

FUNCTIONAL SERVICING STUDY REPORT

For
2409 Carlsen Avenue, Ottawa

Prepared by:

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Revision 0
August 2024

1. Project Description:

1.1. Introduction:

Property at 2409 Carlsen Avenue is located close to intersection of Carlsen Avenue and Heron Road, Ottawa, Ontario. The property is about 0.11 Hectare severed from an existing lot which contain an existing two story building.

Property at 2409 Carlsen Avenue is currently under R3A Zoning. Due to market demand for residential, the idea initiated to use the lot to build 3 three-story dwelling that contains 8 units each. This report will address the servicing (water, sanitary) requirements associated with the proposed development located at 2409 Carlsen Avenue within the City of Ottawa, Ontario. This report is prepared in response to the request from City of Ottawa Planning department.

1.2. Existing Conditions:

The existing site located at 2409 Carlsen Avenue. The property measure a total area of approximately 0.11 Hectare. The site is fronting 305mm diameter UCI water main on Heron Road, 152mm diameter CI water main on Carlsen Avenue and 152mm diameter CI water main on Chasseur Ave. Also the site is fronting 300mm diameter Concrete sanitary main on Heron Road, 225mm diameter Concrete sanitary main on Carlsen Avenue and 300mm diameter Concrete sanitary main on Chasseur Avenue. In this report the development water and sanitary connection will be to mains on Carlsen Avenue and Chasseur Avenue.



1.3. Guidelines, Previous Studies, And Reports

The following studies were utilized in the preparation of this report:

- Ottawa Sewer Design Guidelines,
City of Ottawa, SDG002, October 2012.
(City Standards)
 - Technical Bulletin ISTB-2018-01
City of Ottawa, March 21, 2018.
(ISTB-2018-01)
 - Technical Bulletin ISTB-2018-04
City of Ottawa, June 27, 2018.
(ISTB-2018-04)
- Ottawa Design Guidelines Water Distribution
City of Ottawa, July 2010.
(Water Supply Guidelines)
 - Technical Bulletin ISD-2010-2
City of Ottawa, December 15, 2010.
(ISD-2010-2)
 - Technical Bulletin ISDTB-2014-02
City of Ottawa, May 27, 2014.
(ISDTB-2014-02)
 - Technical Bulletin ISTB-2018-02
City of Ottawa, March 21, 2018.
(ISTB-2018-02)
- Design Guidelines for Sewage Works,
Ministry of the Environment, 2008.
(MOE Design Guidelines)
- Stormwater Planning and Design Manual,
Ministry of the Environment, March 2003.
(SWMP Design Manual)
- Ontario Building Code Compendium
Ministry of Municipal Affairs and Housing Building Development Branch,
January 1, 2012 Update. (OBC)
- Geotechnical Investigation Report

2. Water Supply

Residential Water Demand:

The water demand is calculated based on the City of Ottawa Design Guidelines – Water Distribution as follows:

| Design Parameter | Value |
|---|--|
| Residential 1 Bedroom Apartment | 1.4 P/unit |
| Residential 2 Bedroom Apartment | 2.1 P/unit |
| Residential Average Daily Demand | 280 L/d/P |
| Residential Maximum Daily Demand | 2.5 x Average Daily * |
| Residential Maximum Hourly | 2.2 x Average Daily * |
| Commercial Retail | 2.5 L/m ² /d |
| Commercial Maximum Daily Demand | 1.5 x avg. day |
| Commercial Maximum Hour Demand | 1.8 x max. day |
| Minimum Watermain Size | 150mm diameter |
| Minimum Depth of Cover | 2.4m from top of watermain to finished grade |
| During normal operating conditions desired operating pressure is within | 350kPa and 480kPa |
| During normal operating conditions pressure must not drop below | 275kPa |
| During normal operating conditions pressure must not exceed | 552kPa |
| During fire flow operating pressure must not drop below | 140kPa |

■ Residential occupancy = 1.4 persons per one bedroom apartment and 2.1 persons per 2 bedroom apartment and 3.1 persons per 3 bedroom apartment

- 7 x 2 bedroom units x 2.1 (average) pers./unit = 14.7 persons
- 1 x 1 bedroom units x 1.4 (average) pers./unit = 1.4 persons

Total occupancy taken as = 16.1 persons taken as 17 persons

Residential Average Daily Demand = 280 L/c/d.

- Average daily demand of 280 L/c/day x 17 persons = 4760 Liters/day or 0.06 L/s
- Maximum daily demand (factor of 2.5) is 0.06 L/s x 2.5 = 0.15 L/s
- Peak hourly demand (factor of 2.2) = 0.15 L/s x 2.2 = 0.33 L/s

Fire Fighting Requirement

Based on Fire Underwriter Survey Method

Fire flow protection requirements were calculated as per the Fire Underwriter's Survey (FUS). The estimated fire flow for the proposed buildings was calculated in accordance with ISTB-2018-02. The following parameters were provided by the Architect:

- Type of construction – Ordinary Construction
- Occupancy type – Limited Combustibility
- Sprinkler Protection – Standard Fully Supervised Sprinkler System

The fire flow demand was estimated to be 9,000 L/min,

Fire Flow Calculations as per Fire Underwriter's Survey Guidelines

$$F = 220C\sqrt{A}$$

where

F = Required fire flow in L/min

C = Coefficient related to the type of construction

A = Total floor area in m²

Address:

