



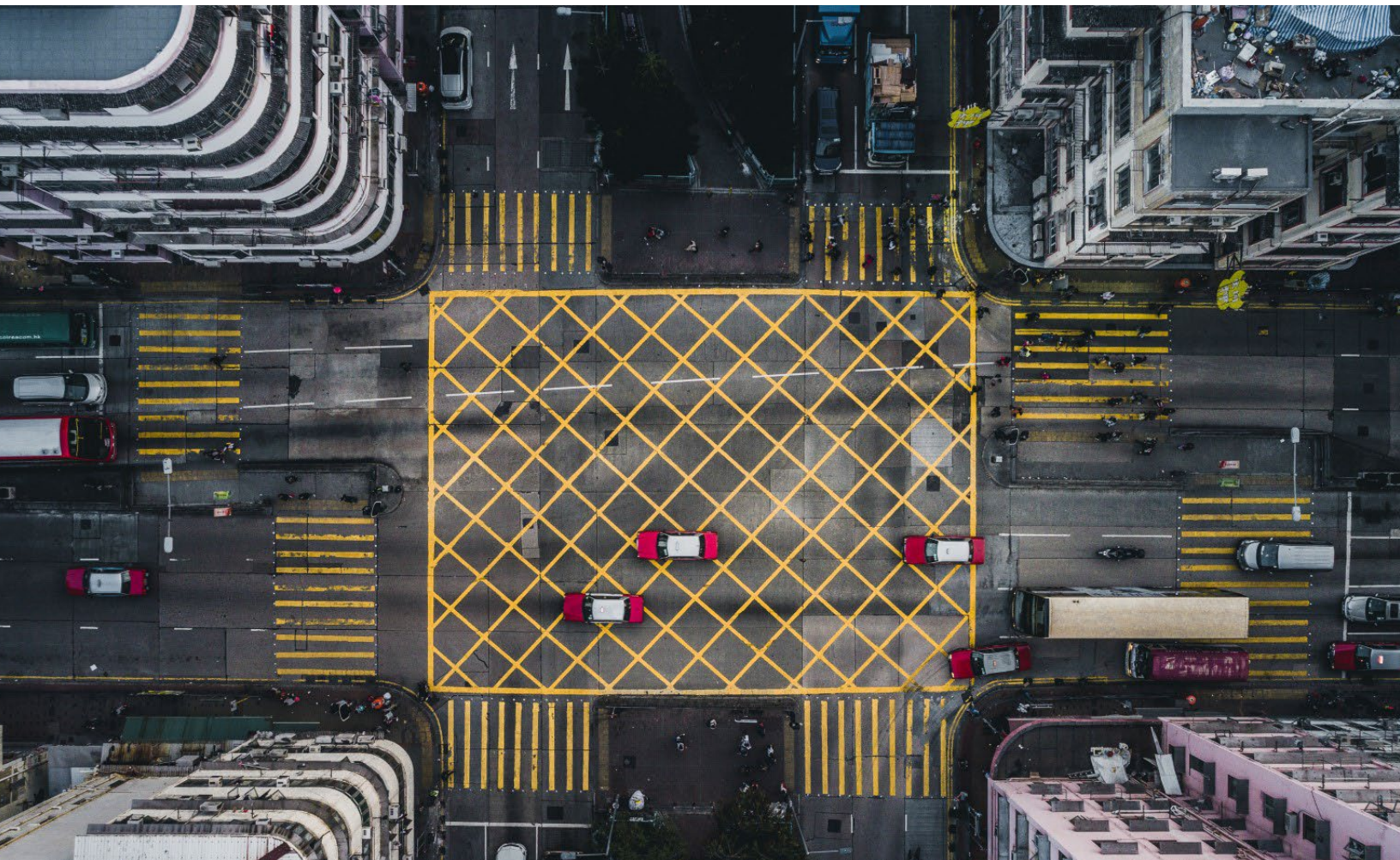
Functional Servicing Report

126-140 Bradford Street

Crown (Bradford) Developments Inc.

27 November 2023

→ **The Power of Commitment**



Scope and Limitations

This report has been prepared by GHD for Crown (Bradford) Developments Inc. and may only be used and relied on by Crown (Bradford) Developments Inc. for the purpose agreed between GHD and Crown (Bradford) Developments Inc. as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Crown (Bradford) Developments Inc. arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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1. Introduction

1.1 Purpose of this report

GHD has been retained by Crown (Bradford) Developments Inc. (the “Owner”) to provide professional engineering services related to the preparation of a Functional Servicing Report for the property known as 126-140 Bradford St. (the “Site”), in the City of Barrie, Ontario.

This report has been prepared to support the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) being submitted for the Site. Included in the following is our account of the existing infrastructure in the vicinity of the Site and recommendations for the conceptual provision of sanitary drainage, storm drainage, and water distribution/fire protection in accordance with the City of Barrie standards and criteria. Additionally, the report will provide greater details on stormwater management.

1.2 Site Description

The proposed development is located on Bradford Street, between John Street and Victoria Street, in the City of Barrie. The Site has a municipal address of 126-140 Bradford Street. The Site location is shown on **Figure 1**.

The Site is bounded to the north by Nimri Express Inc. Auto Service & Detailing, to the south by Premier Law and to the west by other housing.

The site is generally rectangular in shape and is approximately 0.455 ha (1.12 ac) in size, with frontage on existing Bradford Street. The current site is entirely paved with no significant vegetation or mature trees. It has served mixed industrial, commercial, and residential purposes since the early 1900s. The Site is within the designated ‘City Centre’, which permits a broad range of uses, including residential, retail, and commercial. Presently, it hosts the NAPA Autocare Centre (126 Bradford Street), Barrie Foot Clinic (136 Bradford Street), and Get Moving Physio (140 Bradford Street). The NAPA Autocare Centre is an automotive repair facility, and Barrie Foot Clinic and Get Moving Physio provide professional health-related services. The commercial building is surrounded by asphalt-covered parking spaces.

There is an easement adjoining the North boundary of the site. This easement is to remain paved for passage.

Based on the GHD Hydrogeological Assessment Report dated June 30, 2023, the groundwater levels measured ranged from 1.98 to 3.1 mbgs. Overall, the Site topography is relatively flat at an elevation of approximately 225 meters above mean sea level (mAMSL) and slopes slightly eastward towards Kempenfelt Bay, which is approximately 350 meters east of the Site.

The proposed development will consist of two 45-storey residential towers with a 6-storey podium and no underground parking or basement. The development will consist of approximately 912 residential units of various configurations along with common amenity spaces. Vehicular access to the parking is proposed via driveway entrances from Bradford Street.

The Site will be developed in two phases, the first being the north side of the building. Phase 1 will include servicing connections and stormwater management. Under existing conditions, the Site and adjacent properties have full municipal water and sewer services.

Refer to **Appendix A** for the site plan.

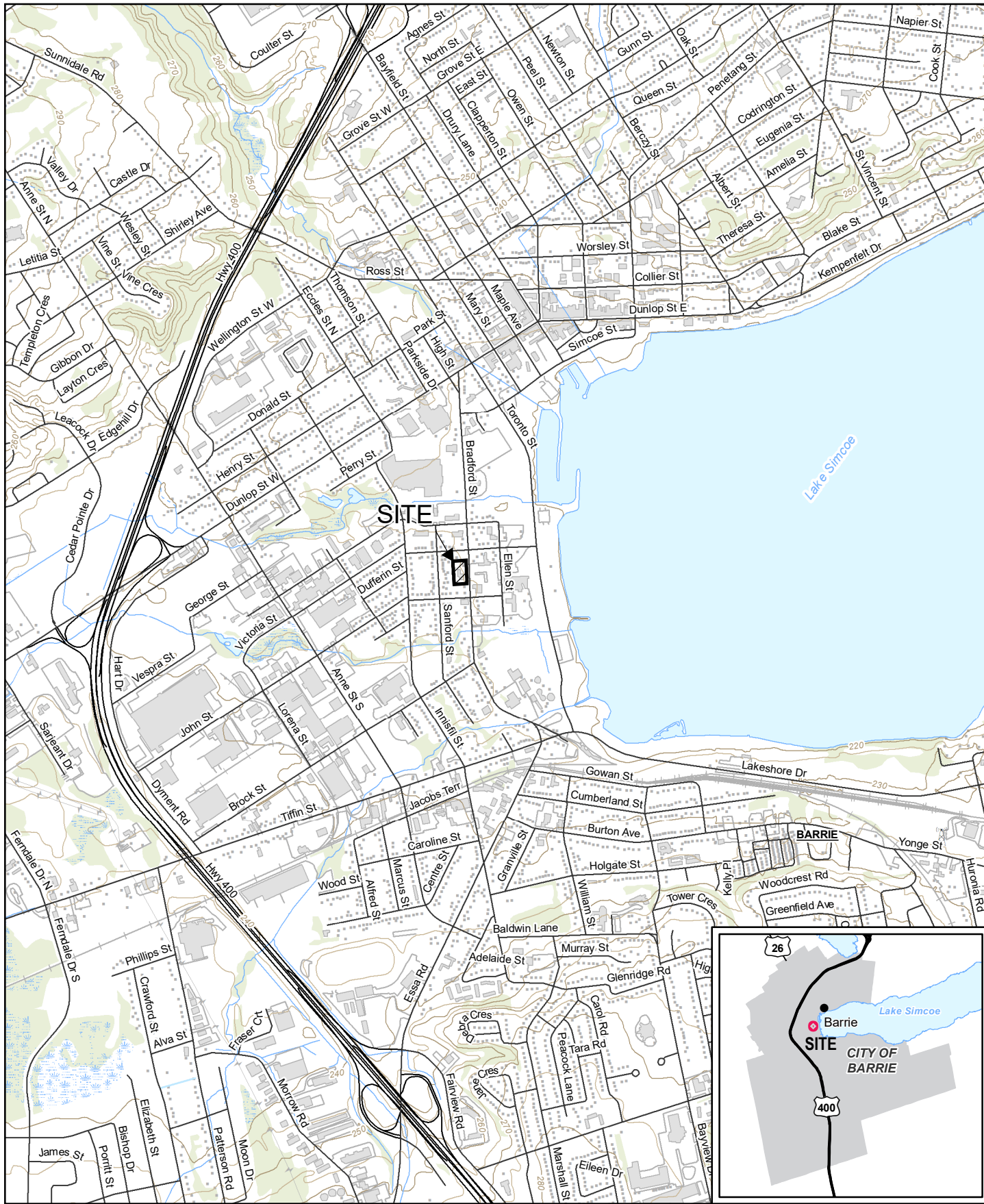
1.3 Background

The servicing and SWM design for the Site has been prepared to meet the requirements of the City of Barrie and County of Simcoe. The following materials were referenced in the preparation of this report:

