120228 – 5.2.2

SERVICING BRIEF
250 BESSERER STREET

City of Ottawa

Prepared for 250 Besserer Ltd. Partnership
by IBI Group
May 9, 2019

Table of Contents

1 Introduction

1.1 Synopsis

IBI Group Professional Services Inc. (IBI Group) has been retained by 250 Besserer Ltd. Partnership to provide civil engineering services for the lands at 250 Besserer Street. The subject lands are located in Ward 12 (Rideau-Vanier) within the City of Ottawa. The site is currently zoned R5B [483] H(19), as per the City of Ottawa geoOttawa. A topographic survey and legal plan for the subject lands was provided by legal surveyor AOV (Annis, O'Sullivan, Vollebekk Ltd.) on registered plan 6, lot 12 and part of lot 13, included in **Appendix A** of this brief. The site is bound by Besserer Street to the north, existing 2 storey brick dwelling and high density residential to the east, existing medium density residential to the south and King Edwards Avenue to the west. Refer to **Figure 1** below for site location.

Figure 1: Site map.

The existing 3 storey commercial building is proposed to be demolished, and a new 9 storey 99 unit residential building be constructed in its place. The basement will consist of general mechanical, electrical, communications and storage area. The ground level floor will consist of general amenity area, including fitness room, lounge, lobby and universal washroom. The main floor also provides a main entrance to Besserer Street, and secondary exit is provided to Besserer

Street and to an accessible walkway parallel to King Edward Avenue. The main level also includes covered visitor parking, which consists of 1 accessible parking space, and 8 standard parking spaces. The parking area is covered by units and private terraces above. The first floor consists of 2-two bedroom and 9-one bedroom units, with a private terrace provided to the 5 south facing units. The second to ninth floors each consist of 2-two bedroom and 9-one bedroom units. The total number of residential units for the building is 99, of which 18 units are two bedroom and 81 units are one bedroom. The penthouse consists of additional mechanical and a common rooftop terrace. Refer to Architectural Site Plan, prepared by Hobin Architects in **Appendix A**.

1.2 Pre-consultation

A pre-application consultation meeting was held with members of the design team, site planners (Fotenn), site Architects (Hobin Achitecture Incorporated) and the City of Ottawa staff. IBI also had discussions with a City of Ottawa Development Approvals Project Manager to discuss and review site servicing constraints. Correspondence with City staff has been provided in **Appendix A**.

The city advised that there was no water or waste water servicing constraints from the subject lands. A standard infill development stormwater management target is being applied for this development.

2 Water Supply

2.1 Existing Conditions

The subject lands currently contain a 3 storey commercial building. The subject lands has frontage on King Edward Avenue and Besserer Street. Both streets have water distribution service readily available. The subject lands location is in City's water pressure zone 1W.

A 400mm diameter watermain exists on King Edwards Avenue between Daly Avenue and Besserer Street. The watermain is located adjacent to the east most curb.

A 400mm diameter watermain exists on Besserer Street between Nelson Street and King Edward Avenue. The watermain is located in the median of Besserer Street.

The existing building is assumed to be serviced from Besserer Street. The existing water service is to be located prior to construction and decommissioned including blanking of the existing service at the main.

2.2 Design Criteria

The following design criteria, which were extracted from the City's Water Distribution Design Guidelines, were used to estimate the water demand requirements for the site:

- Average Daily Demand (ADD) = 280 l/cap/day
- Maximum Daily Demand (MDD) = 2.5 X ADD = 700 l/cap/day
- Peak Hourly Demand = 2.5 X MDD = 1540 l/cap/day
- Fire Demand = 150 l/s (as per Fire Underwriters Survey – calculations provided in **Appendix B**)

Required Hydraulic Gradients are defined by the City of Ottawa Water Distribution Guidelines:

- Minimum – max hour 276 kPa
- Minimum – max day and fire 140 kPa
- Maximum pressure 552 kPa

A site boundary condition was provided by the City of Ottawa, and the hydraulic gradients for the site are provided below. Correspondence of the boundary conditions is provided in **Appendix B**.

- Maximum Day plus Fire Flow 104.0 m
- Minimum HGL (Peak Hour) 105.8 m
- Maximum HGL 115.0 m

The population of the building was calculated using the City of Ottawa guidelines (1.4 ppu for one-bedroom units, 2.1 ppu for two-bedroom units). Based on a building of 99 units (81 1-bd, 18 2-bd), the expected water demand for the proposed development is:

- Average Daily Demand 0.61 l/s
- Maximum Daily Demand 1.53 l/s
- Peak Hourly Demand 3.37 l/s

2.3 Hydraulic Calculation

The main level finished floor elevation for the new building will be approximately 62.45 meters. Under the Minimum HGL condition, the hydraulic head is 105.8m as provided by the City of Ottawa, the head difference to the main level is 43.35m which converts to a water pressure inside the building is 425 kPa, which exceeds the minimum requirement of 276 kPa per the City guidelines.

The minimum pressures of 276kPa are not achieved when the floor levels are higher than 28.16m below the minimum HGL. Therefore, the pressures are not achieved at elevation 77.64m. The 5th floor elevation is approximately 77.70. The minimum pressures are not provided for all levels of the building, therefore booster pumps are required, and shall be designed by a qualified mechanical engineer at building permit stage.

Under the Maximum HGL condition the water pressure is calculated for the lower level finished floor, elevation 58.97 (3.48m below main level finished floor. The head difference between maximum HGL (115m) and the lower level finished floor (58.97) is 56.03m, which equates to a water pressure of **549 kPa**, which is slightly less than the maximum allowed of 552 kPa per City guidelines. Therefore, pressure reducing valves are not required.

A required fire flow rate of 150 l/s has been determined using the methodology from the Fire Underwriters Survey (FUS) 1999, a copy of the calculation is included in **Appendix B**. The 150 l/s fire flow was provided to the City in order to determine the HGL condition for the maximum day plus fire condition as shown in **Section 2.2**. The Maximum Day plus Fire Flow head is 104m, and the Siamese connection to the building elevation is assumed to be 1.0m above the main level finished floor elevation (63.45), the head difference is 40.55, which equates to an available pressure of **397 kPa**, which exceeds the minimum of 140 kPa per City guidelines. Accordingly, there will be sufficient fire flow pressure available for the site.

2.4 Proposed Water Plan

The basic demand for the building is calculated using a residential demand of 280l/day/pop to coincide with current City of Ottawa waste water design criteria. This demand is less than the current water distribution guideline of 350l/day/pop, and is a result of more accurate monitored waste water flows and fixture efficiencies in new construction. The basic daily demand is 0.49 l/s as calculated on the water demands calculation sheet found in **Appendix B.** This demand converts to 42.3m3 per day. Since the total basic day demand for this building is less than 50 cubic metres per day, the building only require 1 service. The new service is proposed to be a single 200 mm diameter water services Besserer Street, connecting to the existing main with a TVS connection. A mechanical room is proposed on the north side of the building adjacent to Besserer Street. Each lateral will have a shutoff valve box located at the property line. The water meter will be installed on the single water service line in the mechanical room. The proposed watermain location is shown on the site servicing plan, drawing **C-100** which is located in **Appendix A**.

3 Waste Water Disposal

3.1 Existing Conditions

The subject lands current contain a 3 storey, commercial building. The subject lands has frontage on King Edward Avenue and Besserer Street. Both streets have waste water services readily available.

A 375mm diameter sanitary sewer exists on King Edwards Avenue between Daly Avenue and Besserer Street.

A 300mm diameter sanitary sewer exists on Besserer Street between Nelson Street and King Edward Avenue.

Both aforementioned sewers connect at the intersection of King Edward Avenue and Besserer Street. The system flows north away from the site, and discharge into the Ottawa Main Interceptor Sewer, which conveys waste water to the City of Ottawa R. O. Picard Waste Water Treatment facility.

In correspondence with City of Ottawa Development approvals Program Manager, no capacity restraints were noted for the subject lands.

3.2 Proposed Development

As previously mentioned, the existing property contains a 3 storey commercial building. The estimated waste water flows for the existing parcel can be estimated using the old City of Ottawa sewer design guidelines parameter of 50,000 l/day/ha. The site area is 0.091Ha. This equates to .05L/s, excluding infiltration and peaking factors.

The waste water flows from the proposed 99 unit residential apartment building can be estimated using the updated City of Ottawa sewer design guidelines parameter of 280/l/day/pop, and 1.4 persons per unit one bedroom unit and 2.1 persons per two bedroom unit. The proposed population can be estimated as (81ux1.4p) + (18ux2.1p) = 151.2 persons. This equates to a residential waste water flow of **0.49 L/s**, excluding infiltration and peaking factors.

It is assumed that the building amenity spaces are for tenant use only, and thus the waste water from the amenity spaces is offset by the residential flow.

The increase of average flow of 0.44L/s from 0.05 L/s to 0.49L/s is considered negligible on a system with no waste water constraints as identified by City staff. The proposed development can be serviced by existing infrastructure.

As typically designed, the internal plumbing will service the elevator pit, covered parking area and drive aisle, and basement level floor drains. Since these flows are very intermittent, typically very low volume, they are not considered in the waste water flows from the subject development.

The proposed building will have intake and exhaust shafts for the building mechanical and electrical systems. These two shafts consist of large upward facing grills and are not protected by a building overhang. Falling rainwater will enter the grills and must be pumped and discharged. It is proposed that the building mechanical engineer design a pump system able to discharge the 100 year flows from each to the sanitary sewer system, so as to avoid any possible contaminants being discharged to the storm sewer system.

The 100 year flow from the exhaust shaft located adjacent to King Edward Avenue can be calculated as follows:

STORM EVENT – EXHAUST SHAFT	CRITERIA AND FORMULAS
Uncontrolled Area (ha), A	0.00024Ha
Runoff Coefficient, C	1.0
Time of Concentration, Tc	10min
100yr Storm Intensity, I	$=1735.688 / (Tc + 6.014)^{0.820}$ $=1735.688 / (10 + 6.014)^{0.820}$ =178.56
Uncontrolled Flowrate, Qu	=2.78 x A x C x I =2.78 x 0.0024 x 1.0 x 178.56 =0.11 L/s

The 100 year flow from the intake shaft located adjacent to Besserer Street can be calculated as follows:

STORM EVENT – INTAKE SHAFT	CRITERIA AND FORMULAS
Uncontrolled Area (ha), A	0.00066Ha
Runoff Coefficient, C	1.0
Time of Concentration, Tc	10min
100yr Storm Intensity, I	$=1735.688 / (Tc + 6.014)^{0.820}$ $=1735.688 / (10 + 6.014)^{0.820}$ =178.56
Uncontrolled Flowrate, Qu	=2.78 x A x C x I =2.78 x 0.0066 x 1.0 x 178.56 =0.33 L/s

Therefore, a sump pump system should be designed by a Mechanical Engineer to provide discharge for the following:

For the exhaust shaft: a minimum level of service of 0.11 l/s or 1.75 USGPM.