File No.:

| | | | |
|--|--|-------------------------------------|-------------------|
| C | Coefficient Related to Type of Construction | | C-Value |
| | • Wood Frame Construction | <input type="checkbox"/> | 1.5 |
| | • Ordinary Construction | <input checked="" type="checkbox"/> | 1.0 |
| | • Non-Combustible Construction | <input type="checkbox"/> | 0.8 |
| | • Fire-Resistive Construction | <input type="checkbox"/> | 0.6 |
| C = 1.0 | | | |
| A | Total Floor Area (m²) | | |
| | 4845 ft ² | 450.12 m ² | |
| F | Required Fire Flow (L/min) | | |
| | = $220C\sqrt{A}$ | | |
| | = 4668 L/min | | |
| Occupancy Reductions or Surcharges | | | |
| | • Non-Combustible | <input type="checkbox"/> | -25% |
| | • Limited Combustible | <input checked="" type="checkbox"/> | -15% |
| | • Combustible | <input type="checkbox"/> | 0% |
| | • Free Burning | <input type="checkbox"/> | 15% |
| | • Rapid Burning | <input type="checkbox"/> | 25% |
| | | | -15% |
| | | | 3967 L/min |
| Sprinkler Reduction | | | |
| | • Adequately Designed System | <input type="checkbox"/> | -30% |
| | • Water Supply is Standard | <input type="checkbox"/> | -10% |
| | • Fully Supervised System | <input checked="" type="checkbox"/> | -10% |
| | | | -10% |
| Reduction: $\frac{3967 \text{ L/min}}{337 \text{ L/min}}$ | | | |
| Fire Flow: 3571 L/min | | | |
| Exposure Surcharge | | | |
| | Distance | Charge | # of Sides |
| | • 0 to 3m | 25% | 1 |
| | • 3.1 to 10m | 20% | |
| | • 10.1 to 20m | 15% | |
| | • 20.1 to 30m | 10% | 2 |
| | • 30.1 to 45m | 5% | 1 |
| | | | 20% |
| | | | 5% |
| | | | 50% |
| Surcharge: $\frac{3571 \text{ L/min}}{1785 \text{ L/min}}$ | | | |
| Fire Flow: 5356 L/min | | | |
| REQUIRED FIRE FLOW | | | |
| Cannot exceed 45,000 L/min nor be less than 2,000 L/min | | | |
| | | | 5356 L/min |
| | | | 89 L/s |
| | | | 1178 IGPM |

There are three (3) existing fire hydrants in proximity to the proposed building that are available to provide the required fire flow demand of 9,000 L/min. Fire hydrant locations are demonstrated in below sketch. Table below summarizes the aggregate fire flow of the contributing hydrants in close proximity to the proposed development based on Table 18.5.4.3 of ISTB-2018-02.



Fire Protection Summary Table

| Building | Fire Flow Demand (L/min) | Fire Hydrant within 75m | Fire Hydrant within 150m | Fire Hydrant within 300m | Available Combine Fire Flow (L/min) |
|------------------------------|--------------------------|-------------------------|--------------------------|--------------------------|-------------------------------------|
| Proposed 2409 Carlsen Avenue | 5,400 | 2 | 0 | 0 | (2 x 5678) + (0 x 3785) = 11,356 |

The total available fire flow from contributing hydrants is equal to 11,356L/min which will provide adequate fire flow for the proposed development. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

The city of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand. The followings are boundary conditions, HGL, for hydraulic analysis at 2409 Carlsen Avenue assumed to be three separate buildings connected via three connections to 152mm watermain at Carlsen and 152mm watermain at Chasseur. Note that 2409 Carlsen Avenue is located in zone 2W2C water pressure.

All three connections:

Minimum HGL: 123.9 m

Maximum HGL: 132.0 m

Max Day + Fire Flow (90 L/s): 116.0 m (Connection 1), 116.0 m (Connection 2), 115.7 m (Connection 3)

Average ground elevation of 78.50 m

Analyzing results:

| Demand Senario | Head (m) | Pressure (KPa) |
|---------------------|-------------------------|----------------|
| Max. HGL | $132.0 - 78.50 = 53.50$ | 524 |
| Min HGL | $123.9 - 78.50 = 45.40$ | 445 |
| Max Day + Fire Flow | $116.0 - 78.50 = 37.50$ | 368 |

❖ Ground Elevation = 78.50 m

| Floor Elevation | Max Day + Fire Flow (m) = 116.0 | Pressure (KPa) at Each Floor |
|----------------------------|------------------------------------|------------------------------|
| Ground Floor EL. = 80.00 m | 36.0 | 353 |

Based on City of Ottawa Design Guidelines – Water Distribution existing water service size of 25mm is adequate where the residential water pressure is over 310 kPa. As such, since the calculated pressure is approximately above the minimum requirement, the service diameter for the proposed development recommended to be 25mm.