- Stormwater Infrastructure Design Standard, prepared by the City of Barrie, June 2023.
- Sanitary Infrastructure Design Standard, prepared by the City of Barrie, April 2023.
- Lot Grading and Drainage Infrastructure Design Standard, prepared by the City of Barrie, April 2023.
- Drinking Water Infrastructure Design Standard, prepared by the City of Barrie, September 2023.
- Technical Guidelines for Stormwater Management Submissions, Lake Simcoe Region Conservation Authority, April 2022.
- Water Supply for Public Fire Protection, A Guide to Recommended Practices in Canada, Fire Underwriters Survey, 2020.

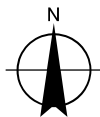
The following technical information were also reviewed:

- Topography Survey, KRCMAR Surveying Inc., completed on April 17, 2023
- Architectural Set including Site Plan, Floor Plans, Unit Count and Stats Breakdown, provided by KIRKOR Architects and Planners, October 2023
- 1970 As-built and 2003 reconstruction plan and profile drawings for Bradford Street, as provided by the City of Barrie, have been referenced for the location and depth of the existing services.



Paper Size ANSI A
0 200 400 600
Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N



1126-140 BRADFORD STREET,
BARRIE, ONTARIO

Project No. 12623952
Revision No. -
Date Sep 29, 2023

SITE LOCATION MAP

FIGURE 1

2. Site Drainage & Stormwater Management

For the detailed drainage design and stormwater management approach, refer to the 'Stormwater Management Report- 126-140 Bradford Street prepared by GHD dated November 2, 2023.

3. Sanitary Servicing

3.1 Existing Sanitary Sewer

There is an existing 250mm diameter sanitary sewer on Bradford Street between John Street and Victoria Street that conveys sanitary flows north towards Victoria Street.

Based on the existing land use (commercial), the pre-development peak sanitary flow is estimated to be approximately 0.07 L/s. Our calculations are included in **Appendix C**.

3.2 Proposed Sanitary Servicing

The proposed building will be serviced by a sanitary service connection from the existing 250mm diameter sanitary sewer located on Bradford Street, with a control manhole at the property line. The service connection will be sized to adequately convey the proposed sanitary discharge from the Site and will be coordinated with the building Mechanical Consultant.

Refer to **Site Servicing Plan** for the location of the proposed sanitary connections.

Contributing sanitary flows from the proposed development were calculated based on the following design criteria:

- Domestic Average Flow of 225 litres/person/day (residential)
- Commercial Average Flow of 28 m³/day/ha
- Low Density Development of 3.13 persons/unit (single detached, duplexes, semi-detached)
- Medium Density Development of 2.34 person/unit (Triplexes, fourplexes, townhouses)
- High Density Development of 1.67 person/unit (apartment dwelling)
- A proposed peaking factor of 3.7 (based on Harmon's Equation)
- Peak extraneous (infiltration) flow of 0.1 L/s/ha

Given the above noted criteria, the equivalent residential population of 1,523 persons and commercial retail space of 0.05 ha, the total peak wastewater flow generated by the proposed development is estimated to be approximately 14.64 litres per second, including extraneous (infiltration) flows. Our calculations are presented in **Appendix C**.

The Site is located within the 'Urban Growth Centre' area, which permits a broad range of uses, including office, commercial, institutional, cultural, retail and residential. By 2031, the Urban Growth Centre area is to accommodate a significant amount of the City's forecasted population and employment growth. The subject site is designated as high density where the minimum residential density is 300 units per hectare. Therefore, the existing sanitary sewer system will be sufficiently sized to accommodate the post-development sanitary flows anticipated by the planned growth outlined in the Simcoe County Official Plan and the City of Barrie Official Plan, and as proposed by this development.

4. Water Servicing

4.1 Existing Conditions

Water supply in the vicinity of the Site consists of an existing 300mm diameter watermain on Bradford Street. There is one existing hydrant in close proximity to the Site. The existing hydrant is located at Bradford Street and is connected to the 300mm diameter watermain on Bradford Street.

4.2 Hydrant Flow Test

The existing capacity of the water distribution system was estimated through a hydrant flow test carried out on October 3, 2023. The Hydrant flow test results and documentation can be found in Appendix B.

4.3 Water Supply

Subject to City approval, we are proposing to install a 200 mm DI water service connection to the existing 300mm diameter DI watermain within the Bradford Street ROW. The water service connection will be a combined fire and domestic water connection. The size of the water connection and the domestic water and fire protection services will be coordinated with the building Mechanical Consultant to meet proposed domestic water and fire protection demands for the development in accordance with City standards and the Ontario Building Code.

For the domestic water service to the building, a water meter will be installed in the mechanical room in accordance with Town standards. Because the proposed building will be residential, a backflow preventer will be provided on the private side of the water meter. The fire supply will be unmetered. The domestic water and fire protection services inside the building will be detailed by the building Mechanical Consultant.

Refer to **Site Servicing Plan** for the location of the proposed water connections.

4.4 Domestic Demand

The estimated domestic water demand will be based on the City of Barrie's design criteria for equivalent population:

- Average water consumption rate of 225 litres/capita/day
- Commercial Average Flow of 28 m³/day/ha
- Low Density Development of 3.13 persons/unit (single detached, duplexes, semi-detached)
- Medium Density Development of 2.34 person/unit (Triplexes, fourplexes, townhouses)
- High Density Development of 1.67 person/unit (apartment dwelling)
- Peaking factors of 3.75 for Maximum Hour and 2.5 for Maximum Day.

Table 1 – Equivalent Population

Unit Type	Units	Density	Pop.
1 Bedroom	608	1.67	1015
2 Bedroom	304	1.67	508
Total	912		1,523

Table 1 above shows the breakdown of units that was used to estimate the equivalent population.

The domestic demand for the new development is based on an residential equivalent population of 1,523 persons with a consumption rate of 225 litres/capita/day and commercial retail of 0.05 ha with a consumption rate of 28 m³/day/ha. Therefore, the domestic demand for the proposed development is as follows:

- Average Day = (225 litres/capita/day x 1,523 persons) + (0.05 ha x 28 m³/day/ha) = 239 litres/min.
- Maximum Day = 2.5 x Average Day = 598 litres/min.
- Maximum Hour = 3.75 x Average Day = 896 litres/min.

4.5 Fire Demand

Based on the site plan, the proposed building will have protected openings (as defined by the Fire Underwriters Survey) and a sprinkler system. It is also confirmed that the building will be constructed using fire-resistive construction methods (Type I). Given the above, the estimated fire flow required is given by the following formula (as based on the 2020 Fire Underwriters Survey: Water Supply For Fire Protection guidelines):

$$F = 220 * C * A^{0.5}$$

All structural elements (walls, arches, floors and roofs) of the building will be constructed with a minimum 2-hour fire resistance rating.

$$C = 0.6$$

Furthermore, all vertical openings and exterior communications will be properly protected in accordance with the National Building Code. Therefore, 'A' is taken as the area of the largest floor plus 25% of each of the two adjoining floors (excluding the basement). As such,

$$A = 4,958 \text{ m}^2$$

Therefore, the required fire flow is:

$$F = 9,300 \text{ litres/min.}$$

As the proposed development will mainly consist of residential occupancies, the building will have "limited combustible contents". The fire flow can be reduced by 15% based on the reduction for occupancy hazard, and thus,

$$F = 7,905 \text{ litres/min.}$$

As the development will be equipped with an automatic sprinkler system which will be designed and installed in accordance with applicable NFPA standards, the fire flow may be further reduced by 50%, or 3,953 litres/min.

Finally, the fire flow will be increased by 60%, or 4,743 litres/min. based on exposure surcharge due to the distance between the proposed building and other buildings on its West, East, and North sides.

Thus, the required fire flow (rounded to the nearest 1,000 litres/min) is:

$F = 9,000$ litres/min. (2,378 U.S. gallons per minute or 150 L/s)

Our detailed calculations are included in **Appendix B**.

4.6 Total Demand

The total demand is the greater of the Maximum Day Domestic Demand plus the Fire Demand or the Maximum Hour Demand. Thus, the total demand for the proposed development is approximately 9,598 litres per minute (approximately 160 litres per second, or 2,536 U.S. gallons per minute).