For the intake shaft: a minimum level of service of 0.33 l/s or 5.25 USGPM.

The two shafts may be plumbed to a common pump location, providing that a minimum pump capacity of 0.44L/s or 7 USGPM is provided.

The proposed building will be serviced by connecting a new sanitary service lateral to Besserer Street. All floors above and including the ground level will gravity drain into the service, while the basement will require a pump to lift waste water to the shallow service entry. Typical backwater valves and clean-outs are required as per local Building Code.

4 Storm Water Management

4.1 Existing Conditions

The subject lands contain an existing commercial building and asphalt parking lot. The existing building is assumed to discharge, uncontrolled to the existing storm sewer on Besserer Street. The existing asphalt parking lot appears to sheet drain, uncontrolled to Besserer Street.

A 750 storm sewer exists on King Edward Avenue between Daly Avenue and Besserer Street.

A 675 storm sewer exists on Besserer Street between Nelson Street and King Edward Avenue.

Both aforementioned sewers connect at the intersection of King Edward Avenue and Besserer Street. The system flows north away from the site. The ultimate receiver of the stormwater is the Ottawa River.

In correspondence with the City of Ottawa, a stormwater management design restriction of the 5 year storm event, runoff coefficient of 0.5 and a typical time of concentration of 20 minutes is to be applied to this site.

4.2 Maximum Allowable Release Rate

4.2.1 Restricted Flowrate

As previously mentioned, the maximum allowable release rate from site can be determined by calculating the maximum restricted flowrate:

STORM EVENT	CRITERIA AND FORMULAS
Site Area (ha), A	0.0911Ha
Runoff Coefficient, C	0.50
Time of Concentration, Tc	20min
5yr Storm Intensity, I	$=998.071 / (Tc + 6.053)^{0.814}$ $=998.071 / (20 + 6.053)^{0.814}$ $=70.25$
Restricted Flowrate, Qr	$=2.78 \times A \times C \times I$ $=2.78 \times 0.0911 \times 0.50 \times 70.25$ $=8.90$ L/s

Therefore, the maximum allowable release rate from site is 8.90L/s.

4.2.2 Uncontrolled Release

As with most site plan developments, there are certain areas where drainage capture is unpractical, and these areas are left to discharge, uncontrolled from site. As a result, the uncontrolled release for the 100 year rainfall event is used for the uncontrolled areas.

STORM EVENT	CRITERIA AND FORMULAS
Uncontrolled Area (ha), A	0.0012Ha
Runoff Coefficient, C	1.0
Time of Concentration, Tc	10min
100yr Storm Intensity, I	$=1735.688 / (Tc + 6.014)^{0.820}$ $=1735.688 / (10 + 6.014)^{0.820}$ =178.56
Uncontrolled Flowrate, Qu	=2.78 x A x C x I =2.78 x 0.0012 x 1.0 x 178.56 =0.60 L/s

Therefore, the uncontrolled release from site can be quantified as 0.60L/s.

4.2.3 Maximum Allowable Release Rate

The maximum allowable release rate to the storm sewer system is the restricted flowrate less the uncontrolled release.

Qmax	=	Qr	-	Qu
Qmax	=	8.90L/s	-	0.60L/s
Qmax	=	8.30L/s		

Therefore, the maximum allowable release rate to the sewer system is **8.30L/s**.

4.3 Proposed Storm Water Management

The proposed building will consist of multilevel roof structure, including covered parking area, widened main level, and penthouse. All roof areas will be plumbed to drain to a common storm water system. As noted above, the landscape areas and perimeter areas are either left to discharge uncontrolled, or are graded in such a way to drain into on-site drains which will be routed to the building storm water system. The perimeter below grade foundation drain will drain into a pit located within the building, and a sump pump will discharge the water to the storm sewer service, immediately downstream of the control CBMH1.

The building stormwater system will convey roof and landscape area storm water to an underground storage system located beneath the main level covered drive aisle. The service entrance monitoring manhole is located just inside the property line, and will also serve as emergency overflow.

The outlet for the underground storage is to be restricted to **8.0 L/s**, by an Ipex LF inlet control device placed in the outlet of CBMH1. The hydraulic head provided for the ICD is calculated based on the top of the Soleno ® storage cell, including clear stone surround. Given this restriction, the maximum volume of 100 year flow is **26.40m³** in the 100 year event. Refer to storm water management calculations in **Appendix C**.

A Soleno ® HS75 underground storage system is proposed. The system will consist of storage beds in 2 locations. The first storage cell is a parallel row of 3 chambers each (6 total), distribution manifold with granular surround located between the southern limit of the parking area, and the approximate midpoint of the basement level. The midpoint of the building is where the proposed storm outlet is to be located for roof and landscape area drains. It will connect the proposed manhole, and a backwater valve is to be provided. The second storage cell is downstream of the manhole, and consists of a parallel row of 2 chambers each, distribution manifold and granular surround. It is located between the midpoint of the basement level and the service entrance. The total volume of storage provided in the underground storage system is **28.94m^3,** as provided by Soleno ®. Calculations and supporting documentation provided in **Appendix C.** The volume of storage provided is considered conservative, as it does not include the storage provided in the manholes and drainage pipes. The volume of storage provided in the Soleno ® Hydrostor HS75 system exceeds the volume of storage required for the subject site.

Lastly, foundation drainage is to be provided by a perimeter subdrain system discharging into a dedicated sump pit. The sump pit shall be provided with a pump, and discharge downstream of CBMH1, so as to not be restricted by the proposed inlet control device.

5 Grading

As previously noted, the proposed development is located at the intersection of Besserer Street and King Edward Avenue. Generally, the site slopes from south to north, and is recessed into the steep decline of King Edward Avenue.

The existing site consists of a paved parking lot which ties into the base of an existing retaining wall located on the lands to the south. The paved parking lot provides sheet drainage towards Besserer Street.

The proposed site will consist of a main entrance located on Besserer. This entrance will provide barrier free access to the entrance and be flush to finished floor. An exit is proposed on Besserer which will also be flush to finished floor. An alternative exit is proposed on the west side of the building. This grade at the exit is above the main level finished floor, and the transition is accommodated internally. The west exit is provided with a walkway between the King Edward Avenue and the west façade of the building. This walkway is elevated in order to provide sheet drainage from south to north, where a trench drain is proposed to collect the discharge. A retaining wall is required along King Edward Avenue, and will be continuous for the entire length of the sideyard. This retaining wall will require a guard and a structural design.

The south portion of the site consists of private terraces from the 1st floor units, above the main level and covered parking area. These terraces include a 1 step riser from grade to the finished floor, and a patio is proposed to slope away from the building. A swale is proposed in the small landscape areas with multiple landscape CB's to capture runoff. A scupper is required on the west building wall in order to provide emergency overland flow from the landscaped area. The scupper will discharge into a small treed area along King Edward, which in turn is graded to discharge into the aforementioned walkway parallel to King Edward.

Grading of the covered parking area is to be provided by the architect, in coordination with the mechanical engineer to design inlets to the waste water disposal system.

A copy of the proposed grading is included on drawing **001** in **Appendix A**.

All construction shall be in accordance with the recommendations contained within the Geotechnical Investigation report PG4821-1 prepared by Paterson Group.

6 Sediment and Erosion Control Plan

During construction existing, and proposed infrastructure can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to introduce a number of mitigative construction measures to reduce unnecessary construction sediment loadings.

These will include:

- Installation of filter sacks on catchbasins in Besserer Street, and filter cloth beneath the frame and cover of existing sanitary and storm manholes.
- Installation of construction hoarding fencing around the perimeter of the site
- Installation of a siltation barrier along the North and East property lines. This barrier may include light duty silt fence if it can practically be installed, or sand bags wrapped in filter fabric to provide a continuous barrier along hard surfaces.
- Temporary Seepage barriers in the waste water and storm control manholes.

The proposed sediment and erosion control plan drawing **900** has been included in **Appendix D.**

7 Approvals and Permit Requirements

7.1 City of Ottawa

The City of Ottawa requires all development application documents included within this report. Once satisfied with the proposed servicing, and all conditions of approval have been met, the City will issue a Commence work notification.

A water permit will be required for the new water service, for which the selected contractor will make an application to the water works department.

A road cut permit will be required for the connections on Besserer Street.

A traffic control plan shall be prepared and submitted to the City by the successful contractor.

7.2 Province of Ontario

This is a single owner property, with a new service. No additional approvals are required from the Ministry of Environment, Conservation and Parks, or the Ontario Ministry of Natural Resources and Forestry.

7.3 Government of Canada

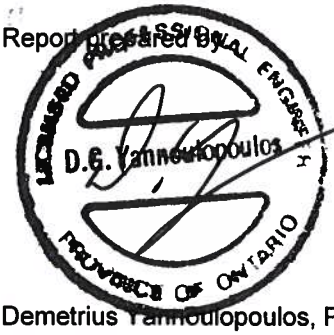
Infill development is not subject to approvals from the Government of Canada, National Capital Commission, Department of Fisheries and Oceans, or of the Ministry of Climate Change and the Environment of Canada.

8 Recommendations

Water, waste water and stormwater systems required to redevelop 250 Besserer Street are in place and constructed with adequate capacity to service the subject development.

The use of lot level controls, conveyance controls and end of pipe controls outlined in the report will result in effective treatment of surface stormwater runoff from the site. Adherence to the proposed sediment and erosion control plan during construction will minimize harmful impacts on surface water.

