Functional Serviceability Report

Official Plan Amendment and Zoning By-law Amendment
16 Storey High Rise Apartment Building
1400 Bank Street, Ottawa ON

Prepared for:

Serco Realty Group
9 Capella Court
Unit 200, Ottawa ON.
K2E 8A7

Attention: Loredena Parcari

LRL File No.: 210617

October 26th, 2021

5430 Canotek Road | Ottawa, ON, K1J 9G2 | info@lrl.ca | www.lrl.ca | (613) 842-3434

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1 INTRODUCTION AND SITE DESCRIPTION

LRL. Associates LTD. was retained by Serco Realty Group to prepare a functional serviceability report to support the Official Plan Amendment and Zoning By-law amendment application for the property located at 1400 Bank Street within the City of Ottawa.

The subject site is within the Capital Ward, located on the west side of Bank Street and has an approximate area of 0.1814 ha, south of Belanger Avenue and north of Rockingham Street. The land is currently occupied by a one storey retail building with a paved parking area, brick walkway and some grass. The subject site can be seen below in figure 1.

Figure 1: Arial View of Subject Lands

Under the City of Ottawa Zoning by-law, the existing land is currently zoned Arterial Mainstreet, AM, Exception 1913 (AM1, [1913]). This servicing study has been prepared to support an Official Plan amendment and Zoning By-law amendment required to add a high-rise building as a permitted use on the Subject Property which is further expanded in in the planning documentation accompanying the submission.

The serviceability review summarized in this document has been completed to further investigate the potential for this property to be redeveloped to accommodate a 16-storey mixed use residential building with approximately 160 residential units and 6 commercial and office units. The concept site plan prepared by Figurr Architects, illustrating the proposed development can be found in appendix A at the back of this report.

Following the Official Plan Amendment and Zoning By-law amendment application, a detailed design will advance with intentions for full Site Plan Control application submission.

2 EXISTING SITE AND AVAILABLE SERVICES

J. D. Barnes Limited prepared a topographic survey of the subject property in January of 2020 which has been included in appendix B for reference. Based on the topography information available, the general elevation of the land is relatively flat.

Utilizing the GeoOttawa mapping portal as well as plan and profile drawings provided by the City of Ottawa indicate the following services are running along Bank Street and Belanger Avenue within the right-of-way in front of the property boundary.

Bank Street:

- 375 mm Sanitary Sewer
- 205 mm Water Main
- 305 mm Storm Sewer

Belanger Avenue:

- 300 mm Sanitary Sewer
- 305 mm Water Main
- 375 mm Storm Sewer

The existing building located central on the site is currently serviced to meet the domestic demand; however, these will be abandoned to accommodate the proposed development of a greater population.

3 WATER SUPPLY SERVICING

The site is intended to be services through a new 150 mm diameter water service connecting to the existing 305 mm PVC watermain within Bank Street.

Bases on the location and available data form the city, the subject property lies within the 2C pressure zone of the water distribution system.

3.1 Domestic Water Demands

Proposed populations have been interpreted from the architectural drawings. Based on the number of residential units within the building combined with the City of Ottawa design guidelines for population projection, the number of units translates to approximately 309 residents. Table 1 below summarizes the proposed population count based on the residential units as interpreted using table 4.1 of the City of Ottawa design guidelines.

Table 1: Development Residential Population Estimate

Proposed Unit Type	Persons Per Unit	Number of Units	Total Population
1 Bedroom unit	1.8	91	163.8
2 Bedroom Unit	2.1	69	144.9
		Total Residential Population	308.7

Table 2 below summarizes the water supply guidelines which must be employed during detailed design and sizing of the service to the building.

Table 2: Water Supply Guidelines

Design Parameter	Value
Residential Average Dailey Demand	280 L/person/Day
Maximum Dailey Peaking Factor (As per MOE Table 3-3)	7.3
Peak Hour Factor (As per MOE Table 3-3)	10.9
Minimum Depth of Cover	2.4m
Desired operating pressure range during normal operating conditions	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure shall not exceed	552 kPa
During fire flow operating conditions pressure must not drop below	140 kPa

The required water supply requirements for the residential units in the proposed building have been calculated using the following formula:

Where:

$$Q = (q \times P \times M)$$

q = average water consumption (L/capita/day)
P = design population (capita)
M = Peak factor

Using a calculated Maximum Day Factor and Peak Hour factor of *3.8* and *5.6* respectively as per Table 3-3 in the *MOE Design Guidelines*, anticipated demands were calculated as follows:

- Average daily domestic water demand is **1.00** L/s,
- Maximum daily demand is **3.56** L/s, and
- Maximum hourly demand is **18.93** L/s.

Additionally, the proposed development comprises of commercial space equivalent to approximately 549 m^2 on the first floor and office space equivalent to approximately 498m^2 on the second floor. According to the City of Ottawa Guidelines, the average water demand for commercial use is **2,500 L/(1000 m^2/d)**, and the daily and hourly peak factors are approximately **1.5** and **2.7**, respectively. The peak design commercial water demands were calculated as follows:

$$Q = q \times A \times M$$

Where:
q = Average water demand (L/m^2/d)
A = Total site area (m^2)
M = Peak factor

Therefore, for the commercial and office area have an average daily demand of **0.030 L/s**, maximum daily is **0.045 L/s**, and maximum hourly is **0.082 L/s**. Adding the water demands from domestic and commercial uses, the total required water supply becomes **1.031 L/s** for average daily demand, **3.606 L/s** for maximum daily demand, and **19.011 L/s** for maximum hourly demand.

Based on maximum hourly rate of 19.011 L/s a minimum of 150 mm dia. servicing is required. Refer to *Appendix C* for water demand calculations.

During the detailed design which will take place during the site plan control process, it is recommended that the City of Ottawa is contacted to obtain boundary conditions associated with the final calculated water demands. At that time, further review will take place to ensure that pressures of the water network remain within the pressure ranges outlined in Table 2 above.

3.2 Fire Protection

The estimated fire flow for the proposed buildings was calculated in accordance with *ISTB-2018-02*. The following parameters were assumed during this functional serviceability review, with detailed input from the building Architect to be requested during the Site Plan Design stage.

- Type of construction – Non-Combustible/Concrete etc.
- Occupancy type – Combustible
- Sprinkler Protection – Automatic Fully Supervised Sprinkler System.

The estimated fire flow demand was estimated to be **4 000 L/min**, see *Appendix C* for details

There are four (4) existing fire hydrants in close proximity to the proposed buildings that are available to provide fire flow demands of approximately 22 000 L/min. Refer to *Appendix C* for fire hydrant locations. Table 3 below summarizes the aggregate fire flow of the contributing hydrants in close proximity to the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.

Table 3: Fire Protection Summary Table

Building	Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Available Combined Fire Flow (L/min)
Proposed 6 Storey Building	TBD During Detailed Design (assumed 10 000 L/min)	4	(4 x 5678) = 22 000

The total available fire flow from contributing hydrants is equal to approximately 22,000 L/min which is sufficient to provide adequate fire flow for the proposed development. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

4 SANITARY SERVICE

There is an existing 375 mm sanitary within Bank Street running across the frontage of the subject site ultimately conveying flow in the north-west direction.

The post development total sanitary effluent was calculated to be is **4.0 L/s** as a result of proposed residential population, commercial uses and a small portion of infiltration. Refer to Appendix *D* for further information on the calculated sanitary flows.

Based on existing as-built information (Refer to Appendix E), the existing 375 mm dia. sanitary sewer is sloped at 1.26% and is calculated to have a maximum capacity of approximately 211 L/s. The proposed increase in total wastewater flow from the increased population represents approximately 1.9% of the existing maximum capacity in the single sanitary sewer. Given that typical design principles are to design with a capacity contingency, and that the overall increase in flow is less than 2%, it is anticipated that the existing local sewer network has sufficient capacity to accommodate the proposed development.

5 STORMWATER MANAGEMENT

The existing site has a large portion of impervious area which will be mostly mimicked in post development conditions. A slight increase is expected in post development conditions as a result of a larger building footprint minimizing a portion of the landscaped area along the south border of the property.

At the time of detailed design, stormwater quantity will be dealt with to ensure that the post-development runoff discharge from the site is controlled to not exceed the 5-year storm release rate.

Given that the development concept is to have the building take up a large portion of the site boundary, there will be little opportunity for any overland drainage or storage. In order to control the quantity of runoff from the site, storage within the building (cistern) or the rooftop is intended.

Additionally, it is noted that the proposed site plan results in only a slightly higher runoff coefficient than that in the pre-development conditions. This is summarized in table 4 below.

Table 4: Pre-Development and Post-Development Runoff Coefficients

Pre-Development Conditions			Post-Development Conditions		
Grass Area (C=0.2)	Building Area/Asphalt (C=0.9)	Combined C Value	Grass Area (C=0.2)	Building Area/Asphalt (C=0.9)	Combined C Value
120m^2	1694m^2	0.85	50m^2	1764m^2	0.88

6 CONCLUSIONS AND SERVICEABILITY CONSIDERATIONS

This evaluation is limited to assessing the technical feasibility of servicing the site described within this document to support an Official Plan Amendment and Zoning By-law Amendment.

Based on the forgoing the conclusions in relation to the serviceability of the site are as follows:

- Water:
  - Total water (domestic and commercial) demands from the proposed high rise building are expected to be in the range of **1.031 L/s** for the Average daily demand, **3.606 L/s** for the maximum daily and **19.011 L/s** for maximum hourly.
  - 4 fire hydrants within 75m are expected to provide the required fire flow.
  - During detailed design, pressures available along Bank Street are to be investigated as it is expected to be serviced from the existing 205 mm PVC watermain.
- Sanitary Sewage:
  - The post development total sanitary effluent was calculated to be is **4.0 L/s** as a result of proposed residential population, commercial uses and a small portion of infiltration.
  - The flow from this development would make up a very small percentage (Less than 2.0 %) of the flow capacity of the existing 375 mm sanitary sewer in Bank Street.
- Stormwater
  - The small increase in impervious area along with strict quantity control requirements outlined by the City of Ottawa will require the site to implement a stormwater quantity management system.
  - Storage could be achieved via a cistern or rooftop storage on site to ensure flow is regulated to not release more than the allowable release rate.

7 CLOSURE

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Prepared by:

LRL Associates Ltd.

Virginia Johnson, P. Eng.

APPENDIX A

Concept Site Plan

KEY PLAN

PROPERTY DESCRIPTION

SIXTEEN STOREY MIXED-USE RESIDENTIAL BUILDING	
CITY OF OTTAWA PIN NUMBER	
MUNICIPAL ADDRESS	1400 BANK STREET

SITE INFORMATION

LOT AREA:	1460m²
LOT FRONTAGE:	42m (BANK STREET), 25.6m (BELANGER AVE.)
LOT DEPTH:	25.6m (NORTH) & 51m (SOUTH)

BUILDING INFORMATION

BUILDING AREA:	1,053 m²
GROSS AREA:	17,079 m²
PROPOSED USE:	MIXED-USE RESIDENTIAL

UNIT BREAKDOWN:
LEVEL 2: 6 UNITS
LEVEL 3-6: 12 UNITS EA.
LEVEL 7-9: 12 UNITS EA.
LEVEL 10-16: 10 UNITS EA.

