Report
Project: 136143-6.04.03

ADEQUACY OF PUBLIC SERVICES REPORT
1275 SHILLINGTON AVE.

Prepared for Farmhouse Investments Inc.
by IBI Group
December 17, 2021

Document Control Page

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AUTHORIZATION:	[Name]
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APPENDICIES:

1 INTRODUCTION

IBI Group has been retained by Farmhouse Investments Inc. to prepare a conceptual servicing of an assembly of parcels of land comprised of 1271-1275 Shillington Avenue and 970-974 Silver Street to support the proposed Zoning Bylaw Amendment for the subject parcel.

The subject parcel is approximately 0.19 ha and is bounded by Shillington Avenue to the south, Silver Street to the east, Alexander Park to the west, and Alexander Community Center to the north. Refer to **Figure 1** in **Appendix A** for site location.

The proposed development consists of one residential multi-storey building with 52 units and underground parking to support the proposed building. A copy of the proposed Site Plan, prepared by P^2 Concepts Inc, is included in **Appendix A**. The plan illustrates the building occupying most of the parcel and vehicular access to the underground parking garage is provided from Silver Street.

This report reviews whether the existing municipal water, sanitary and storm infrastructure is capable of servicing the proposed development to support the owner's application for a Zoning Bylaw Amendment. A pre-consultation meeting was held with the City and the meeting notes are included in **Appendix A**.

2 WATER DISTRIBUTION

2.1 Existing Conditions

The proposed development is located within the City of Ottawa pressure zone 2W. There is a 150 mm diameter watermain along Shillington Avenue and a 150mm diameter watermain along Silver Street, both mains service the existing buildings within the subject parcel. Existing services within the project site will be disconnected and abandoned per City of Ottawa Standards. A survey of the subject parcel was completed by Fairhall, Moffatt & Woodland Ltd. and is included in **Appendix B**.

2.2 Design Criteria

2.2.1 Water Demands

The proposed development plan includes 52 residential units. Water demands have been calculated for the full development. Per unit population density and consumption rates are taken from Tables 4.1 and 4.2 at the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Residential Average Day Demand 280 l/cap/day
- Residential Peak Daily Demand 700 l/cap/day
- Residential Peak Hour Demand 1540 l/cap/day

A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day 0.30 l/s

- Maximum Day 0.76 l/s
- Peak Hour 1.67 l/s

The watermain demand calculation was forwarded to the city to determine the boundary conditions at the site, copy of the boundary conditions is included in **Appendix B** and summarized below.

	Shillington Connection #1	Shillington Connection #2
Minimum HGL	124.1 m	124.1 m
Maximum HGL	133.6 m	133.6 m
Max Day + FireFlow (50.0 L/s)	112.6 m	113.1 m

2.2.2 System Pressures

The 2010 City of Ottawa Water Distribution Guidelines states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure — Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi).

Fire Flow — During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.

Maximum Pressure — Maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code the maximum pressure should not exceed 552 kPa (80 psi) in occupied areas. Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.2.3 Fire Flow Rate

The Fire Underwriters Survey (FUS) method of calculating fire flow requirements is to be used in accordance with the Ottawa Design Guidelines – Water Distribution. Results of the analysis provides a maximum fire flow rate of 3,000 l/min or 50.0l/s is required which is used in the hydraulic analysis. A copy of the FUS calculations are included in **Appendix B**.

2.3 Conceptual Water Plan

A conceptual servicing plan **Figure 2.1** in **Appendix B** illustrates the conceptual layout of the water services to support the proposed development. Two proposed 150mm diameter water services will connect the building to the municipal system. It is proposed to provide two connections to Shillington Ave on either side of the existing water valve for redundancy. For the purposes of this report, assuming a minimal loss within the service connection the pressures within the site can be estimated as follows:

Minimum Pressure (Peak Hour) – The minimum peak hour pressure on the site can be estimated as HGL 124.1m – meter elevation (assumed to be 1m above level P1) 76.95m = 47.15m or 462.54 kPa which exceeds the minimum requirement of 276 kPa. The pressure on the top floor can be estimated as 124.1m – 88.05m = 36.05m or 353.65 KPa which is above the minimum of 276 kPa and it is not anticipated that a domestic water pump will be required, to be confirmed at detailed design.

Fire Flow – At Connection 1, the max day plus fire flow can be estimated as HGL 112.6 – ground floor 78.45 = 34.15m or 335.01 KPa which exceeds the minimum of 140kPa. At Connection 2, the max day plus fire flow can be estimated as HGL 113.1 – 78.45 = 34.65m or 339.92 KPa which also exceeds the minimum of 140kPa.

Max HGL (High Pressure Check) – The high-pressure check can be estimated as HGL 133.6 – (lowest level) 75.95 = 57.65m or 565.55 KPa which exceeds the maximum of 552 kPa, therefore a pressure reducing valve may be required, to be determined at detailed design.

The above results indicate the municipal infrastructure can support the proposed development.

3 WASTEWATER SYSTEM

3.1 Existing Conditions

Municipal sanitary sewers abut the property along both Shillington Ave (750mm dia.) and Silver Street (225mm dia.), which provide services to the existing properties. A survey of the subject parcel was completed by Fairhall, Moffatt & Woodland Ltd. and is included in **Appendix B**. The survey illustrates the location of the existing sanitary sewers adjacent to the site. It is proposed to abandon the existing services for 1271-1275 Shillington Avenue and 970-974 Silver Street, in accordance with City of Ottawa specifications.

3.2 Design Criteria

The sanitary flows for the development are based on the City of Ottawa design criteria which includes, but it not limited to the following criteria:

- Average Residential Flow — 280 l/p/d
- Average Population density — 1.8 PPU for apartments
- Residential Peaking Factor — Harmon Formula [max = 4.0, min. = 2.0]
- ICI Peaking factor — 1.5 if ICI in contributing area >20%
1.0 if ICI in contributing area <20%
- Infiltration allowance — 0.33 l/s/ha
- Velocities — 0.60 m/s min. to 3.0 m/s max.

3.3 Conceptual Wastewater Plan

The conceptual servicing plan **Figure 2.1** in **Appendix B** illustrates the conceptual layout of the sanitary service lateral to service the proposed development. A conceptual sewer design sheet in **Appendix C** confirms the proposed service lateral to service the proposed building has sufficient capacity to accommodate the development.

The proposed redevelopment is a residential development designed to provide a higher density to meet the City objective of more intensification to maximize use of existing infrastructure. During the pre-consultation City staff noted "*The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support a rezoning. Provide sanitary demands to the City project manager for coordination*.

The following reviews the impact of increased density on the volume of wastewater to be generated from the proposed development. The existing municipal sanitary sewer system that services these parcels was constructed in the 1950's it is assumed they would have been designed based on residential sewage loading of 450l/cap/d, 4 p/p/u and infiltration allowance of 0.28l/s/Ha, for the 4 dwellings and 0.19 Ha site would result in an average flow of 0.185l/s.

Avg residential flow: 450l/cap/d X 4ppu X 4units = 0.083 l/s

Infiltration allowance: 0.19Ha X 0.28l/s/Ha = 0.053 l/s,

Original avg. design flow estimated to be, 0.083 + 0.053 = 0.136 l/s

The proposed redevelopment includes only residential uses. Based on the previously noted flow rates of 280 l/p/d for residential, the average waste water flow plus infiltration allowance calculates to 0.71l/s, as noted below:

Avg pop flow: 93.6 (52 units @ 1.8ppu) X 280 l/p/d = 26208 l/d = 0.303 l/s

Infiltration allowance: 0.19Ha X 0.33l/s/Ha = 0.063 l/s,

Rezoned avg flow, 0.303 + 0.063 = 0.366 l/s

The proposed redevelopment results in a theoretical increase in average flow to the downstream system of 0.366-0.136= 0.23 l/s. The sanitary service connection is proposed to connect an existing 750mm dia sanitary sewer along Shillington Ave, we would anticipate that given the size of the sewers that there should be available capacity to accommodate the proposed redevelopment, however we do not have details of any downstream constraints in the system and request the City confirm there is ample capacity to accommodate the estimate 0.23l/s average flow increase. Assuming there is sufficient capacity the conceptual design will be refined based on stakeholder input and the onsite sewers will be designed to meet City of Ottawa and MOE requirements.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

Municipal storm sewers abut the property along both Shillington Ave (1200mm dia.) and Silver Street (300mm dia.), which provide services to the existing properties. A survey of the subject parcel was completed by Fairhall, Moffatt & Woodland Ltd. and is included in **Appendix B**. The survey illustrates the location of the existing sanitary sewers adjacent to the site. It is proposed to abandon the existing services for 1271-1275 Shillington Avenue and 970-974 Silver Street, in accordance with City of Ottawa specifications.

4.2 Design Criteria

During the Pre-consult with the City no infrastructure concerns were noted, and follow-up memo was provided by the City along with the preconsult meeting notes, the stormwater infrastructure comments are summarized below:

Available Infrastructure: Silver Street – 300mm conc., Shillington Avenue – 1200mm conc.

• Existing on-site storm service must be shown on the plans. If existing storm sewer is to be reused, provide CCTV inspection report along with consultant's assessment of the existing sewer conditions. Existing on-site storm sewer to be capped and abandoned to City of Ottawa standards at the property line if it will not be reused.

• For concrete sewer pipe, maintenance holes shall be installed when the service is greater than 50% of the diameter of the mainline concrete pipe

• The Environmental Site Assessment (ESA) may provide recommendations where site contamination may be present. Any recommendations from an ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.

Stormwater Management

Quality Control:

• Rideau Valley Conservation Authority to provide quality control requirements for property.

In addition, the following typical criteria will be employed:

Coefficient (C) of runoff determined as per existing conditions but in no case more than 0.5

TC = To be calculated, minimum 10 minutes

Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.

Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

Roof drains are to be connected downstream of any incorporated ICD within the SWM systemAs noted in the preconsult memo the City of Ottawa requires the site to follow the following design criteria;

- Storm sewers designed to a 2 year level of service
- Site to be designed to limit the 100 year post development flow to a maximum of the 2 year rate with C=0.50.

The stormwater system was designed following the principles of dual drainage, making accommodations for both major and minor flow.

Some of the key criteria include the following:

- Design Storm 1:2 year return (Ottawa)
- Rational Method Sewer Sizing
- Initial Time of Concentration 10 minutes
- Runoff Coefficients
  - Landscaped Areas C = 0.25
  - Asphalt/Concrete C = 0.90

- Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter

4.3 Proposed Minor System

Using the above-noted criteria, the proposed storm service lateral was sized accordingly. A conceptual storm sewer design sheet and the associated conceptual storm sewer drainage area plan are included in **Appendix D**. The current conceptual servicing drawing in **Appendix B** illustrates the proposed building above grade outline, and where the underground structure extends beyond the above grade building. All of the decks, and two lower roofs will be routed inside the building via the mechanical plumbing systems and directed to the building cistern located on the south side of the underground parking. The landscaped areas will be serviced by landscape catchbasins, these catchbasins will discharge into the building plumbing system and will be directed to the building cistern. The cistern will be equipped with duplex storm pumps to control the flow rate of the storm water runoff from the site directed to the municipal storm sewer system. The pumps will discharge to a storm sewer lateral which will also service as an outlet for the building foundation drain. The buildings upper roofs will be equipped with inlet controls similar to Watts R-100 adj, the flow from the roofs will be restricted to maximize storage such that the 1:100 year event is contained, ponding will be limited to 0.15m and emergency overflow scuppers will be provided. The controlled roof drains will be routed inside the building via mechanical plumbing system and connect directly to the buildings service lateral, bypassing the cistern.

4.4 Stormwater Management

The subject site will be limited to a release rate established using the criteria described in section 4.2. This will be achieved through a combination of roof inlet controls and duplex storm pump system set to discharge at the identified release rate. When rainfall events generate flows that are more than the site's allowable release rate excess volume will be stored on the roof and within the cistern respectively.

At certain locations within the site, the opportunity to capture runoff is limited due to grading constraints and building geometry. These locations are generally located at the perimeter of the site where it is necessary to tie into public boulevards and adjacent properties, and it is not always feasible to capture stormwater runoff, these "uncontrolled" areas total 0.015 hectares. The runoff from the remaining site will be collected and discharged into the cistern, sized to accommodate inflow during the 1:100-year event with no overflow leaving the site.

The restricted release rate for the 0.186 Ha site as noted previously is limited to the 2yr flow with C=0.5

$\mathbf{Q_{restricted}} = \mathbf{2.78} \times \mathbf{C} \times \mathbf{i_{2yr}} \times \mathbf{A}$

where:

$\mathbf{C} = \mathbf{0.5}$

$\mathbf{i_{2yr}}$= Intensity of 2-year storm event (mm/hr)

$= 732.951 \times (T_c + 6.119)^{0.810} = 78.61$ mm/hr; where $T_c = 10$ minutes

$\mathbf{Q_{restricted}} = \mathbf{19.86 l/s}$

As noted above, a portion of the site will be left to discharge to the surrounding boulevards and roadways uncontrolled.

Based on a 1:100 year event, the flow from the uncontrolled areas can be determined as:

$\mathbf{Q_{uncontrolled}}$ = **2.78** x **C** x $\mathbf{i_{100yr}}$ x **A**where:

C= Average runoff coefficient of uncontrolled area

$\mathbf{i_{100yr}}$= Intensity of 100-year storm event (mm/hr)

= 1735.688 x $(T_c + 6.014)^{0.820}$ = 178.56 mm/hr; where T_c = 10 minutes

A= Uncontrolled Area = 0.015 Ha, C_{100} =1.0

Therefore, the uncontrolled release rate can be determined as:

$\mathbf{Q_{uncontrolled}}$= **2.23 L/s**

The maximum allowable release rate from the remainder of the site can then be determined as:

$\mathbf{Q_{max\ allowable}}$= $\mathbf{Q_{restricted}}$ **–** $\mathbf{Q_{uncontrolled}}$

= 19.86 L/s – 2.23 L/s = **17.62 L/s**

As noted in the preconsult notes any excess storm water runoff up to the 100-year event is to be stored on-site, in order to not surcharge the downstream municipal storm sewer system. For this site a building cistern will be used. A duplex storm pump will be designed to limit discharge from the tank to meet the maximum allowable release rate to the storm sewer system.

Two options have been considered, one with and one without rooftop storage. The Modified Rational Method was used to identify the required cistern storage in each case, the MRM spreadsheet in **Appendix D** identifies the required storage to accommodate the 1:100yr and 1:2yr events in each scenario. The following table summarizes the on-site storage requirements during both the events.

Option 1 – No Roof Storage

AREA	TRIBUTARY AREA	AVAILABLE STORAGE (M^3)	100-YEAR STORM		2-YEAR STORM	
			RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M^3)	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M^3)
Roof & Decks	0.171	65	17.62	64.85	17.62	16.15
Unrestricted	0.015		2.23		0.96	
TOTAL	**0.186**	**65**	**19.86**	**64.85**	**18.58**	**16.15**

Option 2 – Roof Storage

AREA	TRIBUTARY AREA	AVAILABLE	100-YEAR STORM	2-YEAR STORM

		STORAGE (M^3)	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M^3)	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M^3)
Roof 1	0.056	27.72	1.55	25.98	1.55	8.56
Roof 2	0.051	25.25	1.24	24.80	1.24	8.23
Decks	0.064	20.00	14.83	16.72	14.83	3.77
Unrestricted	0.015	0.00	2.23	0.00	0.96	0.00
TOTAL	**0.186**	**72.97**	**19.86**	**67.50**	**18.58**	**20.55**

The building's cistern is to be sized to accommodate the required storage volume based on whether roof storage will be available.

As demonstrated above, the proposed site controls will restrict the 100 year storm event runoff from the site into the existing storm sewer system to 19.86 l/s. Restricted stormwater will be contained onsite by the building cistern, or a combination of roof top storage and cistern. Should a more extreme event occur, or should a roof inlet become blocked, scuppers will provide for overflow to the street. In the unlikely event the duplex pump system fails, or the cistern service lateral is blocked, an emergency gravity overflow from the building cistern to the street will be provided, should the area suffer a power outage a backup generator will provide power to the pump system.

The conceptual SWM system noted above illustrates a conceptual layout of the storm service to service the site. The storm sewer and SWM facility size and location are conceptual and at detail design stage will be designed to meet City of Ottawa and MOE requirements for SPA.

5 SOURCE CONTROLS

5.1 General

The existing municipal storm sewer system collects and conveys storm runoff to the Ottawa river without any end of pipe quality treatment for captured stormwater. On site level or source control management of runoff will be provided. The proposed building configuration consists of a podium covering most of the site and no onsite surface parking and limited exposed drive lanes are proposed. Roof drainage is typically considered clean and no additional measures are proposed for the runoff from the roofs. Other surface areas where people have daily access. the runoff will be collected and controlled by a cistern and duplex pump system. It is proposed to include a sump within the cistern. The sump will trap pollutants such as sand, grit and debris which can be mechanically removed to avoid transmission to the minor pipe system. The underground garage extends beyond the above grade building at the cistern location, allowing for a maintenance access to be located on the exterior of the building to facilitate the use of a vacuum truck to clean out any debris/sediment from the cistern as needed.

6 SEDIMENT AND EROSION CONTROL PLAN

6.1 General

During construction, existing conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These will include:

- Installation of filter cloths on open surface structures such as maintenance holes and catchbasins during building construction.
- Installation of silt fence on the site perimeter, where practical.

The conceptual Erosion and Sedimentation control measures are detailed in **Figure 6.1** in **Appendix E**.

6.2 Trench Dewatering

Although little groundwater is expected during construction of municipal services, any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed including sediment removal and disposal and material replacement as needed.

6.3 Surface Structure Filters

All catchbasins, and to a lesser degree manholes, convey surface water to sewers. However, until the surrounding surface has been completed these structures should be covered in some fashion to prevent sediment from entering the minor storm sewer system. Until landscaped areas are sodded or until drive isles and parking lots are asphalted and curbed, catchbasins and manholes will be constructed with geotextile filter bags or a geotextile filter fabric located between the structure frame and cover respectively. These will stay in place and be maintained during construction and build until it is appropriate to remove.

7 SOILS and GRADING

A geotechnical engineer will be retained to prepare a geotechnical investigation for the proposed development. The objectives of the investigation will be to prepare a report to:

- Determine the subsoil and groundwater conditions at the site by means of test holes.
- To provide geotechnical recommendations pertaining to design of the proposed development including construction considerations.

A topographic survey of the subject parcel was completed by Fairhall, Moffat & Woodland and is included in **Appendix B.** The survey illustrates spot elevations within and along the perimeter of the site. A conceptual grading plan **Figure 7.1** is provided in **Appendix E** and demonstrates how the site can be graded to suit the existing topography. A full grading plan will be provided at detail design stage to support the Site Plan Application.

8 RECOMMENDATIONS

Municipal water, wastewater and stormwater systems required to develop the proposed site plan are available. The conceptual servicing provided in this report demonstrate the onsite servicing can be designed in accordance with MOE and City of Ottawa's current level of service

requirements. In addition, the report confirms the existing water distribution system and storm sewer system can support the proposed development. It is assumed based on the size of the connecting sewer and proximity of the collector that the existing downstream sanitary sewer system can accommodate the proposed development, City confirmation would be required prior to SPA.

Incorporating into the detail design lot level controls and conveyance controls will result in effective treatment of surface stormwater runoff from the site.

