URBANTECH®

FUNCTIONAL SERVICING REPORT & STORMWATER MANAGEMENT STUDY

420 – 468 South Service Road East
GE Lands

Town of Oakville

REGION OF HALTON

PREPARED FOR
South Service Holding Corp.

Urbantech File No.: 23-307

1st SUBMISSION – November 2024

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1 INTRODUCTION

This report provides functional servicing design and stormwater management information in support of Official Plan Amendment (OPA) for the 420-468 South Service Road East property (GE Lands) in the Town of Oakville (Town), Region of Halton (Region). When approved, the OPA will establish a planning framework for the property, including a multi-block mixed use development, new public roads, and park space.

The servicing and development concepts presented in this report are based on the site plan prepared by Graziani and Corazza Architects (architectural plan and site statistics are available in **Appendix A)**, with input from the following reference reports:

- Preliminary Geotechnical Investigation Report (EXP, October 2024)
- Hydrogeological Investigation Report (EXP, October 2024)
- Town of Oakville Pre-Consultation Comments Report (Town of Oakville, September 2024)
- Conservation Halton Draft Spill Flood Hazard Policies (Conservation Halton, September 2024)
- Town of Oakville Flood Mitigation Opportunities Study Lower Morrison and Lower Wedgewood Creeks (Town of Oakville, June 2024 Draft Report)
- Liveable Oakville Plan / Town of Oakville Official Plan (Town of Oakville, 2021 Consolidation)
- Midtown Oakville Class Environmental Assessment Study (Town of Oakville, 2014)
- Midtown Oakville Stormwater Management Report (Cole Engineering, 2014)
- Sustainable Halton Water and Wastewater Master Plan (AECOM, 2011)
- Region of Halton 2022 Development Charges Update Water/Wastewater Technical Report (GM BluePlan, September 2021)
- Water and Wastewater Area Servicing Plan for Midtown Oakville – Addendum (GM BluePlan, January 2021)

Design information considers the following guidelines:

- Town of Oakville Development Engineering Procedures and Guidelines (2023)
- Regional Municipality of Halton Water and Wastewater Linear Design Manual (2019)

This report is intended to demonstrate the feasibility of site servicing for the proposed development, including water, sanitary and stormwater management. Site grading, and preliminary erosion / sediment control information is also included.

Supporting drawings are available in **Appendix C.** Drawings do not provide design information pertaining to the internal servicing of the proposed buildings. As part of the civil engineering design, a set of storm, sanitary and water connections will be provided for the proposed residential development, beyond which it will be the responsibility of the building mechanical engineer to design the internal servicing concept, in conformance with the servicing and grading design.

1.1. Subject Site

The GE Lands are in the municipality of Oakville within the Region of Halton. The lands are bound by the Queen Elizabeth Way (QEW) highway and South Service Road to the north. The CN Railway Line is to the south. The lands to the east and west are currently used for employment (office space, light industrial and hospitality).

The site is approximately 27 acres and was previously used for industrial purposes. The property is currently vacant, save for one structure (the GE Lamp Plant former office building, registered as a Heritage Property). The remaining land is previously disturbed, with concrete slabs and parking areas covering most of the site. There are some naturalized areas along the east, west, and south property boundaries, but no Conservation Halton regulated areas or areas identified as Natural Heritage.

The proposed development includes three (3) blocks of mixed residential and commercial towers (identified as Block 1, Block 2, and Block 4 in the Architectural Plans attached in **Appendix A**), all with multiple buildings, podiums, and underground parking. A fourth block (Block 3) is reserved as park space. The proposed road network includes a local road to the west of Block 1, an east-west collector road (Davis Road extension), and two arterial roads (the Cross Road extension along the south boundary of the property and a north-south arterial running through the middle of the site).

From a servicing perspective, it is important to note that the north-south arterial road through the middle of the property is anticipated to include a fly-over across the QEW to the north and an underpass across the CN Rail Line to the south. This is a significant grade change which impacts servicing and site design (discussed further in the sections that follow).

1.2. Midtown Oakville Background

As outlined in the Liveable Oakville Plan (Town of Oakville Official Plan, 2021 Consolidation) the Town identifies Midtown Oakville as a key growth and redevelopment area, intended to be developed as a high density, mixed-use, transit supportive neighbourhood. The Midtown Oakville Class Environmental Assessment Study (Class EA), completed in 2014, provides further information and direction on the proposed future road network and stormwater management requirements.

The development application for the GE Lands conforms with the current Liveable Oakville OP and 2014 technical work for Midtown. Urbantech has considered other on-going work (as discussed in the sections that follow), where available and appropriate.

1.2.1. Town of Oakville

We acknowledge that the Town is currently undertaking an Official Plan review of the Midtown area along with the Midtown Oakville Program Implementation Project, led by Jacobs. This work is, ultimately, intended to create a detailed implementation framework for Midtown Oakville. From an infrastructure perspective, deliverables will include:

- Transportation Master Plan
- Stormwater Master Plan
- Municipal Infrastructure and Servicing Plan (Water / Wastewater)
- Utilities Infrastructure Plan
- Roadway Functional Design
- Phasing and Implementation Strategy
- Funding / Financing Strategy

This work is on-going, anticipated to be complete in the 2025 timeframe.

The Town has also recently completed the Flood Mitigation Opportunities Study Lower Morrison and Lower Wedgewood Creeks Municipal Class Environmental Assessment (MCEA) Study. The study was carried out to identify the existing level of flood risk associated with Lower Morrison and Lower Wedgewood Creeks and to develop flood mitigation actions to be implemented. The report also

provides new guidance for future development areas (including Midtown Oakville) to improve stormwater management planning practices. It is important to note that:

- The GE Lands are within the Lower Morrison Creek sub-catchment. Floodplain mapping from the MCEA Study shows no floodlines or flooding risk within the GE Lands site (100-Year Storm Floodlines).
- While the MCEA Study does include new proposed stormwater management design criteria for Midtown Oakville, the Town's direction (as noted in the Pre-Consultation Comments) is to maintain the interim (i.e., 2014) SWM criteria for the purposes of this application. The Town does note that updates may be required as planning proceeds.

1.2.2. Region of Halton

The Region of Halton is currently updating their Water and Wastewater Master Plan. The current Master Plan was completed in 2011 with a planning horizon to 2031. The new Master Plan will review infrastructure needs to 2051. The Region is working with the Town of Oakville to ensure growth projections for Midtown Oakville are properly identified and considered. Future infrastructure improvements and phasing will be determined through the Master Plan process and integrated into the Midtown Oakville Servicing Plan. The Midtown Oakville Servicing Plan will supersede the existing Midtown Oakville Area Servicing Plan (GM BluePlan, 2021). The Region will be engaging with the development community in Fall, 2024 on the Master Plan strategy and is anticipated to complete the Master Plan in 2025.

The Region is also working on the detailed design for trunk sanitary sewer upgrades along the Trafalgar Road corridor from Argus Road south. This capital project (identified most recently in the Region's 2022 Development Charges Technical Update Report, GM BluePlan, 2021) will alleviate existing sanitary capacity constraints in the Midtown Oakville area. Staff have confirmed that construction is intended to begin next year with completion in the 2026 timeframe.

1.2.3. Conservation Halton

Conservation Halton recently introduced their Draft Spill Flood Hazard Policy (September 2024), which is intended to establish clear guidelines for managing new developments within areas impacted by spill flood hazards. According to Conservation Halton, spills occur when flood waters leave a watercourse, its valley and floodplain, and continue to flow overland in multiple directions before rejoining the same watercourse downstream or spilling into another watershed. Spills often move through areas where riverine flooding may not be anticipated and can flow in complex patterns. The Spill Policy was endorsed by Conservation Halton's Board in September 2024. The policy is currently out for public review. Conservation Halton will host several engagement sessions over the next few months to gather industry input. Formal approval by the Conservation Halton Board is anticipated following public engagement (anticipated late 2024 or early 2025).

When approved, the requirements under this policy will need to be met to ensure public safety and the protection of property. This can be updated for the GE Lands as part of the on-going development process and should not impact OPA approval. Current Conservation Halton mapping indicates a potential spill to the north of the site, along the QEW. Detailed hydraulic modeling will be completed by both the Town and Conservation Halton as part of on-going work to confirm the specific characteristics of the spill and the impact to downstream areas. Once this modeling is complete, the spill impacts on the GE Land's development proposal will continue to be evaluated according to the policy's criteria.

Preliminary modeling done by Urbantech using Conservation Halton's 2D HEC RAS model indicates that the depth and velocity of the spill onto the GE Lands meet Conservation Halton's thresholds, which allow for fill in spill areas where flood depths are less than 1 meter and flow velocities do not exceed 1 m/s (meter per second). These depths and velocities do not occur on the subject lands, however, if the spill needs to be filled or redirected, appropriate measures will be taken. This will ensure that the development adheres to all necessary flood management practices.

Additionally, it is anticipated that all building entrances and openings will be adequately floodproofed, meeting the standards set by Conservation Halton to ensure protection from any potential spill impacts. The development will fully comply with these requirements, ensuring that risks are mitigated, and spill flood hazards are appropriately managed in line with the approved policy.

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2 EXISTING CONDITIONS & SITE GRADING DESIGN

2.1. Existing Soil Conditions

A geotechnical investigation was conducted by EXP Services Inc. (available under separate cover as part of the OPA submission). Twenty-one (21) boreholes were drilled to provide geotechnical parameters and recommendations for the design of the proposed high-rise towers.

The findings of the geotechnical investigation conclude that the soil stratigraphy of the site consists of an upper layer of variable fill material overlying native clayey silt till, with shallow bedrock. It is the opinion of the Geotechnical engineer that the existing fill on the site must be removed down to the sound shale bedrock. Bedrock was primarily encountered at depths ranging from 1.5 m below grade to 4.0 m below grade (Georgian Bay Shale).

2.2. Existing Groundwater Conditions

A preliminary hydrogeological assessment was conducted by EXP Services Inc. (available under separate cover as part of the OPA submission). Ten (10) groundwater monitoring wells were installed on the site to depths ranging from 12.17 m to 14.29 m. Groundwater was encountered during borehole drilling and/or after monitoring well installation.

Groundwater depths (measured August 29th, 2024) range from 4.07 m below grade to 7.56 m below grade. It is noted that groundwater levels are seasonal and may vary at other times of the year.

Per the hydrogeological assessment, further consultation with a de-watering contractor and environmental consultant is required to better understand post-construction de-watering options. We acknowledge that the Town does not permit uncontrolled discharge of groundwater to the storm sewer regardless, but options can be further evaluated at the detailed design stage (including overcontrol of the stormwater tank discharge, waterproofing, etc.), depending on the environmental / water quality results.

2.3. Site Grading Design

The existing site ranges in elevation between approximately 105 masl (meters above sea level) and 101 masl, sloping generally from north to south (towards the CN Rail Line). For the purposes of the OPA, road grading was advanced to understand boundary grades of the Blocks as well as stormwater management and sanitary infrastructure requirements (alignment, cover, etc.).

In general, site grading design (as shown on **Drawing GRD-1** in **Appendix C**) considers the following requirements and constraints:

- Conformance to the Town of Oakville's grading criteria.
- Minimizing cut to fill operations and work towards a balanced site.
- Matching existing boundary grading conditions.
- Maintaining required drainage boundaries.
- Providing minimum cover on proposed servicing.

Preliminary site grading is constrained by the overpass and underpass along the mid-block north-south arterial road and associated impacts to the Cross Avenue extension. Further grading coordination will be required as design proceeds. It is noted that the south boundary of the park block will need to be raised to provide stormwater control. Detailed block grading will be completed at the site plan stage.

3 WATER SERVICING

3.1. Existing Conditions - Water

3.1.1. Existing Water Infrastructure

Midtown Oakville (including the GE Lands site) is located within Water Pressure Zone O2 (Oakville Zone 2), serviced by the Region's lake-based water treatment plants. Existing water distribution infrastructure immediately adjacent to the property includes:

- 300 mm watermain on Davis Road (immediately west of the site).
- 900 mm / 750 mm Zone O2 transmission main on South Service Road (immediately north of the site), originating from the Davis Road Booster Pumping Station (west of the site, near Trafalgar Road).
- 300 mm watermain on South Service Road (at the northeast corner of the site).

Refer to **Drawing WM-1** in **Appendix C** for additional information.

Water is supplied to Zone O2 via the Davis Road Booster Pumping Station (BPS), located west of the subject site at Davis Road and Trafalgar Road. Floating storage for Zone O2 is supplied by the Eighth Line Reservoir. Of note, there is an on-going state-of-good-repair (renewal) construction project at the Davis Road BPS which, when completed, will increase capacity from approximately 65 MLD to its rated capacity of 100 MLD.

3.1.2. Existing Water Demand

There is no current water demand associated with the GE Lands site.

3.2. Proposed Conditions - Water

3.2.1. Proposed Water Servicing Strategy

The GE Lands development is proposed to connect to the existing 300 mm watermains on both Davis Road and South Service Road (adjacent to the development) via new watermains along "Street A" and "Street D". It is anticipated that new watermain will also be installed along future Cross Avenue to provide redundancy and looping to all development in the area. A watermain connection between "Street A" and future Cross Ave is also shown for looping.

The strategy proposed is consistent with recommendations in the Midtown Oakville Area Servicing Plan (ASP) (GM BluePlan 2021). The ASP proposes 300 mm watermains along the Davis Road and Cross Avenue extensions (east / west corridors), with north / south watermain connections in several locations for looping. We have moved a north / south 300 mm watermain (shown in the ASP along the mid-block arterial) east to "Street D" to avoid services within the highway overpass.

In addition to the above, please note that:

- Watermains will provide all domestic flow and fire protection to the GE Lands development.
- Per Region of Halton guidelines, a 200 mm diameter fire service and 150 mm diameter domestic (residential) service will be required for each block. A second 200 mm fire service may be

required but will be confirmed at site plan with the mechanical engineer. The mechanical consultant will also be responsible for the design of all the internal water services.

- The final location of the fire department connection (siamese connection) for the buildings will need to be located within 80 m of a municipal fire hydrant. Fire hydrant location will be determined at detailed design but will meet Region of Halton criteria for location and spacing.

Refer to **Drawing WM-1** in **Appendix C** for additional information.

3.2.2. Proposed Water System Demands

Proposed domestic water demand for the GE Lands site has been calculated using the following information:

- Site Statistics (available in **Appendix A**). As a conservative estimate, units are assumed to be a split of 50% 1-Bed and 50% 2-Bed. This will be refined as planning progresses.
- The park block space is assigned a population density of 40 ppl/ha as a preliminary estimate. This will be refined with Town Staff as park planning proceeds.
- Region of Halton Water and Wastewater Linear Design Criteria (per capita usage, max day / peak hour factors).
- Region of Halton Built Boundary Housing Occupancy Rates (per the 2022 DC Background Study, Table A-4)

The domestic water usage projected for the site is as follows, with supporting calculations available in **Appendix B:**

- Population: 10,821 people
- Avg. Day Usage: 275 L/person/day
- Average Day Demand: 34.44 L/s
- Max Day Demand: 77.49 L/s
- Max Hour Demand: 137.77 L/s

Fire flow will be estimated at the site plan stage using the Fire Underwriters Survey (2020) methodology when additional information is available regarding built-form, construction type, building use, sprinkler installation, and protection for vertical openings. Per Regional criteria, the water system will be designed for the higher of Max Hour or Max Day + Fire.