TOTAL: 160 UNITS

RETAIL/OFFICE USE:
LEVEL 1: 352 m²
LEVEL 2: 500 m²

ZONING TABLE

AM1 [1913] - ARTERIAL MAINSTREET, SUBZONE 1, EXCEPTION 1913

CITY OF OTTAWA ZONING BY-LAW No. 2008-250	REQUIRED	PROPOSED
MINIMUM LOT AREA	NO MINIMUM	1,459m²
MINIMUM LOT WIDTH	NO MINIMUM	N/A
MINIMUM FRONT YARD SETBACK	0 m	VARIES
MINIMUM INTERIOR SIDE YARD SETBACK	7.5m (ABUTTING RESIDENTIAL ZONE)	N/A
MINIMUM REAR YARD SETBACK (south)	7.5 m (REAR LOT LINE ABUTTING RESIDENTIAL ZONE)	9.3m- GROUND FLOOR 9m- LEVEL 2-9 11.6m- LEVEL 10-16
MINIMUM CORNER SIDEYARD SETBACK	0 m	0.8 m
MAXIMUM BUILDING HEIGHT	25 m	50 m
MAXIMUM FLOOR SPACE INDEX	3.5	5
MAX # of RESIDENTIAL UNITS	N/A	
LANDSCAPED AREA	N/A	N/A
VEHICLE PARKING REQUIREMENTS AREA Y Table 101-Residences: 0.5 per unit Table 102- Visitors: 0.1 per unit, less the first 12 units Table 101- 1 parking per 100m2 office area	RESIDENTIAL: 80 SPACES VISITORS: 14.8 SPACES RETAIL: N/A OFFICE: 5	66 SPACES
AMENITY AREA REQUIREMENTS Table 137 - (6) 6m2 per dwelling unit, and 10% of the gross floor area of each rooming unit A minimum of 50% of the required total amenity area needs to be communal Aggregated into areas up to 54 m2 , and where more than one aggregated area is provided, at least one must be a minimum of 54 m2	960 m² 481 m² COMMUNAL	BALCONIES: 696 m² ROOF AMENITY: 379 m² EXTERIOR: 134 m²
BICYCLE PARKING SPACES AREA Y TABLE 111A	0.5 per dwelling unit = 80 1 PER 250m² GFA= 3.4	186 SPACES

LEGEND

- GRASS
- UNIT PAVERS REFER TO LANDSCAPE
- ASPHALT PAVING
- CONCRETE
- RIVER STONES. REFER TO LANDSCAPE
- FIRE ROUTE
- EXISTING FENCE
- NEW SCREEN FENCE
- NEW SOUND FENCE
- LOT LINE
- SETBACK LINE
- DESIGNATED BUILDING ENTRANCE / EXIT
- FH NEW FIRE HYDRANT. REFER TO CIVIL
- CB CATCH BASIN
- MH MANHOLE
- FD FLOOR DRAIN
- ELECTRICAL POST
- L.S. LIGHT STANDARD
- DC DEPRESSED CURB
- 0.20ø EXISTING TREE TO REMAIN (REFER TO LANDSCAPE DRAWINGS)
- NEW TREE (REFER TO LANDSCAPE DRAWINGS)
- NEW SHRUBS (REFER TO LANDSCAPE DRAWINGS)
- NEW EVERGREEN SHRUB (REFER TO LANDSCAPE DRAWINGS)
- XX.XX EXISTING GROUND ELEVATION [TO DETERMINE EXISTING AVERAGE GRADE]
- XX.XX PROPOSED GROUND ELEVATION. REFER TO CIVIL

NOTE: 'X'-E INDICATES EXISTING TO REMAIN

No.	Date	Emis pour / Object
1	2021-09-29	FOR COORD.
2	2021-10-13	FOR COORD.
3	2021-10-21	FOR COORD.
4	2021-10-26	OFFICIAL PLAN AMENDMENT AND ZONING BY-LAW AMENDMENT

Planneur / Planner
NOVATECH ENGINEERING CONSULTANTS LTD.

Ingénieur / Engineer
(Mécanique & Électricité / Mechanical & Electrical)

Ingénieur / Engineer
(Structure / Structure)

Architecte/ Architect
(paysagiste / Landscape)

Ingénieur / Engineer
(Civil / Civil)
LRJ ENGINEERING

Client / Client
SERCO REALTY GROUP

Architecte / Architect
fig. 1
1550, Saint-Antoine O.
Montréal QC H4C 1A9
T. 514 861-5122

fig. 2
190 Somerset St W #206
Ottawa ON K2P 0J4
T. 613 695-6122

Collectif d'architectes / Architects Collective
figurr architects collective
www.figurr.ca

Sceau / Seal

Note:

L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

Projet / Project

16-STOREY MIXED-USE RESIDENTIAL BUILDING

1400 BANK ST.
OTTAWA, ON

Titre / Title

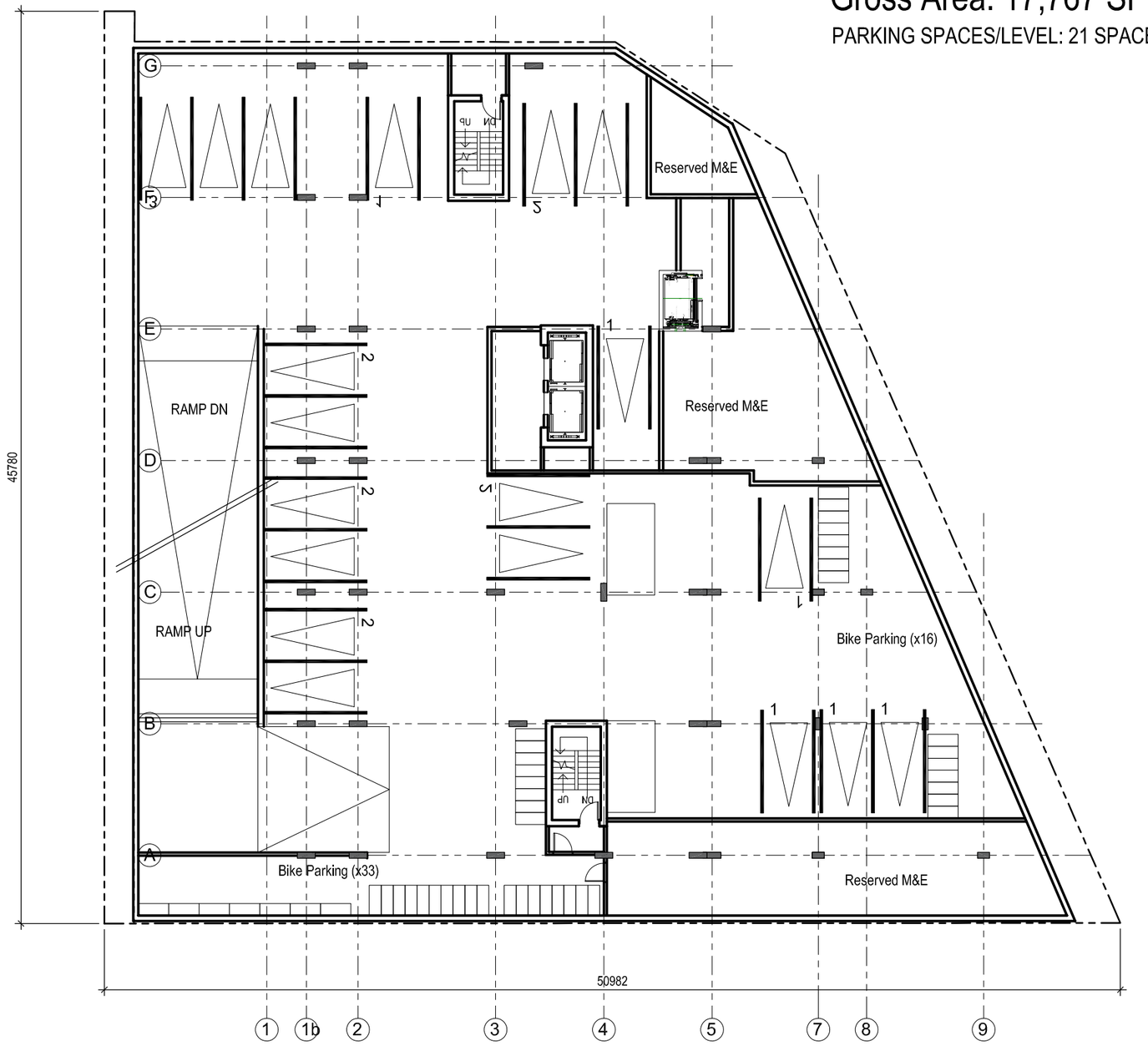
SITE PLAN

Dessiné par / Drawn by	No. projet / Project number: 2144
Vérifié par / Verified by: RC	No. dessin / Drawing number
Échelle / Scale: AS SHOWN	Révision / Revision: 0
Date de création du dessin / Drawing creation date: 2021-09-29	A-105