Final detail design will be subject to governmental approval prior to construction, including but not limited to the following:

- SPA: City of Ottawa
- Commence Work Order: City of Ottawa
- ECA (sewers): MOE
- Watermain Approval: City of Ottawa
- Commence Work Order (utilities): City of Ottawa

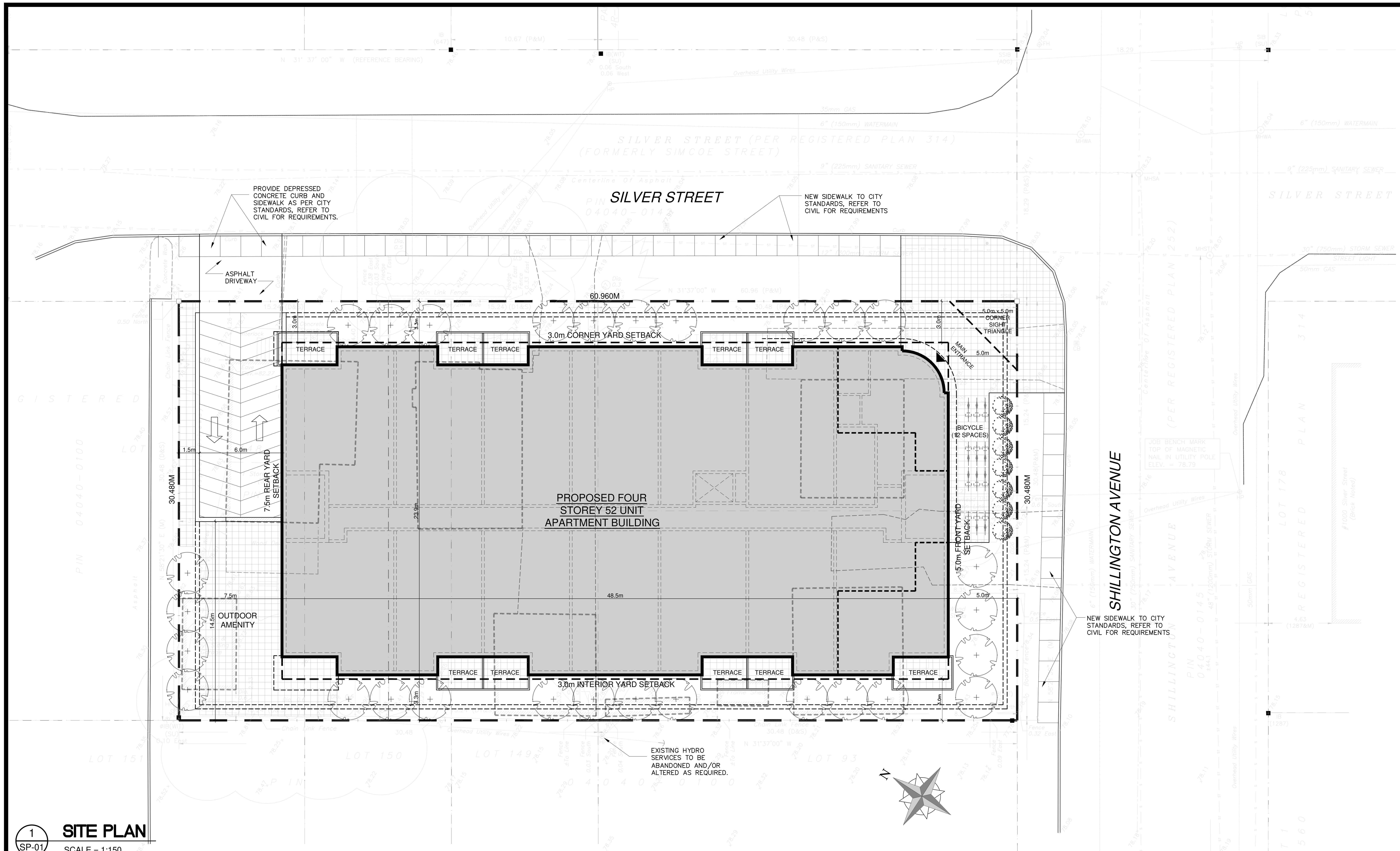
Report prepared by:

Demetrius Yannoulopoulos, P.Eng.
Director

S.E. Labadie, P.Eng.
Project Engineer

APPENDIX A

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	SITE LOCATION	FIGURE 1.1



1 SP-01 **SITE PLAN**
SCALE = 1:150

PLAN OF SURVEY

INFORMATION SHOWN HAS BEEN TAKEN FROM

SURVEYOR'S REAL PROPERTY REPORT – PART 1
TOPOGRAPHIC PLAN OF SURVEY OF
LOTS 91 & 92 AND
PART OF LOTS 147 & 148
REGISTERED PLAN 314
CITY OF OTTAWA
FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

ELEVATION NOTE
1. ELEVATIONS ARE GEODETIC.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN THE ABOVE REFERENCED SURVEY.

CLIENT:

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6M8

LEGEND:

- PROPOSED NEW BUILDING
- NEW UNIT PAVERS
- PROPERTY LINE
- ADJACENT LOT PROPERTY LINES
- EXISTING OVERHEAD HYDRO LINE
- NEW WOOD FENCE
- EXISTING HYDRO POLE TO REMAIN
- ENTRANCE ARROWS
- NEW BIKE RACKS
- NEW PARKING
- EXISTING CONCRETE CURB
- LIGHT STANDARD
- WALL MOUNTED LIGHTING FIXTURE
- EXTERIOR SOFFIT LIGHTING FIXTURE
- EXTERIOR WALL MOUNTED LIGHT FIXTURE

UNIT COUNT

MAIN LEVEL		
1 BED	—	5
1 BED + DEN	—	5
2 BED	—	2
TOTAL	—	12
SECOND LEVEL		
1 BED	—	5
1 BED + DEN	—	5
2 BED	—	4
TOTAL	—	14
THIRD LEVEL		
1 BED	—	5
1 BED + DEN	—	5
2 BED	—	4
TOTAL	—	14
FOURTH LEVEL		
1 BED	—	4
1 BED + DEN	—	4
2 BED	—	4
TOTAL	—	12
TOTAL UNIT COUNT	—	52

TOTAL 1 BED	—	19
TOTAL 1 BED + DEN	—	19
TOTAL 2 BED	—	14
TOTAL	—	52
TOTAL VEHICULAR PARKING		
BELOW GRADE (INCLUDING ONE B.F.)	—	45
ABOVE GRADE	—	0
	—	0.87 RATIO
TOTAL BICYCLE PARKING		
BELOW GRADE	—	32
ABOVE GRADE	—	12
TOTAL	—	44
	—	0.85 RATIO

SITE STATISTICS 970 Silver St. , 974 Silver St., 1271 Shillington Ave., 1275 Shillington Ave.

ITEM	REQUIRED	PROVIDED
Zone	R3A Current	R4Y
Minimum Lot Area	1,400 sqm	1,858 sqm
Minimum Lot Width	n/a	30.48m
Maximum Building Height	16.0m	13.1m - 4 STOREYS
Front Yard	5.0m Min.	5.0m
Side Yard — Corner	3.0m Min.	3.0m
Side Yard — Interior	3.0m Min.	3.0m
Rear Yard	7.5m Min.	7.5m
Building Footprint		
Lot Coverage		
Number of Dwelling units		52 UNITS
PARKING SPACES REQUIRED		45 UNDERGROUND
Required Bike Racks	22.5 REQUIRED (0.5 SPACES/DWELLING)	32 INTERIOR and 12 EXTERIOR
Landscaping — Hard		
Landscaping — Soft		

No.	REVISIONS	BY	DATE
11			
10			
09			
08			
07			
06			
05			
04			
03			
02			
01	FOR REVIEW	PE	NOV.25 2021

STAMP

NORTH ARROW

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6M8

DESIGNED BY: P.E.
DRAWN BY: P.E.
APPROVED BY:

PROJECT
1275 SHILLINGTON AVENUE
OTTAWA

DRAWING TITLE
SITE PLAN

PROJECT NO.
0453

DATE
NOV. 24, 2021

SP-01

Infrastructure Pre-Application Consultation Notes

Date: February 16, 2021
Site Location: 970, 974 Silver/1271, 1275 Lancaster
Type of Development: ☒ **Residential (**☐ **townhomes,** ☐ **stacked,** ☐ **singles,** ☐ **apartments),** ☐ **Office Space,** ☐ **Commercial,** ☐ **Retail,** ☐ **Institutional,** ☐ **Industrial, Other:** N/A
Owner/Representative(s): Farmhouse Investments, IBI Group
Project Manager: Adam Baker
Assigned Planner: Kelby Lodoen Unseth

Infrastructure

Please feel free to contact me at Adam.Baker@ottawa.ca if there for any infrastructure related questions.

Water

Existing public services:

- Silver Street – 152mm UCI
- Shillington Avenue – 152mm UCI

- Existing on-site water service must be shown on the plans. The existing on-site water services will be blanked at the watermain if it will not be reused.

- Watermain Frontage Fees to be paid ($190.00 per metre) ☐ **Yes** ☒ **No**

- Service areas with a basic demand greater than 50 m^3/day or with a sum of 50 residential units or more shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.

