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PROJECT N° 37543

Scotiabank – Rideau and William Street Branch
Site Services Brief

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Scotiabank – Rideau and William Street Branch Site Services Brief

October 19, 2016

7391-001-00



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1 Mechanical and Electrical (excluding storm services)

1.1 Water Services

1.1.1 A 400mm watermain is located on Rideau Street which will provide the water supply to the new Scotiabank building located on the corner of Rideau and William Street. See services plan in appendix 1 showing location of watermain as well as elevation.

1.1.2 An existing fire hydrant is located on the South-East side of the bank on Rideau Street. Refer to services plan in appendix 1 for proposed water and remote meter locations.

1.1.3 The building's water demand is calculated based on the Ontario Building Code (OBC) Table 7.6.3.2.A. The hydraulic loads of water fixtures are expressed in the OBC using the term fixture units. Refer to table in appendix 2. The building will have domestic cold water piping feeding required plumbing fixtures. There will also be separate domestic hot water and recirculation piping feeding the plumbing fixtures.

.1 Total Fixture Units: 140.75

1.1.4 Converting fixture units to flow is achieved by using ASHRAE 2013 Fundamentals Handbook – Chapter 22 Pipe Sizing. Figure 10 Demand versus fixture units. Water flow curve can be found in appendix 3. Based on system with flush tank, we conclude that the required flow for the plumbing fixtures in the Bank will be 4.92 L/sec (78 Gal/min).

1.1.5 An estimated fire demand of 67 l/s (1000gpm) has been calculated for the Bank. The calculations used to determine the fire flow is based on Fire Underwriters Survey and are shown on appendix 4. Calculation takes into account total building floor area, occupancy, type of sprinkler system and adjacent building exposure. The successful Fire Protection Contractor bidder will be responsible to perform the water test on the watermain located on Rideau Street to ensure that the water pressure is adequate to meet the Bank's demand. Based on professional judgment, sufficient pressure should be available to feed the sprinklers in the new Bank as there are multiple high-rise buildings in the vicinity. If water pressure is not adequate, a fire pump will be added to the project.

1.1.6 A proposed 150mm water pipe is proposed to service the Bank. This is the combined pipe for domestic cold water and fire protection demand (see appendix 1).

1.2 Sanitary Services

1.2.1 An existing 375mm sanitary sewer is located on Rideau Street. See appendix 1 for drawing showing location of sanitary sewer main as well as elevation.

1.2.2 The building's sanitary drainage demand is calculated based on the OBC Table 7.4.9.3. The hydraulic loads are expressed in the OBC using the term fixture units. Refer to table in appendix on page 5.

.1 Total Fixture Units: 60

1.2.3 Converting fixture units to flow for drainage is achieved using the OBC Table 7.4.10.5. Based on a total number of 60 fixture units, the maximum probable drainage rate is 44 gal/min = 2.78 l/s.