3.2.3. Water System Capacity Analysis

The ability of the Regional water system to support short-term growth (i.e., to 2031) and long-term growth (i.e., to build-out) in Midtown Oakville area was evaluated as part of the 2021 Area Servicing Plan (ASP) by GM BluePlan. While population projections for Midtown continue to evolve through the Town and Region's on-going studies, the 2021 ASP assumptions (i.e., 11,300 people and 2,559 jobs to 2031) are similar to the Town of Oakville's growth projections (per August 10, 2023 Council Report) of 11,071 people and 1917 jobs (also to 2031).

The GM BluePlan ASP concludes that:

- There is sufficient pumping capacity at the Davis Road Booster Pump Station and sufficient storage capacity at the Eighth Line Reservoir to support growth in Midtown Oakville (Zone O2)

to beyond 2031. Pump station and reservoir upgrades may be required to support longer term growth (i.e., full build-out).

- The existing 300 mm watermains on Davis Road and South Service Road provide sufficient flow and pressure to support growth projections to 2031 and build-out (i.e., there are no recommendations to replace the existing services on these corridors). The broader local water system will be augmented with additional cross-connections on future north/south road alignments.

- Domestic flow / pressure and fire flow / pressure were within acceptable ranges under proposed 2031 and build-out scenarios (in accordance with Region of Halton level of service requirements), with the existing infrastructure in place.

The existing system is robust, with good distribution and looping. The south Halton water system is highly integrated; water treatment capacity is not dependent on a single plant. Midtown Oakville receives water predominantly from the Oakville WTP and Burloak WTP. There is an on-going re-rating project at the Oakville WTP (increasing the rated capacity from 109 MLD to 130 MLD) that is anticipated to be complete in the 2025 timeframe. An expansion is also planned at the Burloak WTP (from 55 MLD to 165 MLD). The Region has indicated through their recent infrastructure review as part of the 2023 Allocation Program that capacity exists in the treatment and transmission main system to meet the Town of Oakville's housing pledge of 33,000 units by 2031, without major upgrades to treatment plants. The Town will rely on both greenfield and built-boundary growth (in key nodes like Midtown Oakville) to meet their 2031 housing goals.

Given work done to-date, water system capacity is not expected to be a limiting factor for development of the GE Lands. As planning proceeds, water distribution pressure and fire flow requirements for the site can be reviewed in more detail. Water hydraulic modelling will be undertaken at the next stage when additional information is available regarding neighbouring developments and long-term plans for Midtown Oakville.

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4 SANITARY SERVICING

4.1. Existing Conditions – Wastewater

4.1.1. Existing Wastewater Infrastructure

Most of Midtown Oakville (including the GE Lands) is located within the Oakville Southwest Wastewater Treatment Plant (WWTP) catchment area. Wastewater drains to a trunk sewer along Trafalgar Road which flows south to Rebecca Street and then west to the WWTP. The Region of Halton has advised that part of the trunk sewer on Trafalgar Road (between Cross Avenue and Cornwall Road) is undersized and currently does not have capacity to accommodate new growth in Midtown. An upgrade project is ongoing by the Region to increase the size of the trunk sewer on Trafalgar Road, which will alleviate this constraint. Construction is anticipated to commence in 2025 and be complete in 2026.

The eastern boundary of Midtown, extending from east of the GE Lands to Chartwell Road, drains away from Trafalgar Road to the Ninth Line Wastewater Pump Station (WWPS) and the Oakville Southeast WWTP via an existing 750 mm trunk sewer on Chartwell Road.

Existing wastewater distribution infrastructure immediately adjacent to the GE Lands property includes:

- 300 mm sanitary sewer on Davis Road (immediately west of the site), draining west to the existing Trafalgar Road sanitary trunk system.
- 300 mm sanitary sewer on South Service Road (at the northeast corner of the site), draining east to the Chartwell Road sanitary trunk sewer.

Refer to **Drawing SAN-1** in **Appendix C** for additional information.

4.1.2. Existing Wastewater Demands

There is no current wastewater demand associated with the GE Lands site.

4.2. Proposed Conditions – Wastewater (Sanitary)

4.2.1. Proposed Sanitary Servicing Strategy

Block 1 of the GE Lands is proposed to connect to the existing 300 mm wastewater main on Davis Road, with flow directed westward to the new Trafalgar Road trunk sewer. Sanitary design sheets for the site (included in **Appendix B**) confirm that there is sufficient capacity in the Davis Road sewer to accommodate Block 1 development. This approach allows the Region to utilize existing infrastructure, enabling Block 1 to proceed independently of other infrastructure and roadwork in the area (Block 1 is proposed to proceed as Phase 1 of the development).

Blocks 2 and 4 are proposed to drain eastward to the existing 750 mm Chartwell Road trunk sewer. An assessment of the Chartwell Road sewer depth indicates it is sufficient to provide cover for connecting local sewers, as shown in **Drawing SAN-1**. Since the GE Lands lie along the drainage boundary between the Oakville Southwest and Oakville Southeast Wastewater Treatment Plants (WWTP), wastewater flows from Blocks 2 and 4 could be sent in either direction. Servicing to the east is preferred due to the following advantages:

- **Avoids the need for a deep Cross Avenue sewer**: The ground elevation at the proposed underpass (located at the intersection of the future north/south arterial and Cross Avenue) is significantly lower than other sections of Cross Avenue. Extending a sewer along Cross Avenue from Trafalgar Road to service Blocks 2 and 4 would increase the pipe depth by approximately 4 meters along the entire alignment to maintain cover. The feasibility of this approach also depends on the invert depths planned for the new Trafalgar trunk sewer connections.
- **Eliminates the need for internal pumping in Block 4**: Directing the sanitary flow from Block 4 to the west would require internal pumping within the block. Sending flow to the east does not require pumping.

Block 3, designated as park block, is proposed to connect to a future sanitary sewer on Cross Avenue (terminating at the west boundary of the site). The necessity, location, and size of the park connection will depend on the park's service requirements and will be further discussed with the Town and Region as planning progresses.

The proposed wastewater servicing options align with recommendations of the Midtown Oakville Area Servicing Plan (ASP) (GM BluePlan 2021). The ASP outlines new east-west sanitary services along the Davis Road and Cross Ave extensions, and a drainage divide at the boundary of the GE Lands. This study proposes that the Region maintain a Davis Road sanitary connection to Trafalgar Road to provide flexibility as the Midtown area builds-out.

In addition to the above, please note that:

- **Drawing SAN-1** includes an alternative sanitary servicing option for Blocks 2 and 4, with connections draining west toward the new Trafalgar Trunk Sewer. While not the preferred servicing strategy for the reasons listed above, this option conceptually demonstrates the requirements for directing flow westward. In this scenario, Blocks 2 and 4 connect to a new sanitary network running east to west across Street “A” and south through a shared servicing easement on the park block's west side (alongside stormwater infrastructure). For this option to work effectively, the Cross Avenue sanitary service connection has been positioned as far west as possible to minimize infrastructure depth on Cross Avenue, and to ensure connection to the new Trafalgar Trunk Sewer. As previously noted, pumping within Block 4 would be necessary to connect sanitary drainage to the proposed Street “A” invert.
- Design of the sanitary network for GE Lands and all other neighbouring developments will need to be closely aligned with the Region’s Trafalgar Trunk Sewer project to ensure appropriate invert depths and manhole locations are provided for future connections.
- Per Region of Halton guidelines, a 250 mm sanitary service connection with property line inspection manhole will ultimately be provided for Blocks 1, 2 and 4. The ultimate elevation of the connection will be confirmed at detailed design with the mechanical engineer. The mechanical consultant will also be responsible for the design of all internal sanitary services.

Refer to **Drawing SAN-1** in **Appendix C** for additional information.

4.2.2. Proposed Wastewater Generation

The future wastewater (sanitary) generation rate for the GE Lands site has been calculated using the following information:

- Site Statistics (available in **Appendix A**), including unit counts and unit types.

- The park block space is assigned a population density of 40 ppl/ha as a preliminary estimate. This will be refined with Town Staff as park needs are further defined.
- Region of Halton Water and Wastewater Linear Design Criteria (per capita generation rate, average day demand, peaking factor, and inflow / infiltration rate).
- Region of Halton Built Boundary Housing Occupancy Rates (per the 2022 DC Background Study, Table A-4).

The wastewater generation rates projected for the site is as follows, with supporting calculations available in **Appendix B.** Sanitary calculations are split between the Davis Road sewer catchment (Block 1), the Chartwell sewer catchment (Cross Road – Blocks 2 and 4) and the park block (Block 3).

Davis Road Sewer:

- Population: 4,244 people
- Avg. Day Usage: 275 L/person/day
- Avg. Dry Weather Flow: 13.51 L/s
- Peaking Factor (Modified Harmon): 3.31
- Inflow / Infiltration: 0.71 L/s (2.48 ha area)
- Peak Wet Weather Flow: 45.42 L/s

Chartwell Road Sewer (via Cross Ave to the east):

- Population: 6,502 people
- Avg. Day Usage: 275 L/person/day
- Avg. Dry Weather Flow: 20.70 L/s
- Peaking Factor (Modified Harmon): 3.14
- Inflow / Infiltration: 1.08 L/s (3.77 ha area)
- Peak Wet Weather Flow: 66.01 L/s

Park Block (Preliminary – to be refined with Town as planning proceeds):

- Population: 74 people
- Avg. Day Usage: 275 L/person/day
- Avg. Dry Weather Flow: 0.24 L/s
- Peaking Factor (Modified Harmon): 4.28
- Inflow / Infiltration: 0.53 L/s (1.86 ha area)
- Peak Wet Weather Flow: 1.54 L/s

4.2.3. Wastewater System Capacity

As noted in Section 4.1.1 the Region is moving forward with a sewer upgrade project on Trafalgar Road, which will provide long-term capacity to accommodate growth in Midtown. The Region has previously completed upgrades to the downstream trunk sewer system on Trafalgar Road, Rebecca Street and Lakeshore Road, up to the Oakville Southwest WWTP.

Similar to the water system, the ability of the Regional sanitary system to support short-term growth (to 2031) and long-term growth (to build-out) in Midtown was evaluated through the 2021 GM BluePlan ASP. The ASP concludes that:

- There is sufficient capacity at the Oakville Southwest WWTP to support near-term growth in Midtown. A plant expansion may be required to accommodate growth post 2031. The need and timing for the future expansion is currently being evaluated as part of the on-going Water and Wastewater Master Plan. A future expansion should not preclude initial development in Midtown.
- There are no sanitary pump stations between Midtown Oakville and the Oakville Southwest WWTP. There are no wastewater pump station capacity considerations or concerns.
- The Oakville Southeast WWTP (currently rated at 31.8 MLD) has approximately 5.8 MLD of existing capacity available to accommodate growth, which is sufficient to support full build-out of both Block 2 and Block 4. The ASP suggests that efficiently utilizing the Oakville Southeast WWTP to support Midtown growth is an important consideration to offset future impacts and expansion needs at the Oakville Southwest WWTP. The concept proposed for the GE Lands builds on this recommendation by proposing that Block 2 and Block 4 flow is ultimately directed east towards Chartwell.
- The Ninth Line WWPS (located upstream of the Oakville Southeast WWTP) is currently undergoing an upgrade project (scheduled to be complete in December 2024). Upgraded capacity will need to be confirmed with Halton Region, but it is anticipated that there will be available capacity for initial development of Block 2 and Block 4.

As such, once the Region has completed the trunk sewer upgrades on Trafalgar Road (2026 timeframe), sanitary trunk sewer capacity is not expected to be a limiting factor for development of the GE Lands. Calculations show that the existing Davis Road sewer can accommodate Block 1 sanitary flow from the GE Lands (see **Appendix B**), which will allow for initial development to proceed. Other Blocks will rely on future local infrastructure as the Midtown area builds-out. As planning proceeds, wastewater hydraulic modelling can be undertaken, when additional information is available regarding neighbouring developments and long-term plans for Midtown Oakville.

5 STORM DRAINAGE & STORMWATER MANAGEMENT

5.1. Existing Storm Drainage

Under existing conditions, the majority of the site drainage is conveyed in a southeasterly direction towards an existing ditch, which runs along the southeast boundary of the subject lands. The existing ditch flows from north to south.

Existing drainage conditions are illustrated on **Drawing STM-1**, provided in **Appendix C**. Several external drainage catchments are conveyed through the subject lands under existing conditions:

- EXT1 & EXT4: boulevard drainage from South Service Road East;
- EXT2 & EXT3: drainage from the existing property to the southwest;
- EXT5: drainage from the existing property to the east; and
- EXT6 & EXT7: drainage from the existing property to the east.

A portion of the existing drainage (catchments EX1 and EXT1) is captured and conveyed to the existing 600 mm ø storm sewer on Davis Drive, as shown on **Drawing STM-1**. The remaining catchments drain to the existing ditch southeast of the site under existing conditions.

5.2. Proposed Storm Drainage Plan

The subject site drains to four proposed outlets under post-development conditions. The post-development drainage plan is shown on **Drawing STM-2**, provided in **Appendix C**. The proposed storm drainage outlets are described in **Table 5-1**.

Table 5-1: Proposed Storm Outlets

Location	Catchments	Total Drainage Area (ha)	Outlet MH ID	Storm Connection / Outlet
Davis Road	BLK1, 8, 9, 11 & EXT3	3.608	EX.STM.MH 13	Ex. 600 mm ø
Future Cross Avenue (West)	BLK2, BLK3, 4, 5 & 6	4.387	STM.MH 1	Fut. 1200 mm ø
Underpass at Cross Avenue	1, 2 & 3	1.591	STM.FUT 10	Drains to Pumped Underpass; Ultimate Outlet by Others
Future Cross Avenue (East)	7 & EXT4	0.925	N/A	Morrison Creek

5.3. Stormwater Management

In accordance with Town of Oakville requirements for stormwater management as outlined in the Midtown Oakville EA Study (June 2014), the design criteria for the subject site are as follows:

Stormwater Quantity Control (Peak Flow Control)

The proposed development is planned to drain to Lower Morrison Creek. As noted in the Midtown Oakville EA Study (June 2014), the target flows applied to Lower Morrison Creek are from the *Lower Morrison/Wedgewood Creeks – Flood, Erosion and Master Drainage Plan Study*, prepared by R.V. Anderson Associates Ltd. (January 1993). In order to meet the target flows from the R.V. Anderson

study, the minimum storage requirement for Lower Morrison Creek identified in the Midtown EA is 280.9 m^3/ha.

The Midtown EA hydrologic model will be updated during the detailed design stage at site plan approval in order to confirm that the downstream target flows in Lower Morrison Creek are still met with the applied unit storage rate to the subject development.