Boundary conditions:
Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

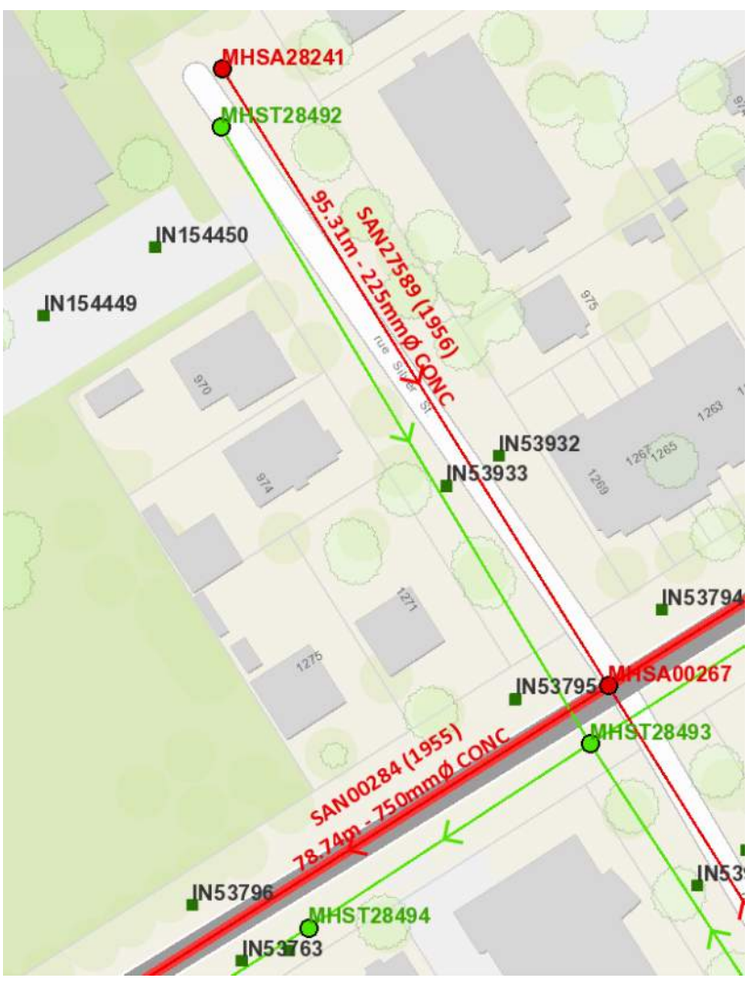
- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
    - Location of service(s)
    - Type of development and the amount of fire flow required (as per FUS, 1999).
    - Average daily demand: ___ l/s.
    - Maximum daily demand: ___l/s.
    - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)
- A water meter sizing questionnaire (water data card) will have to be completed prior to receiving a water permit (water card will be provided post approval)

Given the available watermains are 152mm unlined cast iron, water boundary conditions should be coordinated early on to determine any constraints.

Sanitary Sewer

Existing public services:

- Silver Street – 225mm conc.
- Shillington Avenue – 750mm conc.



Existing connection:

- Existing on-site sanitary service must be shown on the plans. If existing sanitary sewer is to be reused, provide CCTV inspection report along with consultant's assessment of the existing sewer conditions. Existing on-site sanitary sewer to be capped and abandoned to City of Ottawa standards at the property line if it will not be reused.

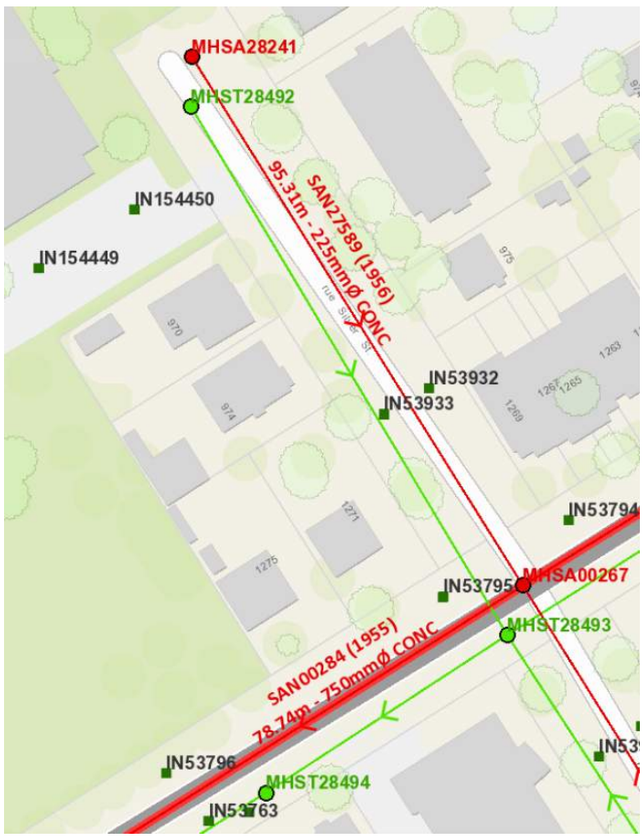
Is a monitoring manhole required on private property? ☒ **Yes** ☐ **No**

- The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support a rezoning. Provide sanitary demands to the City project manager for coordination.

- Any premise in which there is commercial or institutional food preparation shall install a grease and oil inceptor on all fixtures.

Storm Sewer

Existing public services:
- Silver Street – 300mm conc.
- Shillington Avenue – 1200mm conc.



- Existing on-site storm service must be shown on the plans. If existing storm sewer is to be reused, provide CCTV inspection report along with consultant's assessment of the existing sewer conditions. Existing on-site storm sewer to be capped and abandoned to City of Ottawa standards at the property line if it will not be reused.
- For concrete sewer pipe, maintenance holes shall be installed when the service is greater than 50% of the diameter of the mainline concrete pipe
- The Environmental Site Assessment (ESA) may provide recommendations where site contamination may be present. Any recommendations from an ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.

Stormwater Management

Quality Control:
- Rideau Valley Conservation Authority to provide quality control requirements for property.

Quantity Control:

- Master Servicing Study: N/A
- Allowable Runoff coefficient (C): C = the lesser of the existing pre-development conditions to a maximum of 0.5.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable flowrate for connection on Lancaster Road: Control the 100-year storm events to the 2-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

a. The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECP as required.
b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
c. Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
d. Pre-consultation with local District office of MECP is recommended for direct submission.
e. Consultant completes an MECP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
f. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval
g. It is unclear if the proposed development will remain as one property. An ECA will be required where the stormwater management services more than one property parcel.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent

General Service Design Comments

- The City of Ottawa requests that all new services be located within the existing service trench to minimize road cuts.
- Monitoring manholes should be located within the property near the property line in an accessible location to City forces and free from obstruction (i.e. not a parking).
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.
- Services crossing the existing watermain or sewers need to clearly provide the obvert/invert elevations to demonstration minimum separation distances. A watermain crossing table may be provided.

Other

Are there are Capital Works Projects scheduled that will impact the application? ☐ **Yes** ☒ **No**

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below:

https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines

- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
  InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
  (613) 580-2424 ext. 44455
- geoOttawa
  http://maps.ottawa.ca/geoOttawa/

PLEASE NOTE – THESE ARE ONLY THE INFRASTRUCTURE PLANS & STUDIES REQUIREMENTS. THE COMBINED SUBMISSION REQUIREMENTS WILL BE PROVIDED BY THE FILE LEAD FOR THE APPLICATION.

For information on preparing required studies and plans refer to:

http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans

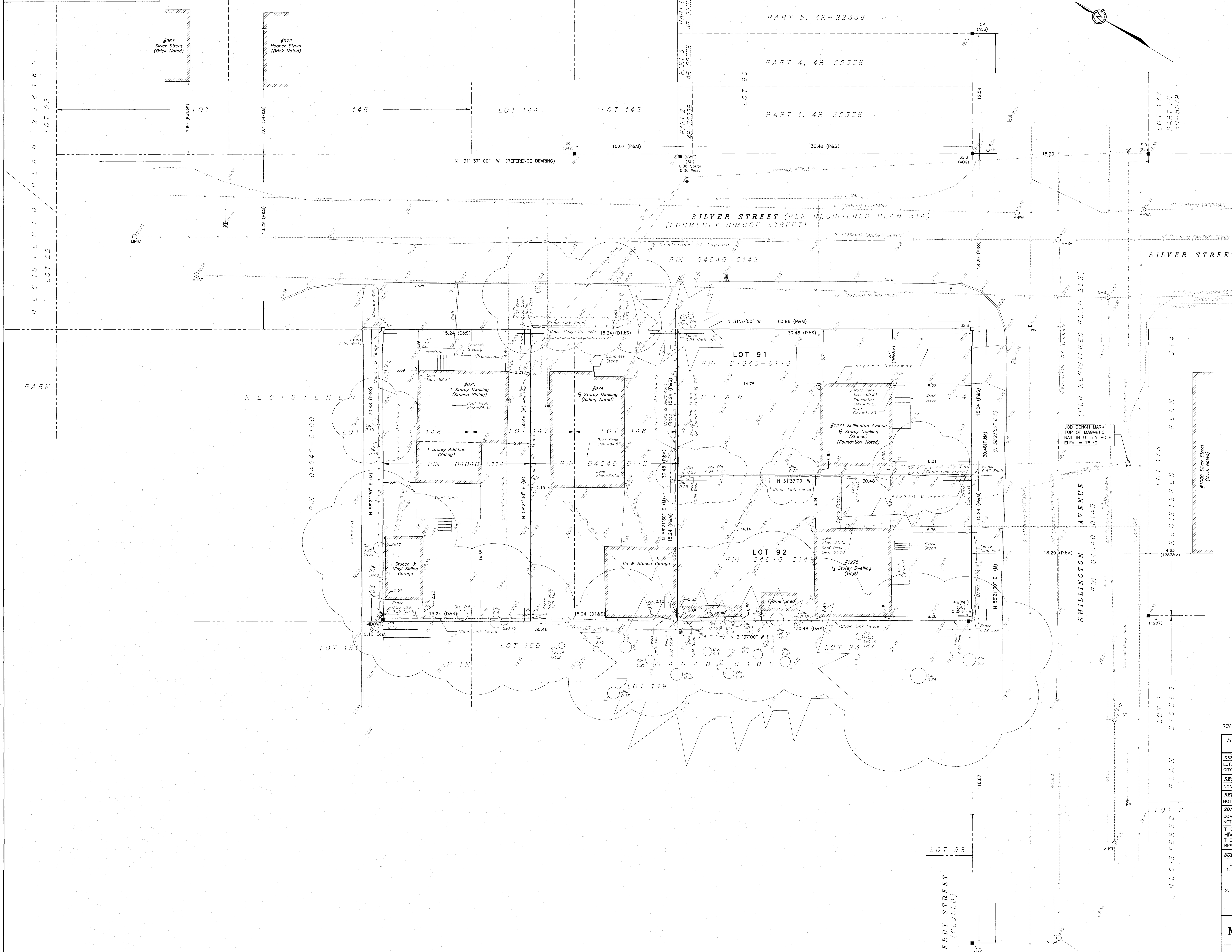
S/A	Number of copies	RE-ZONING		S/A	Number of copies
S		1. Conceptual Servicing Plan	2. Assessment of Adequacy of Public Services	**S**	
		3. Grade Control and Drainage Plan	4. Geotechnical Study	**S**	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief		
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study		
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