To confirm the adequacy of the adjacent existing municipal water distribution system to meet the domestic water supply and fire flow requirements for the proposed development, flow and pressure tests were undertaken adjacent to the subject site. At the direction of our firm, a hydrant flow test was completed by GHD on October 13th, 2023 at 8:45 am to measured flow and pressure tests on the 300mm diameter watermain located on Bradford Sreet. The testing of this 300mm diameter watermain revealed a static pressure of 79.6 pounds per square inch and a residual pressure of 76.8 pounds per square inch at a fire flow rate of 889.8 U.S gallons per minute. Based on the above information, we have calculated the available flow at the desired residual pressure of 20 pounds per square inch, as per the guidelines provided by the National Fire Protection Association (NFPA), to be approximately 21,310 litres per minute (or 355 litres per second, or 5,630 U.S gallons per minute) which is sufficient to accommodate the proposed total demand for the site. The test results and fire flow / protection calculations are included in **Appendix B**.

5. Storm Servicing

The proposed grading will redirect minor external flows toward the catchbasins on Bradford Street. Flows from the roof area will be directed to a stormwater management tank that will release controlled flows to an LID treatment train, then will discharge to the storm sewer on Bradford Street. Flows from the road widening and landscape areas will be uncontrolled and directed to the catchbasins on Bradford Street, as it is neither practical nor feasible to control these flows.

Subject to City approval, we are proposing to install a 300 mm storm service connection to the existing 450mm diameter storm sewer within the Bradford Street ROW.

Refer to the Stormwater Management Report, dated 20 November 2023 for more details.

6. Groundwater Discharge

6.1 Temporary (Short-Term) Groundwater Discharge

For short-term discharge during construction to the receiving sanitary sewer system, based on the findings from the latest hydrogeological report, the total groundwater discharge flow rate is estimated to be 41,380 L/day. A Ministry of the Environment, Conservation and Parks construction groundwater taking EASR is to be required. A City of Barrie Sewer Use discharge permit will be required prior to discharge of construction water to the sewer. The groundwater concentrations are below the sanitary/combined sewer discharge criteria but is exceeds the storm sewer discharge

criteria. If groundwater is discharged to the City of Barrie storm sewer, pre-treatment will be required. Discharged groundwater to the sanitary sewer will not require pre-treatment.

Refer to the latest **Hydrogeological report** for more details.

6.2 Permanent (Long-Term) Groundwater Discharge

The building Structural Engineer will ensure that the building will be designed and constructed as a water-tight structure. Any basement walls and slabs will also be designed to resist hydrostatic and uplift pressures. A Ministry of the Environment, Conservation and Parks long term Permit to Take Water for groundwater seepage to the building PDS is not anticipated to be required. A sewer connection for the discharge of groundwater is also not required.

Refer to the latest **Hydrogeological report** for more details.

7. Summary and Conclusions

This Functional Servicing Report has been prepared in support of the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) being submitted for the Site known as 126-140 Bradford Street in the City of Barrie. This report demonstrates that the proposed development can be serviced through the utilization of existing infrastructures, without any adverse impact to the municipal services of the surrounding areas.

Our findings include:

- Water supply and fire protection for the proposed development can be provided from a new 200mm service connection to the existing 300 mm diameter watermain on Bradford Street, based on hydrant flow test results provided.
- Sanitary flows from the new development can outlet to the existing 250 mm diameter sanitary sewer located on Bradford Street via a new service connection for the proposed building.
- The subject site is designated as high density where the minimum residential density is 300 units per hectare. Therefore, the existing sanitary sewer system will be sufficiently sized to accommodate the post-development sanitary flows anticipated by the planned growth outlined in the Simcoe County Official Plan and the City of Barrie Official Plan, and as proposed by this development.

Based on the above findings, it is anticipated that the proposed development site can be served adequately from the existing watermain, sanitary and storm sewers located adjacent to the property.

All of Which is Respectfully Submitted,

GHD

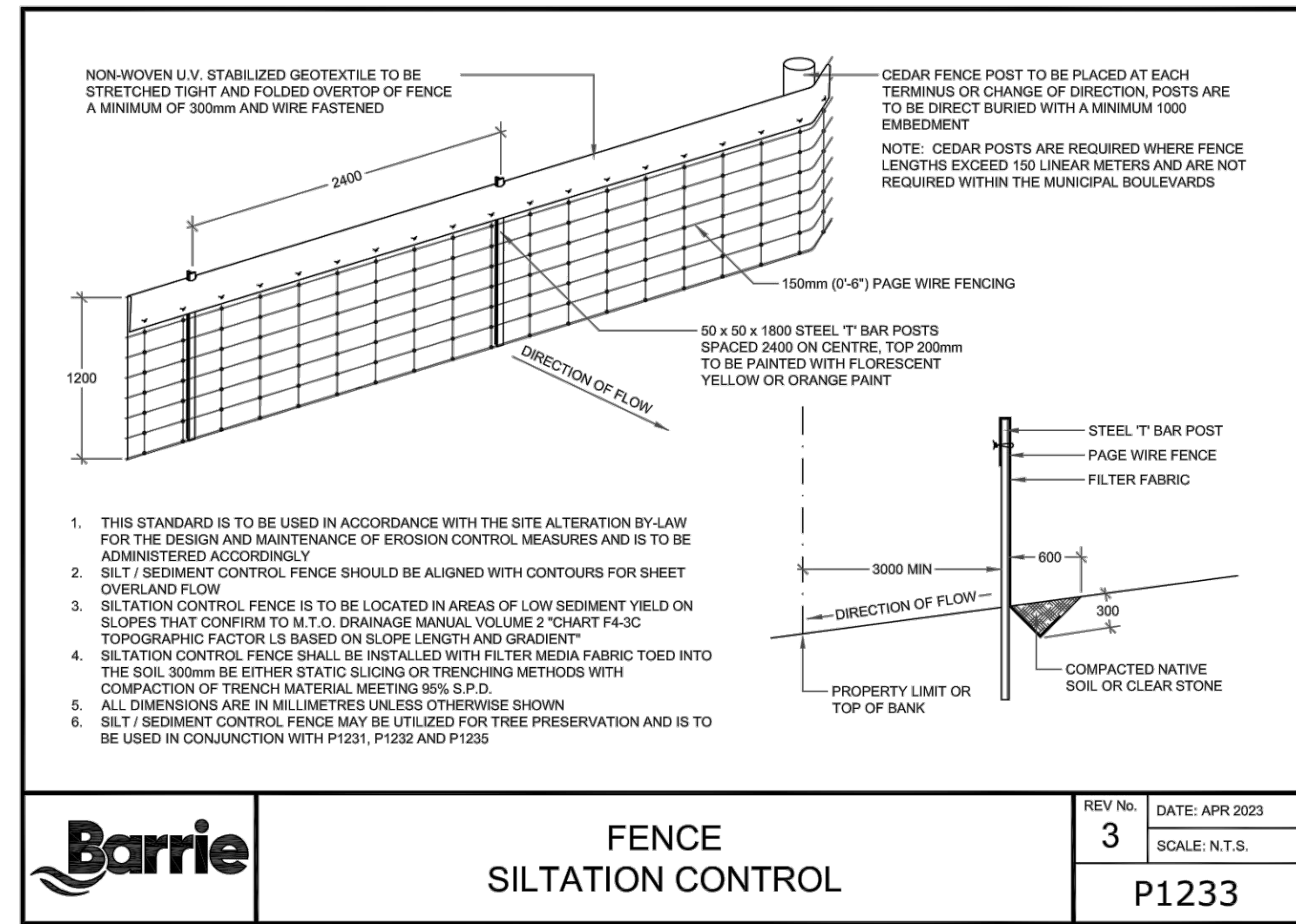
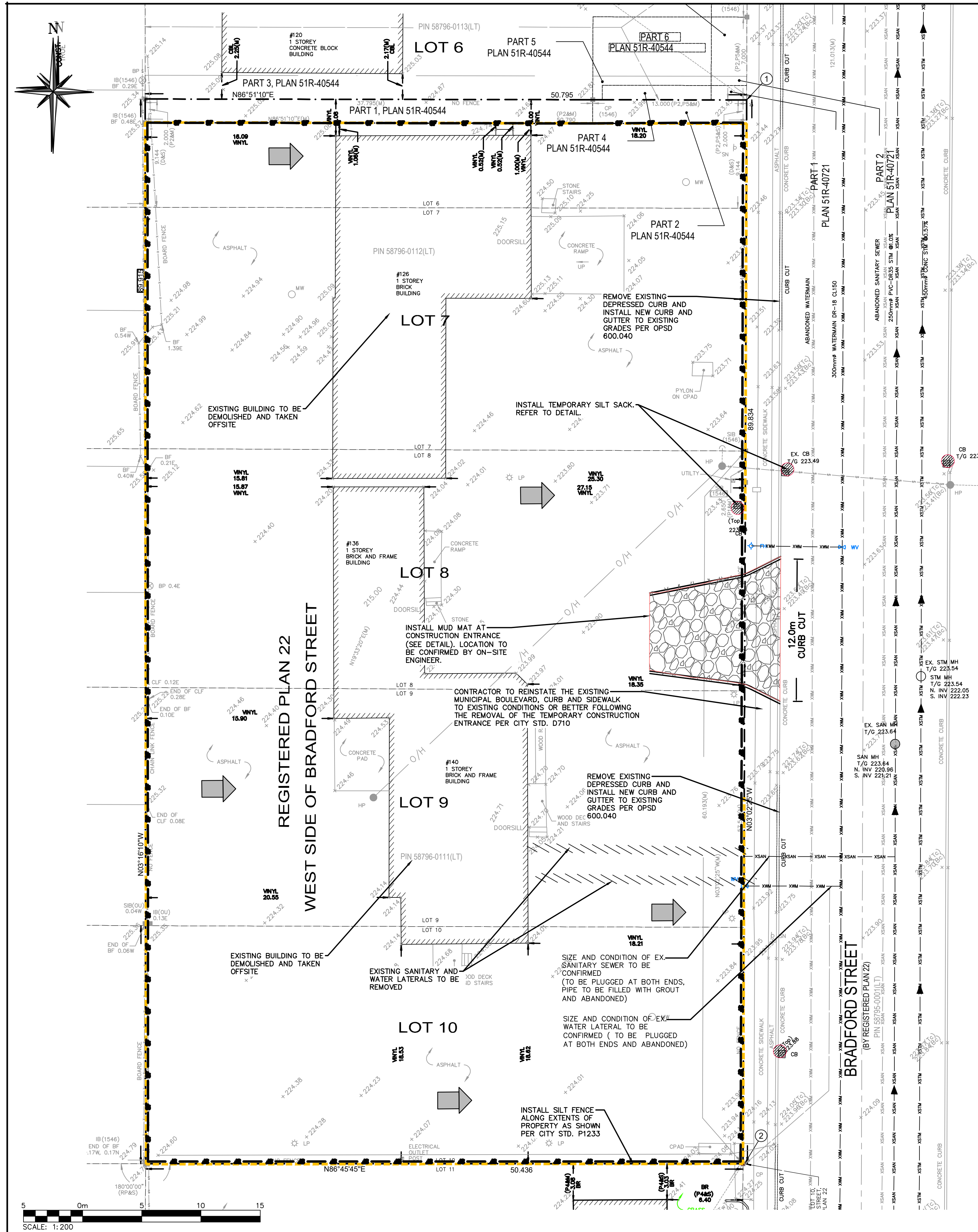