Note that pressure test will be required at the time of construction to confirm minimum pressure is supplied for proposed development.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

3. Sanitary Sewage

The sanitary flow is calculated based on the Ministry of Environment Guidelines as follow:

| Design Parameter | Value |
|--|---|
| Residential 1 Bedroom Apartment | 1.4 P/unit |
| Residential 2 Bedroom Apartment | 2.1 P/unit |
| Average Daily Demand | 280 L/d/per |
| Peaking Factor | Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon Correction Factor 0.8 |
| Commercial Floor/Amenity Space | 2.5 L/m ² /d |
| Commercial Peaking Factor* | 1.0 |
| Infiltration and Inflow Allowance | 0.05 L/s/ha (Dry) 0.28 L/s/ha (Wet) 0.33 L/s/ha (Total) |
| Sanitary sewers are to be sized employing the Manning's Equation | $Q = \frac{1}{n} AR^{2/3} S^{1/2}$ |
| Minimum Sewer Size | 200 mm diameter |
| Minimum Manning's 'n' | 0.013 |
| Minimum Depth of Cover | 2.5 m from crown of sewer to grade |
| Minimum Full Flowing Velocity | 0.6 m/s |
| Maximum Full Flowing Velocity | 3.0 m/s |

3.1. Sanitary Sewage Calculation

Design Flows

Residential

- ☐ 7 x 2 bedroom units x 2.1 (average) pers./unit = 14.7 persons
- ☐ 1 x 1 bedroom units x 1.4 (average) pers./unit = 1.4 persons

Total occupancy taken as = 16.1 persons taken as 17 persons

Residential Average Daily Demand = 280 L/c/d.

- ☐ Average daily of 280 L/c/day x 17 persons = 4760 Liters/day or 0.06 L/s

Peaking Factor = $1 + 14 / (4 + (13 / 1000)^{0.5}) = 4.40$ *use 4 maximum

Q Peak Domestic = 0.06 L/sec x 4.0 = 0.24 L/sec

Infiltration

Q Infiltration = 0.11 L/S/Gross hectare x 0.10 ha = 0.01 L/sec

Total Peak Sanitary Flow = 0.24 + 0.01 = 0.25 L/sec

The Ontario Building Code specifies minimum pipe size and maximum hydraulic loading for sanitary sewer pipe. OBC 7.4.10.8 (2) states "Horizontal sanitary drainage pipe shall be designed to carry no more than 65% of its full capacity." A 150 mm diameter sanitary service with a minimum slope of 5.0% has a capacity of 73 Litres per second.

The maximum peak sanitary flows for the site is 0.43 L/s. Since 0.43 L/s is much less than $0.65 \times 73 = 47$ L/s, which means existing 150mm sanitary line has enough capacity.

The flow depth under peak flow is less than 0.3 of the pipe diameter, therefore, the actual velocity is calculated and pipe slope increased to 5% achieve minimum self-cleansing velocity of 0.6m/s as per the recommendation of section 6.1.2 of the City of Ottawa Sewer Design Guidelines. Please refer to the appendix for sanitary design calculation sheet.

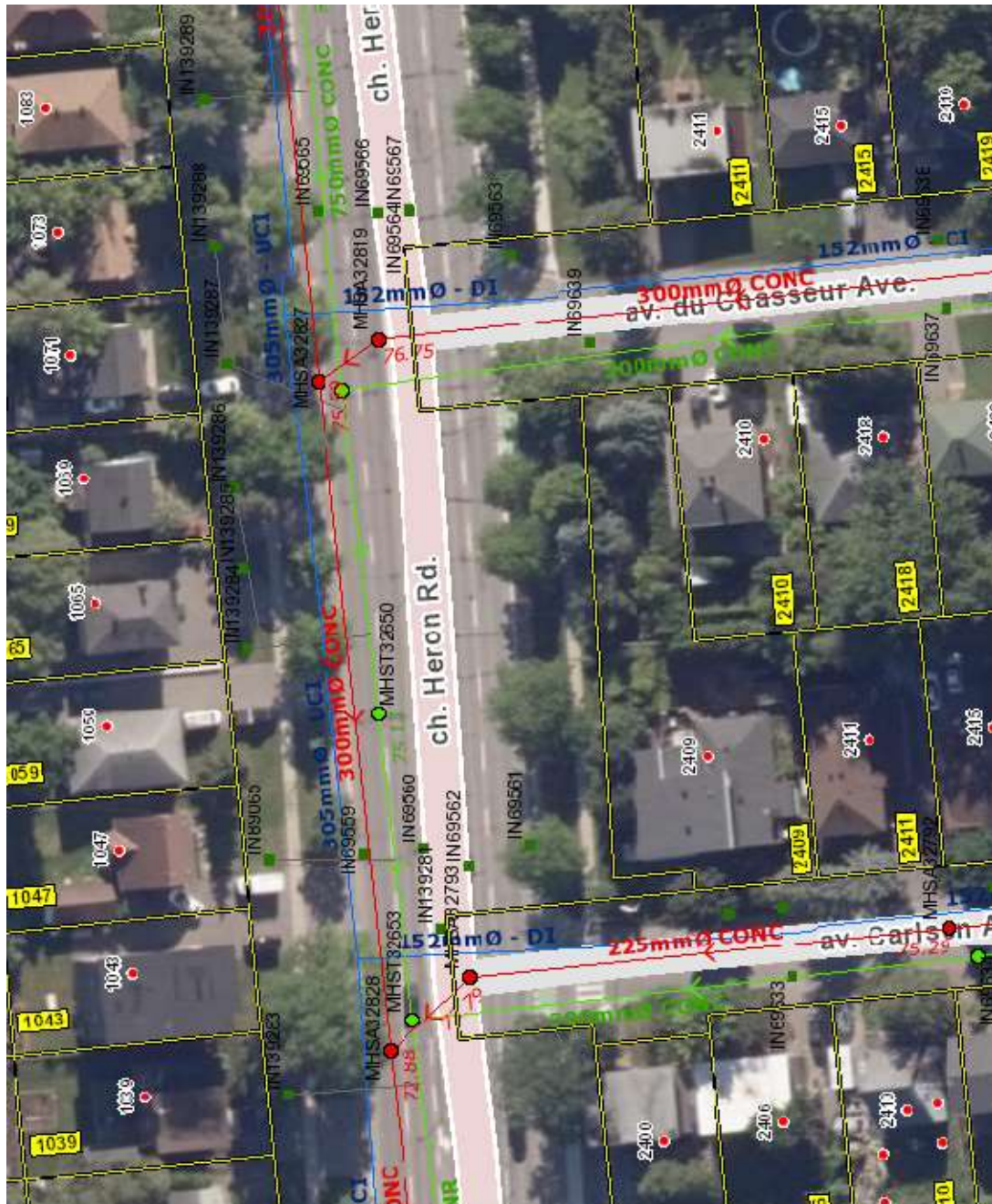
Sewage discharges will be domestic in type and in compliance with the Ministry of Environment guidelines. The peak sanitary flow from the proposed development is less than 10 percent of the capacity of the existing sanitary. As such the proposed increase in sanitary flow as a result of the construction of the proposed development is negligible and there is sufficient available capacity for the proposed development.

