Report
Project: 135883-6.04.01

ADEQUACY OF PUBLIC SERVICES REPORT
255 RICHMOND ROAD

Prepared for Y Street Capital C/O Vince Colizza Architects
by IBI Group
October 21, 2021

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APPENDICIES:

1 INTRODUCTION

IBI Group has been retained by Y Street Capital c/o Vince Colizza Architects to prepare a conceptual servicing of an assembly of parcels of land comprised of 249-255 Richmond Road and 372 Tweedsmuir Ave. to support the proposed Zoning Bylaw Amendment for the subject parcel.

The subject parcel is approximately 0.21 ha and is bounded by Tweedsmuir Ave to the east, and Richmond Road to the south, as well as existing commercial lands to the west and residential lands to the north. Refer to **Figure 1** in **Appendix A** for site location.

The proposed development consists of one mixed use multi-storey building consisting of 91 residential units, retail on the first floor fronting Richmond Road, and underground parking to support the proposed building. A copy of the proposed Site Plan, prepared by Vince Colizza Architects is included in **Appendix A**. The plan illustrates the building occupying most of the parcel and vehicular access to the site is provided from Tweedsmuir Ave.

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 1W. There is a 300 mm diameter watermain along Richmond Road and a 150mm diameter watermain along Tweedsmuir Ave, 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 Farley, Smith, Denis Surveying Ltd. and is included in **Appendix B** the survey illustrates the location of the existing water plant adjacent to the site.

2.2 Design Criteria

2.2.1 Water Demands

The proposed development plan includes 91 residential units, as well as some commercial space on the first floor. 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:

- ICI Average Day Demand 2500 l/m^2/day
- ICI Peak Daily Demand 3750 l/m^2/day
- ICI Peak Hour Demand 6750 l/m^2/day
- 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 0.74 l/s
- Maximum Day 1.64 l/s
- Peak Hour 3.48 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.

	Richmond Connection	Tweedsmuir Connection
Minimum HGL	108.7	108.7
Maximum HGL	114.9	114.9
Max Day + FireFlow (133.3 L/s)	110.0	104.4

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 8,000 l/min or 133.3l/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 a connection to both Tweedsmuir and Richmond mains for redundancy purposes. 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 108.7m – meter elevation (assumed to be 1m above level P1) 63.06m = 45.64m or 447.46 kPa which exceeds the minimum requirement of 276 kPa. The pressure on the top floor can be estimated as 108.7m – 92.58m = 16.12m or 158.1 KPa which is below the minimum of 276 kPa and will require a water pump.

Fire Flow – On Richmond Rd, the max day plus fire flow can be estimated as HGL 110.0 – ground floor 67.47 = 42.53m or 417.2 KPa which exceeds the minimum of 140kPa. On Tweedsmuir Ave, the max day plus fire flow can be estimated as HGL 104.4 – 67.47 = 36.93m or 362.3 KPa which also exceeds the minimum of 140kPa.

Max HGL (High Pressure Check) – The high-pressure check can be estimated as HGL 114.9 – lowest level) 55.66 = 59.24m or 580.8 KPa which exceeds the maximum of 552 kPa, therefore a pressure reducing valve is required.

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 Richmond Road and Tweedsmuir Ave, which provide servicing to the existing properties. A survey of the subject parcel was completed by Farley, Smith, Denis Surveying Ltd. and is included in **Appendix B** the survey illustrates the location of the existing sanitary sewers adjacent to the site.

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]
- Retail Flow — 5 l/m^2/d
- Restaurant Flow — 125 l/seat/d
- 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 sewers to service the development. It is proposed to abandon the existing services for 372 Tweedsmuir, and 249-255 Richmond, in accordance with City of Ottawa specifications. 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 development is a mixed use development designed to provide a higher density meet this City objective of more intensification to maximize use of existing infrastructure. 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 would have been designed based on commercial sewage loading of 50,000l/Ha/d and infiltration allowance of 0.28l/s/Ha, for the 0.21 Ha site would result in an average flow of 0.185l/s.

Avg commercial flow: 50,000l/Ha/d X 0.216Ha=18,000l/d = 0.125 l/s

Infiltration allowance: 0.216Ha X 0.28l/s/Ha = 0.060 l/s,

Original avg. design flow, 0.125 + 0.060 = 0.185 l/s

The proposed mixed-use development includes residential and commercial uses. Based on the previously noted flow rates of 280 l/p/d for residential, 5 l/m^2/d for retail, and 125 l/seat/d for the restaurant portion, the average waste water flow plus infiltration allowance calculates to 0.71l/s, as noted below:

Avg pop flow: 164 (91 units @ 1.8ppu) X 280 l/p/d = 45,920 l/d = 0.53 l/s

plus 5 l/m^2/d X 407m^2 = 2,035 l/d = 0.024 l/s,

and 125 l/seat/d X 60 seats = 7500 l/d = 0.087 l/s

avg flow = 0.53+0.024+0.087 = 0.641 l/s

Infiltration allowance: 0.216Ha X 0.33l/s/Ha = 0.071 l/s,

Rezoned avg flow, 0.641 + 0.071 = 0.712 l/s

The proposed redevelopment results in a theoretical increase in average flow to the downstream system of 0.712-0.185= 0.527 l/s. The sanitary service connection is to an existing 375mm dia sanitary sewer which discharges into the 1500 mm dia West Nepean Collector at the end of Tweedsmuir Ave, and we anticipate that given the size of these sewers that there is ample available capacity to accommodate the proposed redevelopment. 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

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:

Tweedsmuir Avenue, Storm: 1200mm Conc (Install 2002)

Richmond Road, Storm: 375mm PVC (Install 2004)

Stormwater Management:

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 system.

Stormwater management criteria (Quality Control):

Include a section in the SWM report concerning quality control requirements. It is the consultant's responsibility to check with the relevant Conservation Authority for quality control issues and include this information in the SWM report.

As noted above there is a 1200 mm diameter storm sewer along Tweedsmuir Ave and a 375mm diameter storm sewer along Richmond Road, both sewers 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 Farley, Smith, Denis Surveying Ltd. and is included in **Appendix B** the survey illustrates the location of the existing storm sewers adjacent to the site.

4.2 Design Criteria

As 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=0.5.

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 roof drains will be routed inside the building via the mechanical plumbing systems and directed to the building cistern located adjacent to the north east corner of the building. Two landscaped areas will be serviced by rear yard 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 a outlet for the building foundation drain.

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 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 within the cistern.