LEVEL P1/P2/P3

Gross Area: 17,767 SF / Level

PARKING SPACES/LEVEL: 21 SPACES



figurr architects collective

SerCo REALTY GROUP

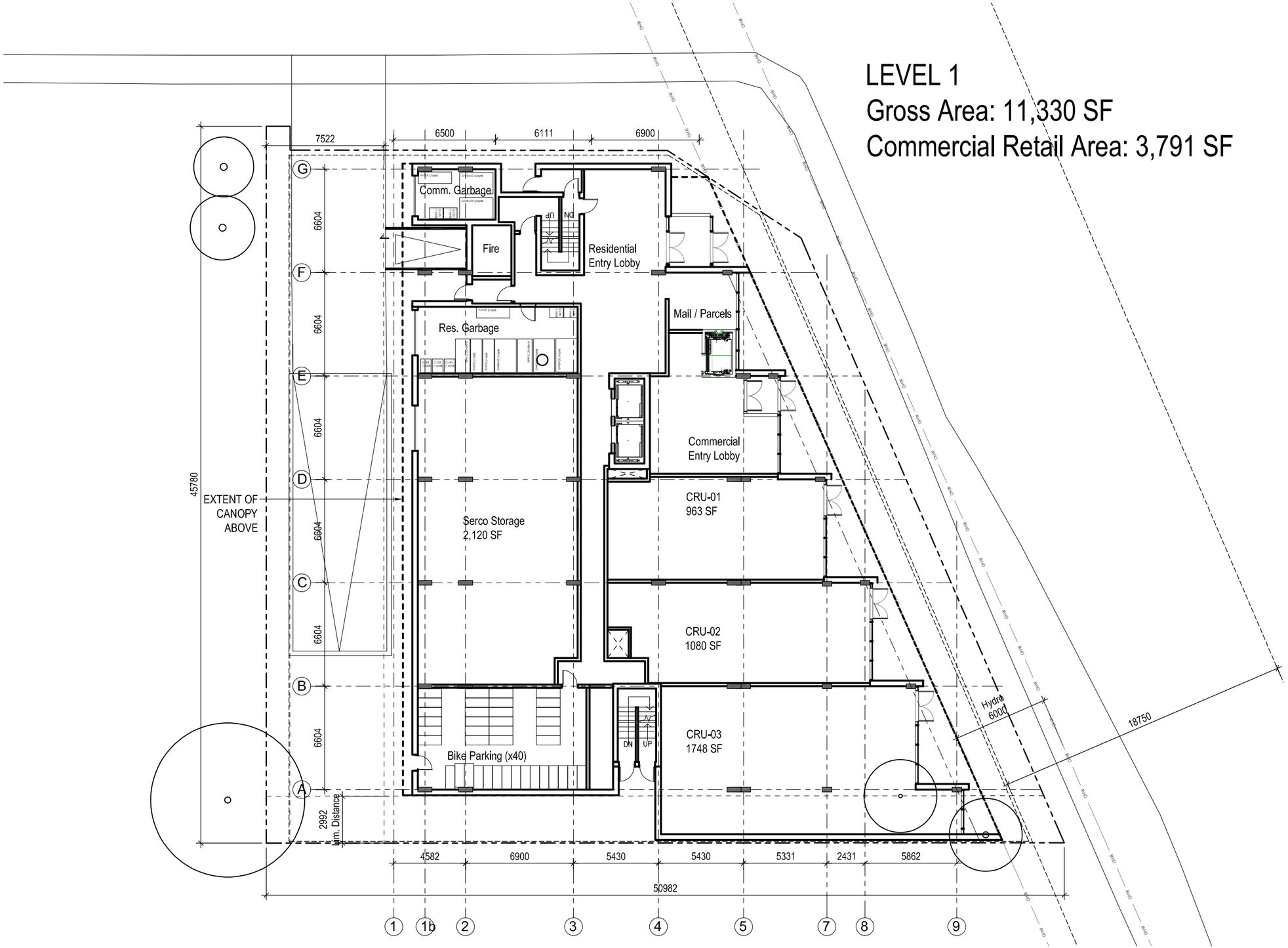
SK-01

1400 BANK STREET

PROJECT # 2144

2021 10 26 PARKING LEVELS- P1, P2, AND P3

LEVEL 1
Gross Area: 11,330 SF
Commercial Retail Area: 3,791 SF



figurr architects collective

SerCo REALTY GROUP

SK-02

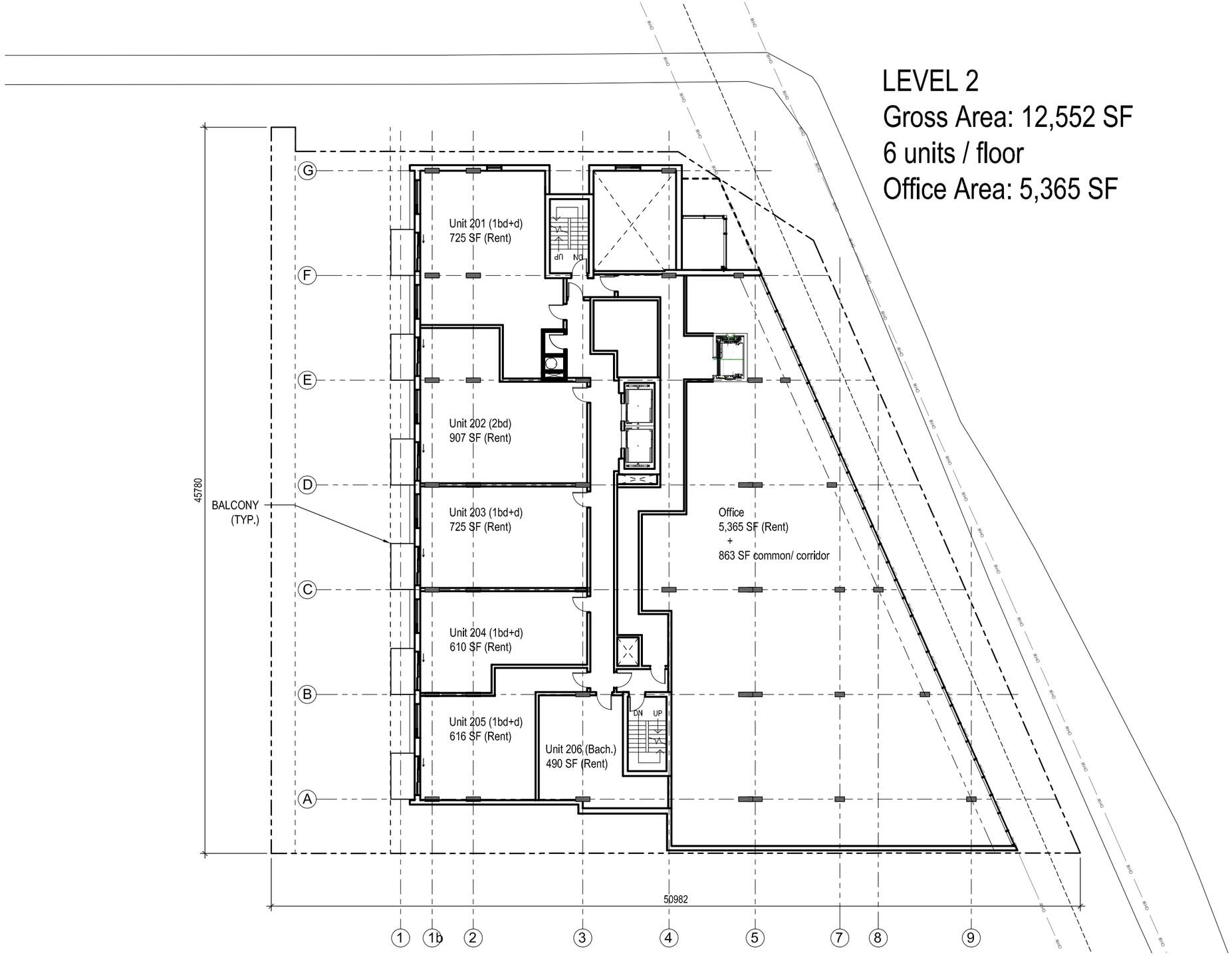
1400 BANK STREET
PROJECT # 2144
2021 10 26 GROUND FLOOR

LEVEL 2

Gross Area: 12,552 SF

6 units / floor

Office Area: 5,365 SF



figurr architects collective

SerCo REALTY GROUP

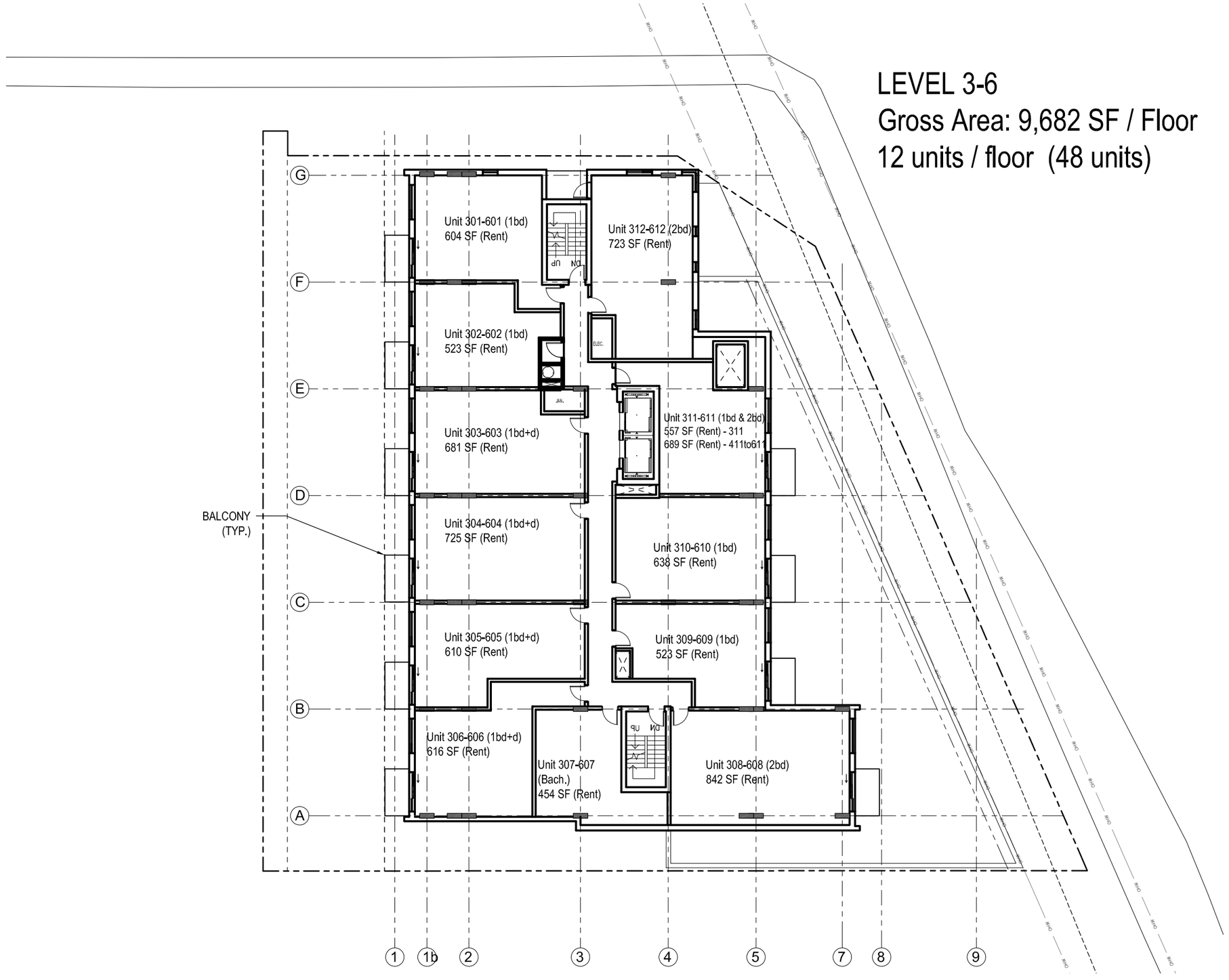
SK-03

1400 BANK STREET

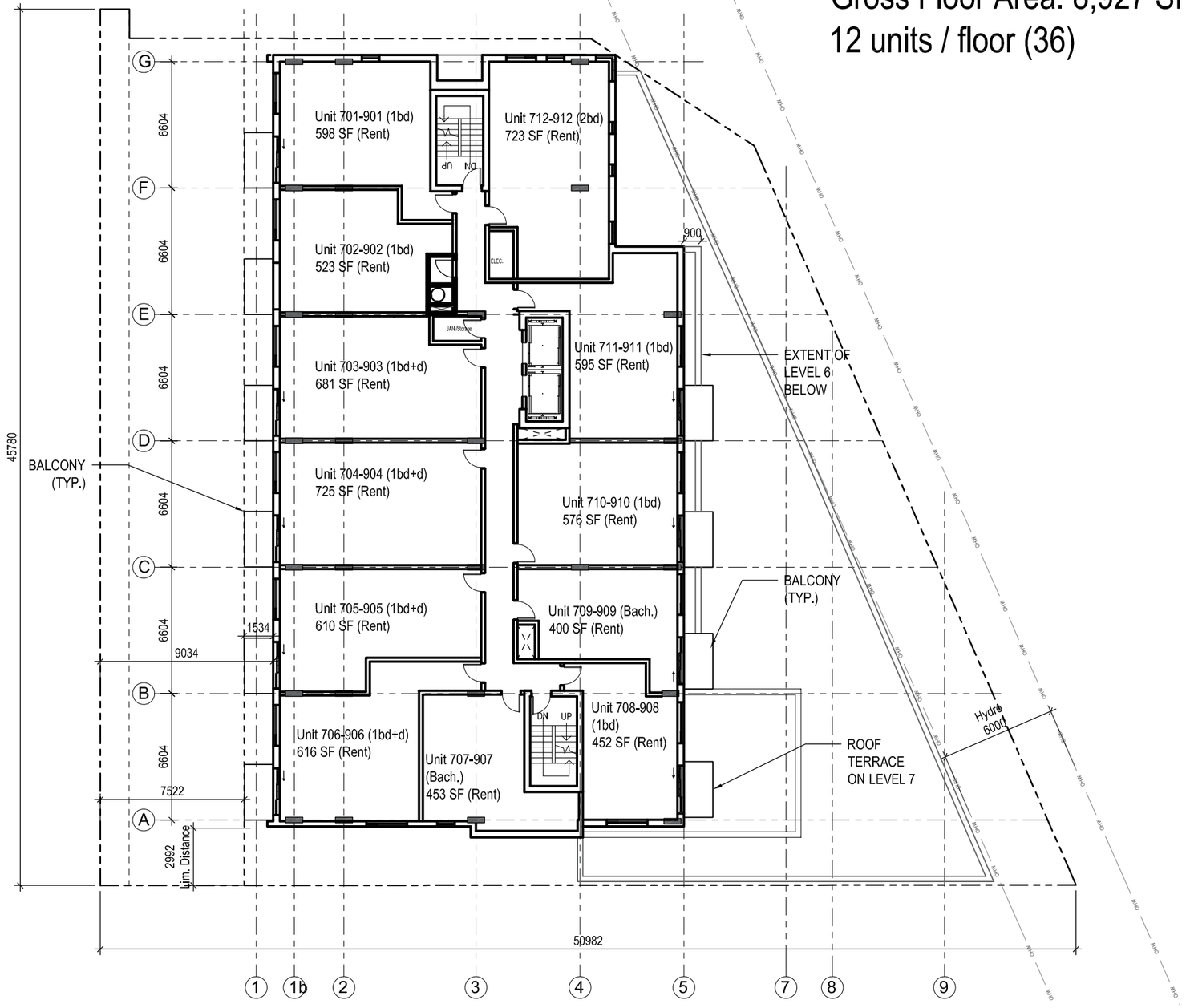
PROJECT # 2144

2021 10 26 LEVEL 2

LEVEL 3-6
Gross Area: 9,682 SF / Floor
12 units / floor (48 units)



LEVEL 7-9
Gross Floor Area: 8,927 SF / Floor
12 units / floor (36)



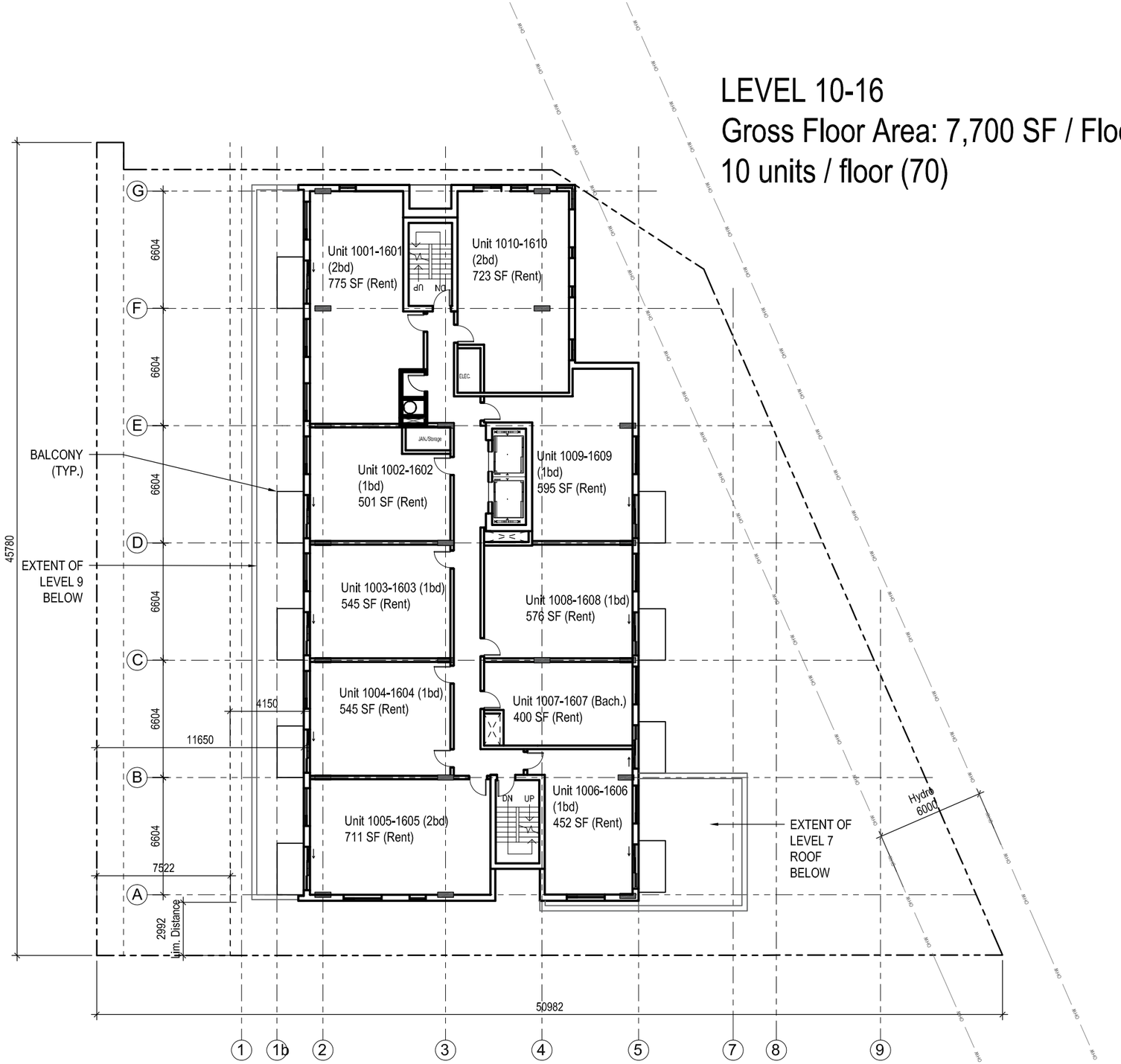
figurr architects collective

SerCo REALTY GROUP

SK-05

1400 BANK STREET
PROJECT # 2144
2021 10 26 LEVEL 7-9

LEVEL 10-16
Gross Floor Area: 7,700 SF / Floor
10 units / floor (70)