1.2.4 A new 150mm diameter service connection is proposed to the existing 375mm sewer located on Rideau Street.

1.3 Electrical Services

1.3.1 Building's demand: Refer to table in the attached appendix 6

.1 Building's estimated electrical demand: 204kVA

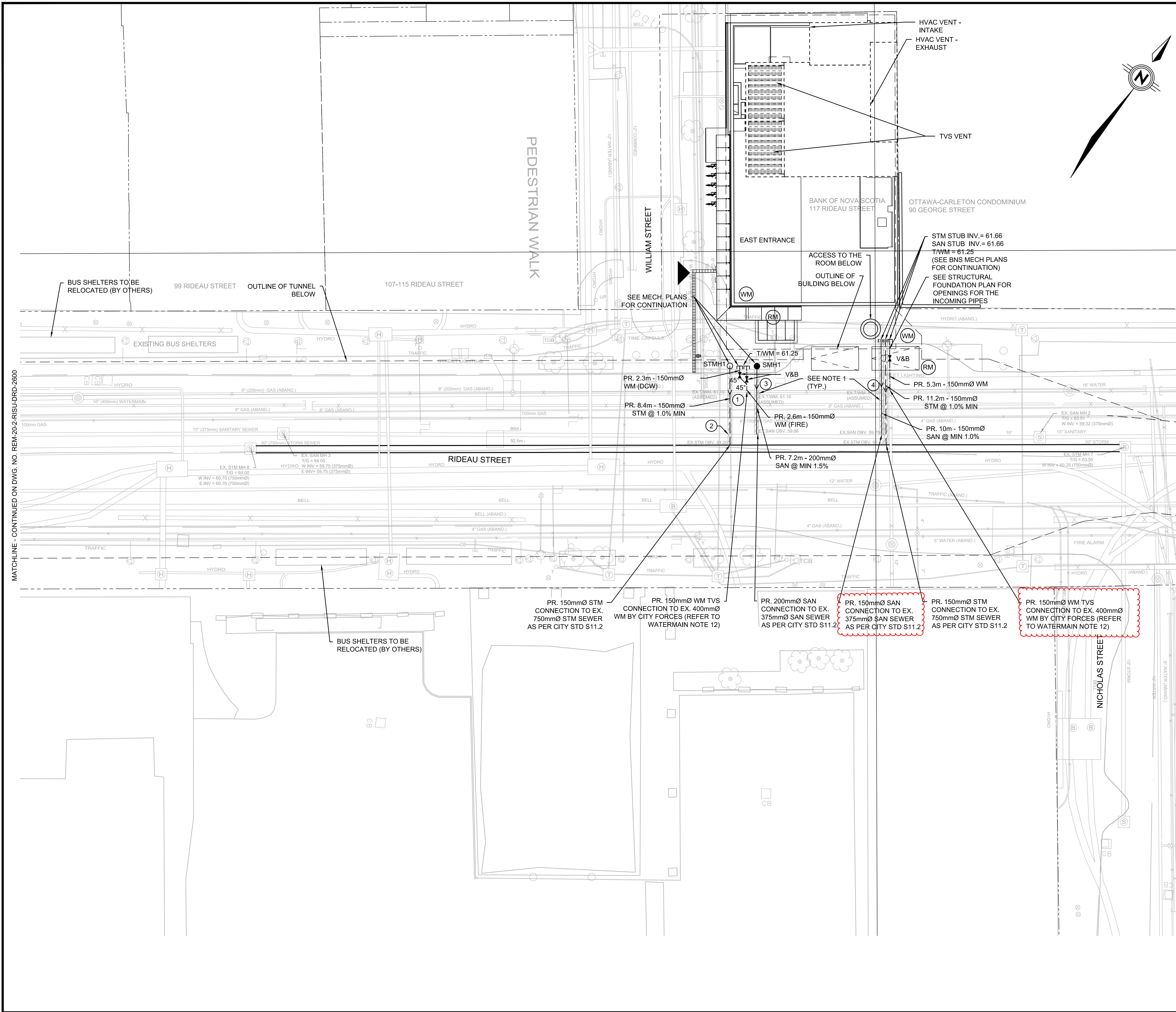
1.3.2 The building (ground and 2nd floor) will be fed with a 400A at 347/600V from the North-West corner of the building as per latest discussions with the City of Ottawa and Hydro Ottawa. The OLRT electrical distribution located directly below the building is separate to the bank's electrical feed.

APPENDIX 1 – SERVICES PLANS

TITLEBLOCK: 780mm x 584mm RTGE JV 2013

MATCHLINE - CONTINUED ON DWG. NO. REM-20-2-RISU-DRD-2600

2015-Jun-26 4:52:28 PM V:\10-40 Municipal Infrastructure\321138-OLRT\Projects\5_LUG Stations\3_Drawings\7_Working Drawings\4_Rideau (RISU)\REM-20-2-RISU-DRD-2600.dwg