Should you have any questions or comments, please feel free to contact undersigned.



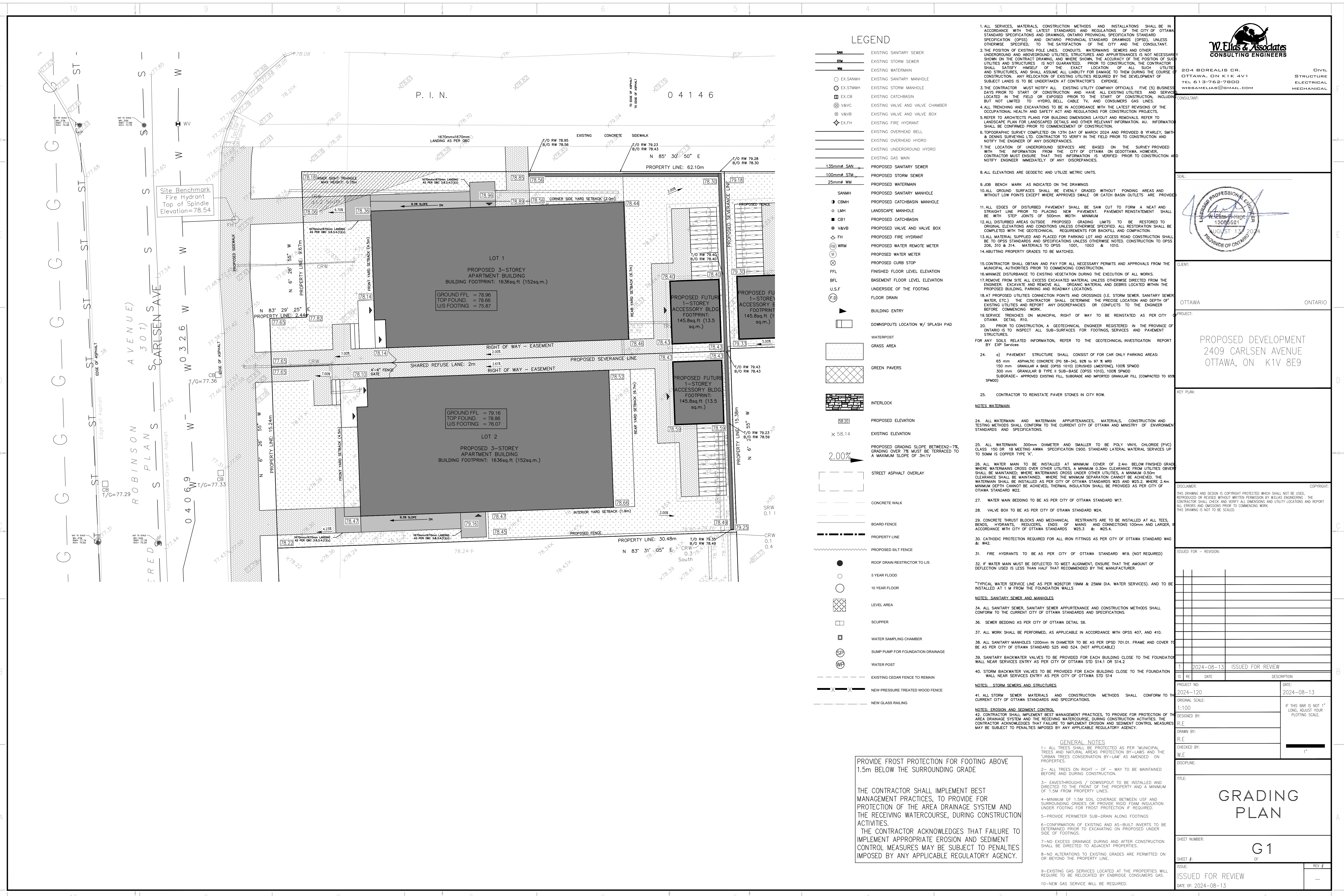
Yours truly,
Wissam Elias, P. Eng
Senior Project Manager

