

A detailed street map of a residential area, likely Port Credit, Ontario, showing a grid of streets, green spaces, and water bodies. The map is overlaid with a large, semi-transparent blue banner at the top and bottom.

3A

Region of Peel

APPENDIX 3A

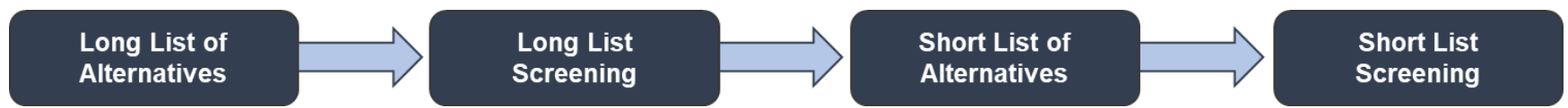
DETAILED LONG LIST OF ALTERNATIVES SCREENING

Detailed Evaluation Process: Long List of Alternatives Screening

This study has four (4) key components:

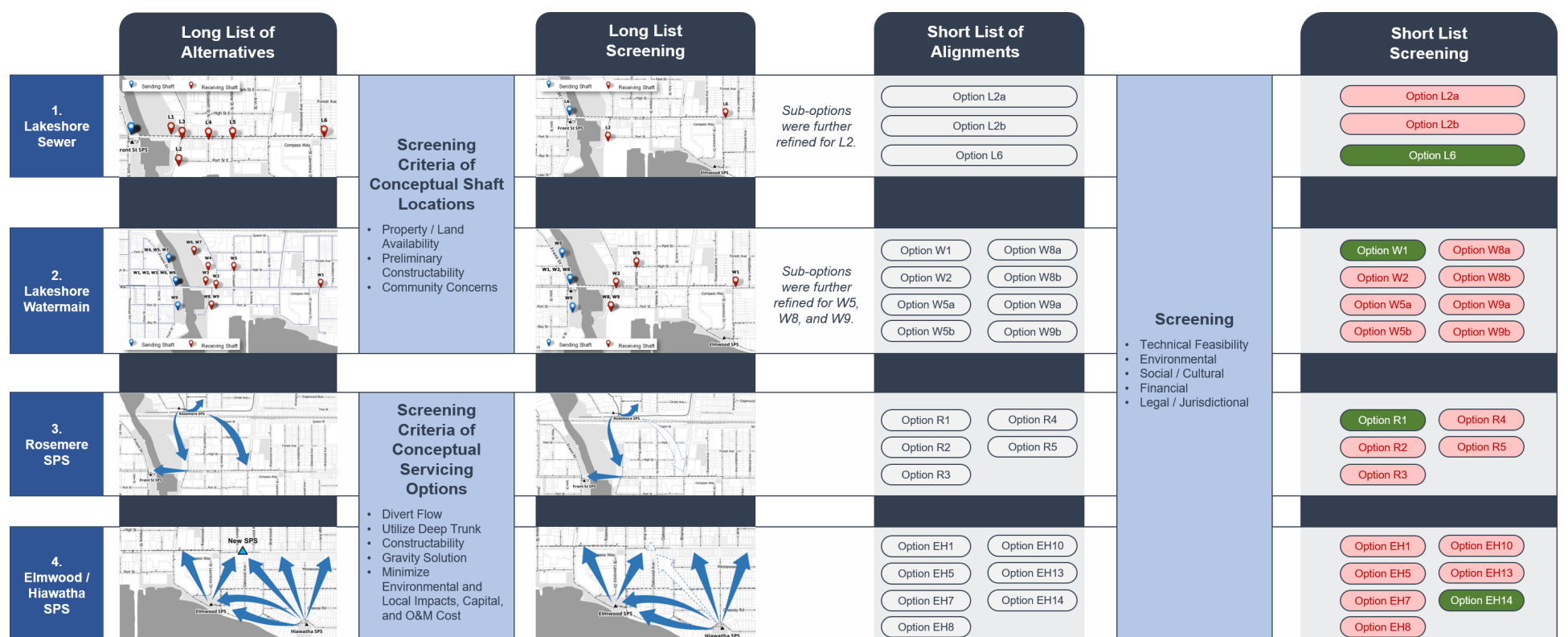
- **New Lakeshore Road Trunk Sewer: Requires crossing of the Credit River.**
- **New Lakeshore Road Sub-Transmission Watermain: Requires crossing of the Credit River. This is a new component of this project.**
- **Rosemere Sanitary Pumping Station.**
- **Elmwood and Hiawatha Sanitary Pumping Stations.**

The Port Credit East evaluation process followed a multi-step approach to cover all study components and ensure solutions are selected in an integrated manner in this order:

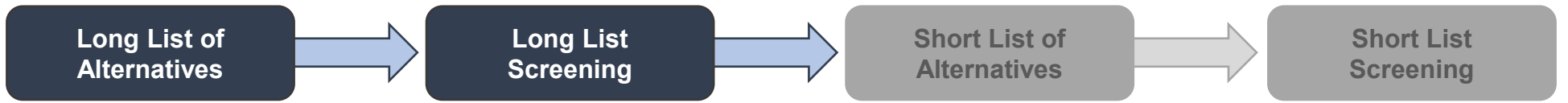


1. Evaluate Lakeshore Road Sewer Shaft Options.
2. Evaluate Lakeshore Road Sewer Alignment Options.
3. Evaluate Lakeshore Road Watermain Shaft Options.
4. Evaluate Lakeshore Road Watermain Alignment Options.
5. Based on preferred Lakeshore Road Sewer shaft location evaluate Rosemere SPS Options.
6. Based on preferred Lakeshore Road Sewer shaft location evaluate Elmwood and Hiawatha SPS Options.
7. Ensure collective components align.

An overview of the process is shown below:





Lakeshore Sewer: Long List of Shaft Alternatives

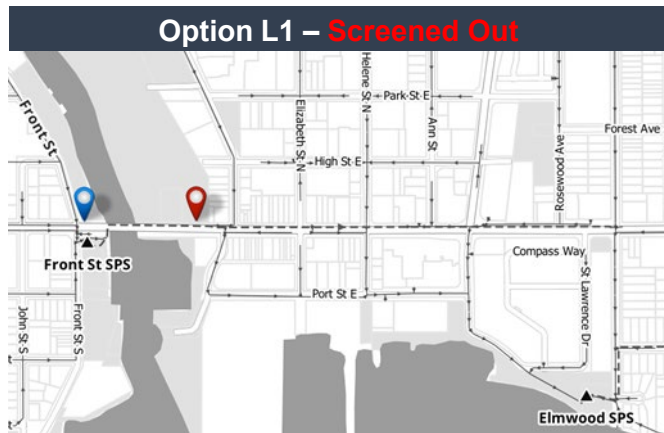


- There were six (6) different options that were identified for the Lakeshore Sewer.
- Options L2 and L6 were carried forward.

Conceptual Servicing Options

 Sending Shaft

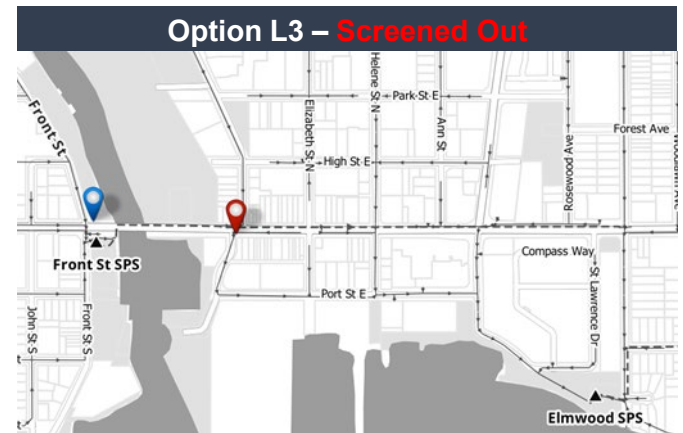
 Receiving Shaft



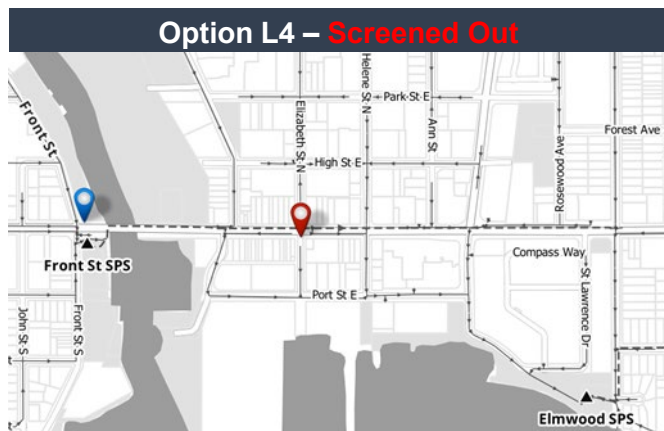
Port Credit Library Parking Lot
No land available for shaft and construction compound. – Screened Out



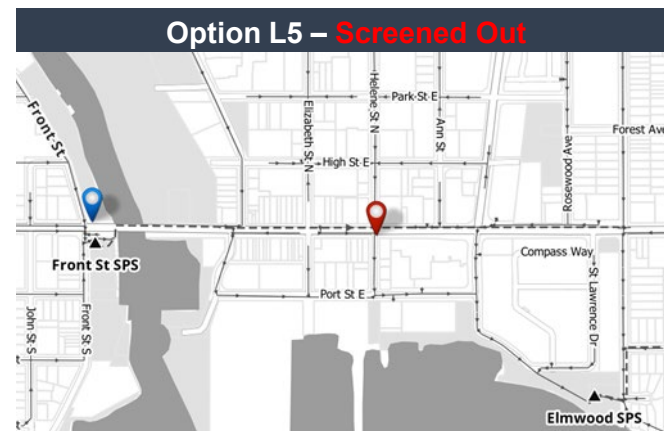
Stavebank Road South / Port Street
Parking lot has available open space. Minimizes disruption along Lakeshore Road. – Carried Forward



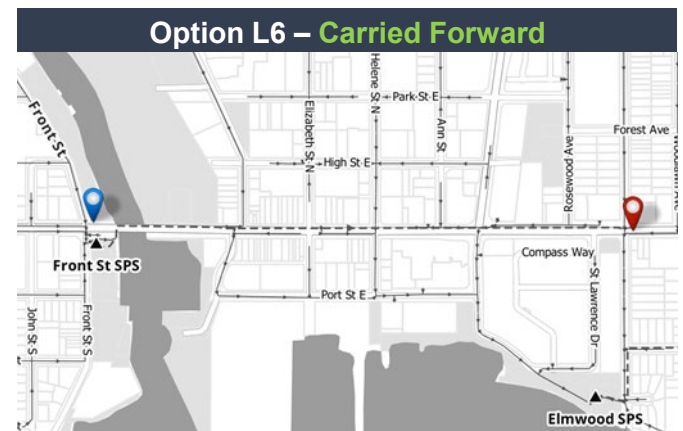
Stavebank Road / Lakeshore Road
Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Road. – Screened Out



Elizabeth Street / Lakeshore Road
Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Road. – Screened Out

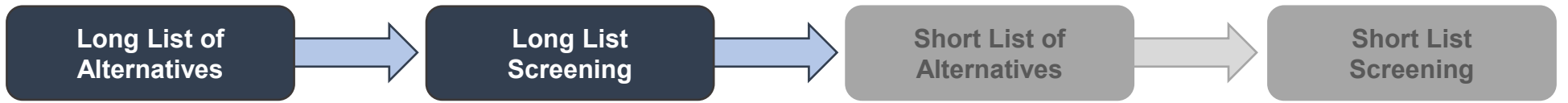


Helene Street / Lakeshore Road
Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Road. – Screened Out





Elmwood Avenue / Lakeshore Road Municipal Parking Lot
Parking lot has available open space. Minimizes disruption along Lakeshore Road. – Carried Forward

Lakeshore Watermain: Long List of Shaft Alternatives




- There were nine (9) different options that were identified for the Lakeshore watermain.
- Options W1, W2, W5, W8, and W9 were carried forward.

Conceptual Servicing Options


-  Sending Shaft
-  Receiving Shaft

Option W1 – Carried Forward




Elmwood Ave Parking Lot / Lakeshore Road
Utilizes same construction compounds and shaft locations as proposed Lakeshore Road Trunk Sewer. – Carried Forward

Option W2 – Carried Forward




Lakeshore Road / Multiple Locations
Direct crossing of the Credit River. – Carried Forward

Option W3 – Screened Out




Port Credit Library Parking Lot / Lakeshore
No land availability for shaft and construction compound. – Screened Out

Option W4 – Screened Out




Port Credit Library Parking Lot / High Street
No land availability for shaft and construction compound. – Screened Out

Option W5 – Carried Forward




Elizabeth / High Street
Direct crossing of the Credit River. Minimizes disruptions along Lakeshore Road. – Carried Forward

Option W6 – Screened Out




Port Credit Memorial Arena Parking Lot / Park Street
Disruptions to the Port Credit Memorial Arena parking lot. Traffic disruptions to the main public entrance into parking lot during construction. – Screened Out

Option W7 – Screened Out




Port Credit Memorial Arena Parking Lot / Park Street
Disruptions to the Port Credit Memorial Arena parking lot. Traffic disruptions to the main public entrance into parking lot during construction. – Screened Out

Option W8 – Carried Forward



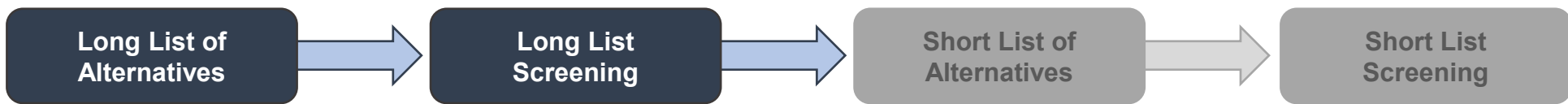
Port Street / Stavebank Road Parking Lot / Port Street
Diagonal crossing of the Credit River. Minimizes disruptions along Lakeshore Road. – Carried Forward

Option W9 – Carried Forward



Port Street / Stavebank Road Parking Lot / Port Street
Direct crossing of the Credit River. Minimizes disruptions along Lakeshore Road. – Carried Forward

Rosemere SPS: Long List of Conceptual Servicing Alternatives



- There were six (6) different conceptual alternatives identified.
- Options R1, R2, R3, R4, and R5 were carried forward.

Conceptual Servicing Options



Option R1 – Carried Forward



Pumping Solution: New SPS and forcemain to the gravity system northeast of the rail tracks. Existing (current) servicing strategy. – Carried Forward

Option R2 – Carried Forward



Pumping Solution: New SPS and forcemain discharging directly to the new Lakeshore deep trunk sewer Utilizes the proposed Lakeshore deep trunk sewer. – Carried Forward

Option R3 – Carried Forward



Pumping Solution: New SPS and forcemain south to the gravity system along Stavebank Road (connects to the new deep trunk sewer along Lakeshore) Utilizes the proposed Lakeshore deep trunk sewer. – Carried Forward

Option R4 – Carried Forward



Pumping Solution: New SPS and forcemain south to the gravity system along Stavebank Road (connects the existing sewers to the Elmwood SPS drainage area) Utilizes existing infrastructure by directing flows to the Elmwood SPS catchment area. Opportunity for integrated solution with Elmwood SPS. – Carried Forward

Option R5 – Carried Forward



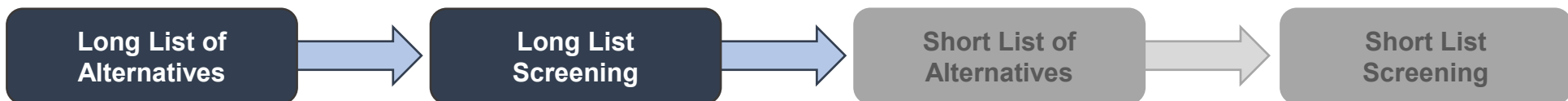
Gravity Solution: New gravity sewer from the current Rosemere SPS location to new deep trunk sewer along Lakeshore Road via Stavebank Road. Decommission of the existing Rosemere SPS. Maximizes benefit use of the proposed Lakeshore deep trunk sewer and decommissions the Rosemere SPS. – Carried Forward

Option R6 – Screened Out



Gravity Solution: New gravity sewer from the current Rosemere SPS location to the new deep trunk sewer along Lakeshore Road via various roads and Hurontario Street. Decommission of Rosemere SPS. Unnecessarily long route for gravity sewers with potential impacts to residential neighbourhoods and busy Hurontario Street. – Screened Out

Elmwood and Hiawatha SPS: Long List of Conceptual Servicing Alternatives



- There were sixteen (16) different conceptual alternatives identified.
- Options EH1, EH5, EH7, EH8, EH10, EH13, and EH14 were carried forward.

Conceptual Servicing Options



Option EH1 – Carried Forward	Option EH2 – Screened Out	Option EH3 – Screened Out	Option EH4 – Screened Out
<p>Multiple New SPS: Elmwood and Hiawatha SPS pumping towards Beechwood SPS. Existing (current) servicing strategy. – Carried Forward</p>	<p>Multiple New SPS: Elmwood and Hiawatha SPS pumping towards new trunk sewer along Lakeshore Road. Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires new Elmwood and Hiawatha SPS. – Screened Out</p>	<p>Multiple New SPS: Elmwood pumping towards new trunk sewer along Lakeshore Road and Hiawatha SPS towards Beechwood SPS. Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires new Elmwood and Hiawatha SPS. – Screened Out</p>	<p>Single New SPS: new gravity sewer from Elmwood to Hiawatha SPS pumping towards Beechwood SPS. Does not benefit of use of proposed Lakeshore deep trunk sewer and requires a new larger Hiawatha SPS. – Screened Out</p>
Option EH5 – Carried Forward	Option EH6 – Screened Out	Option EH7 – Carried Forward	Option EH8 – Carried Forward
<p>Single New SPS: Hiawatha SPS pumping towards Beechwood SPS. Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area. – Carried Forward</p>	<p>Single New SPS: New gravity sewer from Elmwood to Hiawatha SPS pumping towards the new trunk sewer along Lakeshore Road. Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires a new larger Hiawatha SPS. – Screened Out</p>	<p>Single New SPS: Hiawatha SPS pumping towards new trunk sewer along Lakeshore Road. Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area. – Carried Forward</p>	<p>Single New SPS: Hiawatha SPS pumping towards Elmwood SPS. Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area. – Carried Forward</p>
Option EH9 – Screened Out	Option EH10 – Carried Forward	Option EH11 – Screened Out	Option EH12 – Screened Out
<p>Single New SPS: New gravity sewer from Hiawatha to Elmwood SPS pumping towards Beechwood SPS. Does not benefit of use of proposed Lakeshore deep trunk sewer and requires a new Elmwood SPS. – Screened Out</p>	<p>Single New SPS: Elmwood SPS pumping towards the new trunk sewer along Lakeshore Road. Utilizes proposed Lakeshore deep trunk sewer and decommissions Hiawatha SPS. – Carried Forward</p>	<p>Single New SPS: New gravity sewers from Elmwood and Hiawatha to new SPS towards new trunk sewer along Lakeshore Road. Not technically feasible. – Screened Out</p>	<p>Single New SPS: New gravity sewers from Elmwood and Hiawatha to new SPS discharging towards Beechwood SPS. Not technically feasible. – Screened Out</p>
Option EH13 – Carried Forward	Option EH14 – Carried Forward	Option EH15 – Screened Out	Option EH16 – Screened Out
<p>Gravity Only Solution: West Conveyance 1: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current SPS locations to the new deep trunk sewer along Lakeshore Road. Maximizes benefit of use of proposed Lakeshore deep trunk sewer and decommissions Elmwood and Hiawatha SPSs. – Carried Forward</p>	<p>Gravity Only Solution: West Conveyance 2: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current Hiawatha SPS location to Elmwood Avenue. New gravity sewers from current Elmwood SPS location to the new deep trunk sewer along Lakeshore Road. Maximizes benefit of use of proposed Lakeshore deep trunk sewer and decommissions Elmwood and Hiawatha SPSs. – Carried Forward</p>	<p>Gravity Only Solution: East Conveyance 1: Decommission of Elmwood SPS and Hiawatha SPS. New gravity sewers from current SPS locations to the new trunk sewer along Lakeshore Road. Trunk sewer along Lakeshore Road to Beechwood SPS. Not technically feasible. – Screened Out</p>	<p>Gravity Only Solution: East Conveyance 2: Decommission of Elmwood SPS and Hiawatha SPS. Gravity sewers from current SPS locations to new trunk sewer along Lakeshore Road. Trunk sewer along Lakeshore Road to GE Booth WWTP. Not technically feasible. – Screened Out</p>

A detailed map of a residential area with a grid of streets, green spaces, and water bodies. A large, semi-transparent blue bar is positioned at the top of the map area.

3B

Region of Peel

APPENDIX 3B

DESIGN CONCEPT ALTERNATIVES (CRITERIA AND EVALUATION)



Port Credit East Water and Wastewater Servicing Optimization Strategy Schedule 'C' Municipal Class Environmental Assessment

April 2022

Class EA Evaluation Process

Royal Centre, 3300 Highway No. 7 (Suite 402)
Vaughan, ON, L4K 4M3
P: 416 703 0667



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1.0 Evaluation Process

The Port Credit East Water and Wastewater Servicing Optimization Strategy is being undertaken as a Schedule C Class Environmental Assessment (EA), satisfying all five (5) phases in accordance with the Municipal Class EA process (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

Through this Class EA process, alternative wastewater optimization strategies were evaluated for the Port Credit East area including the Elmwood and Hiawatha SPS servicing areas, the vicinity of the Rosemere SPS and Lakeshore Road West to East from Front Street to Seneca Avenue. This Class EA process also evaluated options for the crossing of the Credit River and construction to the East of a new water pressure zone 1 sub-transmission main along Lakeshore Road.

The following sections outline the key evaluated components within the study area:

- New Lakeshore Deep Trunk Sewer.
- Rosemere SPS.
- Elmwood & Hiawatha SPSs.
- New Lakeshore Sub-transmission Watermain.

1.1 Lakeshore Sewer Evaluation Process

The preferred Lakeshore sewer strategy followed a stepped evaluation approach:

1. Long list of crossing of the Credit River and shaft/construction compound location(s).
2. Long list screening criteria.
3. Short list of crossing/shaft location(s) and sewer alignment.
4. Short list evaluation criteria.
5. Preliminary preferred crossing/shaft location(s) and sewer alignment.

1.1.1 Lakeshore Sewer Long List Screening Criteria

The following screening criteria was applied against the long list of Lakeshore Sewer crossing of the Credit River and shaft/construction compound(s) alternatives:

- Availability of property/land for shaft and construction compounds.
- Preliminary constructability review: avoidance of unnecessary/unreasonable construction challenges.
- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.
- Address community concerns for existing and future residents, local businesses, and traffic.

1.1.2 Lakeshore Sewer Short List Evaluation Criteria

The following criteria were evaluated to support the selection of the preliminary preferred Lakeshore sewer servicing strategy:

Technical Constructability and Feasibility:

- Ability to meet existing and future Region servicing standards.
- Maximize use of existing infrastructure capacity, while minimizing capital upgrades where possible.
- Minimize proximity and/or conflict with existing infrastructure.
- Maximize routes along road rights of way and/or easements.
- Minimize highway and/or railway crossings.
- Ability to service capacity for future growth.
- Ability to service via gravity (preference over pumped flow solutions).
- Site availability.
- Preliminary constructability review; avoidance of unnecessary/unreasonable construction challenges.
- Ability to maintain existing services during and following construction.
- Minimize construction in areas with limited access.
- Emergency storage considerations.
- Provide flexibility with system operations and operational security.

Environmental:

- Minimize proximity to environmentally sensitive features.
- Minimize watercourse crossings.
- Minimize potential effects to water features and resources (surface and groundwater).
- Minimize potential impacts on sensitive features.
- Minimize Impact on terrestrial and aquatic wildlife and species at risk.
- Considers potential physical environmental consideration and vegetation.
- Minimize environmental risk with ability to adapt to climate change.

Social/Cultural:

- Address community concerns for existing and future resident, local businesses, and traffic.
- Minimize impact on archaeological/cultural heritage features and resources.
- Minimize air quality, noise, vibration, dust, and odour impacts during construction.
- Minimize impact to existing recreational use during construction and operations.
- Aesthetics of servicing recommendations
- Compatibility with current and planned future land use.
- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.

Financial:

- Minimize capital cost (engineering and contingency).
- Minimize capital cost (estimate susceptible to challenges identified during design and construction).
- Minimize lifecycle cost.
- Minimize annual cost.
- Ability for cash flow, phasing of costs.
- Minimize short- and long-term traffic management needs.
- Minimize operating maintenance and energy needs.

Legal/Jurisdictional:

- Land use, size, and availability.
- Ease of land acquisition/private property.
- Minimize approval, permits and coordination needs.
- Ease of constructability.
- Compatibility with surrounding land use.
- Maximize worker safety and operability.

1.2 SPS Evaluation Process

The Port Credit East SPS evaluation process is presented in Figure 1-2. The sections below discuss the milestone evaluations to support the selection of preferred servicing solutions for the Rosemere, Elmwood, and Hiawatha SPSs.

1.2.1 Individual SPS Servicing Concept Alternatives

Individual SPS servicing concept solutions were reviewed against the problem and opportunity statement to meet the goals of this study. The individual SPS concepts solutions identified are:

1. **Do Nothing:** This concept represents the status quo. This concept was **screened out** as it denotes the absence of new infrastructure or improvements to solve the problems identified.
2. **Limit Growth:** This concept limits growth within the pumping station service areas. This concept was **screened out** because limiting growth does not solve existing infrastructure conditions and is not feasible as a long-term solution.
3. **Retrofit:** This concept involves improvements to the existing pumping station and associated linear infrastructure to meet current Regional standards. This concept was **screened out** as it does not address the problem/opportunity statement and is not feasible as a long-term solution.
4. **Pumping:** This concept involves continuing to pump wastewater flows from the service areas. This concept was **carried forward** as new pumping stations and forcemain alignments would be explored.
5. **Gravity:** This concept aims for gravity solution(s) instead of continuing to pump wastewater flows from the service areas. This concept was **carried forward** as new linear infrastructure would be explored that could allow for existing pumping stations to be decommissioned (removed).

1.2.2 Overall SPS Servicing Concept Alternatives

Due to the proximity of the Elmwood, Hiawatha and Rosemere SPSs, overall servicing concepts that integrate solutions for all SPSs are required while ensuring that the unique requirements for each station are fulfilled. The SPS concepts evaluated included:

1. **Multiple Sewage Pumping Stations:** This concept explored keeping multiple SPS within the study area, either by maintaining the same SPS locations and forcemain alignments or by reconstructing the stations in new sites with new forcemain alignments.
2. **Single Sewage Pumping Station (Elmwood & Hiawatha):** This concept explored keeping on single station within the study area by constructing a new SPS that will receive the total flows from the existing Elmwood, Hiawatha and Rosemere SPSs. Some elements of this concept could include:
 - New SPS site.
 - New forcemain alignment.
 - Gravity sewers from Elmwood and Hiawatha SPS.
3. **Gravity Solution:** This concept explored solutions that will allow for sewage flows in the study area to be conveyed by gravity sewers providing opportunities for SPS and forcemains decommission. Some elements of this concept could include:
 - SPS and forcemains decommission.

- New gravity sewers from Elmwood, Hiawatha and Rosemere SPS to new gravity sewer outlet(s).
- New trunk gravity sewer along Lakeshore Rd.

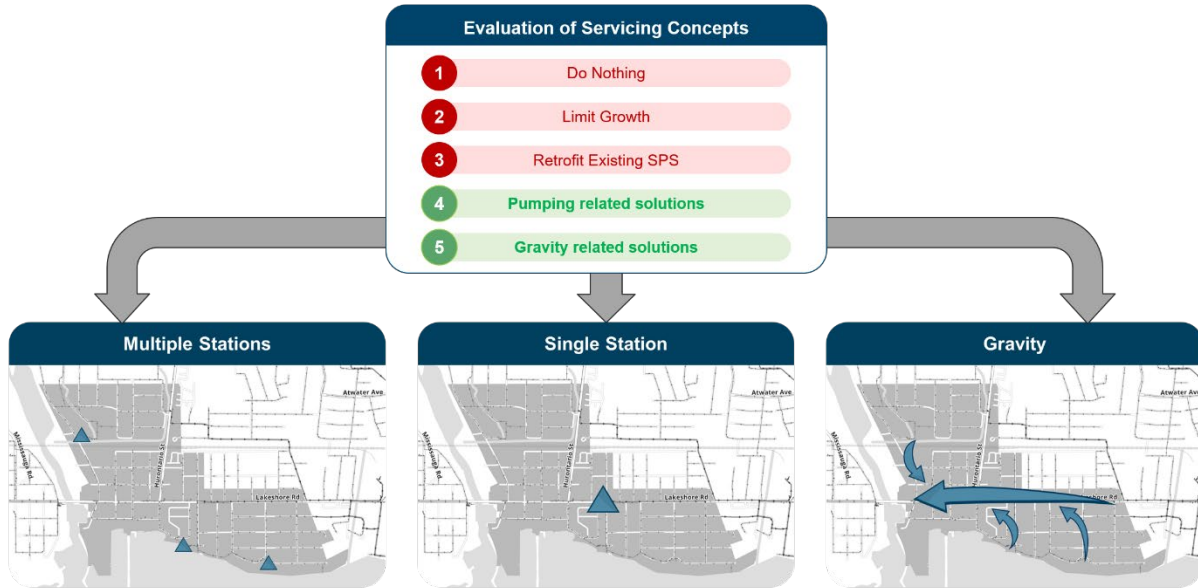


Figure 1-1. SPS Servicing Concept Alternatives

1.2.3 Long List SPS Alternatives Screening Criteria

Following the overall servicing concept solutions, alternative solutions for each SPS were then screened based on its existing opportunities/constraints, technical viability, environmental impacts, social/cultural impacts, legal/jurisdictional impacts, and financial considerations. Key screening criteria included:

- Opportunity to divert flows from the Beechwood SPS and G.E. Booth Wastewater Treatment Plant catchments.
- Utilization of proposed deep trunk sewer along Lakeshore Road for gravity solutions and opportunity to decommission existing SPS.
- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.
- Ability to service via gravity.
- Minimize potential impacts on the environment and system overflows.
- Address community concerns for existing and future residents, local businesses, and traffic.
- Minimize capital costs and operation and maintenance needs.

After screening the long list of alternative solutions, a short list of alternatives was identified for further detailed evaluation. The evaluation of alternative solutions for this study was split into two categories (Rosemere SPS and the combined Elmwood and Hiawatha SPSs) based on location and service catchment areas.

1.2.4 Short List SPS Alternatives Evaluation Criteria

The next step of this study was to conduct a detailed evaluation of the short-listed alternatives. The project team assessed the following criteria to select a preliminary preferred solution:

Technical Constructability and Feasibility:

- Ability to meet existing and future Region servicing standards.
- Maximize use of existing infrastructure capacity, while minimizing capital upgrades where possible.
- Minimize proximity and/or conflict with existing infrastructure.
- Maximize routes along road rights of way and/or easements.
- Minimize highway and/or railway crossings.
- Ability to service capacity for future growth.
- Ability to service via gravity (preference over pumped flow solutions).
- Site availability.
- Preliminary constructability review; avoidance of unnecessary/unreasonable construction challenges.
- Ability to maintain existing services during and following construction.
- Minimize construction in areas with limited access.
- Emergency storage considerations.
- Provide flexibility with system operations and operational security.

Environmental:

- Minimize proximity to environmentally sensitive features.
- Minimize watercourse crossings.
- Minimize potential effects to water features and resources (surface and groundwater).
- Minimize potential impacts on sensitive features.
- Minimize Impact on terrestrial and aquatic wildlife and species at risk.
- Minimize Impact on system overflows.
- Considers potential physical environmental consideration and vegetation.
- Minimize environmental risk with ability to adapt to climate change.

Social/Cultural:

- Address community concerns for existing and future resident, local businesses, and traffic.
- Minimize impact on archaeological/cultural heritage features and resources.
- Minimize air quality, noise, vibration, dust, and odour impacts during construction.
- Minimize impact to existing recreational use during construction and operations.
- Aesthetics of servicing recommendations
- Compatibility with current and planned future land use.

- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.

Financial:

- Minimize capital cost (engineering and contingency).
- Minimize capital cost (estimate susceptible to challenges identified during design and construction).
- Minimize lifecycle cost.
- Minimize annual cost.
- Ability for cash flow, phasing of costs.
- Minimize short- and long-term traffic management needs.
- Minimize operating maintenance and energy needs.

Legal/Jurisdictional:

- Land use, size, and availability.
- Ease of land acquisition/private property.
- Minimize approval, permits and coordination needs.
- Ease of constructability.
- Compatibility with surrounding land use.
- Maximize worker safety and operability.

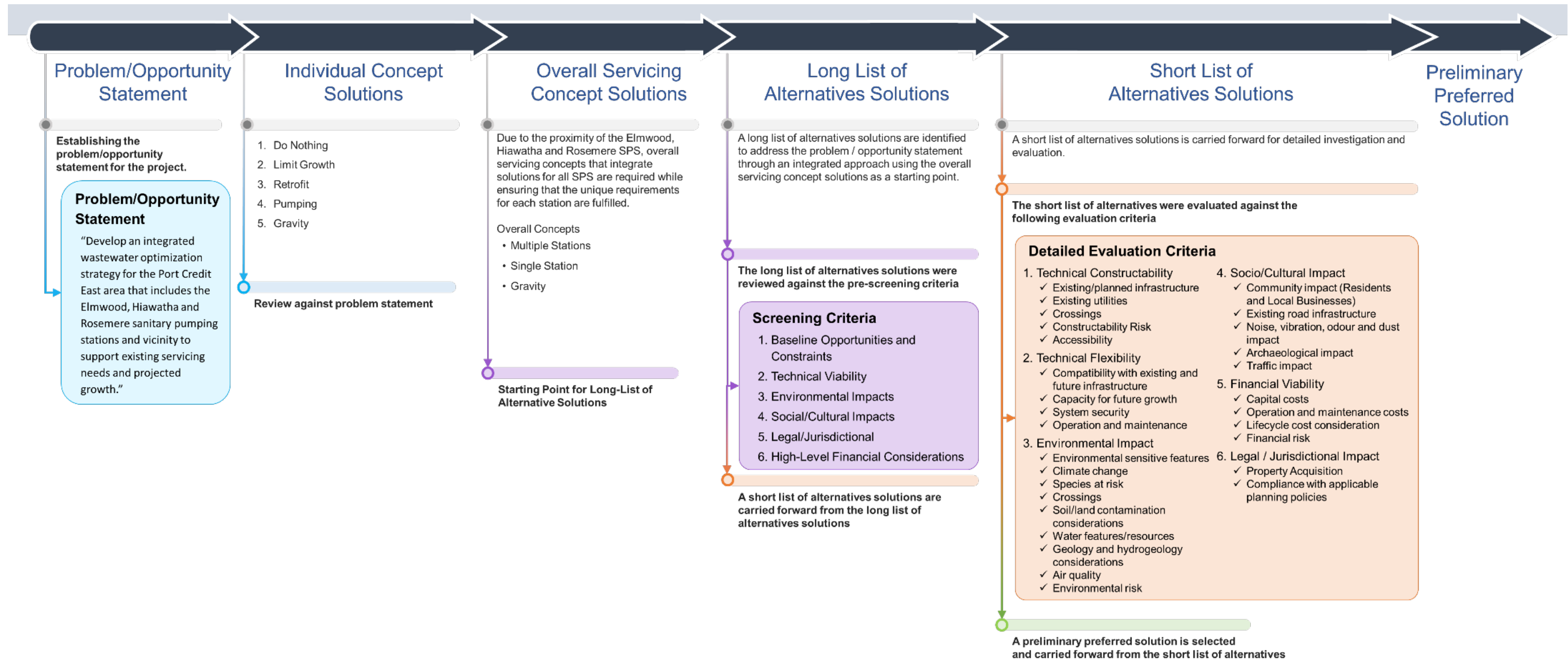


Figure 1-2. SPS Evaluation Process Overview

1.3 Watermain Evaluation Process

The preferred watermain strategy followed a stepped evaluation approach:

1. Long list of crossing of the Credit River and shaft/construction compound location(s).
2. Long list screening criteria.
3. Short list of crossing/shaft location(s) and watermain alignment.
4. Short list evaluation criteria.
5. Preliminary preferred crossing/shaft location(s) and watermain alignment.

1.3.1 Watermain Long List Screening Criteria

The following screening criteria was applied against the long list of watermain servicing alternatives:

- Availability of property/land for shaft and construction compound
- Preliminary constructability review; avoidance of unnecessary/unreasonable construction challenges.
- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.
- Address community concerns for existing and future residents, local businesses, and traffic.

1.3.2 Watermain Short List Evaluation Criteria

The following criteria supported the selection of a preliminary preferred watermain servicing strategy:

Technical Constructability and Feasibility:

- Ability to meet existing and future Region servicing standards.
- Maximize use of existing infrastructure capacity, while minimizing capital upgrades where possible.
- Minimize proximity and/or conflict with existing infrastructure.
- Maximize routes along road rights of way and/or easements.
- Minimize highway and/or railway crossings.
- Ability to service capacity for future growth.
- Site availability.
- Preliminary constructability review; avoidance of unnecessary/unreasonable construction challenges.
- Ability to maintain existing services during and following construction.
- Minimize construction in areas with limited access.
- Provide flexibility with system operations and operational security.

Environmental:

- Minimize proximity to environmentally sensitive features.
- Minimize watercourse crossings.

- Minimize potential effects to water features and resources (surface and groundwater).
- Minimize potential impacts on sensitive features.
- Minimize Impact on terrestrial and aquatic wildlife and species at risk.
- Considers potential physical environmental consideration and vegetation.
- Minimize environmental risk with ability to adapt to climate change.

Social/Cultural:

- Address community concerns for existing and future resident, local businesses, and traffic.
- Minimize impact on archaeological/cultural heritage features and resources.
- Minimize air quality, noise, vibration, dust, and odour impacts during construction.
- Minimize impact to existing recreational use during construction and operations.
- Aesthetics of servicing recommendations
- Compatibility with current and planned future land use.
- Avoidance of route/site considered "unreasonable" that unnecessarily impacts existing and future land uses where possible.

Financial:

- Minimize capital cost (engineering and contingency).
- Minimize capital cost (estimate susceptible to challenges identified during design and construction).
- Minimize lifecycle cost.
- Minimize annual cost.
- Ability for cash flow, phasing of costs.
- Minimize short- and long-term traffic management needs.
- Minimize operating maintenance and energy needs.

Legal/Jurisdictional:

- Land use, size, and availability.
- Ease of land acquisition/private property.
- Minimize approval, permits and coordination needs.
- Ease of constructability.
- Compatibility with surrounding land use.
- Maximize worker safety and operability.

2.0 Lakeshore Sewer

2.1 Long List of Lakeshore Shaft Alternatives



Figure 2-1. Lakeshore Sewer Sending and Receiving Shaft Alternatives

Table 2-1. Lakeshore Sewer Long List Shaft Alternatives

Alternative	Shaft Description	Screening Criteria Result
L1	Port Credit Library Parking Lot	Screened out: No land availability for shaft and construction compound.
L2	Stavebank Rd. South/Port Street	Carried forward: Parking lot has available open space. Minimizes disruptions along Lakeshore Rd.
L3	Stavebank Rd./Lakeshore Rd.	Screened out: Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Rd.
L4	Elizabeth St./Lakeshore Rd.	Screened out: Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Rd.
L5	Helene St./Lakeshore Rd.	Screened out: Limited space for shaft and construction compound. Significant disruption anticipated along Lakeshore Rd.
L6	Elmwood Ave. Parking Lot	Carried forward: Parking lot has available open space. Minimizes disruptions along Lakeshore Rd.

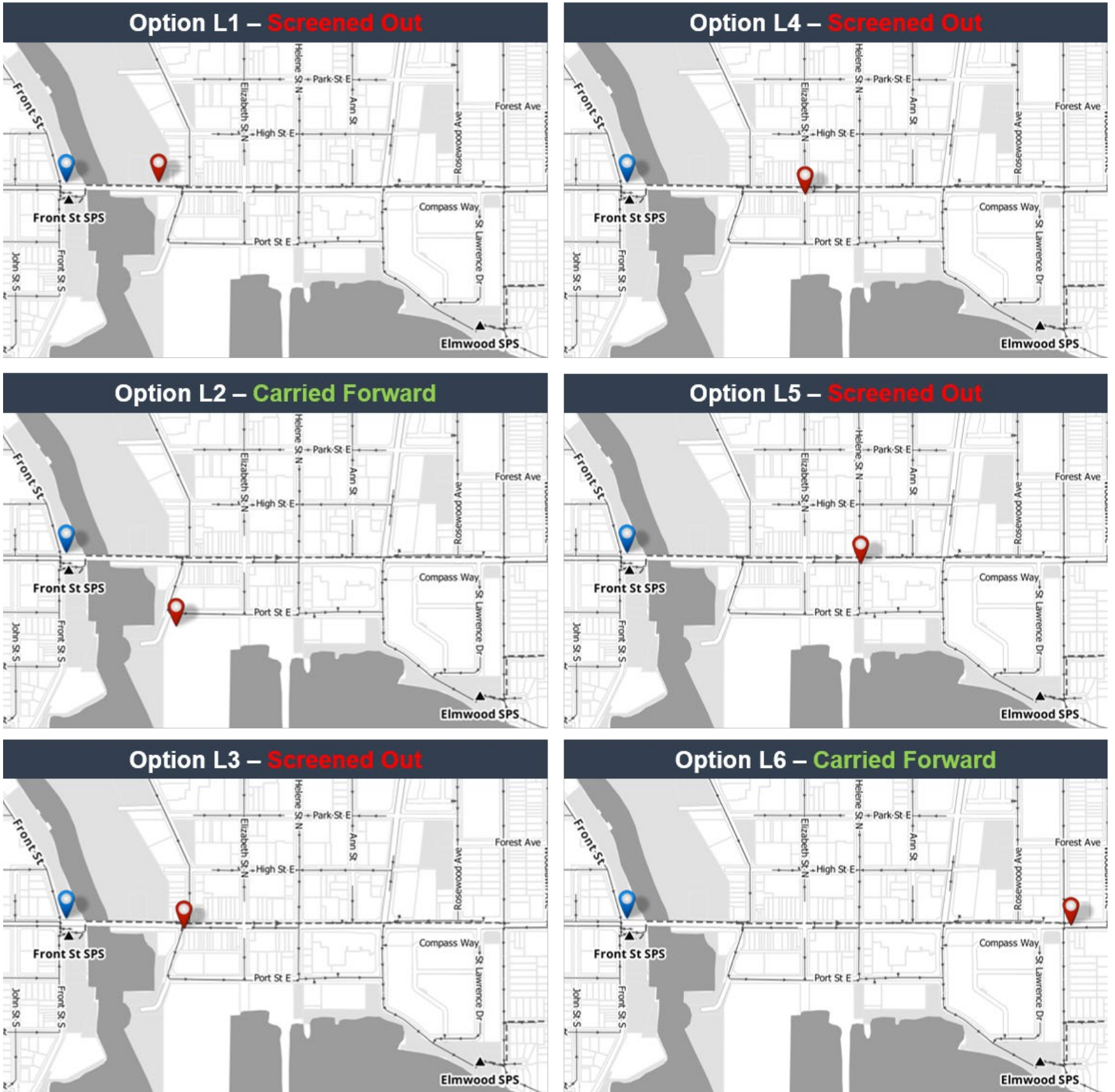


Figure 2-2. Lakeshore Sewer Shaft Long List Alternatives

2.2 Short List of Lakeshore Sewer Alternatives

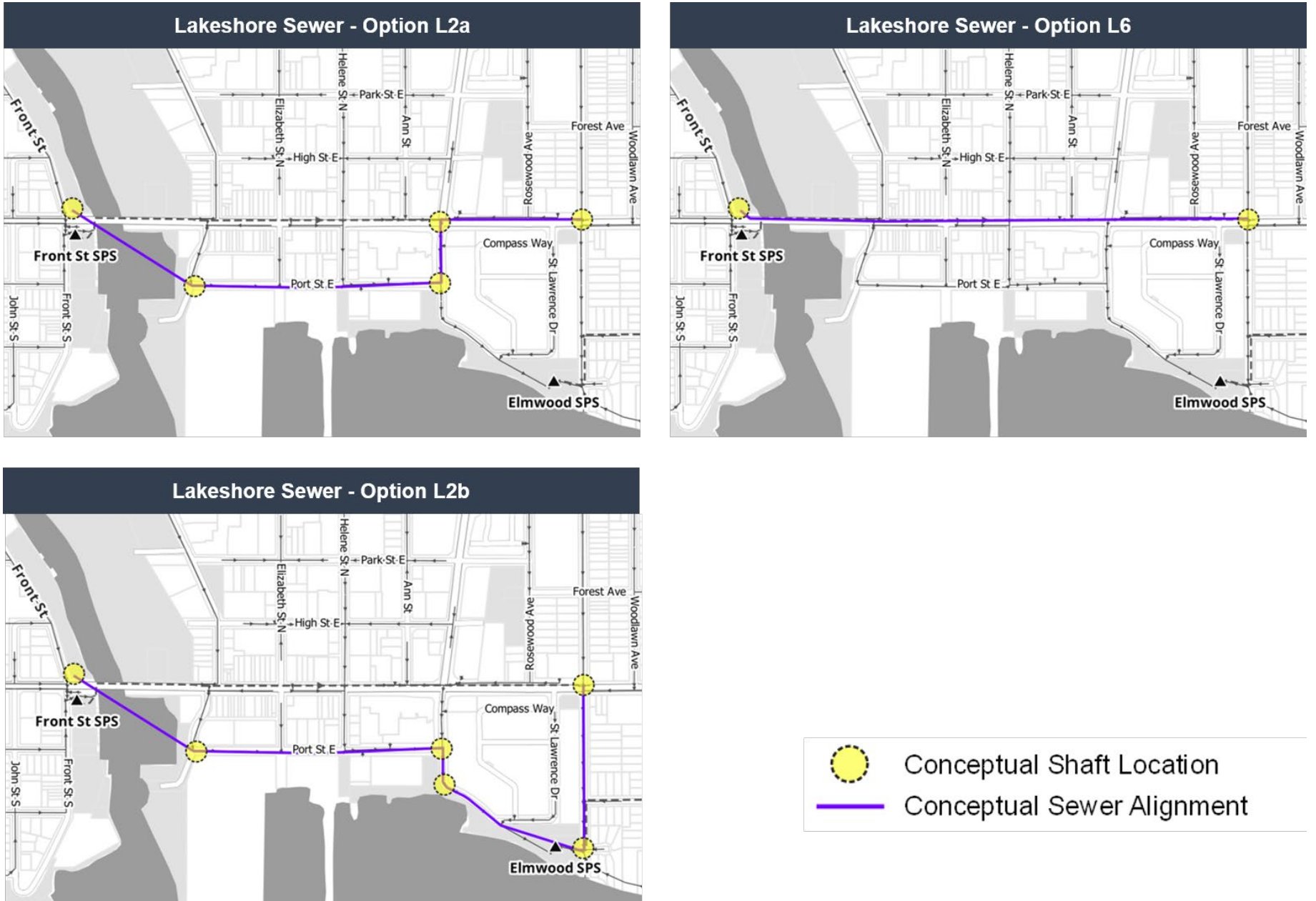


Figure 2-3. Lakeshore Sewer Short List Alignment Alternatives

Table 2-2. Lakeshore Sewer Short List Alignments Alternatives Evaluation

Evaluation Criteria	L2A	L2B	L6
	<i>L2A: Stavebank South/Port Street/St Lawrence</i>	<i>L2B: Stavebank South/Port Street/St Lawrence/Elmwood</i>	<i>L6: Lakeshore Rd/Elmwood Ave Parking Lot</i>
Environmental	<ul style="list-style-type: none"> Requires longer water crossing (diagonal) of the Credit River. Diagonal water crossings have increased complexity during construction and are typically not preferred if a direct route is available to minimize potential environmental impact. Solution requires crossing under the existing marina. 	<ul style="list-style-type: none"> Requires longer water crossing (diagonal) of the Credit River. Diagonal water crossings have increased complexity during construction and are typically not preferred if a direct route is available to minimize potential environmental impact. Solution requires crossing under the existing marina. 	<ul style="list-style-type: none"> Solution provides a direct crossing of the Credit River minimizing the length of water crossing. Solution avoids crossing under the existing marina.
Social/Cultural	<ul style="list-style-type: none"> Some shaft compound locations away from Lakeshore Rd will minimize traffic impact. However, Strategy will require extra sewer length and a minimum of 2 extra shaft compounds to get the sewer back to Lakeshore Rd. This will increase impacts to residents/businesses along Port St, St Lawrence Dr, and portions of Lakeshore Rd. Greater disturbance along Lakeshore Rd due to additional shaft/construction compound at St Lawrence Dr and Lakeshore Rd. Solution includes loss of parking facilities during construction at Stavebank Rd/Port St and Elmwood Ave/Lakeshore Rd. The proposed construction sites are close to existing commercial/residential use. This will require additional noise, air, and odour mitigation. 	<ul style="list-style-type: none"> Some shaft compound locations away from Lakeshore Rd will minimize traffic impact. However, Strategy will require extra sewer length and a minimum of 3 extra shaft compounds to get the sewer back to Lakeshore Rd. This will increase impacts to residents/businesses along Port St, St Lawrence Dr and Elmwood Ave. Solution includes loss of parking facilities during construction at Stavebank Rd/Port St and Elmwood Ave/Lakeshore Rd. The proposed construction sites are close to existing commercial/residential use. This will require additional noise, air, and odour mitigation. 	<ul style="list-style-type: none"> Location off ROW will help minimize traffic impact along Lakeshore Rd. Solution includes loss of parking facility during construction at Elmwood Ave/Lakeshore Rd. The proposed construction sites are close to existing commercial/residential use. This will require additional noise, air, and odour mitigation.
Technical	<ul style="list-style-type: none"> Solution includes an accessible and large open site at Port St and Stavebank Rd to facilitate as a construction compound. Location does not support long term gravity diversion strategy from G.E. Booth unless sewer returns to Lakeshore alignment. Strategy will require extra sewer length and a minimum of 2 extra shaft compounds to get the sewer back to Lakeshore Rd. Proposed shaft compound at St Lawrence Dr and Lakeshore Rd are highly constrained will have high impact to traffic, residents, and businesses (no available site, compound would need to be mainly in ROW). Strategy will require a further shaft compound at Elmwood/LCBO parking lot to facilitate gravity solution from Elmwood SPS. 	<ul style="list-style-type: none"> Solutions includes an accessible and large open site at Port St and Stavebank Rd to facilitate as a construction compound. Location does not support long term gravity diversion strategy from G.E. Booth unless sewer returns to Lakeshore alignment. Strategy will require extra sewer length and a minimum of 3 extra shaft compounds to get the sewer back to Lakeshore Rd. Proposed shaft compounds along St Lawrence Dr highly constrained will have high impact to traffic, residents, and businesses (compounds would need to be mainly in ROW with potential impact to St Lawrence Park). Strategy can be integrated with gravity solution from Elmwood SPS. 	<ul style="list-style-type: none"> The existing site includes an open parking lot at Elmwood Ave and Lakeshore Rd. Solution includes an accessible and large open site to facilitate as a construction compound. Location off ROW will help minimize traffic impact. No interim shaft locations required. Straight drive from west side for the Credit River approx. 1000 m. Solution supports the deep trunk Lakeshore servicing strategy of further east to west diversion of flows from G.E. Booth WWTP.
Legal/Jurisdictional	<ul style="list-style-type: none"> Multiple shaft/construction sites with various owners: <ul style="list-style-type: none"> - Parking lot at Stavebank Rd and Port St owned by Private Owner. - Parking lot at Elmwood Ave and Lakeshore Rd owned by the City of Mississauga. 	<ul style="list-style-type: none"> Multiple shaft/construction sites with various owners: <ul style="list-style-type: none"> - Parking lot at Stavebank Rd and Port St owned by Private Owner. - Parking lot at Elmwood Ave and Lakeshore Rd owned by the City of Mississauga. 	<ul style="list-style-type: none"> Parking lot at Elmwood Ave and Lakeshore Rd owned by the City of Mississauga.
Financial	<ul style="list-style-type: none"> Higher cost due to increased numbers of shaft/construction compound locations and longer alignment. 	<ul style="list-style-type: none"> Higher cost due to increased numbers of shaft/construction compound locations and longer alignment. 	<ul style="list-style-type: none"> Lower cost due to reduced number of shaft/construction compound location and shorter alignment.
Preferred Lakeshore Sewer Evaluation Result	<ul style="list-style-type: none"> L2A: Stavebank South/Port Street/St Lawrence - Screened out at short-list Lakeshore Sewer evaluation. 	<ul style="list-style-type: none"> L2B: Stavebank South/Port Street/St Lawrence/Elmwood - Screened out at short-list Lakeshore Sewer evaluation. 	<ul style="list-style-type: none"> L6: Lakeshore Rd/Elmwood Ave Parking Lot selected as preferred Lakeshore Sewer Servicing Alternative

3.0 Rosemere SPS

3.1 Long List of Rosemere Servicing Alternatives

Table 3-1. Rosemere SPS Long List of Servicing Alternatives

Alternative	Servicing Description	Relevant Screening Criteria
R1	New SPS & forcemain to the gravity system North East of rail tracks (Pumping Solution).	Carried forward: Existing (current) servicing strategy.
R2	New SPS & forcemain discharging directly to new Lakeshore deep trunk sewer (Pumping Solution).	Carried forward: Utilizes proposed Lakeshore deep trunk sewer.
R3	New SPS & forcemain south to gravity system along Stavebank Rd (connect to new deep trunk sewer along Lakeshore) (Pumping Solution).	Carried forward: Utilizes proposed Lakeshore deep trunk sewer.
R4	New SPS & forcemain south to gravity system along Stavebank Rd (connect to existing sewers to Elmwood SPS drainage area) (Pumping Solution).	Carried forward: Utilizes existing infrastructure directing flows to the Elmwood SPS catchment area. Opportunity for integrated solution with Elmwood SPS.
R5	New gravity sewer from the current Rosemere SPS location to new deep trunk sewer along Lakeshore Rd via Stavebank Rd. Decommission of existing Rosemere SPS. (Gravity Solution)	Carried forward: Maximizes benefit use of proposed Lakeshore deep trunk sewer and decommissions Rosemere SPS.
R6	New gravity sewer from the current Rosemere SPS location to new deep trunk sewer along Lakeshore Rd via various roads and Hurontario St. Decommission of Rosemere SPS. (Gravity Solution)	Screened out: Unnecessarily long route for gravity sewers with potential impacts to residential neighbourhoods and busy Hurontario St.