Confederation Line
Ligne de la Confédération

RIDEAU STATION
CIVIL
SERVICING
PLAN

DRAWING NUMBER: **REM-20-2-RISU-DRD-2601**

DESIGN/BUILDER: **OLRT**
CONSTRUCTORS
CONSTRUCTEURS

ENGINEERING JV: **RTGE Joint Venture**

DESIGN FIRM: **MMM GROUP**

SCALE: HORIZONTAL 1:200 FULL SIZE 1:400 HALF SIZE 1:16

REV	DESCRIPTION	BY	DATE
0	SIN-0277: ISSUED FOR CONSTRUCTION	IJ	2015-07-31
1	ISSUED FOR FCD REVIEW	IJ	2015-08-14
2	SIN-0307: ISSUED FOR CONSTRUCTION	GS	2015-08-21
3	SIN-0505: ISSUED FOR CONSTRUCTION	IJ	2016-01-21

KEY MAP
N.T.S.

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LAYOUT INFORMATION BASED ON 3 DEGREE MTM ZONE NAD 83 (OLRT) COORDINATE SYSTEM. COMBINED SCALE FACTOR 0.99948

Ottawa

CONTRACT No. **OILC-11-00-P006**

DESIGNED: I.JAFFERJEE | CHECKED: G.SOMERS
DRAWN: D.GRINCHPOUN | SEALED: I.JAFFERJEE

PRIMARY SEAL

LICENSED PROFESSIONAL ENGINEER
I. JAFFERJEE
100184168
Jan 21, 2016
PROVINCE OF ONTARIO

SECONDARY SEAL (IF REQUIRED)

ASSET No. -
ASSET GROUP -

- NOTES:**
- PROPOSED PIPE TO BE INSULATED WITH MINIMUM 50mm THICK HI-40 SYROFOAM INSULATION.
 - CONTRACTOR TO ENSURE THE EXISTING WATERMAIN IS PROTECTED DURING CONSTRUCTION OF THE CONNECTION TUNNEL. IF WATERMAIN IS EXPOSED, CONTRACTOR SHALL PROVIDE ADEQUATE FROST PROTECTION.
 - EXISTING STRUCTURE MAY BE IMPACTED DUE TO THE LOCATION AND EXTENT OF PROPOSED CONNECTION TUNNEL AND MAY REQUIRE RELOCATION.
 - ROW BASED ON PROPERTY REQUEST PLANS (PRP) PROVIDED BY THE CITY.

<p>STORM STRUCTURE SCHEDULE STMH1 (1200#) T/G = 63.65 NE. INV = 61.93 (FORCEMAIN) N. INV = 62.03 (ROOF DRAIN) S. INV = 61.63</p>		3				
<p>SANITARY STRUCTURE SCHEDULE SMH1 (1200#) T/G = 63.65 NW. INV = 61.98 (FORCEMAIN) NW. INV = 61.98 (FORCEMAIN) N. INV = 62.08 (FLOOR DRAIN) S. INV = 61.68</p>						
<p>SERVICING CROSSING SCHEDULE</p> <table border="1" style="width: 100%;"> <tr> <td>1. EX. WM/PR. STM STM INV = 61.60 T/WM = 61.10</td> <td>2. EX. SAN/PR. STM SAN INV = 59.87 STM INV = 61.56</td> <td>3. EX. WM/PR. SAN SAN INV = 61.60 T/WM = 61.10</td> <td>4. EX. WM/PR. SAN/STM SAN/STM INV = 61.60 T/WM = 61.10</td> </tr> </table>			1. EX. WM/PR. STM STM INV = 61.60 T/WM = 61.10	2. EX. SAN/PR. STM SAN INV = 59.87 STM INV = 61.56	3. EX. WM/PR. SAN SAN INV = 61.60 T/WM = 61.10	4. EX. WM/PR. SAN/STM SAN/STM INV = 61.60 T/WM = 61.10
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APPENDIX 2 – WATER SERVICES

Water Supply Demand (OBC - 7.6.3.1)