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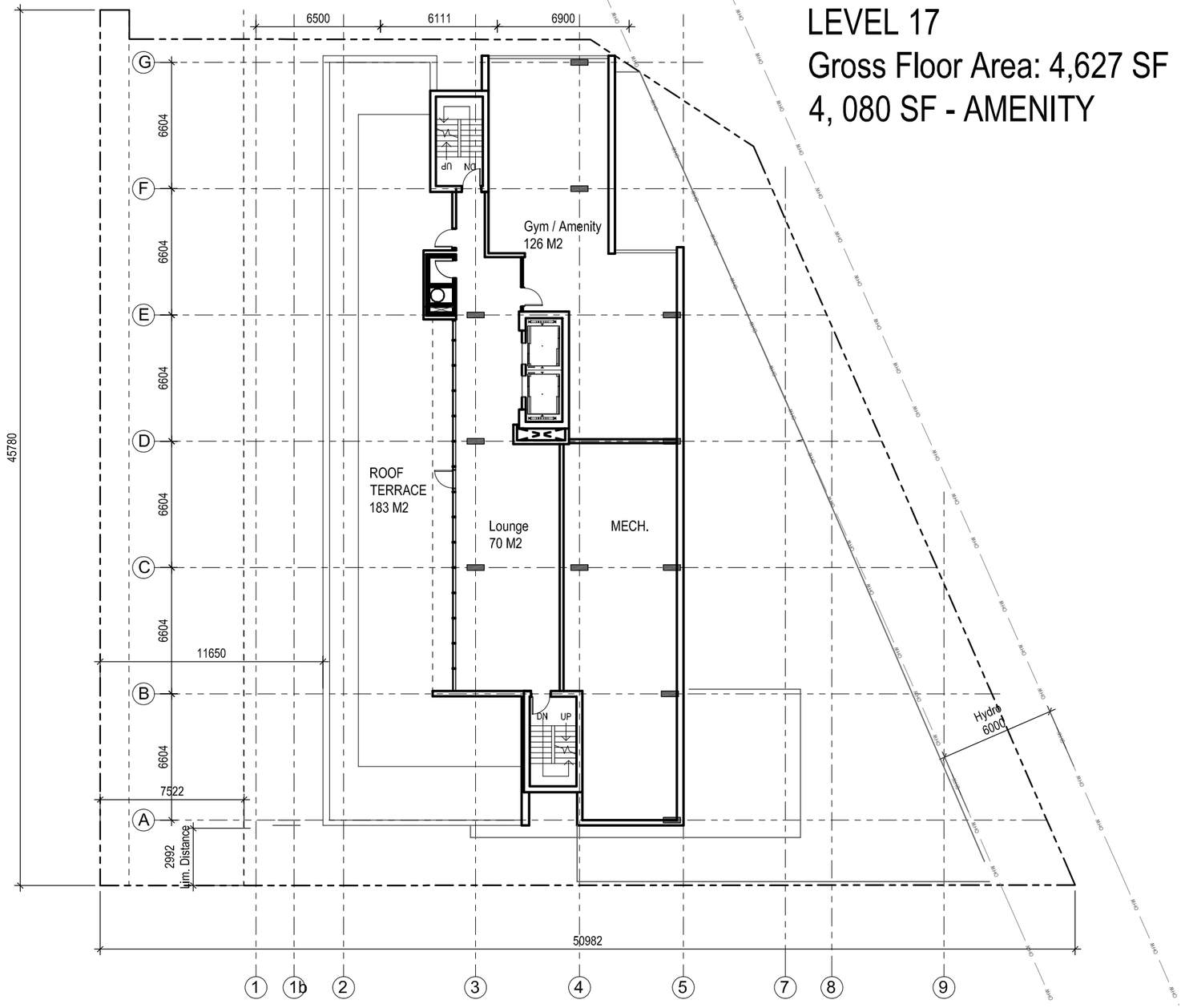
SerCo REALTY GROUP

SK-06

1400 BANK STREET
PROJECT # 2144
2021 10 26 LEVEL 10-16

LEVEL 17
Gross Floor Area: 4,627 SF
4, 080 SF - AMENITY



figurr architects collective

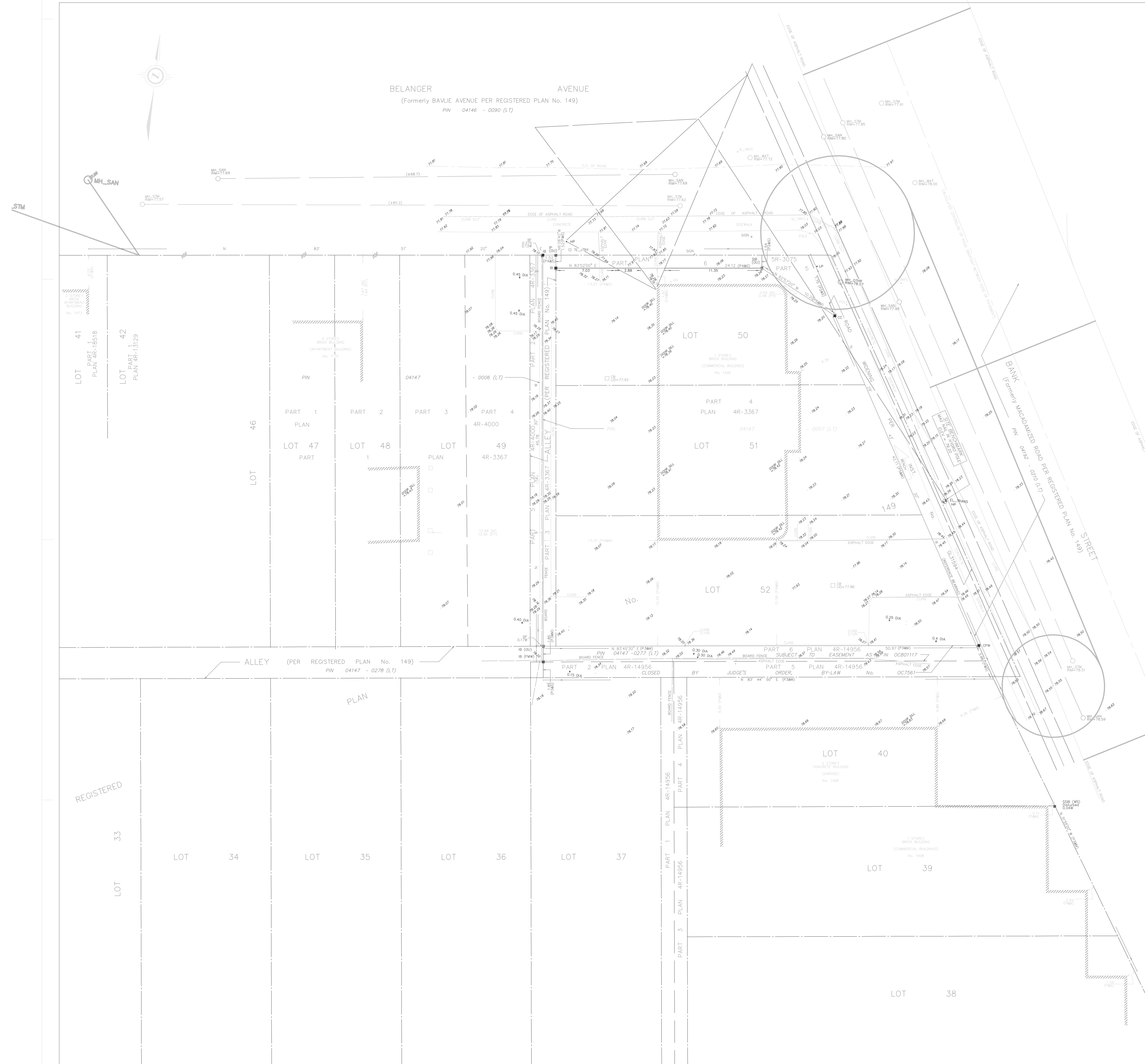
SerCo REALTY GROUP

SK-07

1400 BANK STREET
PROJECT # 2144
2021 10 26 LEVEL 17- AMENITY ROOF TOP

APPENDIX B

Topography Survey



SURVEYOR'S REAL PROPERTY REPORT
WITH TOPOGRAPHIC DETAILS
PART 1 - PLAN SHOWING

PART OF LOTS 50, 51 AND 52 AND PART OF THE ALLEY BETWEEN LOT 49 AND LOTS 50, 51 AND 52 REGISTERED PLAN No. 149 CITY OF OTTAWA

J.D. BARNES LIMITED

SCALE 1 : 150

2.5 0 2.5 5 10 metres

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE GRID, AND ARE REFERRED TO THE WESTERLY LIMIT OF BANK STREET, HAVING A BEARING OF N 29° 43' 30" W, AS SHOWN ON PLAN 5R-283.

ALL BUILDING TIES ARE TAKEN TO CONCRETE FOUNDATION UNLESS OTHERWISE NOTED.

COMPLIANCE WITH ONTARIO BUILDING CODE SETBACK REQUIREMENTS ARE NOT VERIFIED BY THIS SURVEY.

NOTES ON TREES
-TREE DIMENSIONS ARE SHOWN +/- HEREON
-DIAMETER OF TREES TAKEN AT 1.2m ABOVE GRADE
-RADIUS DENOTES MEASUREMENT OF CROWN FROM CENTER OF TREE

PART 2 - SURVEY REPORT

- DESCRIPTION
  PART OF LOTS 50, 51 AND 52 AND PART OF THE ALLEY BETWEEN LOT 49 AND LOTS 50, 51 AND 52 ON REGISTERED PLAN No. 149 BEING ALL OF PIN 04147-0007 (LT), IN THE CITY OF OTTAWA

- REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY
  NONE

- BOUNDARY FEATURES
  NOTE LOCATION OF OVERHEAD UTILITIES ALONG THE NORTHERLY AND EASTERLY LIMITS OF THE SUBJECT PROPERTY.
  NOTE LOCATION OF THE BOARD FENCES ALONG THE SOUTHERLY AND WESTERLY LIMITS OF THE SUBJECT PROPERTY.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
IB	DENOTES	IRON BAR
CC	DENOTES	CUT CROSS
CPW	DENOTES	CONCRETE PIN AND WASHER
IP	DENOTES	IRON PIPE
M	DENOTES	MEASURED
S	DENOTES	SET
OU	DENOTES	ORIGIN UNKNOWN
WS	DENOTES	WEBSTER & SIMMONDS SURVEYING LTD.
FMW	DENOTES	FAIRHALL, MOFFATT & WOODLAND LTD.
Acc	DENOTES	ACCEPTED
WIT	DENOTES	WITNESS
RP	DENOTES	REGISTERED PLAN No. 149
P	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY WEBSTER & SIMMONDS SURVEYING LTD., DATED DECEMBER 22, 1999
P1	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY WEBSTER & SIMMONDS SURVEYING LTD., DATED AUGUST 10, 2004
P2	DENOTES	PLAN 5R-3075
P3	DENOTES	PLAN 4R-14956
P4	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY W.J. WEBSTER LTD., DATED JULY 2, 1985
P5	DENOTES	PLAN 4R-3367
P6	DENOTES	PLAN 5R-283
P7	DENOTES	PLAN BY H.J. MARTIN SURVEYING LTD., DATED APRIL 18, 1984
INST.	DENOTES	INSTRUMENT
No.	DENOTES	NUMBER
———	DENOTES	PROPERTY LINE

N=NORTH / S=SOUTH / E=EAST / W=WEST

TOPOGRAPHIC LEGEND

CONC	DENOTES CONCRETE
MH_SAN	DENOTES SANITARY MANHOLE
MH_STM	DENOTES STORM MANHOLE
MH_WAT	DENOTES WATER MANHOLE
MH_OTHR	DENOTES MANHOLE (UNKNOWN)
CB	DENOTES CATCH BASIN
HP	DENOTES HYDRO POLE
LP	DENOTES LAMP POST
BF	DENOTES BOARD FENCE
C/L	DENOTES CENTERLINE
DIA	DENOTES DIAMETER
EL_TRANS	DENOTES HYDRO TRANSFORMER
TE_JTBX	DENOTES TELEPHONE JUNCTION BOX
SI_TRFC	DENOTES TRAFFIC SIGNAL
GM	DENOTES GAS METER
SIGN	DENOTES SIGN
—— E ——	DENOTES OVERHEAD HYDRO CABLE
—— T ——	DENOTES OVERHEAD TELEPHONE CABLE
—— STM ——	DENOTES UNDERGROUND STORM SEWER
—— SAN ——	DENOTES UNDERGROUND SANITARY SEWER
•	DENOTES DECIDUOUS TREE
•	DENOTES CONIFEROUS TREE

ELEVATION NOTE:

1. ELEVATIONS ARE GEODETIC AND WERE ESTABLISHED USING GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) EQUIPMENT TO ESTABLISH ELLIPSOIDAL HEIGHTS. ELLIPSOIDAL HEIGHTS WERE TRANSFORMED TO CGVD-1928:78 DATUM (GEODETIC) USING THE FEDERAL HT 2.0 HEIGHT TRANSFORMATION MODEL

2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE SITE BENCHMARKS HAVE NOTE BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING

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 JANUARY 15, 2020.