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 0.012 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 0.218 Ha site as noted previously is limited to the 2yr flow with C-=0.5

$\mathbf{Q_{restricted}}$ = **2.78** x **C** x $\mathbf{i_{2yr}}$ x **A** where:

C = **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

$\mathbf{Q_{restricted}}$ = **23.28l/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 three 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

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

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

A_1 = Uncontrolled Area = 0.007 Ha, C_{100} =1.0, Q_1=3.47l/s

A_2 = Uncontrolled Area = 0.005 Ha, C_{100} =0.25, Q_2=0.97l/s

Therefore, the uncontrolled release rate can be determined as:

$Q_{uncontrolled}$ = **3.47+0.97= 4.27L/s**

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

$Q_{max\ allowable}$ = $Q_{restricted} - Q_{uncontrolled}$

= 23.28 L/s – 4.27 L/s = **19.02 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, no roof top or surface storage will be employed. 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. The Modified Rational Method was used to identify the required storage, the MRM spreadsheet in **Appendix D** identifies the required storage to accommodate the 1:100yr and 1:2yr events. The following table summarizes the on-site storage requirements during both the events.

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 & Deck	0.206	70	19.02	60.8	19.02	12.35
Unrestricted	0.012		4.27		3.40	
TOTAL	**1.555**	**70**	**23.28**	**60.80**	**22.42**	**12.35**

In all instances the required storage is met with the building cistern.

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 23.28 l/s. Restricted stormwater will be contained onsite by the building 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 storm service lateral is blocked, an emergency overflow from the building cistern to the street will be provided.

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 or exposed drive lanes are proposed. Surface 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 prior to being flushed into the minor pipe system. The underground garage extends beyond the above grade building at the cistern location allowing for a maintenance hole exterior to the building to facilitate the use of a vacuum truck to clean out any debris/sediment from the tank 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

Paterson Group was retained to prepare a geotechnical investigation for the proposed development. The objectives of the investigation were 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.

The geotechnical report PG5946-1 rev 2, "Geotechnical Investigation 249, 255 Richmond Road and 372 Tweedsmuir Ave." dated September 24, 2021. A copy of the report has been included with the ZBA application. The report contains recommendations for building construction and site services, which include but are not limited to the following for site servicing:

- At least 300 mm of OPSS Granular A should be used for pipe bedding for sewer and water pipes. The bedding should extend to the spring line of the pipe. Cover material, from the spring line to at least 300 mm above the obvert of the pipe, should consist of OPSS Granular A or Granular B Type II with a maximum size of 25 mm. The bedding and cover materials should be placed in maximum 225 mm thick lifts compacted to 99% of the material's standard Proctor maximum dry density.
- The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the material's SPMDD
- Long term groundwater level is expected to range between 5 to 7m below grade
- No Grade raise restrictions were noted.

MATERIAL	Layer Thickness
• **Access Lanes**	
• Asphalt Wearing Course (Superpave 12.5)	• 40 mm
• Asphalt Binder Course (Superpave 19.0)	• 50 mm
• Well Graded Granular Base Course (Granular 'A')	• 150 mm
• Well Graded Granular Sub-Base Course (Granular 'B' Type II)	• 300 mm

A topographic survey of the subject parcel was completed by Farley, Smith, Denis Surveying Ltd. and is included in **Appendix B** the survey illustrates spot elevations within and along the perimeter of the site. The topo survey reveals the high point on the site is where the property lines along Richmond Road and Tweedsmuir Ave. intersect. Along the Richmond Road frontage, the elevation drops 0.28m across the 61m frontage for an average slope of 0.46%, along Tweedsmuir Ave frontage, the elevation drops 2.05m across 57m frontage for an average slope of 3.6%. To take advantage of the drop in elevation along Tweedsmuir the ramp to the underground parking was located along that frontage. To deal with the elevation drop across Tweedsmuir Ave.and provide barrier free access at the various entrances the ground floor Finished Floor elevation drops from 67.47 for the retail entrances along Richmond Road, to 66.47 for the tower lobby, and 66.30 for the low rise entrance. 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

https://ibigroup.sharepoint.com/sites/Projects1/135883/Internal Documents/6.0_Technical/6.04_Civil/01_Brief/CTR-adequacy-pblc-srvcs-2020-10-21.docx\