Stormwater Runoff Volume Reduction (Water Balance)

Any proposed development within the Midtown Oakville study area shall consider water balance by providing retention of 25 mm over the entire area of the proposed development, in accordance with the Town's Stormwater Master Plan.

Stormwater Quality Control

Achieve Enhanced Level 1 Protection, as per the Ministry of Environment's Stormwater Management Planning and Design Manual (March 2003).

5.3.1. Stormwater Quantity Control (Peak Flow Control)

As noted in **Section 5.3**, the minimum storage requirement for Lower Morrison Creek identified in the Midtown EA is 280.9 m^3/ha.

Quantity control storage for the site plan blocks (Block 1, Block 2, and Block 4) and park block (Block 3) is to be provided by underground storage tanks. Runoff from these site plan blocks will be collected through proposed roof drains, trench drains and surface area drains and conveyed to the underground stormwater tanks. An emergency overland flow route is to be provided from each underground stormwater tank to the proposed right-of-way (ROW). More details on the emergency flow route will be provided at the detailed design stage (with coordination from the mechanical engineer).

Quantity control storage for the road ROW catchments will be provided by superpipes, integrated with the proposed storm servicing plan. Runoff from the road ROW catchments is to be captured by proposed catchbasins to the storm sewer system, where the proposed superpipes will provide the required storage attenuation.

The proposed stormwater management plan is shown on **Drawing STM-2**, provided in **Appendix C. Table 5-2** summarizes the proposed storage for the subject development in order to meet the quantity control requirements, as per the Midtown EA study.

Table 5-2: Quantity Control – Required Storage

Catchment Area IDs	Total Area (ha)	Unit Storage Volume (m^3/ha)	Storage Volume Required (m^3)	Storage Type Proposed
BLK1	2.411	280.9	677	Storage tank within proposed building; configuration to be confirmed at detailed design
BLK2	1.455		409	Storage tank within proposed building; configuration to be

Catchment Area IDs	Total Area (ha)	Unit Storage Volume (m^3/ha)	Storage Volume Required (m^3)	Storage Type Proposed
				confirmed at detailed design
BLK3	1.859		522	Storage tank within park; configuration to be confirmed at detailed design
BLK4	1.455		409	Storage tank within proposed building; configuration to be confirmed at detailed design
1	0.658		185	134.3m-900x1800 mm Superpipe within Cross Avenue ROW (From STM-FUT11 to STM.FUT10)
2	0.559		157	99.3m-900x1800 mm Superpipe within Cross Avenue ROW (From STM-FUT13 to STM.FUT10)
3	0.374		105	103.5m-900x1800 mm Superpipe within North-South Road ROW (From STM-FUT12 to STM.FUT10)
4, 5 & 6	1.465		412	148.1m-1200x2400 mm Superpipe within park Block 3 (From STM.MH3to STM.MH1)
7	0.501		141	144.4m-900x1800 mm Superpipe within Cross Avenue ROW (From STM-FUT8 to the creek outlet)
8, 9 & 11	1.070		301	174.4m-900x1800 mm Superpipe within Street 'B' ROW (From STM-FUT11 to STM.FUT10)
Total	**11.807**	**280.9**	**3,317**	**-**

5.3.2. Stormwater Runoff Volume Reduction

As noted in **Section 5.3**, 25 mm of retention is to be provided over the entire area of the subject site, in accordance with the Town's Stormwater Master Plan. Based on the total development area of 11.807 ha, including the site plan blocks, park block and proposed ROWs, a total retention volume of 2,952 m^3 is required for the proposed development.

As per the Midtown EA Study, the water balance retention volume can be achieved by a combination of Low Impact Development (LID) measures including, but not limited to:

- Rainwater harvesting;
- Green roofs;
- Infiltration trenches and soakaway pits;
- Bioretention;
- Permeable pavement; and
- Perforated pipe systems.

The detailed LID and water balance mitigation plan will be provided through detailed design at the site plan approval stage. Site constraints such as clearance to the seasonally high groundwater level will be considered in the selection, implementation, and location of the proposed LID measures.

5.3.3. Stormwater Quality Control

As required by the Town of Oakville, MECP Enhanced Level 1 protection for the removal of >80% of total suspended solids (TSS) is to be provided for the subject site. Enhanced Level quality control is to be provided for the proposed development by either filtration (via Jellyfish units, or approved equivalent), or a treatment train approach combining treatment via oil/grit separator (OGS) units and LIDs.

Adequate maintenance will need to be undertaken for all proposed water quality treatment measures, to provide a minimum 80% TSS removal. The detailed design phase will provide further details on any maintenance requirements, proposed sizing, and proposed specifications for all proposed water quality measures.

5.3.4. Spill Mitigation

We understand that Conservation Halton, in consultation with the Town of Oakville, is updating flood hazard modelling and mapping for the Midtown Oakville Growth Area. The study will ultimately define the flood hazard from the Morrison Wedgewood Diversion Channel and identify associated flood risk information. See **Section 1.2.3** for additional information.

6 EROSION & SEDIMENT CONTROL

Erosion and sediment controls for the subject lands will be designed in conformance with the Town of Oakville and Conservation Halton guidelines. Erosion and sediment controls will be implemented during all site construction works including but not limited to topsoil stripping, bulk earthworks, foundation excavation, site servicing and stockpiling of materials and will conform to ESC guidelines (2019). The following erosion and sediment control measures are proposed to be implemented during construction:

- Installing heavy duty silt control fencing along the perimeter of the site at strategic locations.
- Installing a temporary mud mat at the construction site entrance.
- Wrapping the tops of all inlet structures with filter fabric and using install silt sacks.
- Tree preservation fencing in accordance with the tree preservation plan, if required.
- Gravel mud mat at the construction vehicle access point to minimize off-site tracking of sediments.
- Inspecting all sediment and erosion control controls to maintain them in good repair until such time as the Engineer or the Town approves their removal.

If required, site-specific measures will be determined during the detailed design / site alteration application stage. A detailed Erosion & Sediment Control Plan will be provided in the future through the detailed design stage.

7 CONCLUSIONS

This report has demonstrated that:

- Water servicing for the site will be provided by the existing 300 mm Zone O2 watermains on Davis Road and South Service Road, together with new local 300 mm services along proposed road corridors to provide looping and redundancy.
- The 2021 ASP by GM BluePlan confirmed that there is sufficient pumping and reservoir capacity for near-term growth (to 2031) and that the existing linear infrastructure (i.e., 300 mm watermains) provides flow and pressure in accordance with Region of Halton level of service requirements.
- Sanitary servicing for Block 1 of the GE Lands is provided by the existing 300 mm wastewater main on Davis Road, connected downstream to the Trafalgar Trunk Sewer. Sanitary design sheets completed for the site (available in **Appendix B**) show that there is existing capacity in the Davis Road sewer to accommodate Block 1 development.
- Sanitary servicing for Block 2 and 4 is provided by a new sanitary network along the Cross Avenue extension, directing flow east to the existing 750 mm trunk sewer on Chartwell Road.
- The Region of Halton is currently upgrading the Trafalgar trunk sewer. This project is in detailed design and is intended to be completed in the 2026 timeframe. Once complete, there are no other downstream capacity constraints (for growth to 2031) anticipated in the sanitary trunk system.
- Stormwater from the proposed development is planned to drain to Lower Morrison Creek. As noted in the Midtown Oakville EA Study (June 2014) the minimum storage requirement for Lower Morrison Creek is 280.9 m^3/ha.
- Stormwater quantity control storage for the site plan blocks (Block 1, Block 2, and Block 4) and park block (Block 3) is to be provided by underground storage tanks located in the underground parking structures. Quantity control storage for the road ROW catchments will be provided by superpipes, integrated with the proposed storm servicing plan. Runoff from the road ROW catchments is to be captured by proposed catchbasins to the storm sewer system, where the proposed superpipes will provide the required storage attenuation.
- Water balance is achieved by providing retention of 25 mm over the entire area of the proposed development, in accordance with the Town's Stormwater Master Plan. Based on the total development area including the site plan blocks, park block and proposed ROWs, a total retention volume of 2,952 m^3 is required. Retention will ultimately be achieved by a combination of Low Impact Development (LID) measures, to be defined at the site plan approval stage.
- Enhanced Level 1 quality control will be provided by either filtration (via Jellyfish units, or approved equivalent), or a treatment train approach combining treatment via oil/grit separator (OGS) units and LIDs.
- Erosion and sediment controls will be implemented during construction in accordance with Erosion and Sediment Control Guidelines.

Report Prepared by:

Kate Connell, P. Eng.
Senior Project Manager

Kate Rothwell, M. Eng., P. Eng.
Manager, Water Resources

APPENDIX A:
Background Information and Site Statistics

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THIS DRAWING IS NOT TO BE SCALED. ALL ARCHITECTURAL SYMBOLS INDICATED ON THIS DRAWING ARE GRAPHIC REPRESENTATIONS ONLY.

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ELECTRONIC INFORMATION IS SUPPLIED TO THE OTHER ASSOCIATED FIRMS TO ASSIST THEM IN THE EXECUTION OF THEIR WORK / REVIEW. THE RECIPIENT FIRM MUST DETERMINE THE COMPLETENESS / APPROPRIATENESS / RELEVANCE OF THE INFORMATION IN RESPECT TO THEIR PARTICULAR RESPONSIBILITY.

GRAZIANI + CORAZZA ARCHITECTS INC. SHALL NOT BE RESPONSIBLE FOR:

1. ERRORS, OMISSIONS, INCOMPLETENESS DUE TO LOSS OF INFORMATION IN WHOLE OR PART WHEN INFORMATION IS TRANSFERRED.
2. TRANSMISSION OF ANY VIRUS OR DAMAGE TO THE RECEIVING ELECTRONIC SYSTEM WHEN INFORMATION IS TRANSFERRED.

1. SEP.13.2024 ISSUED TO CITY FOR PAC MEETING
2. NOV.01.2024 ISSUED TO CITY FOR SPA

ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING D-SUITE 300 CONCORD, ONTARIO L4K 4L8
T.905.795.7601 F.905.795.7844 WWW.GC-ARCHITECTS.COM

PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

OAKVILLE — THE ROSE CORPORATION — ONTARIO

PROJECT ARCHITECT:	J. Chimienti
ASSISTANT DESIGNER:	B. DADGOSTAR
DRAWN BY:	B. DADGOSTAR
CHECKED BY:	D. Biase
PLOT DATE:	OCT.30.2024
JOB #	2127.23