MARCH 10, 2020
DATE

GEORGE ZERVOS
ONTARIO LAND SURVEYOR

PREPARED FOR: SERCO COMMERCIAL HOLDING INC.

J.D.BARNES LIMITED
SURVEYING
MAPPING
GIS
LAND INFORMATION SPECIALISTS
2430 DON REID DRIVE, SUITE 204, OTTAWA, ON K1H 1E1
T: (613) 731-7244 F: (613) 731-8955 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
RP	GZ	19-10-150-00
FILE: $FILE$		DATED: 03/10/20

PLOTTED: $DATE$

APPENDIX C

Water Servicing Calculations

Water Supply Calculations

LRL File No.	210617
Date	October 26, 2021
Prepared by	Virginia Johnson

Residential Demand based on the City of Ottawa Design Guidelines-Water Distribution, 2010

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom/Bachelor	1.8	91	163.8
2 Bedroom/1 + Den	2.1	69	144.9
	Total	**160**	**308.7**

Average Water Consumption Rate	280	L/c/d		
Average Day Demand	**86,436**	**L/d**	**1.00**	**L/s**
Maximum Day Factor	3.6		(MOE Table 3-3)	
Maximum Daily Demand	**307,630**	**L/d**	**3.56**	**L/s**
Peak Hour Factor	5.3		(MOE Table 3-3)	
Maximum Hour Demand	**1,635,443**	**L/d**	**18.93**	**L/s**

Commercial Demands

Commercial Area	352	m^2		
Office Area	695	m^2		
Average Daily Demand	2500	$L/(1000m^2/d)$		
Maximum Daily Peak Factor	1.5			
Maximum Hourly Peak Factor	2.7			
Average Commercial Water Demand	2,618	L/d	**0.030**	**L/s**
Maximum Daily Commercial Water Dem	3,926	L/d	**0.045**	**L/s**
Maximum Hourly Commercial Water De	7,067	L/d	**0.082**	**L/s**

Total Water Demand

Average Total Water Demand	**89,054**	**L/d**	**1.031**	**L/s**
Maximum Daily Total Water Demand	**311,556**	**L/d**	**3.606**	**L/s**
Maximum Hourly Total Water Demand	**1,642,511**	**L/d**	**19.011**	**L/s**

Water Service Pipe Sizing

Q = VA Where: V = velocity, A=Area of Pipe, Q=Flow rate

Assuming a maximum velocity of 1.8m/s, the diameter of pipe is calculated as:

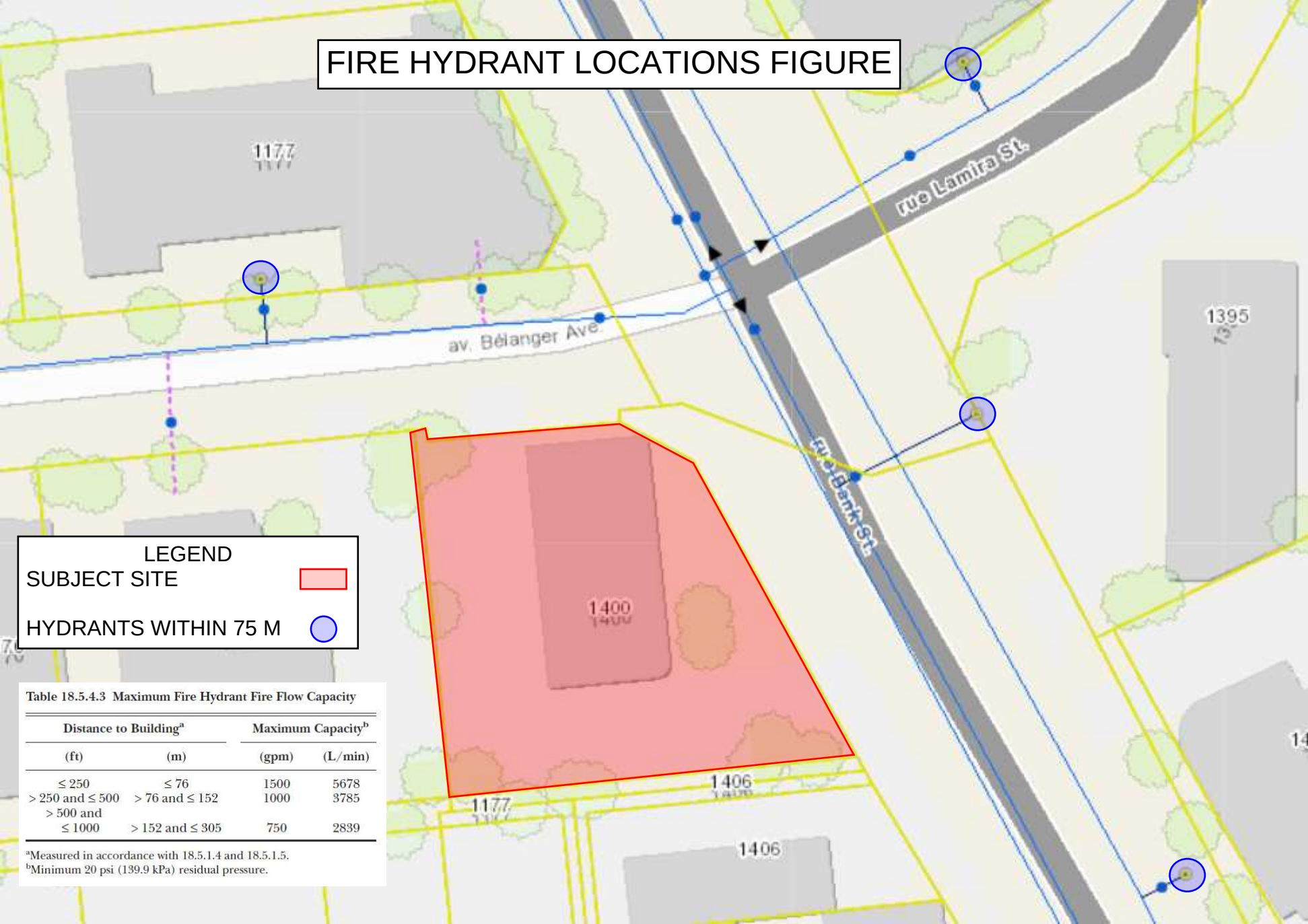
Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$	
=	0.116	m
=	116	mm
Proposed pipe diameter (d) =	**150**	mm

Fire Flow Calculations

LRL File No. 210617
Date September 29, 2021
Method Fire Underwriters Survey (FUS)
Prepared by Virginia Johnson

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Structural Framing Material								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	**0.8**		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
Floor Space Area (A)								
2	Total area (ASSUMED BASED ON PRELIMINARY ARCH DWGS)					**1,200**	m^2	
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x $A^{0.5}$				L/min	**6,097**
Reductions or surcharge due to factors affecting burning								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	**0%**	L/min	**6,097**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	True	**-30%**	L/min	**3,048**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
6	Choose separation	Exposure distance between units	North side	20.1 to 30m	10%		L/min	**4,420**
			East side	>30m	0%			
			South side	3.1 to 10m	20%			
			West side	10.1 to 20m	15%	**45%**		
Net required fire flow								
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	**4,000**
		Minimum required fire flow rate					L/s	**66.7**
		Required duration of fire flow					hr	**2**

FIRE HYDRANT LOCATIONS FIGURE



LEGEND

SUBJECT SITE

HYDRANTS WITHIN 75 M

Table 18.5.4.3 Maximum Fire Hydrant Fire Flow Capacity

Distance to Building[a]		Maximum Capacity[b]	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

[a]Measured in accordance with 18.5.1.4 and 18.5.1.5.
[b]Minimum 20 psi (139.9 kPa) residual pressure.

APPENDIX D

Sanitary Service Calculations

LRL File No. 210617
Project: Apartment Building
Location: 1400 Bank Street, Ottawa
Date: October 26, 2021

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
Commercial & Institutional Flow = 50000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5
Industrial Peak Factor = as per Appendix 4-B = 7
Extraneous Flow = 0.33L/s/gross ha

Pipe Design Parameters

Minimum Velocity = 0.60 m/s
Manning's n = 0.013

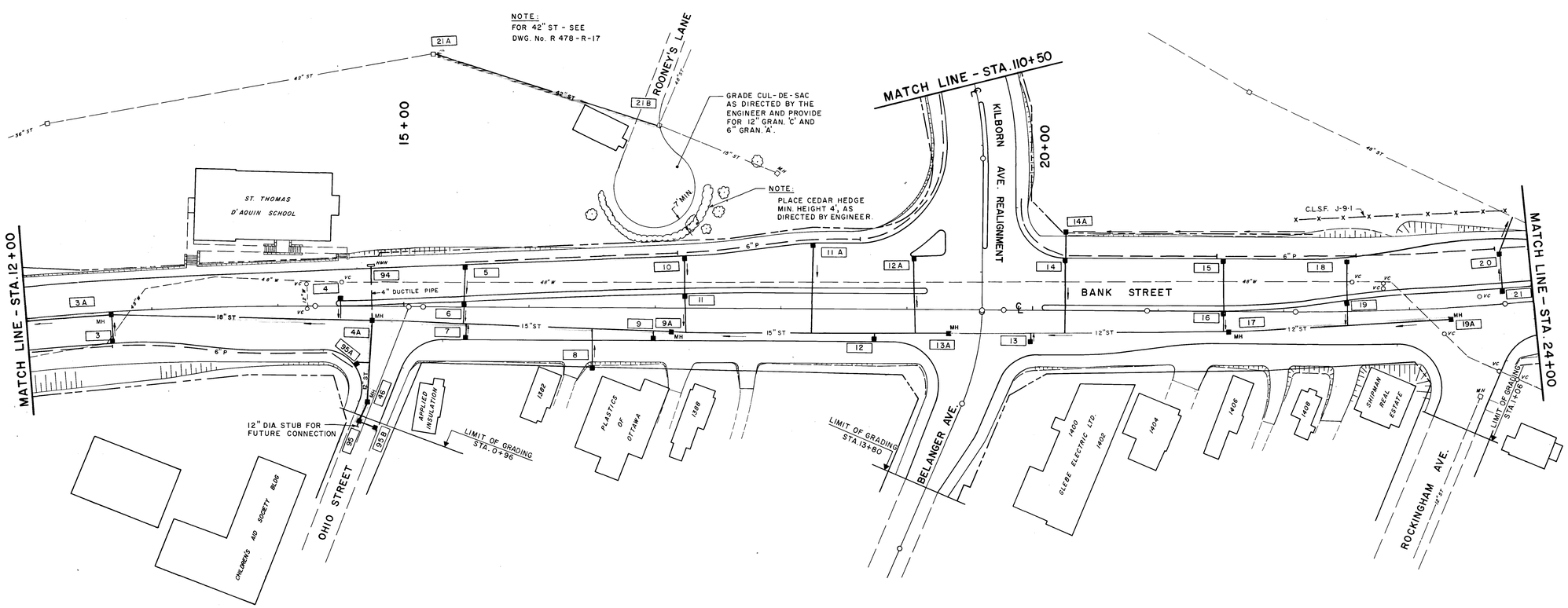
LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW	PIPE					
STREET	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)	(l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
SITE	PROP. BLDG	EX. SAN	0.060	308.0	0.06	308.0	4.0	3.99	0.118	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.18	0.18	0.06	4.05	10.0	150	2.00%	PVC	21.54	1.22

NOTES: Existing inverts and slopes are estimated. They are to be confirmed on-site.