APPENDIX A

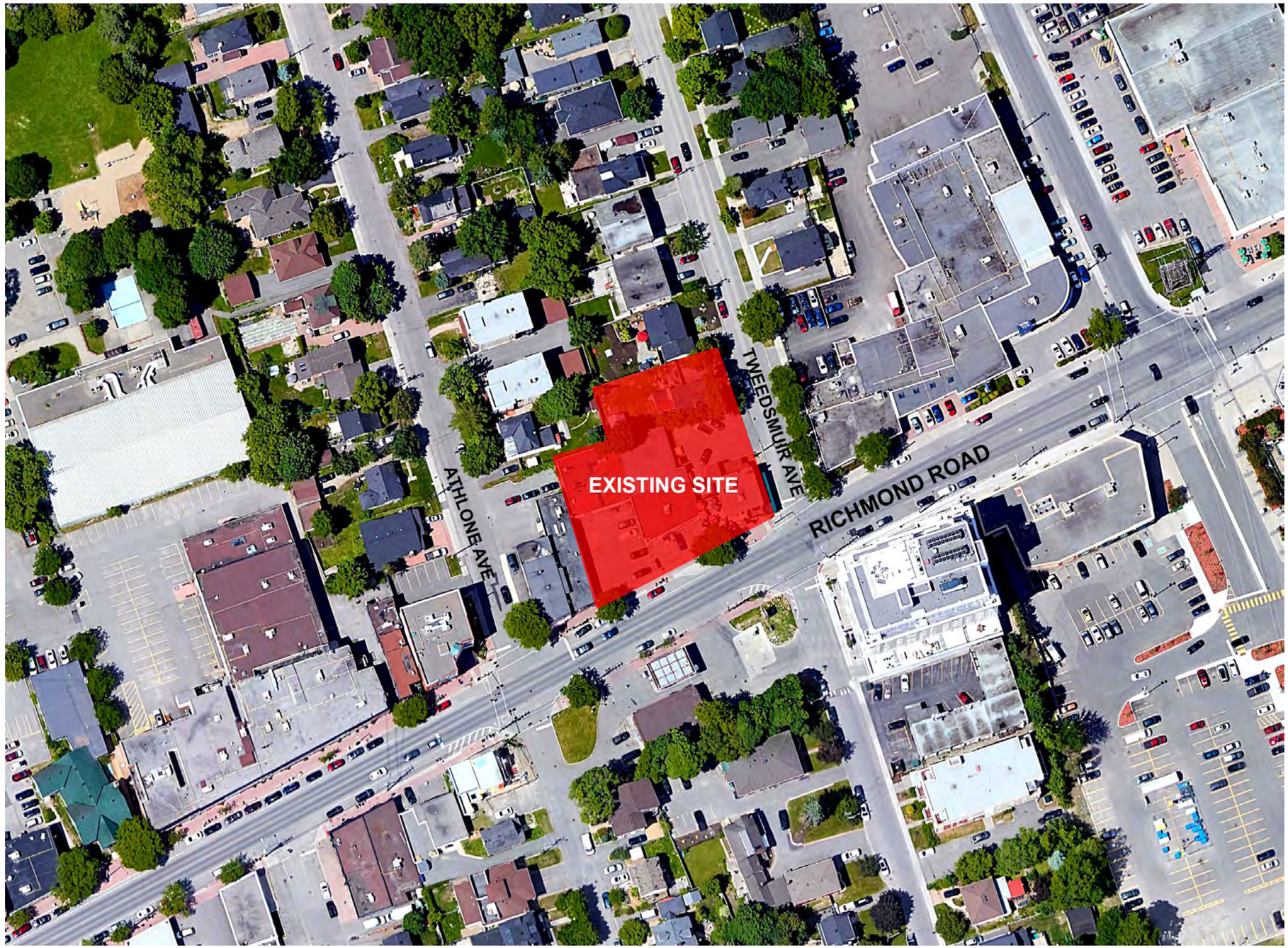
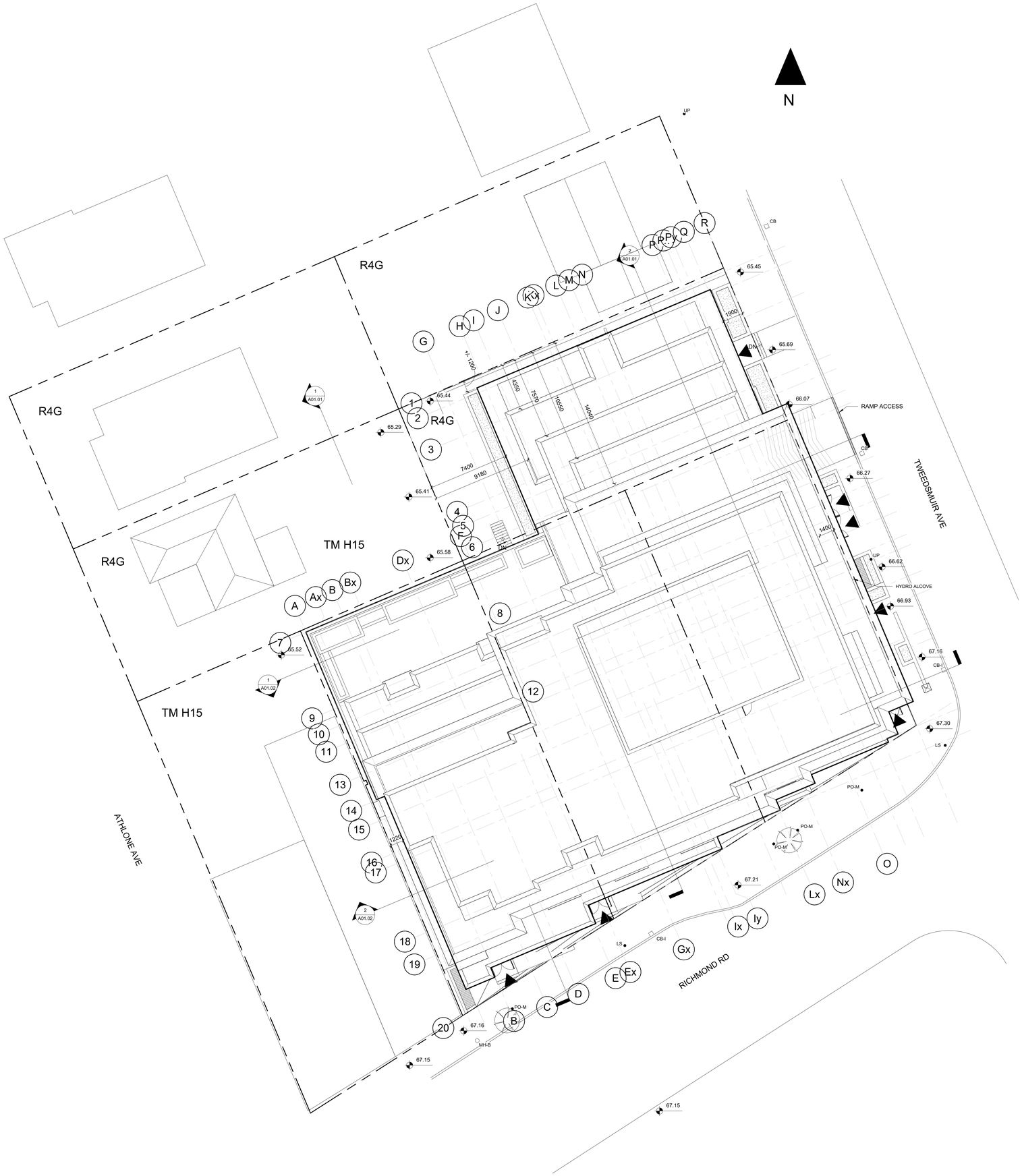


Figure 1

255 Richmond Road



No.	DESCRIPTION	DATE	CHD

REVISIONS

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE THE DRAWINGS

THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE ARCHITECT.

DATE 05/09/21

DRAWN Author

DATE 05/09/21

CHECKED Checker

DATE PRINTED 2021-10-14 12:59:42 PM

VINCENT P. COLIZZA ARCHITECT INCORPORATED

255 Richmond Road

Ottawa, ON

DWG. TITLE

SITE PLAN

SCALE 1 : 150

DWG. NO. A01.00

PROJ. NO. 2219

255 Richmond Road – Infrastructure Notes

Available Infrastructure:

Tweedsmuir Avenue:
Sanitary: 375mm PVC (Install 2002)
Storm: 1200mm Conc (Install 2002)
Water: 150mm PVC (Install 2001)

Richmond Road
Storm: 375mm PVC (Install 2004)
Water: 300mm PVC (Install 2004)

Water Boundary Conditions:

Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and submit Fire Flow Calculation Sheet per FUS method with the request:

- Location of service
- Type of development and amount of required fire flow (per FUS method – include FUS calculation sheet with request)
- Average Daily Demand (l/s)
- Maximum Hourly Demand (l/s)
- Maximum Daily Demand (l/s)
- Water Supply Redundancy – Fire Flow:
  Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

Water services larger than 19 mm require a Water Data Card. Please complete card and submit.