Fixture or device	Fixture units (public use)			Quantity	Totale	dhw
	Cold	Hot	Total			
Lavatory, greater than 8.3 L/min	1.5	1.5	2	3	6	4.5
Sink, service or mop basin	2.25	2.25	3	1	3	2.25
Water closet, with flush tank	115+	N/A	115+	6	125	
	10 (for each additional water closet)		10 (for each additional water closet)			
				Fixture Units	134	6.75
					DCW	DHW

BNS - 7391-001-00

Total FU	140.75
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APPENDIX 3 – WATER FLOW DEMAND CURVE

2013 ASHRAE Handbook—Fundamentals

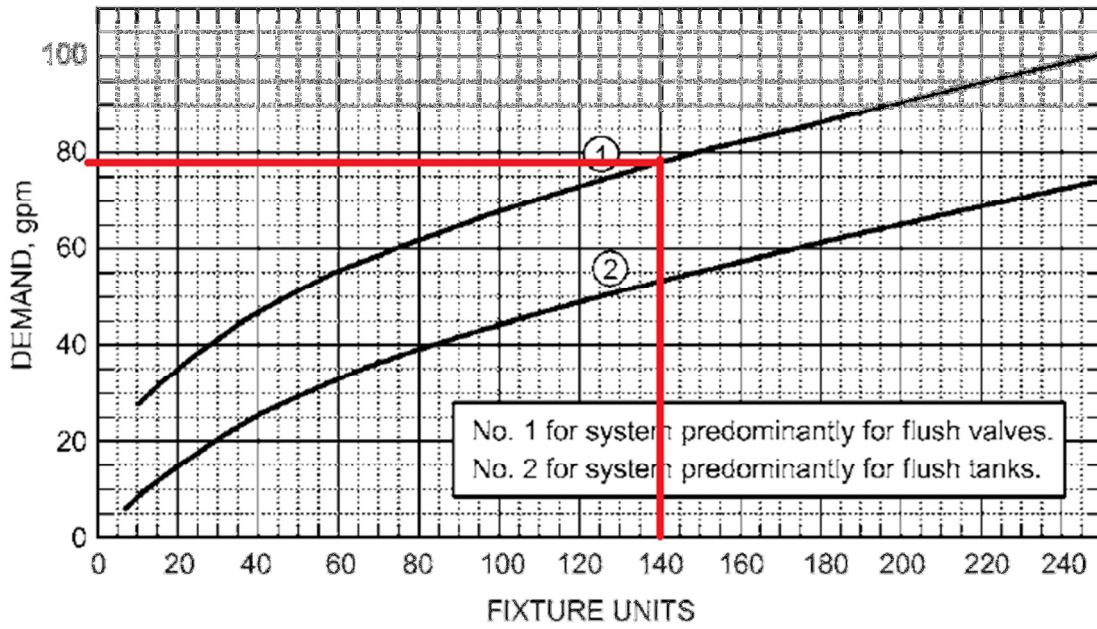


Fig. 10 Section of Figure 9 on Enlarged Scale

APPENDIX 4 – FIRE FLOW SERVICES

Fire Flow Requirement from Fire Underwriters Survey

Scotiabank - Rideau and William Street Branch

Total Building Floor Area 8200ft2 762m2

Fire Flow

$$F = 200C\sqrt{A}$$

C	0.8	C =	1.5 wood frame
A	762 m2		1 ordinary
			0.8 non-combustible
F	4417 l/min		0.6 fire-resistive
use	4000 l/min		

Occupancy Adjustment

Use	-25%	-25% non-combustible
		-15% limited combustible
		0% combustible
Adjustment	-1000 l/min	15% free burning
Fire Flow	3000 l/min	25% rapid burning

Sprinkler Adjustment

		-30% system conforming to NFPA 13
		-50% complete automatic system
Use	-30%	
Adjustment	-900 l/min	