S/A	Number of copies	CONCURRENT SITE PLAN AND RE-ZONING		S/A	Number of copies
S		1. Servicing Plan	2. Site Servicing Report & Assessment of Adequacy of Public Services	**S**	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study	**S**	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	**S**	
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study		
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

APPENDIX B

METRIC
DISTANCES AND ELEVATIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



SURVEYOR'S REAL PROPERTY REPORT – PART 1
TOPOGRAPHIC PLAN OF SURVEY OF LOTS 91 & 92 AND PART OF LOTS 147 & 148 REGISTERED PLAN 314 CITY OF OTTAWA

SCALE 1 : 150

0 1 2 5 10 15 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

ELEVATION NOTES

1. ELEVATIONS SHOWN HEREON ARE REFERRED TO GEODETIC DATUM (CGVD28).
2. ELEVATIONS FOR MANHOLE COVERS AND CATCH BASINS HAVE TO BE INDEPENDENTLY CONFIRMED BEFORE THEY CAN BE ACCEPTED FOR FINAL DESIGN OR CONSTRUCTION PURPOSES.
3. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS DRAWING.

UTILITY NOTES

1. THIS DRAWING CANNOT BE ACCEPTED AS ACKNOWLEDGING ALL UNDERGROUND UTILITIES AND IT WILL BE THE RESPONSIBILITY OF THE USER TO CONTACT THE RESPECTIVE UTILITY AUTHORITIES FOR CONFIRMATION OR LOCATION.
2. UNDERGROUND UTILITIES, AS REPORTED ON THIS DRAWING, ARE NOT BASED ON AN ACTUAL 'FIELD LOCATE' BY THE RESPECTIVE UTILITY AGENCIES BUT HAVE BEEN COMPILED FROM DATA OBTAINED FROM THE FOLLOWING SOURCE:
   a) CITY OF OTTAWA PUBLIC UTILITIES REGISTRY
3. BEFORE ANY WORK INVOLVING PROBING, EXCAVATING, ETC., A FIELD LOCATION OF UNDERGROUND PLANT BY THE PERTINENT UTILITY AUTHORITY IS MANDATORY.

NOTE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE EASTERLY LIMIT OF SILVER STREET AS SHOWN ON REGISTERED PLAN 314 HAVING A BEARING OF N 31°37'00" W.

LEGEND

□	– SURVEY MONUMENT SET
■	– SURVEY MONUMENT FOUND
SIB	– STANDARD IRON BAR
SSIB	– SHORT STANDARD IRON BAR
IB	– IRON BAR
CC	– CUT CROSS
CP	– CONCRETE PIN
(P)	– REGISTERED PLAN 314
(D)	– DEED, INST. N348326
(S)	– SET
(M)	– MEASURED
(SU)	– SOURCE UNKNOWN
(WIT)	– WITNESS
DIA.	– DIAMETER
PIN	– PROPERTY IDENTIFIER NUMBER
(AOG)	– ANNIS, O'SULLIVAN, VOLLEBEKK LTD., O.L.S.,
(1287)	– FARLEY, SMITH & MURRAY SURVEYING LTD., O.L.S. (REF. JOB 370-04)
(RWA)	– R.W. ARNETT, O.L.S. (REF. 8-314NP-0, 9-314NP-0)
(647)	– H. R. FARLEY, O.L.S. (PLAN OF #972 HOOPER STREET, DATED SEPT.27, 1984)
←	– GUY WIRE AND ANCHOR
	– SIGN
	– CONIFEROUS TREE
	– DECIDUOUS TREE
Ⓜ	– GAS METER
○ MH	– MANHOLE
CB	– CATCH BASIN
⊗ UP	– UTILITY POLE
WV	– WATER VALVE
FH	– FIRE HYDRANT
—W—	– WATERMAIN
—SL—	– STREET LIGHTING
—G—	– GAS MAIN
—ST—	– STORM SEWER
—S—	– SANITARY SEWER
══	– CURB
— · —	– OVERHEAD UTILITY WIRES

REVISION : DECEMBER 10, 2021
ADDED TREES ALONG THE BOUNDARY

SURVEYOR'S REAL PROPERTY REPORT – PART 2
REPORT SUMMARY

DESCRIPTION OF LAND
LOTS 91 & 92 AND PART OF LOTS 147 AND 148, REGISTERED PLAN 314, CITY OF OTTAWA AS IN ALL OF PINS 04040-0140, 04040-0141 AND 04040-0114.

REGISTERED EASEMENTS
NONE REGISTERED

REMARKS
NOTE LOCATIONS OF FENCES AND BUILDINGS.

ZONING
COMPLIANCE WITH ZONING, LAND USE, ENVIRONMENTAL AND BUILDING REGULATIONS NOT CERTIFIED BY THIS REPORT.

THIS REPORT WAS PREPARED FOR
HIVE CAPITAL CORPORATION
THE UNDERSIGNED ACCEPTS NO RESPONSIBILITY FOR USE BY OTHER PARTIES.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON NOV 16, 2021.

2021/12/14
DATE

JOHN H. GUTRI
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2179492

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

Fairhall Moffatt & Woodland LIMITED
ONTARIO LAND SURVEYORS
OTTAWA
Surveying and Land Information Services
100-600 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591-2580 FAX: (613) 591-1495
www.fmw.on.ca

JOB No. AB28800

E 365018, N 5026985

REFERENCE No. 22-314 NP

S:\JOBS\AB28800\DWG 21NOV.2021
SR_TP_AB288_REV1.dwg (ss)

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : Shillington Lands
LOCATION : 970 Silver Street
DEVELOPER :

FILE: 136143.6.04
DATE PRINTED: 20-Dec-21
DESIGN: SEL
PAGE : 1 OF 1

NODE	RESIDENTIAL UNITS SF	RESIDENTIAL UNITS TH	RESIDENTIAL UNITS MD	POP'N	NON-RESIDENTIAL INDTRL (ha.)	NON-RESIDENTIAL INST. (ha.)	NON-RESIDENTIAL COMM. (m^2)	AVERAGE DAILY DEMAND (l/s) Res.	AVERAGE DAILY DEMAND (l/s) Non-res.	AVERAGE DAILY DEMAND (l/s) Total	MAXIMUM DAILY DEMAND (l/s) Res.	MAXIMUM DAILY DEMAND (l/s) Non-res.	MAXIMUM DAILY DEMAND (l/s) Total	MAXIMUM HOURLY Res.	MAXIMUM HOURLY Non-res.	MAXIMUM HOURLY Total	FIRE DEMAND (l/s)
Site			52	94				0.30	0.00	0.30	0.76	0.00	0.76	1.67	0.00	1.67	50.0

ASSUMPTIONS

RESIDENTIAL DENSITIES

Single Family	3.4 persons/unit
Townhouse	2.7 persons/unit
Medium Density	1.8 persons/unit

AVG. DAILY DEMAND

Residential	280 l / cap / day
Commercial	28,000 l / ha / day

MAX. DAILY DEMAND

Residential	700 l / cap / day
Commercial	42,000 l / ha / day

MAX. HOURLY DEMAND

Residential	1,540 l / cap / day
Commercial	75,600 l / ha / day

FIRE FLOW

Site	3,000 l / min

Samantha Labadie

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Monday, December 20, 2021 12:07 PM
To: Samantha Labadie
Subject: RE: Shillington Lands - Boundary Conditions Request
Attachments: 970 Silver Street REVISED December 2021.pdf

Hi Sam,

The following are boundary conditions, HGL, for hydraulic analysis at 970 Silver Street (zone 2W2C) assumed to be connected to the 152 mm watermain on Shillington Avenue (see attached PDF for location).

Both Connections

Minimum HGL: 124.1 m

Maximum HGL: 133.6 m

Max Day + FF (50 L/s) = 112.6 m (Connection 1) and 113.1 (Connection 2)

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Thank you,

Tyler Cassidy, EIT
Infrastructure Project Manager,
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

Boundary Conditions for 970 Silver Street

Fire Flow Requirement from Fire Underwriters Survey

Building - 4 Storey Residential

Building Floor Area

Floors 1-2	2,160	m^2
50% Floors 3-4	1,080	m^2
Total	3,240	m^2

Fire Flow

$F = 220C\sqrt{A}$

C	0.6		C =	1.5	wood frame
A	3,240	m^2		1.0	ordinary
				0.8	non-combustile
F	7,514	l/min		0.6	fire-resistive
Use	8,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	-15%		0%	combustile
			+15%	free burning
Adjustment	-1200	l/min	+25%	rapid burning
Fire flow	6,800	l/min		

Sprinkler Adjustment

			-30%	system conforming to NFPA 13
			-50%	complete automatic system
Use	-50%			
Adjustment	-3400	l/min		