SITE PLAN

STATISTICAL INFORMATION

	BLOCK 1		BLOCK 2		BLOCK 3 (PUBLIC PARK)	BLOCK 4		TOTAL	
	REQUIRED	PROVIDED	REQUIRED	PROVIDED		REQUIRED	PROVIDED	REQUIRED	PROVIDED
1. SITE AREA	± 24,949 m2 ± 2.49 ha. ± 268,549 ft2 ± 6.16 ac (GROSS SITE LESS ROAD LESS PARK)		± 22,094 m2 ± 2.20 ha. ± 237,818 ft2 ± 5.45 ac (GROSS SITE LESS ROAD LESS PARK)		± 18,687 m2 ± 1.86 ha. ± 201,145 ft2 ± 4.61 ac (GROSS SITE LESS ROAD LESS PARK)	± 13,255 m2 ± 1.32 ha. ± 142,676 ft2 ± 3.27 ac (GROSS SITE LESS ROAD LESS PARK)		BLOCK 1,2,4 : (DEVELOPMENT BLOCKS) ± 60,298 m2 ± 6.02 ha. / ± 649,043 ft2 ± 14.89 ac BLOCK 3 : (PUBLIC PARK) ± 18,687 m2 ± 1.86 ha. / ± 201,145 ft2 ± 4.61 ac PUBLIC ROADS : ± 31,503 m2 ± 3.15 ha. / ± 339,095 ft2 ± 7.80 ac TOTAL : ± 110,488 m2 ± 11.04 ha. / ± 1,189,283 ft2 ± 27.30 ac	
2. GCA	RESIDENTIAL : 215,053 M2 NON-RESIDENTIAL : 2,175 M2 TOTAL GCA : 217,228 M2 *		RESIDENTIAL : 202,404 M2 NON-RESIDENTIAL : 1,362 M2 TOTAL GCA : 203,766 M2 *			RESIDENTIAL : 133,978 M2 NON-RESIDENTIAL : 2,312 M2 TOTAL GCA : 136,290 M2 *		RESIDENTIAL : 551,435 M2 NON-RESIDENTIAL : 5,849 M2 TOTAL GCA : 557,284 M2 *	
3. LOT COVERAGE	50 %		52%			56%		52% (BASED ON DEVELOPMENT BLOCKS SITE AREA)	
4. FSI	GROSS : (GROSS SITE AREA) = 217,228 m2 / ±42,673 m2 — 5.0 X FSI NET : (GROSS SITE LESS ROAD) = 217,228 m2 / ±32,915 m2 — 6.5 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 217,228 m2 / ±24,949 m2 — 8.7 X FSI		GROSS : (GROSS SITE AREA) = 203,766 m2 / ±36,314 m2 — 5.6 X FSI NET : (GROSS SITE LESS ROAD) = 203,766 m2 / ±26,556 m2 — 7.6 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 203,766 m2 / ±22,094 m2 — 9.2 X FSI			GROSS : (GROSS SITE AREA) = 136,290 m2 / ±31,501 m2 — 4.3 X FSI NET : (GROSS SITE LESS ROAD) = 136,290 m2 / ±21,743 m2 — 6.2 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 136,290 m2 / ±13,255 m2 — 10.2 X FSI		GROSS : (GROSS SITE AREA) = 557,284 m2 / ±110,488 m2 — 5.0 X FSI NET : (GROSS SITE LESS ROAD) = 557,284 m2 / ±81,214 m2 — 6.8 X FSI NET NET : (GROSS SITE LESS ROAD LESS PARK) = 557,284 m2 / ±60,298 m2 — 9.2 X FSI	
5. UNIT COUNT	2,746 UNITS		2,584 UNITS			1,624 UNITS		6,954 UNITS	
6. UNIT BREAKDOWN	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 2,746*** UNITS = (411.90 UNITS) 412 UNITS	1 BEDROOM 1,647 2 BEDROOM 824 3 BEDROOM 275 TOTAL 2,746*** OF WHICH 412 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 2,584*** UNITS = (387.60 UNITS) 388 UNITS	1 BEDROOM 1,551 2 BEDROOM 775 3 BEDROOM 258 TOTAL 2,584*** OF WHICH 388 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC		3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 1,624*** UNITS = (243.60 UNITS) 244 UNITS	1 BEDROOM 975 2 BEDROOM 487 3 BEDROOM 162 TOTAL 1,624*** OF WHICH 244 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC	3.8.2.1 (4) NOT LESS THAN 15% OF ALL RESIDENTIAL SUITES SHALL BE PROVIDED WITH A BARRIER-FREE PATH OF TRAVEL FROM THE SUITE ENTRANCE DOOR TO, (a) AT LEAST ONE BEDROOM AT THE SAME LEVEL, AND (b) AT LEAST ONE BATHROOM, (i) HAVING AN AREA NOT LESS THAN 4.5 m2 AT THE SAME LEVEL, AND (ii) CONFORMING TO SENTENCE 9.6.3.3.(1) REQUIRED = 15% x 6,954*** UNITS = (1,044 UNITS) 1,044 UNITS	1 BEDROOM 4,173 2 BEDROOM 2,086 3 BEDROOM 695 TOTAL 6,954*** OF WHICH 1,044 UNITS MEET 3.8.2.1 (5) OF THE 2012 OBC
7. AMENITY	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 2,746 = 5,492 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 2,746 = 5,492 m2 TOTAL REQUIRED 10,984 m2	AMENITY PROVIDED: INDOOR = 6,895 m2 OUTDOOR = 7,125 m2 TOTAL PROVIDED 14,020 m2	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 2,584 = 5,168 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 2,584 = 5,168 m2 TOTAL REQUIRED 10,336 m2	AMENITY PROVIDED: INDOOR = 7,175 m2 OUTDOOR = 5,856 m2 TOTAL PROVIDED 13,031 m2		AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 1,624 = 3,248 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 1,624 = 3,248 m2 TOTAL REQUIRED 6,496 m2	AMENITY PROVIDED: INDOOR = 3,875 m2 OUTDOOR = 3,280 m2 TOTAL PROVIDED 7,155 m2	AMENITY REQUIRED: INDOOR = 2 m2 PER UNIT = 2 x 6,954 = 13,908 m2 OUTDOOR = 2 m2 PER UNIT = 2 x 6,954 = 13,908 m2 TOTAL REQUIRED 27,816 m2	AMENITY PROVIDED: INDOOR = 17,945 m2 OUTDOOR = 16,261 m2 TOTAL PROVIDED 34,206 m2
8. PARKING RESIDENTIAL RESIDENTIAL VISITORS NON-RESIDENTIAL	REQUIRED : 0.5 SP./UNIT. 2,746 x 0.5 = 1,373 SP. REQUIRED : 0.15 SP./UNIT. 2,746 x 0.15 = 412 SP. REQUIRED : 1.08 SP./ 100m2 NFA. = 22 SP. TOTAL REQUIRED 1,807 SP.	PROVIDED : 1,946 SP. TOTAL PROVIDED 1,946 SP. ****	REQUIRED : 0.5 SP./UNIT. 2,584 x 0.5 = 1,292 SP. REQUIRED : 0.15 SP./UNIT. 2,584 x 0.15 = 388 SP. REQUIRED : 1.08 SP./ 100m2 NFA. = 14 SP. TOTAL REQUIRED 1,694 SP.	PROVIDED : 1,728 SP. TOTAL PROVIDED 1,728 SP. ****		REQUIRED : 0.5 SP./UNIT. 1,624 x 0.5 = 812 SP. REQUIRED : 0.15 SP./UNIT. 1,624 x 0.15 = 244 SP. REQUIRED : 1.08 SP./ 100m2 NFA. = 23 SP. TOTAL REQUIRED 1,079 SP.	PROVIDED : 1,079 SP. TOTAL PROVIDED 1,079 SP. ****	REQUIRED : 0.5 SP./UNIT. 6,954 x 0.5 = 3,477 SP. REQUIRED : 0.15 SP./UNIT. 6,954 x 0.15 = 1,044 SP. REQUIRED : 1.08 SP./ 100m2 NFA. = 59 SP. TOTAL REQUIRED 4,580 SP.	PROVIDED : 4,707 SP. TOTAL PROVIDED 4,707 SP. ****
9. BICYCLE STORAGE RESIDENTIAL NON-RESIDENTIAL	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 2,746 x 0.75 = 2,060 SP. SHORT-TERM = 0.25 SP./UNIT. 2,746 x 0.25 = 687 SP. REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 3 SP. TOTAL REQUIRED 2,750 SP.	PROVIDED : LONG-TERM = 2,060 SP. SHORT-TERM = 684 SP. PROVIDED : LONG-TERM = 3 SP. TOTAL PROVIDED 2,750 SP.	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 2,584 x 0.75 = 1,938 SP. SHORT-TERM = 0.25 SP./UNIT. 2,584 x 0.25 = 646 SP. REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 2 SP. TOTAL REQUIRED 2,586 SP.	PROVIDED : LONG-TERM = 1,938 SP. SHORT-TERM = 646 SP. PROVIDED : LONG-TERM = 2 SP. TOTAL PROVIDED 2,586 SP.		REQUIRED : LONG-TERM = 0.75 SP./UNIT. 1,624 x 0.75 = 1,218 SP. SHORT-TERM = 0.25 SP./UNIT. 1,624 x 0.25 = 406 SP. REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 3 SP. TOTAL REQUIRED 1,627 SP.	PROVIDED : LONG-TERM = 1,218 SP. SHORT-TERM = 406 SP. PROVIDED : LONG-TERM = 3 SP. TOTAL PROVIDED 1,627 SP.	REQUIRED : LONG-TERM = 0.75 SP./UNIT. 6,954 x 0.75 = 5,216 SP. SHORT-TERM = 0.25 SP./UNIT. 6,954 x 0.25 = 1,739 SP. REQUIRED : LONG-TERM = GREATER OF 2 OR 1 SPACE/1,000 m2 NFA = 8 SP. TOTAL REQUIRED 6,963 SP.	PROVIDED : LONG-TERM = 5,216 SP. SHORT-TERM = 1,739 SP. PROVIDED : LONG-TERM = 8 SP. TOTAL PROVIDED 6,963 SP.
10. BUILDING HEIGHT	BUILDING A = 40 STOREYS 124.5m + MECH. BUILDING B = 45 STOREYS 139.5m + MECH. BUILDING C = 35 STOREYS 109.5m + MECH. BUILDING D = 42 STOREYS 130.5m + MECH. BUILDING E = 48 STOREYS 148.5m + MECH. BUILDING F = 45 STOREYS 139.5m + MECH.		BUILDING G = 48 STOREYS 148.5m + MECH. BUILDING H = 45 STOREYS 139.5m + MECH. BUILDING I = 40 STOREYS 124.5m + MECH. BUILDING J = 35 STOREYS 109.5m + MECH. BUILDING K = 42 STOREYS 130.5m + MECH. BUILDING L = 35 STOREYS 109.5m + MECH.			BUILDING M = 40 STOREYS 124.5m + MECH. BUILDING N = 35 STOREYS 109.5m + MECH. BUILDING O = 35 STOREYS 109.5m + MECH. BUILDING P = 30 STOREYS 94.5m + MECH.			
11. BUILDING SETBACKS	NORTH 14.0 m Min EAST 3.0 m Min SOUTH 3.0 m Min WEST 3.0 m Min		NORTH 14.0 m Min EAST 3.0 m Min SOUTH 3.0 m Min WEST 3.0 m Min			NORTH 3.0 m Min EAST 3.0 m Min SOUTH 5.0 m Min WEST 3.0 m Min			

* GCA DOES NOT INCLUDE ABOVE AND BELOW GRADE PARKING.
** ESTABLISHED GRADE DETERMINED ALONG EACH BUILDING SEPARATELY
*** FINAL SUITE MIX AND DWELLING UNIT COUNT SUBJECT TO MARKET CONDITIONS
**** FINAL PARKING COUNT MAY VARY DEPENDING ON FINAL DWELLING UNIT COUNT

1.	SEP.12.2024 ISSUED TO CITY FOR PAC MEETING	J. CHI.
2.	NOV.01.2024 ISSUED TO CITY FOR OPA	J. CHI.

ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING D-SUITE 300 CONCORD, ONTARIO L4K 4L8
T.905.795.2601 F.905.795.2844 WWW.GC-ARCHITECTS.COM

PROPOSED MIXED-USE DEVELOPMENT

SOUTH SERVICE ROAD

THE ROSE CORPORATION

OAKVILLE ONTARIO

PROJECT ARCHITECT:	J. Chimienti
ASSISTANT DESIGNER:	B. DADGOSTAR
DRAWN BY:	B. DADGOSTAR
CHECKED BY:	D. Biase
PLOT DATE:	OCT.30.2024
JOB #	2127.23

STATS

A101

TITLEBLOCK SIZE: 610 x 900

APPENDIX B:
Design Information and Calculations

APPENDIX B1 - STORMWATER CALCULATIONS

URBANTECH®

STORM SEWER DESIGN SHEET

5-100 year capture (Cross Ave)

420 SOUTH SERVICE ROAD

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 23-316
Date: 11-Oct-24
Designed by: RM
Checked by: 0.0

DESIGN CRITERIA

Min. Diameter =	300	mm	Rainfall Intensity =	A / (Tc+B)^c
Mannings 'n'=	0.013			
Starting Tc =	10	min	A =	1170
			B =	5.8
Factor of Safety =	5	%	c =	0.843

Pumped system under Rail

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
	BLK 4	5	1.45	0.90	1.31	1.31	114.2	0.414			0.414	11.0	0.50	675	0.594	1.66	10.00	0.11	10.11	70%
	BLK 2	5	1.45	0.90	1.31	1.31	114.2	0.414			0.414	14.0	0.50	675	0.594	1.66	10.00	0.14	10.14	70%
Street A	5	4	0.39	0.90	0.35	2.96	113.4	0.932	0.391	0.391	1.323	148.3	0.50	975	1.585	2.12	10.14	1.16	11.31	83%
NS Road	6	4	0.62	0.90	0.56	0.56	114.2	0.177	0.325	0.325	0.502	42.7	0.50	675	0.594	1.66	10.00	0.43	10.43	84%
Street A	4	3	0.45	0.90	0.41	3.92	106.8	1.164	0.445	1.161	2.325	157.4	0.50	1200	2.757	2.44	11.31	1.08	12.38	84%
Easement	3	2				3.92	101.5	1.106		1.161	2.267	98.7	0.50	1200x2400 (BOX)	8.504	2.95	12.38	0.56	12.94	27%
	PARK	2	1.86	0.35	0.65	0.65	114.2	0.207			0.207	5.3	0.50	525	0.304	1.40	10.00	0.06	10.06	68%
Easment	2	1				4.58	98.9	1.257		1.161	2.418	117.4	0.50	1200x2400 (BOX)	8.504	2.95	12.94	0.66	13.60	28%
	EXT 2	1	2.62	0.90	2.36	2.36	265.8	1.741			1.741									
Cross Ave	1	EXT 1	0.92	0.90	0.83	7.76	96.1	2.071	0.239	1.400	3.471	249.2	0.25	1200x2400 (BOX)	6.013	2.09	13.60	1.99	15.59	58%
Cross Ave	FUT11	FUT10	0.66	0.90	0.59	0.59	114.2	0.188	0.314	0.314	0.502	134.3	0.50	900x1800 (BOX)	3.949	2.44	10.00	0.92	10.92	13%
Cross Ave	FUT13	FUT10	0.56	0.90	0.50	0.50	114.2	0.160	0.342	0.342	0.502	99.3	5.00	900x1800 (BOX)	12.487	7.71	10.00	0.21	10.21	4%
NS Road	FUT12	FUT10	0.37	0.90	0.33	0.33	114.2	0.106	0.396	0.396	0.502	103.4	0.50	900x1800 (BOX)	3.949	2.44	10.00	0.71	10.71	13%
NS Road	FUT10	Rail	0.00	0.00	0.00	1.43	108.9	0.433	0.000	1.052	1.485	16.5	7.00	900x1800 (BOX)	14.775	9.12	10.92	0.03	10.95	10%
Steet D	FUT9	FUT8	0.50	0.90	0.45	0.45	114.2	0.143	0.359	0.359	0.502	267.4	0.50	675	0.594	1.66	10.00	2.68	12.68	84%
Cross Ave	FUT8	Creek	0.42	0.90	0.38	0.83	100.1	0.230	0.382	0.741	0.971	144.4	0.50	900x1800 (BOX)	3.949	2.44	12.68	0.99	13.67	25%

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PROJECT DETAILS	
Title1:	**STORM SEWER DESIGN SHEET**
Title2:	**Constant Flow (100yr Minor System Capture)**
Project Name:	
Municipality:	
Project No:	
Date:	
Designed by:	
Checked by:	

IDF Parameters			
$I=A/(T+b)^c$		5-yr	100-yr
	A	1170	2150
	B	5.8	5.7
	C	0.843	0.861

CAPTURE	AREA ID	CAPTURE	Area ha	R 5-year	AR 5-year	Flow Length m	Velocity m/s	Tc* min	I10 mm/hr	I100 mm/hr	Q10 m3/s	Q100 m3/s	Q100-Q10 m3/s	Const. flow m3/s
	7		0.5	0.90	0.45		2.00	10.00	114.21	200.8	0.1	0.502	0.359	0.359
	6		0.39	0.90	0.35		2.00	10.00	114.21	200.8	0.1	0.502	0.391	0.391
	5		0.62	0.90	0.56		2.00	10.00	114.21	200.8	0.2	0.502	0.325	0.325
	4		0.2	0.90	0.18		2.00	10.00	114.21	200.8	0.1	0.502	0.445	0.445
	1		0.66	0.90	0.59		2.00	10.00	114.21	200.8	0.2	0.502	0.314	0.314
	2		0.56	0.90	0.50		2.00	10.00	114.21	200.8	0.2	0.502	0.342	0.342
	3		0.37	0.90	0.33		2.00	10.00	114.21	200.8	0.1	0.502	0.396	0.396
	EXT1		0.92	0.90	0.83		2.00	10.00	114.21	200.8	0.3	0.502	0.239	0.239
	EXT 4		0.42	0.90	0.38		2.00	10.00	114.21	200.8	0.1	0.502	0.382	0.382

Total Area 4.64

Tc calcs *where Tc = starting Tc + flow length/velocity*
(starting Tc = 15min)

Assumed Velocities for Calculation of time of Concentration

Pipe Flow \ 2.0 m/s

OLF Velocit 1.5 m/s

External Fl 0.25 m/s

URBANTECH®

STORM SEWER DESIGN SHEET

5-100 year capture (Davis)

420 SOUTH SERVICE ROAD

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 23-316
Date: 11-Oct-24
Designed by: RM
Checked by: 0.0

DESIGN CRITERIA

Min. Diameter =	300	mm	Rainfall Intensity =	A / (Tc+B)^c
Mannings 'n'=	0.013			
Starting Tc =	10	min	A =	1170
			B =	5.8
Factor of Safety =	5	%	c =	0.843

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
South Service Road	15	13	0.70	0.90	0.63	0.63	114.2	0.200	0.302	0.302	0.502	381.3	0.50	675	0.594	1.66	10.00	3.83	13.83	84%
	BLK 1	12	2.41	0.90	2.17	2.17	114.2	0.688			0.688	11.0	0.50	750	0.787	1.78	10.00	0.10	10.10	87%
Street B	13	11	0.35	0.90	0.32	0.95	95.1	0.250	0.502	0.804	1.054	174.4	0.25	900x1800 (BOX)	2.792	1.72	13.83	1.69	15.51	38%
Street B	11	EX13	0.02	0.90	0.02	0.96	88.7	0.237		0.804	1.041	20.2	0.25	900x1800 (BOX)	2.792	1.72	15.51	0.20	15.71	37%