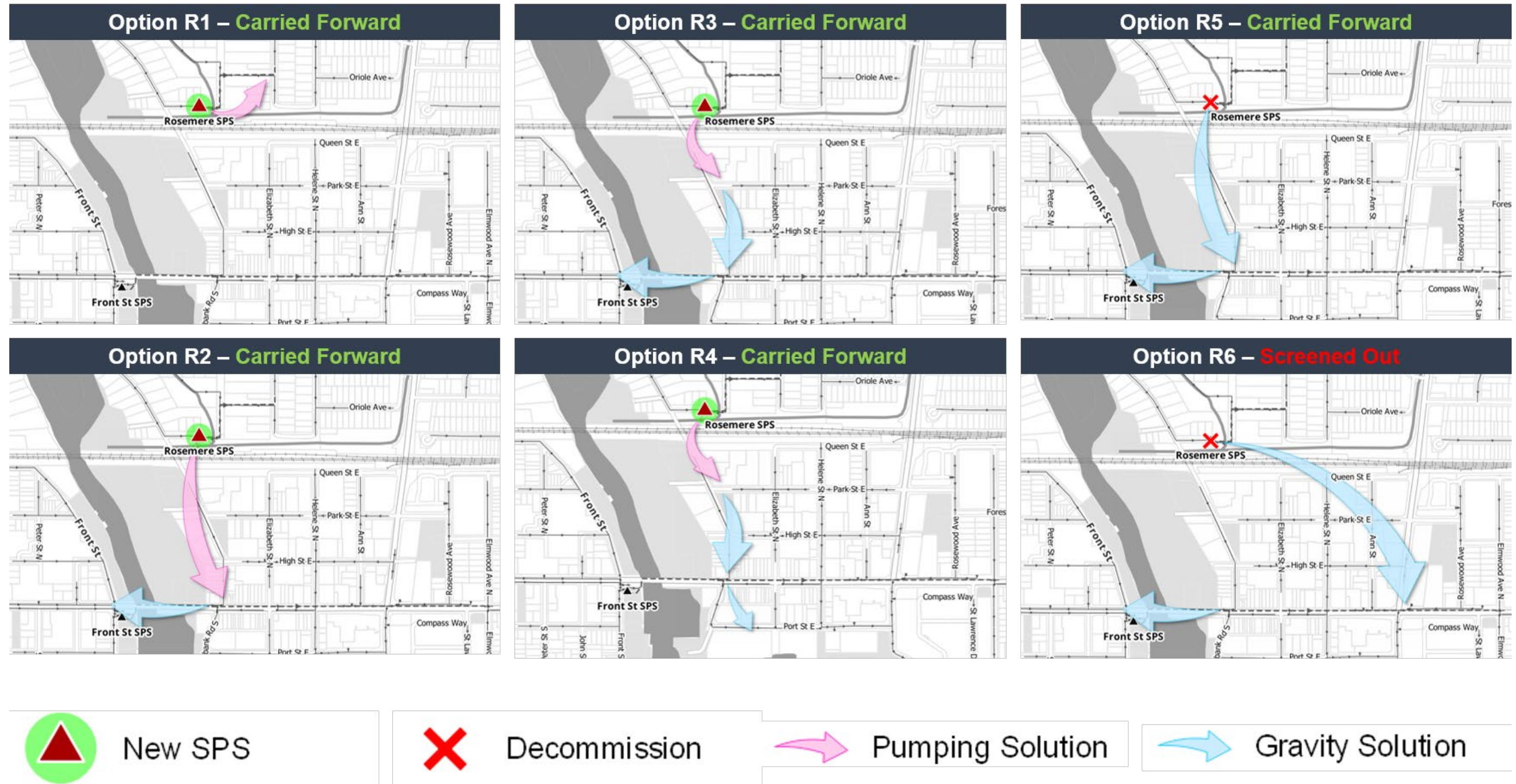


Figure 3-1. Rosemere SPS Long List of Conceptual Servicing Alternatives

3.2 Short List of Rosemere Servicing Alignments Alternatives



Figure 3-2. Rosemere SPS Short List of Servicing Alignments Alternatives

Table 3-2. Rosemere SPS Short List of Servicing Alignments Alternatives Evaluation

Evaluation Criteria	R1	R2	R3	R4	R5
	<i>R1: New SPS & forcemain to the gravity system North East of rail tracks (Pumping Solution).</i>	<i>R2: New SPS & forcemain discharging directly to new Lakeshore deep trunk sewer (Pumping Solution).</i>	<i>R3: New SPS & forcemain south to gravity system along Stavebank Rd (connect to new deep trunk sewer along Lakeshore) (Pumping Solution).</i>	<i>R4: New SPS & forcemain south to gravity system along Stavebank Rd (connect to existing sewers to Elmwood SPS drainage area) (Pumping Solution).</i>	<i>R5: New gravity sewer from the current Rosemere SPS location to new deep trunk sewer along Lakeshore Rd via Stavebank Rd. Decommission of existing Rosemere SPS (Gravity Solution).</i>
Components	<ul style="list-style-type: none"> • New SPS • New twin forcemains 	<ul style="list-style-type: none"> • New SPS • New twin forcemains 	<ul style="list-style-type: none"> • New SPS • New twin forcemains • New gravity sewers along Stavebank Rd 	<ul style="list-style-type: none"> • New SPS • New twin forcemains • New gravity sewers along Stavebank Rd 	<ul style="list-style-type: none"> • SPS Decommission • New gravity sewers along Rosemere Rd and Stavebank Rd
Environmental	<ul style="list-style-type: none"> • Solution requires tunnelling construction to mitigate environmental risk associated with crossing of Kenollie Creek and parallel construction to Mary Fix Creek. • New SPS requires footprint expansion to meet Region Standards, increasing potential for environmental impact. • Solution requires removal of mature trees along Rosemere Rd due to limited space available for construction staging. 	<ul style="list-style-type: none"> • Solution requires tunnelling construction to mitigate environmental risk associated with crossing of Mary Fix Creek. • New SPS requires footprint expansion to meet Region Standards, increasing potential for environmental impact. • Solution requires removal of mature trees along Rosemere Rd due to limited space available for construction staging. 	<ul style="list-style-type: none"> • Solution requires tunnelling construction to mitigate environmental risk associated with crossing of Mary Fix Creek. • New SPS requires footprint expansion to meet Region Standards, increasing potential for environmental impact. • Solution requires removal of mature trees along Rosemere Rd due to limited space available for construction staging. 	<ul style="list-style-type: none"> • Solution requires tunnelling construction to mitigate environmental risk associated with crossing of Mary Fix Creek. • New SPS requires footprint expansion to meet Region Standards, increasing potential for environmental impact. • Solution requires removal of mature trees along Rosemere Rd due to limited space available for construction staging. 	<ul style="list-style-type: none"> • Solution requires tunnelling construction to mitigate environmental risk associated with crossing of Mary Fix Creek. • Decommission of existing SPS will reduce risk for system overflows to Kenollie Creek and eliminate energy needs for long term operations. • Gravity solution requires removal of mature trees along Rosemere Rd due to limited space available for construction staging.
Social/Cultural	<ul style="list-style-type: none"> • SPS solution will have isolated construction impacts to Rosemere Rd and avoids major impact to Stavebank and Lakeshore Rd. • New SPS has higher potential for operations impact including odour, noise, and aesthetics. Design will confirm and mitigate these risks. • Increased potential risk to archaeological features will be mitigated with tunnelled construction. 	<ul style="list-style-type: none"> • SPS solution will have localized and broader construction impacts to Rosemere Rd, Stavebank Rd and Lakeshore Rd. • Potential disruption to entrance of GO Station Parking lot at Stavebank Rd during construction. • Stavebank Rd and Lakeshore Rd intersection is highly constrained and major impact during construction is anticipated. • New SPS has higher potential for operations impact including odour, noise, and aesthetics. Design will confirm and mitigate these risks. • Increased potential risk to archaeological features will be mitigated with tunnelled construction. 	<ul style="list-style-type: none"> • SPS solution will have localized and broader construction impacts to Rosemere Rd, Stavebank Rd and Lakeshore Rd. • Potential disruption to entrance of GO Station Parking lot at Stavebank Rd during construction. • Stavebank Rd and Lakeshore Rd intersection is highly constrained and major impact during construction is anticipated. • New SPS has higher potential for operations impact including odour, noise, and aesthetics. Design will confirm and mitigate these risks. • Increased potential risk to archaeological features will be mitigated with tunnelled construction. 	<ul style="list-style-type: none"> • SPS solution will have localized and broader construction impacts to Rosemere Rd, Stavebank Rd and Lakeshore Rd. • Potential disruption to entrance of GO Station Parking lot at Stavebank Rd during construction. • Stavebank Rd and Lakeshore Rd intersection is highly constrained and major impact during construction is anticipated. • New SPS has higher potential for operations impact including odour, noise, and aesthetics. Design will confirm and mitigate these risks. • Increased potential risk to archaeological features will be mitigated with tunnelled construction. 	<ul style="list-style-type: none"> • Solution will have localized and broader construction impacts to Rosemere Rd, Stavebank Rd, Lakeshore Rd and Vimy Park. • Stavebank Rd and Lakeshore Rd intersection is highly constrained and major impact during construction is anticipated. • Solution will remove potential operation impacts related to odour, noise, and facility aesthetics. • Solution will be focused primarily on the road right-of-way minimizing potential for archaeological impacts.

Evaluation Criteria	R1	R2	R3	R4	R5
Technical	<ul style="list-style-type: none"> • Solution does not provide opportunity to decommission the existing SPS. • Limited siting availability (due to existing features) for continued operations concurrently with construction of a new SPS. • New SPS to be constructed in accordance with new Region SPS Standards requiring larger footprint. • Solution avoids major railway and Mary Fix Creek crossing but does require Kenollie Creek crossing. • Existing forcemain easement is located between two residential properties and is not feasible for continued operations. • Forcemains alignment can avoid congested intersections and traffic along Stavebank Rd and Lakeshore Rd. Further access issues anticipated to residential properties fronting Rosemere Rd. 	<ul style="list-style-type: none"> • Solution does not provide opportunity to decommission the existing SPS. • Limited siting availability (due to existing features) for continued operations concurrently with construction of a new SPS. • New SPS to be constructed in accordance with new Region SPS Standards requiring larger footprint. • Solution will require railway and Mary Fix Creek crossing to discharge towards new trunk sewer at Lakeshore Rd. Solution does avoid Kenollie Creek crossing. • Sewer alignment will be constructed within busy intersections along Stavebank Rd and Lakeshore Rd. Further access issues anticipated to residential properties fronting Rosemere Rd. • Requires a shaft/manhole connection to the deep trunk sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Solution does not provide opportunity to decommission the existing SPS. • Limited siting availability (due to existing features) for continued operations concurrently with construction of a new SPS. • New SPS to be constructed in accordance with new Region SPS Standards requiring larger footprint. • Solution will require railway and Mary Fix Creek crossing to discharge towards new sewer along Stavebank Rd. Solution does avoid Kenollie Creek crossing. • Sewer alignment will be constructed within busy intersections along Stavebank Rd and Lakeshore Rd. Further access issues anticipated to residential properties fronting Rosemere Rd. • Requires a shaft/manhole connection to the deep trunk sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Solution does not provide opportunity to decommission the existing SPS. • Limited siting availability (due to existing features) for continued operations concurrently with construction of a new SPS. • New SPS to be constructed in accordance with new Region SPS Standards requiring larger footprint. • Solution will require railway crossing and Mary Fix Creek to discharge towards new sewer along Stavebank Rd. Solution does avoid Kenollie Creek crossing. • Sewer alignment will be constructed within busy intersections along Stavebank Rd and Lakeshore Rd. Further access issues anticipated to residential properties fronting Rosemere Rd. • Increases capacity constraints in downstream system along Port St towards Elmwood SPS. Coordination of sewer upgrades will be required. 	<ul style="list-style-type: none"> • Gravity solution allows for the decommission of the existing SPS. • Limited siting availability (due to existing features) for construction to remove existing SPS and implement gravity servicing solution. • Prior to decommission, Rosemere SPS will require upgrades in the short-term. These upgrades will provide an interim solution to keep the station working but will not meet all new SPS standards. • Solution will require railway crossing to discharge towards new trunk sewer at Lakeshore Rd. • Sewer alignment will be constructed within busy intersections along Stavebank Rd and Lakeshore Rd. Further access issues anticipated to residential properties fronting Rosemere Rd. • Requires a shaft/manhole connection to the deep trunk sewer along Lakeshore Rd.
Legal/Jurisdictional	<ul style="list-style-type: none"> • Requires coordination and approval for crossing Kenollie Creek, construction parallel to Mary Fix Creek and mature tree removal. • Requires City of Mississauga land acquisition/property easements for new Rosemere SPS. Additional coordination with local development required due to new forcemains alignment. • Requires significant coordination with residential properties fronting Rosemere Rd due to limited siting area for construction. 	<ul style="list-style-type: none"> • Requires coordination and approval for crossing of Mary Fix Creek and mature tree removal. • Requires City of Mississauga land acquisition/property easements for new Rosemere SPS and forcemains. • Requires significant coordination with residential properties fronting Rosemere Rd due to limited siting area for construction. 	<ul style="list-style-type: none"> • Requires coordination and approval for crossing of Mary Fix Creek and mature tree removal. • Requires City of Mississauga land acquisition/property easements for new Rosemere SPS and forcemains. • Requires significant coordination with residential properties fronting Rosemere Rd due to limited siting area for construction. 	<ul style="list-style-type: none"> • Requires coordination and approval for crossing of Mary Fix Creek and mature tree removal. • Requires City of Mississauga land acquisition/property easements for new Rosemere SPS and forcemains. • Requires significant coordination with residential properties fronting Rosemere Rd due to limited siting area for construction. 	<ul style="list-style-type: none"> • Reduces coordination for permits and approvals with less property requirements for siting. • Requires City of Mississauga coordination to remove existing Rosemere SPS and property easements for gravity servicing solution. • Requires significant coordination with residential properties fronting Rosemere Rd due to limited siting area for construction.

Evaluation Criteria	R1	R2	R3	R4	R5
Financial	<ul style="list-style-type: none"> • Lowest estimated capital costs associated with HDD construction. • Higher operation and maintenance costs when compared to gravity only solution. • Second lowest estimated 50-, 80-, and 100- year life cycle net present value. • Avoids short-term upfront cost for existing SPS upgrades prior to construction of new SPS. • Greater siting flexibility for forcemain from Rosemere Rd with more certainty and less likely for cost escalation. 	<ul style="list-style-type: none"> • Marginally highest estimated capital costs. • Higher operation and maintenance costs when compared to gravity only solution. • Marginally highest estimated 50-, 80-, and 100- year life cycle net present value. • Avoids short-term upfront cost for existing SPS upgrades prior to construction of new SPS. • Increased costs related to complexity (limited space and existing conflicts) of Stavebank Rd/Lakeshore Rd connection. 	<ul style="list-style-type: none"> • Second highest estimated capital costs. • Higher operation and maintenance costs when compared to gravity only solution. • Second highest estimated 50-, 80-, and 100- year life cycle net present value. • Avoids short-term upfront cost for existing SPS upgrades prior to construction of new SPS. • Increased costs related to complexity (limited space and existing conflicts) of Stavebank Rd/Lakeshore Rd connection. 	<ul style="list-style-type: none"> • Medium estimated capital costs. • Higher operation and maintenance costs when compared to gravity only solution. • Medium estimated 50-, 80-, and 100- year life cycle net present value. • Avoids short-term upfront cost for existing SPS upgrades prior to construction of new SPS. • Increased costs related to complexity (limited space and existing conflicts). 	<ul style="list-style-type: none"> • High estimated capital costs. • Significantly lower operations and maintenance costs with decommission of Rosemere SPS. • Lowest estimated 50-, 80-, and 100- year life cycle net present value. • Short-term upfront cost for existing SPS upgrades prior to decommission. • Increased costs related to complexity (limited space and existing conflicts) of Stavebank Rd/Lakeshore Rd connection. • Gravity solution and SPS decommission have long-term benefits of reducing energy costs.
Preferred Rosemere Evaluation Result	R1: New SPS & forcemains to the gravity system North East of rail tracks (Pumping Solution)- Selected as preferred Rosemere Servicing Strategy	R2: New SPS & forcemain to new Lakeshore sewer (Pumping Solution) - Screened out through short-list Rosemere Servicing Evaluation	R3: New SPS & forcemain south to gravity system at Lakeshore (connect to new deep trunk sewer along Lakeshore) (Pumping Solution). - Screened out through short-list Rosemere Servicing Evaluation	R4: New SPS & forcemain south to gravity system at Lakeshore (connect to existing sewers to Elmwood SPS drainage area) (Pumping Solution). - Screened out through short-list Rosemere Servicing Evaluation	R5: New gravity sewer from the current Rosemere SPS location to new deep trunk sewer along Lakeshore Rd via Stavebank Rd. Decommission of existing Rosemere SPS (Gravity Solution). - Screened out through short-list Rosemere Servicing Evaluation

4.0 Elmwood & Hiawatha SPSs

4.1 Long List of Elmwood & Hiawatha SPSs Servicing Alternatives

Table 4-1. Elmwood & Hiawatha SPSs Long List Servicing Alternatives

Alternative	Description	Relevant Screening Criteria
E1	Multiple New Sewage Pumping Stations – Elmwood SPS and Hiawatha SPS towards Beechwood SPS.	Carried forward: Existing (current) Servicing Strategy.
E2	Multiple New Sewage Pumping Stations – Elmwood SPS and Hiawatha SPS towards new trunk sewer along Lakeshore Rd.	Screened out: Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires new Elmwood and Hiawatha SPSs.
E3	Multiple New Sewage Pumping Stations – Elmwood SPS towards new trunk sewer along Lakeshore Rd, and Hiawatha SPS towards Beechwood SPS.	Screened out: Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires new Elmwood and Hiawatha SPSs.
E4	Single New Sewage Pumping Station – new gravity sewer from Elmwood to Hiawatha SPS towards Beechwood SPS.	Screened out: Does not benefit of use of proposed Lakeshore deep trunk sewer and requires a new larger Hiawatha SPS.
E5	Single New Sewage Pumping Station – Hiawatha SPS towards Beechwood.	Carried forward: Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area.
E6	Single New Sewage Pumping Stations – new gravity sewer from Elmwood to Hiawatha SPSs towards new trunk sewer along Lakeshore Rd.	Screened out: Does not maximize benefit of use of proposed Lakeshore deep trunk sewer and requires a new larger Hiawatha SPS.
E7	Single New Sewage Pumping Station – Hiawatha SPS towards new trunk sewer along Lakeshore Rd.	Carried forward: Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area.
E8	Single New Sewage Pumping Station – Hiawatha SPS towards Elmwood.	Carried forward: Utilizes proposed Lakeshore deep trunk sewer and decommissions largest SPS in the area.
E9	Single New Sewage Pumping Station – new gravity sewer from Hiawatha to Elmwood SPS towards Beechwood SPS.	Screened out: Does not benefit of use of proposed Lakeshore deep trunk sewer and requires a new Elmwood SPS.
E10	Single New Sewage Pumping Station – Elmwood SPS towards new trunk sewer along Lakeshore Rd.	Carried forward: Utilizes proposed Lakeshore deep trunk sewer and decommissions Hiawatha SPS.

Alternative	Description	Relevant Screening Criteria
E11	Single Sewage Pumping Station – new gravity sewers from Elmwood and Hiawatha to new SPS towards new trunk sewer along Lakeshore Rd.	Screened out: Not technically feasible.
E12	Single Sewage Pumping Station – new gravity sewers from Elmwood and Hiawatha to new SPS discharging towards Beechwood SPS.	Screened out: Not technically feasible.
E13	Gravity Only Solution – West Conveyance 1: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current SPS locations to new deep trunk sewer along Lakeshore Rd	Carried forward: Maximizes benefit of use of proposed Lakeshore deep trunk sewer and decommissions Elmwood and Hiawatha SPSs.
E14	Gravity Only Solution – West Conveyance 2: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current Hiawatha SPS location to Elmwood Avenue. New gravity sewers from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd	Carried forward: Maximizes benefit of use of proposed Lakeshore deep trunk sewer and decommissions Elmwood and Hiawatha SPSs.
E15	Gravity Only Solution – East Conveyance 1: Decommission of Elmwood SPS and Hiawatha SPS. New gravity sewers from current SPS locations to new trunk sewer along Lakeshore Rd. Trunk sewer along Lakeshore Rd to Beechwood SPS	Screened out: Not technically feasible.
E16	Gravity Only Solution – East Conveyance 2. Decommission of Elmwood SPS and Hiawatha SPS. Gravity sewers from current SPS locations to new trunk sewer along Lakeshore Rd. Trunk sewer along Lakeshore Rd to GE Booth WWTP	Screened out: Not technically feasible.

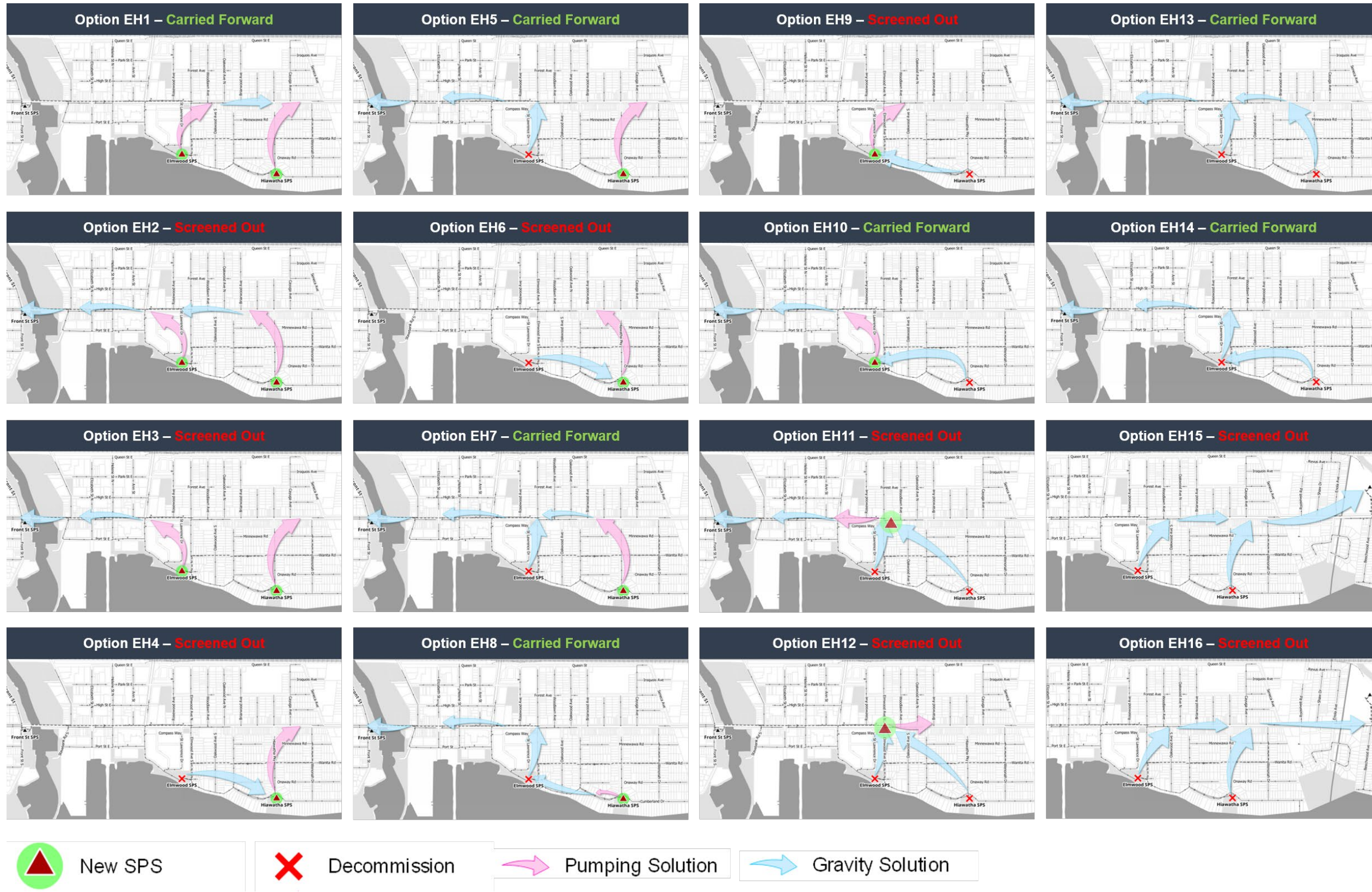


Figure 4-1. Elmwood and Hiawatha SPSs Long List of Conceptual Servicing Alternatives

4.2 Short List of Elmwood & Hiawatha SPSs Servicing Alignment Alternatives

To refine the long list of schematic arrows to a short list of Elmwood & Hiawatha SPSs servicing alternatives, further analysis was completed. This included the review of potential shaft sites, exploring tunnelling vs open cut construction methodologies, and the review of availability for sewer sizing and construction siting.

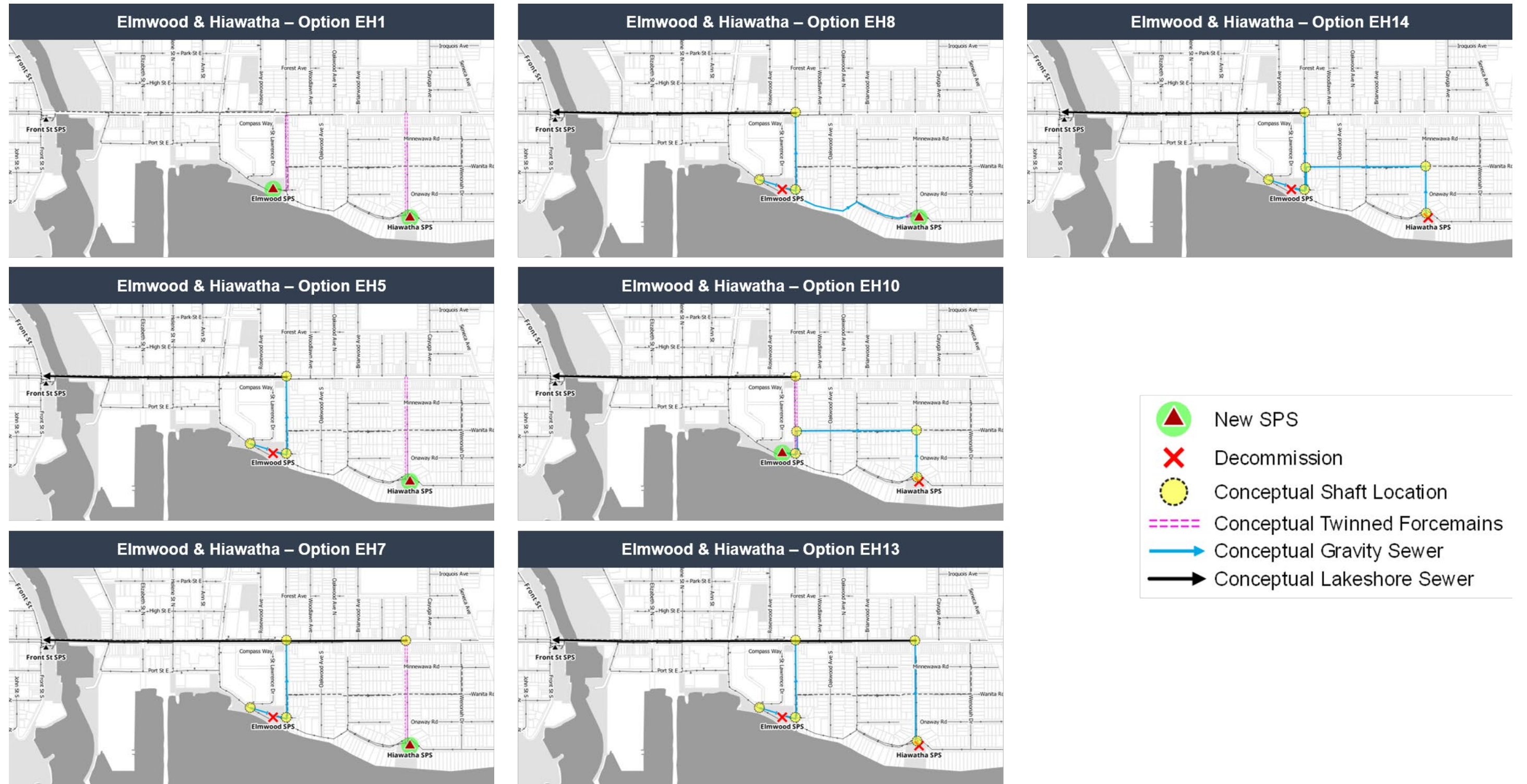


Figure 4-2. Elmwood and Hiawatha SPSs Short List Servicing Alignment Alternatives

Table 4-2. Elmwood & Hiawatha SPSs Short List of Servicing Alignment Alternatives Evaluation

Evaluation Criteria	EH1	EH5	EH7	EH8	EH10	EH13	EH14
	<i>EH1: New Elmwood and Hiawatha SPSs and forcemains discharging towards Beechwood SPS.</i>	<i>EH5: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location towards new deep trunk sewer along Lakeshore Road. New Hiawatha SPS and forcemains discharging towards Beechwood SPS.</i>	<i>EH7: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd. New Hiawatha SPS and forcemains discharging towards new deep trunk sewer along Lakeshore Rd.</i>	<i>EH8: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd. New Hiawatha SPS, forcemains and gravity sewers discharging towards new sewer along Elmwood Ave.</i>	<i>EH10: Decommission of Hiawatha SPS. New gravity sewer from current Hiawatha SPS location to Elmwood SPS. New Elmwood SPS and forcemains discharging towards new deep trunk sewer along Lakeshore Rd</i>	<i>EH13: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current SPS locations to new deep trunk sewer along Lakeshore Rd</i>	<i>EH14: Decommission of existing Elmwood SPS and Hiawatha SPS. New gravity sewers from current Hiawatha SPS location to Elmwood Avenue. New gravity sewers from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd</i>
Components	<ul style="list-style-type: none"> • New Elmwood SPS and twin forcemains • New Hiawatha SPS and twin forcemains 	<ul style="list-style-type: none"> • Elmwood SPS Decommission • New Hiawatha SPS and twin forcemains • New gravity sewers 	<ul style="list-style-type: none"> • Elmwood SPS Decommission • New Hiawatha SPS and twin forcemains • New gravity sewers 	<ul style="list-style-type: none"> • Elmwood SPS Decommission • New Hiawatha SPS and twin forcemains • New gravity sewers 	<ul style="list-style-type: none"> • Hiawatha SPS Decommission • New Elmwood SPS and twin forcemains • New gravity sewers 	<ul style="list-style-type: none"> • Elmwood SPS and Hiawatha SPS Decommission • New gravity sewers 	<ul style="list-style-type: none"> • Elmwood SPS and Hiawatha SPS Decommission • New gravity sewers
Environmental	<ul style="list-style-type: none"> • Increased risk for system overflows to Lake Ontario with new Elmwood and Hiawatha SPSs. • Potential for adverse impact to mature trees located in the vicinity of existing Elmwood and Hiawatha SPSs sites. • Limited ability to enhance green space with new SPS facilities in Tall Oaks Park and Hiawatha Park. 	<ul style="list-style-type: none"> • Decommission of existing Elmwood SPS will reduce risk for system overflows to Lake Ontario. There will be risk for system overflows to Lake Ontario from new Hiawatha SPS. • Potential for adverse impact to mature trees located in the vicinity of existing Hiawatha SPS site. • Ability to restore existing Elmwood SPS footprint to enhance green space. 	<ul style="list-style-type: none"> • Decommission of existing Elmwood SPS will reduce risk for system overflows to Lake Ontario. There will be risk for system overflows to Lake Ontario from new Hiawatha SPS. • Potential for adverse impact to mature trees located in the vicinity of existing Hiawatha SPS site. • Ability to restore existing Elmwood SPS footprint to enhance green space. 	<ul style="list-style-type: none"> • Decommission of existing Elmwood SPS will reduce risk for system overflows to Lake Ontario. There will be risk for system overflows to Lake Ontario from new Hiawatha SPS. • Potential for adverse impact to mature trees located in the vicinity of existing Hiawatha SPS site. • Ability to restore existing Elmwood SPS footprint to enhance green space. 	<ul style="list-style-type: none"> • Decommission of existing Hiawatha SPS will reduce risk for system overflows to Lake Ontario. There will be risk for system overflows to Lake Ontario from Elmwood SPS. • Potential for adverse impact to mature trees located in the vicinity of existing Elmwood SPS site. • Ability to restore existing Hiawatha SPS footprint to enhance green space. 	<ul style="list-style-type: none"> • Decommission of existing Elmwood & Hiawatha SPSs will eliminate risk for system overflows to Lake Ontario. • Less impact anticipated to mature trees located in the vicinity of SPS sites. • Maximize ability to restore existing Elmwood and Hiawatha SPSs footprint to enhance green space. 	<ul style="list-style-type: none"> • Decommission of existing Elmwood & Hiawatha SPSs will eliminate risk for system overflows to Lake Ontario. • Less impact anticipated to mature trees located in the vicinity of SPS sites. • Maximize ability to restore existing Elmwood and Hiawatha SPSs footprint to enhance green space.
Social/Cultural	<ul style="list-style-type: none"> • Significant impacts associated with long term operations of Elmwood and Hiawatha SPSs, including but not limited to odour, noise, aesthetics, etc. • Limited opportunity to enhance public space with new SPSs. • Potential level of opposition to alternative (loss of additional park spaces). 	<ul style="list-style-type: none"> • Impacts associated with operations of Hiawatha SPS, including but not limited to odour, noise, aesthetics, etc. • Some long-term public space enhancement with the opportunity to re-purpose the Elmwood SPS site to improve aesthetics and park access. • Potential level of opposition to alternative 	<ul style="list-style-type: none"> • Impacts associated with operations of Hiawatha SPS, including but not limited to odour, noise, aesthetics, etc. • Some long-term public space enhancement with the opportunity to re-purpose the Elmwood SPS site to improve aesthetics and access to the park. • Potential level of opposition to alternative 	<ul style="list-style-type: none"> • Impacts associated with operations of Hiawatha SPS, including but not limited to odour, noise, aesthetics, etc. • Some long-term public space enhancement with the opportunity to re-purpose the Elmwood SPS site to improve aesthetics and access to the park. • Potential level of opposition to alternative 	<ul style="list-style-type: none"> • Impacts associated with operations of Elmwood SPS, including but not limited to odour, noise, aesthetics, etc. • Some long-term public space enhancement with the opportunity to re-purpose the Hiawatha SPS site to improve aesthetics and access to the park. • Potential level of opposition to alternative 	<ul style="list-style-type: none"> • Eliminate impacts associated with operations of SPS including but not limited to odour, noise, aesthetics, etc.; due to decommission of both SPS. • Long-term public space enhancement with the opportunity to re-purpose the SPS sites to improve aesthetics and access to the parks. • Solution will be focused primarily on road right-of 	<ul style="list-style-type: none"> • Eliminate impacts associated with operations of SPS including but not limited to odour, noise, aesthetics, etc.; due to decommission of both SPS. • Long-term public space enhancement with the opportunity to re-purpose the SPS sites to improve aesthetics and access to the parks. • Solution will be focused primarily on road right-of

Evaluation Criteria	EH1	EH5	EH7	EH8	EH10	EH13	EH14
	<ul style="list-style-type: none"> Potential archaeological impact associated with construction near Elmwood SPS. 	(loss of additional Hiawatha park space).	(loss of additional Hiawatha park space).	(loss of additional Hiawatha park space).	(loss of additional Tall Oaks park space). <ul style="list-style-type: none"> Potential archaeological impact associated with construction near Elmwood SPS. 	ways with minimal impact to archaeological features.	ways with minimal impact to archaeological features.
Technical	<ul style="list-style-type: none"> Solution does not provide opportunity to decommission Elmwood or Hiawatha SPSs. New Elmwood and Hiawatha SPSs to be built in accordance with the new Region SPS Standards including larger footprint and twin forcemains. Does not utilize the proposed new deep trunk sewer along Lakeshore Rd. Avoid short-term upgrades interim solutions at both stations. 	<ul style="list-style-type: none"> Solution does not provide opportunity to decommission Hiawatha SPS. Potential limitations to find sites for shaft locations for tunnelling. New Hiawatha SPS will need to be built in accordance with the new SPS Standards including larger footprint and twin forcemains. Prior to decommission, Elmwood SPS will require upgrades in the short-term. These upgrades will provide an interim solution to keep the station working but will not meet all new SPS standards. Partially utilizes proposed deep trunk sewer at Lakeshore Rd. Provides opportunity to decommission the largest SPS in the area, while building a new small Hiawatha SPS. 	<ul style="list-style-type: none"> Solution does not provide opportunity to decommission Hiawatha SPS. Potential limitations to find sites for shaft locations for tunnelling. New Hiawatha SPS will need to be built in accordance with the new SPS Standards including larger footprint and twin forcemains. Prior to decommission, Elmwood SPS will require upgrades in the short-term. These upgrades will provide an interim solution to keep the station working but will not meet all new SPS standards. Partially utilizes proposed deep trunk sewer at Lakeshore Rd. Provides opportunity to decommission the largest SPS in the area, while building a new small Hiawatha SPS. Requires additional shaft and length of Lakeshore sewer to be constructed for connection from Hiawatha SPS. 	<ul style="list-style-type: none"> Solution does not provide opportunity to decommission Hiawatha SPS. Potential limitations to find sites for shaft locations for tunneling. New Hiawatha SPS will need to be built in accordance with the new SPS Standards including larger footprint and twin forcemains. Prior to decommission, Elmwood SPS will require upgrades in the short-term. These upgrades will provide an interim solution to keep the station working but will not meet all new SPS standards. Gravity sewers from Hiawatha to Elmwood will require upgrades based on existing constraints. Existing sewers are located within easements on private property. Partially utilizes proposed deep trunk sewer at Lakeshore Rd. Provides opportunity to decommission the largest SPS in the area, while building a new small Hiawatha SPS. 	<ul style="list-style-type: none"> Solution does not provide opportunity to decommission Elmwood SPS. Potential limitations to find sites for shaft locations for tunneling. New Elmwood SPS will need to be built in accordance with the new SPS Standards including larger footprint and twin forcemains. Prior to decommission, Hiawatha SPS will require upgrades in the short-term. These upgrades will provide an interim solution to keep the station working but will not meet all new SPS standards. Requires new gravity sewers from Hiawatha to Elmwood SPS which will influence the depth of the Elmwood SPS wet well. Does not maximize benefit of utilizing proposed deep trunk sewer at Lakeshore Rd for a gravity solution. 	<ul style="list-style-type: none"> Allow for gravity service and decommission of both existing SPSs. Potential limitations to find sites for shaft locations for tunneling. Prior to decommission, Elmwood and Hiawatha SPSs will require upgrades in the short-term. These upgrades will provide an interim solution to keep the stations working but will not meet all new SPS standards. Maximizes benefit of utilizing proposed deep trunk sewer at Lakeshore Rd for a gravity solution. Requires additional shaft and length of Lakeshore sewer to be constructed for connection from Hiawatha SPS. 	<ul style="list-style-type: none"> Allow for gravity service and decommission of both existing SPSs. Potential limitations to find sites for shaft locations for tunneling. Prior to decommission, Elmwood and Hiawatha SPSs will require upgrades in the short-term. These upgrades will provide an interim solution to keep the stations working but will not meet all new SPS standards. Maximizes benefit of utilizing proposed deep trunk sewer at Lakeshore Rd for a gravity solution. Requires longer length of sewer and number of shafts on local roads than Option EH13.
Legal/Jurisdictional	<ul style="list-style-type: none"> Requires significant City of Mississauga coordination for land acquisition/easements for new SPSs within Tall Oaks and Hiawatha Parks. Additional requirements needed for the new Elmwood SPS with 	<ul style="list-style-type: none"> Increased coordination with City of Mississauga for land acquisition/easements with new Hiawatha SPS Limited site/property availability for reconstruction of Hiawatha SPS. 	<ul style="list-style-type: none"> Increased coordination with City of Mississauga for land acquisition/easements with new Hiawatha SPS Limited site/property availability for reconstruction of Hiawatha SPS. 	<ul style="list-style-type: none"> Increased coordination with City of Mississauga for land acquisition/easements with new Hiawatha SPS Limited site/property availability for reconstruction of Hiawatha SPS. 	<ul style="list-style-type: none"> Additional requirements needed for the new Elmwood SPS with identified archaeological potential in Tall Oaks Park. Limited site/property availability for reconstruction of Elmwood SPS. 	<ul style="list-style-type: none"> Reduced long term approvals needed with removal of existing Elmwood and Hiawatha SPSs within public parks. Opportunity to enhance existing public space in Tall Oaks Park and Hiawatha Park. 	<ul style="list-style-type: none"> Reduced long term approvals needed with removal of existing Elmwood and Hiawatha SPSs within public parks. Opportunity to enhance existing public space in Tall Oaks Park and Hiawatha Park.

Evaluation Criteria	EH1	EH5	EH7	EH8	EH10	EH13	EH14
	<ul style="list-style-type: none"> identified archaeological potential in Tall Oaks Park. Limited site/property availability for reconstruction of Elmwood and Hiawatha SPSs. 	<ul style="list-style-type: none"> Reduced potential to impact archaeological features in Tall Oaks Park. 	<ul style="list-style-type: none"> Reduced potential to impact archaeological features in Tall Oaks Park. 	<ul style="list-style-type: none"> Reduced potential to impact archaeological features in Tall Oaks Park. 		<ul style="list-style-type: none"> Reduced potential to impact archaeological features in Tall Oaks Park. 	<ul style="list-style-type: none"> Reduced potential to impact archaeological features in Tall Oaks Park.
Financial	<ul style="list-style-type: none"> Second highest estimated capital costs. Significantly lowest estimated operation and maintenance costs. Second highest estimated 50-, 80-, and 100- year average net present value. Solution will have long-term energy costs with new Elmwood and Hiawatha SPSs. Avoids short-term upfront cost for existing SPSs upgrades prior to construction of new SPSs. 	<ul style="list-style-type: none"> Second lowest estimated capital costs. Second lowest estimated operation and maintenance costs. Third lowest estimated 50-, 80-, and 100- year average net present value. Solution will have long-term energy costs with new Hiawatha SPS. Short-term upfront cost for existing Elmwood SPS upgrades prior to decommission. Avoids short-term upfront cost for existing Hiawatha SPS upgrades. 	<ul style="list-style-type: none"> Medium estimated capital costs. Second highest estimated operation and maintenance costs. Medium estimated 50-, 80-, and 100- year average net present value. Solution will have long-term energy costs with new Hiawatha SPS. Short-term upfront cost for existing Elmwood SPS upgrades prior to decommission. Avoids short-term upfront cost for existing Hiawatha SPS upgrades. 	<ul style="list-style-type: none"> Lowest estimated capital costs. Third highest estimated operation and maintenance costs (marginally lower than EH7) Second lowest estimated 50-, 80-, and 100- year average net present value. Solution will have long-term energy costs with new Hiawatha SPS. Short-term upfront cost for existing Elmwood SPS upgrades prior to decommission. Avoids short-term upfront cost for existing Hiawatha SPS upgrades. 	<ul style="list-style-type: none"> Highest estimated capital costs. Significantly highest estimated operation and maintenance costs. Highest estimated 50-, 80-, and 100- year average net present value. Solution will have long-term energy costs with new Elmwood SPS. Short-term upfront cost for existing Hiawatha SPS upgrades prior to decommission. Avoids short-term upfront cost for existing Elmwood SPS upgrades. 	<ul style="list-style-type: none"> Medium estimated capital costs. Medium estimated operation and maintenance costs. Lowest estimated 50-, 80-, and 100- year average net present value. Decommission of Elmwood & Hiawatha SPSs provides long-term benefits of reducing energy costs. Short-term upfront cost for existing Elmwood and Hiawatha SPS upgrades prior to decommission. 	<ul style="list-style-type: none"> Third highest estimated capital costs. Medium estimated operation and maintenance costs. Medium estimated 50-, 80-, and 100- year average net present value. Decommission of Elmwood & Hiawatha SPSs provides long-term benefits of reducing energy costs. Short-term upfront cost for existing Elmwood and Hiawatha SPS upgrades prior to decommission.
Elmwood and Hiawatha Evaluation Result	<ul style="list-style-type: none"> EH1: New Elmwood and Hiawatha SPSs and forcemains discharging towards Beechwood SPS. – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH5: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location towards new deep trunk sewer along Lakeshore Road. New Hiawatha SPS and forcemains discharging towards Beechwood SPS. – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH7: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd. New Hiawatha SPS and forcemains discharging towards new deep trunk sewer along Lakeshore Rd. – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH8: Decommission of Elmwood SPS. New gravity sewer from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd. New Hiawatha SPS, forcemains and gravity sewers discharging towards new sewer along Elmwood Ave. – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH10: Decommission of Hiawatha SPS. New gravity sewer from current Hiawatha SPS location to Elmwood SPS. New Elmwood SPS and forcemains discharging towards new deep trunk sewer along Lakeshore Rd – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH13: Decommission of existing Elmwood SPs and Hiawatha SPS. New gravity sewers from current SPS locations to new deep trunk sewer along Lakeshore Rd – Screened out during the short list Elmwood/Hiawatha servicing evaluation 	<ul style="list-style-type: none"> EH14: Decommission of existing Elmwood SPs and Hiawatha SPS. New gravity sewers from current Hiawatha SPS location to Elmwood Avenue. New gravity sewers from current Elmwood SPS location to new deep trunk sewer along Lakeshore Rd – Selected as the preferred Elmwood/Hiawatha SPS Servicing Strategy.

5.0 Watermain

5.1 Long List of Watermain Servicing Alternatives

Table 5-1. New Watermain Long List of Shaft Alternatives

Alternative	Shaft Description	Screening Criteria Result
W1	Elmwood Ave Parking Lot / Lakeshore Rd.	Carried forward: Utilizes same construction compounds, shaft locations, and tunnel as proposed Lakeshore Sewer.
W2	Lakeshore Rd / Multiple Locations.	Carried forward: Direct crossing of the Credit River.
W3	Port Credit Library Parking Lot / Lakeshore Rd.	Screened out: No land availability for shaft and construction compound.
W4	Port Credit Library Parking Lot / High St.	Screened out: No land availability for shaft and construction compound.
W5	Elizabeth / High St.	Carried forward: Direct crossing of the Credit River. Minimizes disruptions along Lakeshore Rd.
W6	Port Credit Memorial Arena Parking Lot / Park St.	Screened out: Disruptions to the Port Credit Memorial Arena parking lot. Traffic disruption to the main public entrance into parking lot during construction.
W7	Port Credit Memorial Arena Parking Lot / Park St.	Screened out: Disruptions to the Port Credit Memorial Arena parking lot. Traffic disruption to the main public entrance into parking lot during construction.
W8	Port St & Stavebank Rd Parking Lot / Port St.	Carried forward: Diagonal crossing of the Credit River. Minimizes disruptions along Lakeshore Rd.
W9	Port St & Stavebank Rd Parking Lot / Port St.	Carried forward: Direct crossing of the Credit River. Minimizes disruptions along Lakeshore Rd.