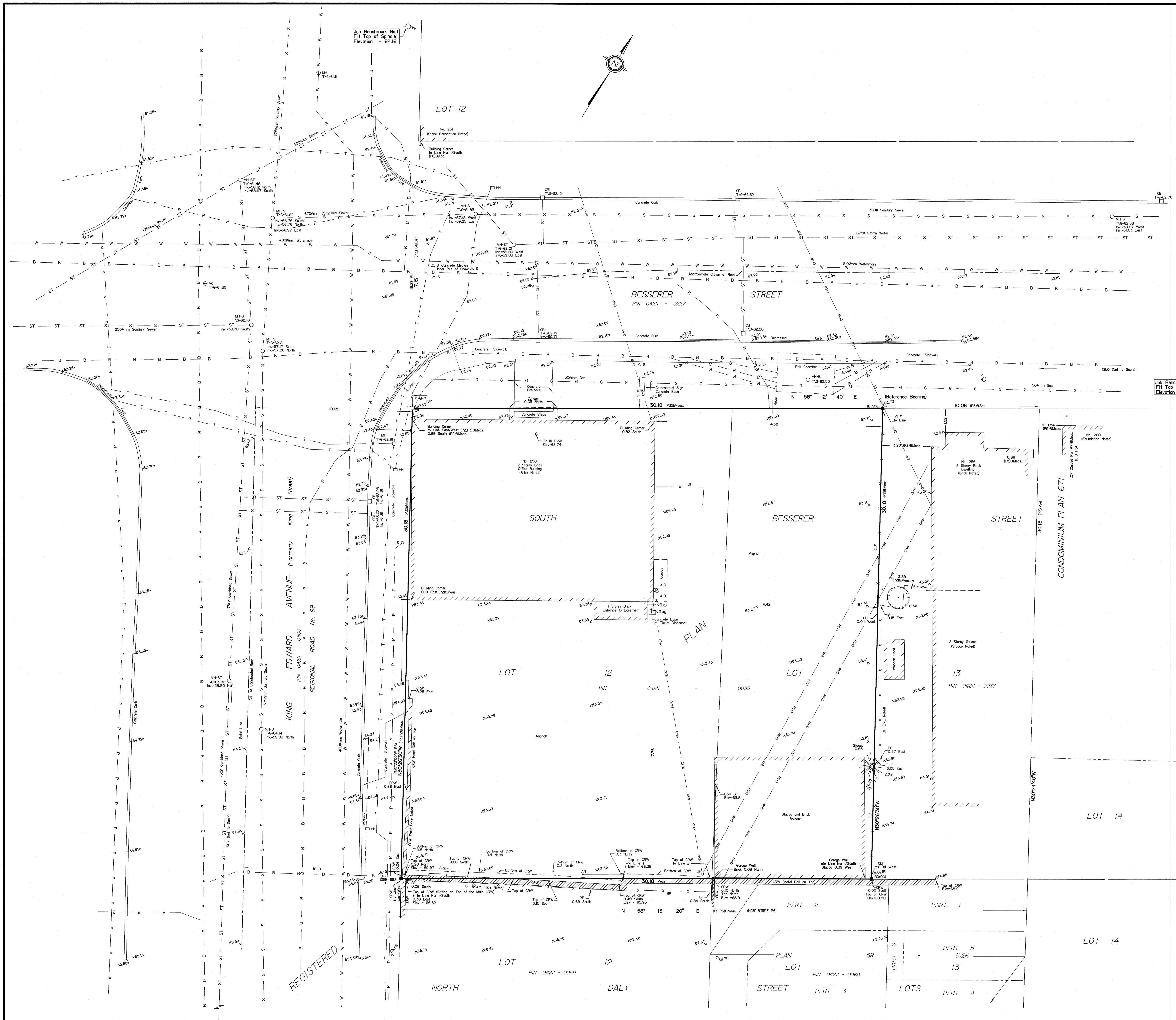
Report prepared by:



Demetrius Yannoulopoulos, P.Eng.
Director

Ryan Magladry, C.E.T.
Project Coordinator

APPENDIX A



TOPOGRAPHICAL PLAN OF SURVEY

LOT 12 AND PART OF LOT 13
SOUTH BESSERER STREET
REGISTERED PLAN 6
CITY OF OTTAWA

Scale 1 : 100

4 3 2 1 0 2 4 Metres

Metric

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

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 Land Titles Act and the regulations made under them.
2. The survey was completed on the 25th day of March, 2018.

March 27, 2019 — Date

E. H. Herweyer
Ontario Land Surveyor

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
Acc.	"	Accepted
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	"	Historically Assumed Dimensions Registered Plan 6
(P2)	"	(AOG) Plan October 12, 1993
(P3)	"	Plan 4R-18186
(P4)	"	(857) Plan August 31, 1978
(P5)	"	(AOG) Plan June 9, 2003
(P6)	"	(1692) Plan June 29, 2009
(P7)	"	Condominium Plan 671
FH	"	Fire Hydrant
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
MH	"	Maintenance Hole (Unidentified)
MH-T	"	Maintenance Hole (Traffic)
HH	"	Handhole
CB	"	Catch Basin
VC	"	Valve Chamber (Watermain)
—— ST ——	"	Underground Storm Sewer
—— S ——	"	Underground Sanitary Sewer
—— W ——	"	Underground Water
—— P ——	"	Underground Power Hydro
—— G ——	"	Underground Gas
—— OHW ——	"	Overhead Wires
—— T ——	"	Underground Traffic
CLF	"	Chain Link Fence
BF	"	Board Fence
	"	Gate
UP	"	Utility Pole
AN	"	Anchor
LS	"	Light Standard
TSP	"	Traffic Signal Post
B	"	Bollard
S	"	Sign
GM	"	Gas Meter
Ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00*	"	Top of Concrete Curb Elevation
C/L	"	Centreline
CRW	"	Concrete Retaining Wall
	"	Deciduous Tree
	"	Coniferous Tree

ELEVATION NOTES

1. Elevations shown hereon are referred to City of Ottawa Control monument OTT.71 Index No. 259 having an elevation of 70.903 metres and are referred to the CGVD28 geodetic datum.
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

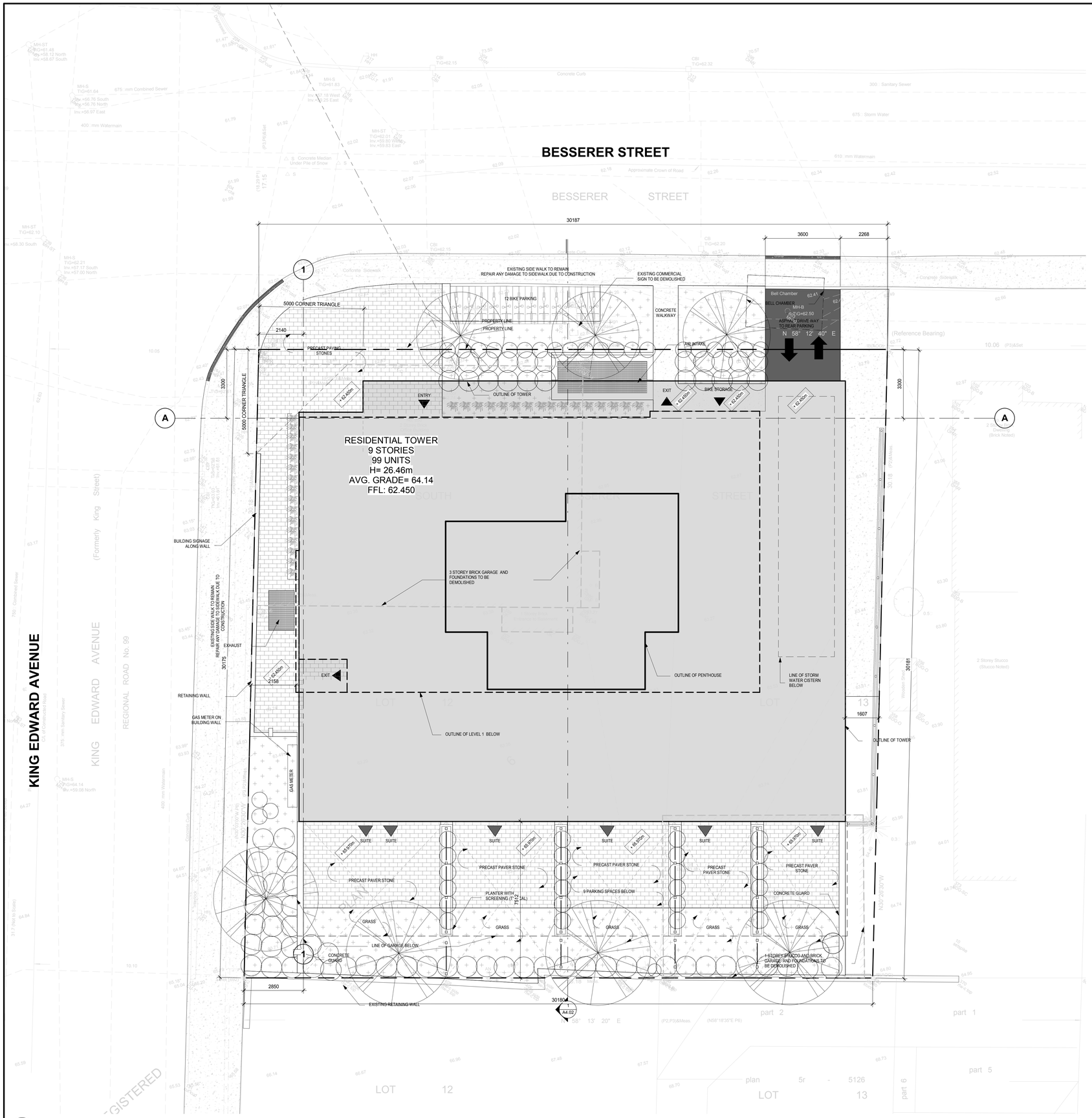
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference D-14-23 & D-14-18
4. Sanitary and storm sewer inverts were derived from City of Ottawa Plans 13506 Sheet No. 2 (Contract No. ISB04-5016) & 14908 Sheet No. 6 (Contract No. ISB07-5189)
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Bearings are grid, derived from GPS Observations and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).
For bearing comparisons, a rotation of 0°21'00" counter-clockwise was applied to bearings on plans P2 & P3.

Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.

Ontario Land Surveyors
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 17663-19 Lt12&PtLt13 PL6 T F | FS



1 A1.00 00-Site Plan
SCALE: 1 : 75

SITE DATA

LEGAL DESCRIPTION:

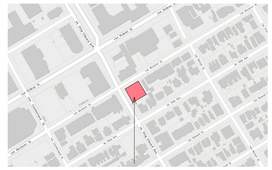
PLAN 6, LOT 12
CITY OF OTTAWA

CIVIL ADDRESS:

250 BESSERER STREET

ZONING NOTES:

OFFICIAL PLAN DESIGNATION: RESIDENTIAL FIFTH DENSITY ZONE
CURRENT ZONING: R5B [483] H(19)
ADJACENT ZONING:
SOUTH - R4T
WEST - RSF [1680] S70
NORTH - TM6 [1558] F(3.5) H(19)
EAST - R5B [483] H(21)



SITE

SURVEY DATA

BOUNDARY INFORMATION FROM ANNIS, O'SULLIVAN,VOLLEBEKK LTD.
SURVEY - 17663-19, MARCH 27, 2019.

PLEASE REFER TO LANDSCAPE PLAN FOR PAVING, PLANTING, AND SITE LIGHTING INFO.