Stormwater Management:

- 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 system.

Stormwater management criteria (Quality Control)

Include a section in the SWM report concerning quality control requirements. It is the consultant's responsibility to check with the relevant Conservation Authority for quality control issues and include this information in the SWM report.

Noise Study:

- Noise study required – property fronts an Arterial Road (Richmond Road).

Phase I and Phase II ESA:

- Phase I ESA is required; Phase II ESA may be required depending on the results of the Phase I ESA. Phase I ESA must include an EcoLog ERIS Report.
- Phase I ESA and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Required Studies

- Servicing and Stormwater Management Report
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)
- Noise Study

Required Plans

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with grading plan)

Relevant information

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications
2. Servicing and site works shall be in accordance with the following documents:
   - ⇨ Ottawa Sewer Design Guidelines (October 2012)
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
   - ⇨ City of Ottawa Accessibility Design Standards (2012)
   - ⇨ Ottawa Standard Tender Documents (latest version)
   - ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. Any proposed work in utility easements requires written consent of easement owner.

APPENDIX B

363499, 5028479

TOPOGRAPHIC PLAN OF SURVEY OF

PART OF LOT 4
AND ALL OF LOTS 5, 6 & 42
REGISTERED PLAN 263
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2020

Scale 1: 150

0 1.5 3 6 9 12 15 metres

Metric Note

Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99996.

Bearing Note

Bearings are grid, are referred to the Easterly limit of Athlone Avenue having a bearing of N 22° 48' 00" W as shown on Plan 4R-29565 and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

Elevation Notes

1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978. (FSD File 246-16)
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 on this drawing.

Utility Notes

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: E-04-15, 3378p&p02 & 13695p&p12.
4. Sanitary and storm sewer grades and inverts were compiled from: Field measurement and City of Ottawa plans.
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

Denotes

□	=	Survey Monument Planted
■	=	Survey Monument Found
SIB	=	Standard Iron Bar
SSIB	=	Short Standard Iron Bar
IB	=	Iron Bar
CC	=	Cut Cross
CP	=	Concrete Pin
(Wit)	=	Witness
Meas	=	Measured
(P1)	=	Registered Plan 263
(P2)	=	Plan 5R-10274
(P3)	=	Plan 4R-15898
(P4)	=	Plan 4R-29565
(P5)	=	Plan by (857) dated December 10, 1991 (Ref. No. 21-263 NP)
(P6)	=	Plan by (647) dated April 22, 1965
(P7)	=	Plan by (1692) dated January 9, 2019 (File No. 272-18)
(P8)	=	Plan by (1692) dated August 27, 2014 (File No. 160-14)
○ MH-ST	=	Maintenance Hole (Storm)
○ MH-S	=	Maintenance Hole (Sanitary)
○ MH-B	=	Maintenance Hole (Bell)
⊕ VC	=	Valve Chamber (Watermain)
———	=	Underground Storm Sewer
———	=	Underground Sanitary Sewer
———	=	Underground Water
———	=	Underground Power
———	=	Underground Gas
———	=	Underground Bell
———	=	Overhead Wires
○ UP	=	Utility Pole
○ AN	=	Anchor
○ LS	=	Light Standard
□ CB	=	Catch Basin
□ CBI	=	Catch Basin Inlet
⊕ WV	=	Water Valve
⊕ SP	=	Water Stand Post
⊕ GV	=	Gas Valve
⊕ GM	=	Gas Meter
△ S	=	Sign
⊟	=	Gate
○ PO-W	=	Wood Pole
○ PO-M	=	Metal Pole
○ M-W	=	Monitoring Well
□ AC	=	Air Conditioner
Ø	=	Diameter
CLF	=	Chain Link Fence
BF	=	Board Fence
PF	=	Picket Fence
CRW	=	Concrete Retaining Wall
TRW	=	Timber Retaining Wall
Inv.	=	Invert
Inv(City)	=	Invert From City of Ottawa Plans
T/G	=	Top of Grate
U/Eave	=	Underside of Eave
TpFdn	=	Top of Foundation
C/L	=	Centreline
+65.00	=	Location of Elevations
+65.00	=	Top of Concrete Curb/Wall Elevation
———	=	Property Line
	=	Deciduous Tree
	=	Coniferous Tree

Detail 'A' Scale 1:25

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 the 3rd day of September, 2020.

Sept. 10/20
Date

Daniel Robinson
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2130264

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

FARLEY, SMITH & DENIS SURVEYING LTD.

ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS

190 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J5
TEL. (613) 727-8226 FAX. (613) 727-1826

FILE No. : 394-20

J:\2020\394-20_249-255 Richmond Rd_372 Tweedsmuir Ave_topo\Final\394-20_249-255 Richmond Rd_372 Tweedsmuir Ave_Lts 4,5,6 and 42 RP263_T_F.dwg

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : 255 Richmond Road
LOCATION : 255 Richmond Road
DEVELOPER :

FILE: 135883.6.04
DATE PRINTED: 15-Sep-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			91	164			645	0.53	0.21	0.74	1.33	0.31	1.64	2.92	0.56	3.48	133.3

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	8,000 l / min

Samantha Labadie

From: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Sent: Thursday, October 7, 2021 1:41 PM
To: Samantha Labadie
Subject: RE: 255 Richmond - Boundary Conditions Request
Attachments: 255 Richmond Road October 2021.pdf

Hi Samantha,

The following are boundary conditions, HGL, for hydraulic analysis at 255 Richmond Road (zone 1W) assumed to be connected to the 305 mm watermain on Richmond Road and the 152 mm on Tweedsmuir Street (see attached PDF for location).