Andrew Sumary, P. Eng.



Winston Thai, P.Eng.
Project Manager

Drawings



CONTAMINANT MANAGEMENT PLAN – PROJECT SPECIFIC NOTES

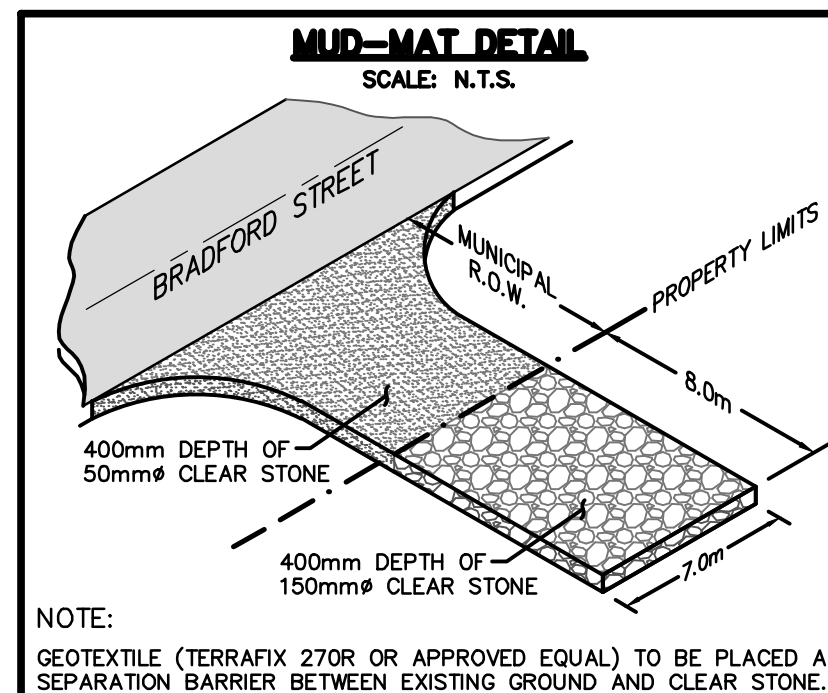
THE CONTAMINANT MANAGEMENT PLAN DEMONSTRATES THE STEPS TO PREVENT CONTAMINATION AND EXPLAINS HOW THE ENVIRONMENTAL RISKS WILL BE MITIGATED AND MANAGED. SOME CONTAMINANTS THAT MAY BE PRESENT AT THIS SITE INCLUDE LIQUID FUEL, OIL, PAINT, AND COOLANT. EVERY PRECAUTION SHOULD BE TAKEN TO AVOID A SPILL. LEAKS SHOULD BE KEPT AWAY FROM FLOOR DRAINS AND CATCH BASINS.

IN THIS SECTION A MINOR SPILL IS DEFINED AS A SPILL SMALL ENOUGH TO BE SAFELY CLEANED UP USING AN EMERGENCY SPILL KIT(S). DOES NOT SPREAD RAPIDLY IS CONTAINED WITHIN THE BUILDING ENVELOPE, AND DOES NOT THREATEN TO ENTER THE SEWER SYSTEM, OR POSE A THREAT FOR AN ADVERSE EFFECT TO THE ENVIRONMENT, PEOPLE, OR PLANT/ANIMAL LIFE.

- IN THE CASE OF A MINOR SPILL, THE SPILL WILL BE ISOLATED FROM ANY POSSIBLE IGNITION SOURCES, SUCH AS SMOKING, HEATERS, WELDING AND GRINDING ACTIVITIES, AND ELECTRICAL EQUIPMENT. THE MINOR SPILL PROCEDURE IS AS FOLLOWS:
1. RESPOND IMMEDIATELY TO SPILLS THAT OCCUR AT THE SITE AS SOON AS IT IS IDENTIFIED.
2. CHECK FOR HAZARDS (FLAMMABLE MATERIAL, NOXIOUS FUMES, CAUSE OF SPILL). IF FLAMMABLE LIQUID, TURN OFF ENGINES AND NEARBY ELECTRICAL SOURCES. IF NOXIOUS FUMES ARE PRESENT, PROVIDE VENTILATION TO THE SPILL AREA. IF SERIOUS HAZARDS ARE PRESENT LEAVE THE AREA AND CALL 911. WHEN IN DOUBT, CONSULT THE SDS FOR HAZARDS.
3. PUT ON APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE)
4. STOP THE SOURCE OF THE SPILL (PLUG THE HOLE, UPRIGHT THE CONTAINER, SHUT OFF THE VALVE, ETC.).
5. NOTIFY THE SUPERVISOR AND ADVISE OF THE SITUATION AND RESPONSE TO BE TAKEN.
6. CONTAIN SPILL USING CONTENTS OF THE SPILL KIT TO PREVENT CONTAMINANTS FROM ENTERING ANY DRAIN OR THE NATURAL ENVIRONMENT.
7. DIRECT SPILL AWAY FROM FLOOR DRAINS, STORM SEWERS, CATCH BASINS, SOURCES OF IGNITION (FIRE HAZARDS), OTHER INCOMPATIBLE CHEMICALS, AND PATHWAYS TO SENSITIVE NATURAL FEATURES (E.G. WELL HEAD PROTECTION AREA – A).
8. CLEAN UP THE SPILL BY MOVING DYKE OF ABSORBENT SOCKS SLOWLY TOWARD THE MIDDLE OF THE SPILL WHILE MAINTAINING THE DYKE. IF ABSORBENT SOCKS OR PADS ARE SPENT AND THERE IS STILL A LARGE QUANTITY OF SPILLED MATERIAL TO BE ABSORBED, PLACE ADDITIONAL ABSORBENT SOCKS, IF AVAILABLE, OUTSIDE THE DYKE OF USED ABSORBENT SOCKS. REMOVE SPENT ABSORBENT SOCKS/PADS/GRANULAR AND PLACE THEM IN THE PLASTIC DISPOSAL BAG IN THE KIT, AND PLACE THE BAG IN THE KIT CONTAINER.
9. MOP THE AREA OF THE SPILL WITH A DISPOSABLE MOP OR WIFE CONTAMINATED SURFACES WITH A DAMP DISPOSABLE CLOTH. DO NOT FLUSH THE AREA WITH WATER.
10. DISPOSE OF USED SPILL RESPONSE EQUIPMENT BY PLACING CONTAMINATED EQUIPMENT AND PPE IN A PLASTIC DISPOSAL BAG INSIDE THE SPILL KIT/CONTAINER. SEAL AND LABEL ALL CONTAINERS CONTAINING CONTAMINATED MATERIALS. CONTACT HAZARDOUS WASTE DISPOSAL CONTRACTOR FOR PICK-UP AND PROPER DISPOSAL.
11. FOLLOW ALL REGULATORY PROCEDURES FOR THE REPORTING OF DISPOSAL OF HAZARDOUS WASTE THROUGH THE HAZARDOUS WASTE INFORMATION NETWORK (SEE WWW.HWIN.CA FOR MORE INFORMATION).
12. RECORD SPILL IN LOGBOOK ON SITE, AND SUBMIT TO SUPERVISOR.