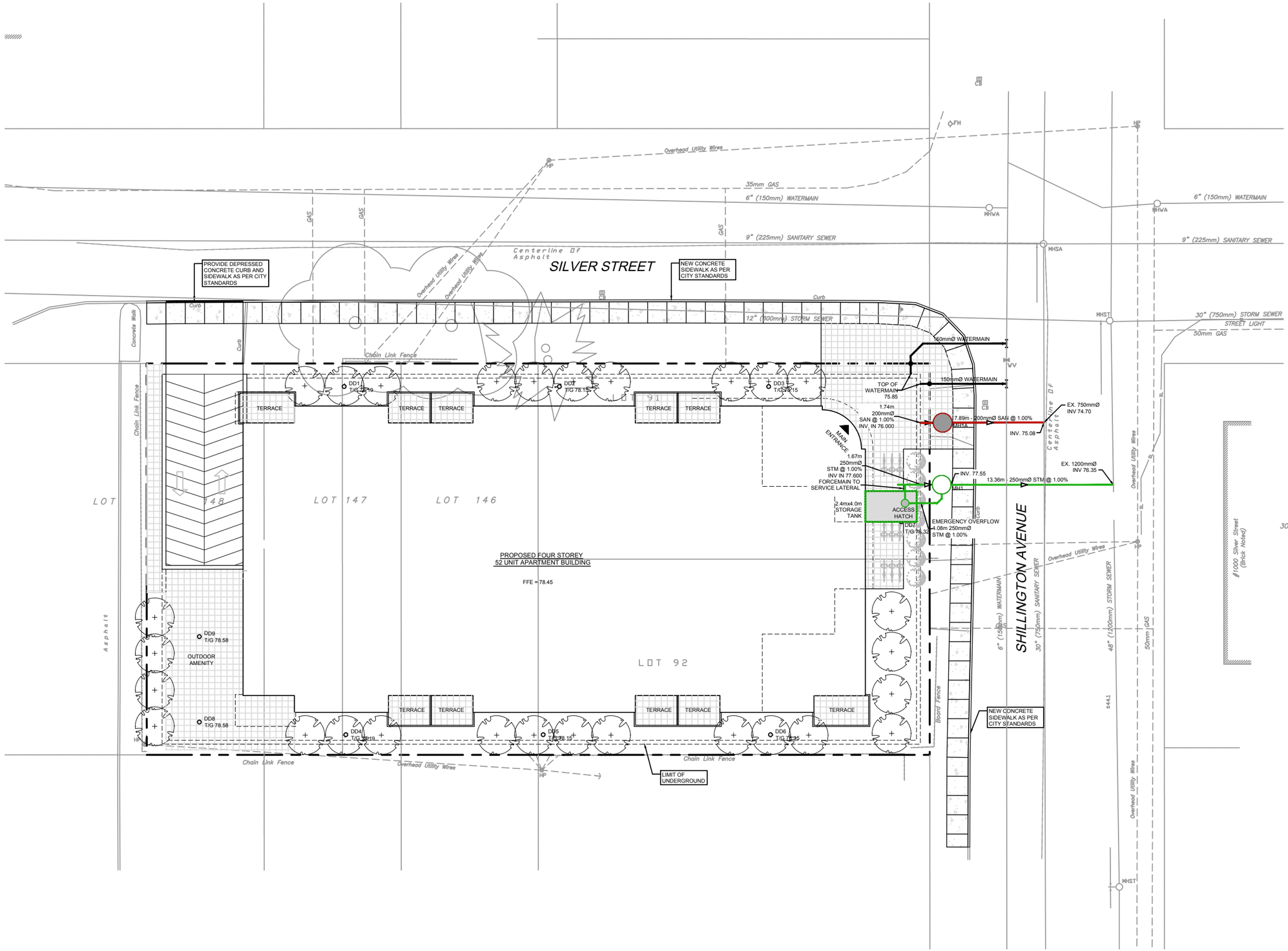
Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	25	Lower elevation			0%
east	22	Lower elevation			0%
south	26	Lower elevation			0%
west	>45				0%
Total					0%

Adjustment - l/min

Required Fire Flow

Total adjustments	(3,400)	l/min
Fire flow	3,400	l/min
Use	**3,000**	**l/min**
	50.0	**l/s**



LEGEND:

6" (150mm) WATERMAIN	EXISTING WATERMAIN c/w DIAMETER
	PROPOSED WATERMAIN SERVICE
30" (750mm) SANITARY SEWER	EXISTING SANITARY SEWER c/w DIAMETER
	PROPOSED SANITARY SERVICE
48" (1200mm) STORM SEWER	EXISTING STORM SEWER c/w DIAMETER
	PROPOSED STORM SERVICE

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	CONCEPTUAL SERVICING	FIGURE 2.1

APPENDIX C

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

SANITARY SEWER DESIGN SHEET

1275 Shillington
CITY OF OTTAWA

LOCATION				RESIDENTIAL									ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA w/ Units (Ha)	UNIT TYPES			AREA w/o Units (Ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA						ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full)	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH		SF	TH	APT		IND	CUM			INSTITUTIONAL		RETAIL (m2)		REST. (S)				IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
													IND	CUM	IND	CUM	IND	CUM														
	Proposed Sanitary			0.186			52		94	94	4.00	1.21							1.00	0.00	0.186	0.186	0.06	0.00	0.00	1.27	34.22	9.63	200	1.00	1.055	32.94	96.27%

Design Parameters:

Residential			ICI Areas			
SF	3.4	p/p/u	INST	28,000	L/Ha/day	
TH/SD*	2.7	p/p/u	RETAIL	5	L/m2/day	
MD	1.8	p/p/u	REST.	125	L/seat/day	MOE Chart
Other	60	p/p/Ha				

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
   where K = 0.8 Correction Factor
5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0

Designed: S.E.L.

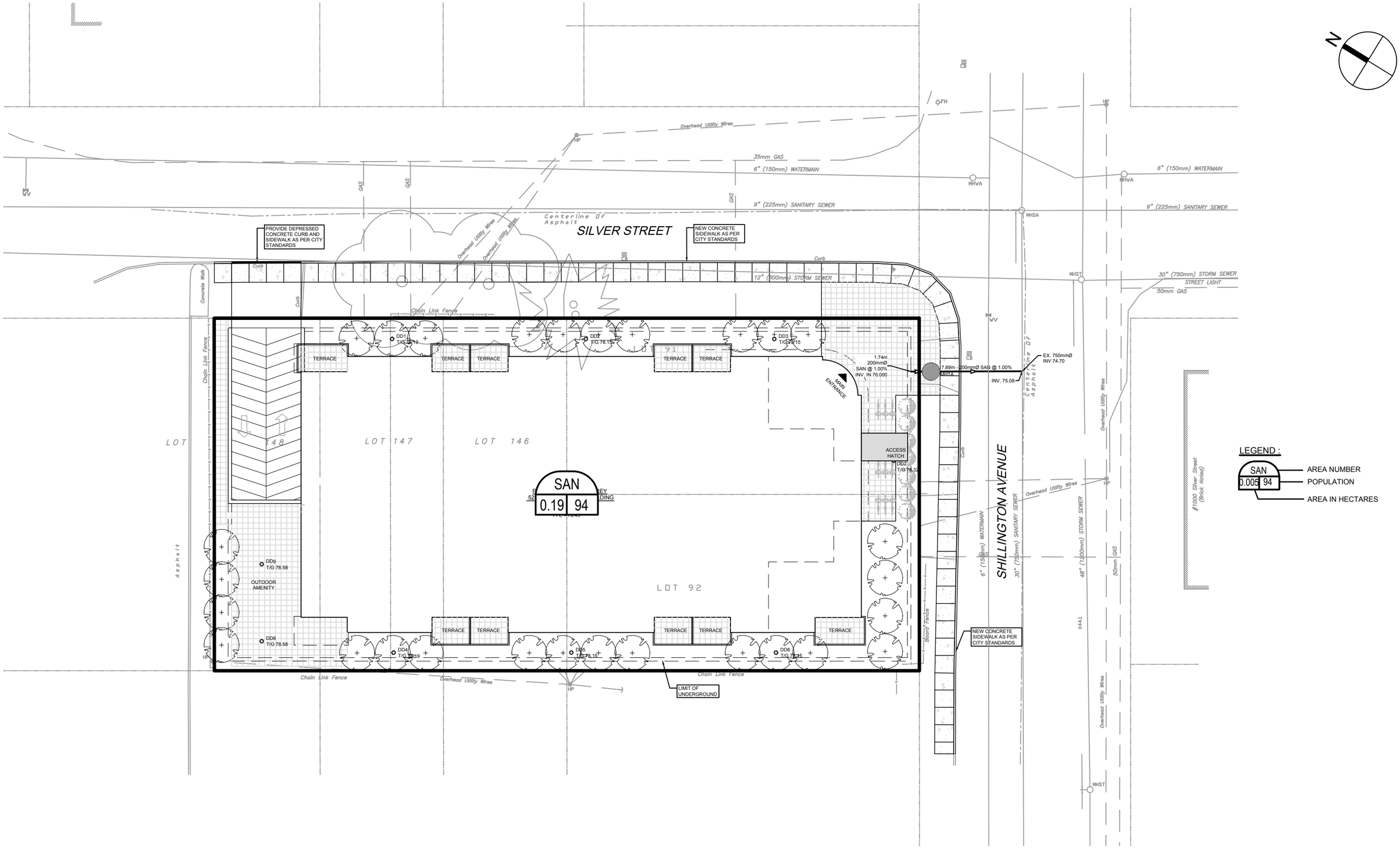
Checked: D.G.Y.

Dwg. Reference:

No.	Revision	Date
1.	Adequacy of Public Services Report	2021-12-08

File Reference: 136143.6.04.04
Date: 2021-12-08
Sheet No: 1 of 1

2021-12-20 11:03 AM



Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	CONCEPTUAL SANITARY TRIBUTARY AREA PLAN	FIGURE 3.1

APPENDIX D

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

STORM SEWER DESIGN SHEET

1275 Shillington
CITY OF OTTAWA

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW												SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.30	C= 0.50	C= 0.55	C= 0.65	C= 0.70	C= 0.80	C= 0.90	C= 1.00	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	PIPE SIZE (mm) W	PIPE SIZE (mm) H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
	Proposed Storm					0.015						0.171		0.44	0.44	10.00	0.20	10.20	76.81	104.19	122.14	178.56	33.82	45.88	53.79	78.63		33.82	62.04	15.03	250			1.00	1.224	28.22	45.48%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: S.E.L.