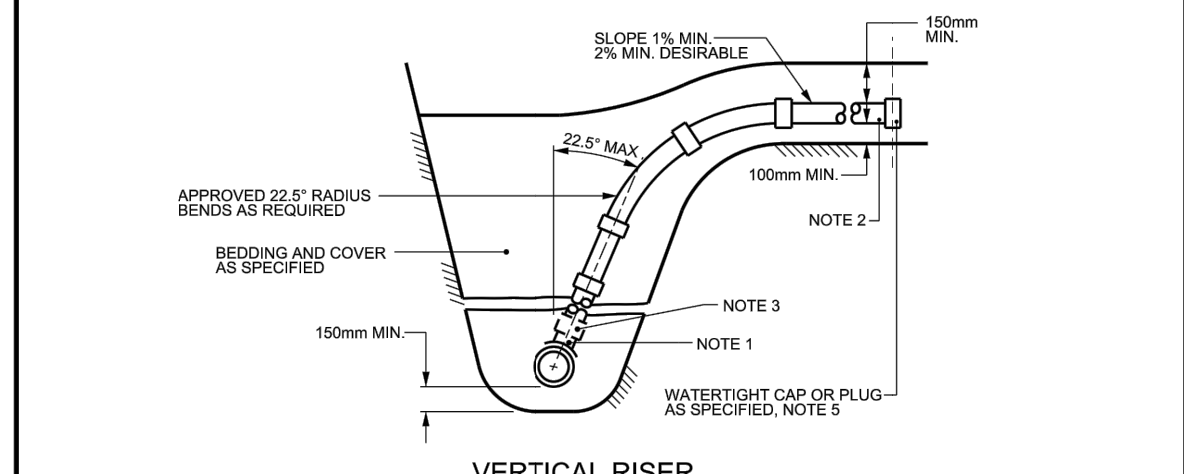
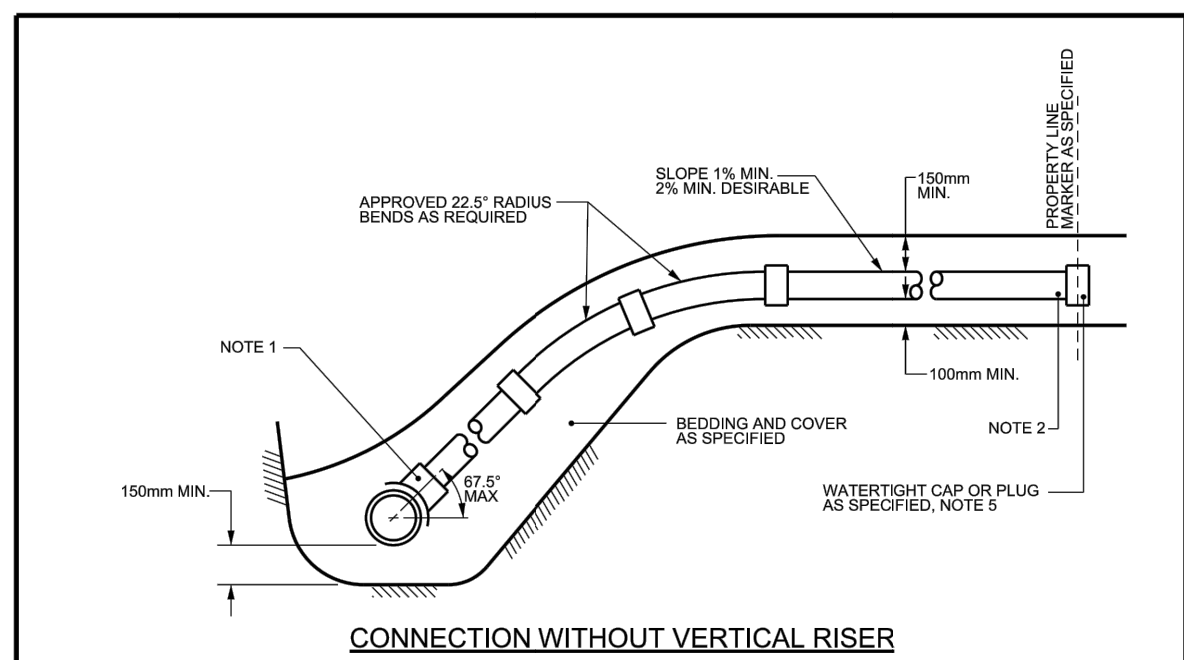
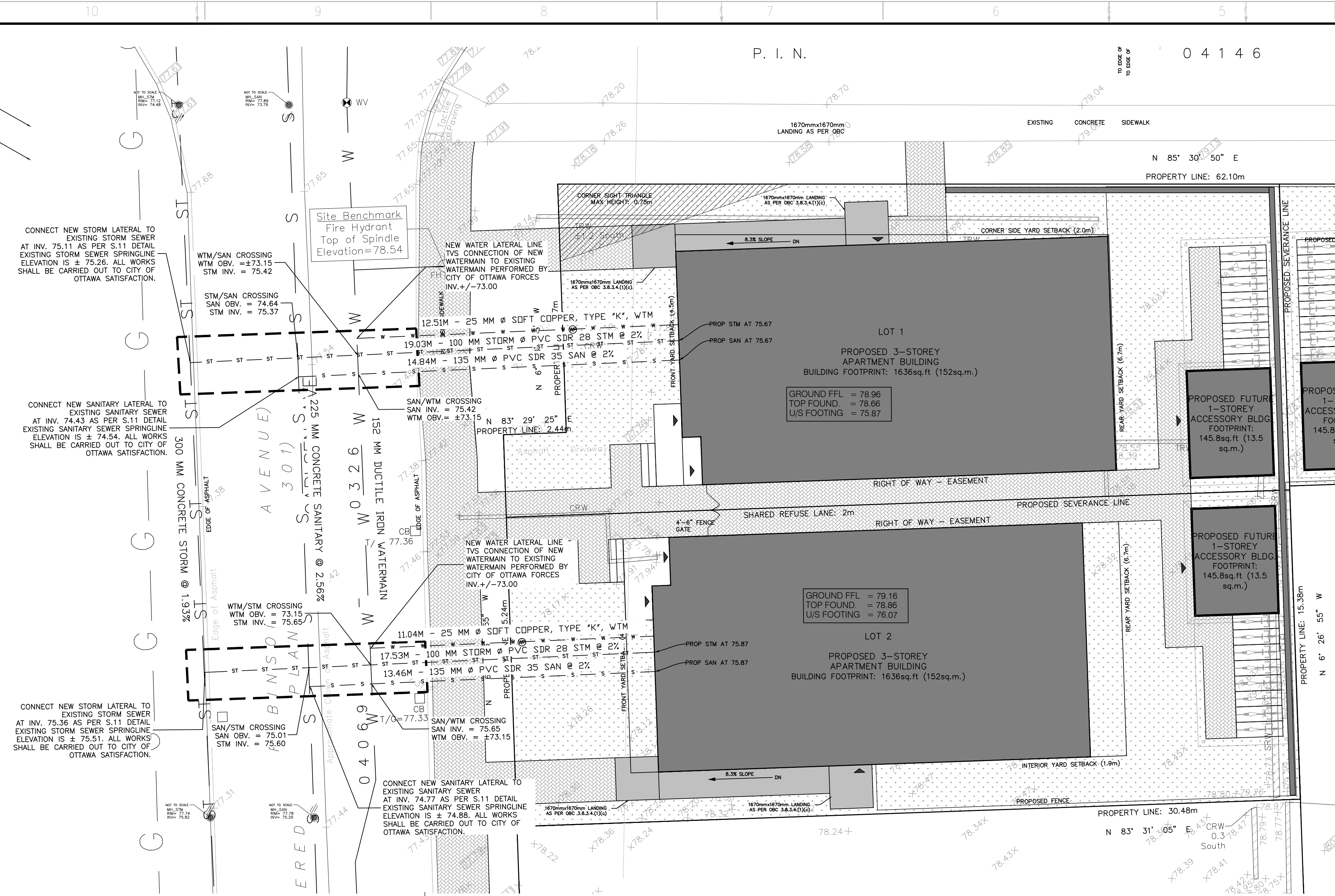
APPENDIX A:
GeoOttawa Snapshot