Designed: VJ	PROJECT: Apartment Building		
Checked: VJ	LOCATION: 1400 Bank		
Dwg. Reference: N/A	File Ref.: 210617	Date: 2021-10-26	Sheet No. 1 of 1

APPENDIX E

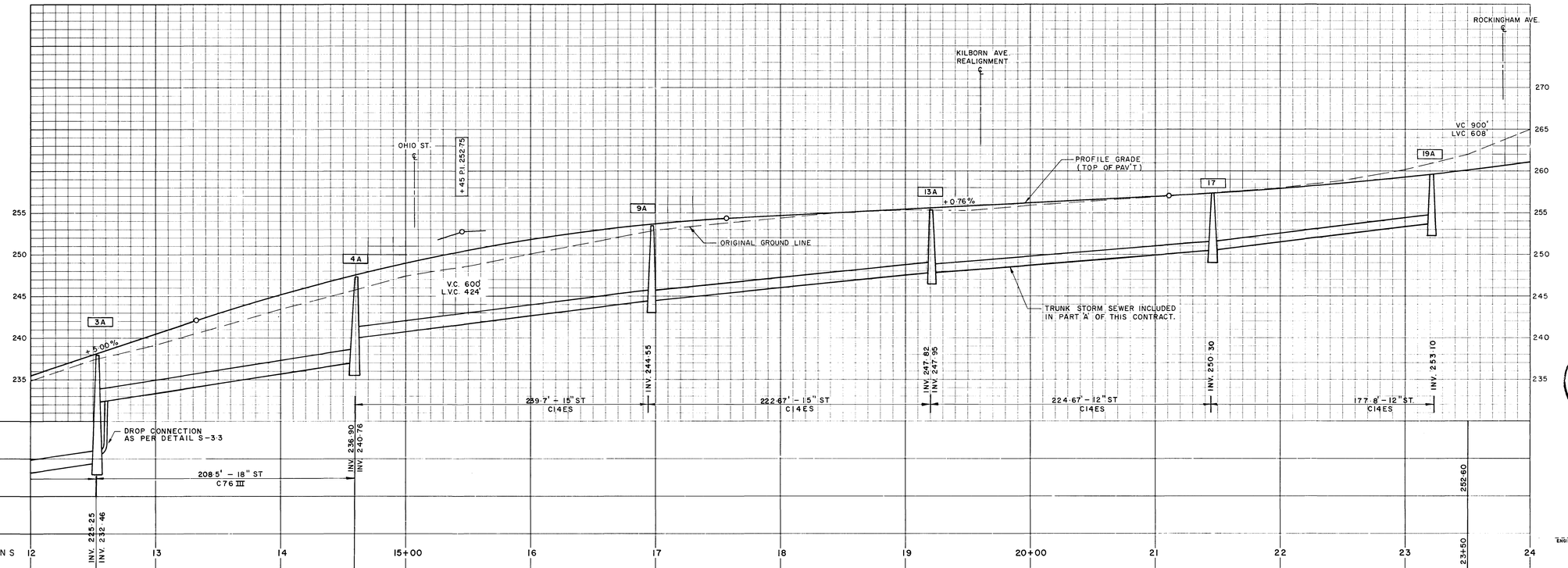
Bank Street Plan and Profile Drawing



NOTE:

1. ALL AREAS OUTSIDE ROADWAY AFFECTED BY CONSTRUCTION TO BE GRADED AS DIRECTED BY THE ENGINEER.
2. AREAS WITHIN RIGHT-OF-WAY TO BE LANDSCAPED WITH 4" OF TOPSOIL AND SODDED.
3. OUTSIDE OF RIGHT-OF-WAY TO BE LANDSCAPED WITH 4" OF TOPSOIL, SEED AND MULCH.

——— TRUNK STORM SEWER INCLUDED IN PART 'A' OF THIS CONTRACT. (CATCH BASINS LATERALS E.T.C. INCLUDED IN PART 'B')



AS BUILT

NO.	REVISION	BY	DATE

THE REGIONAL MUNICIPALITY OF OTTAWA—CARLETON
Roads Department

BANK STREET RECONSTRUCTION

GRADING & DRAINAGE STA. 12+00 TO STA. 24+00

Des: O.H.S.	Chkd: O.B.J.
Dwn: H.R.	Chkd: O.H.S.
Date: MAY 1973	
Scale: Horiz. 1" = 40' Vert. 1" = 6'	

N.H. ORR P. ENG.
Regional Roads Engineer

Eng. I/C Design & Services Branch

CONTRACT NO. 70-518-I PHASE II

DWG. NO. R478-R-8

SHEET 8 OF 25

ENGINEER I/C. SEWER BRANCH

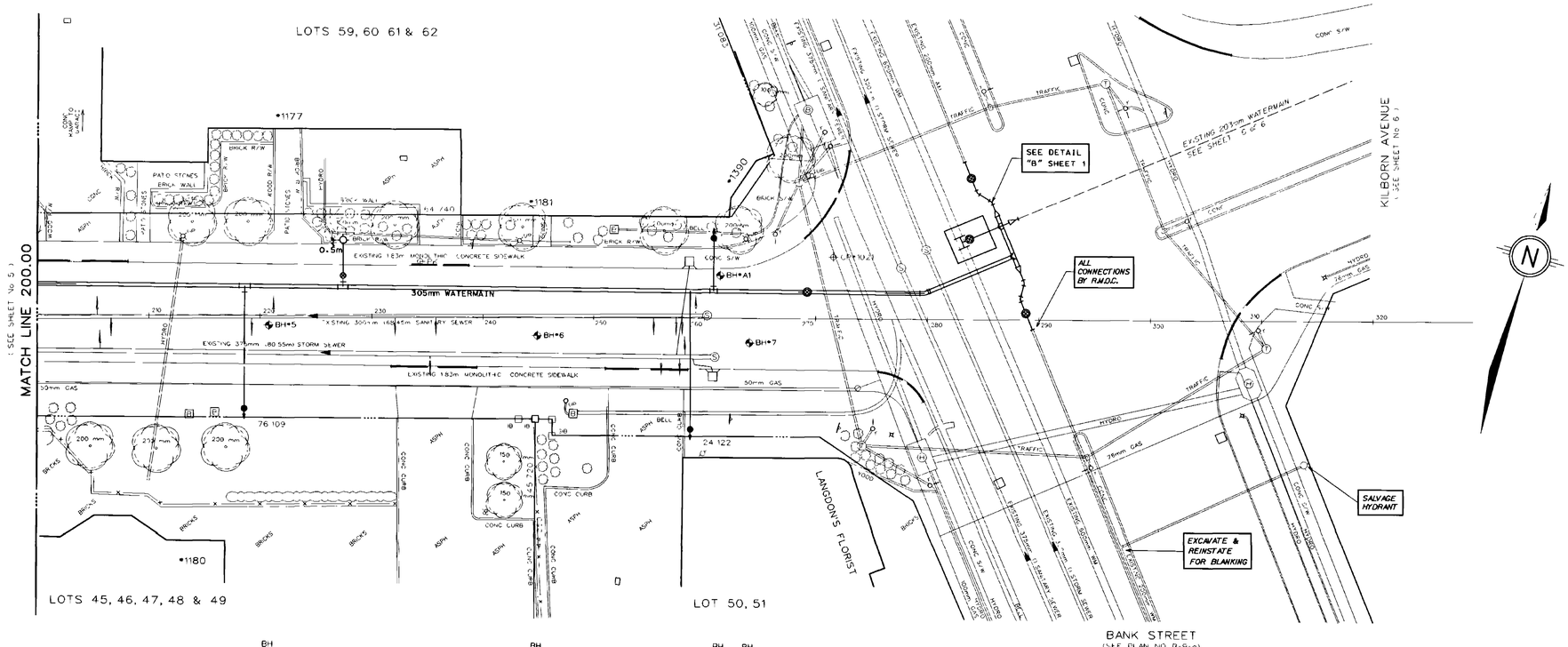
REGISTERED PROFESSIONAL ENGINEER O.B. JOHNSEN PROVINCE OF ONTARIO

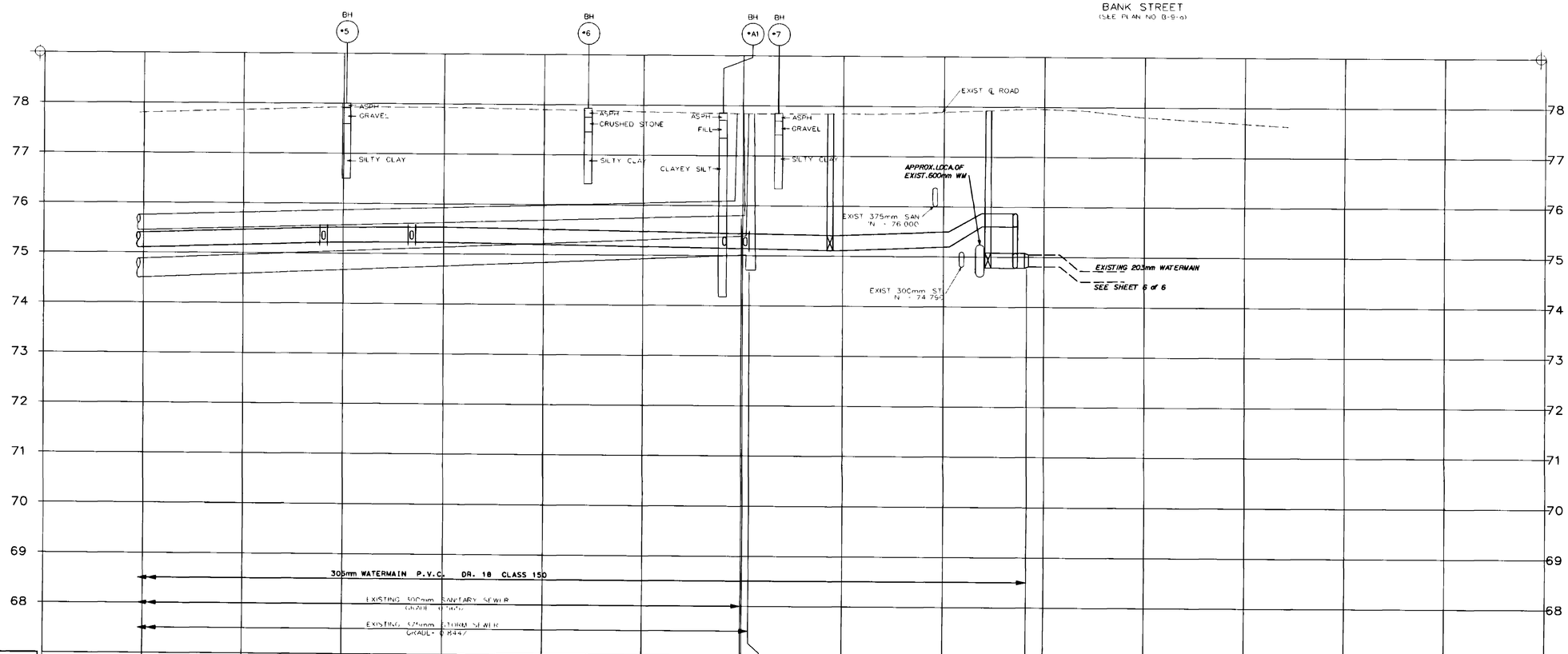
TYPE "A"