Both Connections

Minimum HGL: 108.7 m

Maximum HGL: 114.9 m

Max Day + FF (133.3 L/s): 110.0 m (Richmond) 104.4 m (Tweedsmuir)

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.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central 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 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

---

From: Fawzi, Mohammed
Sent: October 04, 2021 11:25 AM


Boundary Conditions for 255 Richmond Road
av. Tweedsmuir Ave.
152
249
255
Tweedsmuir Connection
ch. Richmond Rd.
305
152
ch. Richmond Rd.
av. Tweedsmuir Ave.
203
Richmond Connection
N
PRIVATE
PUBLIC
City of Ottawa

Fire Flow Requirement from Fire Underwriters Survey

Building - 9 Storey Residential

Building Floor Area (2 largest adjoining floors plus 50% of floors above up to eight)

Floors 1-2	3,292	m^2
50% Floors 3-8	3,794	
Total	7,086	m^2

Fire Flow

$F = 220C\sqrt{A}$

C	0.6		C =	1.5	wood frame
A	7,086	m^2		1.0	ordinary
				0.8	non-combustile
F	11,111	l/min		0.6	fire-resistive
Use	11,000	l/min			

Occupancy Adjustment

			-25%	non-combustile
			-15%	limited combustile
Use	0%		0%	combustile
			+15%	free burning
Adjustment	0	l/min	+25%	rapid burning
Fire flow	11,000	l/min		

Sprinkler Adjustment

			-30%	system conforming to NFPA 13
			-50%	complete automatic system
Use	-30%			
Adjustment	-3300	l/min		

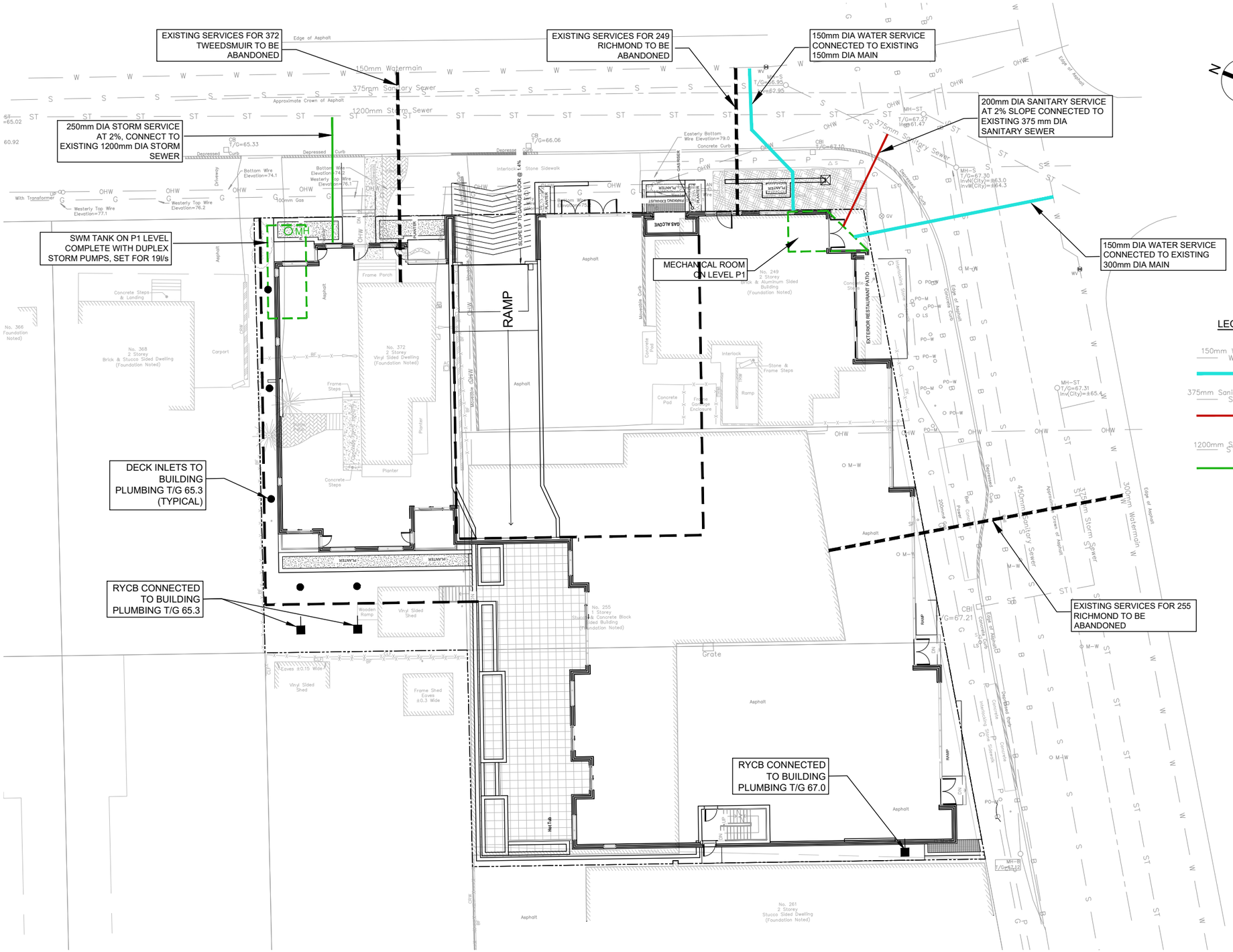
Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	2.1	Lower elevation			0%
east	19	Lower elevation			0%
south	31	Lower elevation			0%
west	1.3	Lower elevation			0%
Total					0%

Adjustment - l/min

Required Fire Flow

Total adjustments	(3,300)	l/min
Fire flow	7,700	l/min
Use	**8,000**	**l/min**
	133.3	**l/s**



LEGEND:

- 150mm Watermain W — EXISTING WATERMAIN c/w DIAMETER
- PROPOSED WATERMAIN SERVICE
- 375mm Sanitary Sewer S — EXISTING SANITARY SEWER c/w DIAMETER
- PROPOSED SANITARY SERVICE
- 1200mm Storm Sewer ST — EXISTING STORM SEWER c/w DIAMETER
- PROPOSED STORM SERVICE

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	255 RICHMOND ROAD	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

255 Richmond
CITY OF OTTAWA
Y Street Capital

LOCATION				RESIDENTIAL									ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA w/ Units	UNIT TYPES			AREA w/o Units	POPULATION		PEAK FACTOR	PEAK FLOW	AREA						ICI PEAK FACTOR	PEAK FLOW	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	(Ha)	SF	TH	MD	(Ha)	IND	CUM		(L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	RETAIL (m2) IND	RETAIL (m2) CUM	REST. (S) IND	REST. (S) CUM		(L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
	Proposed Sanitary			0.15			91		164	164	4.00	2.12	0.00	0.00	407	407	60	60	1.50	0.17	0.216	0.216	0.07	0.00	0.00	2.36	48.39	7.40	200	2.00	1.492	46.03	95.12%