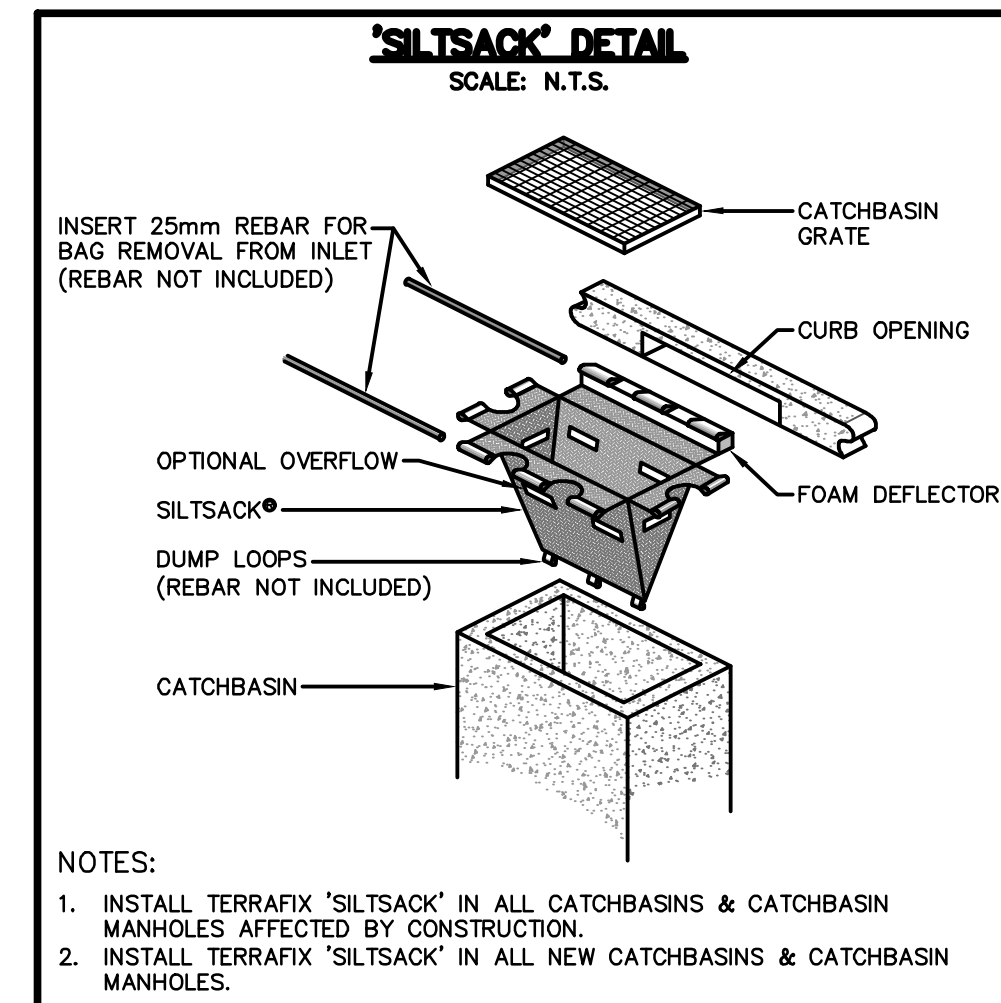
FOR MAJOR SPILLS, THE PROCEDURE IS AS FOLLOWS:

1. NOTIFY MOECC SPILLS ACTION CENTRE (SAC) IMMEDIATELY (1-800-268-6080; FAX: 416-325-3011 – OPEN 24 HOURS A DAY). THE DETAILS OF THE SPILL ARE BASED ON THE INFORMATION AVAILABLE AT THE TIME OF THE CALL, AND ARE REQUIRED TO BE REPORTED TO THE MOECC BY OREG. 675/98 SS 13(3) AND (4), INCLUDING BUT NOT LIMITED TO DESCRIPTION OF THE DISCHARGE OR SPILL LOCATION (MUNICIPAL ADDRESS IF POSSIBLE).
- THE DATE AND TIME THE DISCHARGE SPILL WAS DISCOVERED/OCCURRED.
- THE NAME AND CONTACT INFORMATION FOR THOSE CONTACTED TO RESPOND TO THE DISCHARGE.
- THE DURATION OF THE DISCHARGE.
- THE POLLUTANT(S) DISCHARGED OR SPILLED AND QUANTITY OF POLLUTANT(S) DISCHARGED.
- RELEVANT INFORMATION REGARDING THE CAUSE OF THE DISCHARGE.
2. FOLLOW PROCEDURES FOR 'MINOR SPILLS' STEPS 1-7.
3. CONTACT A REMEDIATION COMPANY TO CLEAN UP THE SPILL AND PROPERLY DISPOSE OF ANY HAZARDOUS MATERIALS FROM THE SITE.
4. BARRICADE THE SPILL AREA WHILE MAINTAINING EMERGENCY ESCAPE ROUTES.
5. RECORD SPILL IN THE LOG BOOK ON-SITE AND SUBMIT IT TO THE SUPERVISOR.



EROSION AND SEDIMENT CONTROL – PROJECT SPECIFIC NOTES

1. ALL SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL AREA IS STABILIZED.
2. IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE.
3. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER AND/OR CALCIUM CHLORIDE AS REQUIRED FOR COMPACTION AND/OR DUST CONTROL.
4. ALL CONSTRUCTION EQUIPMENT MUST BE PARKED ON-SITE.
5. IF CONSTRUCTION IS INTERRUPTED, AND/OR INACTIVITY EXCEEDS 30 DAYS, STRIPPED/ BARE AREAS WILL BE STABILIZED BY SEEDING.
6. SEDIMENT CONTROL FENCE TO BE INSTALLED PER ESC DWG. G101.
7. ALL CONSTRUCTION VEHICLES TO ENTER AND EXIT SITE FROM CONSTRUCTION ACCESS.
8. ALL TOPSOIL STOCKPILES TO BE SURROUNDED WITH SEDIMENT CONTROL FENCING.
9. SILT SACKS WILL BE PLACED ON THE CATCHBASINS ON ALL STREETS ACROSS THE PROPERTY FRONTAGE.
10. STREET SWEEPING, CATCH BASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE CITY.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDITION OF THE SITE AT ALL TIMES. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT CONTROL FENCE, CATCHBASIN SEDIMENT BARRIERS, SEDIMENT TRAPS AND OTHER EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION, IN ACCORDANCE WITH CITY REQUIREMENTS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES AND STRUCTURES IN GOOD WORKING ORDER AT ALL TIMES. CONTRACTOR SHALL INSPECT SUCH DEVICES AT LEAST ONCE PER WEEK AND AFTER EACH RAINFALL EVENT GREATER THAN 10MM, AND MAKE ALL NECESSARY REPAIRS AS REQUIRED.
13. ALL SEDIMENTS SHALL BE DISPOSED OFF-SITE AS PER CITY REGULATIONS.
14. CONTRACTOR IS RESPONSIBLE FOR CLEAN UP OF MUDTRACKING ON A DAILY BASIS OR ON A MORE FREQUENT BASIS IF DIRECTED BY THE TOWN OR OWNER.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL EROSION AND SEDIMENT CONTROL DEVICES AND STRUCTURES ONCE SEEDING OR SODDING IS IN PLACE AND THE SITE HAS STABILIZED.



- NOTES:
1. INSTALL TERRAFIX 'SILT SACK' IN ALL CATCHBASINS & CATCHBASIN MANHOLES AFFECTED BY CONSTRUCTION.
 2. INSTALL TERRAFIX 'SILT SACK' IN ALL NEW CATCHBASINS & CATCHBASIN MANHOLES.

NOT FOR SUBMISSION

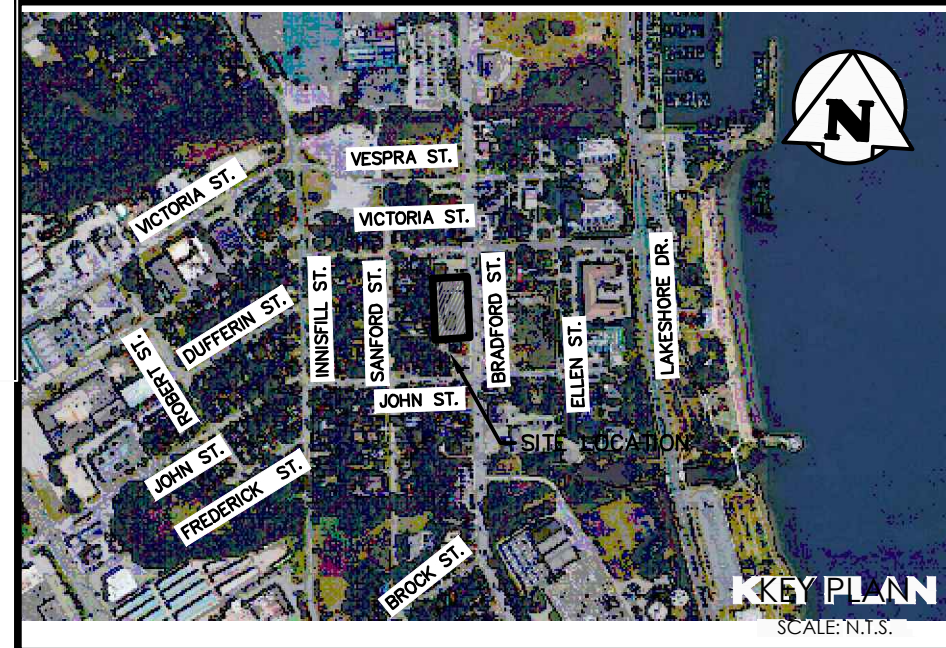
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION



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LEGEND	
---	PROPERTY LINE
o HP	EXISTING HYDRO POLE
---	EXISTING FENCE
---	EXISTING GRADE
---	EXISTING OVERLAND FLOW DIRECTION
---	MUD-MAT; SEE DETAIL
---	SILT FENCE; SEE DETAIL
---	TEMPORARY CATCHBASIN SILTATION CONTROL DEVICE (SILT SACK)
---	LIMITS OF EX. SERVICE TO BE REMOVED