PLEASE REFER TO SITE SERVICING AND GRADING PLAN FOR GRADING INFORMATION

ZONING DATA

ZONING TABLE		
Current Zoning	R5B[483] H(19)	
Site Area	910.8 m^2	
Dwelling Units	99 Dwelling Units	
	REQUIRED	**PROVIDED**
Lot Area	675 m^2	910.8 m^2
Lot Frontage	No minimum	1.5m
Minimum Lot Width	22.5m	30.18m
Setbacks	Front Yard: 3m Corner Side Yard: 3m Interior Side Yard: Within 21m of the front lot line: 1.5m Further than 21m from the front lot line: 6m Rearyard: 7.5m	Front Yard (Besserer): 1.5m Corner Side Yard (King Edward): 2.15m Interior Side Yard ((East): 1.6m Rearyard: 7.5m
Maximum Building Height	19m	28.76m from average grade of 64.21m
Amenity Area Total of 6m^2 per dwelling unit of which 50% is required to be communal	Total (6m2 per dwelling unit): 594m^2 Communal (50% of required total): 297m^2	**Private Amenity Space** -Private Terraces: 195m^2 **Common Amenity Space** -Groundfloor Amenity: 133m^2 -Exterior rooftop amenity: 266m^2 **Total Amenity Area: 594m^2**
Percentage of Site Landscaping	30% of Site to be landscaped	Site Area = 910.8 m2 Grade = 371 m2 Private Terrace = 195 m2 **Total = 566 m2 (62% of Site)**
Parking **Residential:** Minimum: .5 spaces/unit after first 12 units. **Residential Visitor:** Minimum: 0.1 spaces/unit after first 12 units. Maximum: 30 spaces	**Minimum Required:** Residential: (99-12) x .5 = 44 spaces Residential Visitor: (99-12 x..1) = 9 spaces	**Total Provided: 9 Spaces** Provided: 0 spaces Provided: 9 spaces
Bicycle Parking Requirements Residential: 0.5/dwelling unit	**Minimum Required:** Residential: 99 x .5 = 50 spaces required	**Total Bicycle Parking: 105 spaces** Outdoor: 38 spaces Indoor: 61 spaces City Property: 12 spaces **Total: 111 spaces (12 spaces on City property)**

UNIT MIX DATA

	BACH	1BED	1+DEN	2 BED	2+DEN / 3 BED	Guest Suite	
GROUND							0
LEVEL 1	2	7		2			11
LEVEL 2	2	7		2			11
LEVEL 3	2	7		2			11
LEVEL 4	2	7		2			11
LEVEL 5	2	7		2			11
LEVEL 6	2	7		2			11
LEVEL 7	2	7		2			11
LEVEL 8	2	7		2			11
LEVEL 9	2	7		2			11
TOTAL							99

BACH	1BED	1+DEN	2 BED	2+DEN / 3 BED	Guest	
18	63	0	18	0	0	99

Gross Building Area - per OBC Definition
Total area of all floors above grade taken to the exterior face of the exterior wall.

Level 1 464 sq.m.
Level 2-9 3712 sq.m.
Roof Top 55 sq.m.

Total : 4231 sq.m.

GFA - per City Definition:
Gross floor area means total area of each floor, above and below grade, measure to interior of exterior walls. Including floor area occupied by interior walls.
Excluding: Mechanical, electrical, common hallways, corridors, stairwells, shafts, voids, bike parking, car parking, common laundry, storage, common washrooms, amenity or play areas and living quarters for a caretaker of the building.

Basement Level 1 0 sq.m.
Groundfloor 0 sq.m.
Level 1 427 sq.m
Level 2-9 3416 sq.m
Roof Top 0 sq.m.

Total : 3843 sq.m

Note: all existing site information as per site survey plan dated September 16, 2015 and prepared by STANTEC GEOMATICS ltd. Ref No. 161613350-310

no.	date	revision

Hobin Architecture Incorporated

63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7

T: 613-238-7200
F: 613-235-2005
E:mail@hobinarc.com

hobinarc.com

HOBIN ARCHITECTURE

PROJECT
250 BESSERER STREET

250 BESSERER STREET

DRAWING TITLE
SITE PLAN

DRAWN	DATE	SCALE
Author	XX/XX/XXXX	As indicated

PROJECT
1917

DRAWING NO.
A1.00

REVISION NO.

DX.XX.XX.XXXX

XXXXX

Ryan Magladry

From: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Sent: Friday, February 22, 2019 4:09 PM
To: Demetrius Yannoulopoulos
Subject: 250 Besserer

Demetrius

Based on our discussions;

No constraints. Storm, San and water available. Careful on the valving on this intersection when considering redundancy protection.
Will need to check to see if there are road widenings (not sure right now but will get back to you Monday).
Storm C=0.5 for a 1:5 year storm.

Have a greet weekend.

Richard Buchanan, CET

Project Manager, Development Approvals
Planning, Infrastructure and Economic Development Department
Planning & Growth Management Branch
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27801
ottawa.ca/planning / ottawa.ca/urbanisme

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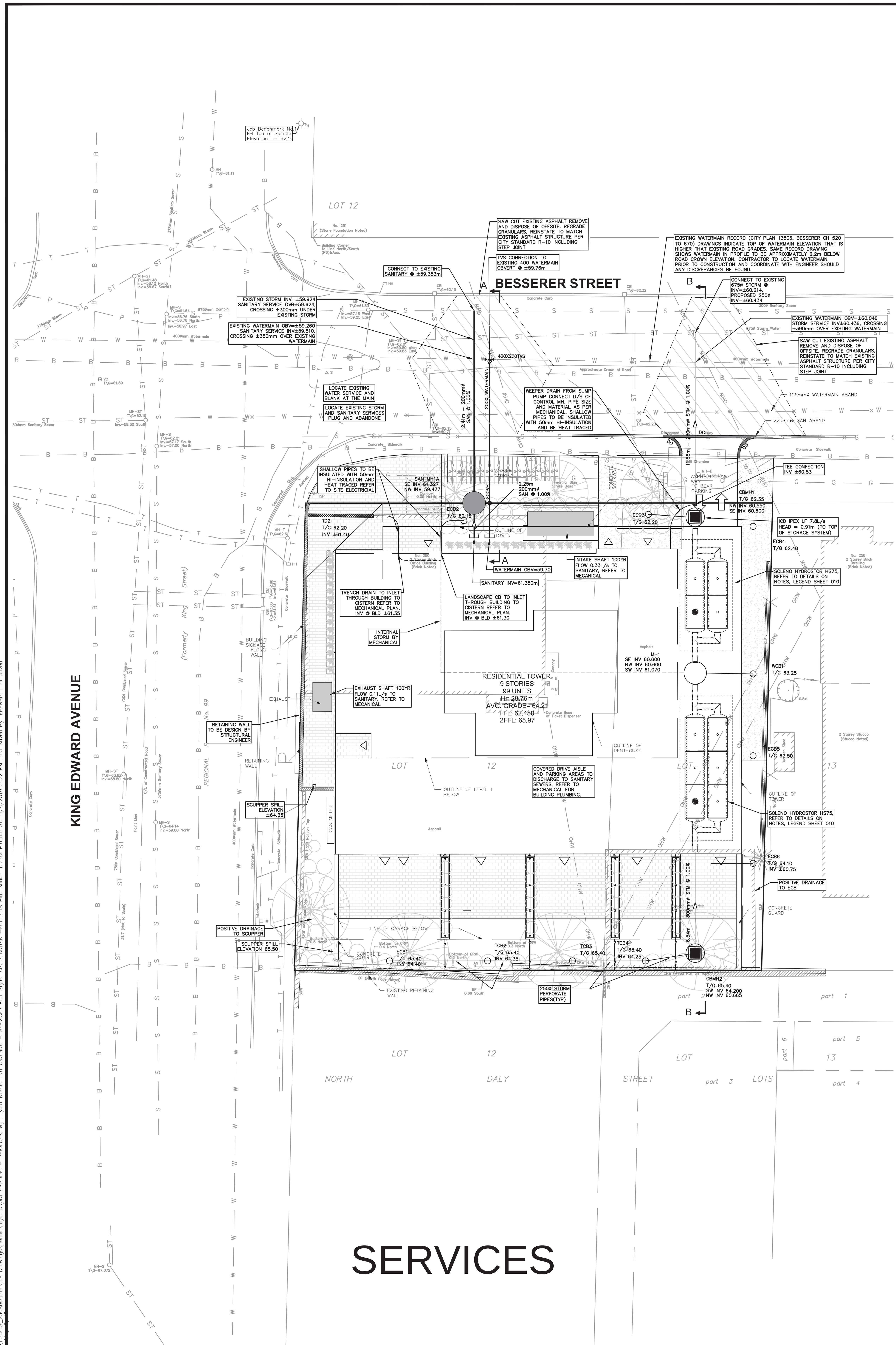
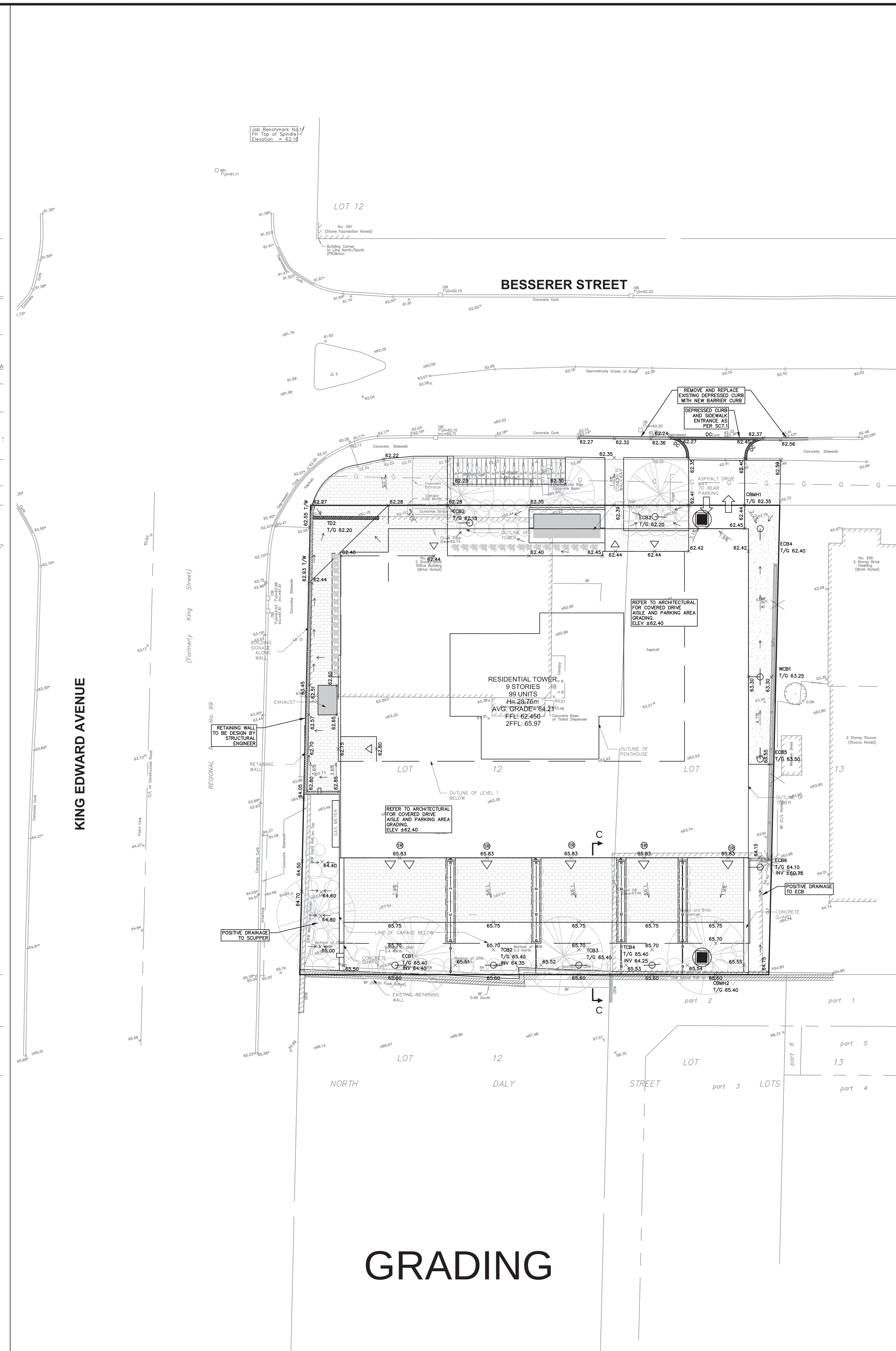