Design Parameters:

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

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

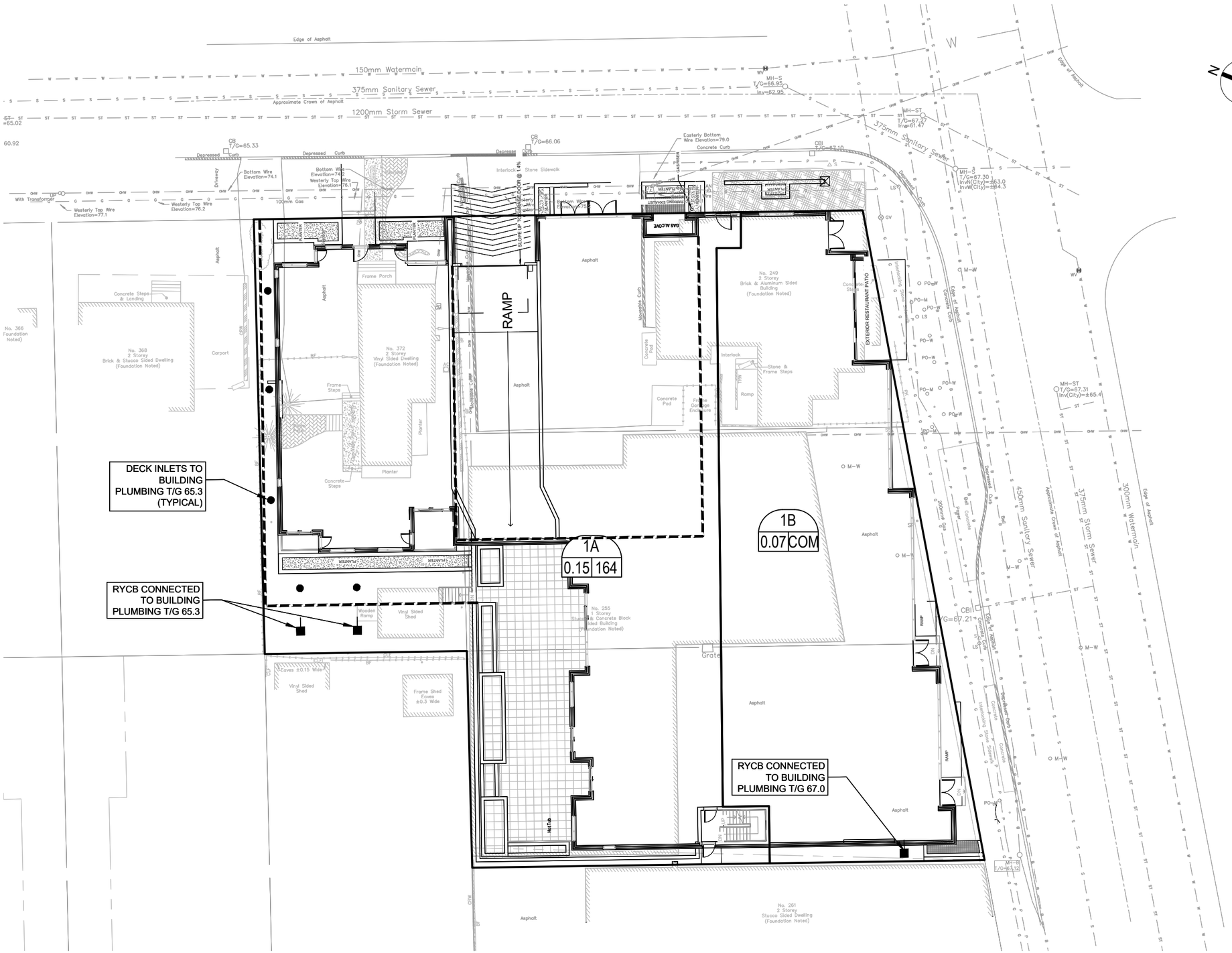
Designed: D.G.Y.

Checked: D.G.Y.

Dwg. Reference:

No.	Revision	Date
1.	Adequacy of Public Services Report	2021-10-21

File Reference: 135883.6.04.04 | **Date:** 2021-10-20 | **Sheet No:** 1 of 1



A:\158855_255_Richmond\7.0_Production\7.03_Design\04_Civil_Land\Adequacy Report\Sheet Set\Figure 4.1 CONCEPTUAL SANITARY TRIBUTARY AREA PLAN.dwg Plotted At: 10/21/2021 5:27 PM Last Saved By: ddore Last Saved At: Oct. 21, 21

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	255 RICHMOND ROAD	CONCEPTUAL SANITARY TRIBUTARY ARE PLAN	Figure 4.1

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

255 Richmond
CITY OF OTTAWA
Y Street Capital

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW													SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	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				0.004							0.206		0.52	0.52	10.00	0.09	10.09	76.81	104.19	122.14	178.56	39.80	53.99	63.29	92.53		39.80	87.74	9.60	250			2.00	1.731	47.94	54.64%

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: D.G.Y.

Checked: D.G.Y.

Dwg. Reference:

No.	Revision	Date
1.	Assessment of Adequacy Report	2021-10-21

File Reference: 135883.6.04.04
Date: 2021-10-20
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: 255 Richmond
DATE: 08/09/2021
FILE: 135883 6.04.04
REV #: 1
DESIGNED BY: A.Z.
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
$i2_{yr}$ =	76.81	mm/hr
A_{site} =	0.218	Ha

$Q_{restricted}$ =	23.28	L/s

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

Grass area

C =	0.32	
T_c =	10	min
i_{100yr} =	178.56	mm/hr
$A_{uncontrolled}$ =	0.005	Ha

$Q_{uncon\ grass}$ =	0.79	L/s

hard surface area

C =	1.00	
T_c =	10	min
i_{100yr} =	178.56	mm/hr
$A_{uncontrolled}$ =	0.007	Ha

$Q_{uncon\ hard}$ =	3.47	L/s

$Q_{uncontrolled\ total}$ =	4.27	L/s

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

$Q_{max\ allowable}$ =	19.02	L/s

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

Drainage Area	***Roof & Decks***		
Area (Ha)	0.206		
C =	1.00	Restricted Flow Q_r (L/s)=	19.02

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)***
22	112.88	64.68	19.02	45.66	60.273
24	106.68	61.12	19.02	42.11	60.632
26	101.18	57.97	19.02	38.96	**60.772**
28	96.27	55.16	19.02	36.15	60.726
30	91.87	52.64	19.02	33.62	60.519