Checked: D.G.Y.

Dwg. Reference:

No.	Revision	Date
1.	Assessment of Adequacy Report	2021-12-08

File Reference: 136143.6.04.04
Date: 2021-12-08
Sheet No: 1 of 1

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT: 1275 Shillington
DATE: 2021-12-06
FILE: 136143 6.04.04
REV #: 1
DESIGNED BY: S.L.
CHECKED BY: D.Y.

STORMWATER MANAGEMENT

Formulas and Descriptions

i_{2yr} = 1:2 year Intensity = $732.951 / (T_c+6.199)^{0.810}$
i_{100yr} = 1:100 year Intensity = $1735.688 / (T_c+6.014)^{0.820}$
T_c = Time of Concentration (min)
C = Average Runoff Coefficient
A = Area (Ha)
Q = Flow = 2.78CiA (L/s)

Maximum Allowable Release Rate

Restricted Flowrate (based on C=0.50 Tc=10min)

C =	0.5	
T_c =	10	min
i_{2yr} =	76.81	mm/hr
A_{site} =	0.186	Ha
$Q_{restricted}$ =	19.86	L/s

Uncontrolled Release ($Q_{uncontrolled} = 2.78*C*i_{100yr}*A_{uncontrolled}$)

Grass Area

C =	0.30	
T_c =	10	min
i_{100yr} =	178.56	mm/hr
$A_{uncontrolled}$ =	0.015	Ha
$Q_{uncon\ grass}$ =	2.23	L/s

Hard Surface Area

C =	1.00	
T_c =	10	min
i_{100yr} =	178.56	mm/hr
$A_{uncontrolled}$ =	0.000	Ha
$Q_{uncon\ hard}$ =	0.00	L/s

$Q_{uncontrolled\ total}$ = 2.23 L/s

Maximum Allowable Release Rate ($Q_{max\ allowable} = Q_{restricted} - Q_{uncontrolled}$)

$Q_{max\ allowable}$ = 17.62 L/s

MODIFIED RATIONAL METHOD (100-Year, & 2-Year Ponding)

OPTION 1 - No Roof Storage

Drainage Area	***Roof & Decks***		
Area (Ha)	0.171	Theoretical Flow Q_{max} (L/s)=	17.62
C =	1.00	Restricted Flow @ 50% Q_r (L/s)=	8.81

100-Year Ponding

T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***
42	72.57	34.50	8.81	25.69	64.729
44	70.18	33.36	8.81	24.55	64.814
46	67.96	32.31	8.81	23.50	**64.846**
48	65.89	31.32	8.81	22.51	64.831
50	63.95	30.40	8.81	21.59	64.772

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	64.85	0.00	0.00	64.85

Drainage Area	***Roof & Decks***		
Area (Ha)	0.171	Theoretical Flow Q_{max} (L/s)=	17.62
C =	0.90	Restricted Flow @ 50% Q_r (L/s)=	8.81

2-Year Ponding

T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
16	59.50	25.46	8.81	16.65	15.98
18	55.49	23.74	8.81	14.93	16.12
19	53.70	22.97	8.81	14.16	**16.15**
20	52.03	22.26	8.81	13.45	16.14
22	49.02	20.97	8.81	12.16	16.05

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	16.15	0.00	0.00	16.15

OPTION 2 - Roof Stroage

Drainage Area	***Roof 1***		
Area (Ha)	0.056		
C =	1.00	Restricted Flow Q_r (L/s)=	1.55

100-Year Ponding

T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***
104	36.77	5.72	1.55	4.17	26.047
106	36.23	5.64	1.55	4.09	26.014
108	35.71	5.56	1.55	4.01	**25.978**
110	35.20	5.48	1.55	3.93	25.940
112	34.71	5.40	1.55	3.85	25.899

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	25.98	27.72	0.00	0.00

Drainage Area	***Roof 1***		
Area (Ha)	0.056		
C =	1.00	Restricted Flow Q_r (L/s)=	1.55

2-Year Ponding

T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
36	35.37	5.51	1.55	3.96	8.54
38	34.06	5.30	1.55	3.75	8.56
39	33.45	5.21	1.55	3.66	**8.56**
40	32.86	5.12	1.55	3.57	8.56
42	31.76	4.94	1.55	3.39	8.55

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	8.56	27.72	0.00	0.00

Drainage Area	***Roof 2***		
Area (Ha)	0.051		
C =	1.00	Restricted Flow Q_r (L/s)=	1.24

100-Year Ponding

T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***
94	39.76	5.64	1.24	4.40	24.798
96	39.12	5.55	1.24	4.31	24.803
98	38.50	5.46	1.24	4.22	**24.805**
100	37.90	5.37	1.24	4.13	24.803
102	37.33	5.29	1.24	4.05	24.799

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	24.80	25.25	0.00	0.00

Drainage Area	***Roof 2***		
Area (Ha)	0.051		
C =	1.00	Restricted Flow Q_r (L/s)=	1.24

2-Year Ponding

T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
42	31.76	4.50	1.24	3.26	8.22
44	30.73	4.36	1.24	3.12	8.23
45	30.24	4.29	1.24	3.05	**8.23**
46	29.77	4.22	1.24	2.98	8.23
48	28.88	4.09	1.24	2.85	8.22

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	8.23	25.25	0.00	0.00

Drainage Area	***Decks***		
Area (Ha)	0.064	Theoretical Flow Q_{max} (L/s)=	14.83
C =	1.00	Restricted Flow @ 50% Q_r (L/s)=	7.42

100-Year Ponding

T_c Variable (min)	***i_{100yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{100yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 100yr (m^3)***
18	128.08	22.79	7.42	15.37	16.602
20	119.95	21.34	7.42	13.92	16.710
22	112.88	20.08	7.42	12.67	**16.721**
24	106.68	18.98	7.42	11.56	16.651
26	101.18	18.00	7.42	10.59	16.513

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	16.72	0.00	20.00	0.00

Drainage Area	***Decks***		
Area (Ha)	0.064	Theoretical Flow Q_{max} (L/s)=	14.83
C =	1.00	Restricted Flow @ 50% Q_r (L/s)=	7.42

2-Year Ponding

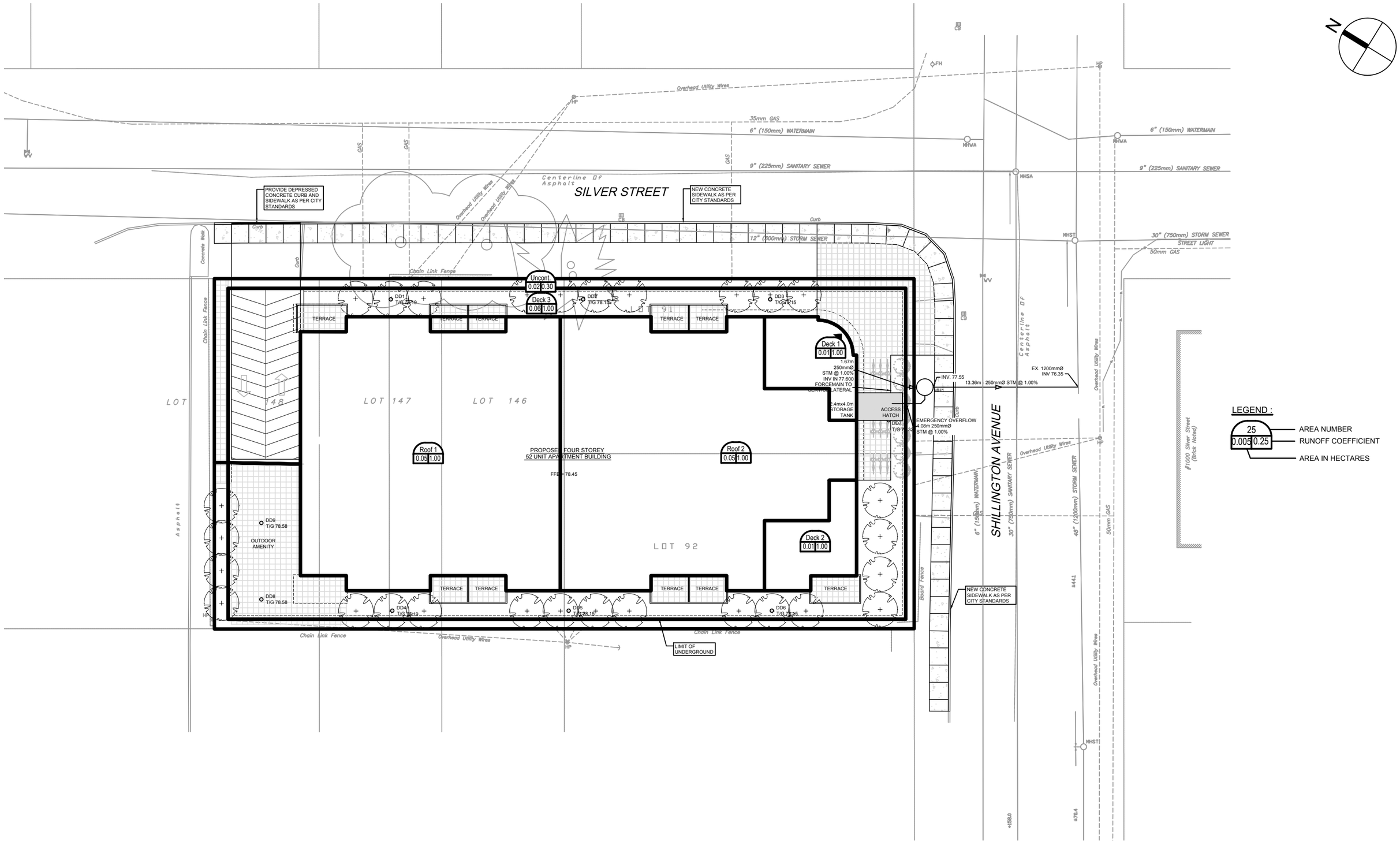
T_c Variable (min)	***i_{2yr} (mm/hour)***	***Peak Flow $Q_p=2.78xCi_{2yr}A$ (L/s)***	***Q_r (L/s)***	***Q_p-Q_r (L/s)***	***Volume 2yr (m^3)***
6	96.64	17.19	7.42	9.78	3.52
8	85.46	15.20	7.42	7.79	3.74
9	80.87	14.39	7.42	6.97	**3.77**
10	76.81	13.67	7.42	6.25	3.75
12	69.89	12.44	7.42	5.02	3.61