Figure 5-1. Long List of Watermain Shaft Alternatives

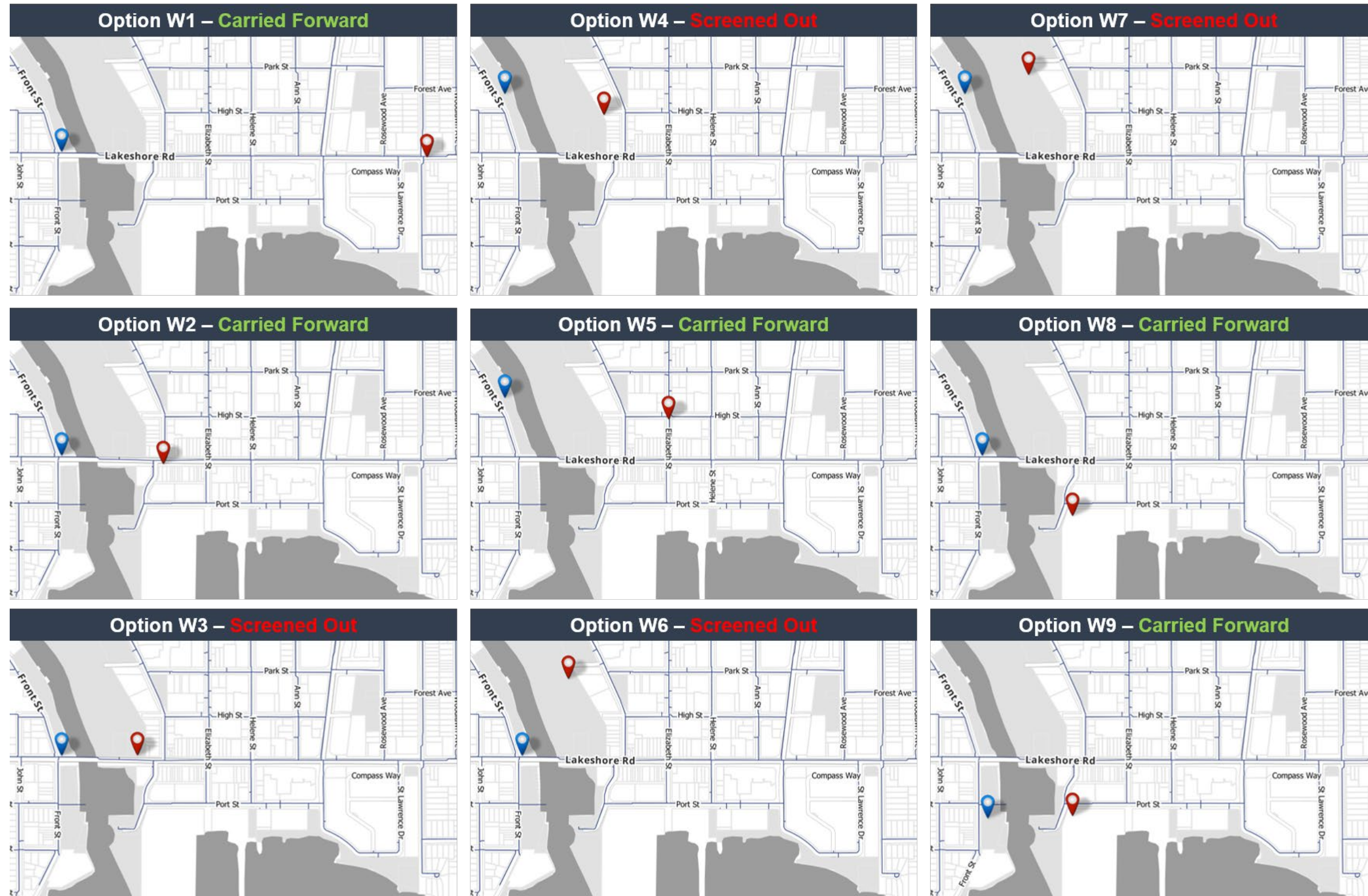


Figure 5-2. Long List of Watermain Shaft Alternatives Location

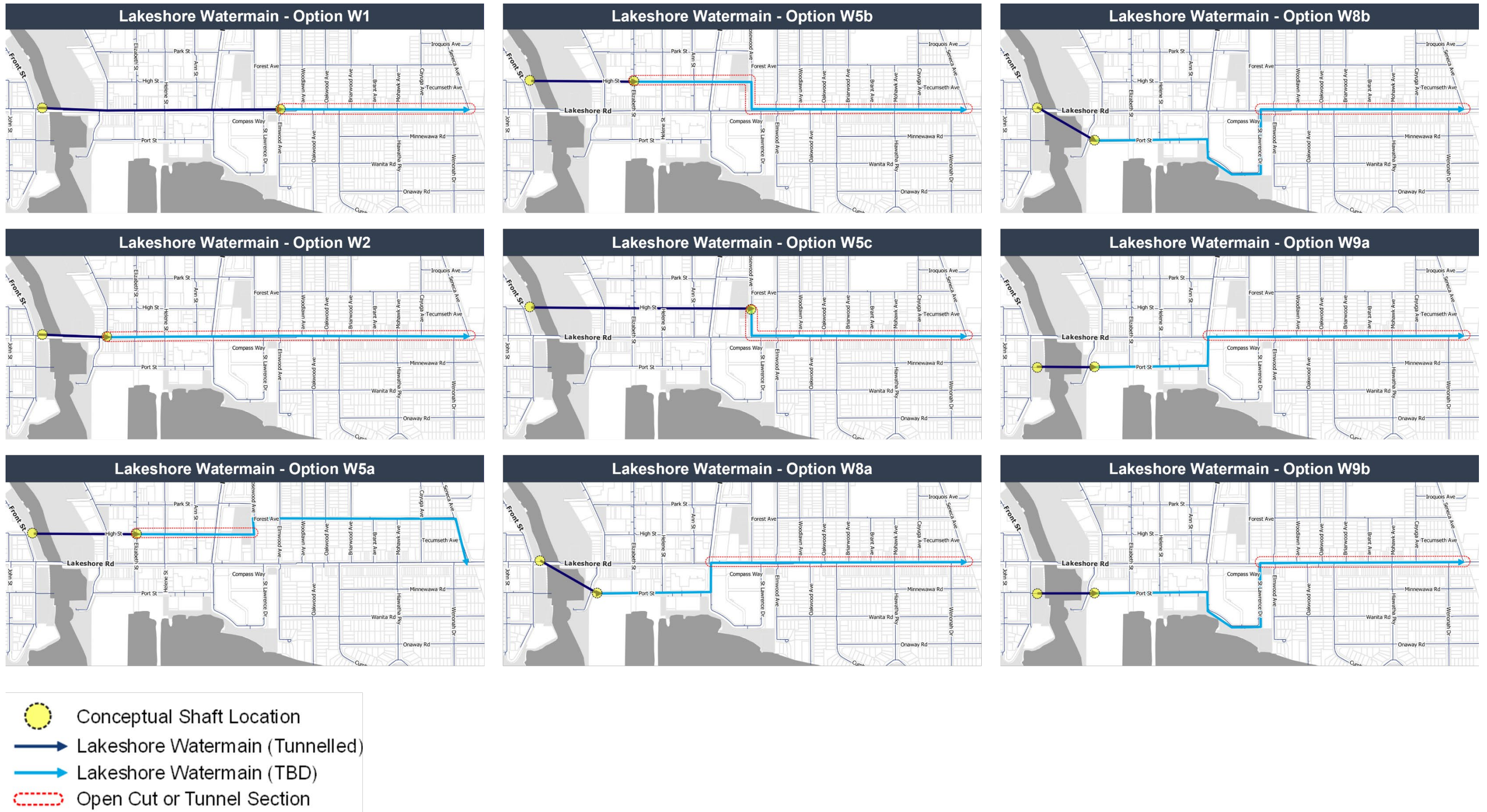


Figure 5-3. Short List of Watermain Alignment Alternatives

Table 5-2. Watermain Alignment Alternatives Evaluation

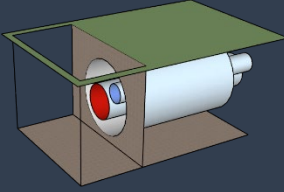
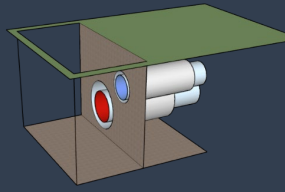
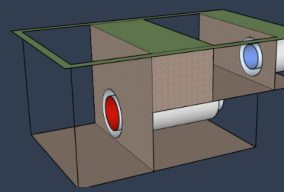
Evaluation Criteria	W1	W2	W5A	W5B	W5C	W8A	W8B	W9A	W9B
	Lakeshore Rd.	Lakeshore Rd.	High St. / Rosewood Ave. / Forest Ave.	High St. / Lakeshore Rd.	High St. / Rosewood Ave. / Lakeshore Rd.	Port St / St. Lawrence Dr. / Lakeshore Rd.	Port St / St. Lawrence Dr. / Lakeshore Rd.	Port St / St. Lawrence Dr. / Lakeshore Rd.	Port St / St. Lawrence Dr. / Lakeshore Rd.
Components	<ul style="list-style-type: none"> • Shaft location at Elmwood Ave Parking Lot / Lakeshore Rd. • Tunnelled Solution along Lakeshore Rd. 	<ul style="list-style-type: none"> • Shaft location at Stavebank Rd. / Lakeshore Rd. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Shaft location at Elizabeth St. / High St. • Opportunity for open-cut or tunnelled sewer along High St. 	<ul style="list-style-type: none"> • Shaft location at Elizabeth St. / High St. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Shaft Location at Harold E. Kennedy Park on High St. and Rosewood Ave. • Opportunity for open-cut along Rosewood to Lakeshore Rd. 	<ul style="list-style-type: none"> • Port St & Stavebank Rd Parking Lot / Port St. / Lakeshore Rd. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Port St & Stavebank Rd Parking Lot / Port St. / St. Lawrence Dr. / Lakeshore Rd. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Port St & Stavebank Rd Parking Lot / Port St. / Lakeshore Rd. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. 	<ul style="list-style-type: none"> • Port St & Stavebank Rd Parking Lot / Port St. / St. Lawrence Dr. / Lakeshore Rd. • Opportunity for open-cut or tunnelled sewer along Lakeshore Rd.
Environmental	<ul style="list-style-type: none"> • Minimizes surface disturbance with tunnelled solution along Lakeshore Rd. • Provides direct crossing of the Credit River within bedrock to minimize potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Shared tunnel crossing of the Credit River with the sewer eliminates need for second crossing minimizing potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Requires diagonal water crossing of the Credit River increasing length of watermain. • Diagonal water crossings have increased complexity during construction and are typically not preferred if a direct route is available to minimize potential environmental impact. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Requires diagonal water crossing of the Credit River increasing length of watermain. • Diagonal water crossings have increased complexity during construction and are typically not preferred if a direct route is available to minimize potential environmental impact. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment. 	<ul style="list-style-type: none"> • Provides direct crossing of the Credit River within bedrock to remove potential impact to waterbody. • Depth of river crossing will avoid impact to ecological features. • Second crossing of the Credit River required separate to the sewer, increased potential environmental impacts. • Construction primarily within road right-of-way minimizing impact to natural environment.
Social/Cultural	<ul style="list-style-type: none"> • Minimizes major traffic disruption on Lakeshore Rd. with tunnelled solution. • Disruption localized to one shaft location rather than open cut alternatives/or multiple shaft compounds. • Minimizes separate watermain alignments minimizing socio/economic impact to local roads, residents, and business. 	<ul style="list-style-type: none"> • Requires closer of Stavebank Road and two lanes of Lakeshore during construction • Shaft construction at Stavebank not considered a reasonable alternative based on availability of more reasonable options. • Requires significant disruption along Lakeshore Rd if 	<ul style="list-style-type: none"> • Avoids major construction near Lakeshore Rd. • Open-cut solution will require lane/road closures impacting local traffic. • Hurontario crossing will need trenchless crossing and two shaft compounds to facilitate construction increasing local disturbance • Potential impact to archaeological 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Open-cut solution will require lane/road closures impacting local traffic. • Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Disruption senior living resident condominiums and its underground parking • Greater impact to local / surrounding residents, schools, businesses • Potential disruption of Harold E. Kennedy Park 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction • Open-cut solution will require lane/road closures impacting 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction • Less construction is required along Lakeshore Rd. 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction • Open-cut solution will require lane/road closures impacting 	<ul style="list-style-type: none"> • Requires significant disruption along Lakeshore Rd. if constructed by open cut and/or trenchless. • Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction • Less construction is required along Lakeshore Rd.

Evaluation Criteria	W1	W2	W5A	W5B	W5C	W8A	W8B	W9A	W9B
	<ul style="list-style-type: none"> Shaft construction at Elmwood / Lakeshore would require relocating local farmer's market. Suitable site alternatives are available. Potential impact to archaeological features minimized with tunneled watermain and shaft construction in a previously disturbed area. 	<p>constructed by open cut.</p> <ul style="list-style-type: none"> Open-cut solution would require lane/road closures impacting local traffic. Potential impact to archaeological features minimized with proposed construction in previously disturbed areas. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 	<p>features minimized with proposed construction in previously disturbed areas.</p> <ul style="list-style-type: none"> Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 	<ul style="list-style-type: none"> Increase impact during construction to Lakeshore compared to W1. Potential impact to archaeological features minimized with proposed construction in previously disturbed areas. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 		<p>local traffic south of Lakeshore</p> <ul style="list-style-type: none"> Trenchless construction would require shaft compounds on Lakeshore causing increased impact during construction Increased risk to archaeological features with historic Port features. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 	<p>reducing traffic and community impacts.</p> <ul style="list-style-type: none"> Open-cut solution will require lane/road closures impacting local traffic south of Lakeshore Increased risk to archaeological features with historic Port features. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 	<p>local traffic south of Lakeshore</p> <ul style="list-style-type: none"> Increased risk to archaeological features with historic Port features. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative. 	<p>reducing traffic and community impacts.</p> <ul style="list-style-type: none"> Open-cut solution will require lane/road closures impacting local traffic south of Lakeshore Increased risk to archaeological features with historic Port features. Air, noise, dust, and vibration impacts from construction can be localized to shaft location only if avoiding the open-cut alternative.
Technical	<ul style="list-style-type: none"> Direct deep perpendicular water crossing reducing technical complexity. Avoids bridge structure, marina, and potential poor geotechnical conditions close to Credit River and historical port area. Minimizes major disruption on Lakeshore Rd. with tunnelled solution. Complex watermain operation and maintenance due to depth (approx. 20m). Design will need to mitigate risk of potential contamination due to close proximity of watermain and sewer within shared tunnel. No requirement for local watermain connection between Credit River and Elmwood, opportunity to connect into system at Elmwood (will require deep chamber). Solution provides opportunity for shared tunnel construction 	<ul style="list-style-type: none"> Direct deep perpendicular water crossing reducing technical complexity. Limited opportunity for watermain connections along the tunnel alignment. 	<ul style="list-style-type: none"> Direct water crossing reducing technical complexity. Avoids bridge structure, marina, and potential poor geotechnical conditions close to Credit River and historical port area. Avoids major construction along Lakeshore Rd. Provides an opportunity of combination of open-cut and trenchless construction once Credit River is crossed. Opportunity for increased local watermain connections to new 600 mm. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer construction as per Alternative W1. 	<ul style="list-style-type: none"> Direct water crossing reducing technical complexity. Avoids bridge structure, marina, and potential poor geotechnical conditions close to Credit River and historical port area. Opportunity for increased local watermain connections to new 600 mm. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer construction as per Alternative W1. 	<ul style="list-style-type: none"> Direct water crossing reducing technical complexity. Avoids bridge structure, marina, and potential poor geotechnical conditions close to Credit River and historical port area. Opportunity for increased local watermain connections to new 600 mm. Need to consider phasing between sewer and watermain construction to coordinate parking lot leading to substantially longer construction period Followed by reinstating LCBO parking lot or using the Harold E. Kennedy Park for tunnel shaft compound Construction complexity of how to continue next phase to the East 	<ul style="list-style-type: none"> Requires diagonal water crossing increasing technical complexity for construction with bridge structure and marina. Potential poor geotechnical conditions close to River and historical port area. Provides an opportunity of open-cut and trenchless construction once Credit River is crossed. Opportunity for increased local watermain connections to new 600 mm. Opportunity to undertake/coordinate local upgrades on Port Street. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer 	<ul style="list-style-type: none"> Requires diagonal water crossing increasing technical complexity for construction with bridge structure and marina. Potential poor geotechnical conditions close to River and historical port area. Provides an opportunity of combination of open-cut and trenchless construction once Credit River is crossed. Opportunity for increased local watermain connections to new 600 mm. Opportunity to undertake/coordinate local upgrades on Port Street. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer 	<ul style="list-style-type: none"> Direct deep perpendicular water crossing reducing technical complexity. Avoids bridge structure with water crossing. Potential poor geotechnical conditions close to River and historical port area. Provides an opportunity of combination of open-cut and trenchless construction once Credit River is crossed. Opportunity for increased local watermain connections to new 600 mm. Opportunity to undertake/coordinate local upgrades on Port Street. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer 	<ul style="list-style-type: none"> Direct deep perpendicular water crossing reducing technical complexity. Avoids bridge structure with water crossing. Potential poor geotechnical conditions close to River and historical port area. Provides an opportunity of combination of open-cut and trenchless construction once Credit River is crossed. Opportunity for increased local watermain connections to new 600 mm. Opportunity to undertake/coordinate local upgrades on Port Street. Following construction phases east of Study Area will likely require construction within Lakeshore, solution does not provide opportunity for alignment with sewer

Evaluation Criteria	W1	W2	W5A	W5B	W5C	W8A	W8B	W9A	W9B
	with sewer for further eastern phases. • Shared tunnelled solution provides opportunity to theoretically connect into local water system at next shaft location in the proximity of Beachwood Ave. SPS.					construction as per Alternative W1.	construction as per Alternative W1.	construction as per Alternative W1.	construction as per Alternative W1.
Legal/Jurisdictional	<ul style="list-style-type: none"> Utilizes same construction compounds, shaft locations, and tunnel as proposed Lakeshore Sewer. Requires increased pipe sizing to accommodate. Potential need for larger permanent easement at shaft locations. Limit's easement needs north and south of Front Street SPS and land on east side of Credit River. 	<ul style="list-style-type: none"> Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. Shaft location at Stavebank/ Lakeshore requires City property agreement. 	<ul style="list-style-type: none"> Increased need for temporary and permanent easements west and east of Credit River and to facilitate crossing of Hurontario and access to Rosewood Ave. Increased coordination with local residents on High St./ Forest Ave. Open-cut construction alternative requires increased City coordination for traffic management but avoids major impact of Lakeshore Rd. 	<ul style="list-style-type: none"> Increased need for temporary and permanent easements west and east of Credit River and to facilitate crossing of Hurontario Increased coordination with local residents on High St. Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. 	<ul style="list-style-type: none"> Increased need for temporary and permanent easements west and east of Credit River and to facilitate crossing of Hurontario Increased coordination with local residents on High St., as well as senior living resident condominiums. Increased need to coordinate with City of Mississauga for property requirements at Memorial Park, and Harold E. Kennedy Park Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. 	<ul style="list-style-type: none"> Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. Increased need for temporary and permanent easements east of Credit River. Increased coordination with proposed development(s) on Port St. 	<ul style="list-style-type: none"> Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. Increased need for temporary and permanent easements east of Credit River. Increased coordination with local residents on St. Lawrence Dr. and proposed development(s) on Port St. 	<ul style="list-style-type: none"> Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. Increased need for temporary and permanent easements west and east of Credit River. Increased coordination with proposed development(s) on Port St. 	<ul style="list-style-type: none"> Open-cut construction alternative requires significant City coordination for traffic management on Lakeshore Rd. Increased need for temporary and permanent easements west and east of Credit River. Increased coordination with local residents on St. Lawrence Dr.
Financial	<ul style="list-style-type: none"> Increased cost to sewer construction to upsize tunnel and shafts to accommodate watermain and sewer. Avoids need for second crossing and additional shaft compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds. 	<ul style="list-style-type: none"> Potential higher cost due to separate tunnel with multiple shaft locations and compounds.
Lakeshore Watermain Evaluation Result	W1: Shaft location at Elmwood Ave. Parking Lot / Lakeshore Rd. Tunnelled Solution along Lakeshore Rd. – Selected as preferred watermain alternative	W2: Shaft location at Stavebank Rd. / Lakeshore Rd. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation	W5A: Shaft location at Elizabeth St. / High St. Opportunity for open-cut or tunnelled sewer along High St. – Screened out during the short list Watermain servicing evaluation	W5B: Shaft location at Elizabeth / High St. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation	W5C:	W8A: Port St & Stavebank Rd Parking Lot / Port St. / Lakeshore Rd. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation	W8B: Port St & Stavebank Rd Parking Lot / Port St. / St. Lawrence Dr. / Lakeshore Rd. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation	W9A: Port St & Stavebank Rd Parking Lot / Port St. / Lakeshore Rd. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation	W9B: Port St & Stavebank Rd Parking Lot / Port St. / St. Lawrence Dr. / Lakeshore Rd. Opportunity for open-cut or tunnelled sewer along Lakeshore Rd. – Screened out during the short list Watermain servicing evaluation

EVALUATION OF ALTERNATIVES – LAKESHORE WATERMAIN AND SEWER SHAFT COMPOUND AT MARINA PARK AND ELMWOOD/LAKESHORE (PARKING LOT)

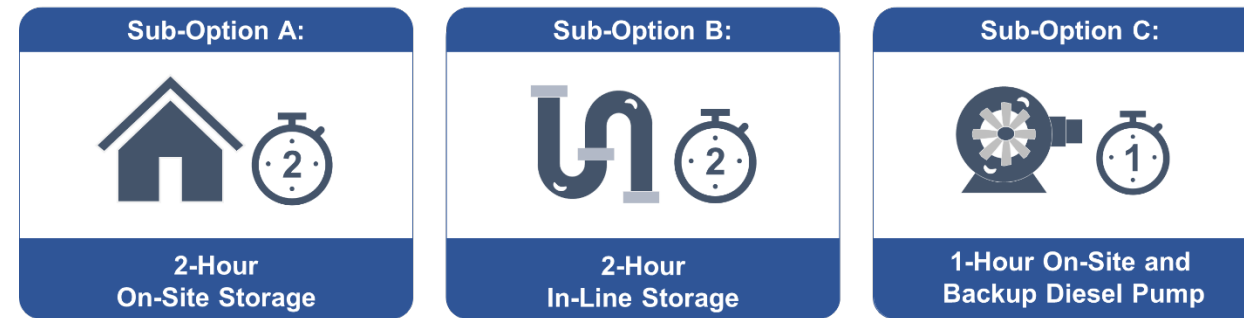
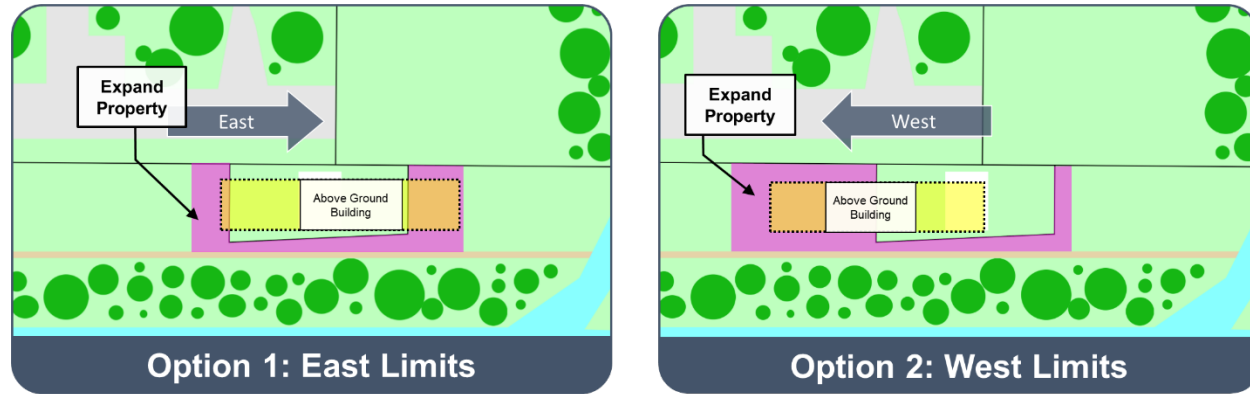
Category	Evaluation Criteria	 Option 1 Shared Compound Shared Shafts Shared Tunnel	 Option 2 Shared Compound Shared Shafts Separate Tunnel	 Option 3 Shared Compound Separate Shafts Separate Tunnel	
Environmental	Above Surface Impact and Considerations	<ul style="list-style-type: none"> - Larger compound needed (at both compound locations) to accommodate larger shaft and tunnel boring machine. - Less surface and physical environment disruption due to single shaft compound (at both compound locations) compared to option 3. - No impact to street trees anticipated. 	<ul style="list-style-type: none"> - Larger compound may be needed (at both compound locations) to accommodate larger shaft. - Less surface and physical environment disruption due to single shaft compound (at both compound locations) compared to option 3. - No impact to street trees anticipated. 	<ul style="list-style-type: none"> - Largest compound likely needed (at both compound locations) compared to options 1 and 2 to accommodate two separate shafts. - Most surface and physical environment disruption due to multiple shafts in the same compound (at both compound locations) compared to options 1 and 2. - No impact to street trees anticipated. 	
	Sub-Surface Impact and Considerations	<ul style="list-style-type: none"> - Single shaft in each compound. - Additional considerations needed due to oversized shaft to accommodate larger boring machine to tunnel both sewer and watermain leading to larger volume of excavated materials compared to options 2 and 3. - Increased complexity to avoid bridge abutments crossing the Credit River at Marina Park (west compound location) due to oversized tunnel. 	<ul style="list-style-type: none"> - Single shaft in compound at Marina Park (west compound location). - Multiple shafts in compound at CoM Parking Lot (east compound location). - Requires least volume to be excavated for two separate tunnels. 	<ul style="list-style-type: none"> - Multiple shafts (two shafts per compound at both locations). - Requires less volume to be excavated for two separate tunnels. - However, additional volume is required to be excavated for two separate shafts (at both shaft locations) compared to option 2. 	
	Commentary	All three options are similar in depth. Impact to the environment (both above and below the surface) will be mitigated through detailed design.			
	Overall Rank	Negligible difference in environmental impact between options – all considered preferred			
Social / Cultural	Traffic Considerations (pedestrian, road)	<ul style="list-style-type: none"> - No road closures anticipated at either compound locations. - Sidewalk may be re-routed at both compound locations. 	<ul style="list-style-type: none"> - No road closures anticipated at either compound locations. - Sidewalk may be re-routed at both compound locations. 	<ul style="list-style-type: none"> - No road closures anticipated at either compound locations. - Sidewalk may be re-routed at both compound locations. 	
	Impact to Existing and Future Land Uses / Community Impact	<ul style="list-style-type: none"> - Dust, noise, and vibration during construction will require mitigation at both compound locations. - Closure of Marina Park (west compound location) during construction. - Temporary impacts during construction to Port Credit Farmer's Market and nearby properties to the CoM parking lot (east compound location). 	<ul style="list-style-type: none"> - Dust, noise, and vibration during construction will require mitigation at both compound locations. - Closure of Marina Park (west compound location) during construction. - Temporary impacts during construction to Port Credit Farmer's Market and nearby properties to the CoM parking lot (east compound location). 	<ul style="list-style-type: none"> - Dust, noise, and vibration during construction will require mitigation at both compound locations. - Closure of Marina Park (west compound location) during construction. - Temporary impacts during construction to Port Credit Farmer's Market and nearby properties to the CoM parking lot (east compound location). 	
	Commentary	Option 1 is slightly preferred with regards to surrounding social / cultural impacts. Efforts to mitigate dust, noise, and vibration will be done through detailed design.	Option 2 and 3 have increased social / cultural impacts because it requires two tunnel drives which has the potential for prolonged construction period. The prolonged construction timing leads to additional dust, noise, and vibration to surrounding residents and businesses. Overall, Option 2 and 3 have the potential for increased social/cultural impact due to two separate tunnel drives.	Option 2 and 3 have increased social / cultural impacts because it requires two tunnel drives which has the potential for prolonged construction period. The prolonged construction timing leads to additional dust, noise, and vibration to surrounding residents and businesses. Overall, Option 2 and 3 have the potential for increased social/cultural impact due to two separate tunnel drives	
	Overall Rank	Preferred.	Less Preferred.	Less Preferred.	
Technical	Constructability	<ul style="list-style-type: none"> - Will require bigger shaft compound (at both compound locations) to accommodate larger boring machine to tunnel both sewer and watermain. - Tunnelling and construction of pipes in tunnel can happen at the same time (single tunnel drive) - Increased complexity of construction of watermain and sewer within shared tunnel and shared shafts (vortex structure, manholes, and valves) at both compound locations 	<ul style="list-style-type: none"> - Will require bigger shaft to accommodate 2 boring machines (at west compound location). - Increased complexity of construction of watermain and sewer within shared shafts (vortex structure, manholes, and valves) at west locations. 	<ul style="list-style-type: none"> - Will require 2 separate smaller shafts (at both compound locations) compared to options 1 and 2. - Reduced complexity of construction of watermain and sewer with separate shafts (vortex structure, manholes, and valves) at both compound locations 	
	Timing / Phasing Considerations	<ul style="list-style-type: none"> - Single tunnel drive: Sewer and watermain can be tunneled and potentially installed concurrently. 	<ul style="list-style-type: none"> - Two tunnel drives: Sewer and watermain must be tunneled at phased times as 2 boring machines cannot operate from the same shaft at the same time. 	<ul style="list-style-type: none"> - Two tunnel drives: Sewer and watermain may have to occur at phased times. Additional coordination required if construction is to proceed from the same time from different shafts. 	
	Impact on Existing Infrastructure and Utilities	<ul style="list-style-type: none"> - Minor impact anticipated to existing utilities (pending investigations). - Increased complexity to avoid bridge abutments crossing the Credit River at Marina Park (west compound location) due to single, larger tunnel. 	<ul style="list-style-type: none"> - Minor impact anticipated to existing utilities (pending investigations). 	<ul style="list-style-type: none"> - Minor impact anticipated to existing utilities (pending investigations). - Increased area to avoid bridge abutments crossing the Credit River at Marina Park (west compound location) two separate launch shafts, smaller tunnels with increased alignment flexibility. 	

Category	Evaluation Criteria	 <p>Option 1 Shared Compound Shared Shafts Shared Tunnel</p>	 <p>Option 2 Shared Compound Shared Shafts Separate Tunnel</p>	 <p>Option 3 Shared Compound Separate Shafts Separate Tunnel</p>
	Future Flexibility and Design Considerations	- Increased coordination/integration required for new watermain and sewer from the west along Lakeshore Rd (Front Street EA).	- Increased coordination/integration required for new watermain and sewer from the west along Lakeshore Rd (Front Street EA).	- Provides opportunity for coordination or independence for new watermain and sewer from the west along Lakeshore Rd (Front Street EA).
	Future Servicing, O&M Considerations	- Watermain will operate at slightly higher pressure due to increased depth - Increased complexity and reduced flexibility to service/maintain watermain and sewer within a shared tunnel in the future.	- Watermain has independent tunnel from sewer and therefore can be slightly shallower.	- Watermain has independent tunnel from sewer and therefore can be slightly shallower.
	Geotechnical Conditions and Risks	- Design will need to ensure tunnels are within bedrock from launch to reception	- Design will need to ensure tunnels are within bedrock from launch to reception	- Design will need to ensure tunnels are within bedrock from launch to reception
	Commentary	Option 1 has the highest technical complexity related to constructability. There is also reduced flexibility for future servicing, operations, and maintenance considerations due to the nature of a shared tunnel. Overall, Option 1 has the most technical complexity with highest probability of unpredictable risks and challenges.	Option 2 requires two tunnel drives from shared shafts which has the potential to prolong the construction period, leading to additional dust, noise, and vibration (social/cultural impact) to surrounding residents and businesses. Overall, Option 2 has reduced technical complexity compared to Option 1 with some probability of unpredictable risks and challenges due to shared shafts.	Option 3 requires two tunnel drives that potentially could occur together or phased providing construction flexibility. However, with separate shafts opportunity to construct simultaneously reducing the construction period (in comparison to Option 2). Increased flexibility for future servicing, operations, and maintenance with separate shafts. Overall, Option 3 has the least technical complexity.
	Overall Rank	Least Preferred.	Less Preferred.	Most Preferred.
Legal / Jurisdictional	Required Easements / Property / Permission to Access	- Potential to marginally reduce size of construction compound at Marina Park (west compound location) compared to option 3. (Temporary impact not considered a substantial differentiator between options) - All options minimize shaft locations and compounds (2) - Permanent and temporary construction easement required with CoM for access at both compound locations.	- Potential to marginally reduce size of construction compound at Marina Park (west compound location) compared to option 3. (Temporary impact not considered a substantial differentiator between options) . - All options minimize shaft locations and compounds (2) - Permanent and temporary construction easement required with CoM for access at both compound locations.	- May require marginally larger construction compound at Marina Park (west compound location) compared to options 1 and 2. (Temporary impact not considered a substantial differentiator between options) - All options minimize shaft locations and compounds (2) - Permanent and temporary construction easement required with CoM for access at both compound locations.
	Commentary	Option 1,2 and 3 are similar with regards to legal / jurisdictional complexity.	Option 1,2 and 3 are similar with regards to legal / jurisdictional complexity.	Option 1,2 and 3 are similar with regards to legal / jurisdictional complexity.
	Overall Rank	Preferred.	Preferred.	Preferred.
Financial	Cost to Construct	- Potential for high construction cost due to tunnelling requirements. - Higher risk for construction cost to escalate due to complexity of shared tunnel and need for oversized tunnel boring machine.	- Potential for high construction cost due to tunnelling requirements.	- Potential for high construction cost due to tunnelling requirements.
	O&M and Lifecycle Costs	- Potentially higher O&M complexity due to shared tunnel and depth of tunnel.	- Similar anticipated O&M and lifecycle cost as Option 3.	- Similar anticipated O&M and lifecycle cost as Option 2.
	Commentary	Option 1 has the highest potential for increased cost of construction due to the technical complexity of a large, shared tunnel, which also increases the O&M complexities in the future (additional costs).	Although Options 2 and 3 may not have the potential for increased cost of construction due to technical complexity of a shared tunnel, they have the potential for increased cost of construction due to the possibility of phased installation.	
	Overall Rank	Least Preferred.	Preferred.	Preferred.
Overall Ranking		3 (9)	2 (7)	1 (6) This option was selected based on minimized construction complexity and risk, preferred operations, maintenance and lifecycle factors and flexibility in construction phasing

The preferred strategy for the Rosemere SPS was selected through completion of Phase 2 of the Class EA process. This option includes the construction of a new SPS to replace the existing aging facility. It also requires two staging compound areas to facilitate the tunnel construction of twinned forcemains from the existing Rosemere SPS station on the west, to Sandham Road and Vesta Drive to the east.

The new SPS could be constructed either East or West of the existing station.

Each of the design options are accompanied by storage sub-options.

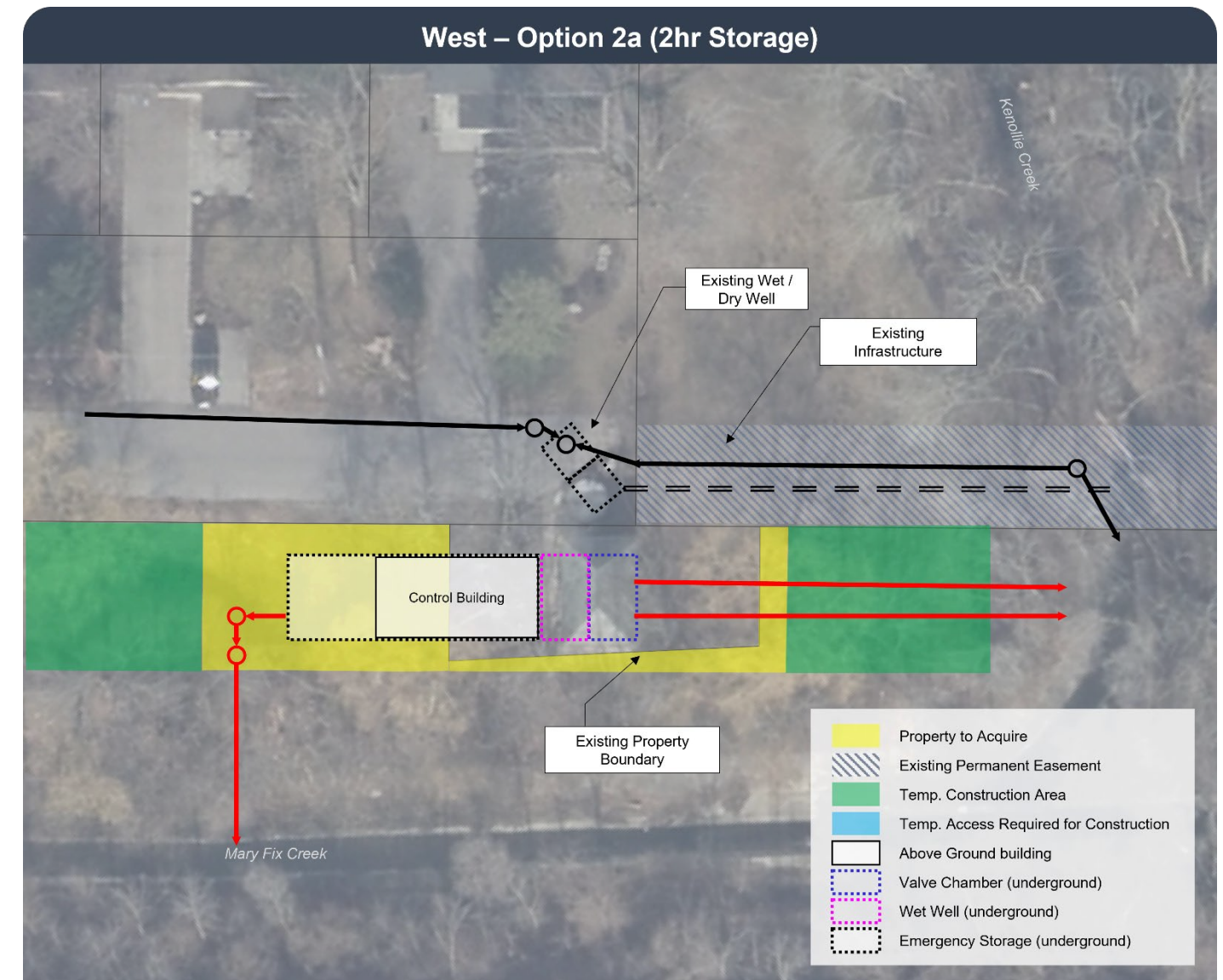
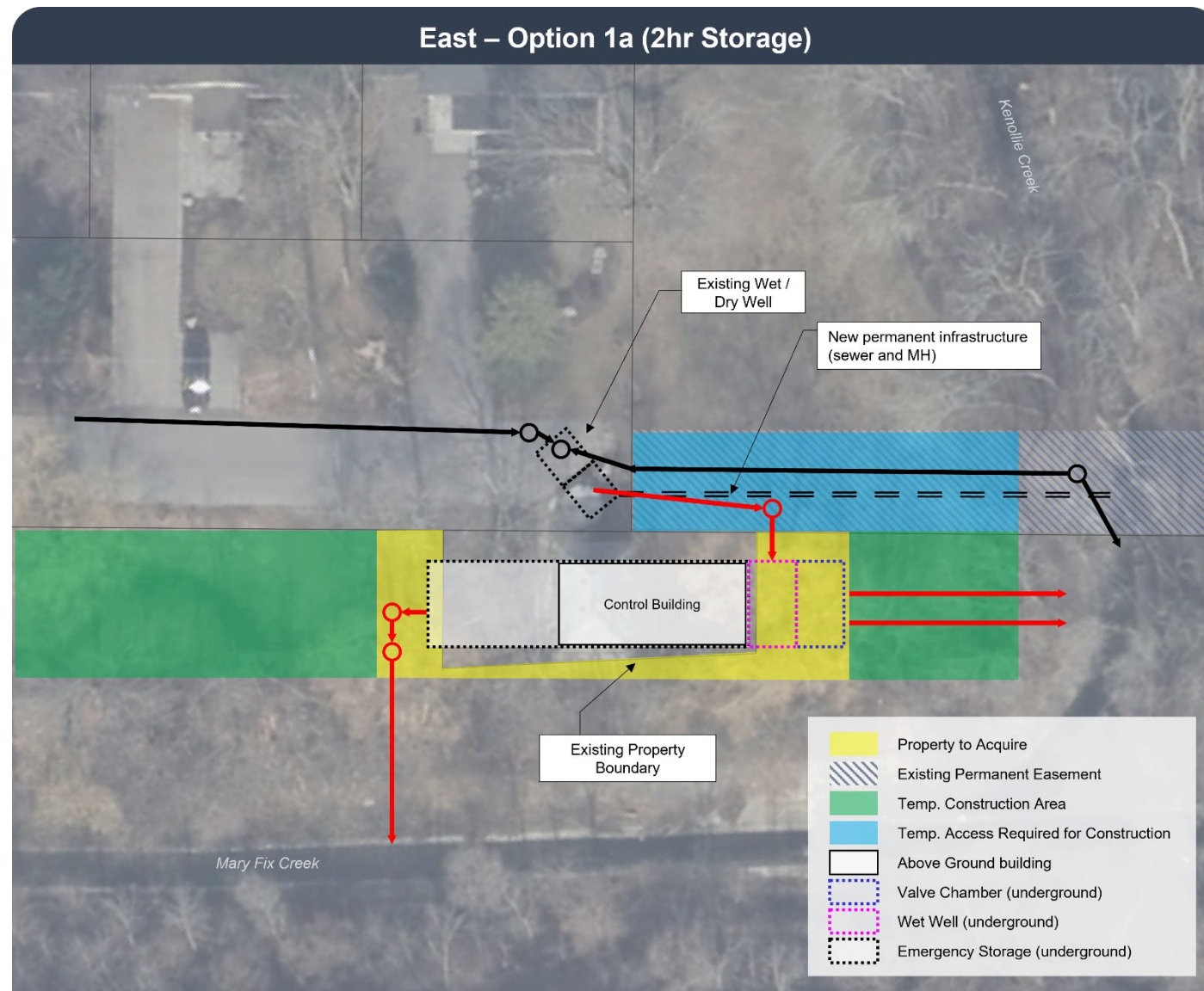


EVALUATION OF ALTERNATIVES – ROSEMERE SPS DESIGN

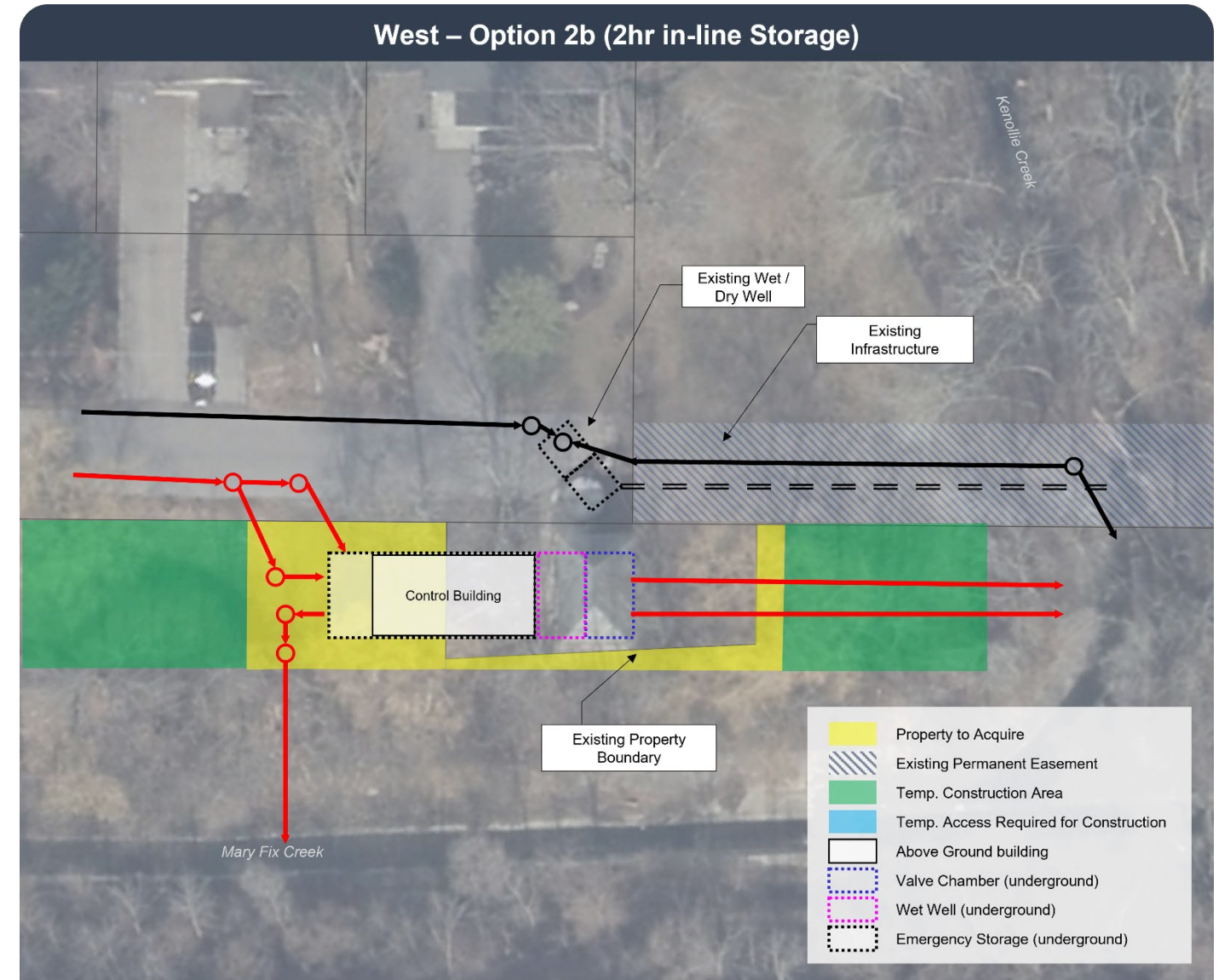
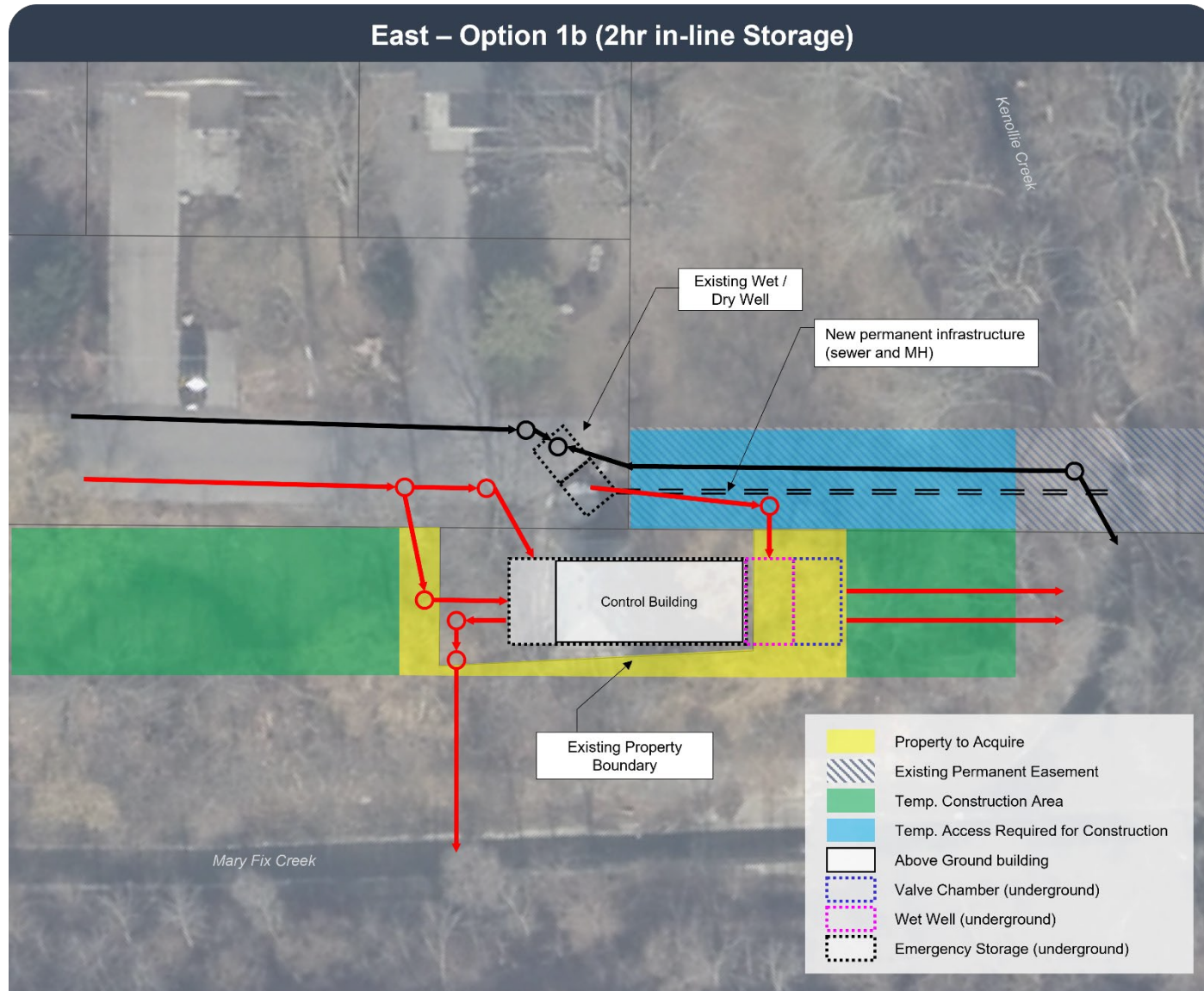
Category	Evaluation Criteria	2-hour Storage		2-hour In-Line Storage		1-hour Backup Diesel Pump	
		Option 1a – East	Option 2a – West	Option 1b – East	Option 2b – West	Option 1c – East	Option 2c – West
Environmental	Tree Impacts	- Existing trees will be safeguarded during construction and replaced if removed. - Tree removal required to place HDD rig to construct forcemain. Efforts to preserve/safeguard trees or replace removed trees will be followed according to the City's Tree Preservation and Protection Standards.	- Additional tree removal required due to building location towards the west limits. - Tree removal required to place HDD rig to construct forcemain. Efforts to preserve/safeguard trees or replace removed trees will be followed according to the City's Tree Preservation and Protection Standards.	- Same as Option 1a	- Same as Option 2a	- Same as Option 1a	- Same as Option 2a
	GHG Emissions	- Lower GHG emissions compared to options 1c and 2c.				- Higher GHG emissions associated with additional backup diesel pump.	
	Watercourse	- Construction of new overflow into Mary Fix Creek - Twinned forcemain will cross Kenollie Creek					
	Risk of Emergency Overflow	- Lower risk of emergency overflow compared to options 1c and 2c.				- Potentially slightly higher risk of overflow to the environment due to 1-hour emergency storage. However, additional pump provided a safety factor to lower risk of overflow to the environment.	
	Commentary	All options have similar environmental impacts, regardless if the property was designed to the east or west limits. Impact to the environment (both above and below the surface) will be mitigated through detailed design.					
	Overall Rank	Preferred		Preferred		Less Preferred	
Social / Cultural	Temporary Construction Impacts	- Mitigation measures needs to be in place to address air, noise, and traffic impact during construction		- Mitigation measures needs to be in place to address air, noise, and traffic impact during construction - Most impact to Rosemere residents during construction of linear storage (additional air and noise impact) within ROW.		- Same as Options 1a and 2a	
	Aesthetic Impacts	- Building location at far east limit thus less impact to residents sightline. Landscaping to be incorporated when structure is built.	- Building location is further west thus greater impact to residents sightline. Landscaping to be incorporated when structure is built.	- Same as Option 1a	- Same as Option 2a	- Same as Option 1a	- Same as Option 2a
	Commentary	Sub-option A and Sub-option C are similar in temporary construction impacts. However, options to the east will be less visible to existing residents than to the west. Sub-Option B is less preferred as it will have additional air and noise impacts due to construction of in-line storage within the road right of way.					
	Overall Rank	Preferred		Less Preferred		Preferred	

Category	Evaluation Criteria	2-hour Storage		2-hour In-Line Storage		1-hour Backup Diesel Pump	
		Option 1a – East	Option 2a – West	Option 1b – East	Option 2b – West	Option 1c – East	Option 2c – West
Technical	Emergency Storage	- Underground 2-hr emergency storage within chamber		- Combination of 2-hr emergency storage within linear and chamber		- 1-hr storage within chamber with an emergency backup diesel pump	
	Construction and O&M Access	- Inability to pave part of the existing permanent easement on private land. This will create difficulties to access the underground wet well and valve chamber during construction and future operation and maintenance activities.	- No anticipated restrictions.	- Inability to pave part of the existing permanent easement on private land. This will create difficulties to access the underground wet well and valve chamber during construction and future operation and maintenance activities.	- No anticipated restrictions.	- Inability to pave part of the existing permanent easement on private land. This will create difficulties to access the underground wet well and valve chamber during construction and future operation and maintenance activities.	- No anticipated restrictions.
	Commentary	All options to the east are not technically feasible due to legal / jurisdictional limitations. Options to the west is preferred as it is more technically feasible. Additionally, Option 2a is most preferred in fulfilling 2-hour emergency storage on-site.					
	Overall Rank	Less Preferred	Most Preferred	Less Preferred	Preferred	Less Preferred	Preferred
Legal / Jurisdictional	Property to be Acquired	- Requires the third largest property compared to all options that needs to be acquired from CoM.	- Requires the largest property compared to all options that needs to be acquired from CoM.	- Requires the fourth largest property compared to all options that needs to be acquired from CoM.	- Requires the second largest property compared to all options that needs to be acquired from CoM.	- Requires the least property compared to all options that needs to be acquired from CoM.	- Same as Option 2b
	Easement / Permitting Needs	- Additional coordination required for temporary access and construction along existing permanent easement. - New underground infrastructure within existing permanent easement on private land.	- Same as Option 1a	- Additional coordination required for temporary access and construction along existing permanent easement. - New underground infrastructure within existing permanent easement on private land. - Requires Road Occupancy Permit to construct in-line storage within ROW.	- Same as Option 1a	- Same as Option 1a	- Same as Option 1a
	Commentary	All east options face limitations as existing permanent easement on private land cannot be paved, which is required for construction access and future SPS maintenance. Options to the west are preferred as it has reduced legal / jurisdictional complexity.					
	Overall Rank	Less Preferred	Preferred	Less Preferred	Less Preferred	Less Preferred	Preferred
Financial	Life Cycle Cost	- Potentially increased property acquisition cost due to property required.	- Potentially the highest property acquisition cost due to property required.	- Potentially increased property acquisition cost due to property required. - Potentially highest capital cost with construction of in-line storage within ROW.	- Potentially increased property acquisition cost due to property required. - Potentially highest capital cost with construction of in-line storage within ROW.	- Least property acquisition cost as it is the option with the least property required. - Potentially slightly higher O&M cost to maintain spare backup pump.	- Potentially increased property acquisition cost due to property required. - Potentially slightly higher O&M cost to maintain spare backup pump.
	Commentary	Sub-option A has the highest property acquisition cost.		Although Sub-option B has less property acquisition costs, it has higher additional cost of construction for the in-line storage within the ROW.		Although Sub-option C has less property acquisition costs, it has potential increase in O&M costs to maintain the spare backup pump.	
	Overall Rank	Negligible difference in financial impacts between the options – all considered preferred.					
Overall Ranking	10 This option was screened out for the inability to have paved access to wet well and valve chamber during construction and for performing future operation and maintenance.	1 This option was selected based on ability to access wet well and valve chamber during construction and future operation and maintenance. Additionally, it also enables the ability for full 2-hour emergency storage on site in accordance with the Region's SPS Design Standards.	10 This option was screened out for the inability to have paved access to wet well and valve chamber during construction and for performing future operation and maintenance.	3 This option is least preferred due to increased air and noise impact as well as potential highest capital cost for construction of in-line storage within the right-of-way.	10 This option was screened out for the inability to have paved access to wet well and valve chamber during construction and for performing future operation and maintenance.	2 This option is less preferred due to potential for increased O&M cost and GHG emissions associated to operating and maintaining additional backup diesel pump.	