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PROJECT DETAILS	
Title1:	**STORM SEWER DESIGN SHEET**
Title2:	**Constant Flow (100yr Minor System Capture)**
Project Name:	
Municipality:	
Project No:	
Date:	
Designed by:	
Checked by:	

IDF Parameters			
$I=A/(T+b)^C$		5-yr	100-yr
	A	1170	2150
	B	5.8	5.7
	C	0.843	0.861

CAPTURE	AREA ID	CAPTURE	Area ha	R 5-year	AR 5-year	low Lengt m	Velocity m/s	Tc* min	I10 mm/hr	I100 mm/hr	Q10 m3/s	Q100 m3/s	Q100-Q10 m3/s	Const. flow m3/s
	9		0.7	0.90	0.63		2.00	10.00	114.21	200.8	0.2	0.502	0.302	0.302
	EXT 3		0.13	0.90	0.12		2.00	10.00	114.21	200.8	0.0	0.502	0.465	0.465
	8		0.35	0.90	0.32		2.00	10.00	114.21	200.8	0.1	0.502	0.402	0.402
	10		0.25	0.90	0.23		2.00	10.00	114.21	200.8	0.1	0.502	0.431	0.431
	11		0.02	0.90	0.02		2.00	10.00	114.21	200.8	0.0	0.502	0.496	0.496

Total Area 1.45

Tc calcs *where Tc = starting Tc + flow length/velocity*
(starting Tc = 15min)

Assumed Velocities for Calculation of time of Concentration

Pipe Flow \ 2.0 m/s

OLF Velocil 1.5 m/s

External Fl 0.25 m/s

APPENDIX B2 - SANITARY CALCULATIONS

PROPOSED CONDITIONS - POPULATION ESTIMATE

Project Name: GE Lands (420 South Service Rd)
Municipality: Town of Oakville
Project No.: 23-307

Prepared by: KC
Checked by: BM
Date: 2-Oct-24

Persons Per Unit (Note 2)

Apartments - Less Than 2-Bed	1.355	persons per unit
Apartments - Greater Than 2-Bed	1.831	persons per unit

Site Population Estimate

	1-Bed Units	2+ Bed Units	Total Units	Population Residential
Total Plan Area				
Block 1	1647	1099	2746	4244
Block 2	1551	1033	2584	3993
Block 3 (Park Block)	-	-	-	74
Block 4	975	649	1624	2509
TOTAL	**4,173**	**2,781**	**6,954**	**10,821**

Notes:
1. Proposed Unit Count (by Block) by Graziani and Corazza Architects (Sep. 13, 2024 drawing set)
2. Proposed park block population is based on an initial estimate of 40 ppl/ha (1.86 ha total). This can be refined as planning work proceeds in consultation with Town staff.
3. Persons Per Unit from Halton Region 2022 DC Background Study Table A-4 (Housing Occupancy Rates) - Built Boundary

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WASTEWATER DEMAND CALCULATIONS - PROPOSED CONDITIONS

Project Name: GE Lands (420 South Service Rd)
Municipality: Town of Oakville
Project No.: 23-307

Prepared by: KC
Checked by: BM
Date: 2-Oct-24

Sanitary Flow Calculations - Davis Road Sewer (Block 1)

Average Dry Weather Flow

Population =	4244	persons, from Site Statistics
Per Capita WW Generation Rate (Res) =	275	L/person/day (Halton Linear Design Manual, Section 3.2.2)
Average Dry Weather Flow =	13.51	L/s
Total Average Dry Weather Flow =	13.51	L/s

Peaking Factor (Modified Harmon)

Kav =	1.0	(Halton Linear Design Manual, Section 3.2.3)
Peaking Factor =	3.31	(Halton Linear Design Manual, Section 3.2.3)

Inflow /Infiltration

Factor =	0.286	L/ha/s (Halton Linear Design Manual, Section 3.2.4)
Area =	2.480	ha
I/I =	0.709	L/s

Design Flow = 45.42 L/s

Sanitary Flow Calculations - Chartwell Sewer (Block 2 and Block 4)

Average Dry Weather Flow

Population =	6502	persons, from Site Statistics
Per Capita WW Generation Rate (Res) =	275	L/person/day (Halton Linear Design Manual, Section 3.2.2)
Average Dry Weather Flow =	20.70	L/s
Total Average Dry Weather Flow =	20.70	L/s

Peaking Factor (Modified Harmon)

Kav =	1.0	(Halton Linear Design Manual, Section 3.2.3)
Peaking Factor =	3.14	(Halton Linear Design Manual, Section 3.2.3)

Inflow /Infiltration

Factor =	0.286	L/ha/s (Halton Linear Design Manual, Section 3.2.4)
Area =	3.770	ha
I/I =	1.078	L/s

Design Flow = 66.01 L/s

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URBANTECH

WASTEWATER DEMAND CALCULATIONS - PROPOSED CONDITIONS

Project Name: GE Lands (420 South Service Rd)
Municipality: Town of Oakville
Project No.: 23-307

Prepared by: KC
Checked by: BM
Date: 2-Oct-24

Sanitary Flow Calculations - Park Block (Block 3)

Average Dry Weather Flow

Population =	74	persons, from Site Statistics
Per Capita WW Generation Rate (Res) =	275	L/person/day (Halton Linear Design Manual, Section 3.2.2)
Average Dry Weather Flow =	0.24	L/s
Employment =	0	employees, from Site Statistics
Per Capita WW Generation Rate (Emp) =	275	L/employee/day (Halton Linear Design Manual, Section 3.2.2)
Average Dry Weather Flow =	0.00	L/s
Total Average Dry Weather Flow =	0.24	L/s

Peaking Factor (Modified Harmon)

Kav =	1.0	(Halton Linear Design Manual, Section 3.2.3)
Peaking Factor =	4.28	(Halton Linear Design Manual, Section 3.2.3)

Inflow /Infiltration

Factor =	0.286	L/ha/s (Halton Linear Design Manual, Section 3.2.4)
Area =	1.860	ha
I/I =	0.532	L/s

Design Flow = 1.54 L/s

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SANITARY SEWER DESIGN SHEET

420 SOUTH SERVICE ROAD

REGIONAL MUNICIPALITY OF HALTON

PROJECT DETAILS

Project No: 23-316
Date: 5-Nov-24
Designed by: RM
Checked by: KC

DESIGN CRITERIA

Min Diameter =	200	mm	Avg. Domestic Flow =	275.0 l/c/d
Mannings 'n'=	0.013		Infiltration =	0.286 l/s/ha
Min. Velocity =	0.6	m/s	Max. Peaking Factor =	4.50
Max. Velocity =	3.0	m/s	Min. Peaking Factor=	2.00
Factor of Safety =	20	%		

NOMINAL PIPE SIZE USED

			RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL						FLOW CALCULATIONS							PIPE DATA					
STREET	FROM MH	TO MH	AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENSITY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
CROSS AVE. OUTLET (TO CHARTWELL)																												
	BLK 2	FUT. 4B	1.45	1.45				3993	3993							0.4	3993	3.33	42.4			42.8	1.00	250	59.5	1.2	1.3	72%
Street D	FUT. 4B	FUT. 2B	0.30	1.75					3993							0.5	3993	3.33	42.4			42.9	0.50	300	68.4	1.0	1.0	63%
	BLK 4	FUT. 3B	1.45	1.45				2509	2509							0.4	2509	3.51	28.0			28.4	1.00	250	59.5	1.2	1.2	48%
Future Cross Ave.	FUT. 3B	FUT. 2B	0.20	1.65					2509							0.5	2509	3.51	28.0			28.5	0.50	250	42.0	0.9	0.9	68%
Future Cross Ave.	FUT. 2B	FUT. 1B	0.37	3.77					6502							1.1	6502	3.14	64.9			66.0	0.50	375	124.0	1.1	1.1	53%
PARK BLOCK																												
Easement	PARK	MH1A	1.86	1.86		40		75	75							0.5	75	4.28	1.0			1.6	0.50	200	23.2	0.7	0.4	7%
DAVIS OUTLET																												
	BLK1	MH8A	2.41	2.41				4244	4244							0.7	4244	3.31	44.7			45.4	1.00	250	59.5	1.2	1.3	76%
Street B	MH8A	MH7A	0.07	2.48					4244							0.7	4244	3.31	44.7			45.4	0.50	300	68.4	1.0	1.0	66%
Street A	MH7A	MH6A		2.48					4244							0.7	4244	3.31	44.7			45.4	0.50	300	68.4	1.0	1.0	66%
Davis Road	MH6A	EXT. MH5		2.48					4244							0.7	4244	3.31	44.7			45.4	0.66	300	78.6	1.1	1.1	58%

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APPENDIX B3 - WATER CALCULATIONS

PROPOSED CONDITIONS - POPULATION ESTIMATE

Project Name: GE Lands (420 South Service Road)
Municipality: Town of Oakville
Project No.: 23-307

Prepared by: KC
Checked by: BM
Date: 2-Oct-24

Persons Per Unit (Note 2)

Apartments - Less Than 2-Bed	1.355	persons per unit
Apartments - Greater Than 2-Bed	1.831	persons per unit

Retail (Note 3)

Square Foot per Employee	403	sq. ft. / employee
	37	sq. m / employee

Site Population Estimate

	1-Bed Units	2-Bed Units	Total Units	Population Residential
Total Plan Area				
Block 1	1647	1099	2746	4244
Block 2	1551	1033	2584	3993
Block 3 (Park Block)	-	-	-	74
Block 4	975	649	1624	2509
TOTAL	**4,173**	**2,781**	**6,954**	**10,821**

Notes:
1. Proposed Unit Count (by Block) by Graziani and Corazza Architects (Sep. 13, 2024 drawing set)
2. Proposed park block population is based on an initial estimate of 40 ppl/ha (1.86 ha total). This can be refined as planning work proceeds in consultation with Town staff.
3. Persons Per Unit from Halton Region 2022 DC Background Study Table A-4 (Housing Occupancy Rates) - Built Boundary

WATER DEMAND CALCULATIONS - PROPOSED CONDITIONS

Project Name: GE Lands (420 South Service Road)
Municipality: Town of Oakville
Project No.: 23-307

Prepared by: KC
Checked by: BM
Date: 2-Oct-24

Domestic Flow Calculations

Average Day Demand

Population =	10821	persons, from Site Statistics
Per Capital Water Demand (Res) =	275	L/person/day (Halton Linear Design Manual, Section 2.4)
Average Water Demand =	34.44	L/s
Total Average Day Water Demand =	34.44	L/s

Max Day Demand

Max Day Factor (Residential) =	2.25	all uses (Halton Linear Design Manual, Section 2.4.2)
Max Day Demand (Residential) =	77.49	L/s
Total Max Day Water Demand =	77.49	L/s

Max Hour Demand

Peak Hour Factor (Residential) =	4.0	for Residential (Table 2-2, Section 2.4)
Peak Hour Demand (Residential) =	137.77	L/s
Total Peak Hour Water Demand =	137.77	L/s

Notes:
1. Water usage per Region of Halton Water and Wastwater Linear Design Manual (2019)

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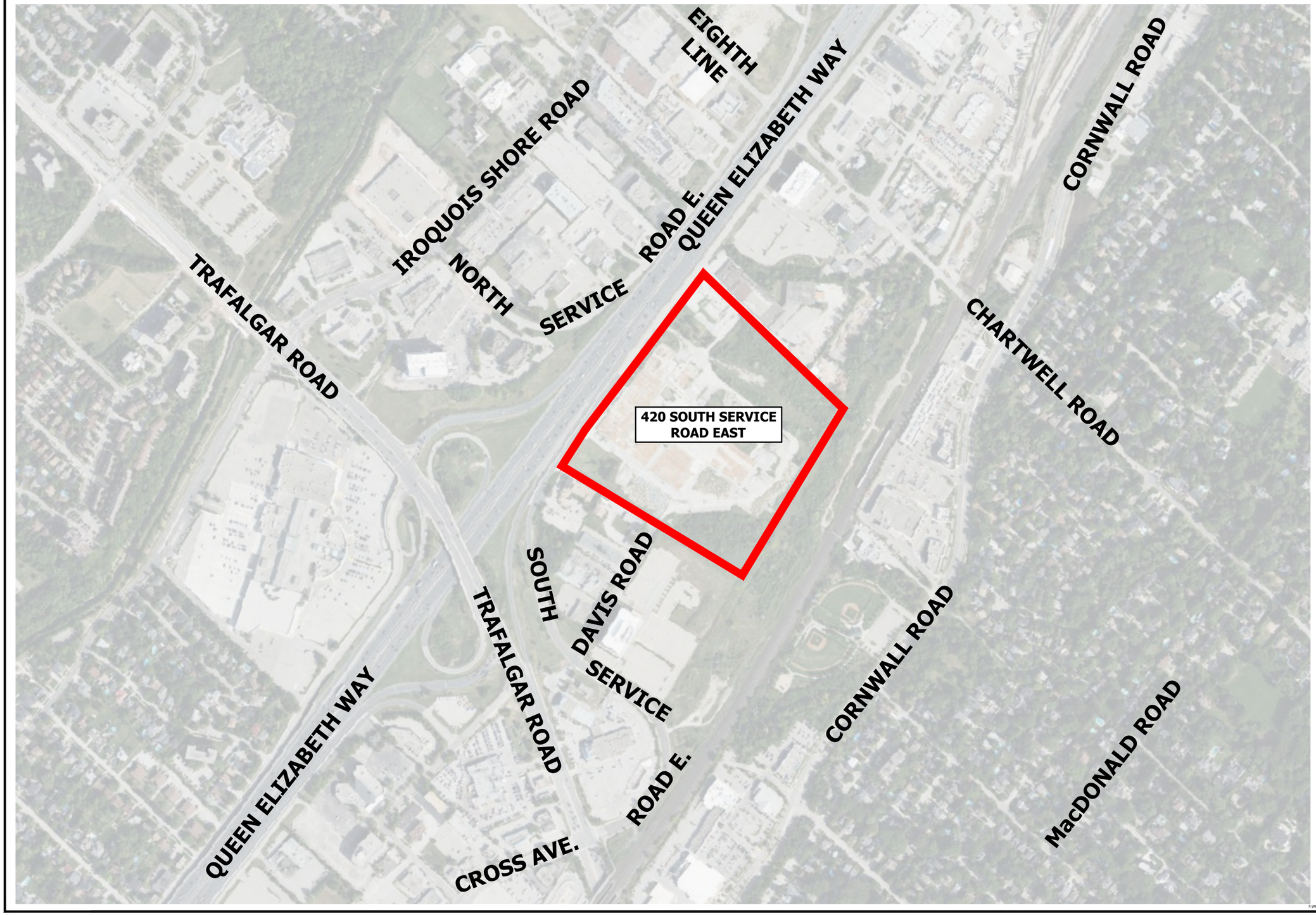
APPENDIX C:
Drawings and Figures