MATCH LINE - STA. 12+00
ADJACENT CONTRACT
LIMIT OF CONTRACT
STA. 15+00±
15+00
ST THOMAS D'AQUIN SCHOOL
ROONEY'S LANE
STA 16+30 PERMANENT SUPPORT FOR BELL DUCT
MATCH LINE - STA. 110+50
KILBORN AVE. REALIGNMENT
20+00
EXTRA DEPTH EXC.
BROKEN 5/8" SERVICE
BANK STREET
9A
APPLIED INSULATION
PLASTICS OF OTTAWA
LIMIT OF GRADING STA. 0+96
LIMIT OF GRADING STA. 13+80
BELANGER AVE.
GLEBE ELECTRIC LTD
FIRE HYDRANT, VALVE BOX AND 6" DIA. CONNECTION TO 48" DIA. WATERMAIN SUPPLIED AND INSTALLED BY CONTRACTOR
STA. 22+55 ACCESS MH. 6" GATE VALVE
TAPPING VALVE AND SLEEVE TO EXISTING 24" WATERMAIN SUPPLIED AND INSTALLED BY THE WORKS DEPARTMENT
STA 22+79 12" GATE VALVE 2" AIR RELEASE VALVE
LIMIT OF CONTRACT STA. 24+48
ADJACENT CONTRACT
2-BELL DUCT WITH PERMANENT SUPPORT
STA. 24+00.5 BUTTERFLY 4" DRAIN VALVE 2" AIR-RELEASE VALVE.
4" GAS MAIN RELOCATED WITH 12"x6" SUPPORT
STA 24+17 8" GATE VALVE
STAGE III BY OTHERS STA 24+38±
2"Ø GAS RELOCATED WITH 12"x6" SUPPORT
STA 23+42 4" DRAIN VALVE
VC 2 RELOCATED 6' AHEAD BECAUSE OF INTERFERENCE WITH BELL DUCTS & ACCESS TO VAVE CHAMBER
STA 22+00 ℄ OF BANK ST.
= STA 22+00 ℄ OF WATERMAIN 9/8 23'± RT
8" OFF 8" TEE
CONNECTIONS TO EXISTING 8" Ø WATERMAIN BY WORKS DEPARTMENT
ROCKINGHAM AVE.
PLAN
NOTE: BEFORE MOVING TEST CAP CONTRACTOR WILL HAVE TO CONTACT THE WORKS DEPARTMENT TO ENSURE THAT EXISTING 48 INCH WATERMAIN IS NOT IN OPERATION
NOTE: GRADING AND DRAINAGE FOR RECONSTRUCTION OF BANK STREET IS NOT PART OF WATERMAIN CONTRACT.
WIDTH = O.D. PIPE + 30"
RESTORE EXISTING ROADWAY WITH 12" OF GRAN. 'A' OR AS DIRECTED
COMPACTED CLASS 'C' GRANULAR MATERIAL
℄ PIPE
COMPACTED PIPE BEDDING MATERIAL (STONE DUST)
UNDISTURBED GROUND
TYPICAL TRENCH SECTION
SCALE 1/2" = 1'-0"
NOTE: TYPE VIII VC CHANGED TO TYPE VII R BY TAGGART CONST. LTD.
KILBORN AVE. REALIGNMENT
ROCKINGHAM AVE.
PROPOSED PROFILE GRADE ℄ WATERMAIN
ORIGINAL GROUND ℄ WATERMAIN
ORIGINAL GROUND LINE
PROPOSED PROFILE GRADE ℄ (TOP OF PAV'T)
OHIO ST.
V.C. 600' L.V.C. 424'
+0.76%
+5.00%
GR.=6.43%
GR.=1.26%
0°20' DEFL FOR 2 JOINTS TOTAL DEFL 0°40'
24" TO BOTTOM OF VC
EXTRA DEPTH EXC. BECAUS OF WET CONDITIONS
REMOVE EXIST. 48" TEST CAP.
PROPOSED 48" DIAMETER "HYPRESCON" PRE-STRESSED CONC. LINED CYLINDER PIPE A.W.W.A. C-301I
℄ 48" W.M.
STATIONS 12 13 14 15+00 15+93 16 17 18 19 20+00 21 21+30 21+70 22 22+55 22+79 22+87 23+11 23+17 23+40 23+47 23+50 23+60 23+73 24+00.5 24 24+17 24+38± 24+50
SECTION
THRUST BLOCKS STA. 22+87 TO STA. 23+73
SCALE: 1/4" = 1'-0"
NOTE: THRUST BLOCK UNDER BEND STA 23+54 SHALL BE 2' DEEP AND 5' X 5' WIDE.
AS BUILT
NOTE: AV.- 2" AIR RELEASE VALVE DO.- 4" DRAIN VALVE (R)-DENOTES BELL BOLT-TIED JOINTS
PERMANENT UTILITY SUPPORTS
2 AS BUILT (REVISIONS) H.B. 29/01/74
1 ELBOW STA 23+73 REVISED, RESTRAINED JOINTS AND FIRE HYDRANT ADDED. 23/8/73
NO REVISION BY DATE
THE REGIONAL MUNICIPALITY OF OTTAWA–CARLETON
Works Department
SOUTH OTTAWA FEEDER WATERMAIN
OHIO ST. TO ROCKINGHAM AVE.
PLAN & PROFILE
STA. 12+00 TO STA. 24+48
Des: H.V.M. Chkd: O.B.J.
Dwn: E.B.M. Chkd: O.H.S.
Date MAY 1973
Scale Horiz. 1" = 40' Vert. 1" = 6'
De Leuw, Cather
CONTRACT NO. 11-73 STAGE II
DWG. NO. 4302-5
SHEET 5 OF 8
2335-1-4
TYPE "A"

~~2803~~ (5) BELANGER AVENUE

BELANGER AVENUE





Elevations	200.00	210.00	218.55–220.00	227.33–230.00	240.00	250.00	258.70–38mm SERVICE–	260.80–152x305mm TEE W/ 152mm VALVE & BOX–	269.20–270.00	273.30	280.00	282.30	288.78–290.00	300.00	310.00	320.00
Existing Surface	77.798	77.857	77.96	77.932	77.900	77.868	77.835	77.835	77.842	77.844	77.851	77.934	77.924	77.892	77.768	
Proposed North Gutter																
Proposed & Road																
Proposed South Gutter																
Asbuilt Top of Watermain	75.440	75.410	75.511 / 75.516	75.564 / 75.532	75.520		75.364		305mm VALVE & CHAMBER– 75.403		305mm x 22½° HOR. BEND	75.450	305x203mm REDUCER			
Sewer Type & Diameter			102x305mm TEE W/ 102mm VALVE & BOX–	HYDRANT WITH VALVE & BOX–												
Sewer Inverts Existing & Proposed																
Stations	200.00	210.00	220.00	230.00	240.00	250.00			270.00		280.00		290.00	300.00	310.00	320.00

Revisions

No	Date	Description	Drawn By	Approved By
1	March 2000	Asbuilt Watermain	M Wood	

Design:

Designed By	Date	Checked By	Date
Surve, Data By	Date	Field Checked By	Date
Drafting By	Date	Checked By	Date

LICENSED PROFESSIONAL ENGINEER — REG REHBEIN — PROVINCE OF ONTARIO — ROAD & SEWER

LICENSED PROFESSIONAL ENGINEER — F MARCUCCIO — PROVINCE OF ONTARIO — WATER ONLY

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — NARROWINGS

Chief Design & Const Ex.
H V. Poscoe, P Eng.

Final Measurements:

Construction Type		Inspector	
WATERMAIN, ROAD AND SIDEWALKS		GUY QUIROUETTE	
Work Commenced		Project Manager	
APRIL 26, 1999		REG RHBEIN	
Work Completed		Field Book #	
AUGUST , 1999		NIL	
Contractor		Date	
O'LEARY'S LTD		AUGUST 9, 1999	
Final and Revisions	Date	Checked By	
GUY QUIROUETTE			

Notes:

- While illustrators and utilities shown are taken from the best available information, they cannot be guaranteed
- The contractor is requested to check with all utility companies before digging
- Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary
- The actual rock line was recorded during construction of the existing sewer
- Soil information taken from J D PATERSON & ASS LTD •S6385-1 •G6929-1
- Reference bench mark
- Date of television inspection Oct 12, 1990 & March 1, 1995
- This plan supersedes (in whole or in part) plan •

Watermain Notes:

1. All watermain materials and construction methods shall be in accordance with the latest edition of the R M O C Environment Section Specifications and Standard Drawings
2. All connections of new watermains to existing watermains and all blankings of existing mains and services shall be performed by R M O C staff. The Contractor shall provide excavation, backfilling and reinstatement
3. All copper services (19mm to 51mm) shall be installed by R M O C staff after the watermain has been successfully disinfected
4. All new water services shall be installed at 2.4m cover
5. All new water services that conflict with sanitary and storm sewers at crossings shall be installed under the sewers unless otherwise directed by the Regional Project Manager
6. The proposed watermain shall be insulated at specified locations per R M O C Specification WSD 21 and 23
7. A minimum 2.0m separation is required between all new water services and catch basins or open structures and shall be insulated per R M O C Specification WSD-23 as applicable
8. A minimum 2.0m separation is required between all new hydrants and catch basins or open structures and shall be insulated per R M O C Specification WSD 23 as applicable
9. The Contractor shall be responsible to determine via excavation, the exact location and elevation of the existing watermains as required for all connections relocations and blankings

Regional Municipality of Ottawa Carleton Environmental & Transportation Department — Municipalité régionale d'Ottawa Carleton Service de l'environnement et des transports

Approved

Date WATER WORKS

RMOC Drawing No. 5238

5238 – 3

Boundary information shown hereon has been compiled and calculated from Teranet data and not based on an actual survey
Distances shown to survey monuments are for reference purposes only. Survey monuments may not define property boundaries

City of Ville d' Ottawa

Department of Urban Planning & Public Works
Engineering Branch
Design And Construction Division
111 SUSSEX DRIVE, SUSSEX PAVILION, 7TH FLOOR, OTTAWA, ONTARIO K1N 5A1

E.M. Robinson	W.R. Cole, P.Eng.