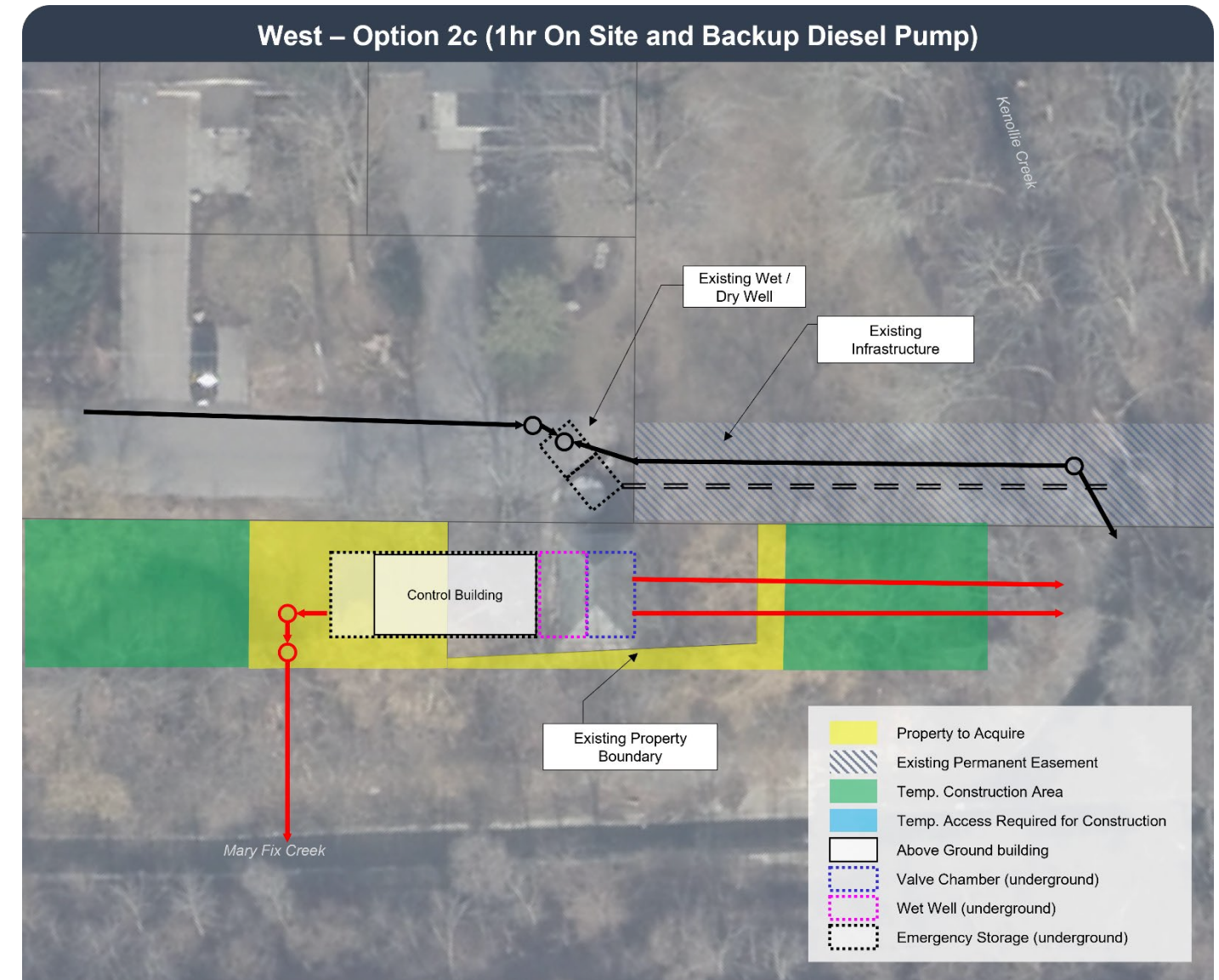
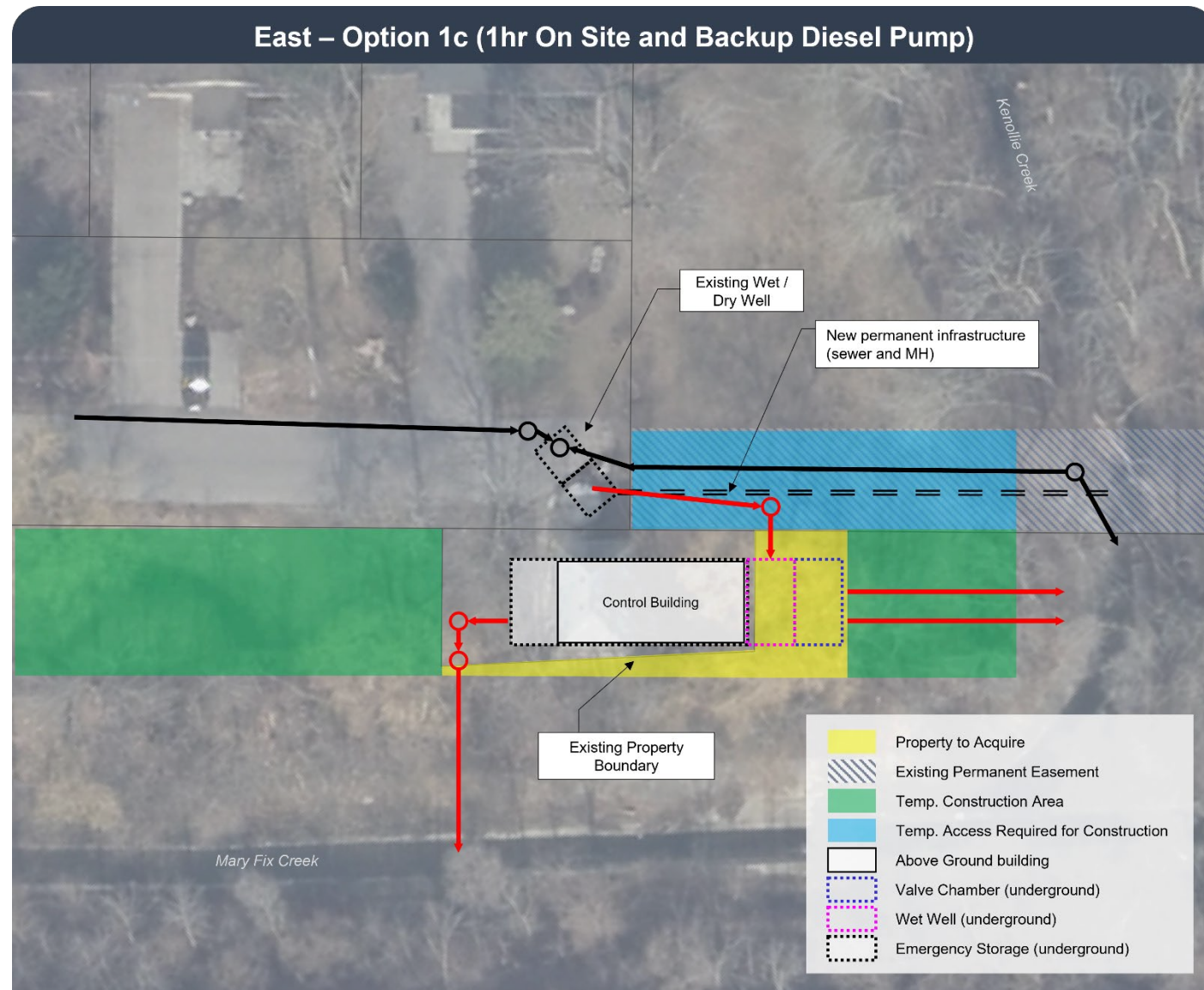
ROSEMERE ALTERNATIVE OPTION 1A AND 2A (EAST VS. WEST) 2-HOUR ON-SITE STORAGE SCHEMATIC

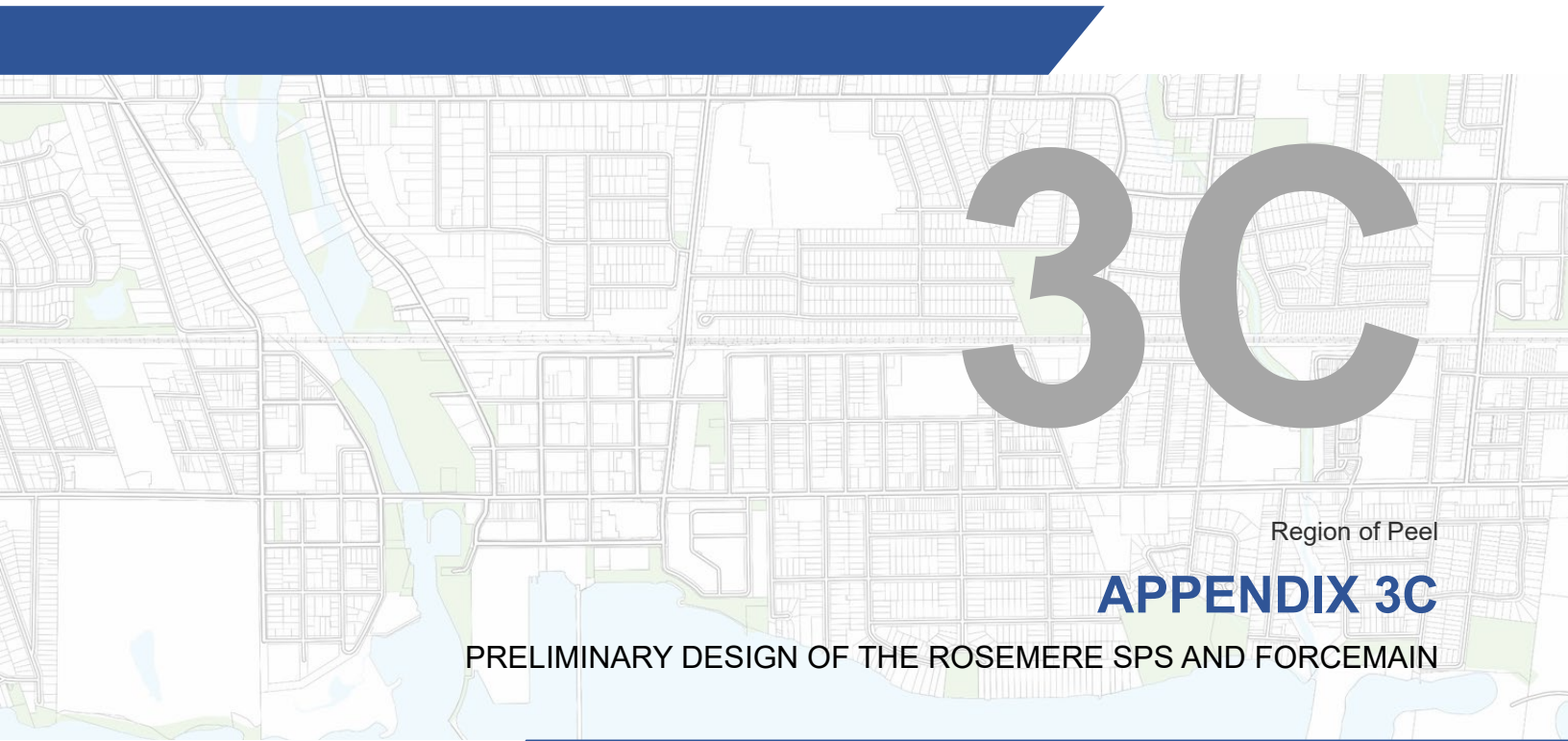


ROSEMERE ALTERNATIVE OPTION 1B AND 2B (EAST VS. WEST) 2-HOUR IN-LINE STORAGE SCHEMATIC



ROSEMERE ALTERNATIVE OPTION 1C AND 2C (EAST VS. WEST) 1-HOUR ON-SITE STORAGE AND BACKUP DIESEL PUMP SCHEMATIC



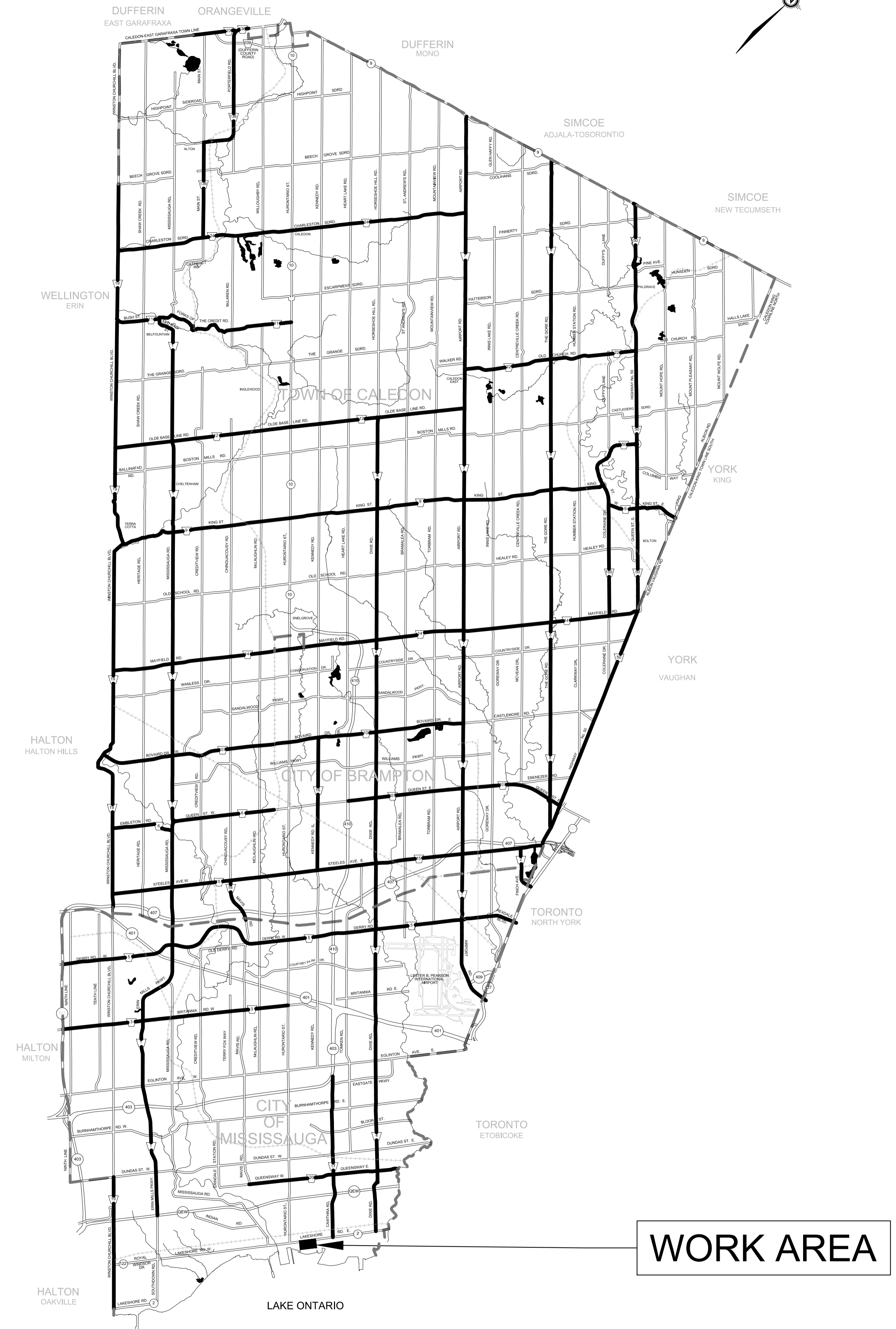
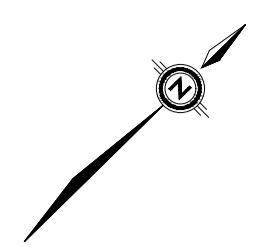


3C

Region of Peel

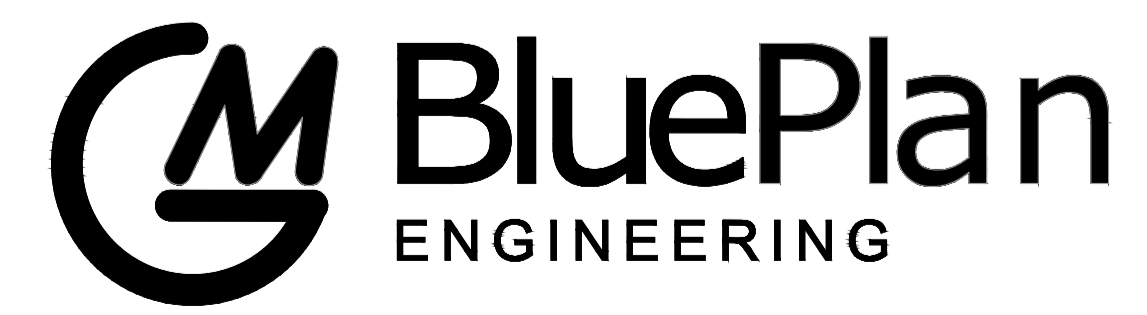
APPENDIX 3C

PRELIMINARY DESIGN OF THE ROSEMERE SPS AND FORCEMAIN



PROJECT No. 16-2905 MUNICIPAL CLASS EA ROSEMERE SPS & FORCEMAIN

PRELIMINARY DESIGN "ISSUED FOR PRELIMINARY DESIGN REPORT"



Document XXXXX-XXXXT

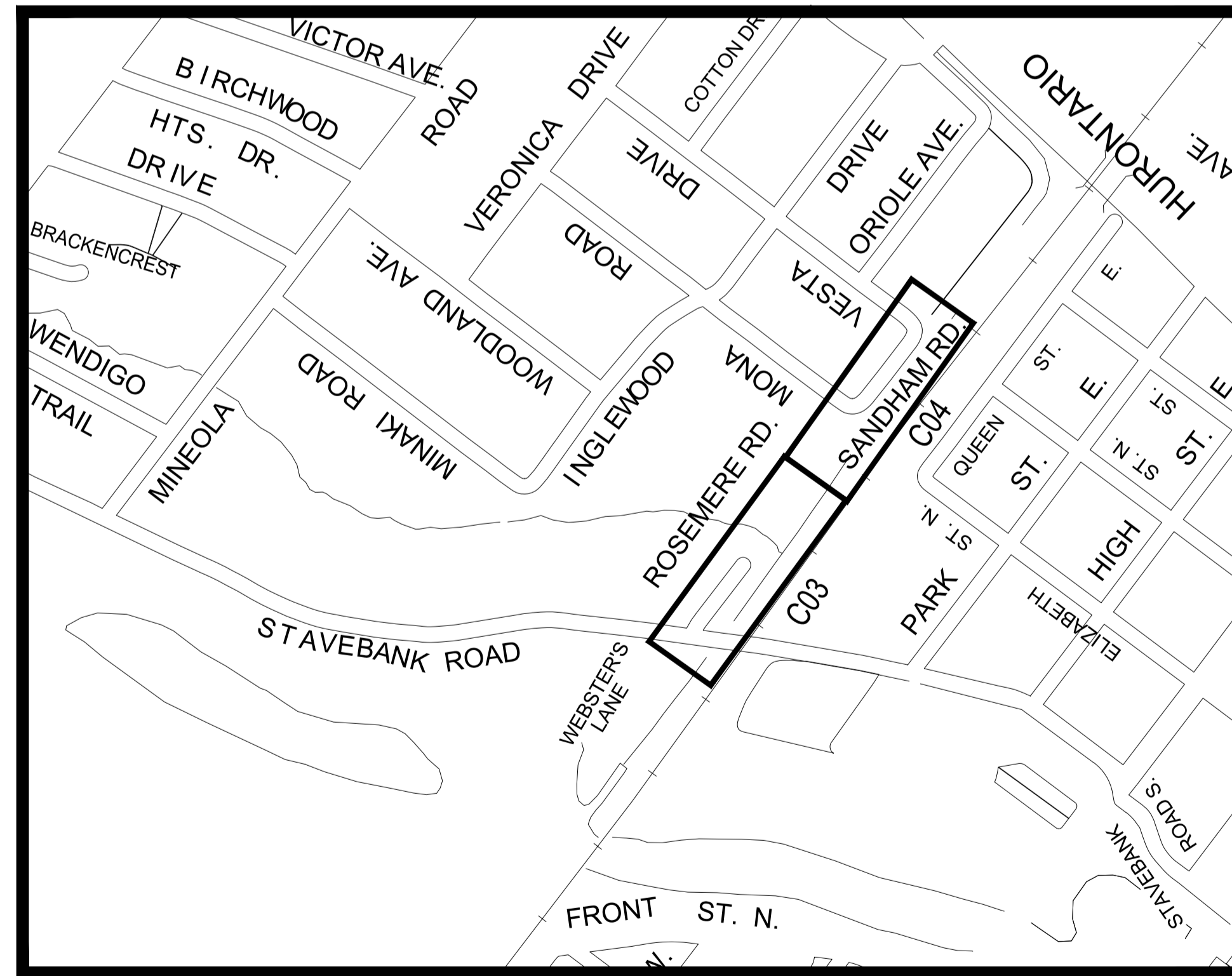
REVISIONS		
DATE	DETAILS	INIT.
FEB 16, 2023	DRAFT PRELIMINARY DESIGN DRAWINGS FOR REVIEW	BP
APR 10, 2023	ISSUED FOR PRELIMINARY DESIGN REPORT	BP

LEGEND

	EXISTING WATER VALVE CHAMBER		BOREHOLE		DITCH LINE
	EXISTING HYDRANT		SIB		EXISTING TOPOGRAPHICAL CONTOUR (M.A.S.L.)
	EXISTING WATER VALVE		EXISTING DECIDUOUS TREE		EXISTING STORM PIPE
	EXISTING WATER SERVICE		EXISTING CONIFEROUS TREE		EXISTING SANITARY PIPE
	EXISTING STORM MANHOLE				EXISTING WATER PIPELINE
	EXISTING SANITARY MANHOLE				EXISTING UNDERGROUND HYDRO
	EXISTING CATCH BASIN				EXISTING OVERHEAD HYDRO
	EXISTING HYDRO POLE AND GUY WIRE				EXISTING BELL
	EXISTING HAND WELL				EXISTING TV
	EXISTING LIGHT STANDARD				EXISTING GAS
	EXISTING BOLLARD				EXISTING FENCE
	EXISTING MAN DOOR				ROW PROPERTY LINE
	EXISTING SIGN				PROPERTY LINE
					PROPOSED SANITARY PIPELINE

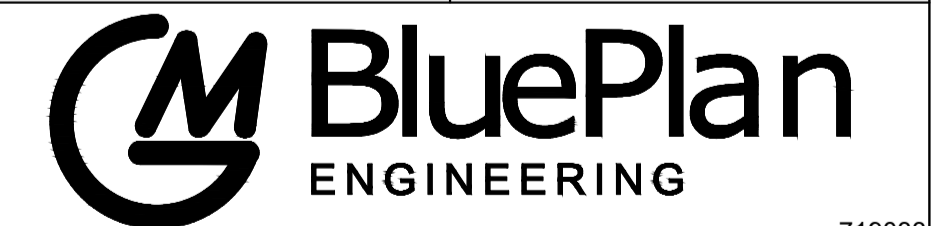
DRAWING INDEX

SHEET No.	DRAWING No.	DESCRIPTION	STATION
0		TITLE PAGE	
1	INDEX	INDEX, KEYPLAN, LEGEND AND DETAILS	
2	C01	CIVIL - SITE PLAN	
3	C02	CIVIL - SITE PLAN	
4	C03	CIVIL - PROP. TWIN 200mm HDPE SANITARY FORCEMAIN	STA 0+000 TO STA 0+210
5	C04	CIVIL - PROP. TWIN 200mm HDPE SANITARY FORCEMAIN	STA 0+210 TO STA 0+420
6	P01	PROCESS - PIPING LAYOUT	
7	P02	PROCESS - ROOF LAYOUT	
8	P03	PROCESS - OVERALL SECTION 1	
9	P04	PROCESS - OVERALL SECTION 2	
10	P05	PROCESS - OVERFLOW CHAMBER SECTIONS	
11	P06	PROCESS - WET WELL SECTIONS	



KEY MAP
N.T.S.

Designed by _____	Chkd. _____	Approved by _____
-------------------	-------------	-------------------

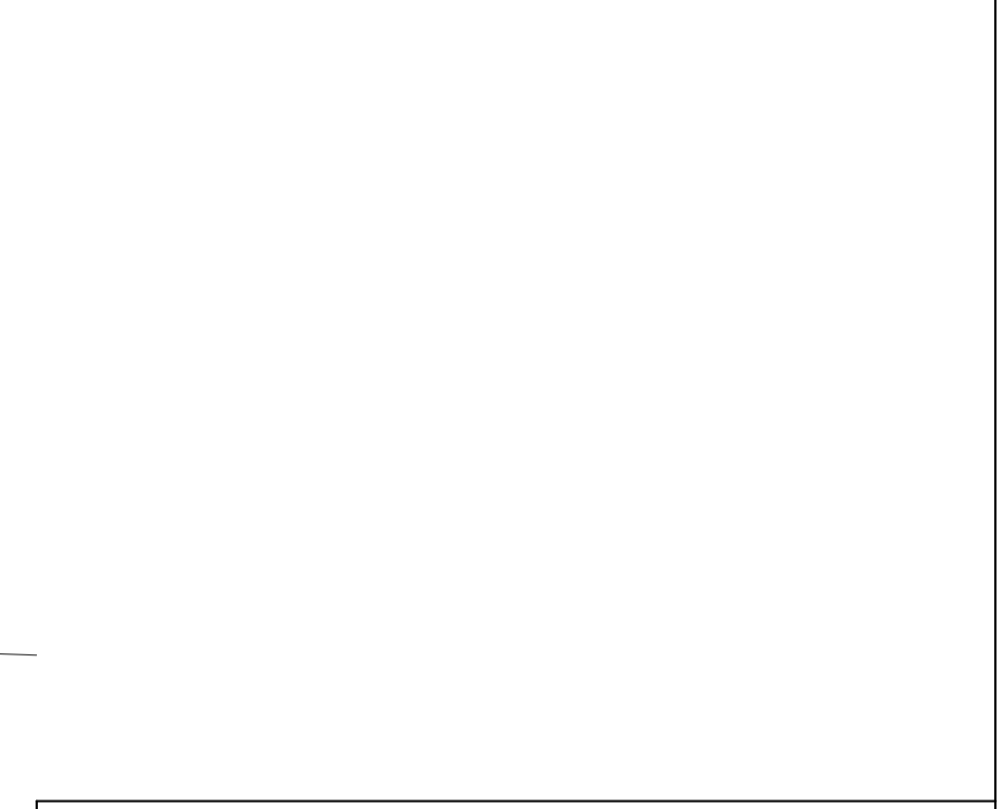
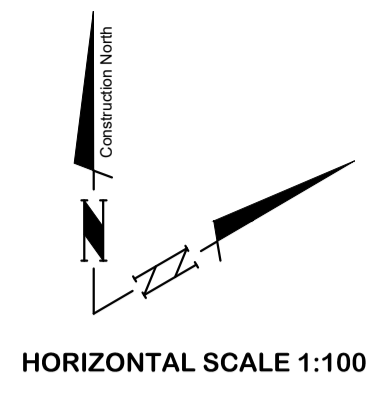


INDEX, LEGEND, NOTES & DETAILS

DWG No. INDEX	Area	Project No. 16-2905
Checked by BP	Drawn by B.A.	
Date FEBRUARY 2023	Sheet 1 of 11	Plan No. INDEX

REVISIONS		
DATE	DETAILS	INIT.
FEB. 16, 2023	DRAFT PRELIMINARY DESIGN DRAWINGS FOR REVIEW	BP
APR. 10, 2023	ISSUED FOR PRELIMINARY DESIGN REPORT	BP

NOTES:
 1. REGIONAL FLOOD WATER SURFACE ELEVATION OF 90.81m.
 2. PROPOSED ELEVATIONS ARE APPROXIMATE AND FOR CONCEPTUAL DESIGN ONLY.



General Notes
 All Driveways Are ASPHALT Unless Otherwise Noted
 All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
 All Horizontal And Vertical Bends Are In Degrees
 All Pipes Size In mm
 20C Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm

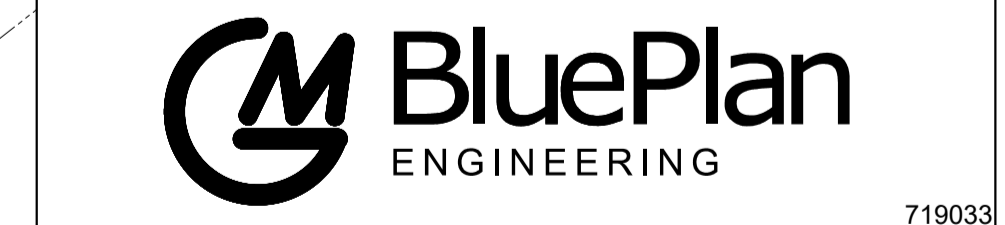
The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by: _____
 Chkd: _____
 Approved by: _____

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

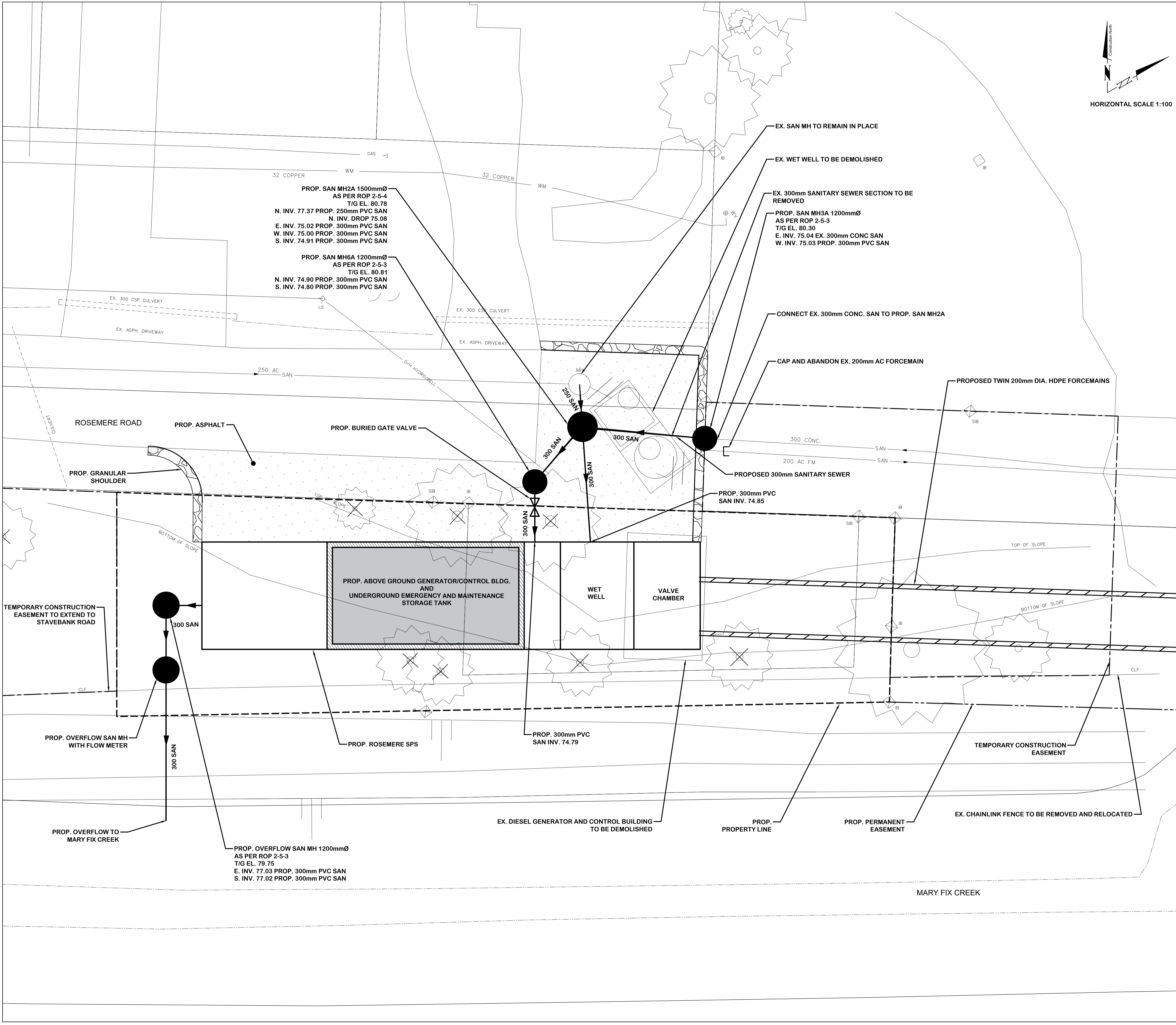
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

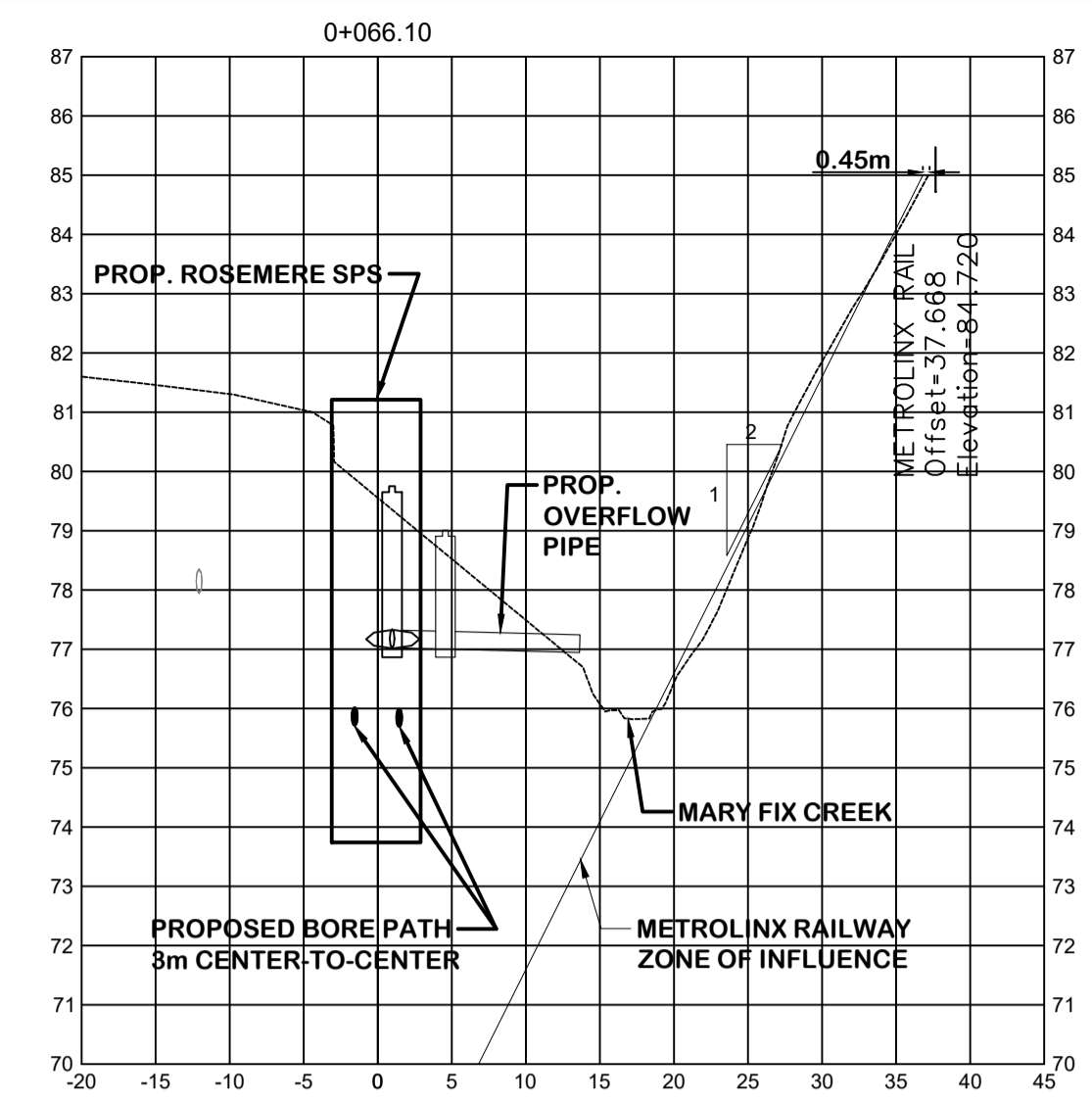
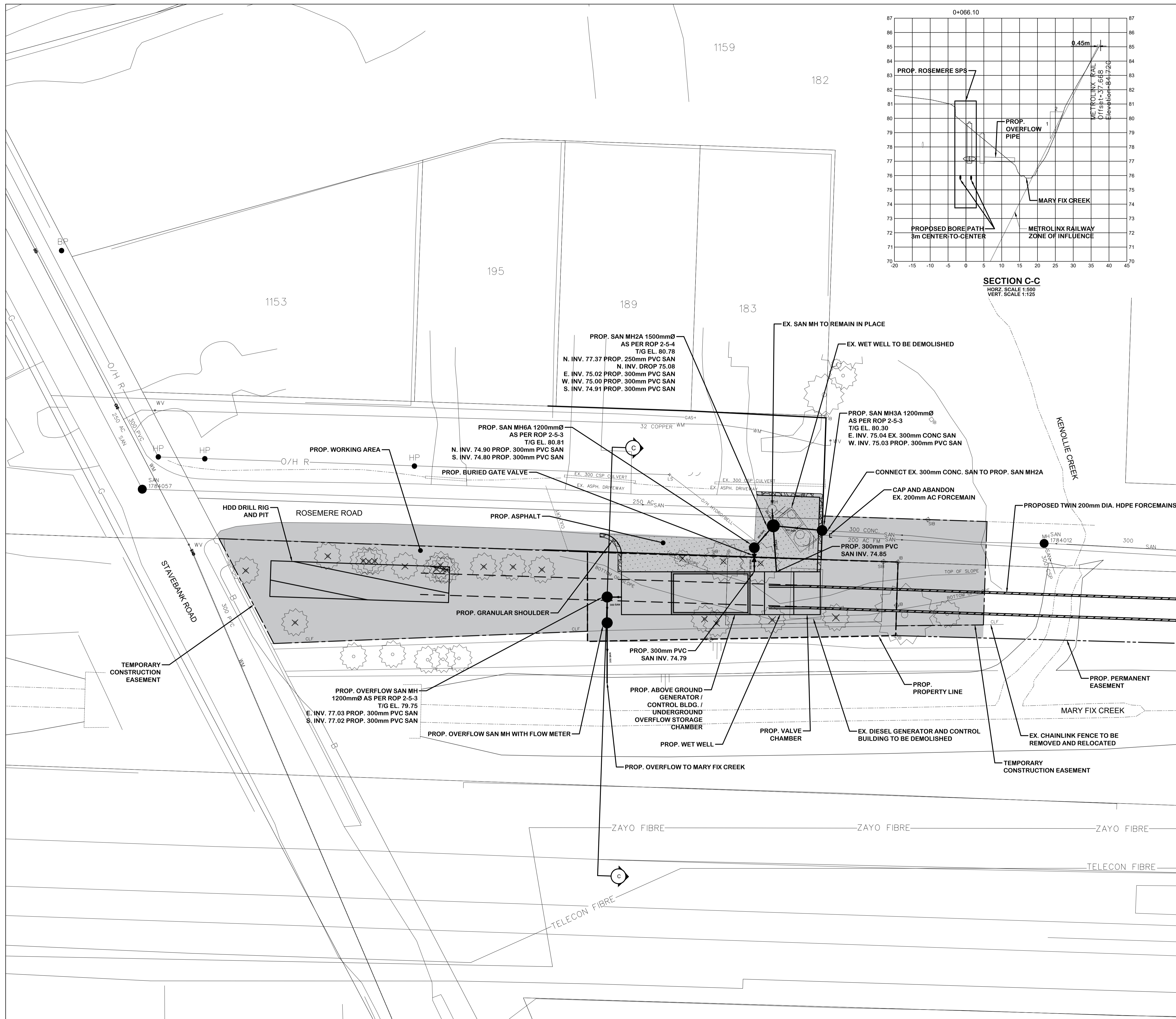
1 0 1 2 4
 1:100 (m) HORIZONTAL SCALE 1:100



PORT CREDIT EAST CLASS EA
 ROSEMERE SPS PRELIMINARY DESIGN
 SITE PLAN

DWG No. C01	Area	Project No. 16-2905
Checked by BP	Drawn by KK	Plan No. C01
Date FEBRUARY 2023	Sheet 2 of 11	

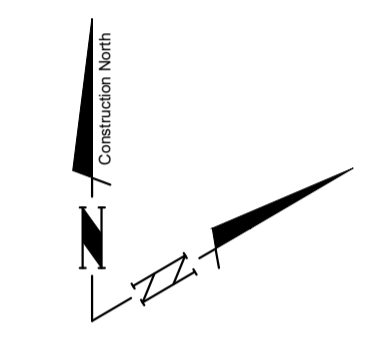




SECTION C-C
 HORZ. SCALE 1:500
 VERT. SCALE 1:125

REVISIONS		
DATE	DETAILS	INIT.
FEB. 16, 2023	DRAFT PRELIMINARY DESIGN DRAWINGS FOR REVIEW	BP
APR. 10, 2023	ISSUED FOR PRELIMINARY DESIGN REPORT	BP

- NOTES:**
- REGIONAL FLOOD WATER SURFACE ELEVATION OF 80.81m.
 - PROPOSED ELEVATIONS ARE APPROXIMATE AND FOR CONCEPTUAL DESIGN ONLY.



HORIZONTAL SCALE 1:250

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
 All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
 All Horizontal And Vertical Bends Are In Degrees
 All Pipes Size In mm
 20C Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only. To Be Verified In Field By Contractor.

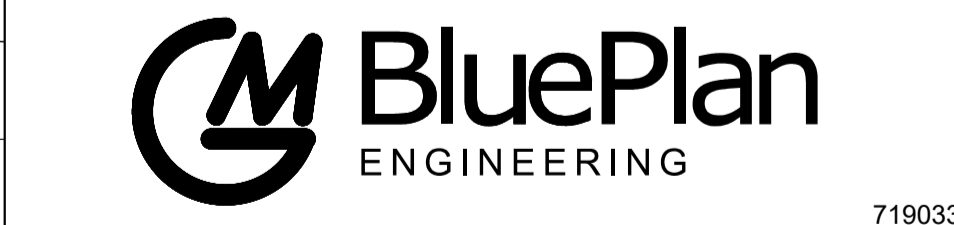
Designed by: _____
 Chkd: _____
 Approved by: _____

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
 CITY OF MISSISSAUGA WORKS DEPT.
 TOWN OF CALEDON WORKS DEPT.
 BELL CANADA
 ENBRIDGE INCORPORATED-GAS DISTRIBUTION
 ONTARIO MINISTRY OF TRANSPORTATION
 ONTARIO CLEAN WATER AGENCY
 HYDRO ONE NETWORKS
 ENERSOURCE, HYDRO MISSISSAUGA
 HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBROPTIC PROVIDERS:
 BELL CANADA
 ENERSOURCE TELECOM
 HYDRO ONE TELECOM
 ROGERS CABLE
 ALLSTREAM
 PSN (PUBLIC SECTOR NETWORK)
 FUTURWAY (FCI BROADBAND)

1:250 (m) HORIZONTAL SCALE 1:250



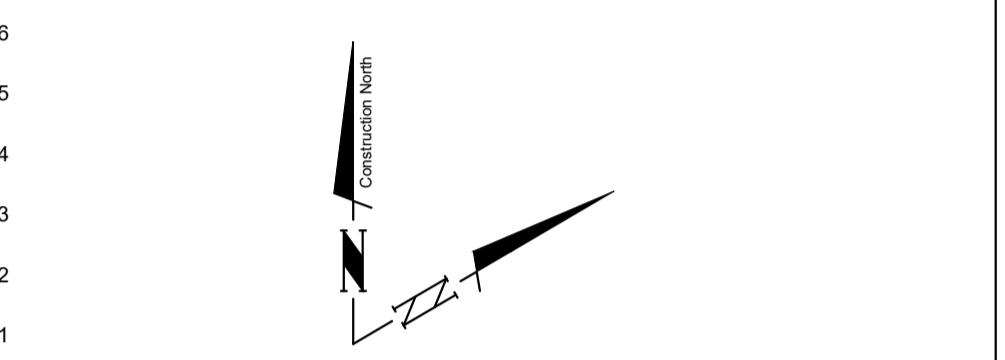
PORT CREDIT EAST CLASS EA
 ROSEMERE SPS PRELIMINARY DESIGN
 SITE PLAN

DWG No. C02	Area	Project No. 16-2905
Checked by BP	Drawn by KK	Plan No. C02
Date FEBRUARY 2023	Sheet 3 of 11	

REVISIONS		
DATE	DETAILS	INIT.
FEB. 16, 2023	DRAFT PRELIMINARY DESIGN DRAWINGS FOR REVIEW	BP
APR. 10, 2023	ISSUED FOR PRELIMINARY DESIGN REPORT	BP

KEY PLAN (N.T.S.)

- NOTES:
- REGIONAL FLOOD WATER SURFACE ELEVATION OF 88.81m.
 - PROPOSED ELEVATIONS ARE APPROXIMATE AND FOR CONCEPTUAL DESIGN ONLY.



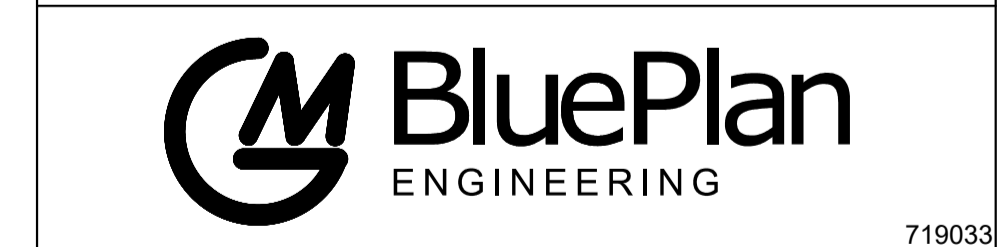
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:50

- General Notes**
- All Driveways Are ASPHALT Unless Otherwise Noted
 - All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
 - All Horizontal And Vertical Bends Are In Degrees
 - All Pipes Size In mm
 - 20C Existing Water Service, Size In mm
 - WS25 Proposed Water Service, Size In mm

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only. To Be Verified In Field By Contractor.