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	3.77	0.00	20.00	0.00

	Area (ha)	Flow (L/s)	Storage Required	Storage Provided
Roof 1	0.056	1.55	25.98	27.72
Roof 2	0.051	1.24	24.80	25.25
Decks	0.064	14.83	16.72	20.00
Unrestricted	0.015	2.23	0.00	0.00
	0.186	**19.86**	**67.50**	**72.97**

	Area (ha)	Flow (L/s)	Storage Required	Storage Provided
Roof 1	0.056	1.55	8.56	27.72
Roof 2	0.051	1.24	8.23	25.25
Decks	0.064	14.83	3.77	20.00
Unrestricted	0.015	0.96	0.00	0.00
	0.186	**18.58**	**20.55**	**72.97**



LEGEND :

25
0.005 0.25

AREA NUMBER
RUNOFF COEFFICIENT
AREA IN HECTARES

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	CONCEPTUAL STORM TRIBUTARY ARE PLAN	FIGURE 4.1

APPENDIX E

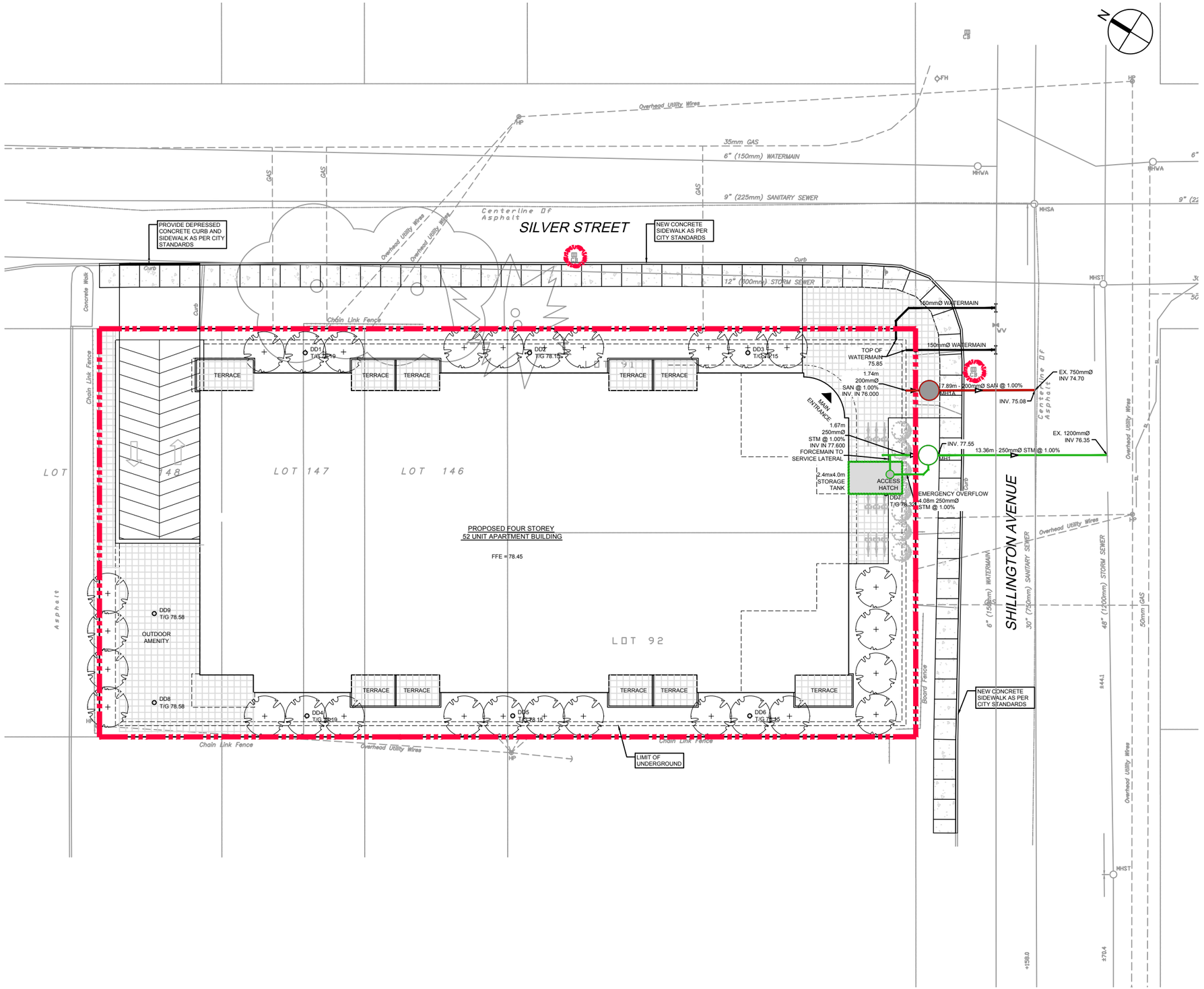
NOTES:

THE 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 APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY,

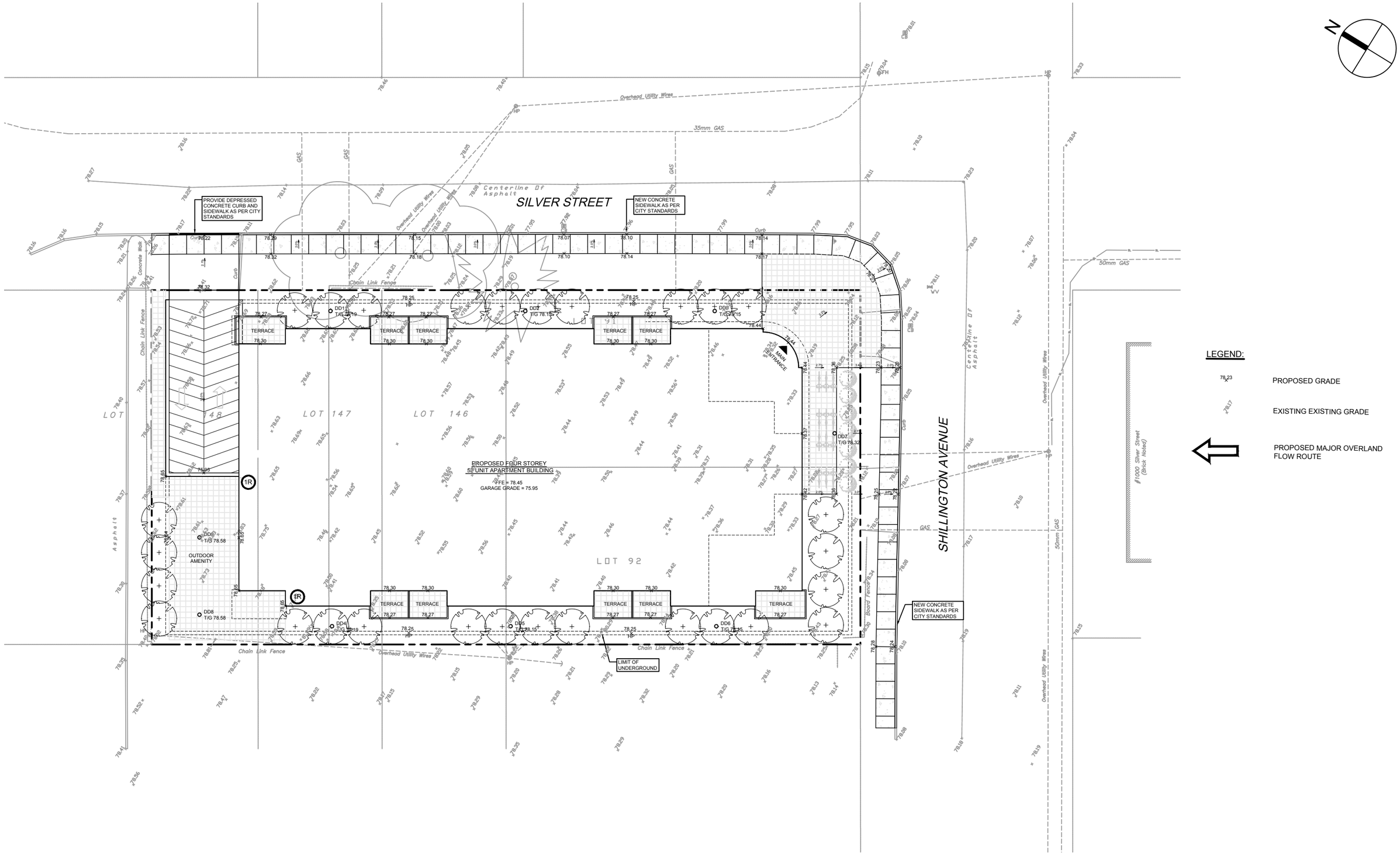
1. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
2. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
3. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
4. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
5. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
6. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
7. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT

LEGEND :

- LIGHT DUTY SILT FENCE AS PER OPSD-219.110
- SNOW FENCE
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH



Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	CONCEPTUAL SEDIMENT AND EROSION CONTROL PLAN	FIGURE 6.1



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LEGEND:

78.23 PROPOSED GRADE

78.17 EXISTING EXISTING GRADE

PROPOSED MAJOR OVERLAND FLOW ROUTE

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	1275 SHILLINGTON AVENUE	CONCEPTUAL MACRO GRADING	FIGURE 7.1

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