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	60.77		70.00	0.00

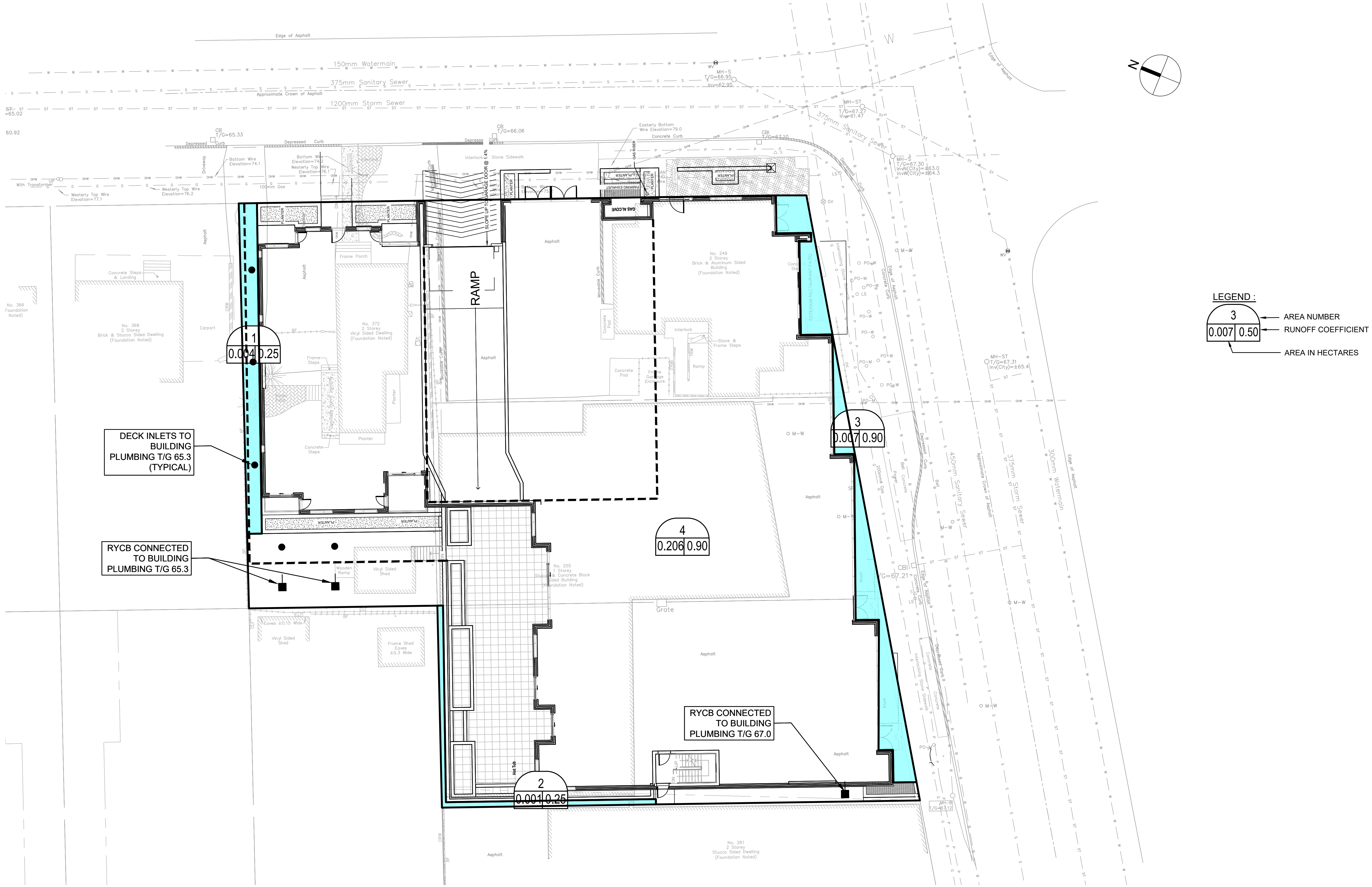
Drainage Area	***Roof & Decks***		
Area (Ha)	0.206		
C =	0.90	Restricted Flow Q_r (L/s)=	19.02

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)***
8	85.46	44.07	19.02	25.05	12.02
10	76.81	39.61	19.02	20.59	12.35
11	73.17	37.73	19.02	18.71	**12.35**
12	69.89	36.04	19.02	17.03	12.26
14	64.23	33.12	19.02	14.11	11.85

Storage (m^3)

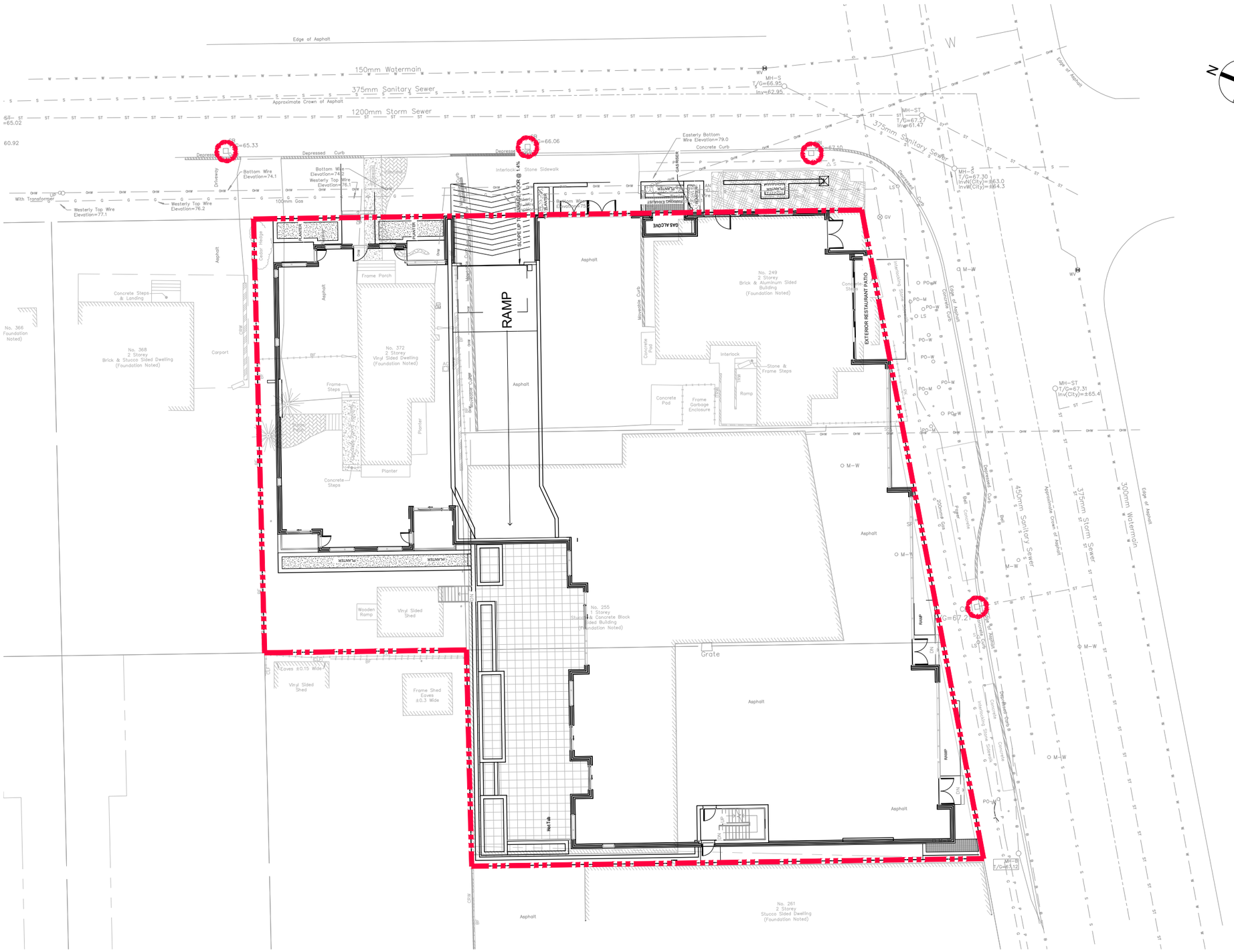
Overflow	Required	Surface	Sub-surface	Balance
0.00	12.35		70.00	0.00