Exposure Adjustment

Building Face	Seperation	Charge	Separation Charge	
			Separation	Charge
			0 to 3m	25%
			3.1 to 10m	20%
			10.1 to 20m	15%
North	0m	25%	20.1 to 30m	10%
East	0m	25%	30.1 to 45m	5%
South	20.1 to 30m	10%		
West	10.1 to 20m	15%		
Total		75%		
Adjustment		2250 l/min		

Required Fire Flow

Fire Flow with total adjustments	4350 l/min
Use	4000 l/min
	67 l/s

APPENDIX 5 – SANITARY SERVICES

Drainage Demand (OBC - 7.4.9.3)

Fixtures	Min. size outlet pipe	Fixture Units	Quantity	Total
Floor drain with 75mm trap	75mm	3	6	18
Lavatory: domestic type single, or 2 single with com trap	32mm	1	3	3
Sink, others	75mm	3	1	3
Water closet				
Water closet with flush valve	75mm	6	6	36
BNS - 7391-001-00			Total FU	60

APPENDIX 6 – LOAD CALCULATION

Project: BNS - Bank of Nova Scotia - Rideau St. *****Draft Calculation*****
 PMA Folder: 7391-001-00/Dos32 Date: 30-août-16
 Prepared by: Eric Vaillancourt, P.Eng.
 Verified by: Eric Vaillancourt, P.Eng.

		Voltage:	347/600V, 3PH
Total area of the building		746	Service Type
			Service Conductors
8-210 a)	Type of units	Area (m²)	Demand factor as required by table 14
a)	Office: First 930 m² @ 50 W/m²	746	90%
			0%
			Loads of all units
			33 570 VA
8-210 b)	ALL OTHER LOADS		
i)	Electric heating and Air-conditionning loads		
62-116 3)	Electric heating loads (thermal storage heating system, duct heater, and electric furnace)	11 000W	11 000 W
62-116 4) b)	Other electric heating loads	@ 75%	0 W
	Air-conditionning loads		
	Interlock that prevents electric heating and air-conditionning to work simultaneously?		No
8-106 4)	Sum of electric heating and air-conditionning loads		11 000 VA
iii)	Other Major Loads		
	Air Handling Unit (AHU-01)	21 861 VA	21 861 VA
	Air Handling Unit (AHU-02)	29 148 VA	29 148 VA
	Water Heater (3kW)	3 000 VA	3 000 VA
	Recirculating pump DHW	30 VA	30 VA
	Jockey pump	1 HP	1 434 VA
	Elevator	41 640 VA	41 640 VA
	Elavator Pit - Sump Pump	1 HP	1 434 VA
	Escalator (Future)	26 025 VA	26 025 VA
	Specialty Lighting (To be confirmed)	5 000 VA	5 000 VA
	Specialty Loads (To be confirmed)	30 000 VA	30 000 VA
	Other Loads sum		159 572 VA
	Assume 1 W = 1 VA		
	Building's total demand		204 142 VA
8-104 3)	Building load portion that can be considered none-continuous:		

Table	Equipment with continus rating at		Total Building Load with Devaluation	Conductor Amperage	
	80%	100%		Normal	Tolérance 5%, 8-106 1)
1 ou 3		85%	240 167 VA	231	220
1 ou 3	70%		291 632 VA	281	267
2 ou 4		100%	204 142 VA	197	188
2 ou 4	80%		255 178 VA	246	234

- 8-104 (4) (a) Continuous Operation Fuse/Breaker 100% w/ table 2 or 4 (cable in conduits)
- 8-104 (4) (b) Continuous Operation Fuse/Breaker 100% w/ table 1 or 3 (free air) - 85%
- 8-104 (5) (a) Continuous Operation Fuse/Breaker 80% w/ table 2 or 4 (cable in conduits) - 80%
- 8-104 (5) (b) Continuous Operation Fuse/Breaker 80% w/ table 1 or 3 (free air) - 70%

Calculated Minimum Amps for Service Entrance: 400 A - 347/600V, 3PH

Selected Minimum Amps for Entrance: 400A - 347/600V, 3PH