Designed by	Chkd.	Approved by
-------------	-------	-------------

- NOTICE TO CONTRACTOR**
- 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING
- | | |
|--|---------------------------------------|
| THE REGIONAL MUNICIPALITY OF PEEL | CABLE TELEVISION/FIBROPTIC PROVIDERS: |
| CITY OF MISSISSAUGA WORKS DEPT. | BELL CANADA |
| TOWN OF CALEDON WORKS DEPT. | ENERSOURCE TELECOM |
| BELL CANADA | HYDRO ONE TELECOM |
| ENBRIDGE INCORPORATED-GAS DISTRIBUTION | ROGERS CABLE |
| ONTARIO MINISTRY OF TRANSPORTATION | ALLSTREAM |
| ONTARIO CLEAN WATER AGENCY | PSN (PUBLIC SECTOR NETWORK) |
| HYDRO ONE NETWORKS | FUTUREWAY (FCI BROADBAND) |
| ENERSOURCE, HYDRO MISSISSAUGA | |
| HYDRO ONE BRAMPTON | |

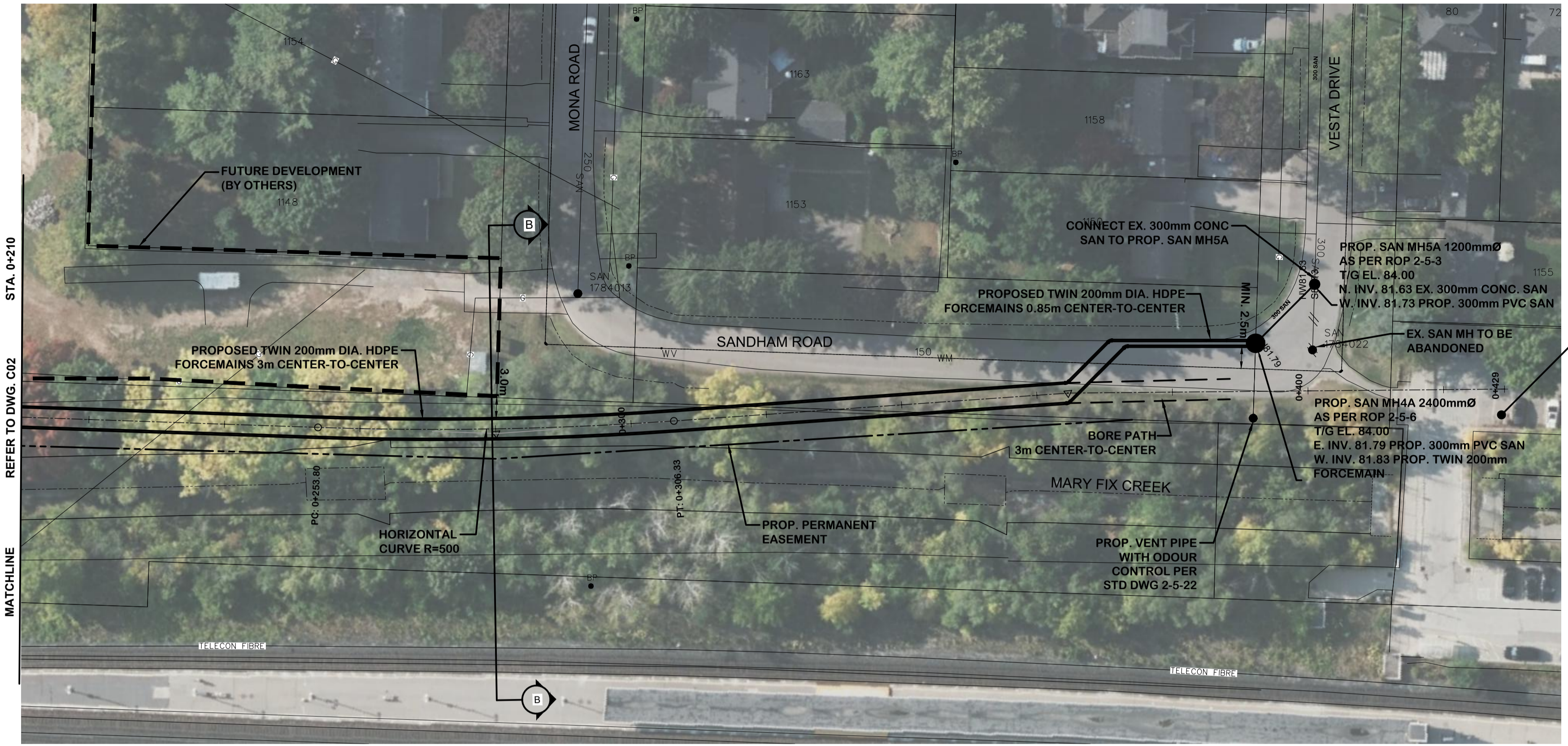


PORT CREDIT EAST CLASS EA

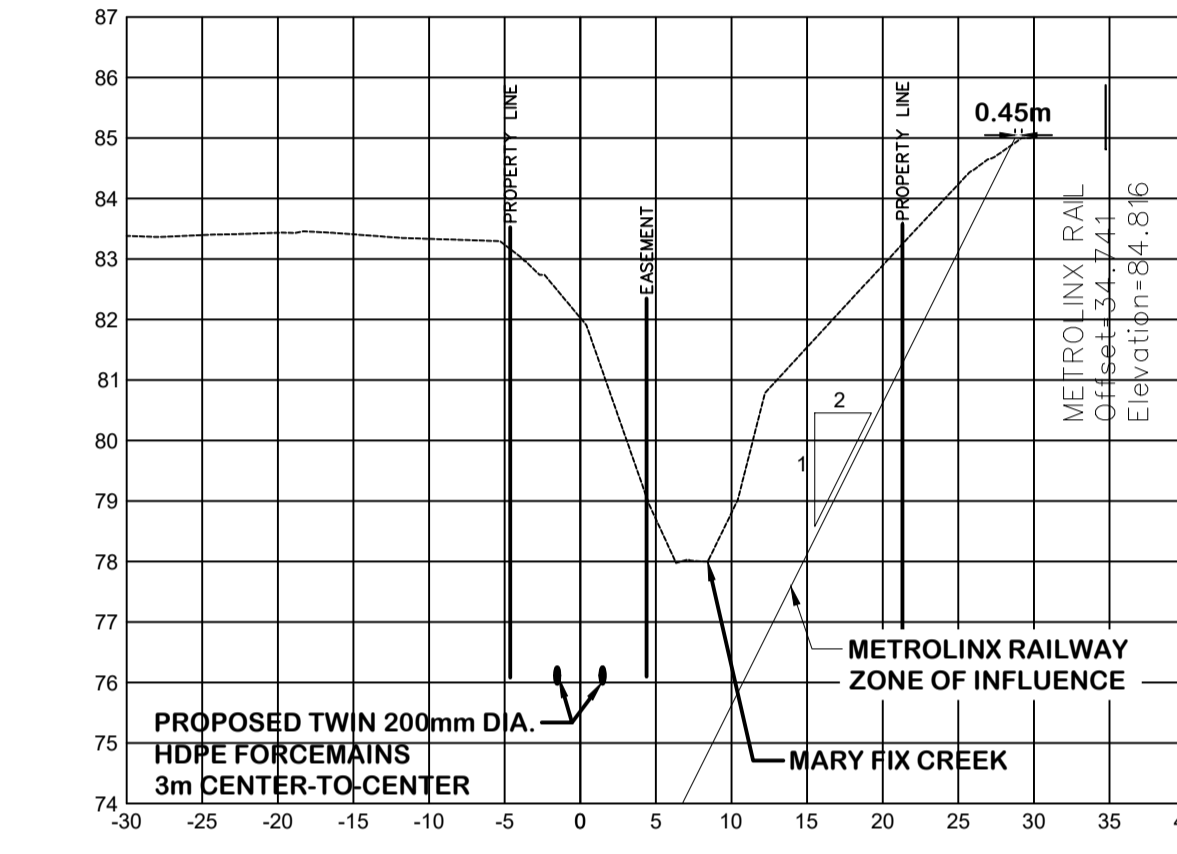
ROSEMERE SPS PRELIMINARY DESIGN

PROP. TWIN 200mm HDPE SANITARY FORCEMAIN

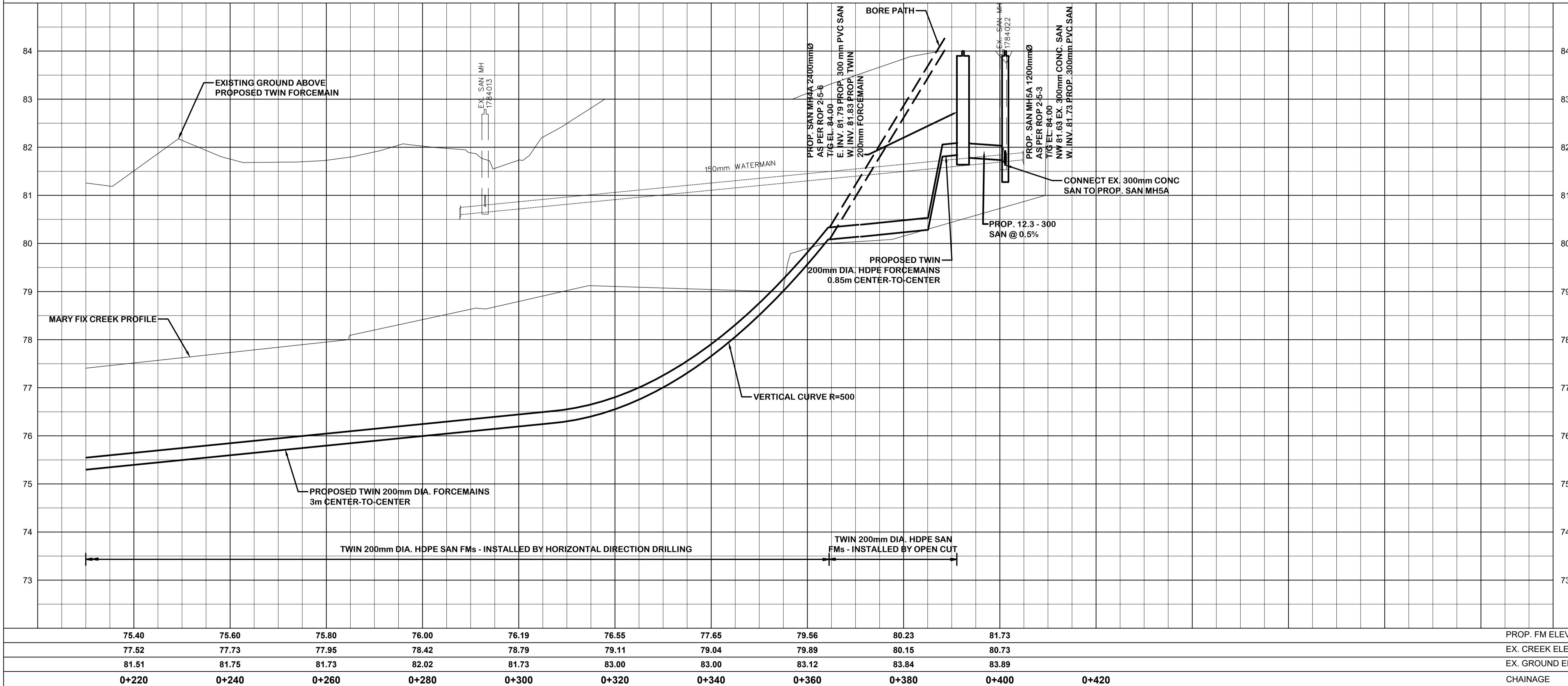
PROP. FM ELEV.	STA. 0+210	TO	STA. 0+420
EX. CREEK ELEV.			
EX. GROUND ELEV.			
CHAINAGE	DWG No. C04	Area	Project No. 16-2905
	Checked by BP	Drawn by KK	Plan No. C04
	Date FEBRUARY 2023	Sheet 5 of 11	



PORT CREDIT GO STATION NORTH PARKING LOT IS A POTENTIAL LAYDOWN AREA FOR HDPE SAN FM PIPE PULL BACK, SUBJECT TO PERMISSIONS AND COORDINATION.



SECTION B-B
HORZ. SCALE 1:500
VERT. SCALE 1:125

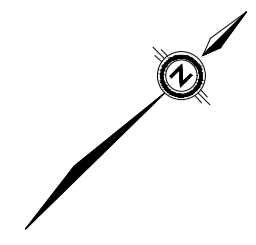


A large, bold, grey '3D' graphic is centered on the page, overlaid on a background map of a residential area with streets and green spaces.

Region of Peel

APPENDIX 3D

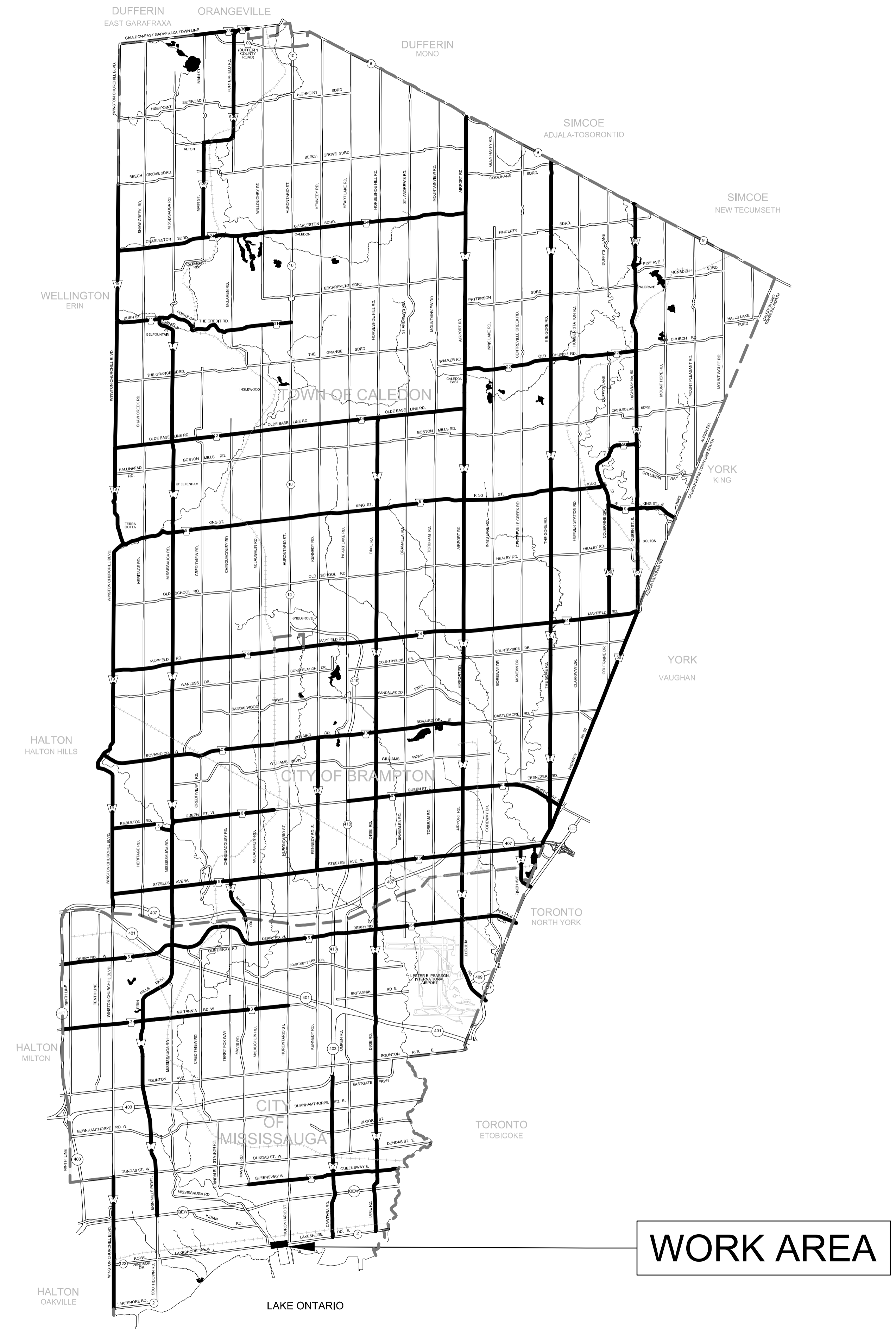
PRELIMINARY DESIGN OF THE LAKESHORE, ELMWOOD AND HIAWATHA COMPONENT



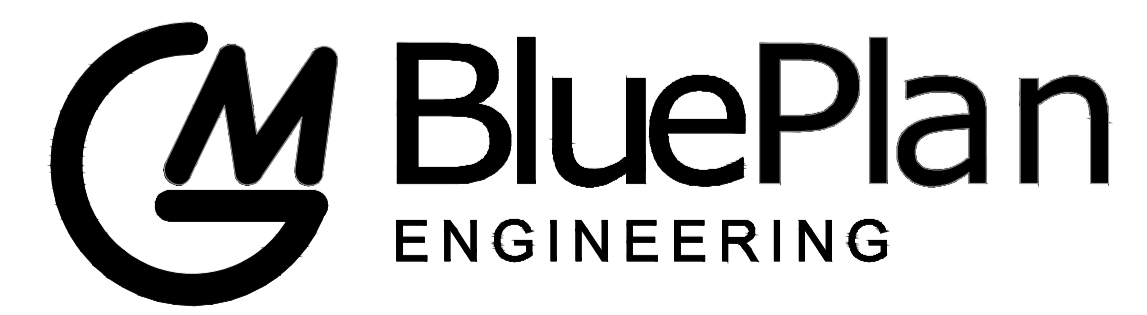
PROJECT No. XXXX MUNICIPAL CLASS EA LAKESHORE TRUNK SEWER AND WATERMAIN

FROM FRONT STREET TO ELMWOOD AVE. NORTH

PRELIMINARY DESIGN "ISSUED FOR ESR"



WORK AREA



Document XXXXX-XXXXT

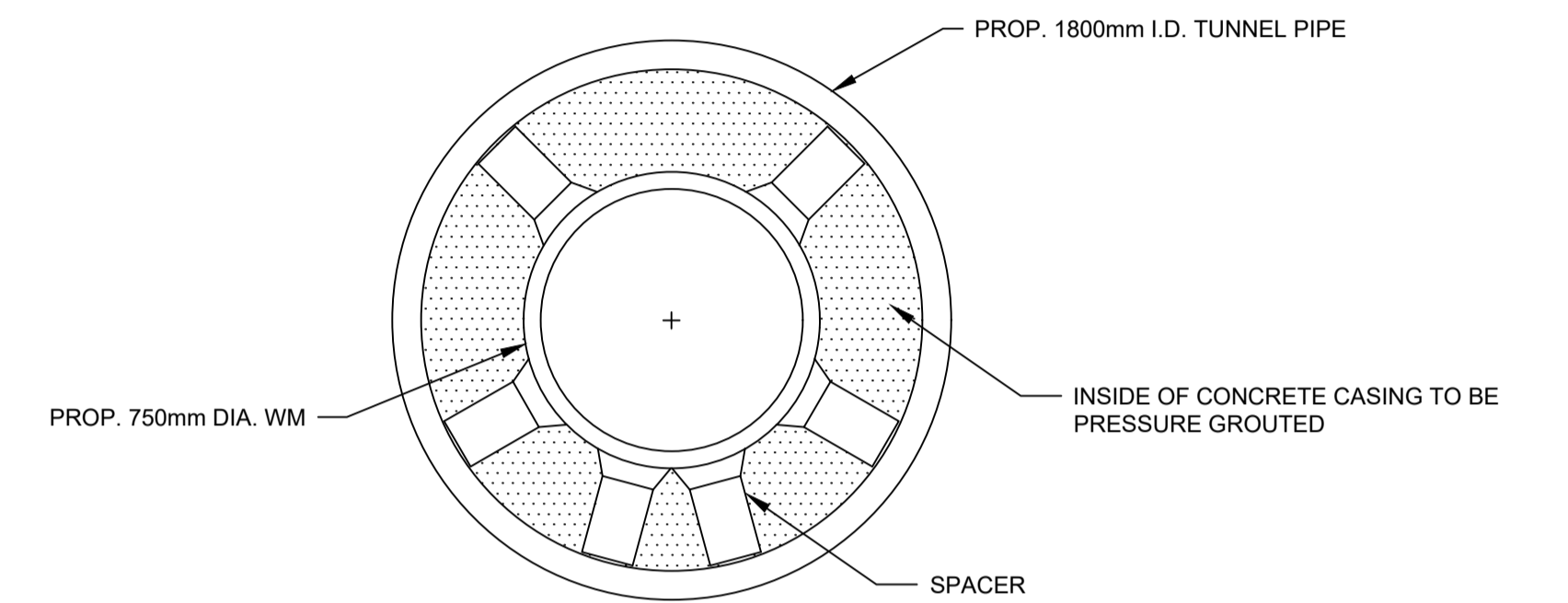
REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	

LEGEND

	EXISTING WATER VALVE CHAMBER		BOREHOLE		DITCH LINE
	EXISTING HYDRANT		SIB		EXISTING TOPOGRAPHICAL CONTOUR (M.A.S.L.)
	EXISTING WATER VALVE		EXISTING DECIDUOUS TREE		EXISTING STORM PIPE
	EXISTING WATER SERVICE		EXISTING CONIFEROUS TREE		EXISTING SANITARY PIPE
	EXISTING STORM MANHOLE				EXISTING WATER PIPELINE
	EXISTING SANITARY MANHOLE				EXISTING UNDERGROUND HYDRO
	EXISTING CATCH BASIN				EXISTING OVERHEAD HYDRO
	EXISTING HYDRO POLE AND GUY WIRE				EXISTING BELL
	EXISTING HAND WELL				EXISTING TV
	EXISTING LIGHT STANDARD				EXISTING GAS
	EXISTING BOLLARD				EXISTING FENCE
	EXISTING MAN DOOR				ROW PROPERTY LINE
	EXISTING SIGN				PROPERTY LINE
					PROPOSED SANITARY PIPELINE

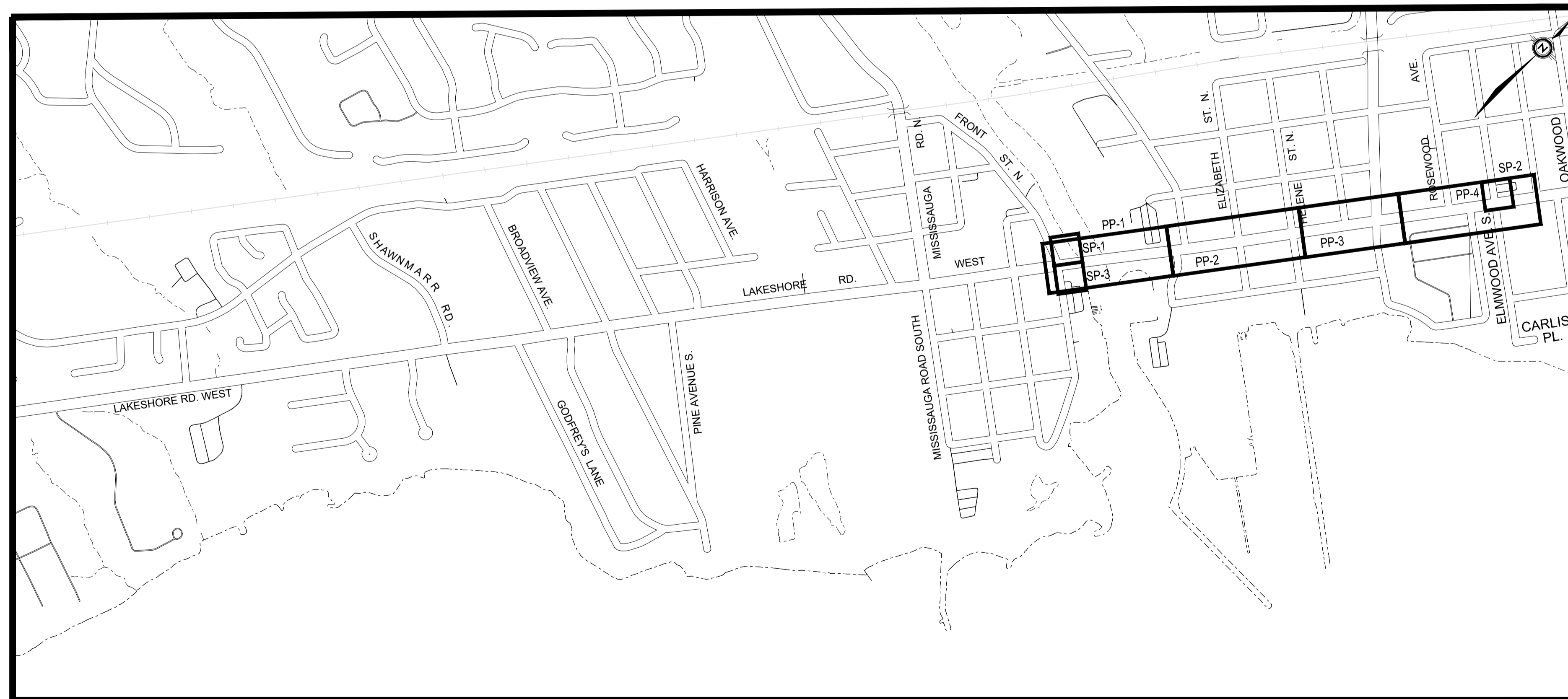
DRAWING INDEX

SHEET No.	DRAWING No.	DESCRIPTION	STATION
0		TITLE PAGE	
1	INDEX	INDEX, KEYPLAN, LEGEND AND DETAILS	
2	PP-1	LAKESHORE WATERMAIN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN	STA 3+080 TO STA 3+360
3	PP-2	LAKESHORE WATERMAIN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN	STA 3+360 TO STA 3+640
4	PP-3	LAKESHORE WATERMAIN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN	STA 3+640 TO STA 3+920
5	PP-4	LAKESHORE WATERMAIN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN	STA 3+920 TO STA 4+180
6	SP-1	SITE PLAN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN - SENDING SHAFT	
7	SP-2	SITE PLAN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN - RECEIVING SHAFT	
8	SP-3	SITE PLAN - PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN - SENDING SHAFT	



TYPICAL WATERMAIN TUNNEL DETAIL

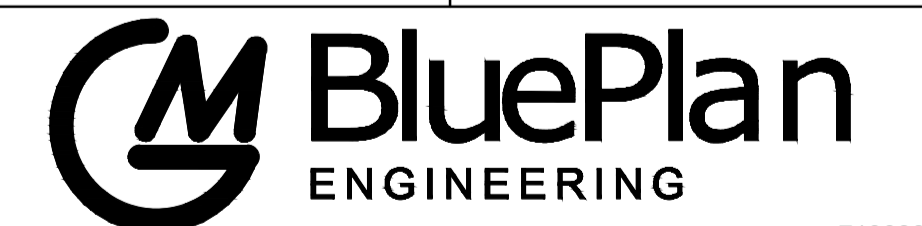
SCALE N.T.S.



KEY MAP

N.T.S.

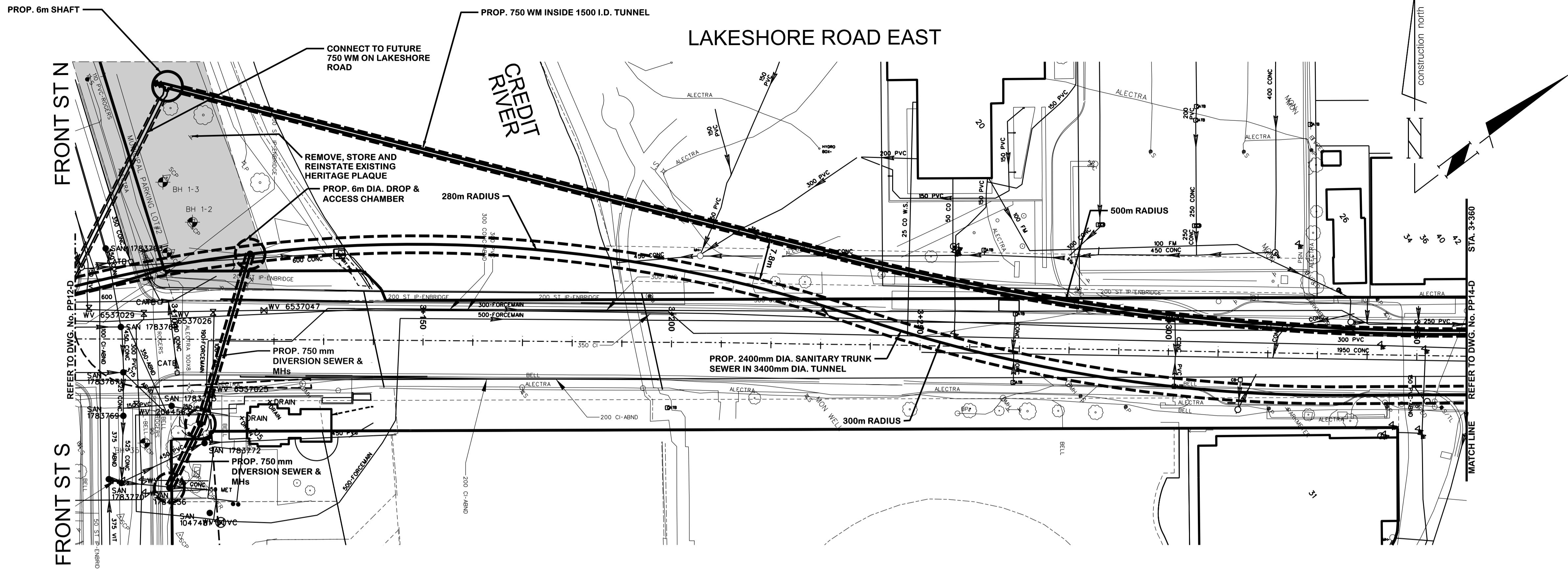
Designed by	Chkd.	Approved by
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INDEX, LEGEND, NOTES & DETAILS

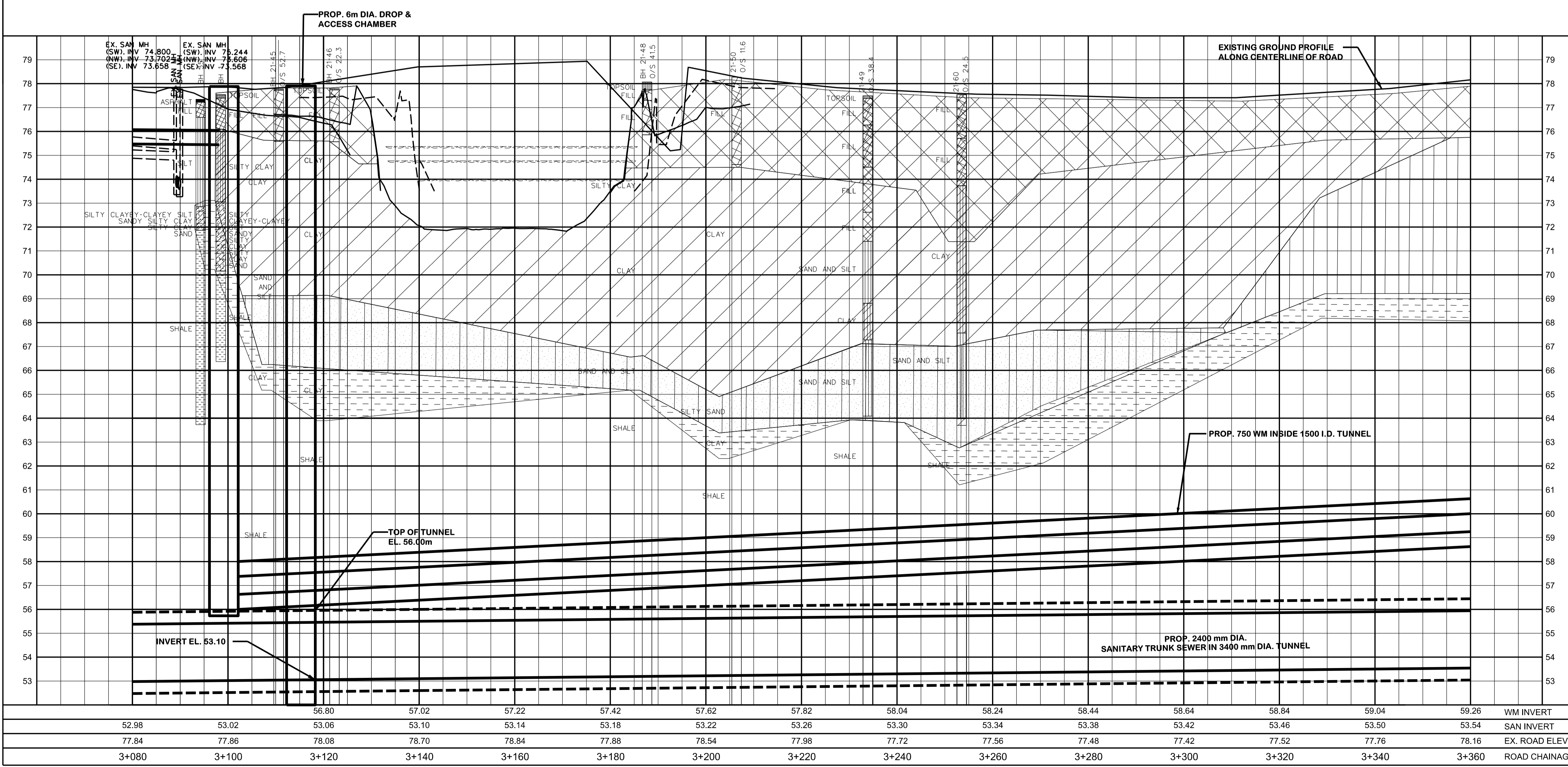
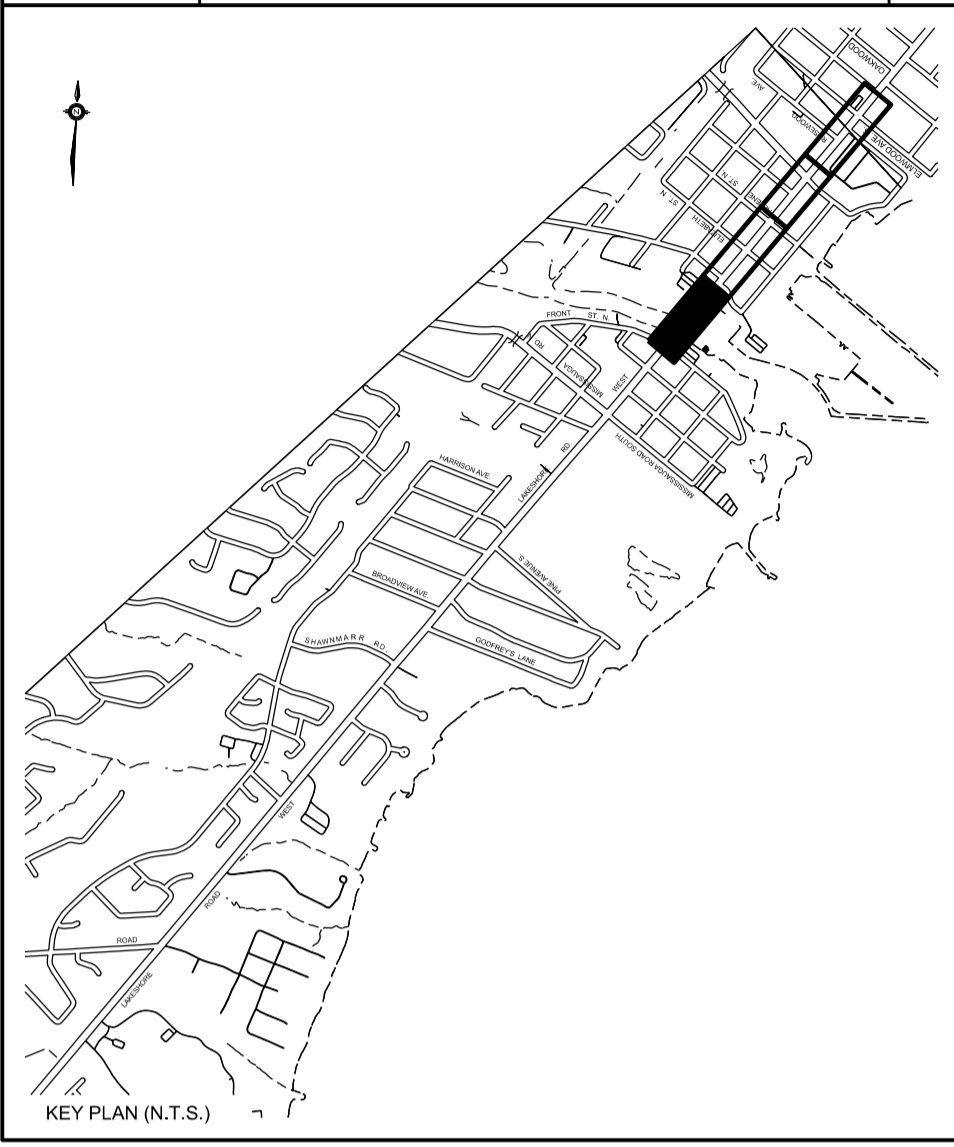
CAD Area	Area	Project No. 19-2215
Checked by BP	Drawn by B.A.	Plan No. INDEX
Date FEBRUARY 2023	Sheet 1 of 8	

LAKESHORE ROAD EAST



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATER MAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



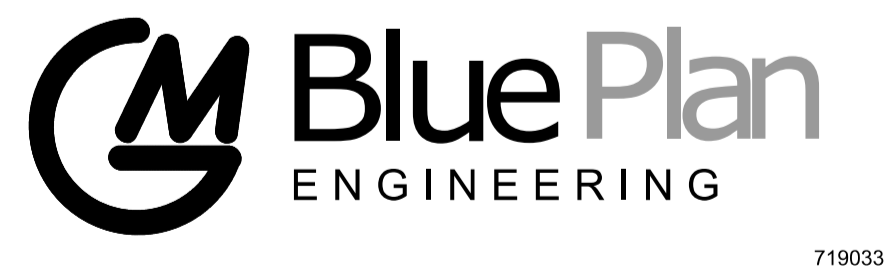
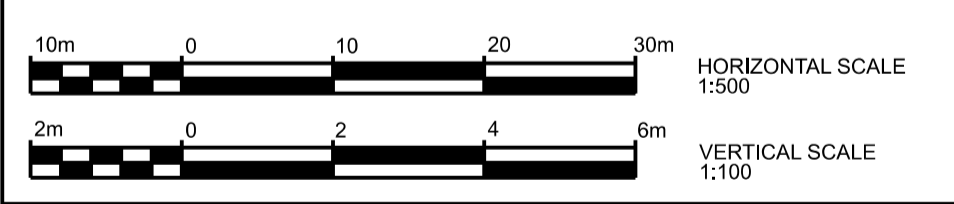
General Notes

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 All Horizontal And Vertical Bends Are In Degrees
 All Pipes Size In mm
 20C Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm
 B.M. No. Elev.
 Description Location
 The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____
 Approved by _____

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



LAKESHORE WATERMAIN
 (FROM FRONT STREET TO ELMWOOD AVE. N.)
PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN

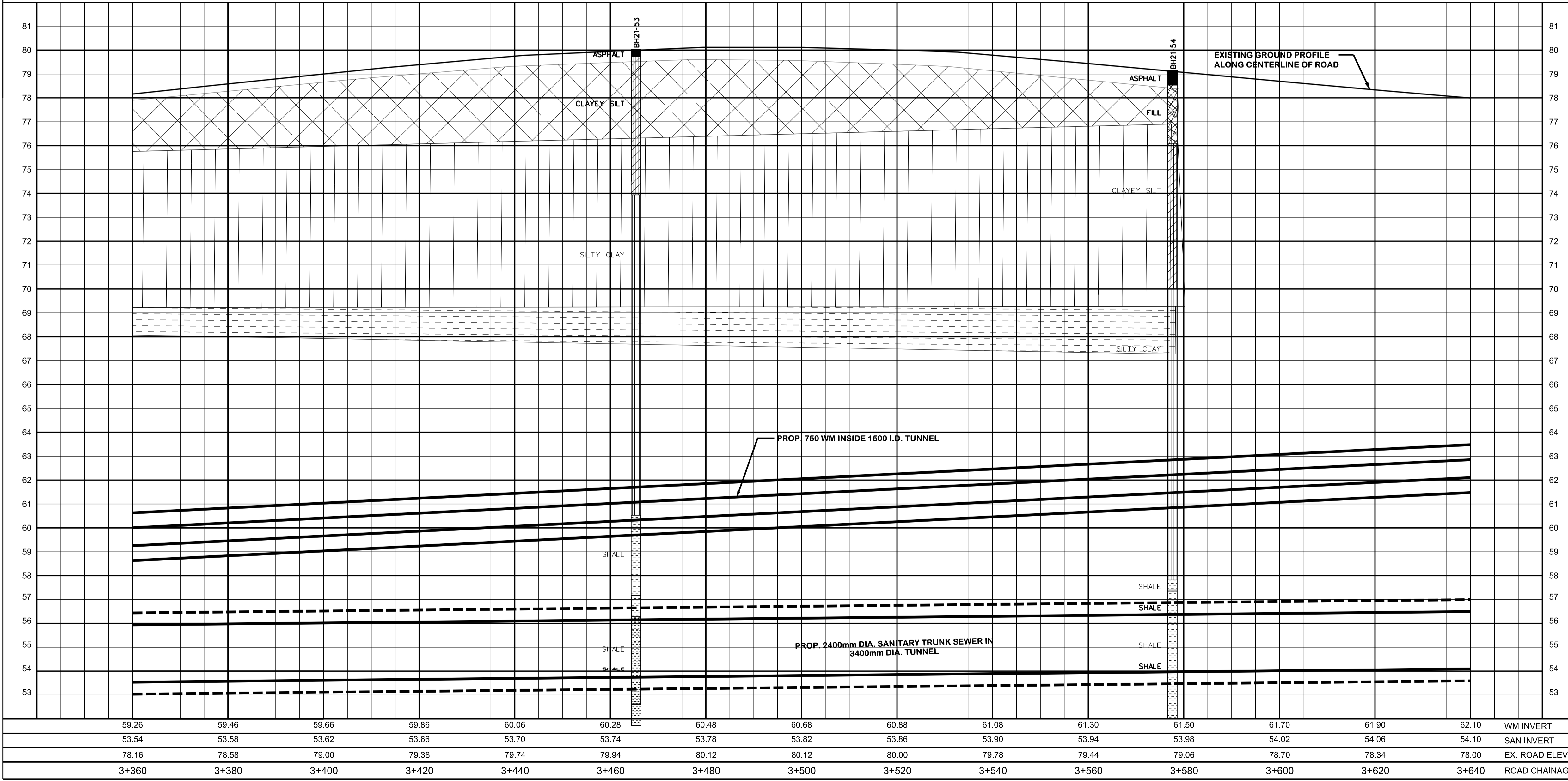
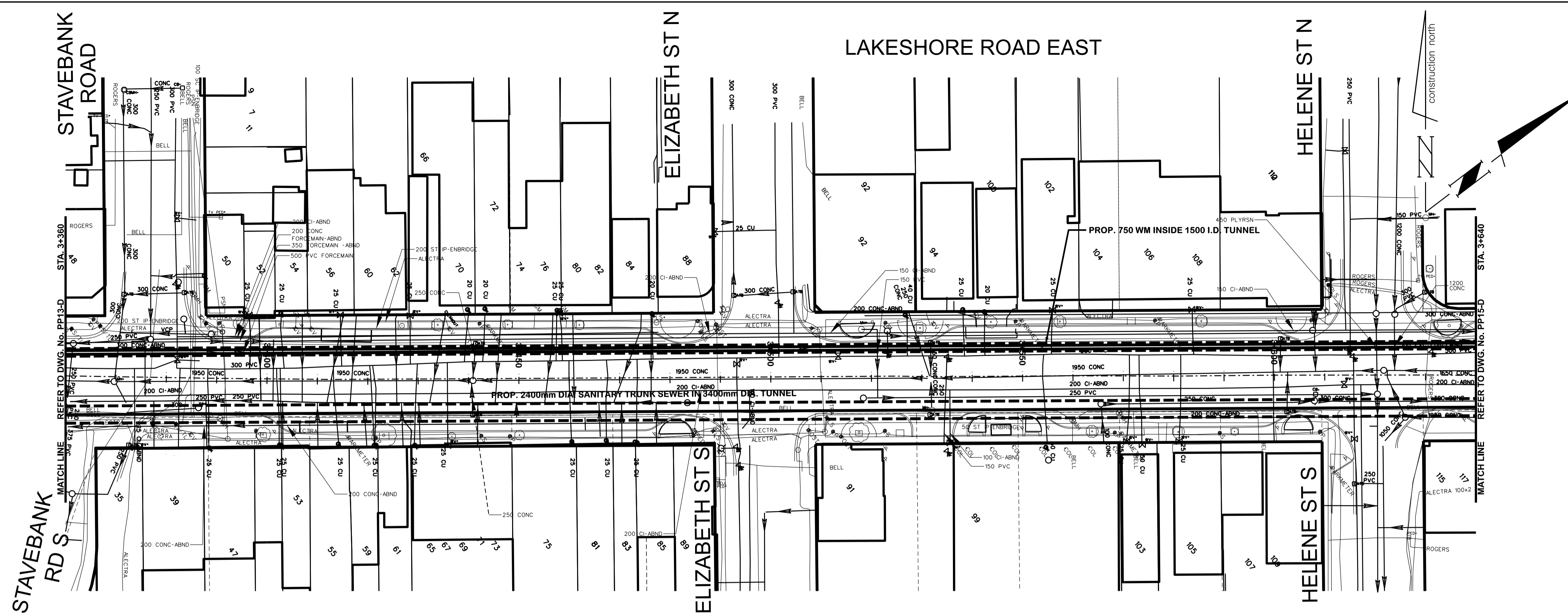
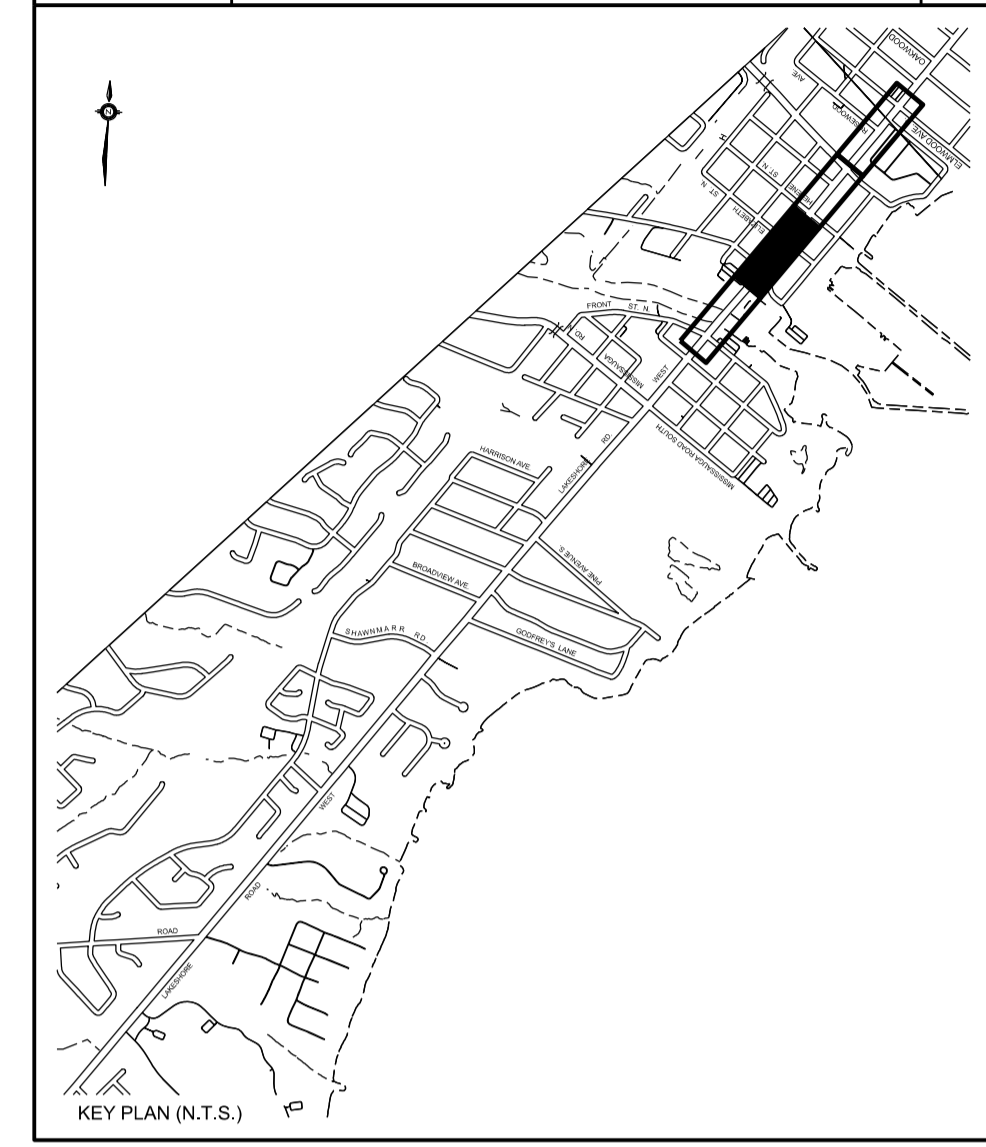
CAD Area	Area	Project No.
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53.10	78.70	
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53.18	77.88	
53.22	78.54	
53.26	77.98	
53.30	77.72	
53.34	77.56	
53.38	77.48	
53.42	77.42	
53.46	77.52	
53.50	77.76	
53.54	78.16	
53.58	78.16	
53.62	78.16	
53.66	78.16	
53.70	78.16	
53.74	78.16	
53.78	78.16	
53.82	78.16	
53.86	78.16	
53.90	78.16	
53.94	78.16	
53.98	78.16	

Checked by	Drawn by	Sheet	Project No.
B.P.	T.H.	2 of 8	19-2215

Date FEBRUARY 2023 Sheet 2 of 8 Plan No. **PP-1**

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



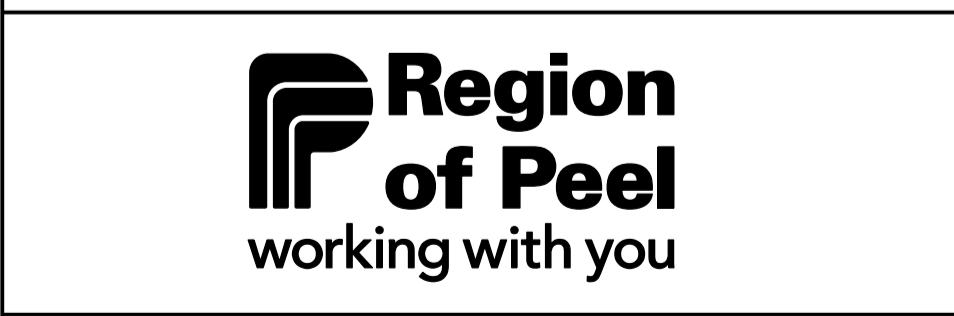
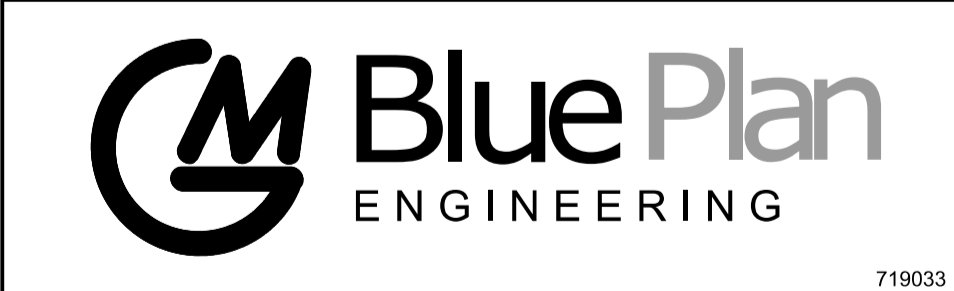
General Notes