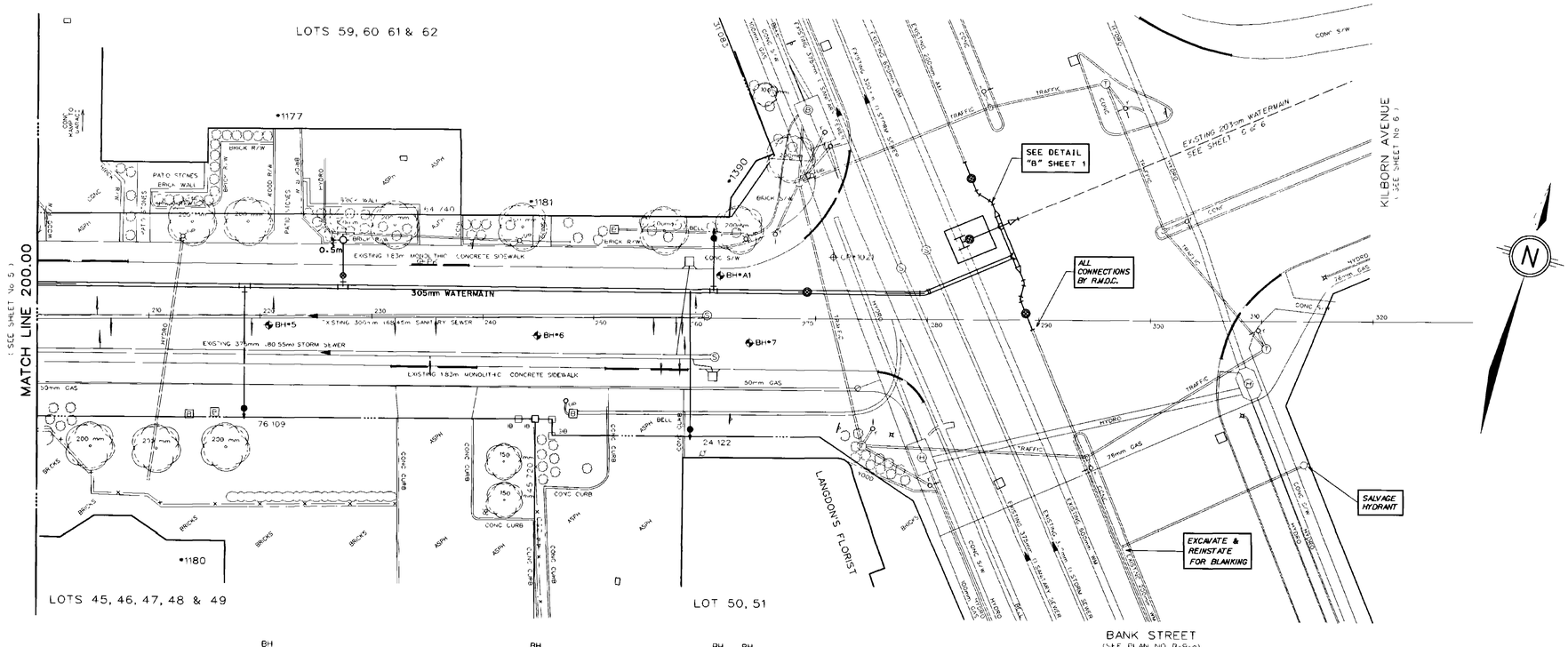
BELANGER AVENUE

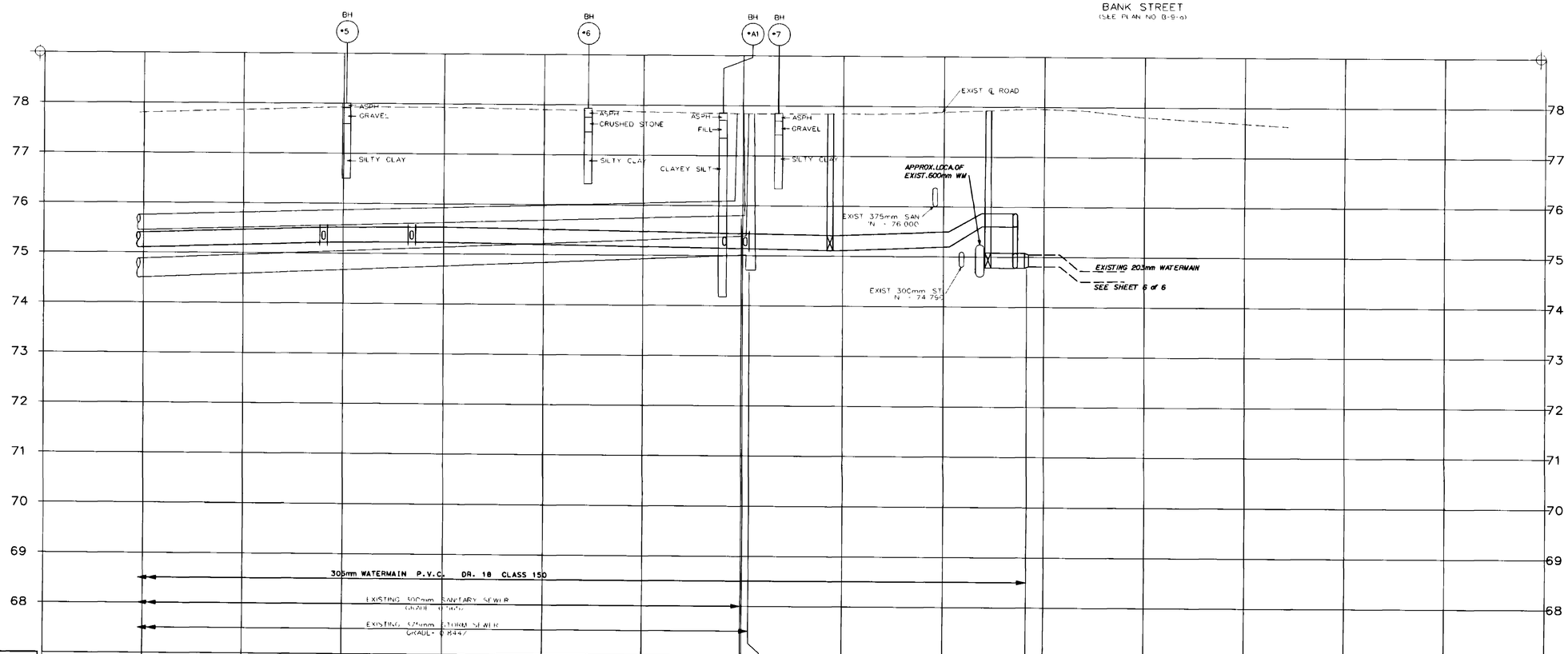
FROM STATION 200.00 TO BANK STREET

99C2803		HOR. 1:250 VERT. 1:50	2803

~~2803~~ (5) BELANGER AVENUE

BELANGER AVENUE





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Revisions

No	Date	Description	Drawn By	Approved By
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LICENSED PROFESSIONAL ENGINEER — F MARCUCCIO — PROVINCE OF ONTARIO — WATER ONLY

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O'LEARY'S LTD		AUGUST 9, 1999	
Final and Revisions	Date	Checked By	
GUY QUIROUETTE			

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Regional Municipality of Ottawa Carleton Environmental & Transportation Department — Municipalité régionale d'Ottawa Carleton Service de l'environnement et des transports

Approved

Date WATER WORKS

RMOC Drawing No. 5238

5238 – 3

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111 SUSSEX DRIVE, SUSSEX PAVILION, 7TH FLOOR, OTTAWA, ONTARIO K1N 5A1

E.M. Robinson	W.R. Cole, P.Eng.

BELANGER AVENUE

FROM STATION 200.00 TO BANK STREET

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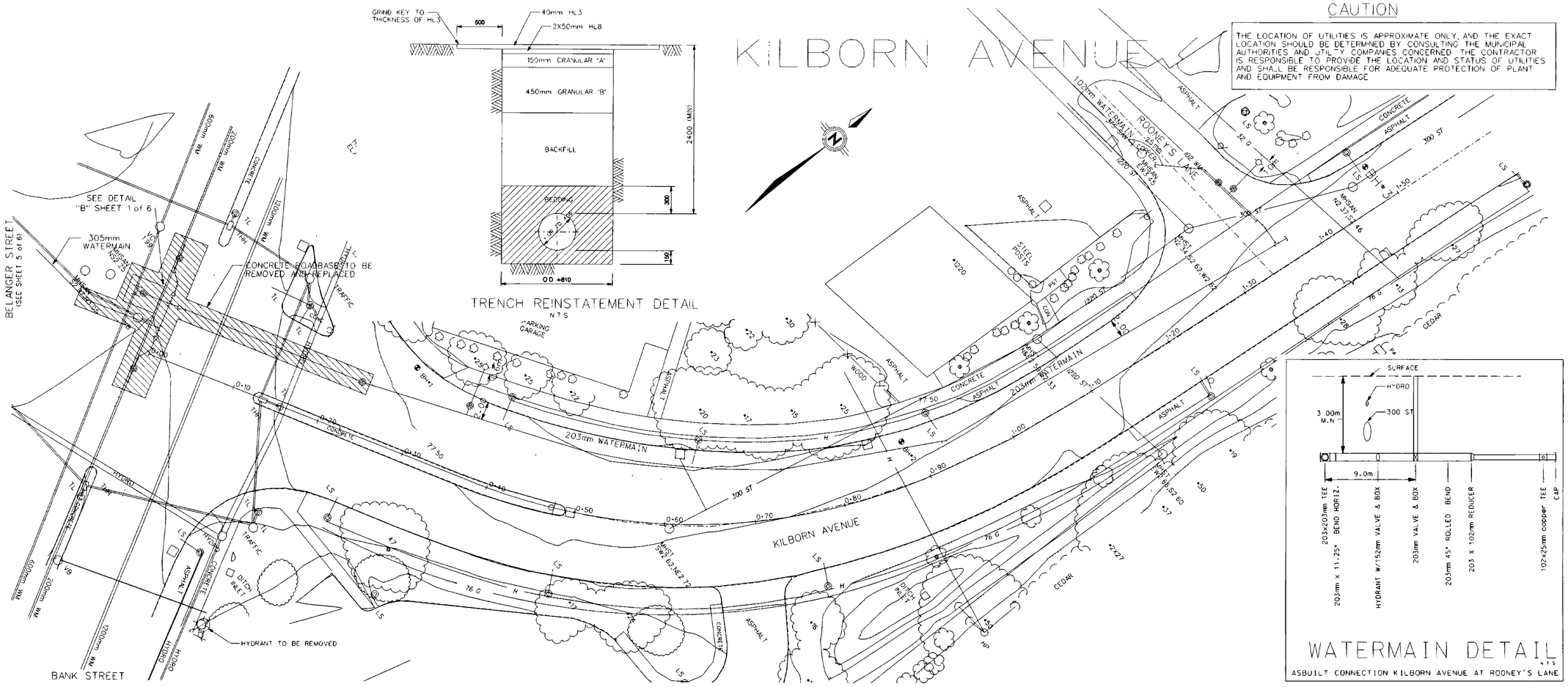

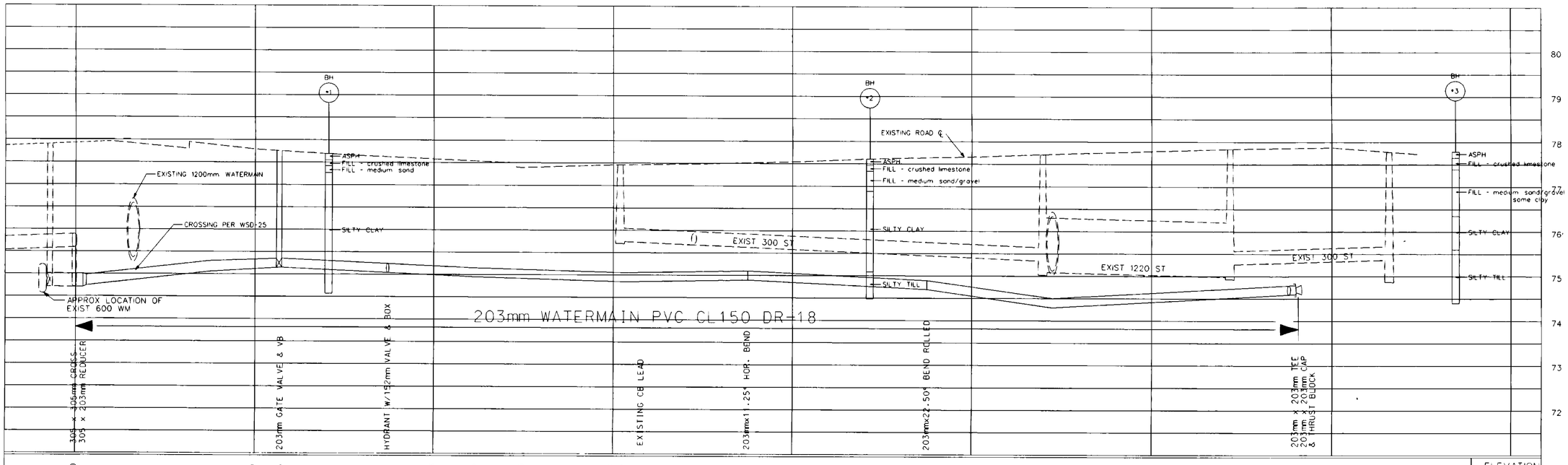

~~2803~~ (6) KILBORN AVENUE

CAUTION

THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF PLANT AND EQUIPMENT FROM DAMAGE

WATERMAIN DETAIL
N T S
ASBUILT CONNECTION KILBORN AVENUE AT ROONEY'S LANE

Ottawa-Carleton

ENVIRONMENT
and
TRANSPORTATION
DEPARTMENT

M J E SHEFLIN P Eng
ENVIRONMENT and TRANSPORTATION
COMMISSIONER

Approved by

Engineering Services

Date

LICENSED PROFESSIONAL ENGINEER
F MARCUCCIO
PROVINCE OF ONTARIO

Project Officer — MICHAEL WILLMETS — Date

Drawn by	Verified by	Date
JAMES G CHARRON		

Survey details by.	Book #	Date
REGION		

"As Built" Inspection by — Date

NOTES

1 SOIL INFORMATION, IF SHOWN IS NOT GUARANTEED CONTRACTORS ARE ADVISED TO COLLECT ADDITIONAL SOIL INFORMATION AS DEEMED NECESSARY SEE McROSTIE, GENEST, ST.-LOUIS REPORT NO SF-4518 FROM NOV 3, '98.

2 ALL COPPER SERVICES (19mm TO 51mm) SHALL BE INSTALLED BY R M O C STAFF AFTER THE W M HAS BEEN SUCCESSFULLY DISINFECTED

3 ALL WATERMAIN MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE R M O C STANDARD SPECIFICATIONSAND STANDARD DRAWINGS

4 ALL CONNECTIONS OF NEW W M TO EXIST W M AND ALL BLANKINGS OF EXIST MAINS AND SERVICES SHALL BE PERFORMED BY R M O C FORCES THE CONTRACTOR SHALL PROVIDE EXCAVATION BACKFILL AND REINSTATEMENT

5 ALL NEW WATER SERVICES SHALL BE INSTALLED AT 2 4m COVER

6 THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN IN GOOD WORKING ORDER ALL SERVICE LATERALS ENCOUNTERED DURING CONSTRUCTION

7 REINSTATEMENT SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE LOCAL MUNICIPAL AUTHORITY, OR AS SPECIFIED

8 ALL WATER SERVICES THAT CONFLICT WITH SAN AND STORM SEWERS AT CROSSINGS SHALL BE INSTALLED UNDER THE SEWERS UNLESS OTHERWISE DIRECTED BY THE R M O C PROJECT MANAGER

9 THE PROPOSED W M SHALL BE INSULATED AT SPECIFIED LOCATIONS AS PER R M O C SPEC WSD-23

10 A MINIMUM 2m SEPARATION IS REQUIRED BETWEEN ALL NEW WATER SERVICES OR HYDRANTS AND CATCH-BASINS OR OPEN STRUCTURES AND SHALL BE INSULATED AS PER R M O C SPEC WSD-23 AS APPLICABLE

Regional Municipality of Ottawa Carleton Environment & Transportation Department
Municipalité régionale d'Ottawa Carleton Le Service de l'environnement et des transports
Approved
Date: -
WATER WORKS
RMOC Drawing No 5238

By	Description	Rev	Date
MJW	ASBUILT	1	03/00

Scale HORIZ 1 250
VERT 1 50

Project Title

KILBORN
STREET

203mm WATERMAIN

BANK STREET
TO
ROONEY'S LANE

Drawing No 5238

Sheet No 4 of 1

Filename 5238kilborn.DGN
Reference 5238kilborndet.DGN