N

LEGEND

LIMIT OF DEVELOPMENT

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
00820208149	606389.733	4812958.951	111.672
00820208150	606731.198	4813293.073	107.023

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420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

SITE LOCATION PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:6000	**SLP-1**

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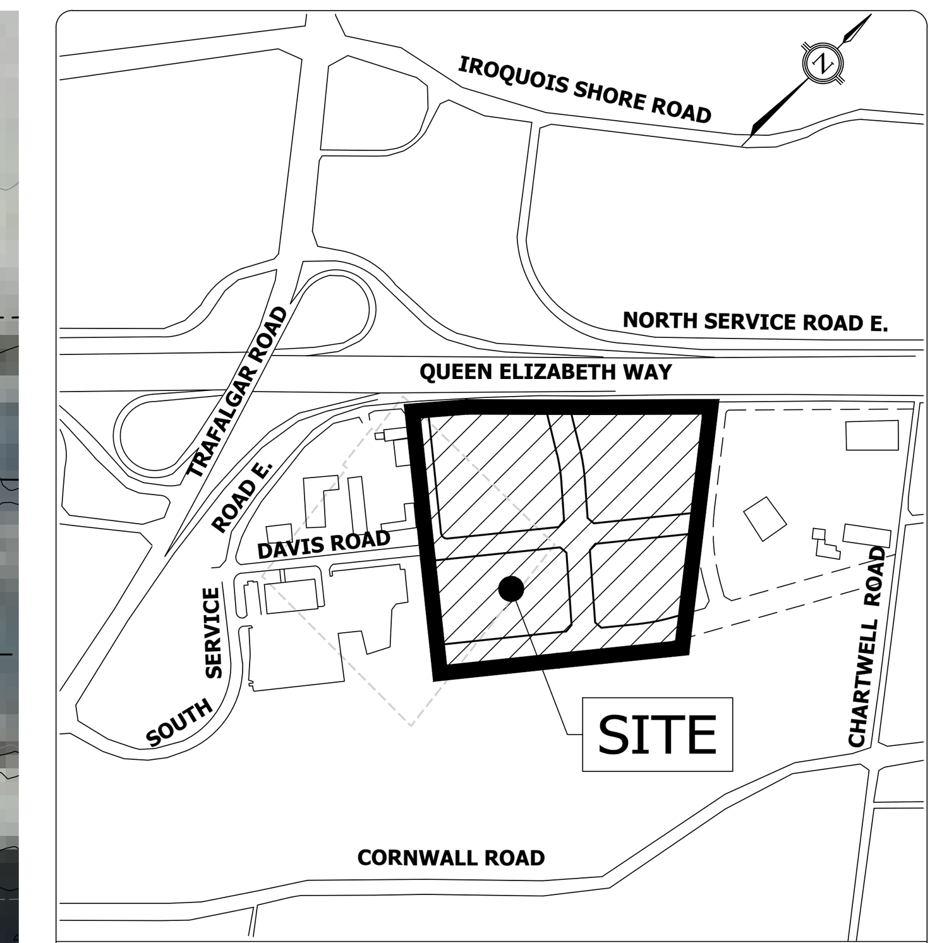

KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING STORM MANHOLE ID
- EXISTING GROUND ELEVATION
- EXISTING SEWER INVERTS
- EXISTING SANITARY MANHOLE ID
- EXISTING GROUND ELEVATION
- EXISTING SEWER INVERTS
- EXISTING CONTOUR & ELEVATION
- EXISTING OVERLAND FLOW ROUTE
- EXISTING WATERCOURSE
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
00820208149	606389.733	4812958.951	111.672
00820208150	606731.198	4813293.073	107.023

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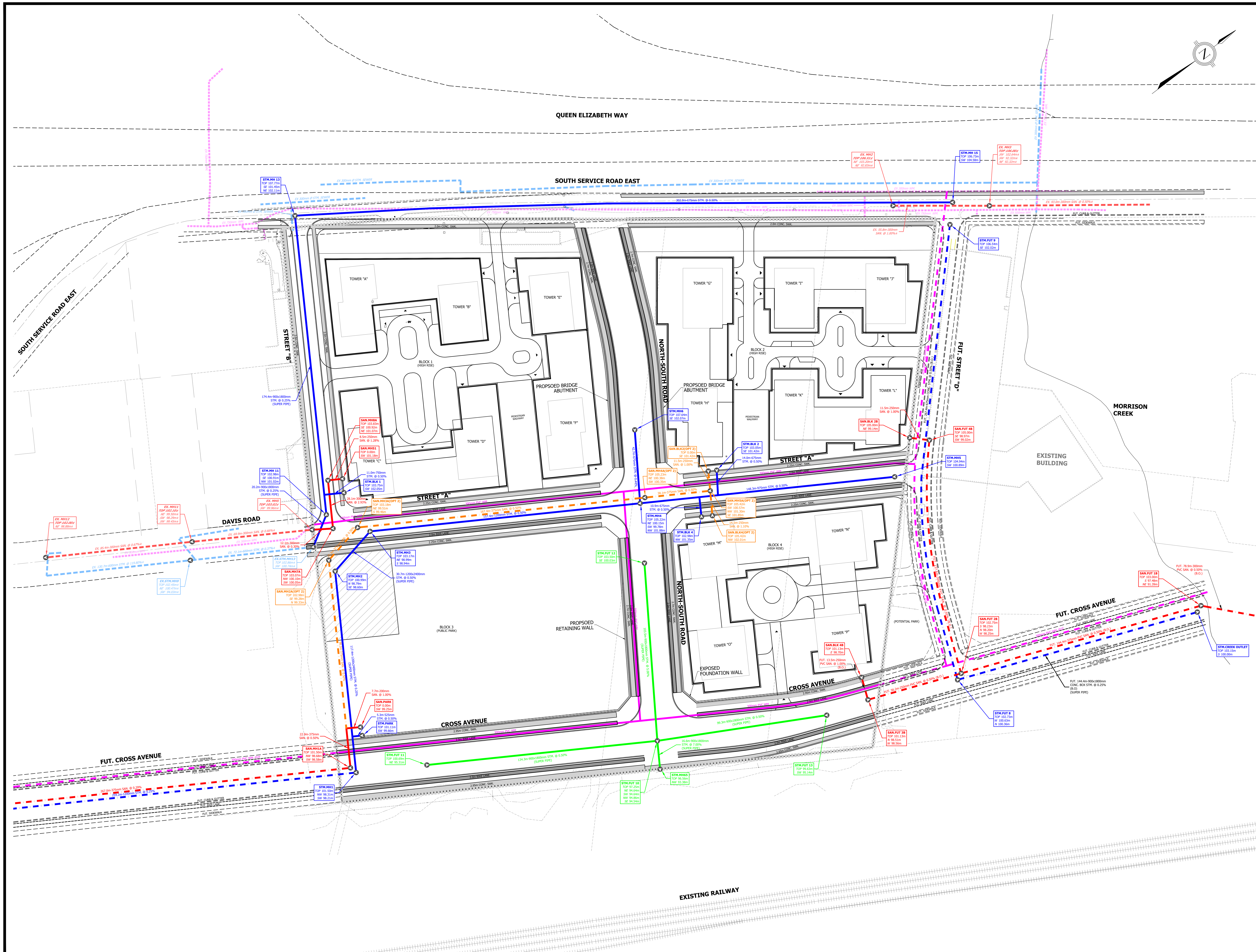
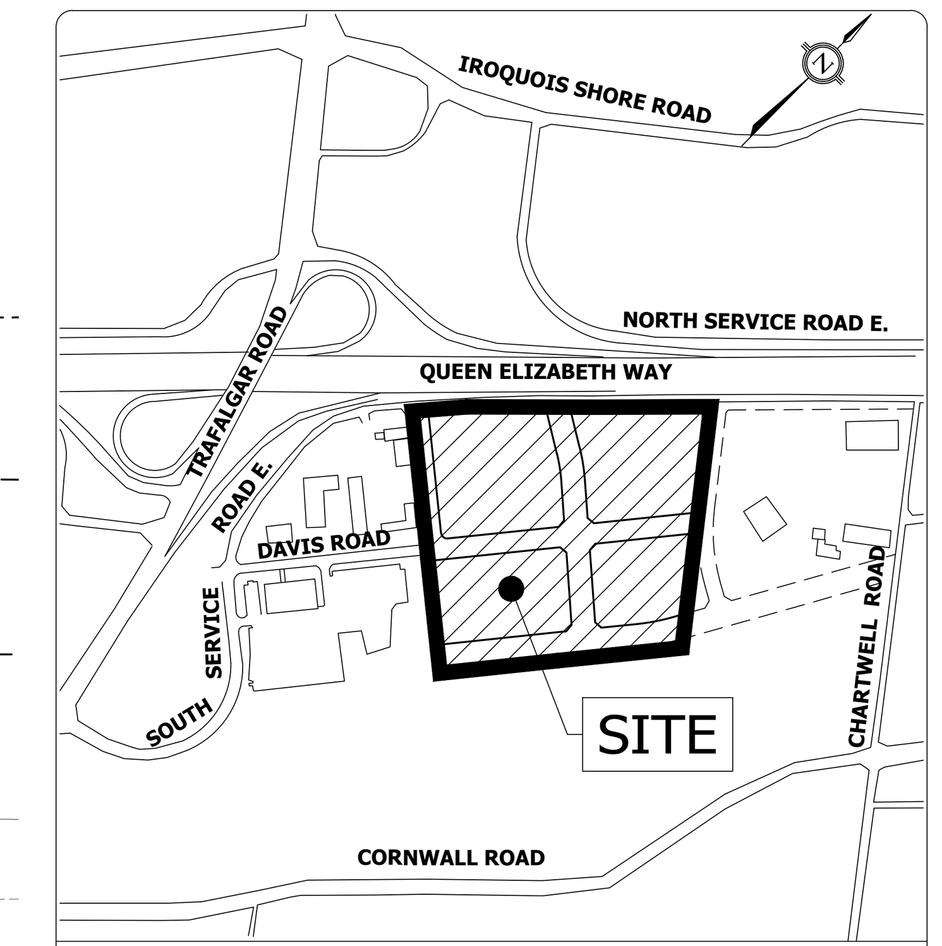
420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

EXISTING CONDITIONS PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	**EXC-1**

F:\PROJECTS\23-307W - GE LANDS DUE DILIGENCE (ROSE CORP)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\EXC-1_EXISTING CONDITIONS PLAN.DWG





KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- PROPOSED STORM SEWER
- PROPOSED PUMPED STORM SYSTEM
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- FUTURE STORM SEWER
- FUTURE SANITARY SEWER
- ALTERNATIVE SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- FUTURE WATERMAIN
- MANHOLE ID / GROUND ELEVATION / SEWER INVERTS
- MANHOLE ID / GROUND ELEVATION / SEWER INVERTS
- MANHOLE ID / GROUND ELEVATION / SEWER INVERTS
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
00820208149	606389.733	4812958.951	111.672
00820208150	606731.198	4813293.073	107.023

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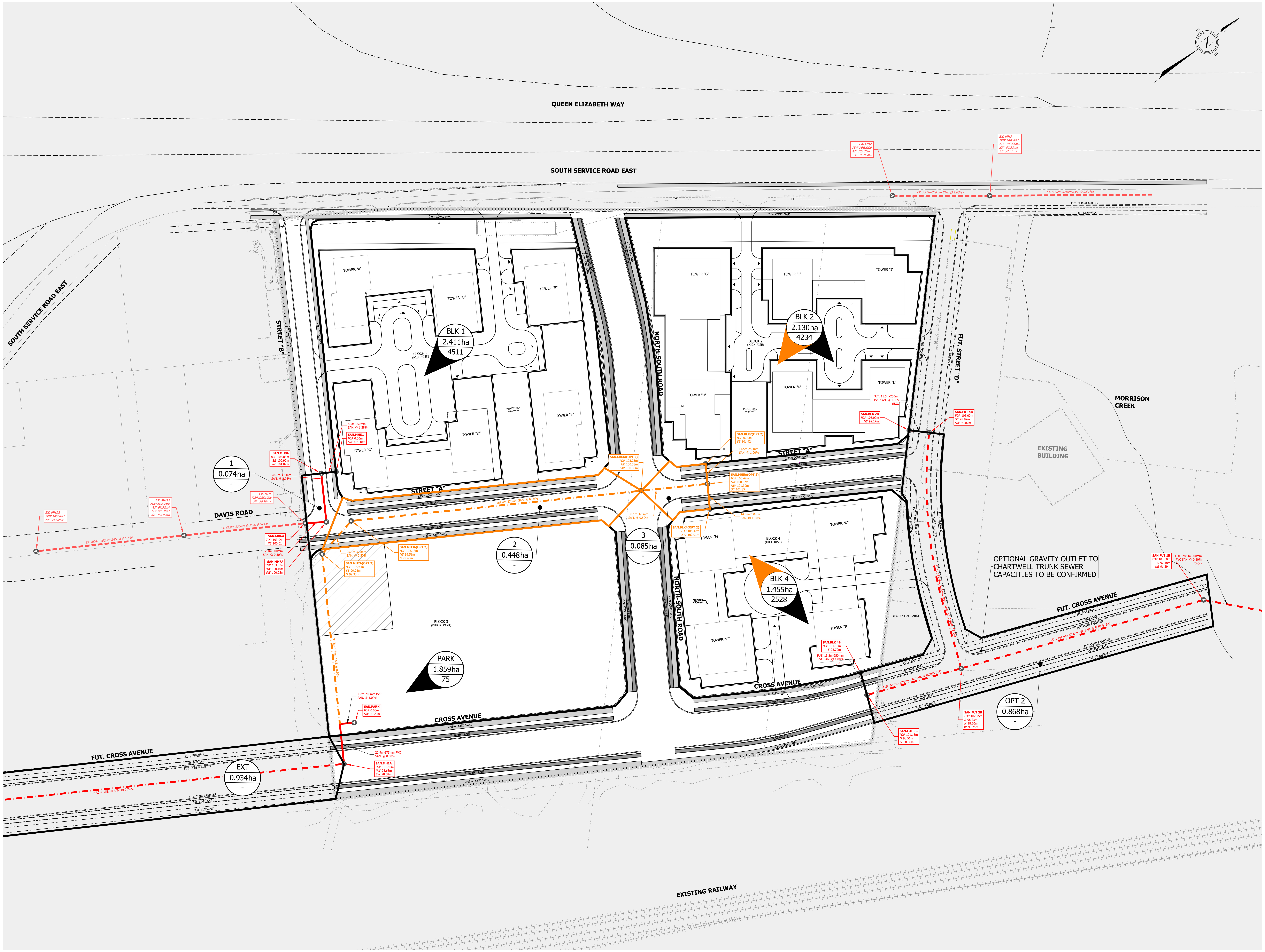
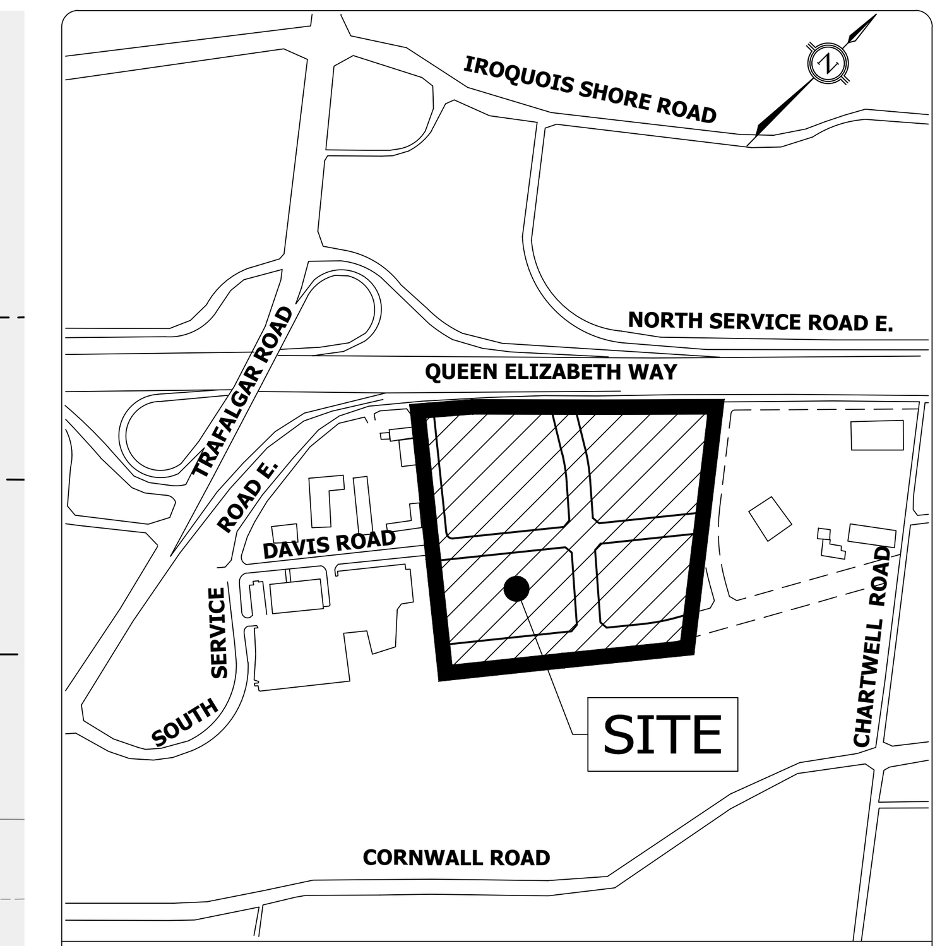
420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