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- All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
- All Horizontal And Vertical Bends Are In Degrees
- All Pipes Size In mm
- 20C Existing Water Service, Size In mm
- WS25 Proposed Water Service, Size In mm
- B.M. No. Elev.
- Description Location
- The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

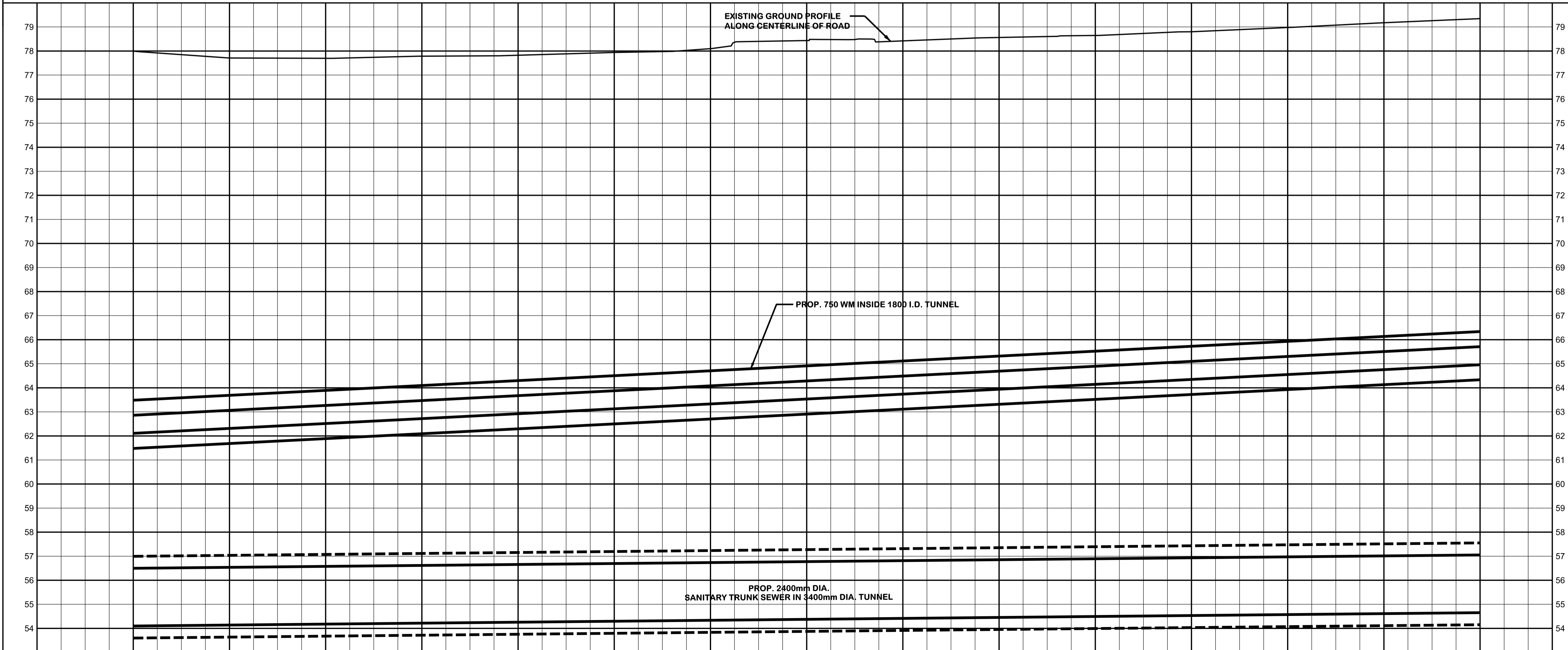
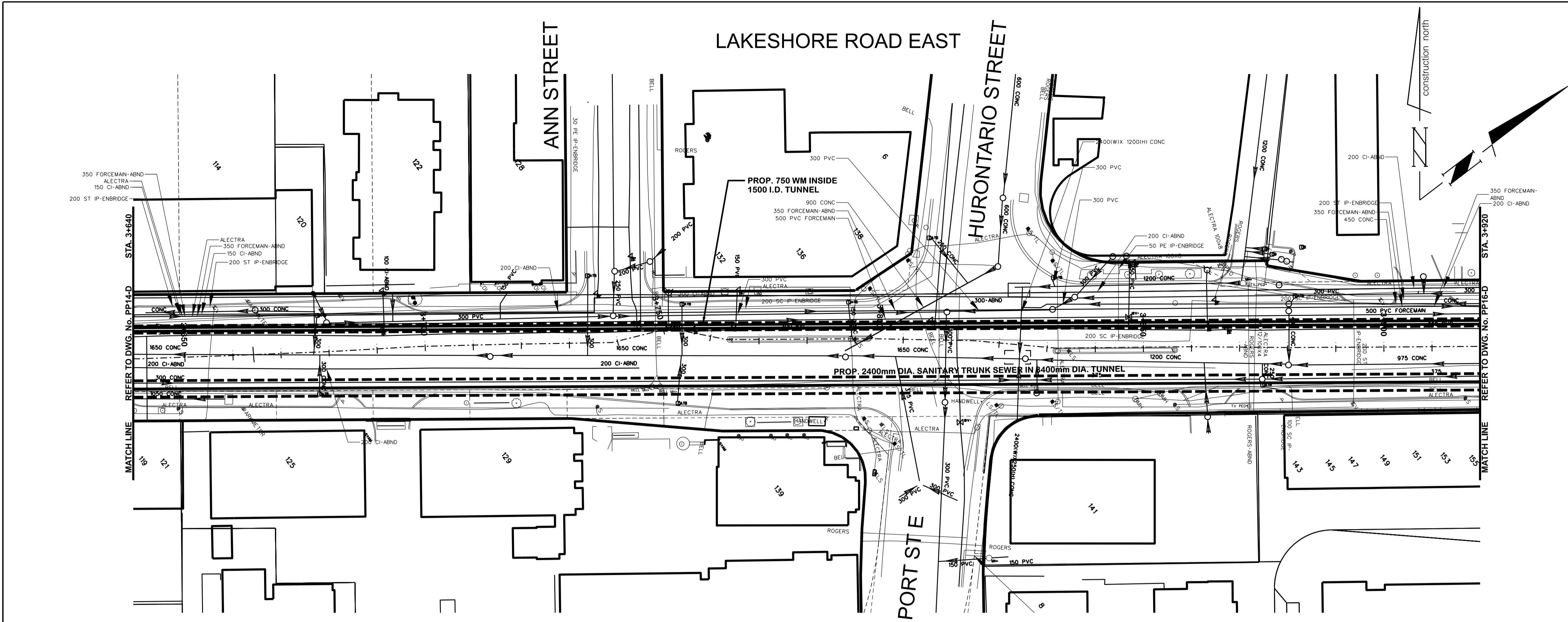
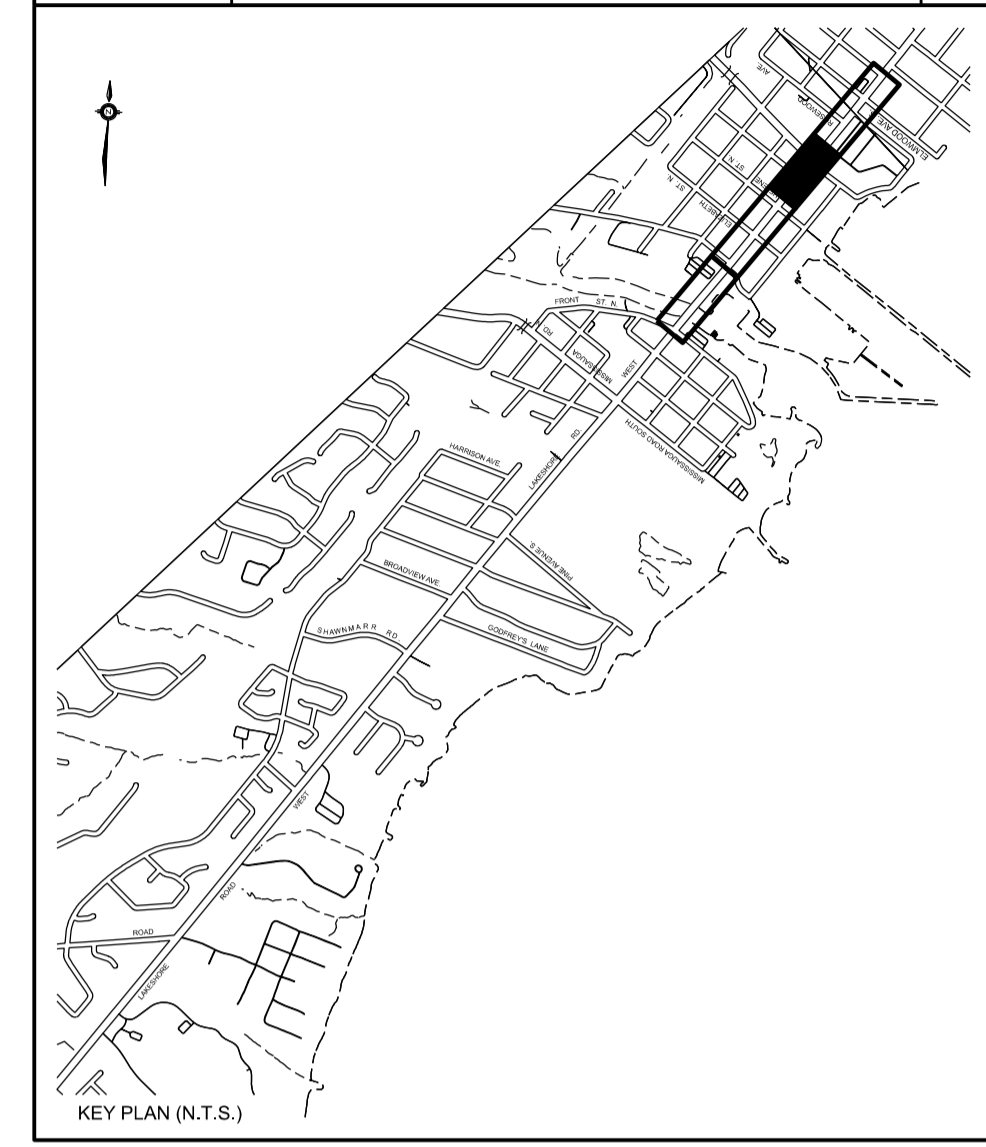


LAKESHORE WATERMAIN
(FROM FRONT STREET ELMWOOD AVENUE NORTH)
PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN

CAD Area	Area	Project No.	19-2215
Checked by B.P.	Drawn by T.H.	Sheet	3 of 8
Date FEBRUARY 2023	Sheet	Plan No.	PP-2

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



62.10	62.32	62.52	62.72	62.92	63.12	63.32	63.54	63.74	63.94	64.14	64.34	64.56	64.76	64.96	WM INVERT
54.10	54.14	54.18	54.22	54.26	54.30	54.34	54.38	54.42	54.46	54.50	54.54	54.58	54.62	54.66	SAN INVERT
78.00	77.72	77.70	77.78	77.82	77.94	78.10	78.44	78.42	78.56	78.64	78.80	78.98	79.18	79.34	EX. ROAD ELEV.
3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	ROAD CHAINAGE

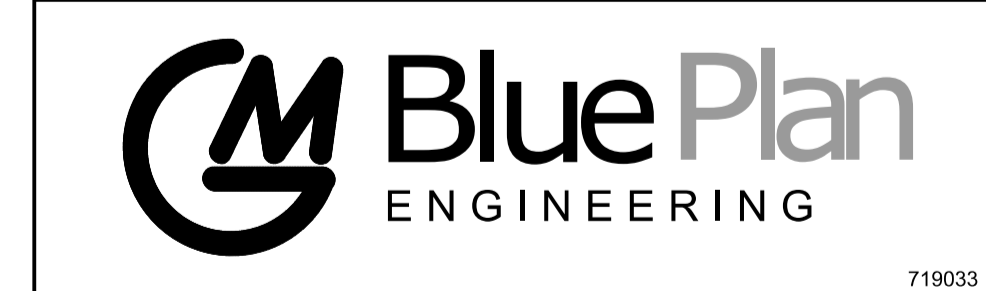
General Notes

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 B.M. No. Elev.
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Designed by _____ Chkd. _____
 Approved by _____

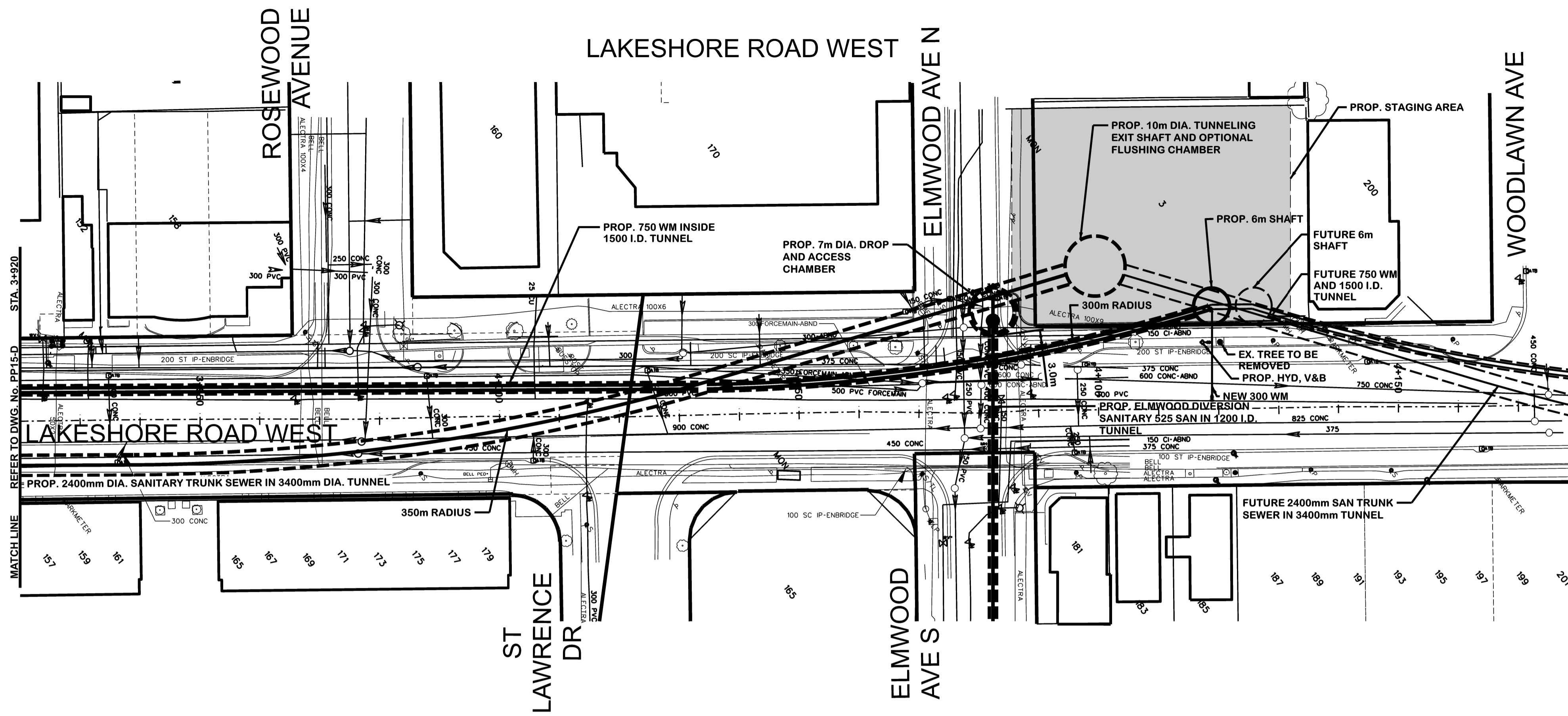
NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



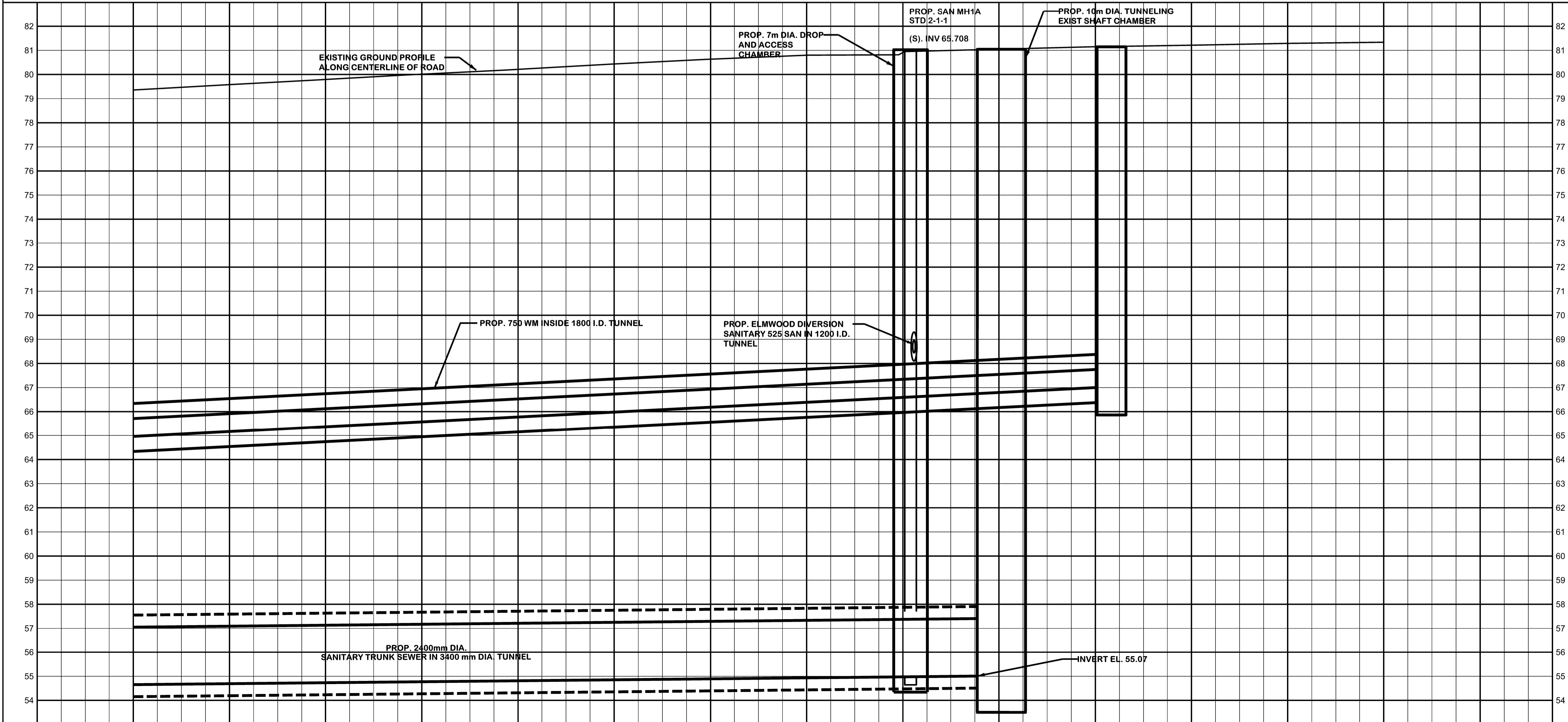
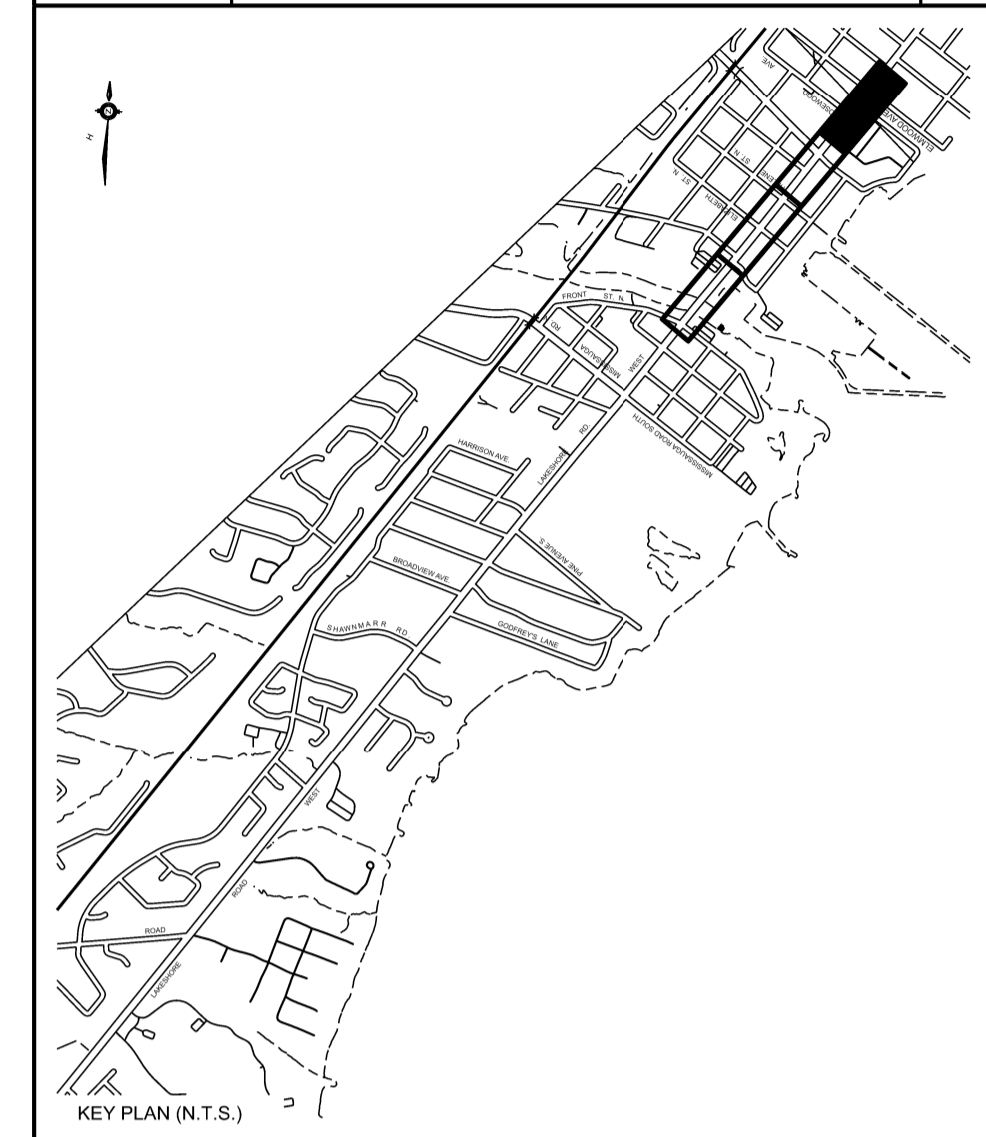
LAKESHORE WATERMAIN
 (FROM FRONT STREET TO ELMWOOD AVE. N.)
PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN

STA. 3+640	TO STA. 3+920
CAD Area	Area
Checked by B.P.	Drawn by T.H.
Date FEBRUARY 2023	Sheet 4 of 8
Project No. 19-2215	Plan No. PP-3



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



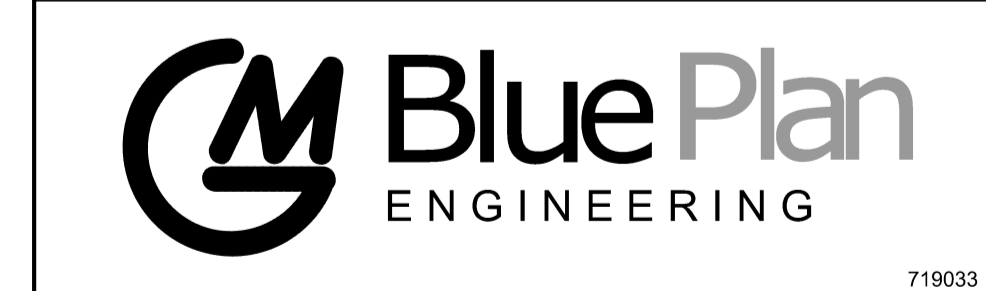
General Notes

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Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

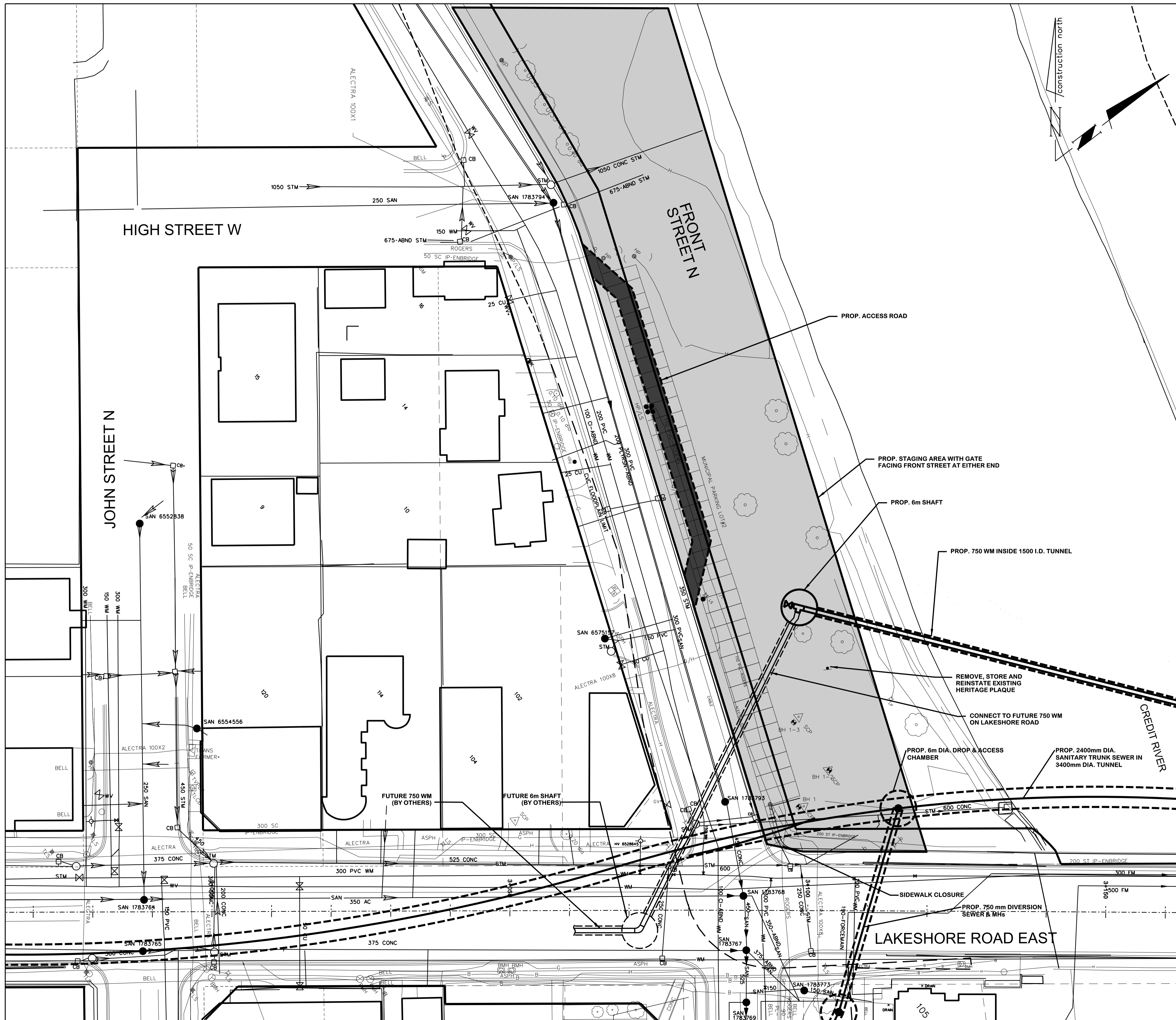
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



LAKESHORE WATERMAIN
(FROM FRONT STREET TO ELMWOOD AVE. N.)
PROP. 2400mm TRUNK SEWER AND 750mm WATERMAIN

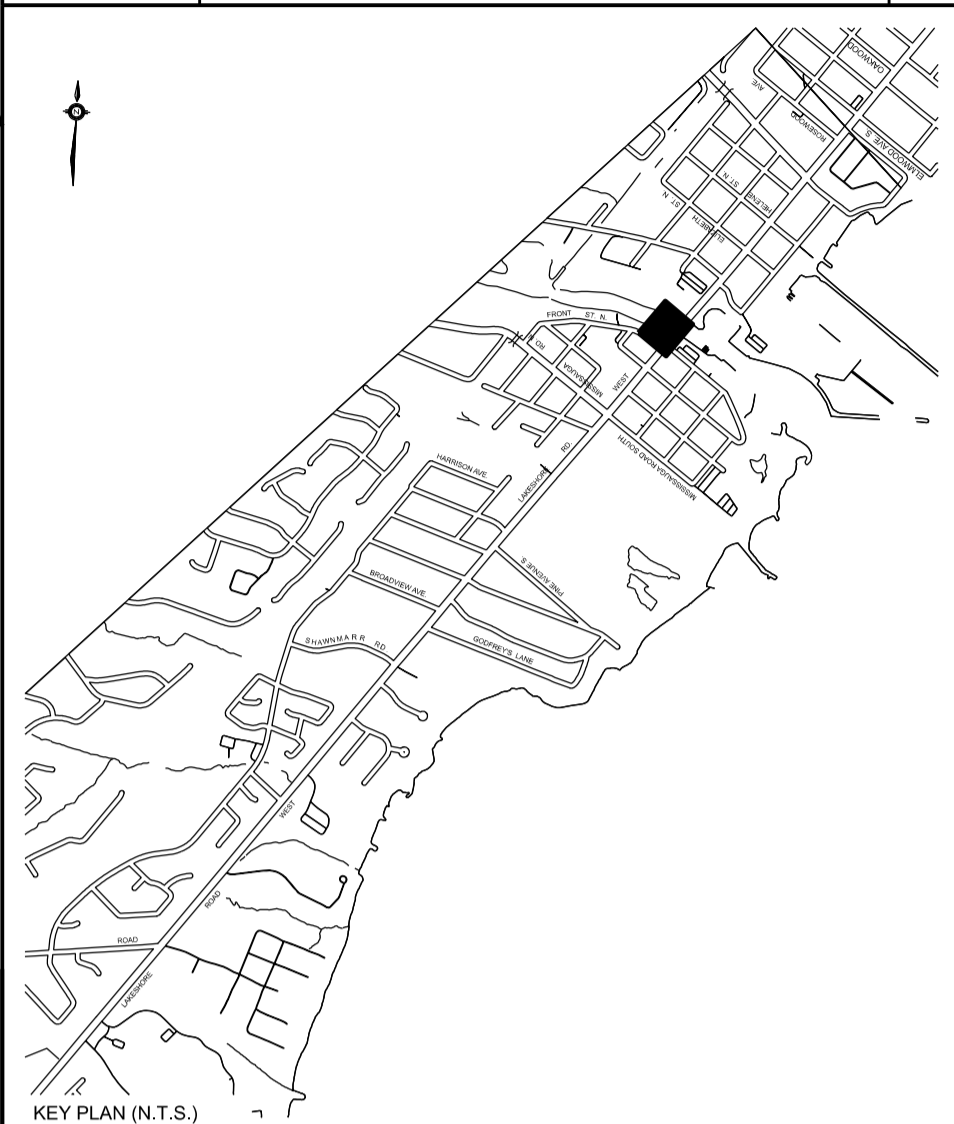
WM INVERT														STA. 3+920		TO STA. 4+180		
64.96	65.16	65.36	65.58	65.78	65.98	66.18	66.38	66.60	66.80	67.00								
54.66	54.70	54.74	54.78	54.82	54.86	54.90	54.94	54.98	55.02	55.06	55.10	55.14	55.18	55.22	55.26	55.30	55.34	55.38
79.34	79.58	79.80	80.02	80.22	80.44	80.64	80.80	80.92	81.04	81.14	81.22	81.28	81.34					
3+920	3+940	3+960	3+980	4+000	4+020	4+040	4+060	4+080	4+100	4+120	4+140	4+160	4+180					

SAN INVERT		EX. ROAD ELEV.		ROAD CHAINAGE		Project No.	
CAD Area	Area	Checked by	B.P.	Drawn by	T.H.	19-2215	
Date	FEBRUARY 2023	Sheet	5 of 8	Plan No.			PP-4



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



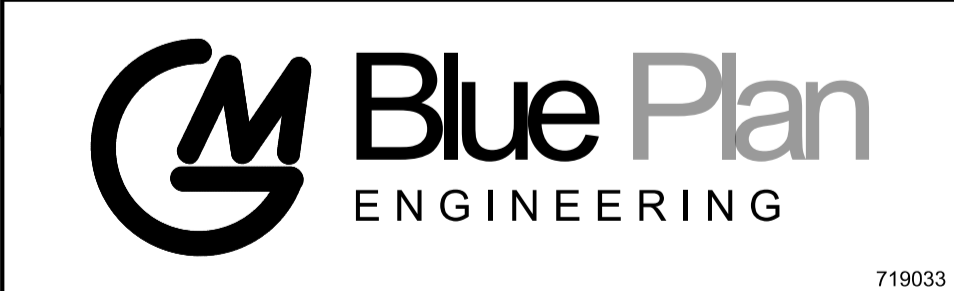
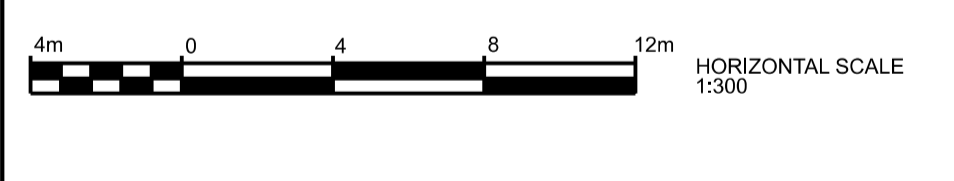
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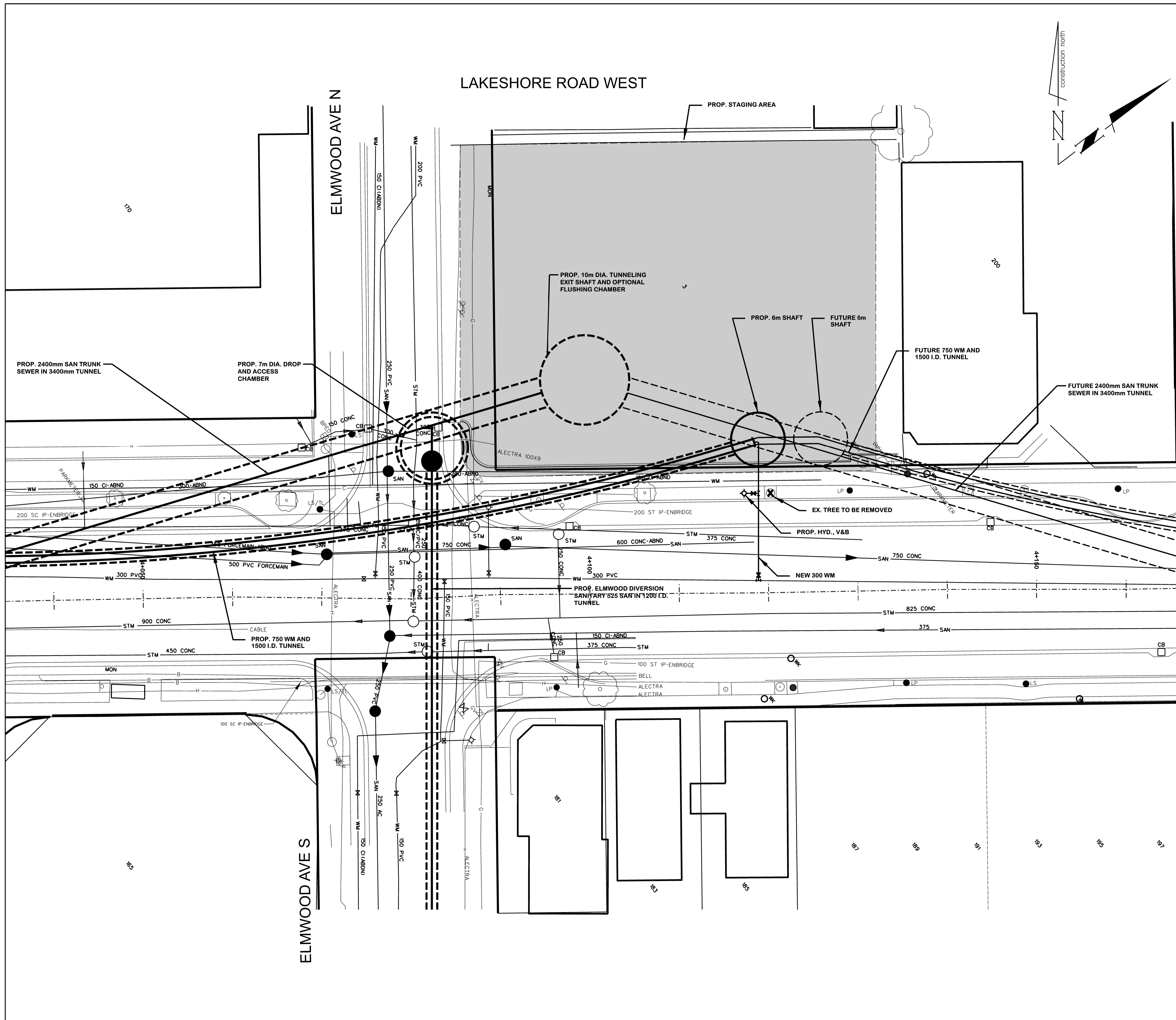
NOTICE TO CONTRACTOR
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CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
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ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



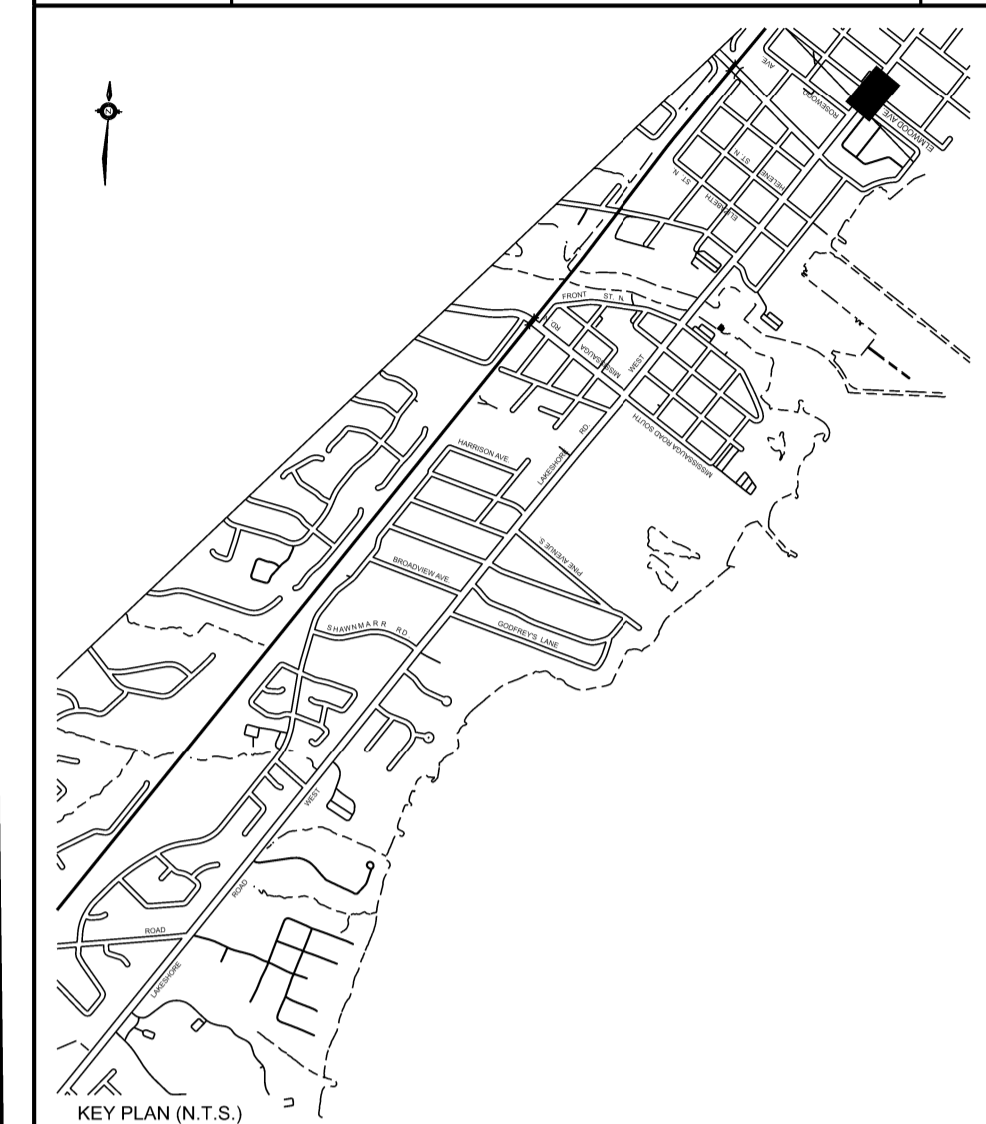
LAKESHORE WATERMAIN
SITE PLAN
PROP. 2400mm TRUNK SEWER
AND 750mm WATERMAIN SENDING SHAFT

CAD Area	Area	Project No.	19-2215
Checked by B.P.	Drawn by T.H.	Sheet	6 of 8
Date FEBRUARY 2023		Plan No.	SP-1



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



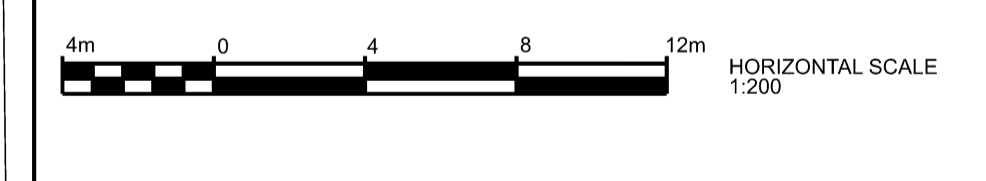
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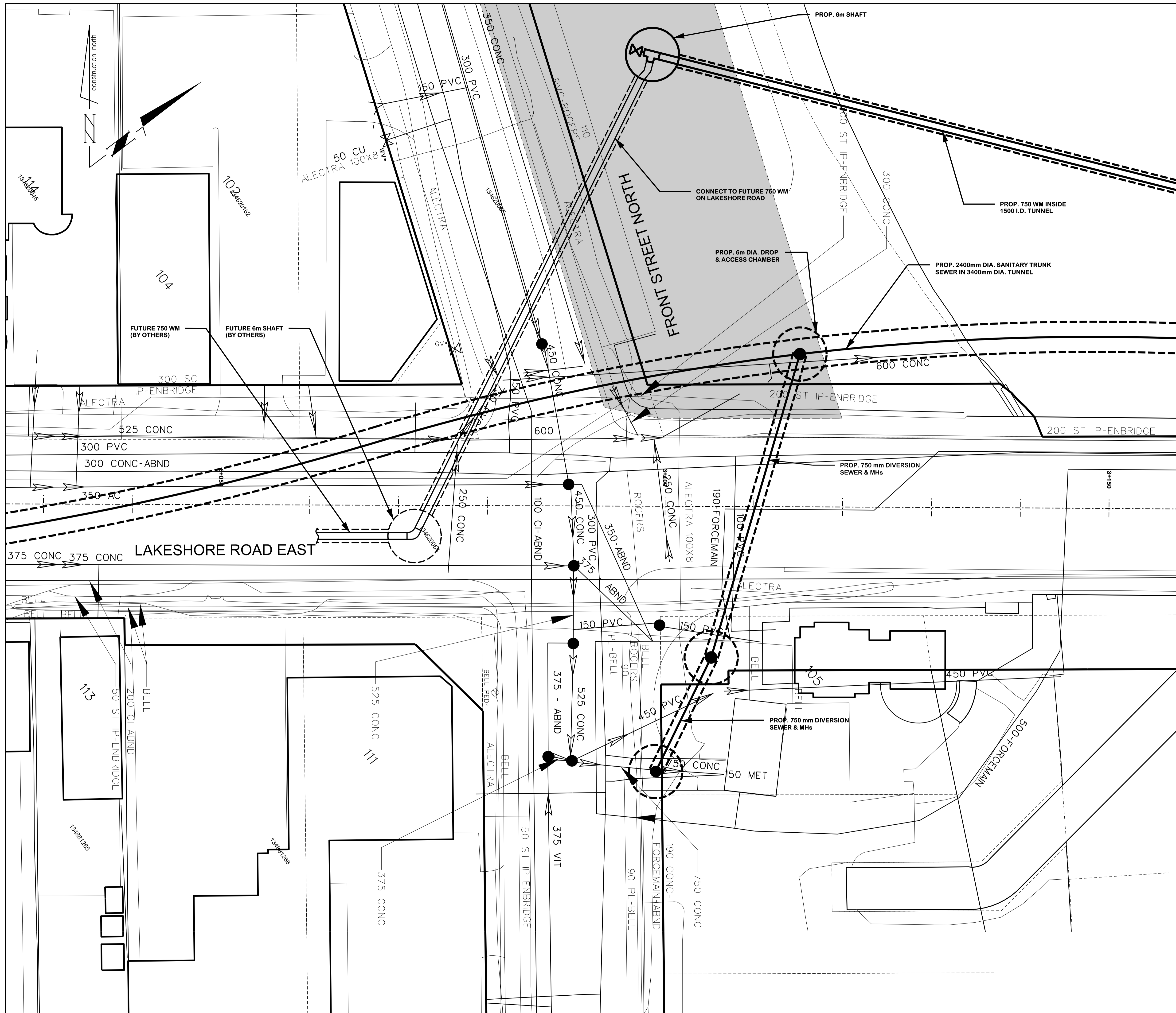
THE REGIONAL MUNICIPALITY OF PEEL CITY OF MISSISSAUGA WORKS DEPT. CITY OF BRAMPTON WORKS DEPT. TOWN OF CALEDON WORKS DEPT. BELL CANADA ENBRIDGE INCORPORATED-GAS DISTRIBUTION ONTARIO MINISTRY OF TRANSPORTATION ONTARIO CLEAN WATER AGENCY HYDRO ONE NETWORKS ENERSOURCE, HYDRO MISSISSAUGA HYDRO ONE BRAMPTON	CABLE TELEVISION/FIBROPTIC PROVIDERS: BELL CANADA ENERSOURCE TELECOM HYDRO ONE TELECOM ROGERS CABLE ALLSTREAM PSN (PUBLIC SECTOR NETWORK) FUTUREWAY (FCI BROADBAND)
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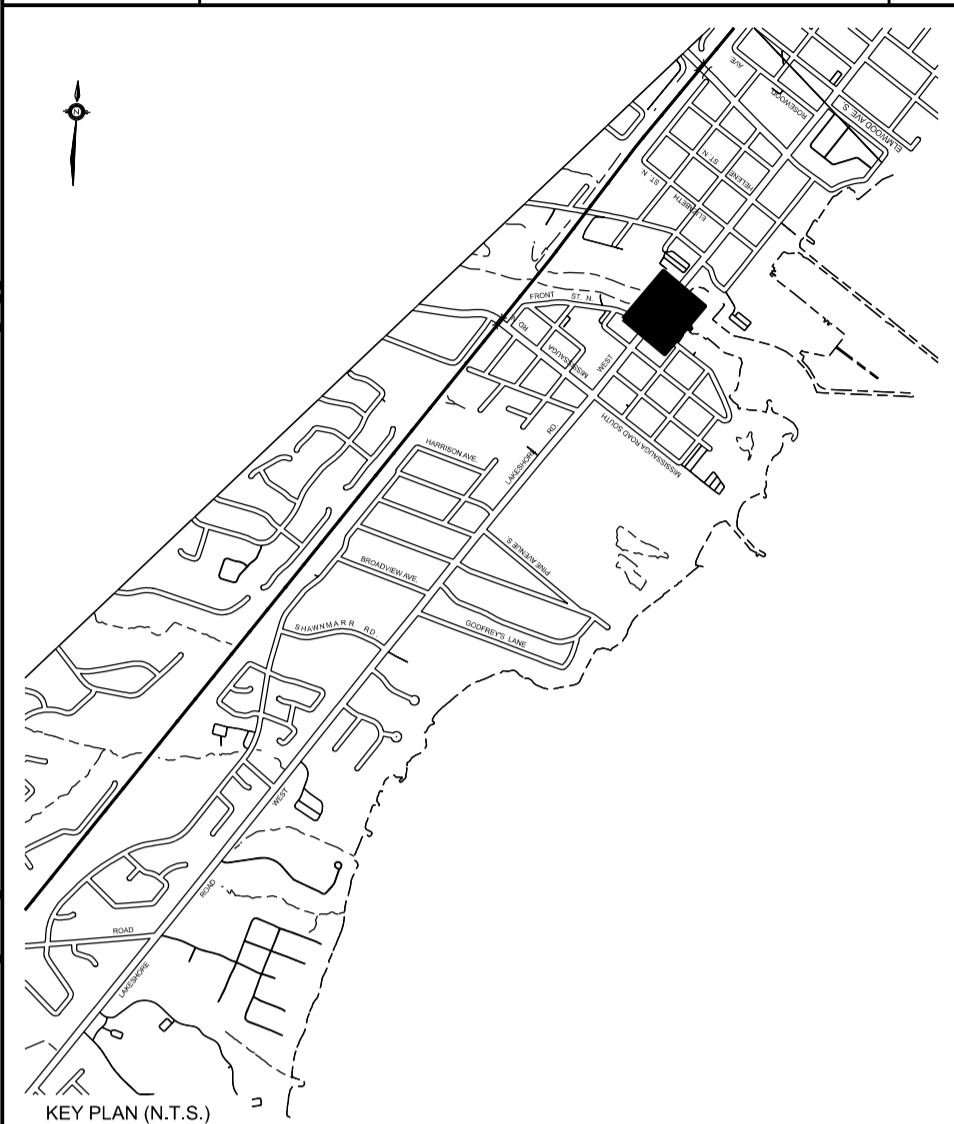
LAKESHORE WATERMAIN

SITE PLAN
 PROP. 2400mm TRUNK SEWER
 AND 750mm WATERMAIN RECEIVING SHAFT

CAD Area	Area	Project No.	19-2215
Checked by	B.P.	Drawn by	T.H.
Date	FEBRUARY 2023	Sheet	7 of 8
		Plan No.	SP-2