REFER TO DRAWING 010 FOR NOTES, LEGEND, SECTIONS AND DETAILS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	ISSUED FOR SPA	DGY	19:05:08

250 BESSERER LTD. PARTNERSHIP

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

Project Title

250 BESSERER

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
xx/xx/xx
PROVINCE OF ONTARIO

N

Drawing Title

GRADING - SERVICES

Scale: 1 : 150

Design	Date
R.M.	APRIL 2019
Drawn	**Checked**
E.H.	R.M. / D.G.Y.
Project No.	**Drawing No.**
120228	001

APPENDIX B

Ryan Magladry

From: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Sent: Tuesday, April 23, 2019 11:47 AM
To: Amy Zhuang
Subject: FW: Water Boundary Condition Request
Attachments: 250 Besserer April 2019.pdf

Hi Amy,

Please see below as requested.

--

Thanks,

Mohammad Abdul Mottalib, P. Eng.
Extension: 27798

From:……..
Sent: April 23, 2019 9:54 AM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: Water Boundary Condition Request

The following are boundary conditions, HGL, for hydraulic analysis at 250 Besserer (zone 1W) assumed to be connected to the 406mm on Rideau (see attached PDF for location).

Minimum HGL = 105.8m

Maximum HGL = 115.0m

MaxDay + FireFlow (250 L/s) = 104.0m

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.

From: Amy Zhuang <Amy.Zhuang@ibigroup.com>
Sent: April 15, 2019 10:16 AM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Cc: Ryan Magladry <rmagladry@IBIGroup.com>
Subject: RE: Water Boundary Condition Request

WATERMAIN DEMAND CALCULATION SHEET

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

PROJECT : 250 Besserer
LOCATION : City of Ottawa
DEVELOPER : 250 Besserer Ltd. Partnership

FILE: 120228-5.7.3
DATE PRINTED: 2019-04-30
DESIGN: 2018-04-30
PAGE : 1 OF 1

NODE	RESIDENTIAL UNITS 1bd	2bd	TH	POP'N	NON-RESIDENTIAL INDTRL (ha.)	COMM. (ha.)	RETAIL (m^2)	AVERAGE DAILY DEMAND (l/s) Res.	Non-res.	Total	MAXIMUM DAILY DEMAND (l/s) Res.	Non-res.	Total	MAXIMUM HOURLY DEMAND (l/s) Res.	Non-res.	Total	FIRE DEMAND (l/min)
BUILDING	81	18	0	151				0.61	0.00	**0.61**	1.53	0.00	**1.53**	3.37	0.00	**3.37**	**9,000**

ASSUMPTIONS

RESIDENTIAL DENSITIES

One-bedroom (1bd)	1.4	p / p / u
Two-bedroom (2bd)	2.1	p / p / u
Townhouse (TH)	2.7	p / p / u

AVG. DAILY DEMAND

Residential:	350	l / cap / day
Industrial:		l / ha / day
Commercial:		l / ha / day
Retail:		l / 1000m^2 / day

MAX. DAILY DEMAND

Residential:	875	l / cap / day
Industrial:		l / ha / day
Commercial:		l / ha / day
Retail:		l / 1000m^2 / day

MAX. HOURLY DEMAND

Residential:	1,925	l / cap / day
Industrial:		l / ha / day
Commercial:		l / ha / day
Retail:		l / 1000m^2 / day

FIRE FLOW

From FUS Calculation 8,000 l / min

Fire Flow Requirement from Fire Underwriters Survey - 250 Besserer Street

Building

Floor Area (1 & 2)	838	m^2
50% Floor Area (3 to 7)	2,216	m^2
Total Floor Area	3,054	m^2

Area	
1 & 2	**3 to 9, PH**
295	543
543	543
	543
	543
	543
	543
	543
	543
	87
838	**4431** sqm
	2216 sqm (50%)

F = 220C√A

C	0.6		C =	1.5	wood frame
A	3,054	m^2		1.0	ordinary
				0.8	non-combustible
F	7,295	l/min		0.6	fire-resistive
use	8,000	l/min			

Occupancy Adjustment

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

Sprinkler Adjustment

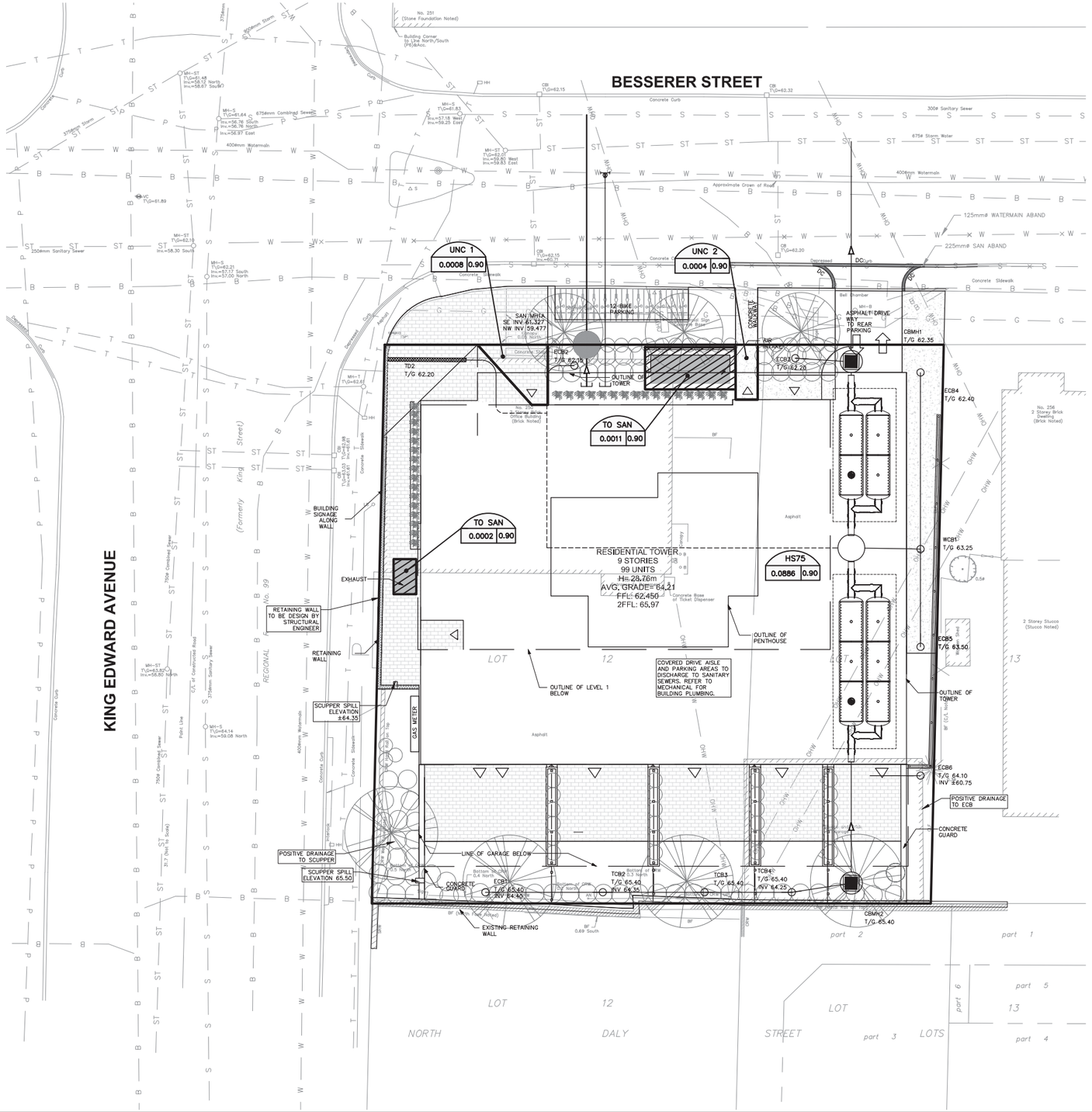
		-30%	system conforming to NFPA 13
		-50%	complete automatic system
Use	30%		
Adjustment	2040 l/min		

Exposure Adjustment

Building Face	Separation	Charge
north	18	15%
east	5	20%
south	15	15%
west	25	10%
Total		60%
Adjustment		4,080 l/min
Fire flow		8,840 l/min
Use		**9,000 l/min**
		150 l/s

Separation	Charge
0 to 3m	+25%
3.1 to 10m	+20%
10.1 to 20m	+15%
20.1 to 30m	+10%
30.1 to 45m	+5%

APPENDIX C



TOTAL SITE AREA = 0.0911Ha
TOTAL TO SANITARY = 0.0013Ha
TOTAL TO STORM = 0.0886Ha
TOTAL UNCONTROLLED = 0.0012Ha

J:\120228_250Besserer\5.9 Drawings\59civil\layouts\500 STM DRAINAGE AREA.dwg Layout Name: 500 Plot Scale: 1:5.13 Plotted At: 5/8/2019 Last Saved By: EHenrie Last Saved At: May. 8, 19

Scale	Project Title	Drawing Title	Sheet No.
1:250	250 NESSERER	STORM DRAINAGE AREA	500

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

PROJECT: 250 Besserer
DATE: 2019-05-08
FILE: 120228-5.7
REV #: -
DESIGNED BY: RM
CHECKED BY: RM

STORMWATER MANAGEMENT

Formulas and Descriptions

i_{2yr} = 1:2 year Intensity = $732.951 / (T_c+6.199)^{0.810}$
i_{5yr} = 1:5 year Intensity = $998.071 / (T_c+6.053)^{0.814}$
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 5 year storm C=0.5, assumed Tc=20min)

C =	0.5	
T_c =	20	min
i_{5yr} =	70.25	mm/hr
A_{site} =	0.0911	Ha
$Q_{restricted}$ =	8.90	L/s