ISSUED FOR COORDINATION	
A	2023/NOV/06
No. ISSUE / REVISION	
Y	YYYY/MMM/DD

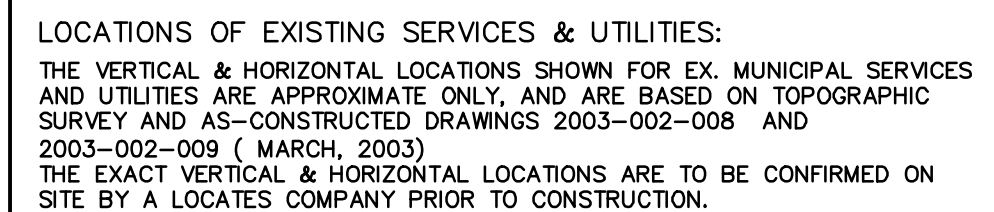
ELEVATION NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE GEODETIC AND ARE RELATED TO HORIZONTAL CONTROL MONUMENT NO. 03120080022 HAVING AN ELEVATION OF 222.437 METRES. (VERTICAL DATUM: CGVD2011)

SURVEY NOTES:
SURVEY COMPLETED BY KROMAR SURVEYOR LTD. (2023/APR/17)
JOB NO. 23-041
BEARINGS SHOWN HEREIN ARE GRID DERIVED FROM HORIZONTAL CONTROL MONUMENTS NO. 03120080022 AND 03120080023 AND ARE REFERRED TO THE 6° UTM COORDINATE SYSTEM, ZONE 17, NAD83 (GSR) (2010.0)
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9997145

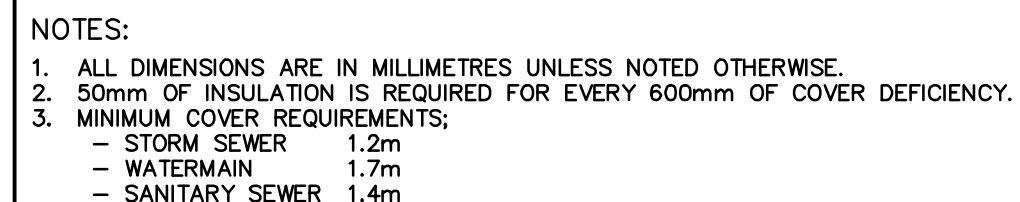
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DRAWING NO. A2022, REV X (2023/SEPT/21)
PROJECT NO. 23-072

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Project		126 BRADFORD STREET CITY OF BARRIE COUNTY OF SIMCOE	
Drawing		REMOVALS PLAN EROSION & SEDIMENT CONTROL & CONTAMINANT MANAGEMENT PLAN	
Drawn	A.S.	Design	A.S.
Check	A.B.	Check	A.B.
Scale		1:200	
Dwg.		G101	
Project No.		12623952	



THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LOCATIONS FOR PROTECTION AND TEMPORARY RELOCATION OF UNDERGROUND UTILITIES AND SERVICES AS REQUIRED FOR THE COMPLETE INSTALLATION OF THE PROPOSED WORKS.



WATERMAIN & WATER SERVICES SHALL HAVE A MINIMUM DEPTH OF 1.7m AND SHALL HAVE A MINIMUM OUTSIDE BARREL VERTICAL SEPARATION OF 0.5m & HORIZONTAL SEPARATION OF 2.5m BETWEEN THE WATER PIPE AND SEWERS PIPES. IN CASE OF CONFLICT BETWEEN THE PROPOSED WATERMAIN AND PROPOSED SEWERS, CONTRACTOR TO LOWER THE PROPOSED WATERMAIN TO ENSURE MIN. 0.5m CLEARANCE BETWEEN WATERMAIN PIPE AND SEWERS PIPE, PER DETAIL ON THIS DRAWING.

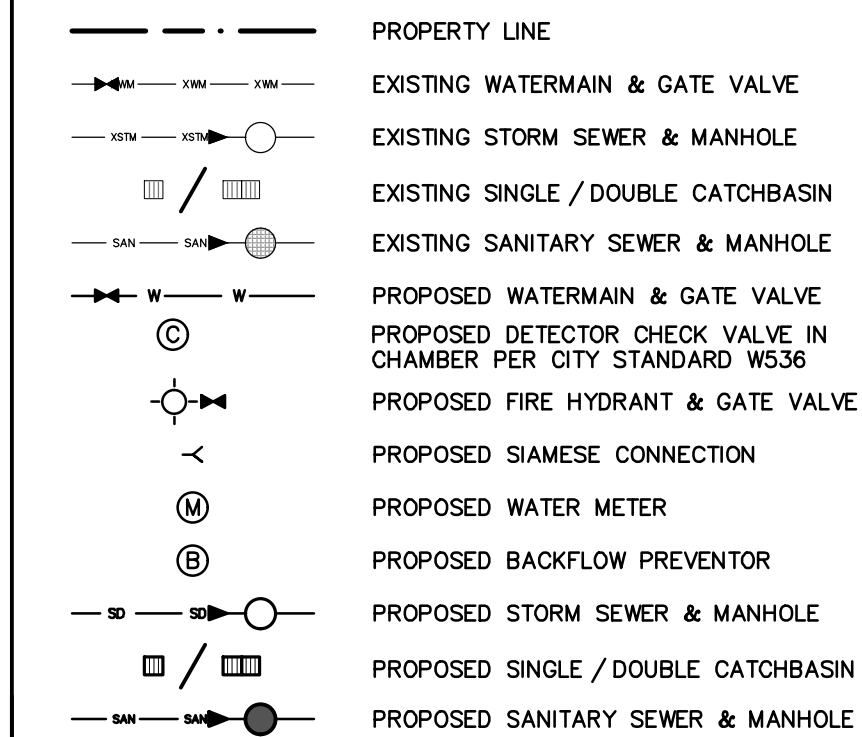
SANITARY SEWER NOTE:
SANITARY SERVICE CONNECTIONS TO BE PVC SDR-28 AND SANITARY SEWER MAIN LINE TO BE PVC SDR-35 WITH MINIMUM PIPE STIFFNESS OF 320kPa - MANUFACTURED TO C.S.A. STANDARD B182.2 (A.S.T.M. SPECIFICATION D 3034) WITH RUBBER GASKETTED BELL AND SPIGOT JOINTS.

STORM SEWER NOTE:
MAIN SEWERS LESS THAN 450mmØ SHALL BE PVC PIPE SDR 35 (OPSS 410), MIN. PIPE STIFFNESS SHALL BE 320kPa. MAIN SEWERS 450mmØ OR GREATER SHALL BE CONCRETE CLASS-6SD UNLESS NOTED OTHERWISE. ALL PIPE TO BE JOINED WITH A GASKETTED BELL AND SPIGOT SYSTEM.

WATERMAIN MATERIAL NOTE:
WATERMAIN AND/OR WATER SERVICE MATERIALS 100mm (4") TO 300mm (12") SHALL BE PVC PIPE, DR-18, AWWA C900. WATERMAIN AND/OR WATER SERVICE MATERIALS 400mm (16") SHALL BE PVC CSA B137.3, AWWA C905.



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A	ISSUED FOR COORDINATION	2023/NOV/06
No.	ISSUE / REVISION	YYYY/MMM/DD

ELEVATIONS SHOWN ON THIS PLAN ARE GEODETIC AND ARE RELATED TO HORIZONTAL CONTROL MONUMENT NO. 03120080022 HAVING AN ELEVATION OF 222.437 METRES. (VERTICAL DATUM: CGVD28:78

SURVEY COMPLETED BY KRCMAR SURVEYOR LTD. (2023/APR/17)
JOB No.: 23-041

BEARINGS SHOWN HEREIN ARE GRID DERIVED FROM HORIZONTAL CONTROL MONUMENTS NO. 03120080022 AND 03120080023 AND ARE REFERRED TO THE 6" UTM COORDINATE SYSTEM, ZONE 17, NAD83 (GSRs) (2010.0)