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		



REVISIONS		
DATE	DETAILS	INIT.
MAR XX 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
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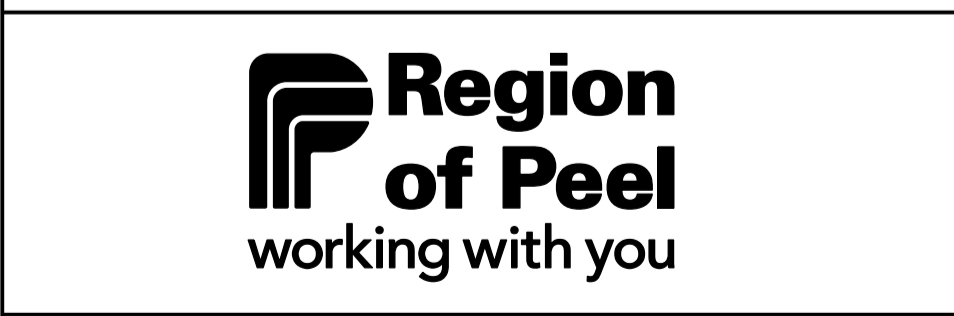
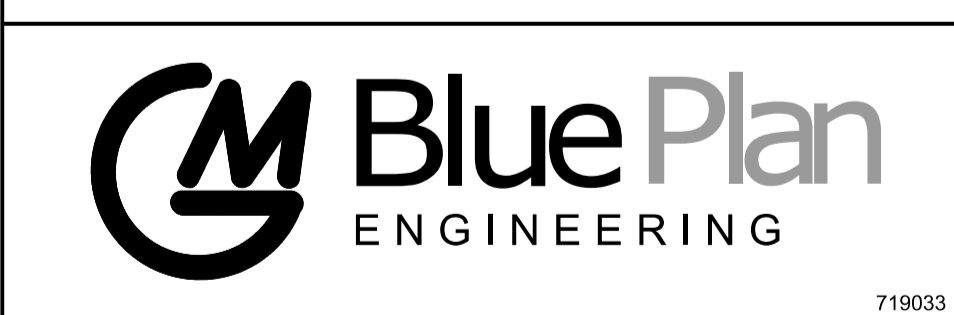
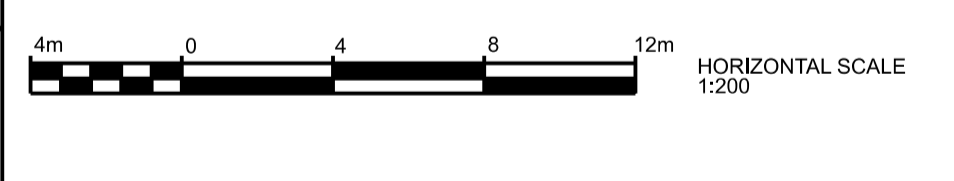
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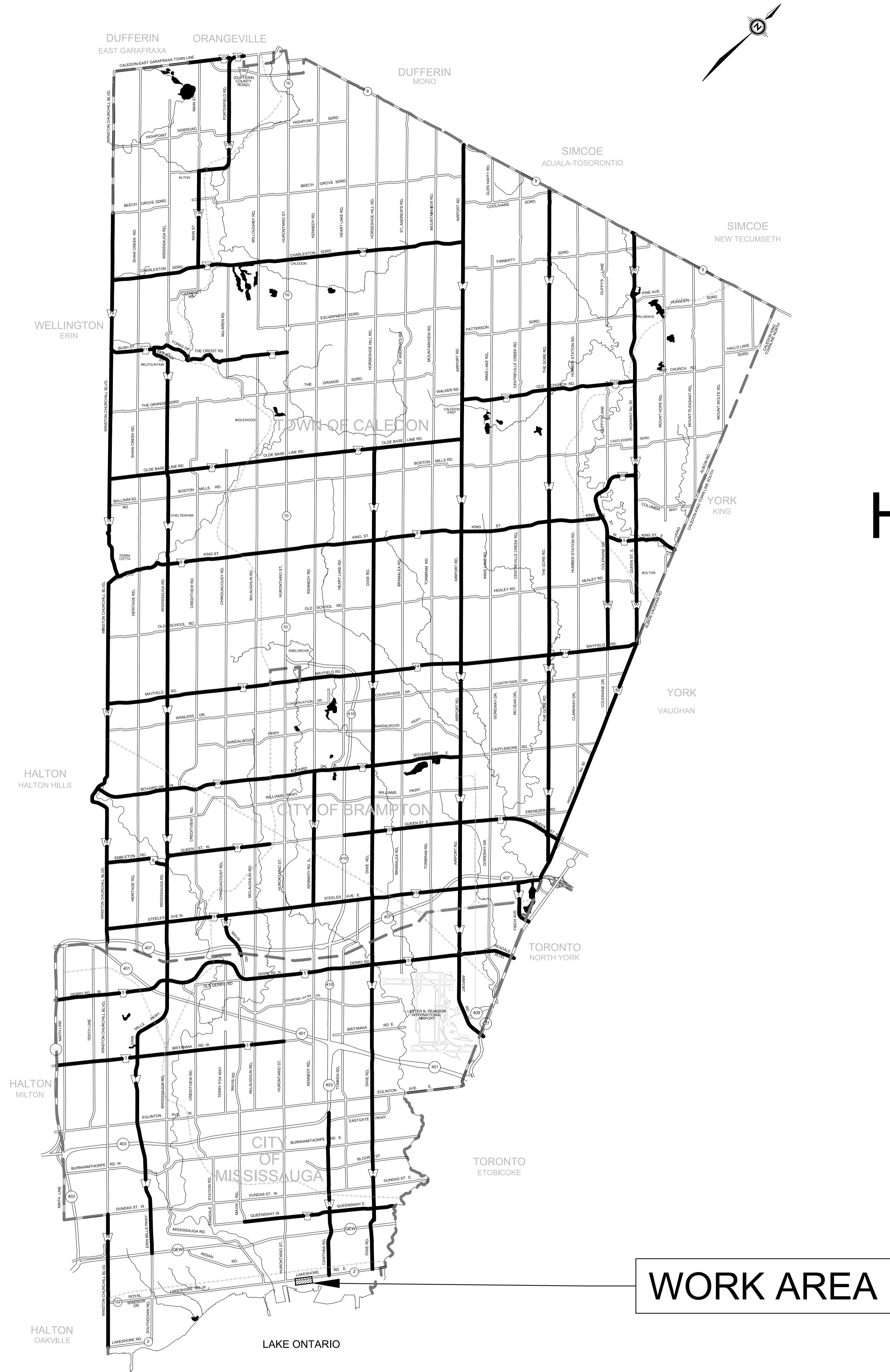
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CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
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ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



LAKESHORE WATERMAIN

SITE PLAN
 PROP. 2400mm TRUNK SEWER
 AND 750mm WATERMAIN SENDING SHAFT

CAD Area	Area	Project No.	19-2215
Checked by	B.P.	Drawn by	T.H.
Date	FEBRUARY 2023	Sheet	8 of 8
		Plan No.	SP-3

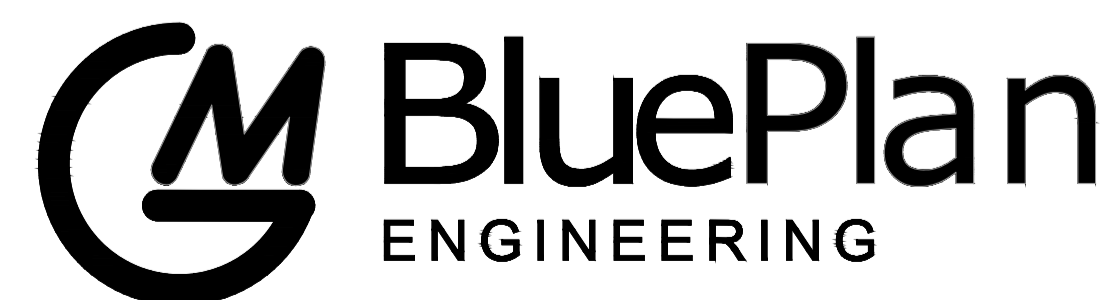


PROJECT No. 19-2215 MUNICIPAL CLASS EA HIAWATHA AND ELMWOOD SEWER

ELMWOOD AVENUE SOUTH
TALL OAKS PARK
WANITA ROAD
HIAWATHA PARKWAY

PRELIMINARY DESIGN

"ISSUED FOR ESR"



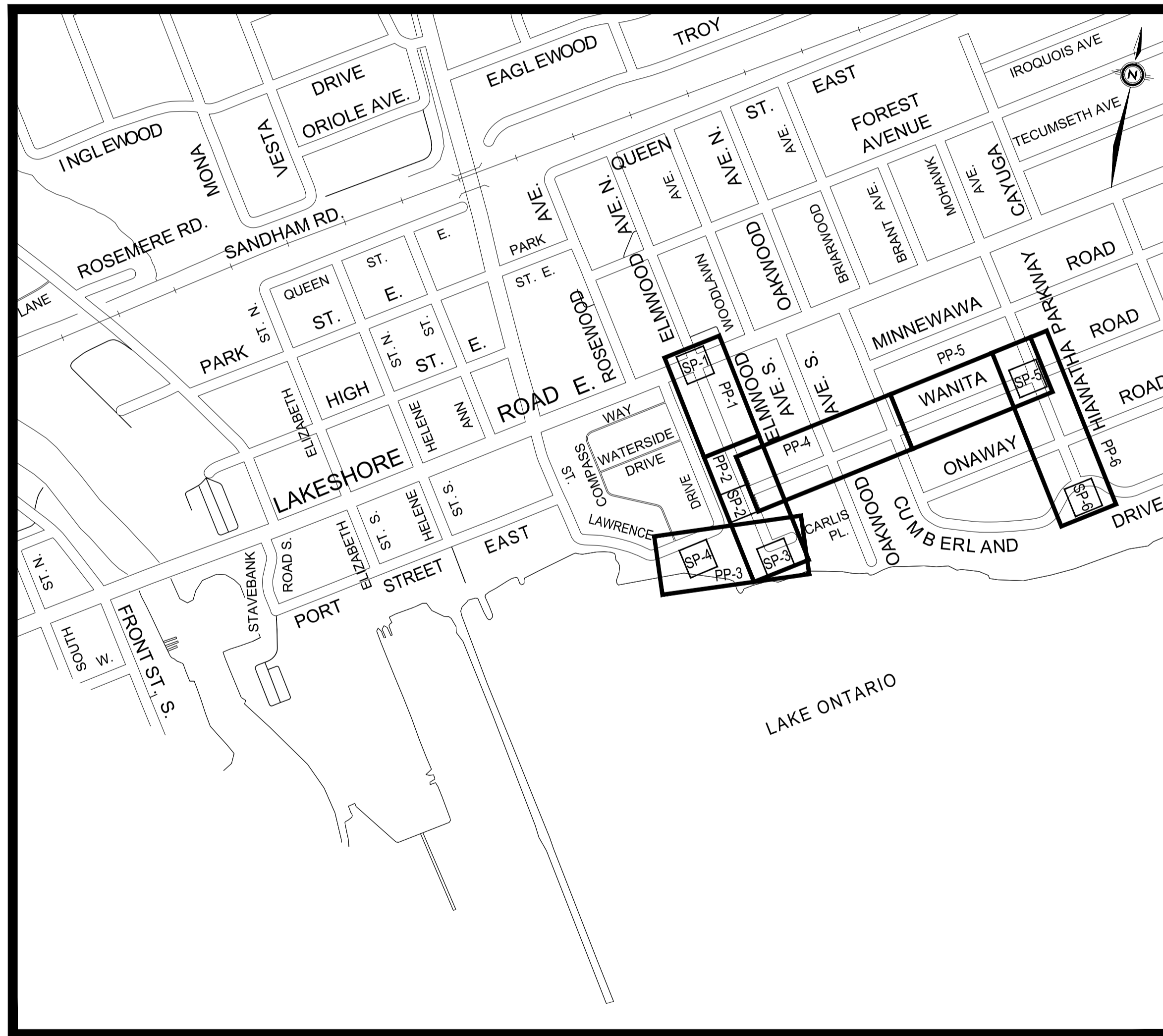
REVISIONS		
DATE	DETAILS	INIT.
FEB 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	

LEGEND

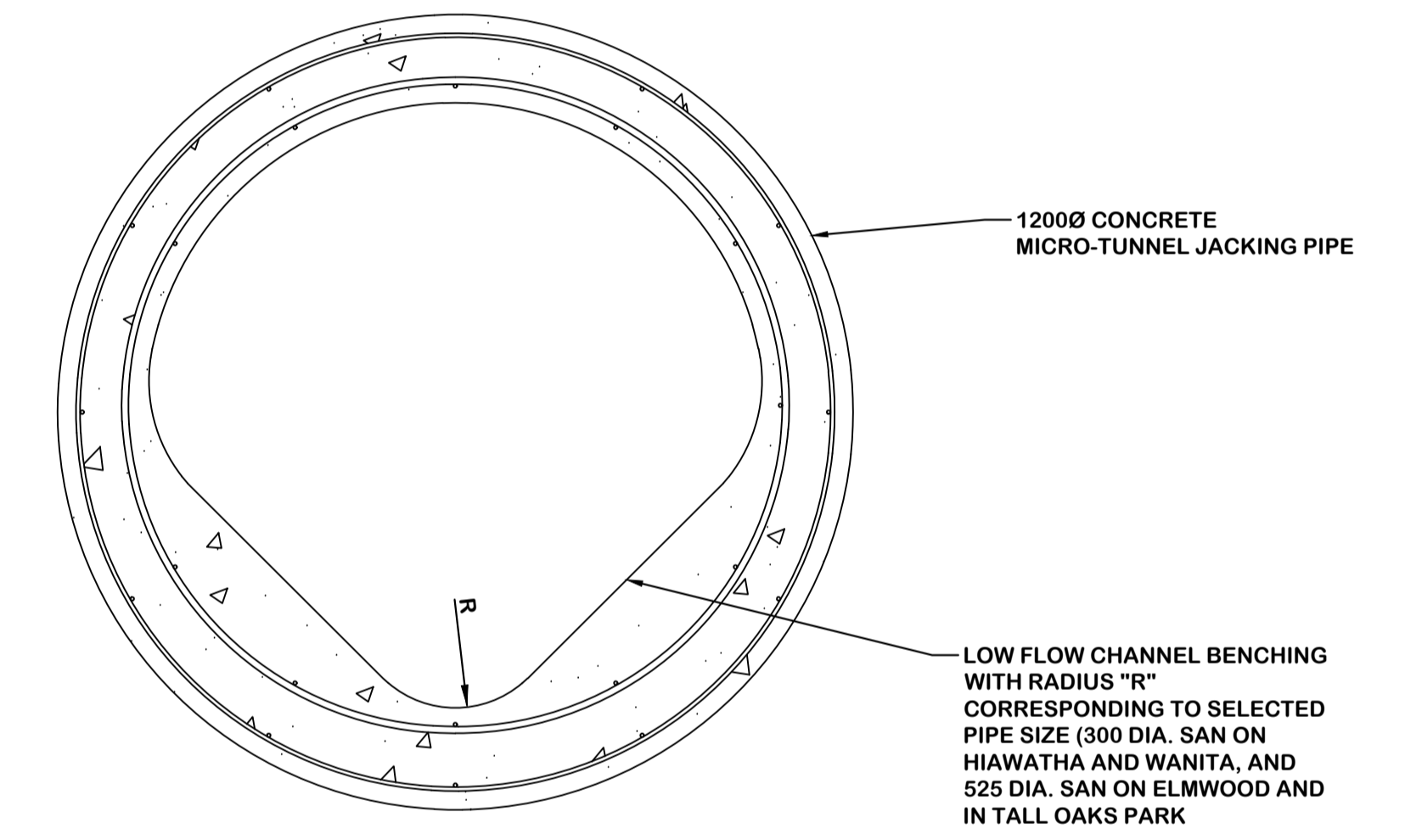
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	EXISTING HYDRANT		SIB		EXISTING TOPOGRAPHICAL CONTOUR (M.A.S.L.)
	EXISTING WATER VALVE		EXISTING DECIDUOUS TREE		EXISTING STORM PIPE
	EXISTING WATER SERVICE		EXISTING CONIFEROUS TREE		EXISTING SANITARY PIPE
	EXISTING STORM MANHOLE				EXISTING WATER PIPELINE
	EXISTING SANITARY MANHOLE				EXISTING UNDERGROUND HYDRO
	EXISTING CATCH BASIN				EXISTING OVERHEAD HYDRO
	EXISTING HYDRO POLE AND GUY WIRE				EXISTING BELL
	EXISTING HAND WELL				EXISTING TV
	EXISTING LIGHT STANDARD				EXISTING GAS
	EXISTING BOLLARD				EXISTING FENCE
	EXISTING MAN DOOR				ROW PROPERTY LINE
	EXISTING SIGN				PROPOSED SANITARY PIPELINE

DRAWING INDEX

SHEET No.	DRAWING No.	DESCRIPTION	STATION
0		TITLE PAGE	
1	INDEX	INDEX, KEYPLAN, LEGEND AND DETAILS	
2	PP-1	HIAWATHA / ELWOOD SEWER - ELMWOOD AVENUE SOUTH	STA 0+000 TO STA 0+220
3	PP-2	HIAWATHA / ELWOOD SEWER - ELMWOOD AVENUE SOUTH	STA 0+180 TO STA 0+360
4	PP-3	HIAWATHA / ELWOOD SEWER - TALL OAKS PARK	STA 0+000 TO STA 0+140
5	PP-4	HIAWATHA / ELWOOD SEWER - WANITA ROAD	STA 10+000 TO STA 10+280
6	PP-5	HIAWATHA / ELWOOD SEWER - WANITA ROAD	STA 10+280 TO STA 10+520
7	PP-6	HIAWATHA / ELWOOD SEWER - HIAWATHA PARKWAY	STA 20+000 TO STA 20+280
8	SP-1	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT LAKESHORE RD E. AND ELMWOOD AVE. S.	
9	SP-2	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT ELMWOOD AVE. S. AND WANITA RD.	
10	SP-3	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT ELMWOOD AVE. S.	
11	SP-4	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT TALL OAKS PARK	
12	SP-5	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT WANITA RD. AND HIAWATHA PKWY.	
13	SP-6	SITE PLAN - PROPOSED TUNNELLING COMPOUND AT HIAWATHA PARK	

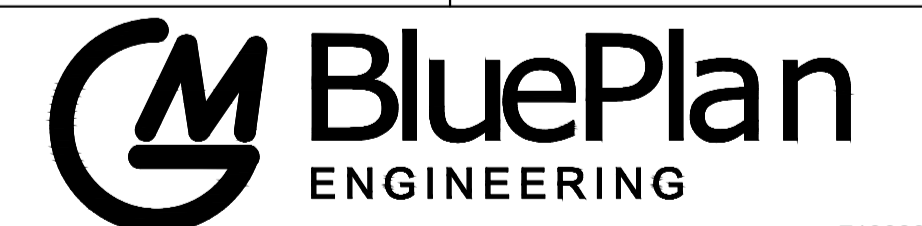


KEY MAP
N.T.S.



TYPICAL LOW FLOW CHANNEL PIPE CROSS SECTION
SCALE N.T.S.

Designed by	Chkd.	Approved by
-------------	-------	-------------

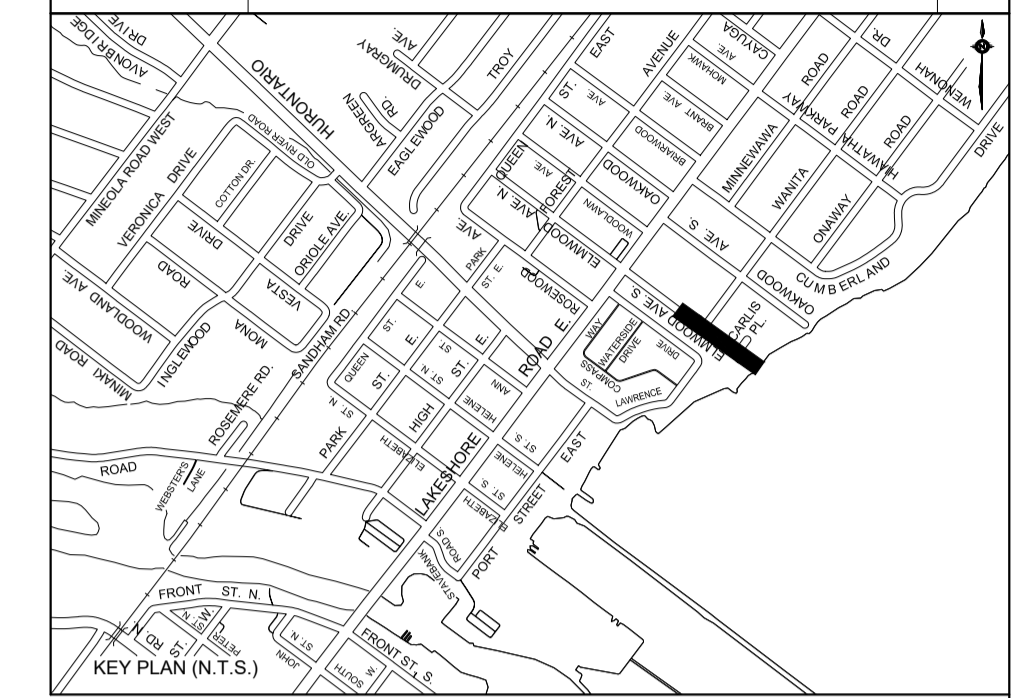


INDEX, LEGEND, NOTES & DETAILS

CAD Area	Area	Project No. 19-2215
Checked by BP	Drawn by B.A.	Plan No. INDEX
Date FEBRUARY 2023	Sheet 1 of 13	

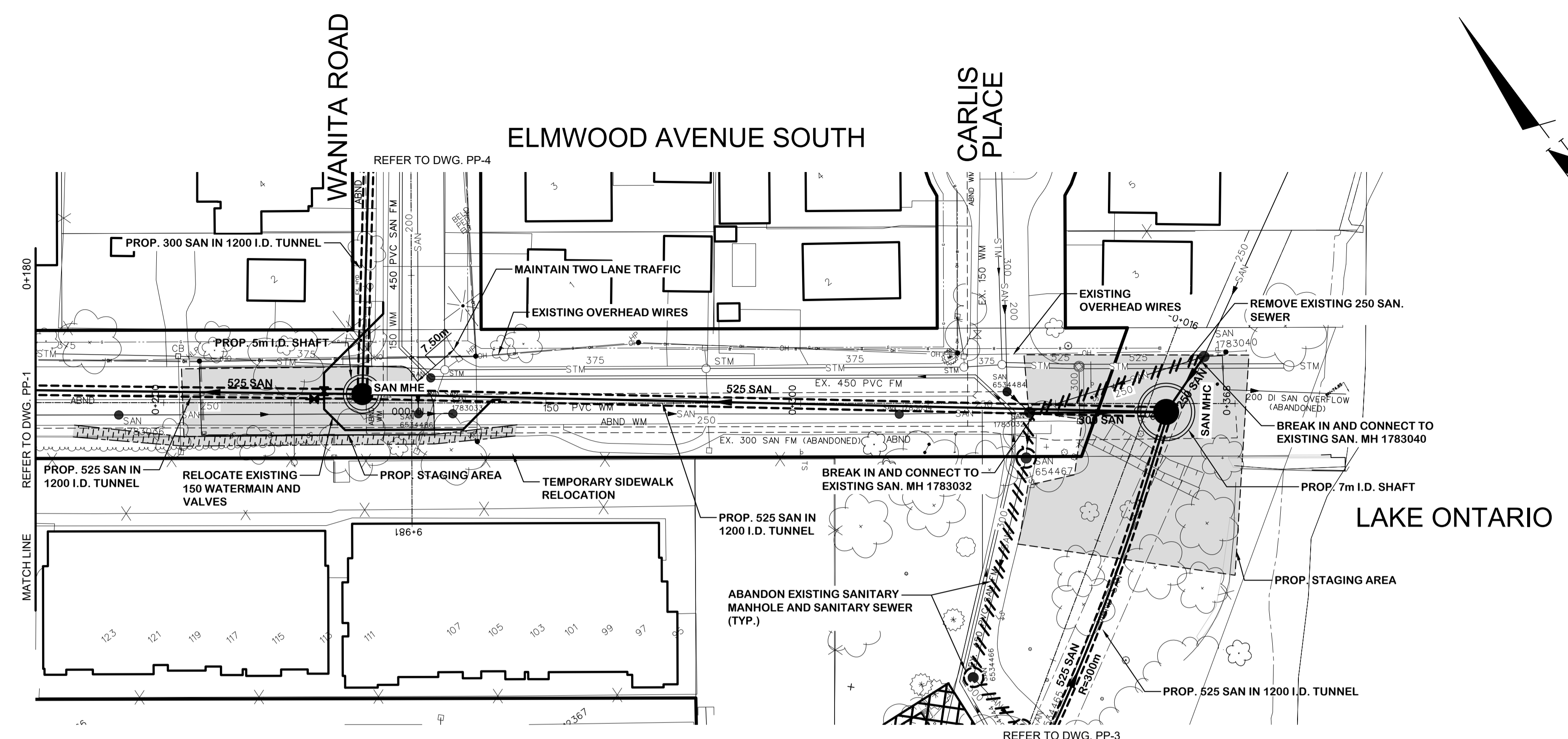
SERVICE DATA					
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SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



NOTES:

1. SURFACE ELEVATION AND SURFACE PROFILES ARE BASED ON GIS CONTOUR DATA PROVIDED BY THE REGION OF PEEL.



General Notes

- All Driveways Are ASPHALT Unless Otherwise Noted
- All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
- All Horizontal And Vertical Bends Are In Degrees
- All Pipes Size In mm
- 20C Existing Water Service, Size In mm
- WS25 Proposed Water Service, Size In mm
- Elev.
- B.M. No
- Description
- Location
- The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

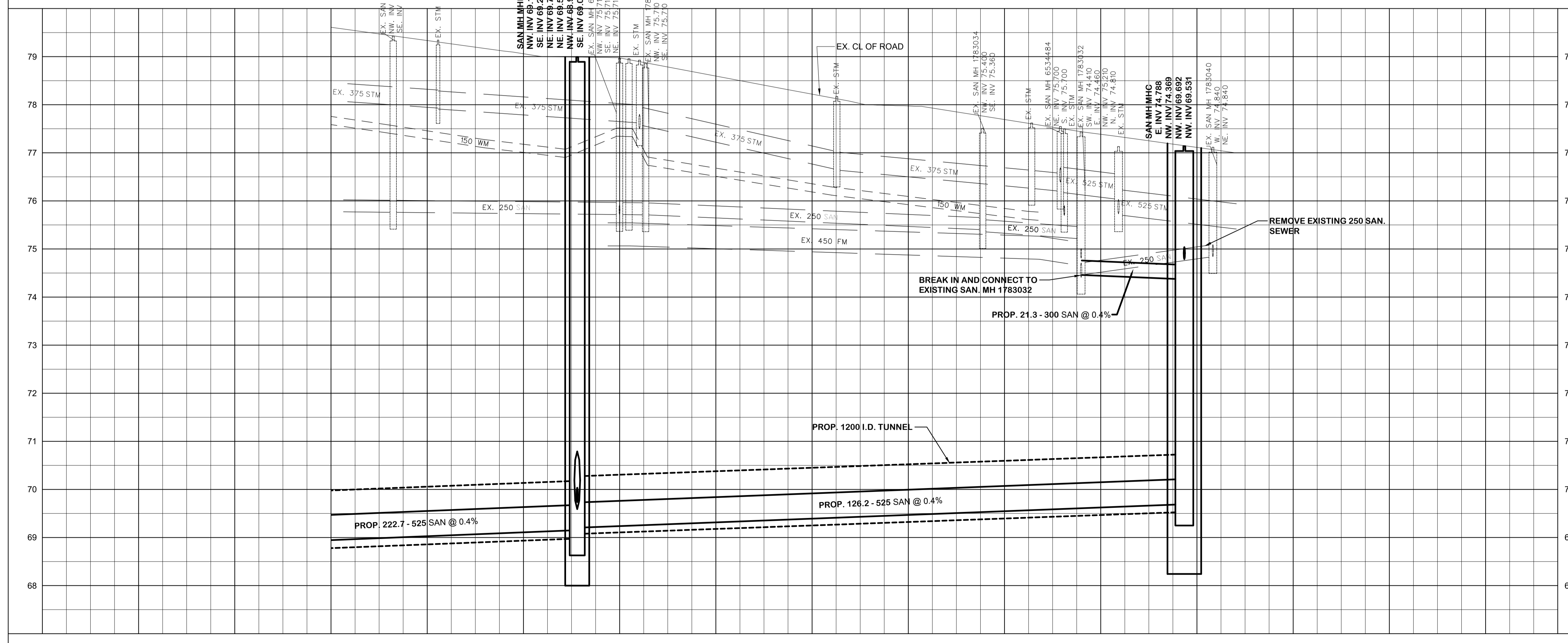
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

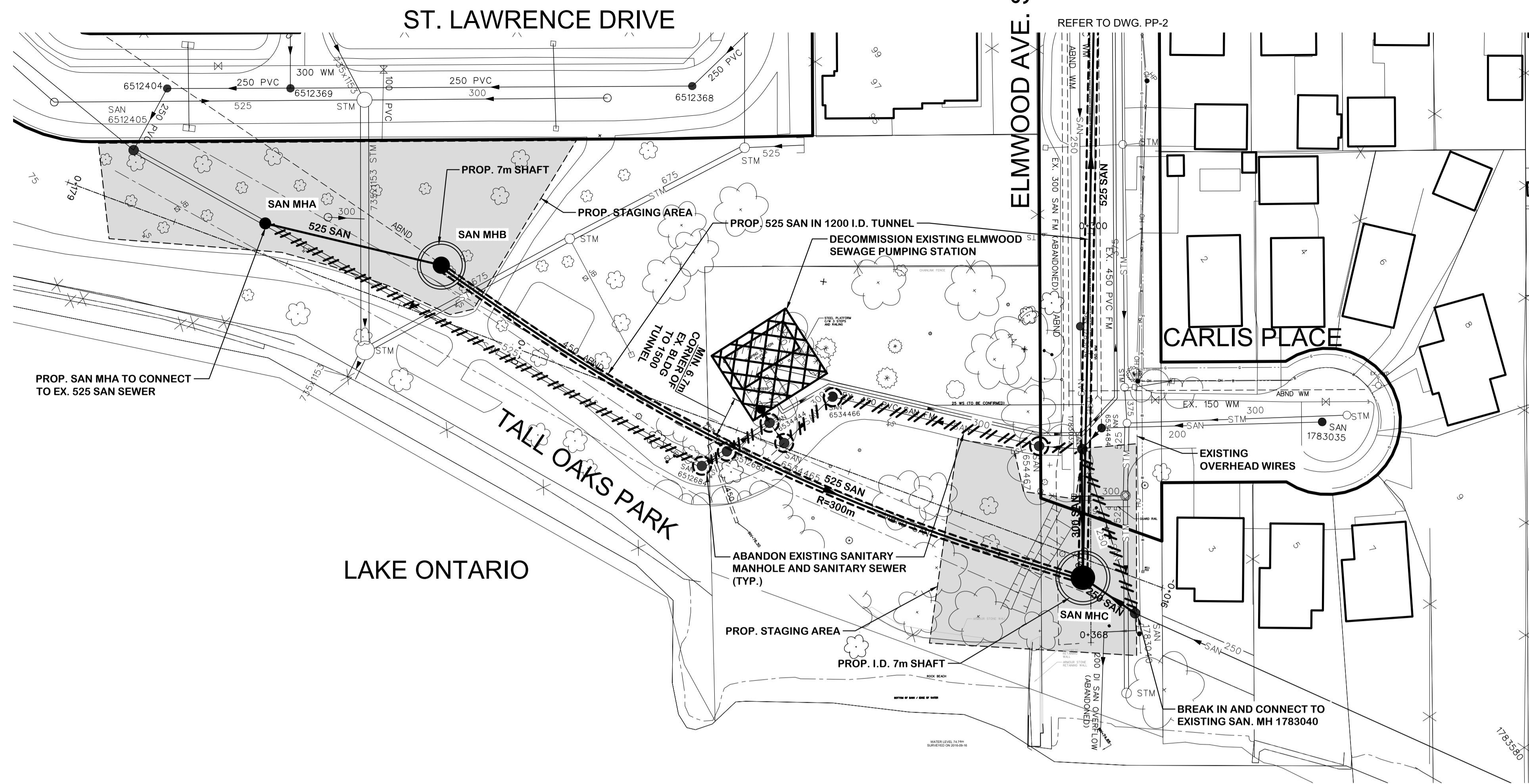


HIAWATHA/ELMWOOD SEWER
ELMWOOD AVENUE SOUTH
PROPOSED SANITARY SEWER

STA. 0+180	TO STA. 0+360
CAD Area X-XX	Area X-XX
Project No. 19-22152	
Checked by B.P.	Drawn by T.H.
Date FEBRUARY 2023	Sheet 3 of 13
	Plan No. PP-2



79.61	79.33	79.06	78.97	78.60	78.22	77.97	77.69	77.38	77.11
0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360
EX. ROAD ELEV.									
ROAD CHAINAGE									



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

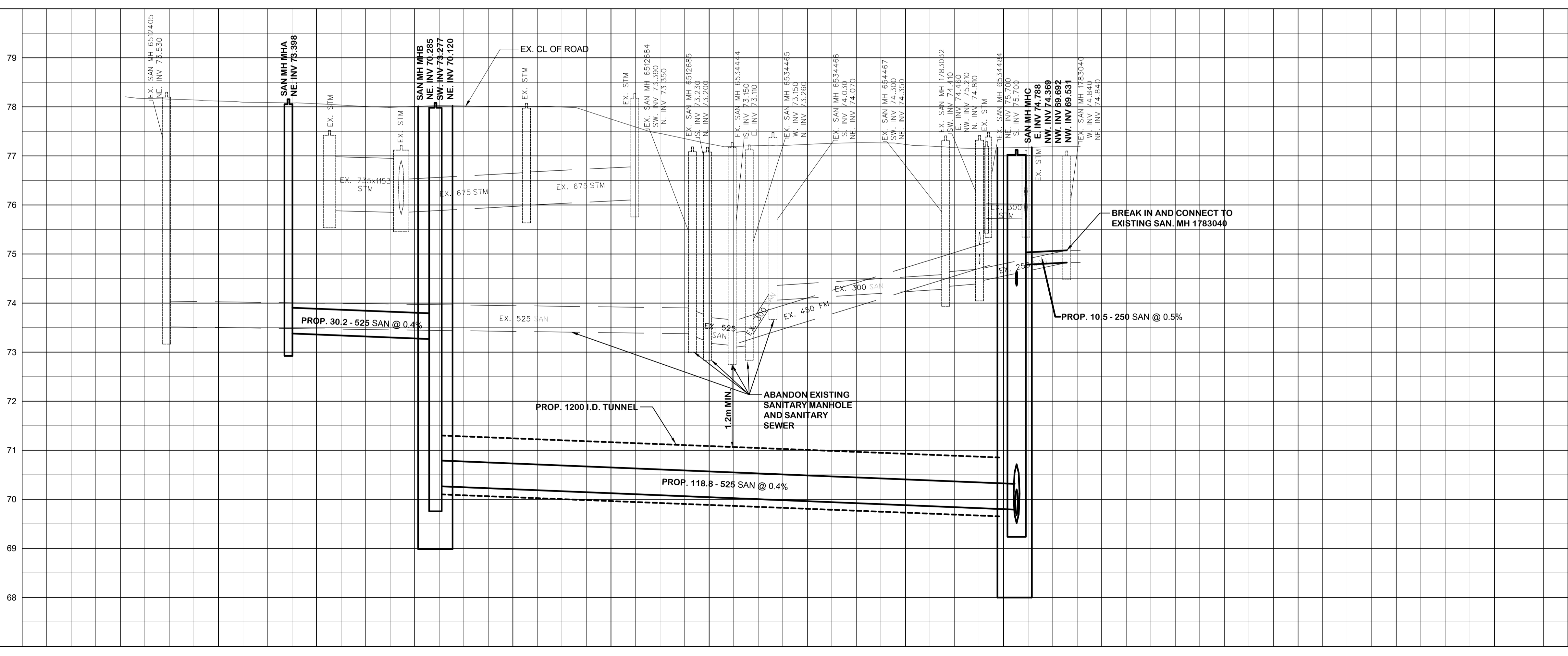
REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	

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 B.M. No. Description Location
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Designed by: _____ Chkd: _____ Approved by: _____

NOTICE TO CONTRACTOR
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THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
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ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

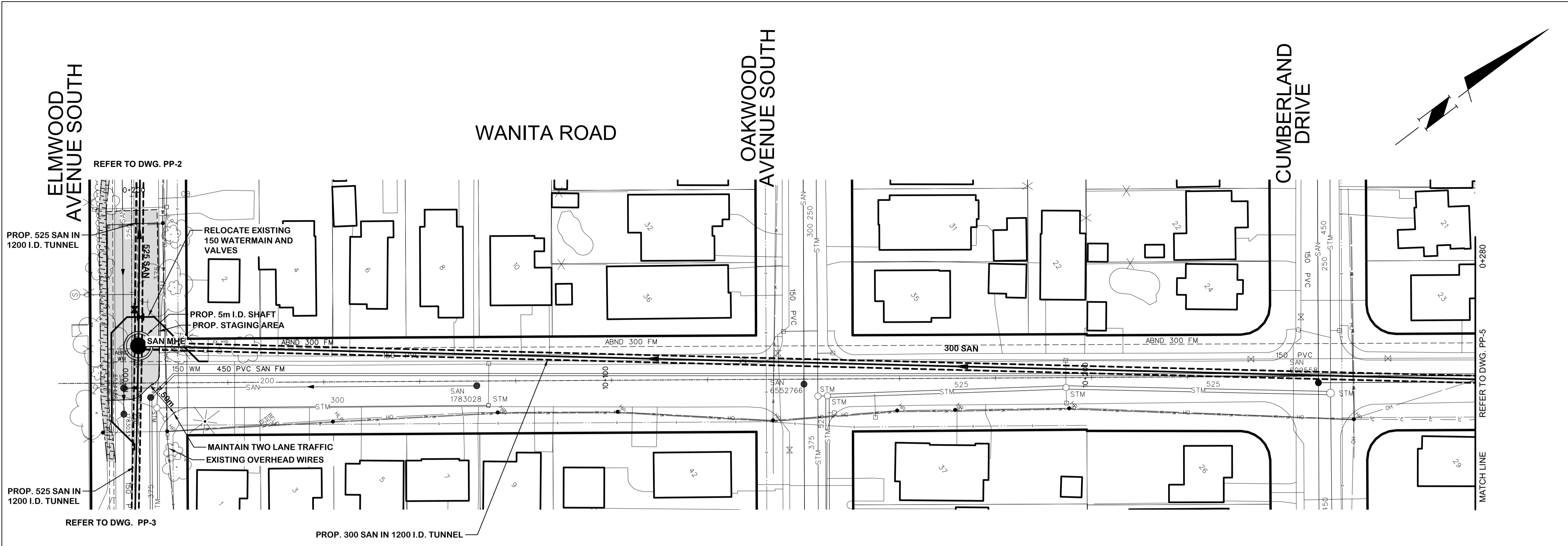
10m 0 10 20 30m HORIZONTAL SCALE
 1m 0 1 2 3m VERTICAL SCALE

719033

HIAWATHA/ELMWOOD SEWER
 TALL OAKS PARK
 PROPOSED SANITARY SEWER

STA. 0+000 TO STA. 0+140

78.08	78.02	78.02	77.77	77.26	77.25	77.25	77.18	EX. ROAD ELEV.	Checked by	B.P.	Drawn by	T.H.	Project No.	19-22152
0+140	0+120	0+100	0+080	0+060	0+040	0+020	0+000	ROAD CHAINAGE	Date	FEBRUARY 2023	Sheet	4 of 13	Plan No.	PP-3

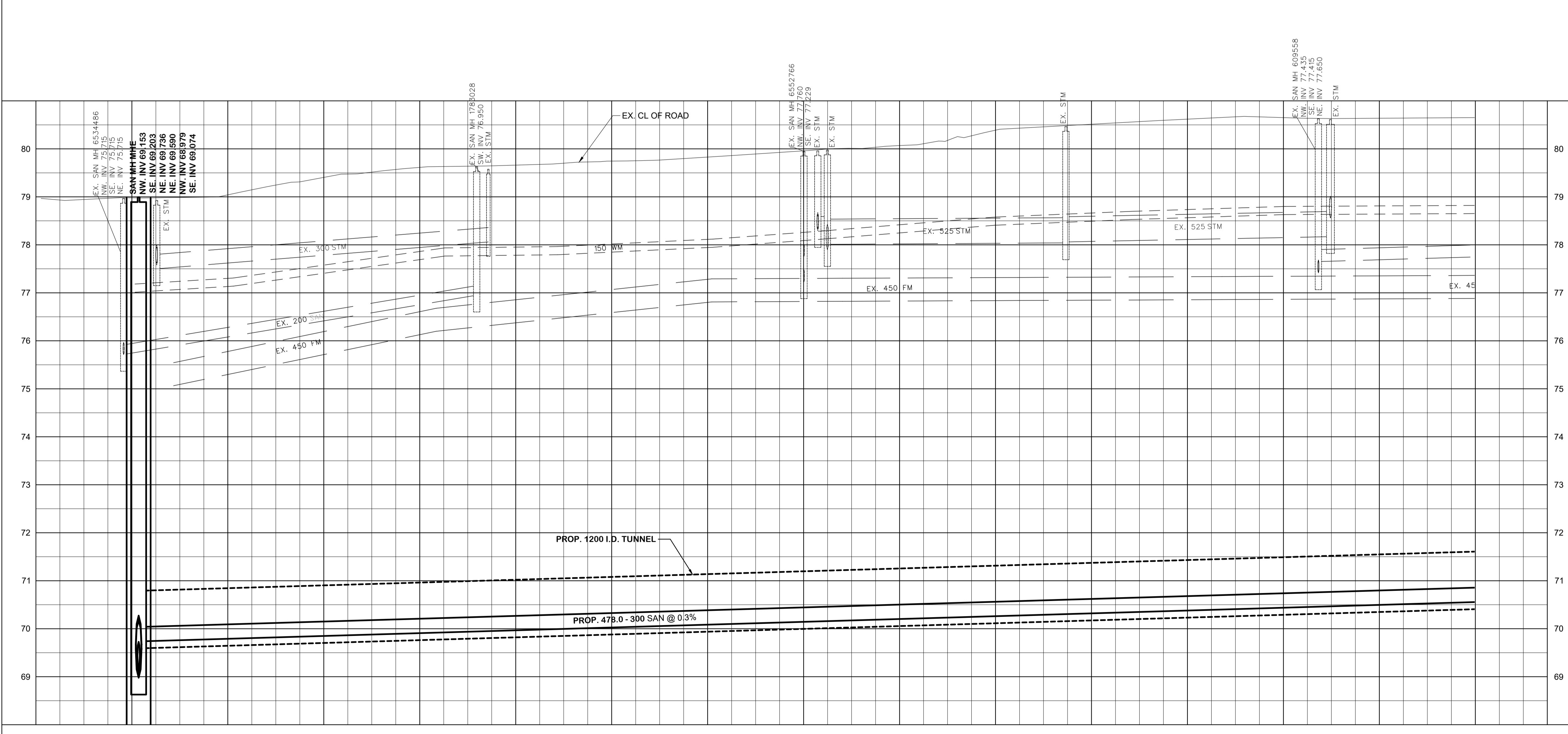


SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	

NOTES:

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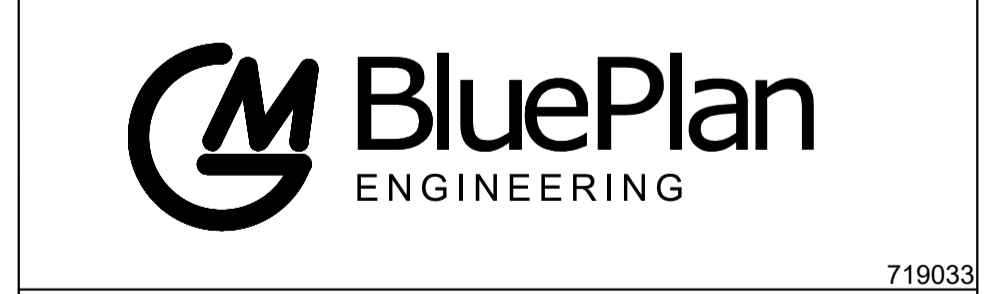
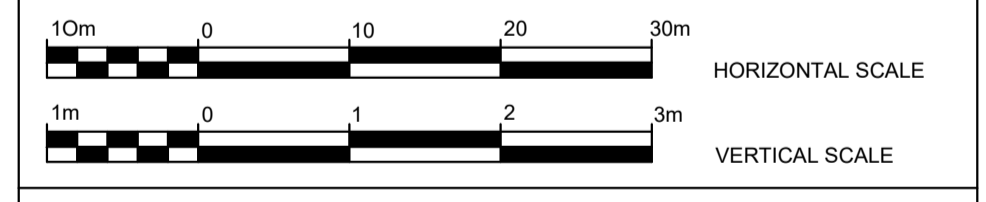
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NOTICE TO CONTRACTOR
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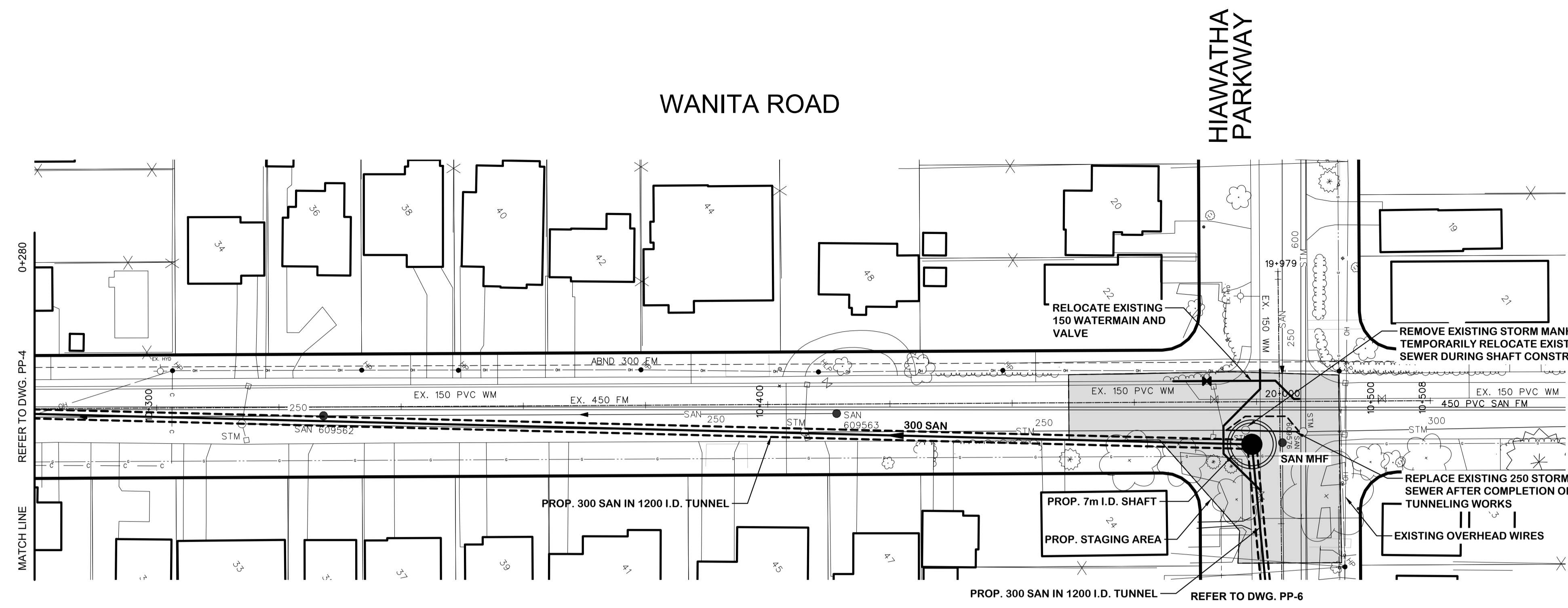
THE REGIONAL MUNICIPALITY OF PEEI	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



HIAWATHA/ELMWOOD SEWER
 WANITA ROAD
 PROPOSED SANITARY SEWER
 STA. 10+000 TO STA. 10+280

STA.	78.98	79.04	79.40	79.61	79.66	79.74	79.83	79.96	80.07	80.39	80.51	80.62	80.65	80.64	80.65	EX. ROAD ELEV.
ROAD CHAINAGE	10+000	10+020	10+040	10+060	10+080	10+100	10+120	10+140	10+160	10+180	10+200	10+220	10+240	10+260	10+280	

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.	Sheet	5 of 13
Date	FEBRUARY 2023	Plan No.	PP-4		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

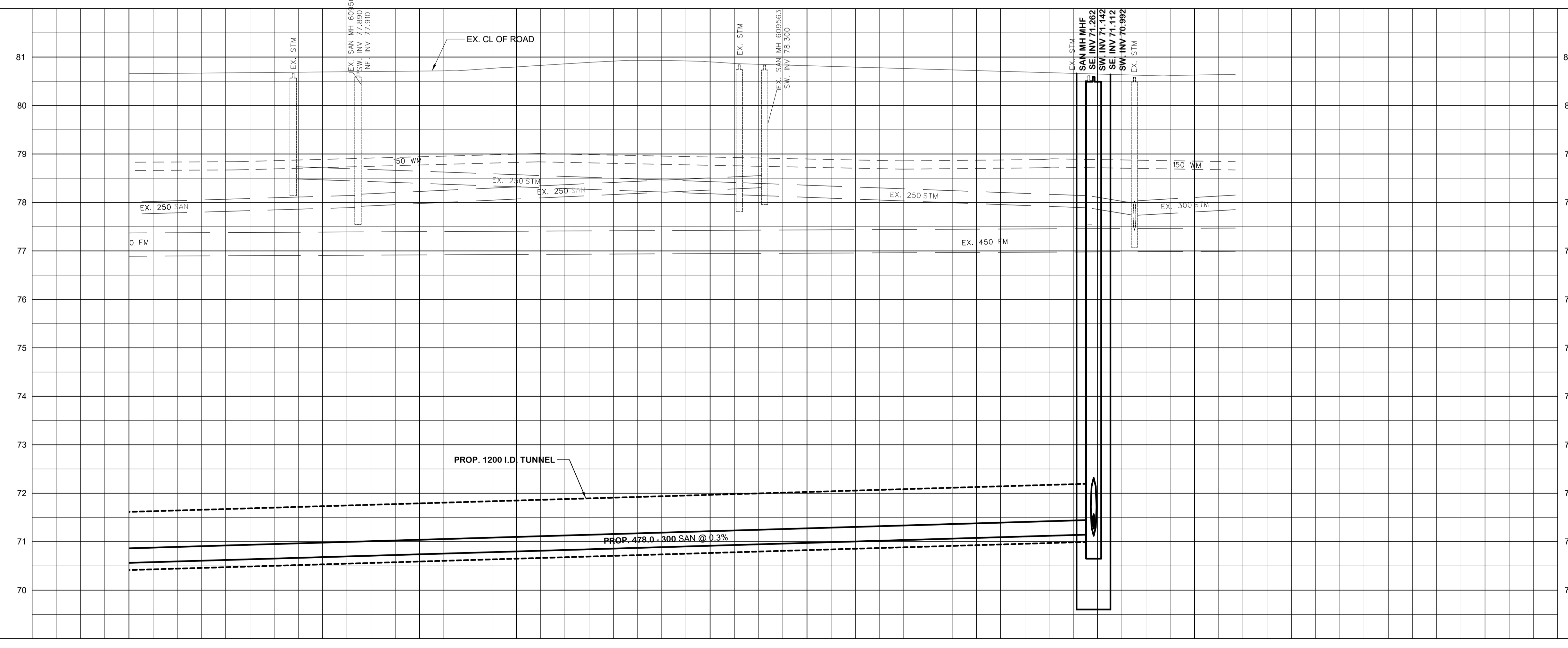
REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	