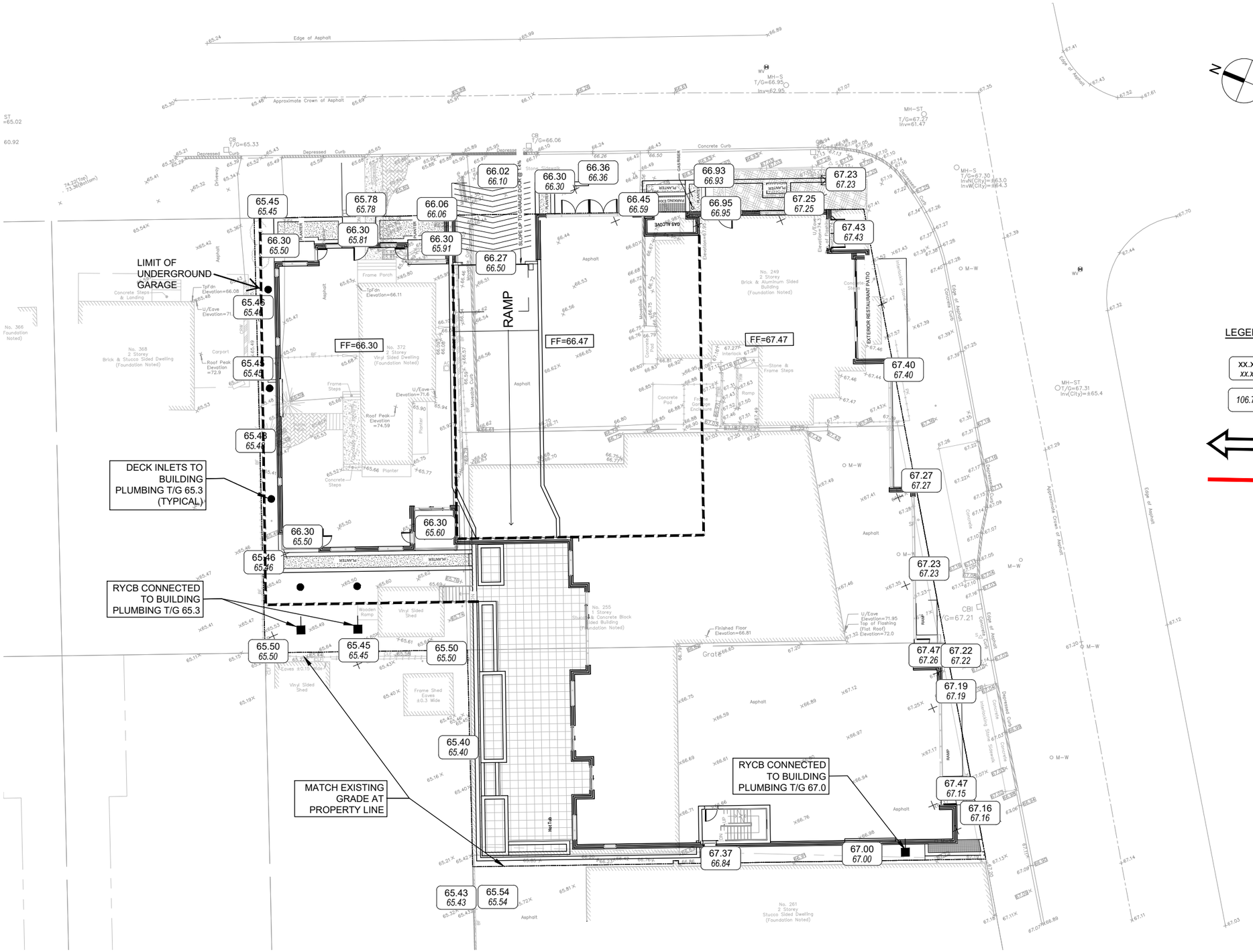
IBI

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	255 RICHMOND ROAD	CONCEPTUAL STORM TRIBUTARY AREA PLAN	Figure 3.1

APPENDIX E



Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	255 RICHMOND ROAD	CONCEPTUAL SEDIMENT AND EROSION CONTROL PLAN	Figure 6.1



A:\135883_255_Richmond\7.0_Production\7.03_Design\04_Civil_Land\Adequacy Report\Sheet Set\Figure 7.1 CONCEPTUAL MACRO GRADING.dwg Plotted At: 10/21/2021 5:27 PM Last Saved By: ddore Last Saved At: Oct. 21, 21

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	255 RICHMOND ROAD	CONCEPTUAL MACRO GRADING	FIGURE 7.1