the wet weather scenario and the existing system currently outlets to the LLI. If a connection to the existing system is pursued further, we recommend a flow monitoring analysis.

---

## 10.4 STORM SEWAGE

As a result of the flood protection, the storm drainage from the Site will be redirected to the southeast. A new municipal storm sewer system will be constructed within the public road allowances to convey storm runoff offsite. This drainage system will include a pump station to convey flows from the low point of the Broadview Avenue Extension underpass. Stormwater Management systems will be implemented in the municipal road allowances including Low Impact Development techniques to control the public drainage. The Stormwater Management strategy will also implement various techniques for the private drainage within the development blocks. A Stormwater Management Report has been prepared under separate cover outlining the stormwater controls required for this Site.

The grading design for the Site will direct major storm drainage away from the buildings to approved outlets, such as the adjoining public rights-of-way. The proposed development will result in a significant decrease in the rate of storm flows through on-site storage and control; however, the redirecting of these flows will result in capacity constraints in the receiving storm sewers. As such, external storm sewer improvements are required to convey the runoff from the Site to the trunk storm sewer at Lake Shore Boulevard East and Morse Street. Ultimately, storm drainage from the Site is tributary to the contemplated stormwater infrastructure proposed within the vicinity of Commissioners Street and Carlaw Avenue that forms part of the Port Lands redevelopment.

---

## 10.5 GROUNDWATER

Based on the hydrogeological investigation, it is expected that the proposed buildings will be constructed into the groundwater table. It is expected that proposed buildings will be constructed water-tight below grade such that foundation drainage systems would not be required. If discharge of groundwater is required to the City's municipal sewer systems to facilitate long-term or construction dewatering, it would likely have to be treated to meet the City's Sewer Use Bylaw, and the capacity of the receiving sewer system would have to be reviewed.

---

## 10.6 SITE GRADING

The proposed redevelopment will result in some significant changes to the existing Site grading in order to facilitate the flood protection and the Broadview Avenue Extension underpass. The proposed grading will be designed to convey storm flow away from buildings towards approved outlets and will comply with Stormwater Management strategy and the City of Toronto Standards. As the majority of the Site will be excavated for underground parking, it is not expected that the Site will balance from a cut / fill perspective.

---

## 10.7 UTILITIES

New utility services will be extended into the Site to service the new development. The utility stakeholders will provide the design of their required services for this proposed development. Composite utility plans will be prepared during the detailed design process to ensure that all of the services and utilities within the Site are coordinated and have an adequate corridor.

---

## 10.8 PHASING

This report has been prepared to analyze the ultimate development of the Cadillac Fairview lands in order to confirm the existing municipal infrastructure has capacity to accommodate the requested redevelopment proposal. The Phased infrastructure implementation will be constructed to provide a complete system in the interim scenario and allow for future extension to service future phases and the ultimate development of the Unilever Precinct.