SERVICING PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	SER-1





KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- FUTURE SANITARY SEWER
- ALTERNATIVE SANITARY SEWER
- MANHOLE ID / GROUND ELEVATION / SEWER INVERTS
- DRAINAGE AREA (Ha.) / POPULATION / # OF UNITS / OR POPULATION PER HECTARE (p/Ha.)
- SANITARY DRAINAGE BOUNDARY
- EXISTING SANITARY DRAINAGE BOUNDARY
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
00820208149	606389.733	4812958.951	111.672
00820208150	606731.198	4813293.073	107.023

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420 SOUTH SERVICE ROAD EAST
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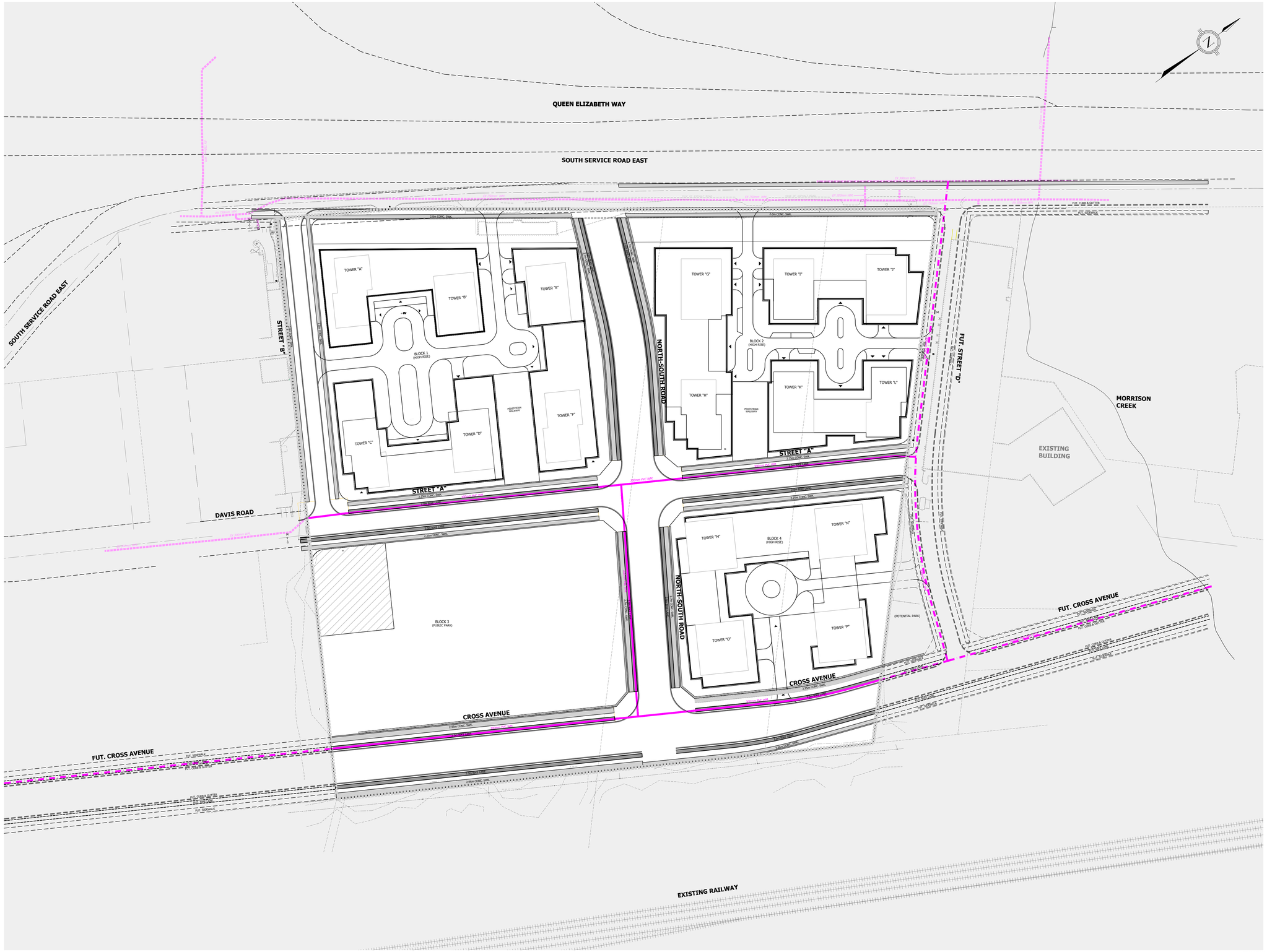
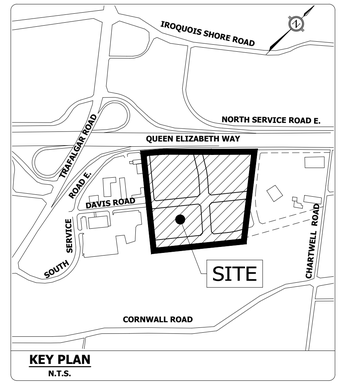
SANITARY DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	SAN-1





KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- FUTURE WATERMAIN
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
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00820208150	606731.198	4813293.073	107.023

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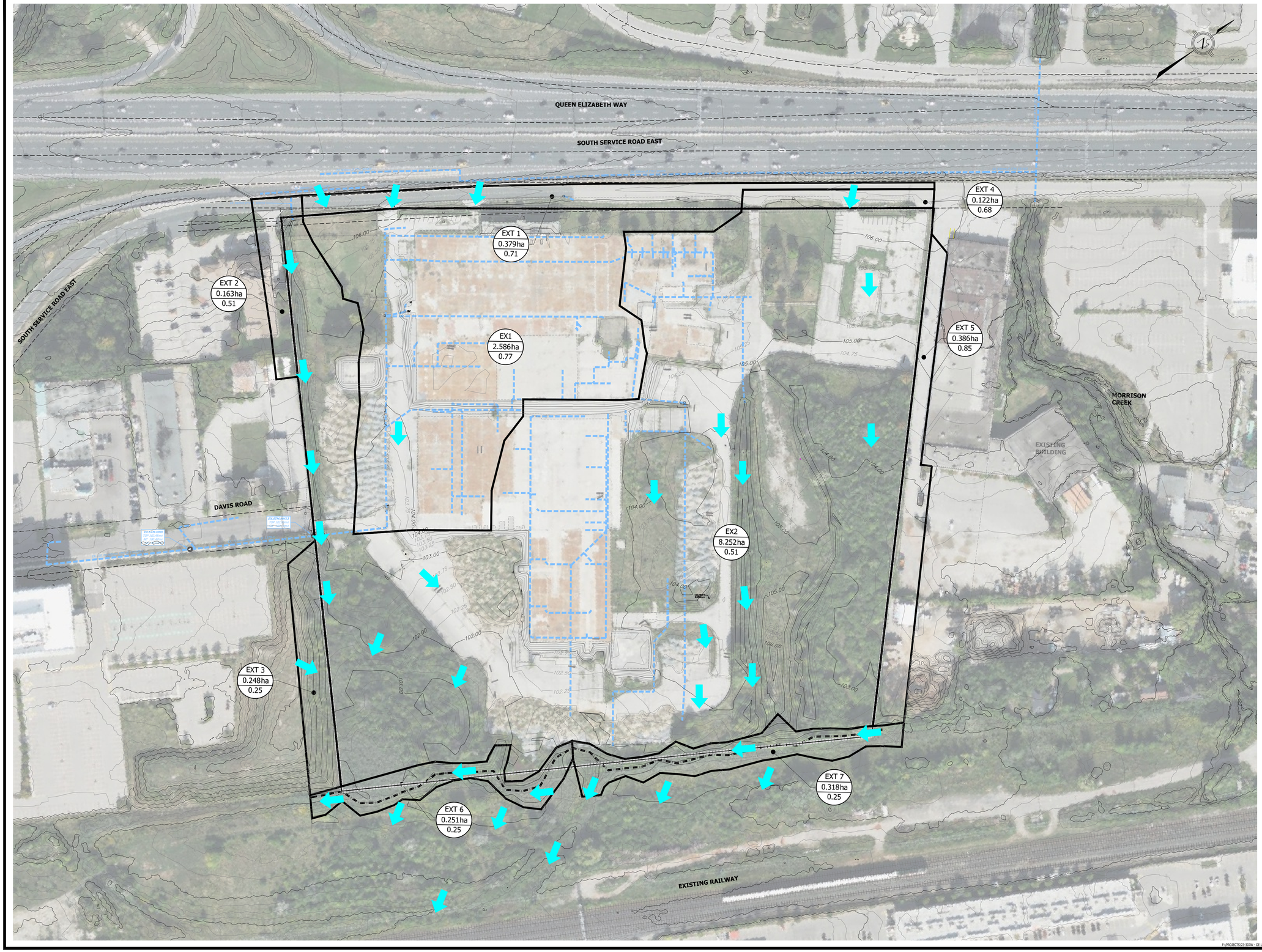
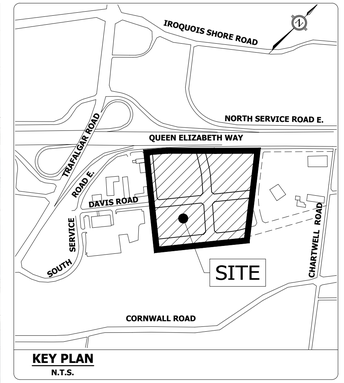
WATERMAIN DISTRIBUTION PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	**WM-1**

F:\PROJECTS\23-307W - GE LANDS DUE DILIGENCE (ROSE CORP)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\WM-1_WATERMAIN DISTRIBUTION PLAN.DWG





KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- EXISTING STORM SEWER
- EXISTING STORM MANHOLE ID
- EXISTING GROUND ELEVATION
- EXISTING SEWER INVERTS
- EXISTING AREA I.D.
- EXISTING DRAINAGE AREA (Ha.)
- EXISTING RUNOFF COEFFICIENT
- EXISTING CONTOUR & ELEVATION
- EXISTING OVERLAND FLOW ROUTE
- EXISTING STORM DRAINAGE BOUNDARY
- EXISTING WATERCOURSE
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

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00820208150	606731.198	4813293.073	107.023