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126 BRADFORD STREET
CITY OF BARRIE
COUNTY OF SIMCOE

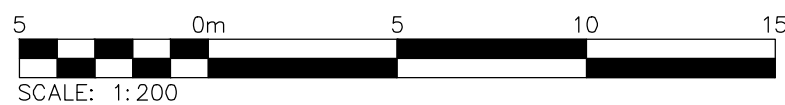
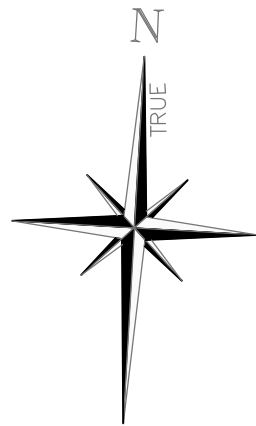
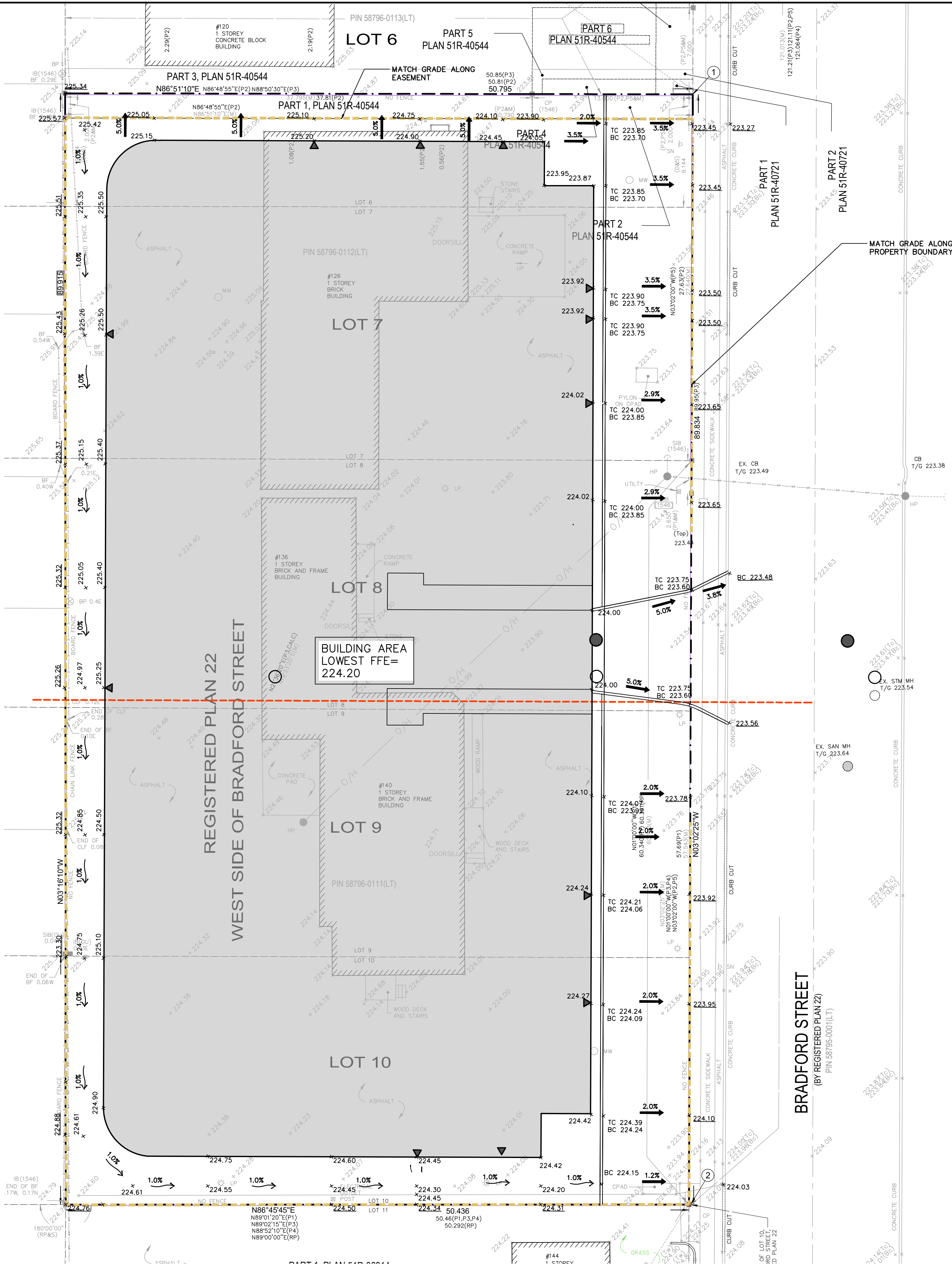
SITE SERVICING PLAN

Drawn	A.S.	Design	A.S.	Project No.	12623952
Check	A.B.	Check	A.B.	Scale	1: 200
				Dwg.	G102

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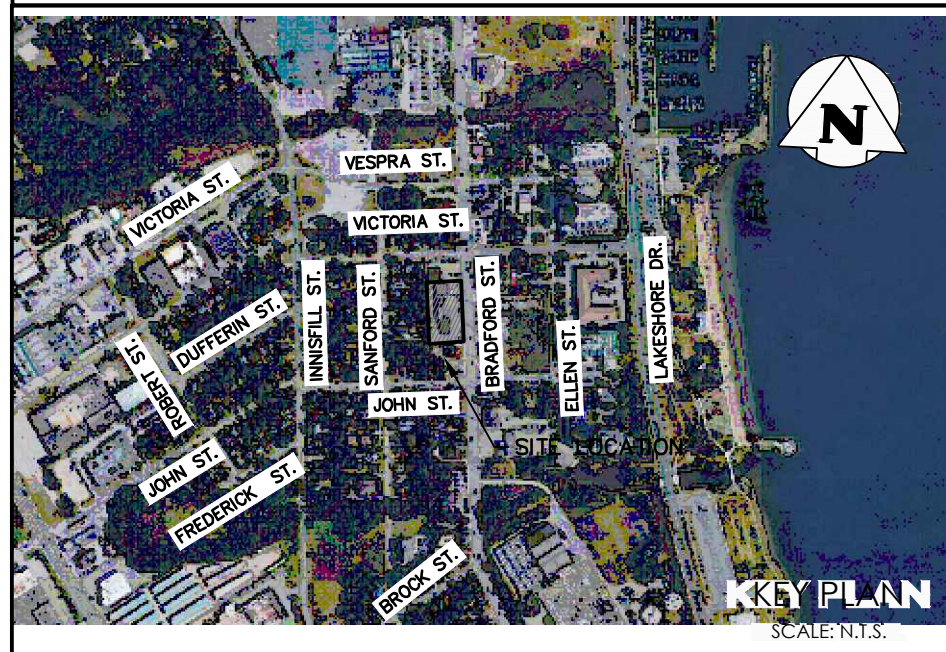
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Stamp
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LEGEND

- PROPERTY LINE
- EXISTING FENCE
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED GRADE (TO MATCH EXISTING)
- PROPOSED MINOR FLOW DIRECTION
- PROPOSED GRASSED SWALE
- PROPOSED RETAINING WALL
- PROPOSED SLOPE (3:1 MAX.)
- EXTENTS OF WORK
- BUILDING ENTRANCE (PERSONNEL DOOR)
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE (FIRE DEPT.) CONNECTION

A	ISSUED FOR COORDINATION	2023/NOV/06
No.	ISSUE / REVISION	YYYY/MM/DD

ELEVATION NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE GEODETIC AND ARE RELATED TO HORIZONTAL CONTROL MONUMENT NO. 03120080022 HAVING AN ELEVATION OF 222.437 METRES. (VERTICAL DATUM: CGVD2878)

SURVEY NOTES:
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JOB No.: 23-041
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DRAWING No.: AD202, REV.X (2023/SEPT/21)
PROJECT No.: 23-072

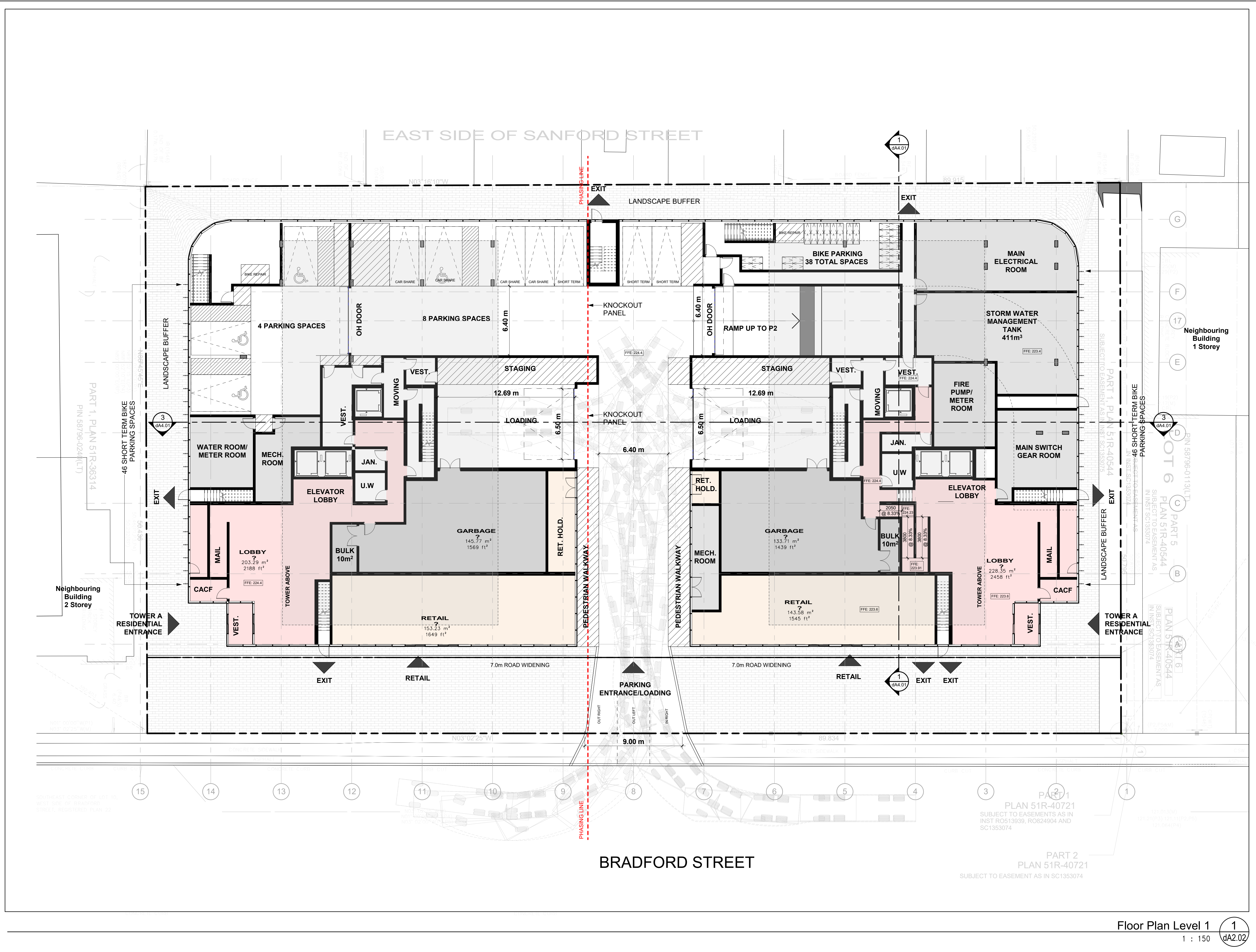
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Project	126 BRADFORD STREET CITY OF BARRIE COUNTY OF SIMCOE			
Drawing	SITE GRADING PLAN			
Drawn	A.S.	Design	A.S.	Project No. 12623952
Check	A.B.	Check	A.B.	Scale 1:200 Dwg. G103