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

C =	1	
T_c =	10	min
i_{100yr} =	178.56	mm/hr
$A_{uncontrolled}$ =	0.0012	Ha
$Q_{uncontrolled}$ =	0.60	L/s

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

$Q_{max\ allowable}$ =	8.30	L/s

MODIFIED RATIONAL METHOD (100-Year, 5-Year & 2-Year Ponding)

Drainage Area	***HS75***		
Area (Ha)	0.089		
C =	1.00	Restricted Flow Q_r (L/s)=	8.00

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	31.55	8.00	23.55	25.43
23	109.68	27.02	8.00	19.02	26.24
28	96.27	23.71	8.00	15.71	**26.40**
33	86.03	21.19	8.00	13.19	26.12
38	77.93	19.20	8.00	11.20	25.53

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	26.40	0.00	28.94	0.00

2x2 System #1 12.34
2x3 System #2 16.60
Total HS75 System **= 28.94
Does not include storage provided in connecting pipes and manholes.

overflows to: Besserer

Drainage Area	***HS75***		
Area (Ha)	0.089		
C =	0.90	Restricted Flow Q_r (L/s)=	8.00

5-Year Ponding

T_c Variable (min)	***i_{5yr} (mm/hour)***	***Peak Flow $Q_p = 2.78xCi_{5yr}A$ (L/s)***	***Q_r (L/s)***	***$Q_p - Q_r$ (L/s)***	***Volume 5yr (m^3)***
11	99.19	21.99	8.00	13.99	9.23
13	90.63	20.09	8.00	12.09	9.43
15	83.56	18.52	8.00	10.52	**9.47**
17	77.61	17.20	8.00	9.20	9.39
19	72.53	16.08	8.00	8.08	9.21

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	9.47	0.00	28.94	0.00

overflows to: Besserer

Drainage Area	***HS75***		
Area (Ha)	0.089		
C =	0.90	Restricted Flow Q_r (L/s)=	8.00

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)***
9	80.87	17.93	8.00	9.93	5.36
10	76.81	17.03	8.00	9.03	5.42
11	73.17	16.22	8.00	8.22	**5.42**
12	69.89	15.49	8.00	7.49	5.40
13	66.93	14.84	8.00	6.84	5.33

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	5.42	0.00	28.94	0.00

overflows to: Besserer

May 7th, 2019

Ryan Magladry
IBI Group
Suite 400, 333 Preston Street
Ottawa, ON
K1S 5N4
T: 613-225-1311 X64061
E : rmagladry@ibigroup.com

Subject: **250 Besserer, Ottawa**
Stormwater Detention System (HS75 chambers)

Dear Amy,

In response to your email dated May 3rd, see below our storage calculations for the two proposed Hydrostor HS-75 systems. This information is given for information purposes only. The engineer of record will have to validate the values used as well as the calculations method.

Key Information :

System 1
Top of system elevation – 61.59m
Top of chamber elevation – 61.44m
Bottom of chamber elevation – 60.69m
Bottom of system elevation – 60.54m
Width of system – 3.4m
Length of system – 7.2m

Calculation 1A – System Storage

Storage in Chambers and End Caps (cu.m.) = 4chs X 1.31cu.m./ch + 4ec X 0.16cu.m./ec = 5.88cu.m.

Volume of System (cu.m.) = (61.59m – 60.54m) X 3.4m X 7.2m = 25.70cu.m.

Storage in Stone (Assumed 40% voids) = (25.70cu.m. – 5.88cu.m.) X 0.4 = 7.93cu.m.

Storage in Chambers, End Caps and Stone = 5.88cu.m. + 7.93cu.m. = 13.81cu.m. (excluding storage in 300mm dia. manifolds)

Calculation 1B – System Storage (above chamber bottom elevation)

Storage in Chambers and End Caps (cu.m.) = 4chs X 1.31cu.m./ch + 4ec X 0.16cu.m./ec = 5.88cu.m.

Volume of System (cu.m.) = (61.59m – 60.69m) X 3.4m X 7.2m = 22.03cu.m.

Storage in Stone (Assumed 40% voids) = (22.03cu.m. – 5.88cu.m.) X 0.4 = 6.46cu.m.

Storage in Chambers, End Caps and Stone = 5.88cu.m. + 6.46cu.m. = 12.34cu.m. (excluding storage in 300mm dia. Manifolds)

System 2
Top of system elevation – 63.12m
Top of chamber elevation – 62.97m
Bottom of chamber elevation – 62.22m
Bottom of system elevation – 62.07m
Width of system – 3.4m
Length of system – 9.4m

Calculation 2A – System Storage

Storage in Chambers and End Caps (cu.m.) = 6chs X 1.31cu.m./ch + 4ec X 0.16cu.m./ec = 8.5cu.m.

Volume of System (cu.m.) = (63.12m – 62.07m) X 3.4m X 9.4m = 33.56cu.m.

Storage in Stone (Assumed 40% voids) = (33.56cu.m. – 8.5cu.m.) X 0.4 = 10.02cu.m.

Storage in Chambers, End Caps and Stone = 8.5cu.m. + 10.02cu.m. = 18.52cu.m. (excluding storage in 300mm dia. manifolds)

Calculation 2B – System Storage (above chamber bottom elevation)

Storage in Chambers and End Caps (cu.m.) = 6chs X 1.31cu.m./ch + 4ec X 0.16cu.m./ec = 8.5cu.m.

Volume of System (cu.m.) = (63.12-62.22m) X 3.4m X 9.4m = 28.76cu.m.

Storage in Stone (Assumed 40% voids) = (28.76cu.m. – 8.5cu.m.) X 0.4 = 8.10cu.m.

Storage in Chambers, End Caps and Stone = 8.5cu.m. + 8.10cu.m. = 16.60cu.m. (excluding storage in 300mm dia. Manifolds)

If you have questions on this matter, please contact us.

Warm Regards,
Dave Kanters

David Kanters, P.Eng., CSP
Engineer, Technical Services

Suite 347, 15-75 Bayly St. W.
Ajax, Ontario
L1S 7K7
Canada

Encl:
250 Besserer - Ottawa – HS75 System Drawings
250 Besserer - Ottawa – Hydrostor HS75 Stage-Storage Volumes

SC03425 SOLENO HYDROSTOR HS75 SYSTEM 6 CHAMBERS 18.6m³

PROJECT: 250 BESSERER - SYSTEM 2
JOB LOCATION: OTTAWA (ON)
CONTACT:
OWNER/ENGINEERING FIRM/CONTRACTOR NAME: IBI GROUP

Paul Antoine Sales Representative Tel: 613-292-4094 Email: pantoine@soleno.com
David Kanters Engineer, Technical Service Tel: 416-347-2799 Email: dkanters@soleno.com

1. INSTALLATION MUST BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
2. SYSTEM IS DESIGNED TO WITHSTAND TRAFFIC LOAD CSA CL-625 AND AASHTO H-20.
3. HS75 CHAMBERS MUST BE MINIMALLY BACKFILLED WITH 150 mm (6'') OF CRUSHED STONE AND 300 mm (12'') OF GRANULAR MATERIAL COMPACTED AT 90% P.M.
4. HYDROSTOR GEOGRID FOR FOUNDATION STABILIZATION IS CONSIDERED UNDER ALL THE CHAMBERS.
5. FOR TRAFFIC APPLICATIONS, A MINIMUM COVER OF 450mm IS REQUIRED, MEASURED FROM TOP OF CHAMBER TO THE BOTTOM OF THE FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS, INCREASE COVER TO 610mm. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS.

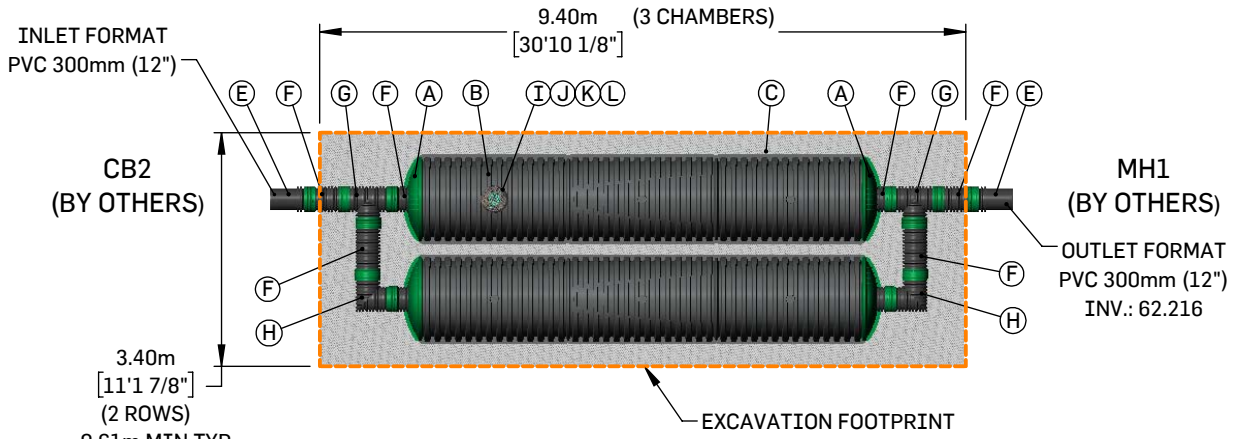
APPROVAL : _____

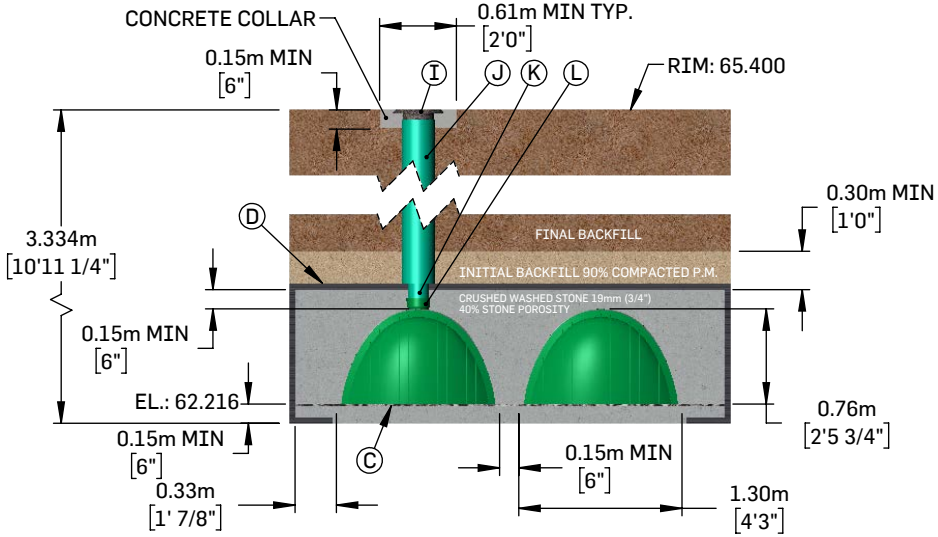
SC03425 SOLENO HYDROSTOR HS75 SYSTEM 6 CHAMBERS 18.6m³

STORAGE PROVIDED = 16.6 cu.m (TOP OF SYSTEM ELEV. TO BOTTOM OF CHAMBER ELEV.) / 18.6 cu.m. (TOP OF SYSTEM ELEV. TO BOTTOM OF SYSTEM ELEV.)