NOTES:

1. SURFACE ELEVATION AND SURFACE PROFILES ARE BASED ON GIS CONTOUR DATA PROVIDED BY THE REGION OF PEEL.

General Notes

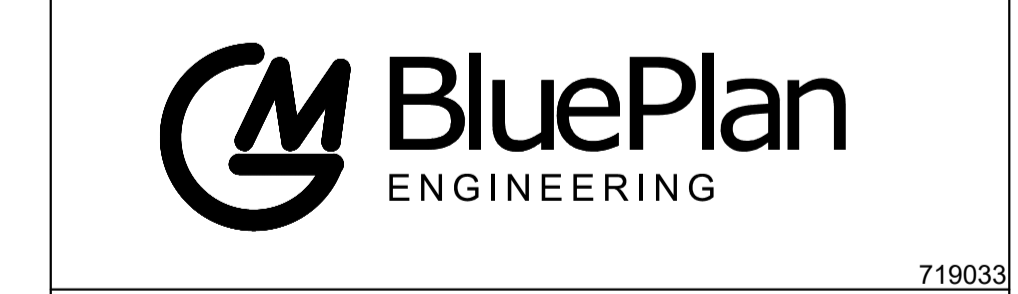
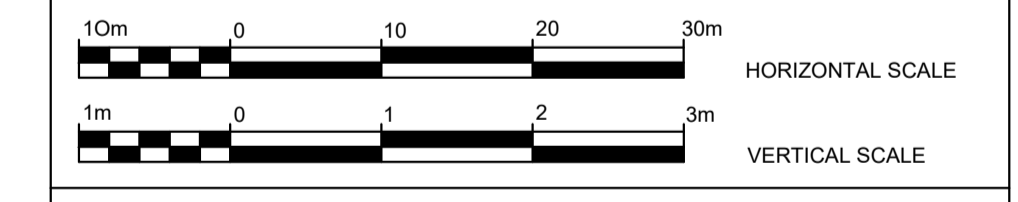
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 All Pipes Size In mm
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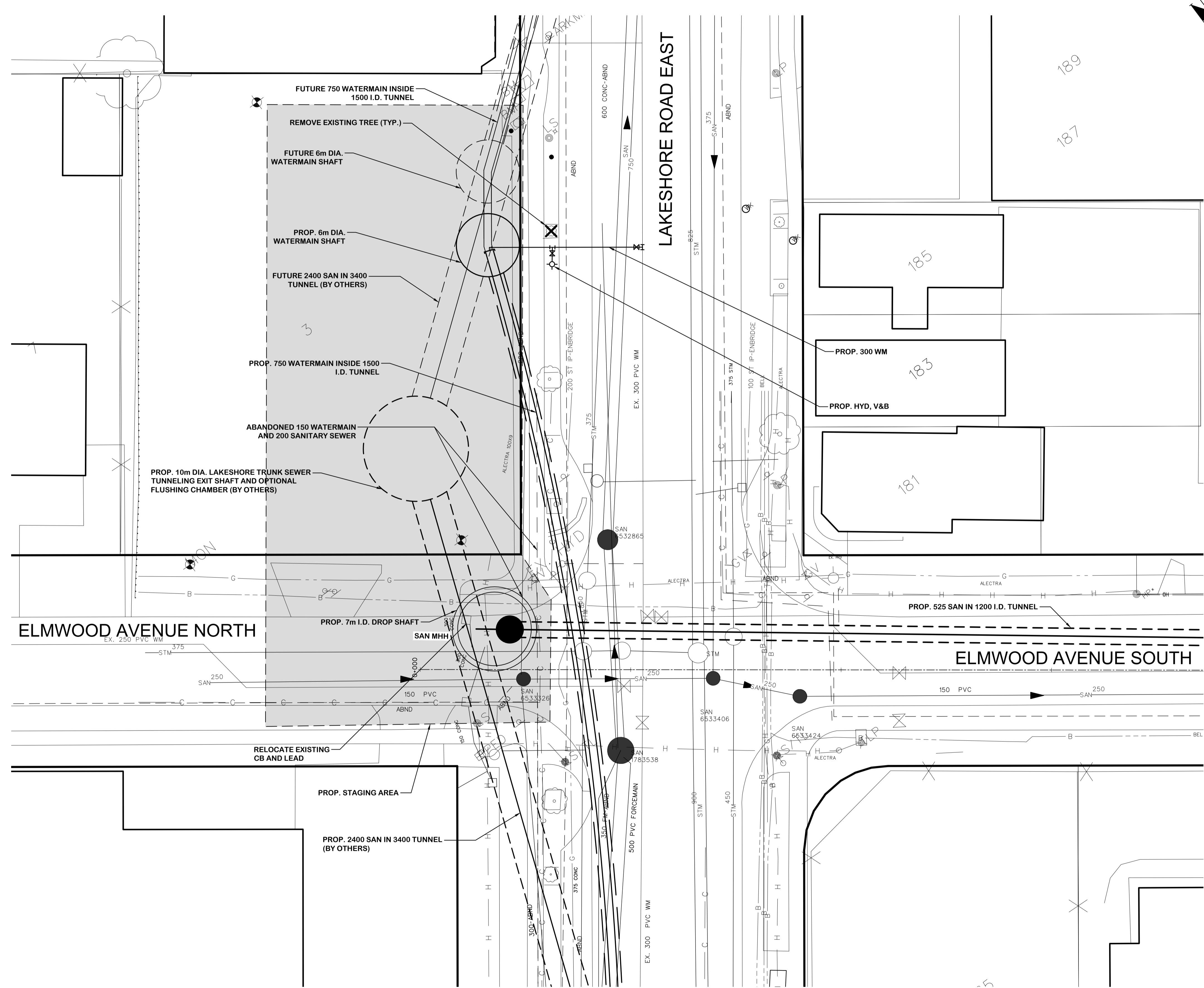
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
EMBROSE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



HIAWATHA/ELMWOOD SEWER
 WANITA ROAD
PROPOSED SANITARY SEWER
 STA. 10+280 TO STA. 10+520

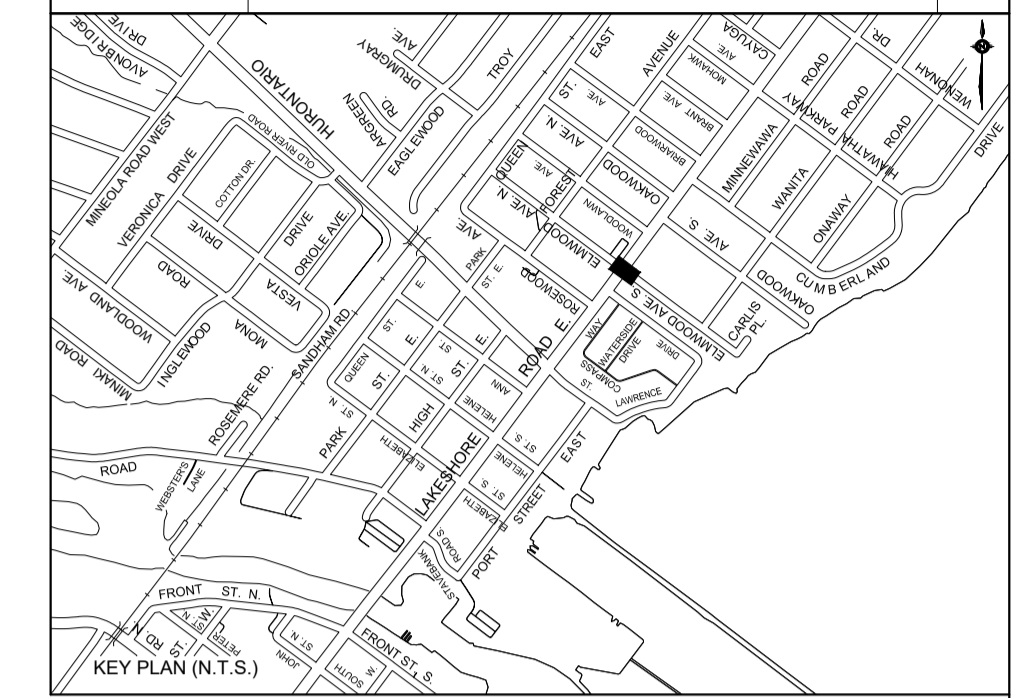
Station	80.65	80.66	80.68	80.70	80.79	80.91	80.89	80.81	80.76	80.70	80.64	80.62	10+280	10+300	10+320	10+340	10+360	10+380	10+400	10+420	10+440	10+460	10+480	10+500	10+520	
EX. ROAD ELEV.																										
ROAD CHAINAGE																										

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.	Plan No.	PP-5
Date	FEBRUARY 2023	Sheet	6 of 13		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
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T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



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General Notes

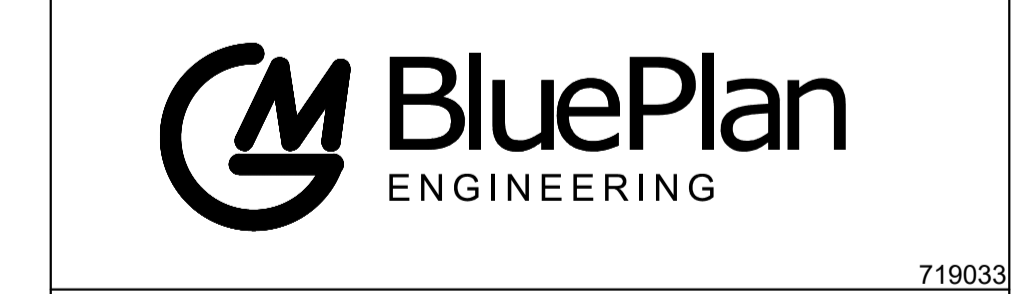
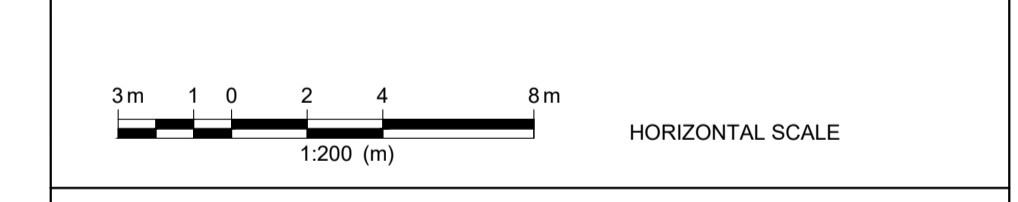
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 All Pipes Size In mm
 200 Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm
 B.M. No. Description Location
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THE REGIONAL MUNICIPALITY OF PEEL
 CITY OF MISSISSAUGA WORKS DEPT.
 CITY OF BRAMPTON WORKS DEPT.
 TOWN OF CALEDON WORKS DEPT.
 BELL CANADA
 ENBRIDGE INCORPORATED-GAS DISTRIBUTION
 ONTARIO MINISTRY OF TRANSPORTATION
 ONTARIO CLEAN WATER AGENCY
 HYDRO ONE NETWORKS
 ENERSOURCE, HYDRO MISSISSAUGA
 HYDRO ONE BRAMPTON

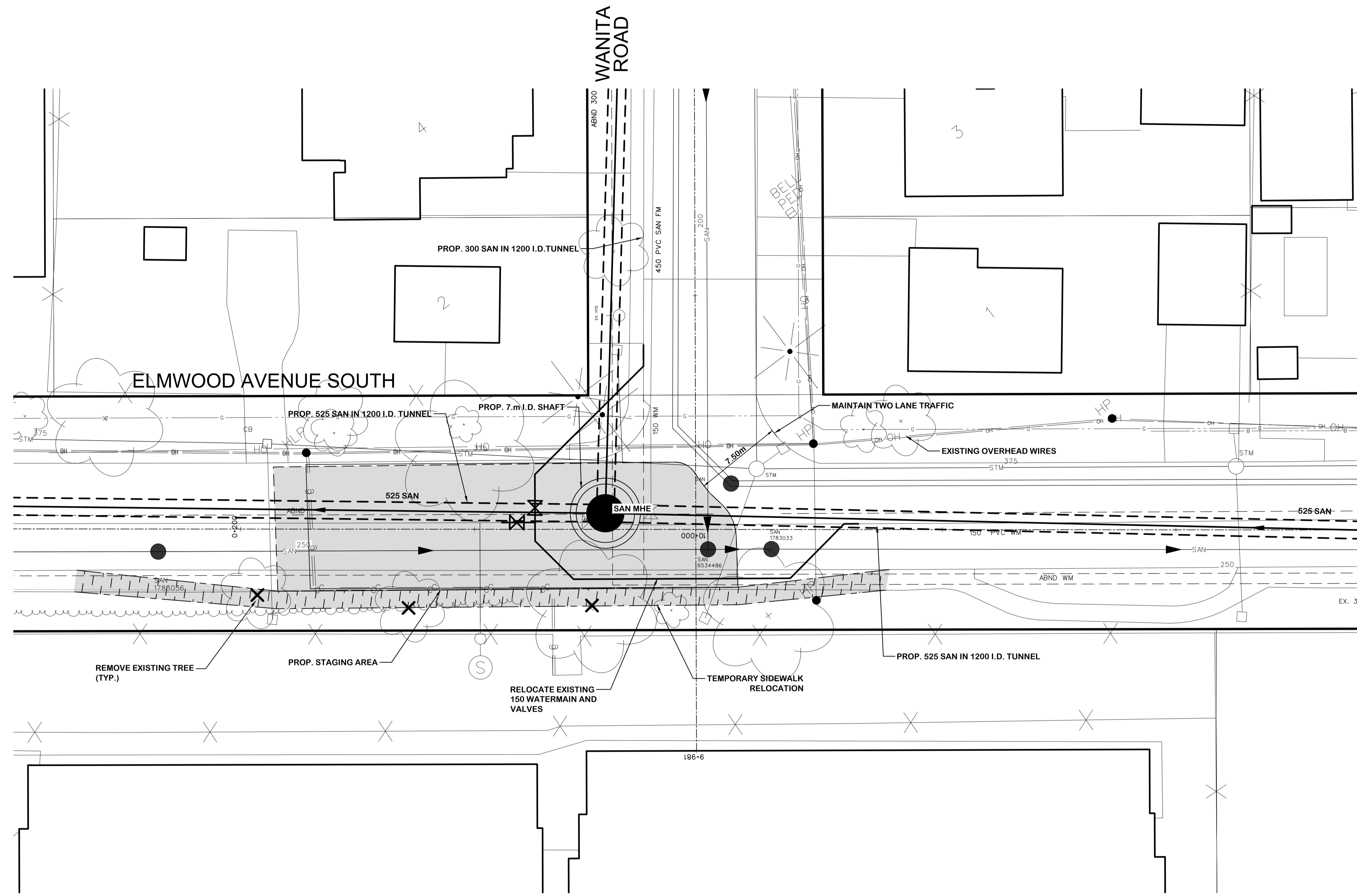
CABLE TELEVISION/FIBROPTIC PROVIDERS:
 BELL CANADA
 ENERSOURCE TELECOM
 HYDRO ONE TELECOM
 ROGERS CABLE
 ALLSTREAM
 PSN (PUBLIC SECTOR NETWORK)
 FUTUREWAY (FGI BROADBAND)



HIAWATHA/ELMWOOD SEWER

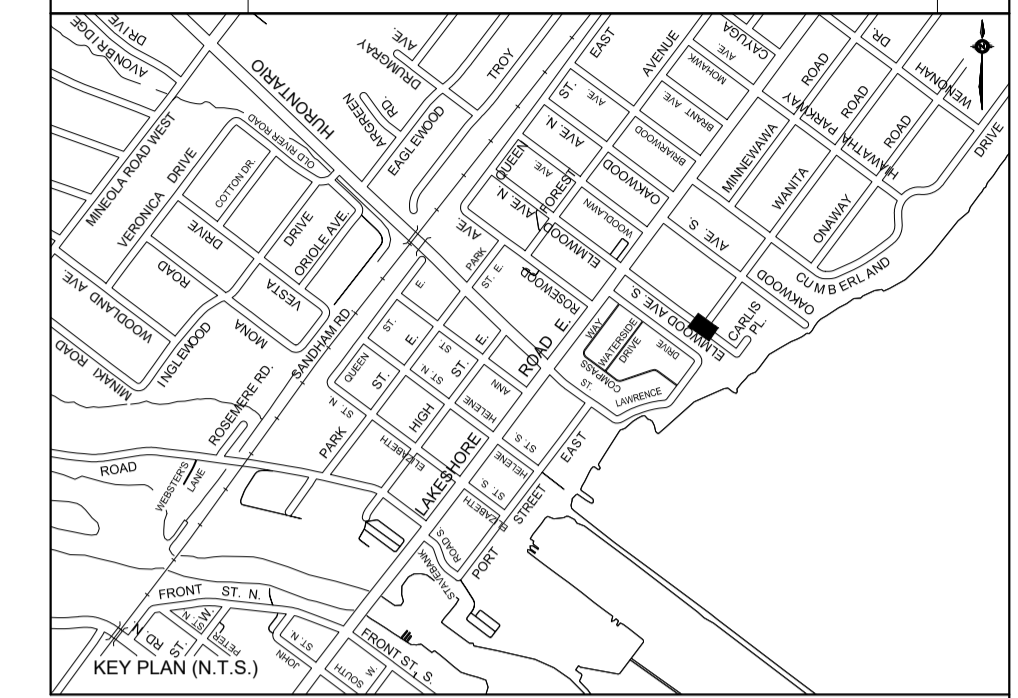
PROPOSED TUNNELLING COMPOUND AT LAKESHORE RD E. AND ELMWOOD AVE. S.

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.	Date	FEBRUARY 2023
Date	FEBRUARY 2023	Sheet	8 of 13	Plan No.	SP-1



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



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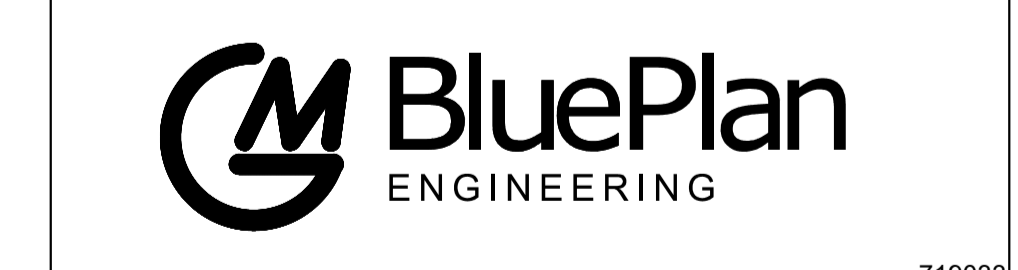
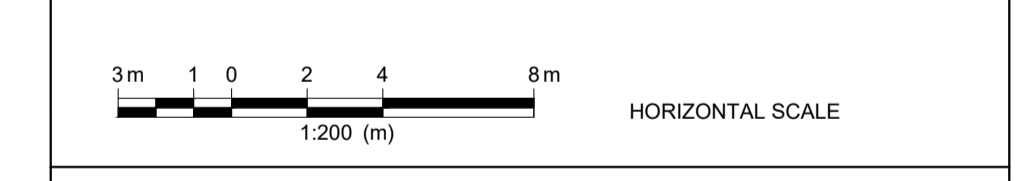
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TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
EMBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

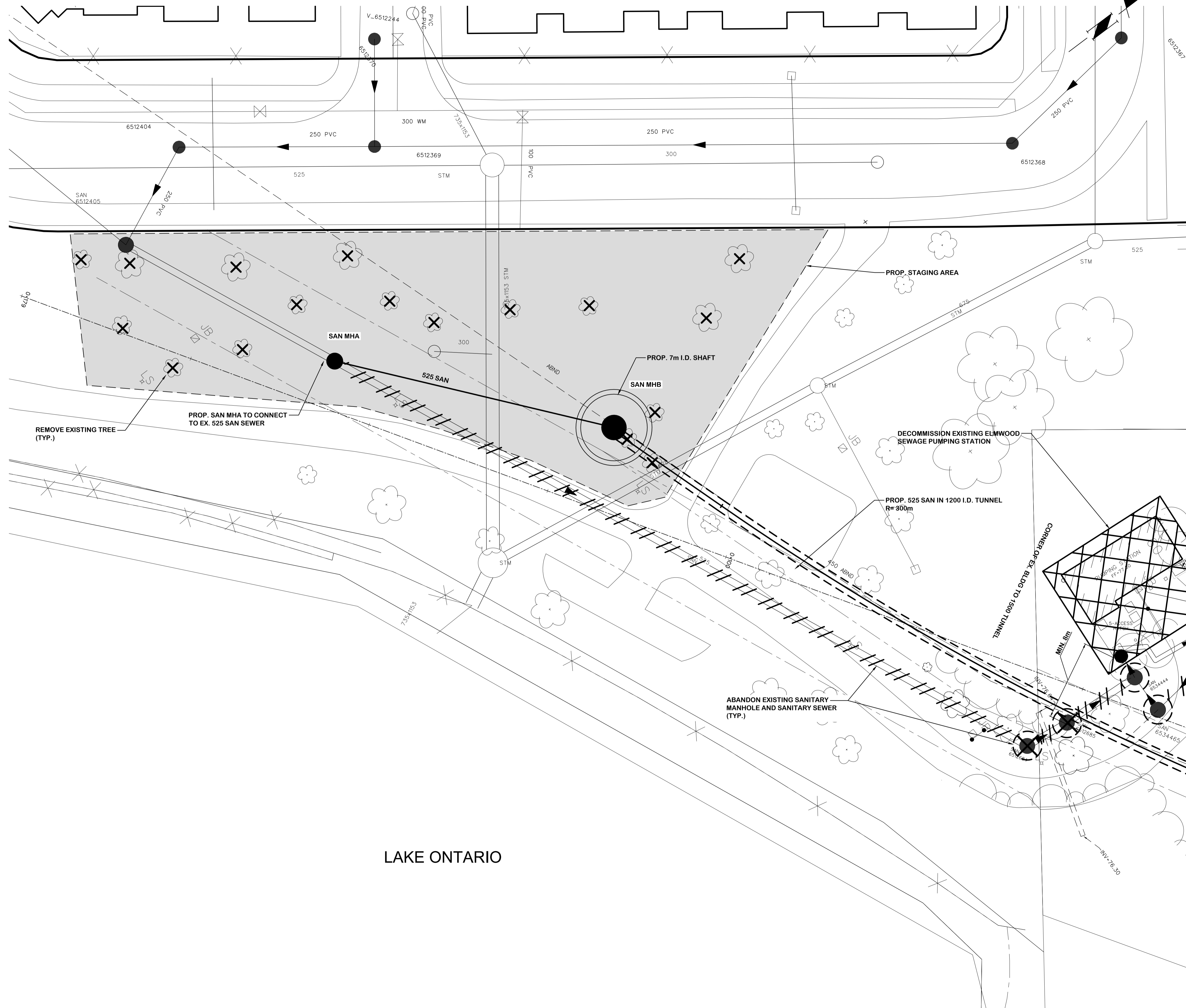


HIAWATHA/ELMWOOD SEWER

PROPOSED TUNNELING COMPOUND AT ELMWOOD AVE. S. AND WANITA RD.

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.		
Date	FEBRUARY 2023	Sheet	9 of 13	Plan No.	SP-2

ST. LAWRENCE DRIVE



LAKE ONTARIO

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATER MAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
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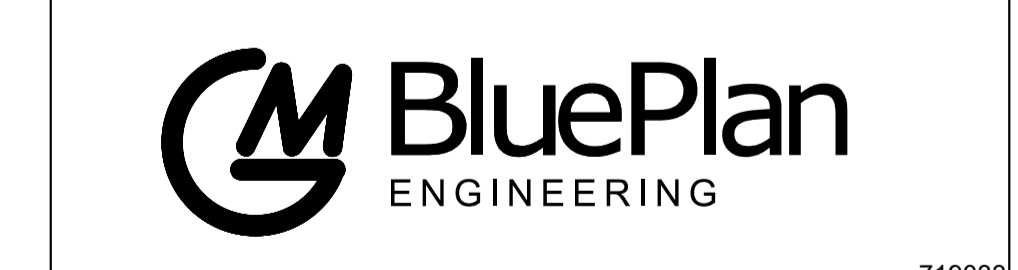
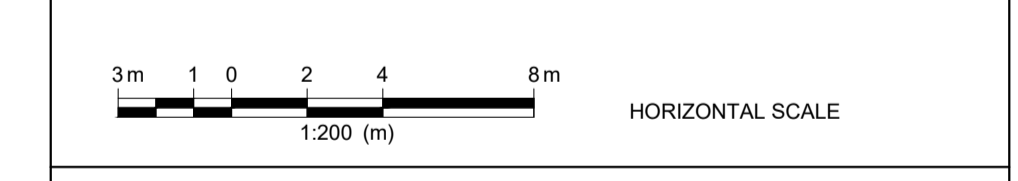
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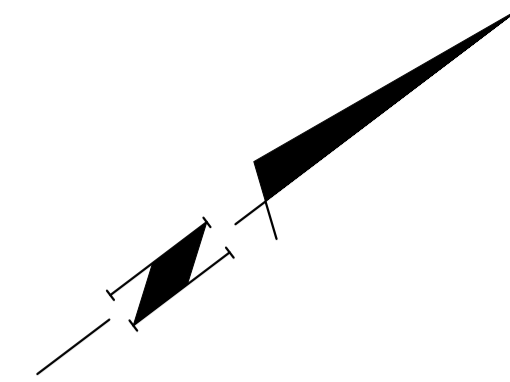
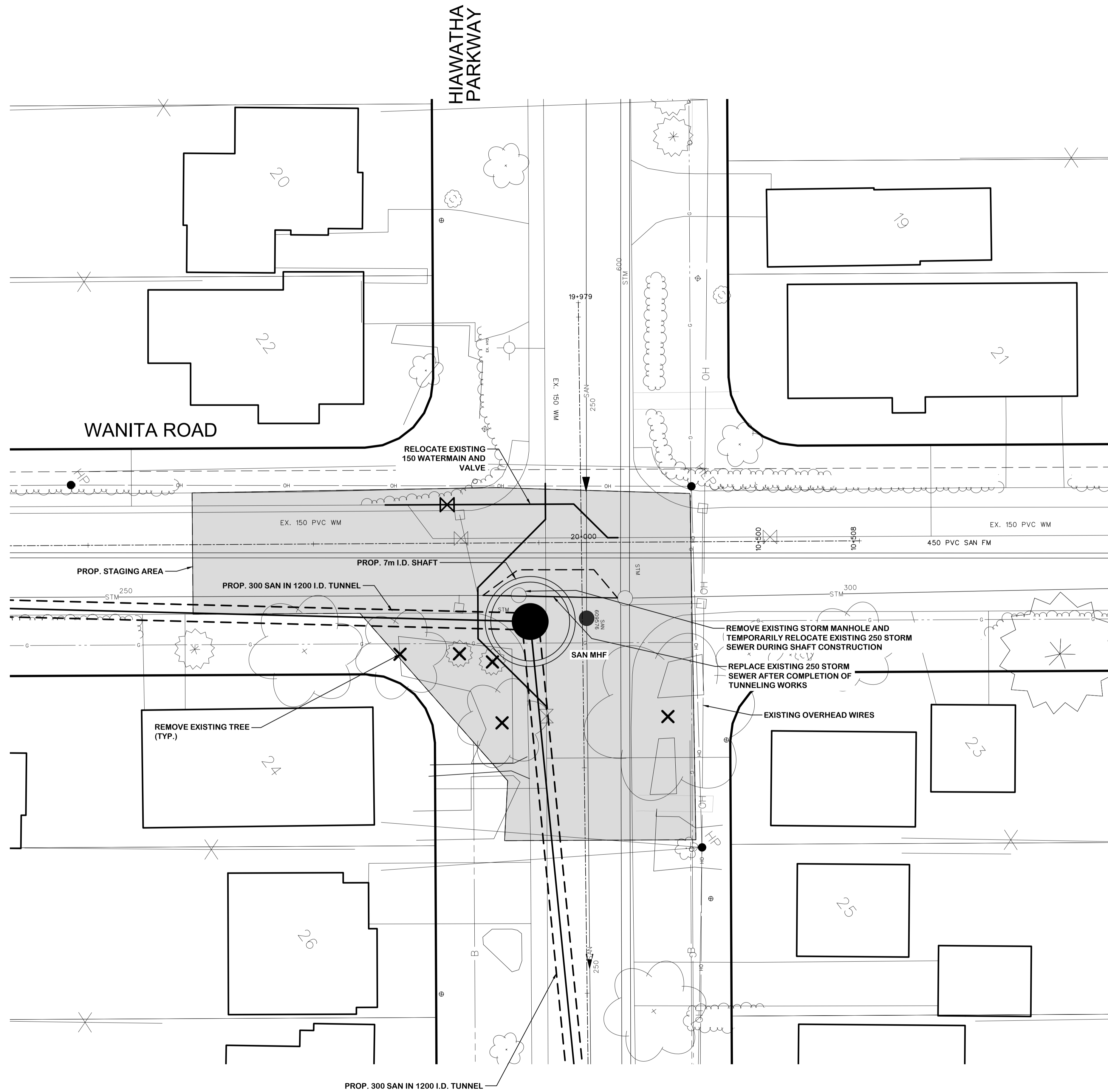
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TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
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ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



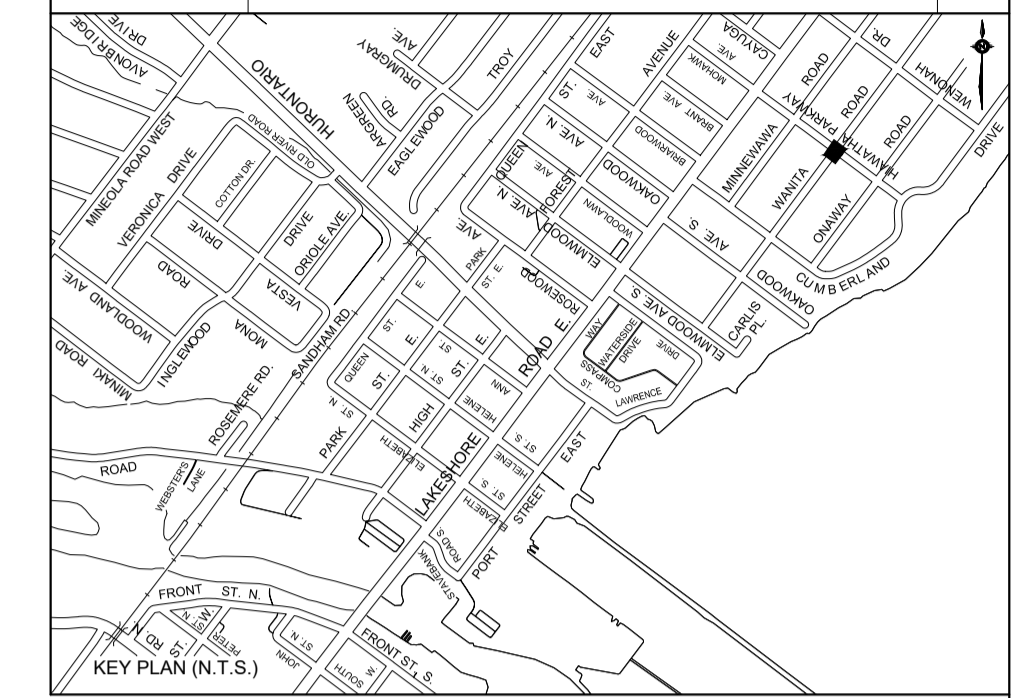
HIAWATHA/ELMWOOD SEWER
 PROPOSED TUNNELLING COMPOUND
 AT TALL OAKS PARK

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.	Sheet	11 of 13
Date	FEBRUARY 2023	Sheet	11 of 13	Plan No.	SP-4



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



NOTES:

1. SURFACE ELEVATION AND SURFACE PROFILES ARE BASED ON GIS CONTOUR DATA PROVIDED BY THE REGION OF PEEL.

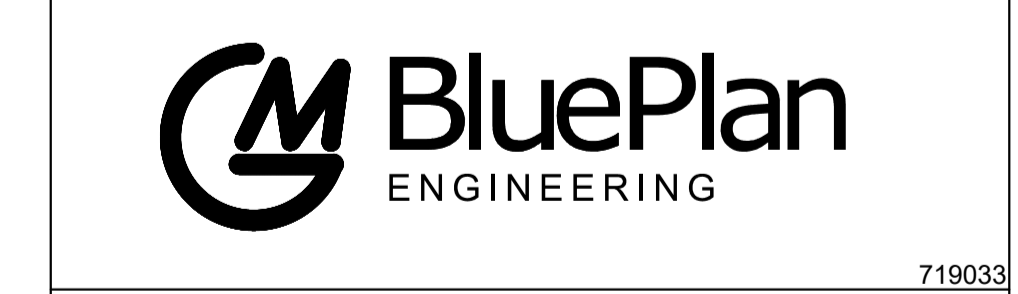
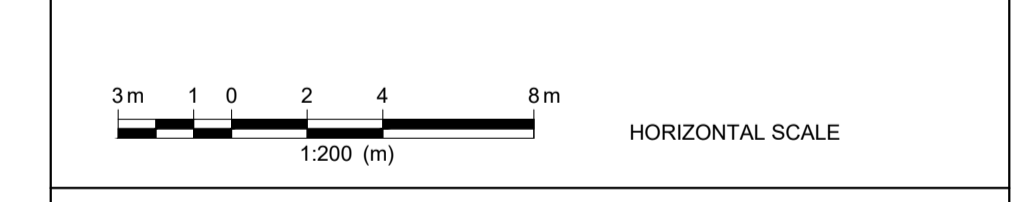
General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
 All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
 All Horizontal And Vertical Bends Are In Degrees
 All Pipes Size In mm
 20°C Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm
 B.M. No. Description Location
 The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

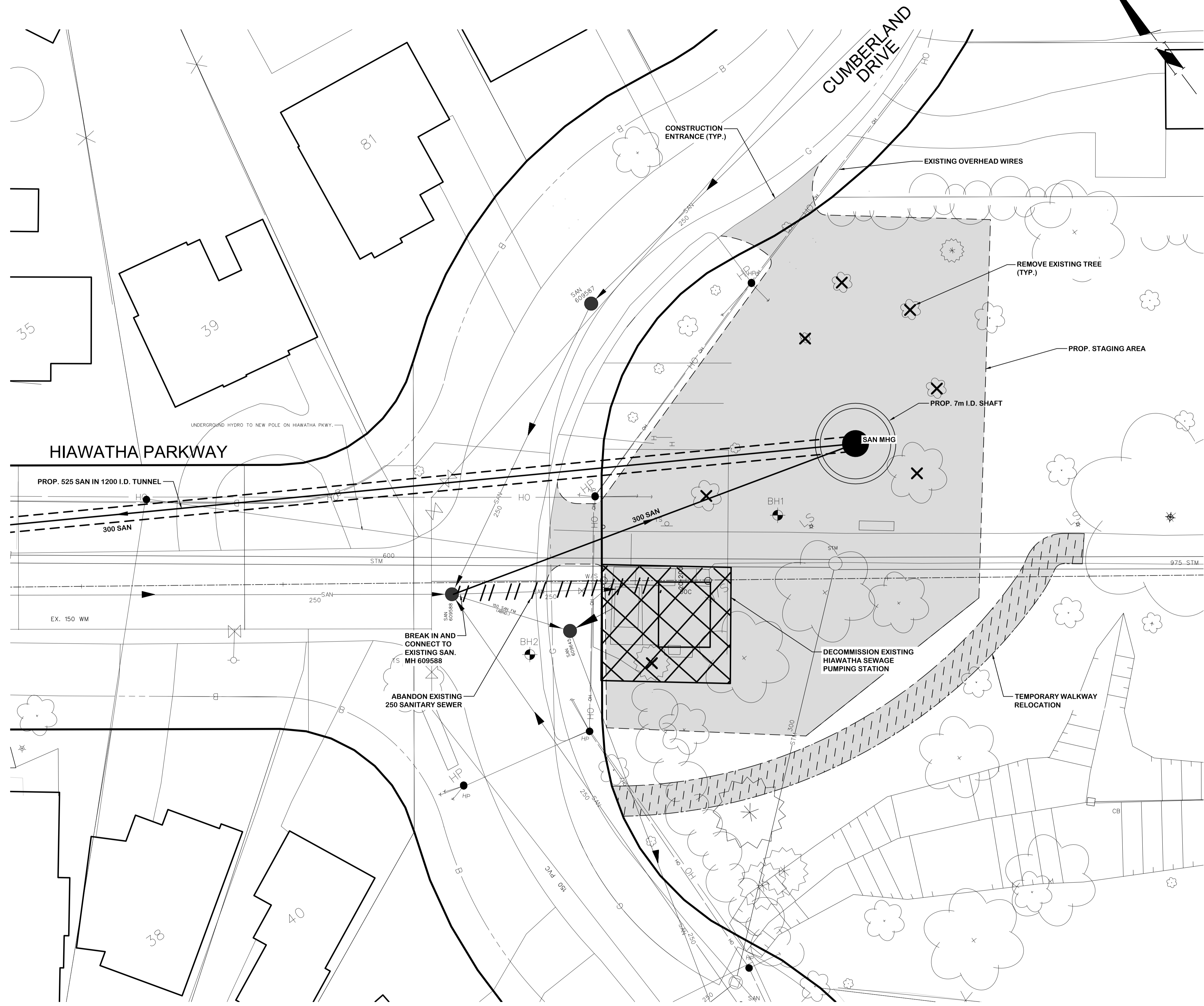
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



HIAWATHA/ELMWOOD SEWER

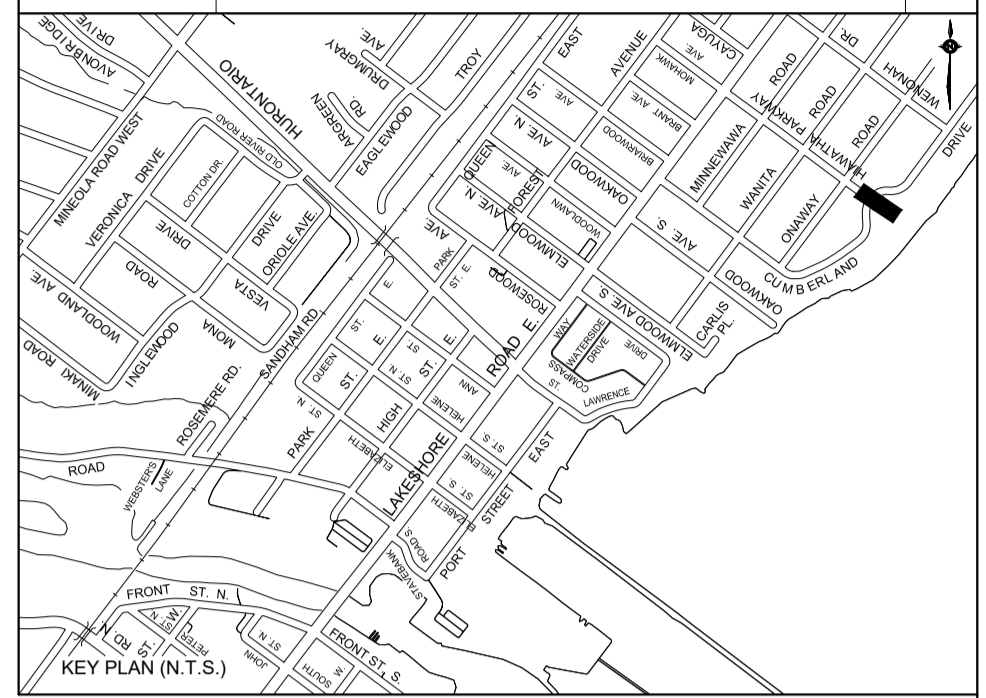
PROPOSED TUNNELLING COMPOUND AT WANITA RD. AND HIAWATHA PKWY.

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.		
Date	FEBRUARY 2023	Sheet	12 of 13	Plan No.	SP-5



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATER MAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.
FEB. 21, 2023	DRAFT PRELIMINARY DESIGN FOR REVIEW	
T.B.C.	PRELIMINARY DESIGN ISSUED FOR ESR	



NOTES:

1. SURFACE ELEVATION AND SURFACE PROFILES ARE BASED ON GIS CONTOUR DATA PROVIDED BY THE REGION OF PEEL.

General Notes

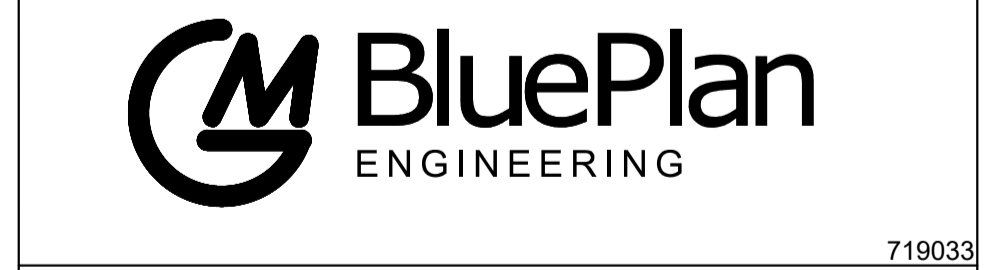
All Driveways Are ASPHALT Unless Otherwise Noted
 All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
 All Horizontal And Vertical Bends Are In Degrees
 All Pipes Size In mm
 20C Existing Water Service, Size In mm
 WS25 Proposed Water Service, Size In mm
 B.M. No. Description Location Elev.
 The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
 CITY OF MISSISSAUGA WORKS DEPT.
 CITY OF BRAMPTON WORKS DEPT.
 TOWN OF CALEDON WORKS DEPT.
 BELL CANADA
 ENBRIDGE INCORPORATED-GAS DISTRIBUTION
 ONTARIO MINISTRY OF TRANSPORTATION
 ONTARIO CLEAN WATER AGENCY
 HYDRO ONE NETWORKS
 ENERSOURCE, HYDRO MISSISSAUGA
 HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
 BELL CANADA
 ENERSOURCE TELECOM
 HYDRO ONE TELECOM
 ROGERS CABLE
 ALLSTREAM
 PSN (PUBLIC SECTOR NETWORK)
 FUTUREWAY (FCI BROADBAND)



HIAWATHA/ELMWOOD SEWER
PROPOSED TUNNELLING COMPOUND
AT HIAWATHA PARK

CAD Area	X-XX	Area	X-XX	Project No.	19-22152
Checked by	B.P.	Drawn by	T.H.		
Date	FEBRUARY 2023	Sheet	13 of 13	Plan No.	SP-6

A detailed street map of a residential area, likely Port Credit, showing a grid of streets, green spaces, and a water body at the bottom. The map is overlaid with a large, semi-transparent blue banner at the top and bottom.

3E

Region of Peel

APPENDIX 3E

COST ESTIMATES

LAKESHORE SANITARY TRUNK (PORT CREDIT EA)
OPINION OF PROBABLE COST - CLASS B

Region of Peel

Project: 165640286

Summary Table

Item	OPC
Site Breakdown	
General Tunneling (including Sewer installation and commissioning)	\$20,290,000
Front St (North of Lakeshore)	\$3,800,000
Front St (at SPS)	\$600,000
Elmwood Ave	\$7,360,000
Traffic Control, Utility Relocation and Misc.	\$320,000
Optional Interim Low Flow Flushing Chamber ²	\$2,000,000
OPC Contingency (10%) ³	\$3,440,000
Subtotal	\$37,810,000
Project Allowances¹	
Engineering Support During Construction and CA/Inspection (3%)	\$4,090,000
Property Costs (Temporary Easements) (1.5%)	\$2,050,000
Region of Peel Internal Costs (3%)	\$4,090,000
Construction Contingency (10%) ³	\$13,650,000
Total OPC + Project Allowances⁴	\$61,690,000

Notes:

¹Project allowances shown herein match those included for previous OPCs produced throughout the preliminary design phase. Refinement of the categories included and associated percentages to be completed in consultation with the Region prior to finalization.

²Included to account for need to provide mitigation measures for low flow velocities. Optional cost included here assumes that the Elmwood temporary TBM extraction shaft will be outfit with permanent concrete chamber, actuated slide gate, and potable water supply for periodic flushing of the LST. Evaluation of required potable water storage volume, gate sizing, and chamber configuration will be reviewed during further detailed design.

³The OPC contingency is for items not yet detailed or accounted for in the design and OPC breakdown. The construction phase contingency is for unforeseen site conditions and construction phase risks and uncertainties.

⁴This Class B OPC includes an accuracy range of +/- 15%, as required for the preliminary design stage by the Region of Peel Project Implementation Procedures Manual.

PRESSURE ZONE 1 WATERMAIN UPGRADES ON LAKESHORE ROAD WEST - PORT CREDIT EA

Region of Peel Opinion of Probable Cost (OPC)

Site	Item	Quantity	Unit Cost	Capital Cost
750mm Watermain in Microtunnel from Front Street Parkette to Elmwood	8m Circular Launch Shaft at Front Street Parkette (24m deep)	24	\$45,000	\$1,080,000
	5m Circular Receiving Shaft (16m deep) at Elmwood	16	\$40,000	\$640,000
	1800mm MicroTunnel from Front Street Parkette to Elmwood	1000	\$7,500	\$7,500,000
	750mm WM in Tunnel	1000	\$1,500	\$1,500,000
	750mm Piping Within Shaft	1	\$100,000	\$100,000
	Special Drain Chamber in Shaft at Front Street Parkette	1	\$250,000	\$250,000
	Shafts Backfill and Surface Restoration	1	\$50,000	\$50,000
Miscellaneous Costs	Mob, Demob, Dewater, Bond, Insurance, Support of Utilities, ESC, Traffic Control	1	\$1,741,471	\$556,000
Opinion of Probable Cost Sub-Total				\$11,676,000
OPC Contingency (10%)				\$1,167,600
Opinion of Probable Cost (with 10% Contingency) Sub-Total				\$12,843,600
Project Allowances				
Engineering Support During Construction and CA/Inspection (3%)				\$385,308.00
Region of Peel Internal Costs (2%)				\$256,872.00
Construction Contingency (10%)				\$1,284,360.00
Total Project OPC				\$14,770,140

Rosemere SPS Preliminary Design
 Peel Project:
 GMBP Project 719033



Preliminary Design Cost Estimate (2023 Pricing)

Item	Estimated Cost
Division 1 – General Requirements	\$ 774,500
Division 2 – Site Works	\$ 2,805,600
Division 3 – Concrete	\$ 2,400,000
Division 4 – Masonry	\$ 240,000
Division 5 – Metals (Structural & Architectural)	\$ 53,750
Division 6 – Wood & Plastics	\$ 193,000
Division 7 – Thermal & Moisture Protection	\$ 60,000
Division 8 – Windows and Doors	\$ 119,200
Division 9 – Finishes	\$ 380,000
Division 11 – Equipment	\$ 516,350
Division 15 – Mechanical & Ventilation	\$ 744,000
Division 16 – Electrical	\$ 506,050
SUBTOTAL	\$ 8,792,450
Miscellaneous Items (Bonding, etc.)	\$ 265,000
Provisional Items	\$ 350,000
Budget Contingency (30%)	\$ 2,822,235
Engineering Budget (20%)	\$ 2,445,937
TOTAL ESTIMATED VALUE	\$ 14,675,622

Description	Construction Sub-Total
	(2023 \$)
Launch shaft , SAN MH "H" and drop structure interconnection to Lakeshore Trunk Sewer (Elmwood Avenue North and Lakeshore Road East)	\$ 1,540,000
Receiving shaft, SAN MH "E" (Elmwood Avenue South and Wanita Road)	\$ 490,000
Launch shaft, SAN MH "C" (Elmwood Avenue South and Tall Oaks Park)	\$ 550,000
Reception shaft, SAN MH "B" (St. Lawrence Park at St. Lawrence Drive)	\$ 550,000
Launch/reception shaft. SAN MH "F" (Wanita Road and Hiawatha Parkway)	\$ 670,000
Launch shaft, SAN MH "G" (Hiawatha Parkway and Cumberland Drive)	\$ 600,000
1200 AWWA C30X SAN tunnel with 525 flow channel, SAN MH "H" to SAN MH "E" (Elmwood Avenue South from Lakeshore Road East to Wanita Road)	\$ 2,680,000
1200 AWWA C30X SAN tunnel with 525 flow channel, SAN MH "C" to SAN MH "E" (Elmwood Avenue South from Tall Oaks Park to Wanita Road)	\$ 1,520,000
1200 AWWA C30X SAN tunnel with 525 flow channel, SAN MH "B" to SAN MH "C" (Tall Oaks Park from St. Lawrence Drive to Elmwood Avenue South)	\$ 1,430,000
1200 AWWA C30X SAN tunnel with 300 flow channel, SAN MH "F" to SAN MH "E" (Wanita Road from Hiawatha Parkway to Elmwood Avenue South)	\$ 5,740,000
1200 AWWA C30X SAN tunnel with 300 flow channel, SAN MH "G" to SAN MH "F" (Hiawatha Parkway from Cumberland Drive to Wanita Road)	\$ 2,530,000
SAN MH "A" and Connection to Existing 525 SAN (Tall Oaks Park)	\$ 120,000
300 SAN from SAN MH 1783032 to SAN MH "C" (Elmwood Avenue South at Carlis Place)	\$ 80,000
250 SAN from SAN MH 1783040 to SAN MH "C" (Elmwood Avenue South)	\$ 60,000
525 SAN from SAN MH "A" to SAN MH "B" (Tall Oaks Park)	\$ 100,000
300 SAN from SAN MH 609588 to SAN MH "G" (Cumberland Drive and Hiawatha Parkway)	\$ 80,000
150 WM Relocation (Elmwood Avenue South at Wanita Road)	\$ 90,000
150 WM Relocation (Wanita Road at Hiawatha Parkway)	\$ 60,000
150 WM Relocation (Hiawatha Parkway at Wanita Road)	\$ 60,000
Temp Relocate and Reinstall 300 STM (Wanita Road at Hiawatha Parkway)	\$ 60,000
Decommission and Abandon Elmwood WWPS	\$ 320,000
Grout and Abandon Elmwood WWPS SAN FM	\$ 140,000
Decommission and abandon Hiawatha WWPS	\$ 160,000
Grout and Abandon Hiawatha WWPS SAN FM	\$ 10,000
SUBTOTAL	\$ 19,640,000
Design/Engineering (15%)	\$ 2,950,000

Description	Construction Sub- Total
	(2023 \$)
Contingency (30%)	\$ 5,900,000
TOTAL	\$ 28,490,000