Appendices

Appendix A

Site Plan



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KIRKOR
ARCHITECTS AND PLANNERS

20 De Boers Drive Suite 400
Toronto ON M3J 0H1

Revisions:
No.: Revision: Date:

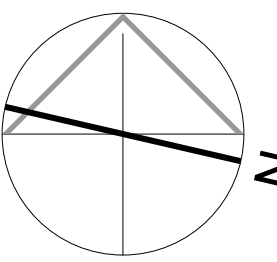
1	REZONING SUBMISSION	NOV 10, 2023
No.:	Issued For:	Date:

Client:
Crown Communities Developments Inc.

126 Bradford St, Barrie, ON L4N 3B3
Proposed Residential Development

Drawing Title:
Parking Floor - Level 1

Scale:
1 : 150
Drawn by:
A.P.
Checked by:
R.P.
Project No.:
23-072
Date:
NOV 10, 2023
Drawing No.:



dA2.02

Floor Plan Level 1
1 : 150

1
dA2.02

Appendix B

Fire Protection

Fire Protection Computations

As per the National Fire Protection Association (NFPA) Guidelines

PROJ: 126-140 Bradford Street
JOB#: 12623952

DATE CREATED:
DATE PRINTED:

November 1, 2021
November 3, 2023

Q_F Observed Flow

c Coefficient; 0.90 - 0.95

d Nozzle / Outlet Diameter

p Pitot Pressure

c 0.90

d 2 in.

p 25 psi

$$Q_F = 29.83 \cdot c \cdot (d^2) \cdot (p^{0.5}) \text{ U.S. GPM}$$

$$Q_F = 1,080 \text{ U.S. GPM}$$

Q_R Available Flow

h_R Drop in pressure from static pressure to
desired residual baseline pressure

h_F Drop in pressure from static pressure to
actual residual pressure measured during test

Static Pressure 79.6 psi

Desired Residual Pressure 20 psi

Measured Residual Pressure 76.8 psi

$$Q_R = (Q_F) \cdot (h_R^{0.54}) / (h_F^{0.54}) \text{ U.S. GPM}$$

$$Q_R = 5,630 \text{ U.S. GPM}$$

$$\text{or } 21,310 \text{ L/min}$$

$$\text{or } 355 \text{ L/s}$$

HYDRANT FLOW TEST RESULTS



126 Bradford Street

Date:	13-Oct-23	Time:	8:45 (hh:mm)	Notes:	Along Bradford Street
Tested By:	Zack Claxton				City Operator: Tom Sibo



Subject Hydrant & Valve Details			
Residual Hydrant:	At Bradford St. and John St.		
Flow Hydrant:	126 Bradford St.		
Conditions before Test (STATIC)			
Residual Hydrant:	79.6 psi	549 kPa	
Flow Hydrant:	79.6 psi	549 kPa	
Subject Watermain Details			
Diameter:		Material:	

<u>Hydrant Classification as per NFPA 291</u>			
Class	AA	Color	BLUE
Water Discharged During Test:			1600 L
Rounded up to closest 100L			

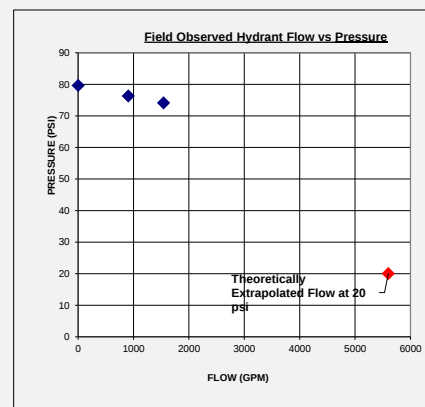
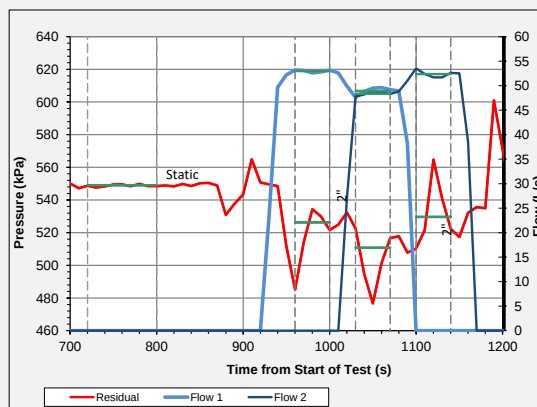


Hydrant Test Points

TEST	TEST FLOW			RESIDUAL PRESSURE (psi)
Port Size (in)	Nozzle Pressure (psi)	(USGPM)	(L/s)	Monitoring Hydrant
STATIC	n/a	0	0	79.6
Single Port Open Test Point				
2	29.0	903.9	57.0	76.3
2"	28.1	889.8	56.1	76.8
Two Port Test Point				
2	24.1	766.0	48.3	74.1
2	24.7	776.0	48.9	

Result Summary

Number of Ports Open	Pressure (psi)	Flow (L/s)
Static (Zero)	79.6	0
1	76.3	57
2	74.1	97
Extrapolated (at 20 psi)	20.0	353



DISCLAIMER FOR FIRE FLOW TESTS

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Appendix C

Sanitary

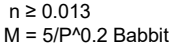
Project Name: 126-140 Bradford Street
Project Number: 12623952
Date Created: Wednesday, November 1, 2023
Date Printed: November 3, 2023

Sanitary Sewer Calculations - Equivalent Populations and Wastewater Flows (Existing vs. Proposed)

	Residential Units	Commercial (Ha)	Residential Population	Commercial Generation Rate (L/day)	Residential Generation Rate (L/day)	Generation Peak Rate (L/s)	Infiltration Allowance (L/s)	Peak Groundwater Discharge (L/s)	Total Sanitary Discharge (L/s)
Existing Development	0	0.08	0	2,156	0	0.02	0.05	0.0	0.07
Proposed Development	912	0.05	1,523	1,316	1,259,281	14.59	0.05	0.00	14.64

Note: Foundation to be watertight with no long-term groundwater discharge anticipated.

Average Generation Rate	225	L/capita/day
Low Density Development (single detached, duplexes or semi-detached dwellings) =	3.13	persons/unit
Medium Density Development (Triplexes and Fourplexes, townhouses, etc) =	2.34	persons/unit
High Density Development (apartment dwellings) =	1.67	persons/unit
Commercial Average Daily Flow =	28	m3/day/ha
Site Area =	0.455	hectares
Peaking factor (Existing) =	N/A	
Peaking factor (Proposed) =	3.7	(Based on Harmon's Equation)
Infiltration Allowance=	0.10	L/s/Ha



SANITARY SEWER DESIGN
Land Use or Zoning Designation Basis (Residential)

DESIGN SHEET EXISTING DESIGN FLOW

FILE NO

CONTRACT / PROJECT

≥ 0.013	Numbers in blue or text in red are equations
$M = 5/P^{0.2}$ Babbitt	(Harmon or Babbitt peaking factor where; $M \geq 2$), the greater of the
$Q_p = P^*q^*M/86400$	(Peak population flow where; $q = 225$ L/day/person; P = population)
$Q_i = I^*A$	(Peak extraneous flow: $I = 0.1$ L/s/ha over development area)
$Q_{tot} = Q_p + Q_i$	(Total peak flow as the sum of peak population flow and peak extraneous flow)

Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; $M \geq 2$), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

225 litres/person/day.

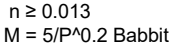
[illegible]

DATE: _____ CALCULATED BY: _____

CHECKED BY:

Notes:

- (1) without extraneous flow
- (2) with extraneous flow
- (3) $d/D > 0.5$ for pipes 375 and less, $d/D > 0.70$ for pipes greater than 375
- (4) Velocity check based on the lesser of full flow or partial velocity



Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; $M \geq 2$), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

$$Q_p = P \cdot q \cdot M / 86400$$

(Peak population flow where; q = 225 L/day/person; P = population)

$$Q_i = I \cdot A \quad (\text{Peak extraneous flow: } I = 0.1 \text{ L/s/ha over development area})$$

225 litres/person/day.

$$Q_{\text{tot}} = Q_p + Q_i$$

(Total peak flow as the sum of peak population flow and peak extraneous flow)

[illegible]

DATE:

CALCULATED BY:

CHECKED BY:

Notes:

- (1) without extraneous flow
- (2) with extraneous flow
- (3) $d/D > 0.5$ for pipes 375 and less, $d/D > 0.70$ for pipes greater than 375
- (4) Velocity check based on the lesser of full flow or partial velocity



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