Paul Antoine
Sales Representative
Tel: 613-292-4094
Email:
pantoine@soleno.com

David Kanters
Engineer, Technical Service
Tel: 416-347-2799
Email:
dkanters@soleno.com





PART	DESCRIPTION	QTY
A	HYDROSTOR END CAP HS75	4
B	HYDROSTOR CHAMBER HS75	6
C	STABILIZATION NETTING HYDROSTOR	1
D	SOLENO TX-90 SEPARATION NONWOVEN GEOTEXTILE, ABOVE AND ON THE SIDES	1
E	MANHOLE ADAPTER FORMAT PVC 300mm (12") DR35	2
F	STD LENGTH 6m (236") SOLFLO MAX 300mm (12")	2
G	TEE SOLFLO MAX 300mm (12")	2
H	ELBOW SOLFLO MAX 300mm (12")	2
I	ADJUSTABLE FRAME AND COVER 250mm (10")	1
J	PVC PIPE ACCESS WELL 250mm (10") (PROVIDED BY OTHER)	-
K	PVC PIPE ACCESS WELL 100mm (4") (PROVIDED BY OTHER)	-
L	MANHOLE ADAPTER FORMAT PVC 100mm (4") DR35	1

APPROVAL : _____

2019-05-07

SC03434 SOLENO HYDROSTOR HS75 SYSTEM 4 CHAMBERS 13.87m³

PROJECT: 250 BESSERER - SYSTEM 1
JOB LOCATION: OTTAWA (ON)
CONTACT:
OWNER/ENGINEERING FIRM/CONTRACTOR NAME: IBI GROUP

Paul Antoine Sales Representative Tel: 613-292-4094 Email: pantoine@soleno.com
David Kanters Engineer, Technical Service Tel: 416-347-2799 Email: dkanters@soleno.com

1. INSTALLATION MUST BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
2. SYSTEM IS DESIGNED TO WITHSTAND TRAFFIC LOAD CSA CL-625 AND AASHTO H-20.
3. HS75 CHAMBERS MUST BE MINIMALLY BACKFILLED WITH 150 mm (6'') OF CRUSHED STONE AND 300 mm (12'') OF GRANULAR MATERIAL COMPACTED AT 90% P.M.
4. HYDROSTOR GEOGRID FOR FOUNDATION STABILIZATION IS CONSIDERED UNDER ALL THE CHAMBERS.
5. FOR TRAFFIC APPLICATIONS, A MINIMUM COVER OF 450mm IS REQUIRED, MEASURED FROM TOP OF CHAMBER TO THE BOTTOM OF THE FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS, INCREASE COVER TO 610mm. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS.

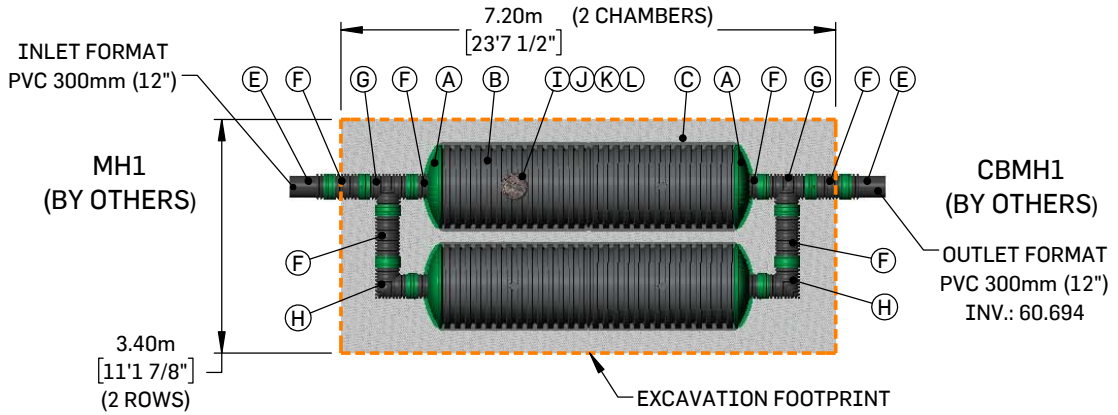
APPROVAL : _____

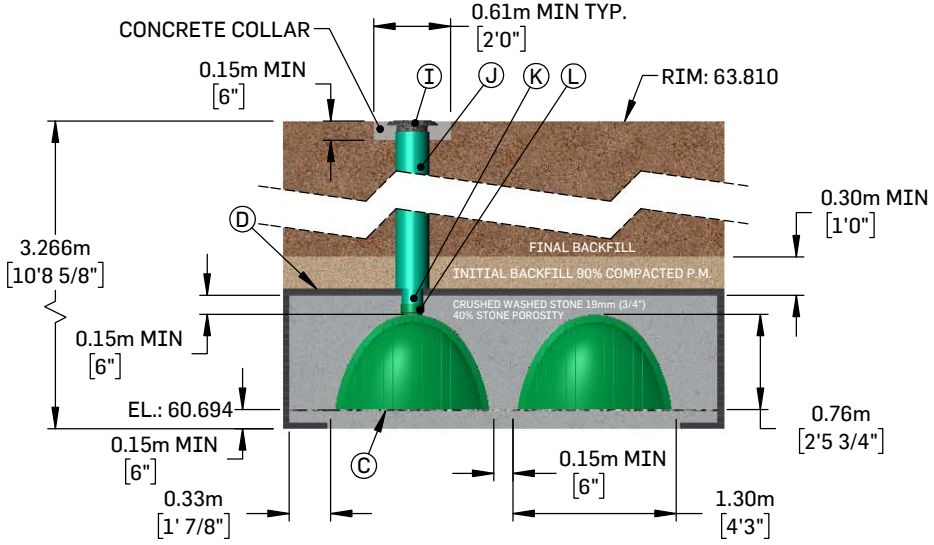
SC03434 SOLENO HYDROSTOR HS75 SYSTEM 4 CHAMBERS 13.87m³

STORAGE PROVIDED = 12.4 cu.m (TOP OF SYSTEM ELEV. TO BOTTOM OF CHAMBER ELEV.) / 13.87 cu.m. (TOP OF SYSTEM ELEV. TO BOTTOM OF SYSTEM ELEV.)

Paul Antoine
Sales Representative
Tel: 613-292-4094
Email:
pantoine@soleno.com

David Kanters
Engineer, Technical Service
Tel: 416-347-2799
Email:
dkanters@soleno.com





PART	DESCRIPTION	QTY
A	HYDROSTOR END CAP HS75	4
B	HYDROSTOR CHAMBER HS75	4
C	STABILIZATION NETTING HYDROSTOR	1
D	SOLENO TX-90 SEPARATION NONWOVEN GEOTEXTILE, ABOVE AND ON THE SIDES	1
E	MANHOLE ADAPTER FORMAT PVC 300mm (12") DR35	2
F	STD LENGTH 6m (236") SOLFLO MAX 300mm (12")	2
G	TEE SOLFLO MAX 300mm (12")	2
H	ELBOW SOLFLO MAX 300mm (12")	2
I	ADJUSTABLE FRAME AND COVER 250mm (10")	1
J	PVC PIPE ACCESS WELL 250mm (10") (PROVIDED BY OTHER)	-
K	PVC PIPE ACCESS WELL 100mm (4") (PROVIDED BY OTHER)	-
L	MANHOLE ADAPTER FORMAT PVC 100mm (4") DR35	1

APPROVAL : _____

2019-05-07

Hydrostor HS75 Stage-Storage Volumes

Project Name:	250 Besserer - Ottawa - System 1	
Number of HS75 chambers:	4	
Number of HS75 end caps:	4	
System Length:	7.20	m
System Width:	3.40	m
System Height:	1.06	m
System Bedding Thickness:	0.152	m
Stone Voids (porosity):	0.40	Typically, 0.4 is used
Base of Stone Elevation:	60.54	m

Note: Assumed 6" (152mm) of stone below chambers and 6" (152mm) of stone above chambers
The minimum stone below and above the chambers to be determined by the design engineer
Questions? Contact David Kanters (Soleno Engineer, Technical Service) at 416-347-2799 or dkanters@soleno.com

System Height	Incremental Single Chamber Storage	Incremental Single End Cap Storage	Incremental Total Chamber Storage	Incremental Total End Cap Storage	Incremental Total Stone Storage	Incremental Total Chamber, End Cap & Stone Storage	Cumulative System Storage	Elevation
mm	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	m
1066.8	0	0	0	0	0.25	0.25	13.99	61.61
1041.4	0	0	0	0	0.25	0.25	13.74	61.59
1016	0	0	0	0	0.25	0.25	13.49	61.56
990.6	0	0	0	0	0.25	0.25	13.24	61.53
965.2	0	0	0	0	0.25	0.25	13.00	61.51
939.8	0	0	0	0	0.25	0.25	12.75	61.48
914.4	0	0	0	0	0.25	0.25	12.50	61.46
889	0.004	0	0.015	0	0.24	0.26	12.25	61.43
863.6	0.009	0.000	0.034	0.000	0.23	0.27	11.99	61.41
838.2	0.017	0.001	0.069	0.003	0.22	0.29	11.72	61.38
812.8	0.024	0.001	0.097	0.005	0.21	0.31	11.43	61.36
787.4	0.029	0.002	0.114	0.008	0.20	0.32	11.12	61.33
762	0.032	0.002	0.129	0.010	0.19	0.33	10.80	61.31
736.6	0.035	0.003	0.141	0.012	0.19	0.34	10.47	61.28
711.2	0.038	0.003	0.151	0.014	0.18	0.35	10.13	61.26
685.8	0.040	0.004	0.160	0.016	0.18	0.35	9.78	61.23
660.4	0.042	0.004	0.168	0.017	0.17	0.36	9.42	61.20
635	0.044	0.005	0.176	0.019	0.17	0.37	9.06	61.18
609.6	0.046	0.005	0.183	0.021	0.17	0.37	8.70	61.15
584.2	0.047	0.006	0.188	0.022	0.16	0.37	8.33	61.13
558.8	0.049	0.006	0.195	0.023	0.16	0.38	7.95	61.10
533.4	0.050	0.006	0.201	0.025	0.16	0.38	7.57	61.08
508	0.052	0.007	0.206	0.026	0.16	0.39	7.19	61.05
482.6	0.052	0.007	0.210	0.027	0.15	0.39	6.80	61.03
457.2	0.054	0.007	0.215	0.029	0.15	0.40	6.41	61.00
431.8	0.055	0.007	0.219	0.030	0.15	0.40	6.02	60.98
406.4	0.056	0.008	0.223	0.031	0.15	0.40	5.62	60.95
381	0.057	0.008	0.228	0.032	0.14	0.40	5.22	60.93
355.6	0.058	0.008	0.230	0.033	0.14	0.41	4.81	60.90
330.2	0.058	0.008	0.234	0.034	0.14	0.41	4.41	60.87
304.8	0.060	0.009	0.238	0.034	0.14	0.41	4.00	60.85
279.4	0.060	0.009	0.240	0.035	0.14	0.41	3.58	60.82
254	0.061	0.009	0.244	0.036	0.14	0.42	3.17	60.80
228.6	0.061	0.009	0.246	0.037	0.14	0.42	2.75	60.77
203.2	0.062	0.009	0.249	0.037	0.13	0.42	2.34	60.75
177.8	0.063	0.009	0.253	0.038	0.13	0.42	1.92	60.72
152.4	0	0	0	0	0.25	0.25	1.49	60.70
127	0	0	0	0	0.25	0.25	1.24	60.67
101.6	0	0	0	0	0.25	0.25	0.99	60.65
76.2	0	0	0	0	0.25	0.25	0.75	60.62
50.8	0	0	0	0	0.25	0.25	0.50	60.59
25.4	0	0	0	0	0.25	0.25	0.25	60.57
0	0	0	0	0	0.00	0.00	0.00	60.54

Storage above chamber bottom elevation:	12.3 cu.m.	Storage above system bottom elevation:	13.8 cu.m.