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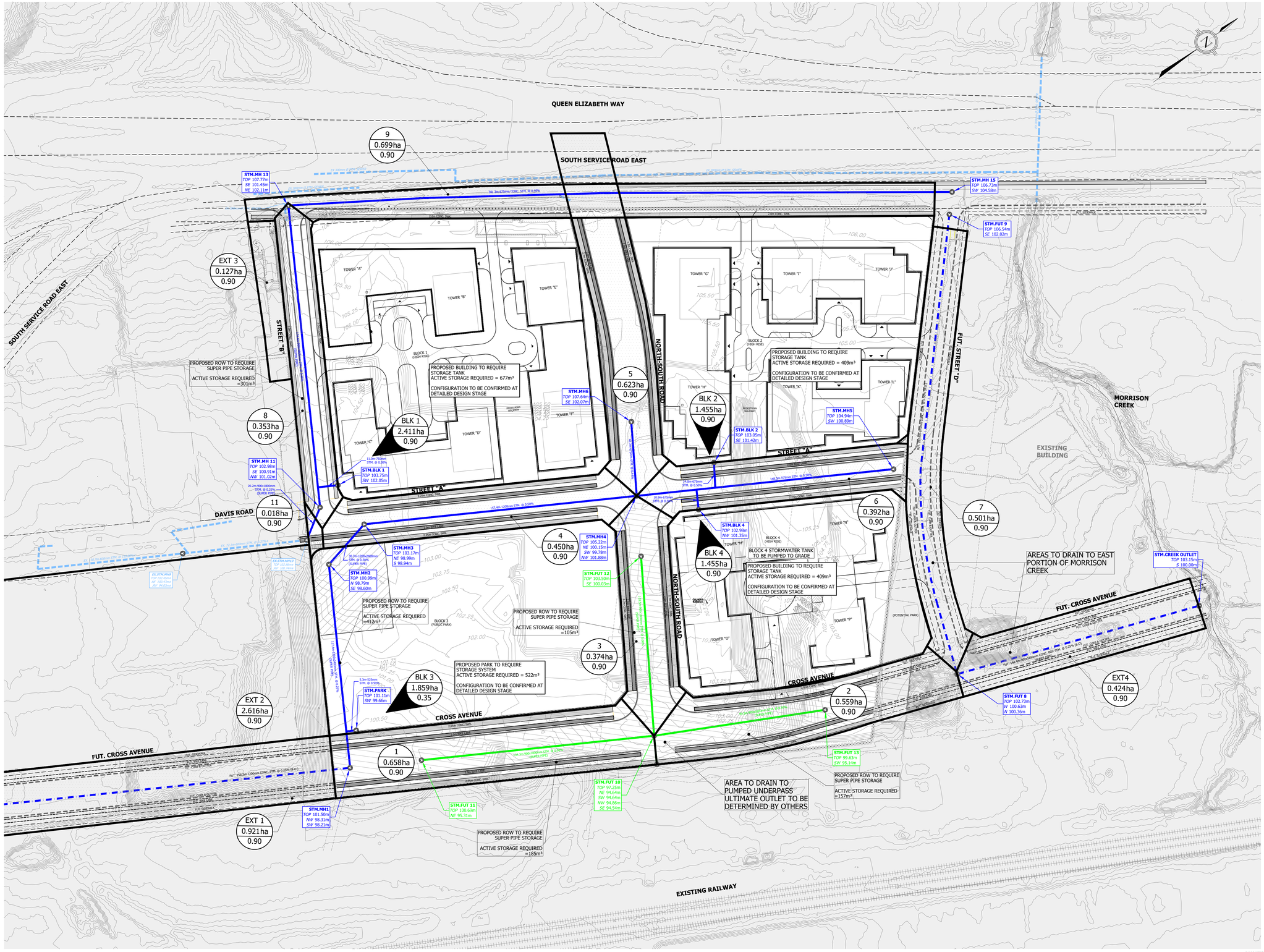
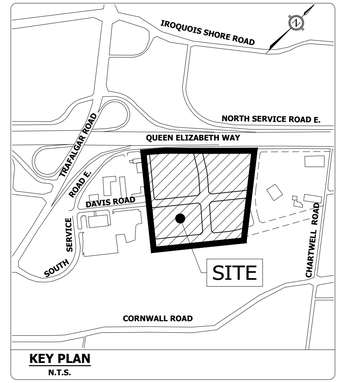
420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

PRE-DEVELOPMENT STORM DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	**STM-1**

F:\PROJECTS\23-307#-QE LANDS DUE DILIGENCE (ROSE CORP)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\STM-1_PRE-DEVELOPMENT STORM DRAINAGE PLAN.DWG





KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- PROPOSED STORM SEWER
- PROPOSED PUMPED STORM SYSTEM
- EXISTING STORM SEWER
- FUTURE STORM SEWER
- MANHOLE ID / GROUND ELEVATION / SEWER INVERTS
- PROPOSED AREA I.D. / PROPOSED DRAINAGE AREA (Ha.) / PROPOSED RUNOFF COEFFICIENT
- EXISTING CONTOUR & ELEVATION
- PROPOSED OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- PROPOSED STORM DRAINAGE BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- PROPOSED SWALE
- EXISTING WATERCOURSE
- FUTURE / EXISTING DEVELOPMENT LANDS
- 100 YR CAPTURE AREA
- PUMPED AREA

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
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00820208150	606731.198	4813293.073	107.023

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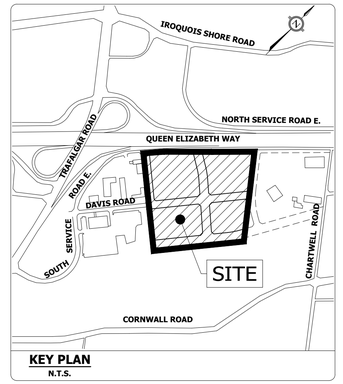
POST STORM DRAINAGE PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	**STM-2**



KEY PLAN
N.T.S.

LEGEND

- LIMIT OF DEVELOPMENT
- 105.50 PROPOSED ELEVATION
- 102.505W PROPOSED SWALE ELEVATION
- 105.50 EXISTING ELEVATION
- MAXIMUM 3:1 (UNLESS OTHERWISE NOTED)
- 102.00 EXISTING CONTOUR & ELEVATION
- PROPOSED OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- FUTURE OVERLAND FLOW ROUTE
- PROPOSED SWALE
- EXISTING WATERCOURSE
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
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00820208150	606731.198	4813293.073	107.023

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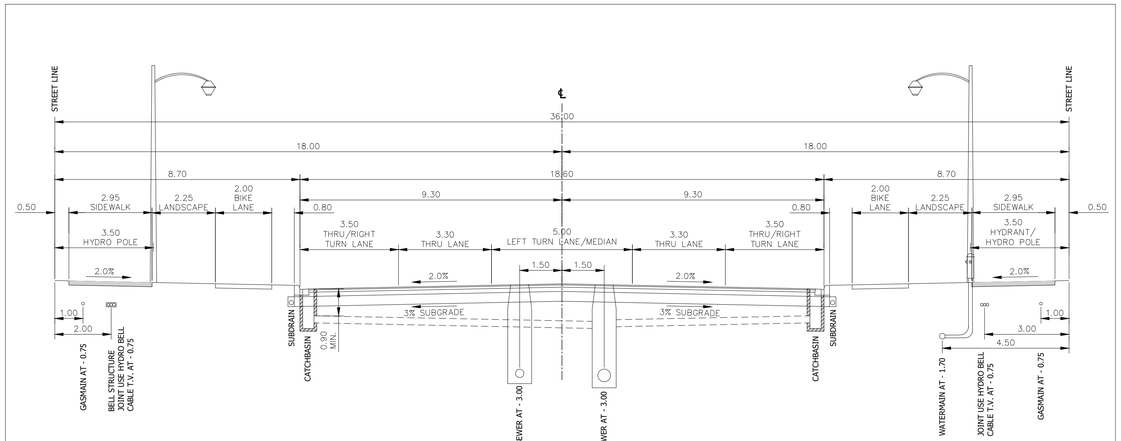
420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

GRADING PLAN

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:1000	**GRD-1**

F:\PROJECTS\23-3078 - GE LANDS DUE DILIGENCE (ROSE CORP)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\GRD-1_GRADING PLAN.DWG



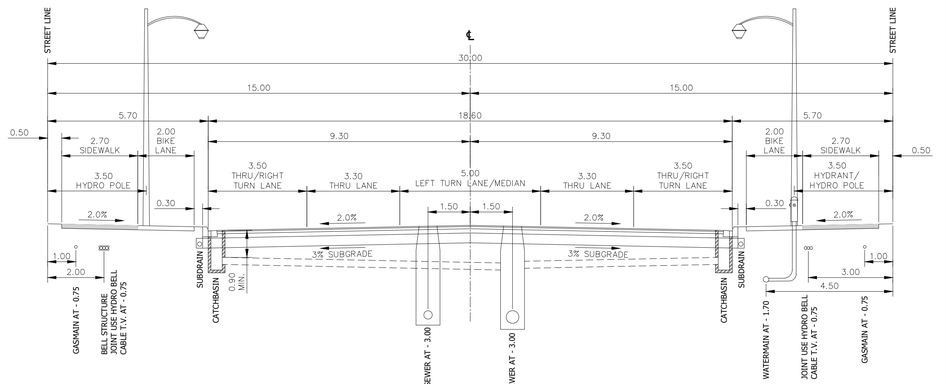
NOTE: WHERE THE WIDTH OF ROAD IS LESS THAN THAT SHOWN, TREES MAY BE LOCATED IN THE BOULEVARD - SUBJECT TO APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.

- STREET LIGHTING SUBJECT TO SPECIAL DESIGN.
- FOR GENERAL NOTES REFER TO STD. 7-2.

DIMENSIONS IN METRES EXCEPT AS NOTED.

MUNICIPALITY TOWN OF OAKVILLE

MODIFIED STREET SECTION FOR 36m ROAD ALLOWANCE



NOTE: WHERE THE WIDTH OF ROAD IS LESS THAN THAT SHOWN, TREES MAY BE LOCATED IN THE BOULEVARD - SUBJECT TO APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.

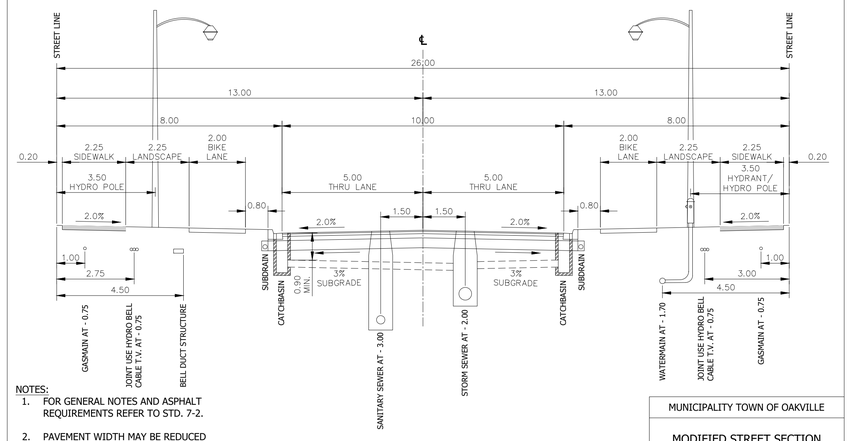
- STREET LIGHTING SUBJECT TO SPECIAL DESIGN.
- FOR GENERAL NOTES REFER TO STD. 7-2.

DIMENSIONS IN METRES EXCEPT AS NOTED.

MUNICIPALITY TOWN OF OAKVILLE

MODIFIED STREET SECTION FOR 30m ROAD ALLOWANCE

STD. 7-4



NOTES:

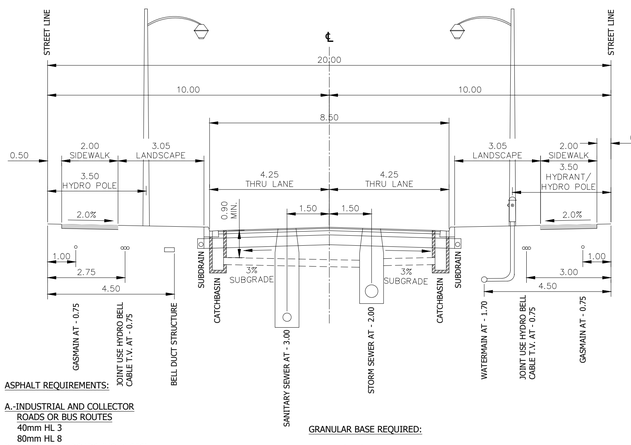
1. FOR GENERAL NOTES AND ASPHALT REQUIREMENTS REFER TO STD. 7-2.
2. PAVEMENT WIDTH MAY BE REDUCED TO 12.50m FOR INDUSTRIAL ARTERIALS AND TO 10.00m FOR INDUSTRIAL COLLECTORS SUBJECT TO DIRECTOR OF PUBLIC WORKS APPROVAL. IN THESE CASES BOULEVARD WIDTHS WILL VARY.

DIMENSIONS IN METRES EXCEPT AS NOTED.

MUNICIPALITY TOWN OF OAKVILLE

MODIFIED STREET SECTION FOR 26m ROAD ALLOWANCE

STD. 7-3



GENERAL NOTES:

1. THE ELEVATION AT STREET LINE FOR LOT DRAINAGE SHALL BE 150mm HIGHER THAN THE FINISHED ROAD CROWN.
2. GRANULAR 'B' SUB-BASE THICKNESS MAY BE REDUCED BY 75mm WHEN GROUND CONDITIONS CONSIDERED SUITABLE BY THE DIRECTOR OF PUBLIC WORKS.
3. MAXIMUM ROAD GRADIENT 7%.
4. ALL MATERIAL TO MEET ONTARIO PROVINCIAL STANDARD SPECIFICATIONS.
5. WATERMAINS AND SANITARY SEWERS TO CONFORM TO LATEST REGIONAL MUNICIPALITY OF HALTON SPECIFICATIONS AND REQUIREMENTS.
6. ALL DRIVEWAYS BETWEEN CURB AND SIDEWALKS TO BE ASPHALTED.
7. IF ANY TRENCH AFFECTS EITHER THE ROADWAY OR CURBS, THEN COMPACTED GRANULAR 'B' MATERIAL WILL BE REQUIRED FOR THE BACKFILL.
8. 9.00m PAVEMENT TO BE USED ON MINOR COLLECTOR AND LOCAL INDUSTRIAL ROADS.
9. TOP COURSE ASPHALTIC CONCRETE SHALL BE ADDED TO THE ROAD ONLY AFTER ADJACENT BUILDINGS (HOMES, INDUSTRIAL, COMMERCIAL, ETC.) HAVE BEEN CONSTRUCTED AND OR ONLY WITH THE SPECIFIC CONSENT OF THE DIRECTOR OF PUBLIC WORKS.
10. FULL LENGTH SUB-DRAINS ARE TO BE INSTALLED.
11. AN EXTRA 150mm THICKNESS OF GRANULAR 'B' SHALL BE ADDED AT ARTERIAL AND INDUSTRIAL ROAD INTERSECTIONS. THIS EXTRA DEPTH SHALL BE EXTENDED FOR A MINIMUM OF 15mm FROM THE PROPERTY LINE OF THE INTERSECTING STREET.
12. SUB-GRADE CROSS-FALL SHALL BE 3 PERCENT.
13. SODDING REQUIREMENTS TO CONFORM TO OPSS 570 AND 571.

ASPHALT REQUIREMENTS:

A.-INDUSTRIAL AND COLLECTOR ROADS OR BUS ROUTES
40mm HL 3
80mm HL 8
B.-RESIDENTIAL ROADS (NO BUSES)
40mm HL 3
50mm HL 8
C.-DRIVEWAYS
50mm DRIVEWAYS MIX ASPHALT (HL-3A)

GRANULAR BASE REQUIRED:

A.-ALL ROADS
150mm OF GRANULAR 'A' MATERIAL HL 3
350mm OF GRANULAR 'B' SUB-BASE (SEE NOTE 2)
B.-DRIVEWAYS
150mm OF 19mm CRUSHER RUN STONE

DIMENSIONS IN METRES EXCEPT AS NOTED.

MUNICIPALITY TOWN OF OAKVILLE

MODIFIED STREET SECTION FOR 20m ROAD ALLOWANCE

STD. 7-2

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM (CGVD28 :78) AND ARE DERIVED FROM MINISTRY OF TRANSPORTATION CONTROLS No. 00820208149 AND 00820208150

CONTROL ID	EASTING	NORTHING	ELEVATION
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00820208150	606731.198	4813293.073	107.023

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420 SOUTH SERVICE ROAD EAST
TOWN OF OAKVILLE

TYPICAL ROAD CROSS SECTIONS

PROJECT No.	DATE	SCALE	DWG No.
23-307	SEPT. 2024	1:100	**RXS-1**

F:\PROJECTS\23-307W - GE LANDS DUE DILIGENCE (ROSE CORP)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\RXS-1_ROAD CROSS SECTIONS.DWG