APPENDIX B:

Correspondent
&
Architectural/Engineering Drawings





NOTES:

- ALL DIAMETERS OF SERVICE CONNECTIONS THAT HAVE NOMINAL DIAMETERS NO GREATER THAN 50% OF THE NOMINAL DIAMETER OF THE RIGID MAIN SEWER PIPE SHALL BE MADE USING A BELL END INSERT AS PER S11.2 OR AN APPROVED RUBBER GASKETED INSERT, INSTALLED ABOVE THE SPRINGLINE.
- SANITARY SERVICES TO BE 150mm AND STORM SERVICES TO BE 100mm FOR NEW RESIDENCES UNLESS SPECIFIED OTHERWISE. SERVICE PIPES AND MANHOLES SHALL BE APPROVED OR AS PER S11.2 OR AN APPROVED RUBBER GASKETED INSERT, INSTALLED ABOVE THE SPRINGLINE.
- APPROVED CONTROLLED SETTLEMENT JOINTS OPTIONAL FOR SERVICE CONNECTIONS TO MAIN SEWERS UP TO 5m DEEP. WHERE APPROVED, CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS.
- VERTICAL RISER SHALL BE SAME AS SERVICE PIPE UNLESS OTHERWISE SPECIFIED.
- CAP OR PLUG AT THE PROPERTY LINE SHALL BE ADEQUATELY BRACED TO WITHSTAND TESTING PRESSURE.
- FOR NEW CONSTRUCTION, INSERTS MUST BE INSTALLED ON THE MAIN PIPE BEFORE THAT PIPE IS LAID. FOR SERVICE CONNECTIONS, INSERTS MUST BE INSTALLED ON THE MAIN PIPE BEFORE THAT PIPE IS LAID.
- APPROVED CUT-IN TOOL MUST BE USED FOR FIELD MADE CONNECTIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

SEWER SERVICE CONNECTIONS FOR RIGID MAIN SEWER PIPE (MODIFIED OPSD-1006.010)