Hydrostor HS75 Stage-Storage Volumes

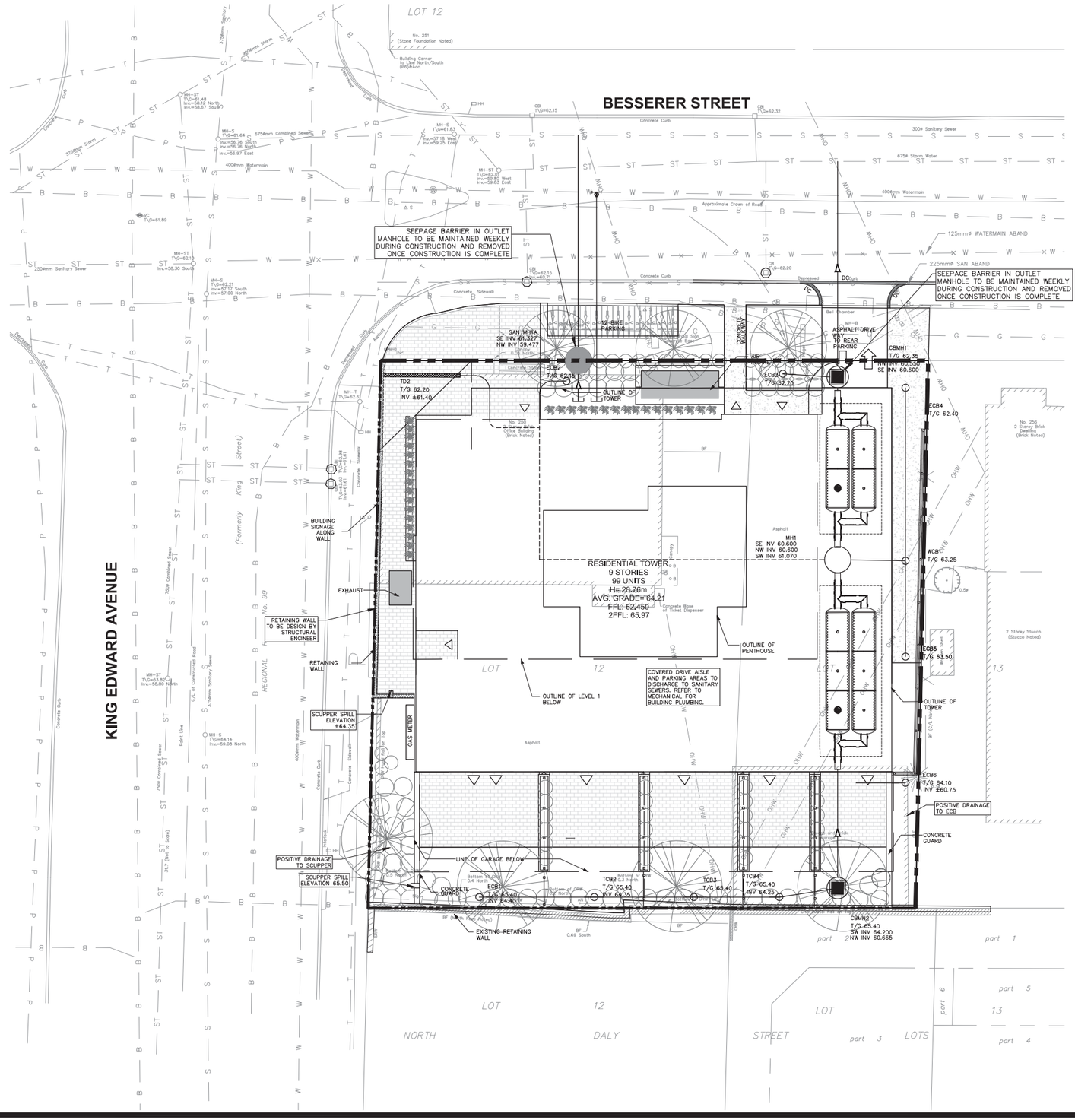
Project Name:	250 Besserer - Ottawa - System 2	
Number of HS75 chambers:	6	
Number of HS75 end caps:	4	
System Length:	9.40	m
System Width:	3.40	m
System Height:	1.06	m
System Bedding Thickness:	0.152	m
Stone Voids (porosity):	0.40	Typically, 0.4 is used
Base of Stone Elevation:	62.07	m

Note: Assumed 6" (152mm) of stone below chambers and 6" (152mm) of stone above chambers
The minimum stone below and above the chambers to be determined by the design engineer
Questions? Contact David Kanters (Soleno Engineer, Technical Service) at 416-347-2799 or dkanters@soleno.com

System Height	Incremental Single Chamber Storage	Incremental Single End Cap Storage	Incremental Total Chamber Storage	Incremental Total End Cap Storage	Incremental Total Stone Storage	Incremental Total Chamber, End Cap & Stone Storage	Cumulative System Storage	Elevation
mm	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	cu.m.	m
1066.8	0	0	0	0	0.32	0.32	18.76	63.13
1041.4	0	0	0	0	0.32	0.32	18.43	63.11
1016	0	0	0	0	0.32	0.32	18.11	63.08
990.6	0	0	0	0	0.32	0.32	17.78	63.06
965.2	0	0	0	0	0.32	0.32	17.46	63.03
939.8	0	0	0	0	0.32	0.32	17.14	63.01
914.4	0	0	0	0	0.32	0.32	16.81	62.98
889	0.004	0	0.022	0	0.32	0.34	16.49	62.95
863.6	0.009	0.000	0.051	0.000	0.30	0.36	16.15	62.93
838.2	0.017	0.001	0.104	0.003	0.28	0.39	15.79	62.90
812.8	0.024	0.001	0.146	0.005	0.26	0.42	15.40	62.88
787.4	0.029	0.002	0.172	0.008	0.25	0.43	14.99	62.85
762	0.032	0.002	0.194	0.010	0.24	0.45	14.56	62.83
736.6	0.035	0.003	0.211	0.012	0.24	0.46	14.11	62.80
711.2	0.038	0.003	0.226	0.014	0.23	0.47	13.65	62.78
685.8	0.040	0.004	0.240	0.016	0.22	0.48	13.18	62.75
660.4	0.042	0.004	0.252	0.017	0.22	0.49	12.70	62.73
635	0.044	0.005	0.264	0.019	0.21	0.49	12.22	62.70
609.6	0.046	0.005	0.274	0.021	0.21	0.50	11.72	62.68
584.2	0.047	0.006	0.282	0.022	0.20	0.51	11.22	62.65
558.8	0.049	0.006	0.292	0.023	0.20	0.51	10.72	62.62
533.4	0.050	0.006	0.301	0.025	0.19	0.52	10.20	62.60
508	0.052	0.007	0.309	0.026	0.19	0.53	9.68	62.57
482.6	0.052	0.007	0.315	0.027	0.19	0.53	9.15	62.55
457.2	0.054	0.007	0.323	0.029	0.18	0.54	8.62	62.52
431.8	0.055	0.007	0.328	0.030	0.18	0.54	8.09	62.50
406.4	0.056	0.008	0.335	0.031	0.18	0.54	7.55	62.47
381	0.057	0.008	0.342	0.032	0.18	0.55	7.01	62.45
355.6	0.058	0.008	0.345	0.033	0.17	0.55	6.46	62.42
330.2	0.058	0.008	0.350	0.034	0.17	0.56	5.90	62.40
304.8	0.060	0.009	0.357	0.034	0.17	0.56	5.35	62.37
279.4	0.060	0.009	0.360	0.035	0.17	0.56	4.79	62.35
254	0.061	0.009	0.366	0.036	0.16	0.57	4.23	62.32
228.6	0.061	0.009	0.369	0.037	0.16	0.57	3.66	62.29
203.2	0.062	0.009	0.374	0.037	0.16	0.57	3.09	62.27
177.8	0.063	0.009	0.379	0.038	0.16	0.57	2.52	62.24
152.4	0	0	0	0	0.32	0.32	1.95	62.22
127	0	0	0	0	0.32	0.32	1.62	62.19
101.6	0	0	0	0	0.32	0.32	1.30	62.17
76.2	0	0	0	0	0.32	0.32	0.97	62.14
50.8	0	0	0	0	0.32	0.32	0.65	62.12
25.4	0	0	0	0	0.32	0.32	0.32	62.09
0	0	0	0	0	0.00	0.00	0.00	62.07

Storage above chamber bottom elevation:	16.6 cu.m.	Storage above system bottom elevation:	18.6 cu.m.

APPENDIX D



SEDIMENT EROSION LEGEND

CONSTRUCTION HOARDING FENCING TO INCLUDE SILTATION BARRIER, IE FILTER FABRIC WRAPPED SAND BAG

CONSTRUCTION HOARDING FENCING

SILT SACK IN EXISTING CATCH BASING TO BE MAINTAINED WEEKLY AND AFTER AND SIGNIFICANT RAINFALL

J:\120228_250Besserer\5.9 Drawings\59civil\layouts\900 SED-EROS.dwg Layout Name: 900 Plot Scale: 1:5.13 Plotted At: 5/8/2019 Last Saved By: EHenrie Last Saved At: May. 8, 19

Scale	Project Title	Drawing Title	Sheet No.
1:250	250 NESSERER	EROSION AND SEDIMENTATION	900