| | |
|------------|------------|
| DATE: | MARCH 2008 |
| REV. DATE: | MARCH 2014 |
| OWG. No.: | S11 |

Ottawa

- ### LEGEND
- | | |
|--|--|
| SW | EXISTING SANITARY SEWER |
| STM | EXISTING STORM SEWER |
| WM | EXISTING WATERMAIN |
| EX-SANMH | EXISTING SANITARY MANHOLE |
| EX-STMMH | EXISTING STORM MANHOLE |
| EX-CB | EXISTING CATCHBASIN |
| V&V | EXISTING VALVE AND VALVE CHAMBER |
| V&VB | EXISTING VALVE AND VALVE BOX |
| EX-FH | EXISTING FIRE HYDRANT |
| OVERHEAD BELL | EXISTING OVERHEAD BELL |
| OVERHEAD HYDRO | EXISTING OVERHEAD HYDRO |
| UNDERGROUND HYDRO | EXISTING UNDERGROUND HYDRO |
| GAS MAIN | EXISTING GAS MAIN |
| 135mm SAN | PROPOSED SANITARY SEWER |
| 100mm STM | PROPOSED STORM SEWER |
| 25mm WM | PROPOSED WATERMAIN |
| SANMH | PROPOSED SANITARY MANHOLE |
| CBMH | PROPOSED CATCHBASIN MANHOLE |
| LMH | LANDSCAPE MANHOLE |
| CB | PROPOSED CATCHBASIN |
| V&VB | PROPOSED VALVE AND VALVE BOX |
| FH | PROPOSED FIRE HYDRANT |
| WRM | PROPOSED WATER REMOTE METER |
| WATER METER | PROPOSED WATER METER |
| CURB STOP | PROPOSED CURB STOP |
| FFL | FINISHED FLOOR LEVEL ELEVATION |
| BFL | BASEMENT FLOOR LEVEL ELEVATION |
| USF | UNDERSIDE OF THE FOOTING |
| FLOOR DRAIN | FLOOR DRAIN |
| BUILDING ENTRY | BUILDING ENTRY |
| DOWNSPUTS LOCATION W/ SPLASH PAD | DOWNSPUTS LOCATION W/ SPLASH PAD |
| WATERPOST | WATERPOST |
| GRASS AREA | GRASS AREA |
| GREEN PAVERS | GREEN PAVERS |
| INTERLOCK | INTERLOCK |
| PROPOSED ELEVATION | PROPOSED ELEVATION |
| EXISTING ELEVATION | EXISTING ELEVATION |
| PROPOSED GRADING SLOPE BETWEEN 2-7% GRADING OVER 7% MUST BE TERRACED TO A MAXIMUM SLOPE OF 3H:1V | PROPOSED GRADING SLOPE BETWEEN 2-7% GRADING OVER 7% MUST BE TERRACED TO A MAXIMUM SLOPE OF 3H:1V |
| STREET ASPHALT OVERLAY | STREET ASPHALT OVERLAY |
| CONCRETE WALK | CONCRETE WALK |
| BOARD FENCE | BOARD FENCE |
| PROPERTY LINE | PROPERTY LINE |
| PROPOSED SILT FENCE | PROPOSED SILT FENCE |
| ROOF DRAIN RESTRICTOR TO L/S | ROOF DRAIN RESTRICTOR TO L/S |
| 5 YEAR FLOOD | 5 YEAR FLOOD |
| 10 YEAR FLOOD | 10 YEAR FLOOD |
| LEVEL AREA | LEVEL AREA |
| SCUPPER | SCUPPER |
| WATER SAMPLING CHAMBER | WATER SAMPLING CHAMBER |
| SUMP PUMP FOR FOUNDATION DRAINAGE | SUMP PUMP FOR FOUNDATION DRAINAGE |
| WATER POST | WATER POST |
| EXISTING CEDAR FENCE TO REMAIN | EXISTING CEDAR FENCE TO REMAIN |
| NEW PRESSURE TREATED WOOD FENCE | NEW PRESSURE TREATED WOOD FENCE |
| NEW GLASS RAILING | NEW GLASS RAILING |

- ### GENERAL NOTES
- ALL TREES SHALL BE PROTECTED AS PER 'MUNICIPAL TREES AND NATURAL AREAS PROTECTION BY-LAW' AND THE 'URBAN TREES CONSERVATION BY-LAW' AS AMENDED ON PROPERTIES.
 - ALL TREES ON RIGHT-OF-WAY TO BE MAINTAINED BEFORE AND DURING CONSTRUCTION.
 - EAVESDROUGHTS / DOWNSPOUTS TO BE INSTALLED AND DIRECTED TO THE FRONT OF THE PROPERTY AND A MINIMUM OF 1.5M FROM PROPERTY LINES.
 - MINIMUM OF 1.5M SOIL COVERAGE BETWEEN USF AND SURROUNDING GRADES OR PROVIDE RIGID FOAM INSULATION UNDER FOOTING FOR FROST PROTECTION IF REQUIRED.
 - PROVIDE PERIMETER SUB-DRAIN ALONG FOOTINGS.
 - CONFIRMATION OF EXISTING AND AS-BUILT INVERTS TO BE DETERMINED PRIOR TO EXCAVATING ON PROPOSED UNDER SIDE OF FOOTINGS.
 - NO EXCESS DRAINAGE DURING AND AFTER CONSTRUCTION SHALL BE DIRECTED TO ADJACENT PROPERTIES.
 - NO ALTERATIONS TO EXISTING GRADES ARE PERMITTED ON OR BEYOND THE PROPERTY LINE.
 - EXISTING GAS SERVICES LOCATED AT THE PROPERTIES WILL REQUIRE TO BE RELOCATED BY ENBRIDGE CONSUMERS GAS.
 - NEW GAS SERVICE WILL BE REQUIRED.

- ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY AND THE CONSULTANT.
- THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LOTS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.
- THE CONTRACTOR MUST NOTIFY ALL EXISTING UTILITY COMPANY OFFICIALS FIVE (5) BUSINESS DAYS PRIOR TO START OF CONSTRUCTION AND HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED IN THE FIELD OR EXPOSED PRIOR TO THE START OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO HYDRO, BELL, CABLE TV, AND CONSUMERS GAS LINES.
- ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
- REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- TOPOGRAPHIC SURVEY COMPLETED ON 13TH DAY OF MARCH 2024 AND PROVIDED BY YARLEY, SMITH & DENNIS SURVEYING LTD. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- THE LOCATION OF UNDERGROUND SERVICES ARE BASED ON THE SURVEY PROVIDED WITH THE INFORMATION FROM THE CITY OF OTTAWA ON GEOTOWN. HOWEVER, CONTRACTOR MUST ENSURE THAT THIS INFORMATION IS VERIFIED PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
- ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
- 9.08 BENCH MARK AS INDICATED ON THE DRAWINGS.
- ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
- ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
- ALL DISTURBED AREAS OUTSIDE PROPOSED GRADING LIMITS TO BE RESTORED TO ORIGINAL ELEVATIONS AND CONDITIONS UNLESS OTHERWISE SPECIFIED. ALL RESTORATION SHALL BE COMPLETED WITH THE GEOTECHNICAL REQUIREMENTS FOR BACKFILL AND COMPACTION.
- ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 200, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
- ABUTTING PROPERTY GRADES TO BE MATCHED.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.
- MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
- AT PROPOSED UTILITIES CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
- SERVICE TRENCHES ON MUNICIPAL RIGHT OF WAY TO BE REINSTATED AS PER CITY OF OTTAWA DETAIL R10.
- PRIOR TO CONSTRUCTION, A GEOTECHNICAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO IS TO INSPECT ALL SUB-SURFACES FOR FOOTINGS, SERVICES AND PAVEMENT STRUCTURES.
- FOR ANY SOILS RELATED INFORMATION, REFER TO THE GEOTECHNICAL INVESTIGATION REPORT BY EXP Services.
- a) PAVEMENT STRUCTURE SHALL CONSIST OF FOR CAR ONLY PARKING AREAS: 65 mm ASPHALTIC CONCRETE (PG 58-34), 92% to 97% WTD, 150 mm GRANULAR A BASE (OPSS 1010) (CRUSHED LESTONEL, 100% SPMD 300 mm GRANULAR B TYPE II SUB-BASE (OPSS 1010), 100% SPMD SUBGRADE - APPROVED EXISTING FILL, SUBGRADE AND IMPORTED GRANULAR FILL (COMPACTED TO 95% SPMD)

NOTES WATERMAIN

- ALL WATERMAIN AND WATERMAIN APPURTENANCES, MATERIALS, CONSTRUCTION AND TESTING METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA AND MINISTRY OF ENVIRONMENT STANDARDS AND SPECIFICATIONS.
- ALL WATERMAIN 300mm DIAMETER AND SMALLER TO BE POLY VINYL CHLORIDE (PVC) CLASS 150 DR 18 MEETING AWWA SPECIFICATION C900. STANDARD LATERAL MATERIAL SERVICES UP TO 50M IS COPPER TYPE K.
- ALL WATER MAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m BELOW FINISHED GRADE. WHERE WATERMANS CROSS OTHER UTILITIES, A MINIMUM 0.30m CLEARANCE FROM UTILITIES SERVIT SHALL BE MAINTAINED; WHERE WATERMANS CROSS UNDER OTHER UTILITIES, A MINIMUM 0.30m CLEARANCE SHALL BE MAINTAINED. WHERE THE MINIMUM SEPARATION CANNOT BE ACHIEVED, THE WATERMAIN SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARDS W25 AND W25.2. WHERE 2.4m MINIMUM DEPTH CANNOT BE ACHIEVED, THERMAL INSULATION SHALL BE PROVIDED AS PER CITY OF OTTAWA STANDARD W22.
- WATER MAIN BEDDING TO BE AS PER CITY OF OTTAWA STANDARD W17.
- VALVE BOX TO BE AS PER CITY OF OTTAWA STANDARD W24.
- CONCRETE THRUST BLOCKS AND MECHANICAL RESTRAINTS ARE TO BE INSTALLED AT ALL TEES, BENDS, HYDRANTS, REDUCERS, ENDS OF MAINS AND CONNECTIONS 100mm AND LARGER, IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS W25.3 & W25.4.
- CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS AS PER CITY OF OTTAWA STANDARD W40 & W42.
- FIRE HYDRANTS TO BE AS PER CITY OF OTTAWA STANDARD W19, (NOT REQUIRED).
- IF WATER MAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.

NOTES: SANITARY SEWER AND MANHOLES

- ALL SANITARY SEWER, SANITARY SEWER APPURTENANCE AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
- SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.
- ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, AND 410.
- ALL SANITARY MANHOLES 1200mm IN DIAMETER TO BE AS PER OPSS 701.01. FRAME AND COVER TO BE AS PER CITY OF OTTAWA STANDARD S25 AND S24. (NOT APPLICABLE)
- SANITARY BACKWATER VALVES TO BE PROVIDED FOR EACH BUILDING CLOSE TO THE FOUNDATION WALL NEAR SERVICES ENTRY AS PER CITY OF OTTAWA STD S14.1 OR S14.2.
- STORM BACKWATER VALVES TO BE PROVIDED FOR EACH BUILDING CLOSE TO THE FOUNDATION WALL NEAR SERVICES ENTRY AS PER CITY OF OTTAWA STD S14.

NOTES: EROSION AND SEDIMENT CONTROL

- CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

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CIVIL
STRUCTURE
ELECTRICAL
MECHANICAL

CONSULTANT:

CLIENT:

PROJECT:

KEY PLAN:

ISSUED FOR - REVISION:

| REV | DATE | DESCRIPTION |
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| 1 | 2024-08-13 | ISSUED FOR REVIEW |

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ORIGINAL SCALE: 1:100
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