

Energy Modeling Analysis Report

409 Huron Street, TORONTO, ON

5/6/2019

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Executive summary

409 Huron Street is a residential building that will be located in Toronto, Ontario. This report has been prepared based on schematic design drawing set issued on May 6, 2019. The energy model and simulation were conducted for building permit energy analysis purposes to determine the eligibility of design to meet energy consumption levels of ASHRAE 90.1-2013 + SB-10(2017), based on the current design. Software COMcheck 4.0.6.1 was chosen as the energy modeling tool due to its flexibility and ability to model the systems being proposed for this project.

The current energy modeling indicates:

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2012 Ontario Building Code and Chapter 2 of Division 2 of SB-10 in COMcheck Version 4.0.6.1 and to comply with the mandatory requirements in the Requirements Checklist.

1.1 Introduction

409 Huron Street building is a residential building with basement parking garage, service room, penthouse service room and residential suites.

The project is designed to comply with OBC SB-10 (2017). The ASHRAE 90.1-2013 modified by SB-10 compliance path is selected.

The model setup will be introduced in Section 2. The energy performance of the design will be presented in Section 3. Additional modeling notes and disclaimer are summarized in Section 4.

1.2 Energy Efficiency measures

The summary of energy efficiency measures included in the design is:

- Heat pump units VFR system for all residential suites
- VSD on hydronic pumps
- Condensing heating boilers (Efficiency: 95%) for common and service areas
- Condensing DHW boilers (efficiency: 94%)
- Low flow fixtures in DHW

Section 2: model setup

2.1.2 Weather file

A weather of Toronto/North York-Downsview Climate zone: 5a is used in COMcheck.

2.2 proposed model

2.2.1 Building envelope

The thermal properties of the building envelope were estimated based on the current architectural drawings and provided information. Solid wall and glazing U-value and

window to wall ratio were provide by the architects and the rest of the information were assumed based on the previous projects. The properties can be updated in the model when more detailed information is available from the design team.

Table 1: building envelope thermal performance	
Building envelope	Thermal properties
Exterior walls	Overall effective R value R24
Windows	Estimated U vlue:0.25, SHGC:0.4, 53%WWR
Roofs	R30

2.2.2 Internal load, outdoor air, and domestic hot water
Space occupancy and plug load in Table 2.

Table 4: proposed lighting inputs	
Spaces	LPDs (W/sqft)
Corridor	0.66
Elec/mech room	0.43
Lobby	1.0
Lounge/recreation	0.62
Office	0.93
Restroom	0.85
Retail	0.9
Stair	0.58
Storage	0.63

2.2.3 Airside HVAC

A summary of the air side HVAC settings are listed in the table below.

Table 5: summary of HVAC systems in COMcheck		
System	Area served	Basic settings
Make-up air unit and heat pump units	Suites and corridors	Makeup air unit with dedicated OA and fan coil
Heat pump units	Amenity	VRF
Unit heater	stairs/mechanical rooms/storages	Hydronic unit heaters

2.2.4 Water side HVAC

One air cooled chiller provides chilled water to the building, while one condensing hot water boilers provide space heating hot water to the building.

Table 6: equipment in central plant			
Tag	Type	capacity	Efficiency
HP-*	Heat pump units	Auto-sized	SEER13
HB-1,2,	Condensing boilers	Auto-sized	95% efficiency

2.3 baseline model

The baseline energy model was generated automatically by the COMcheck software based on the minimum requirements of ASHRAE 90.1-2013 chapter 11 modified by SB-10(2017) and the geometry and design parameters of the proposed building model. The baseline design will be different in several areas compared to the proposed design model. These differences include the window to wall ratio, thermal resistance of envelope elements, the capacities, efficiencies and flow rates of mechanical equipment. Schedules, thermostat set points, lighting power densities and receptacle loads remain the same in both the models.

Section 3, results and conclusions

The COMcheck self-contained function based on the OBC and ASHRAE shows “Passes” for the proposed energy model.

Four compliance certificates have been generated by the software:

Envelope Compliance Certificate

Interior Lighting and Power Compliance Certificate

Exterior Lighting Compliance Certificate

Mechanical Compliance Certificate





Envelope Compliance Certificate

Project Information

Energy Code: 2012 Ontario Building Code and Chapter 2 of Division 3 of SB-10(2017)
 Project Title: 409 Huron Street
 Location: Toronto / North York-Downsview, Ontario
 Climate Zone: 5a
 Project Type: New Construction
 Vertical Glazing / Wall Area: 17%
 Performance Sim. Specs: EnergyPlus 8.1.0.009 (EPW: CAN_ON_Toronto.716240_CWEC.epw)

Construction Site:
 409 Huron Street
 Toronto, Ontario M5S 2S5

Owner/Agent:

Designer/Contractor:
 Jason Li
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Building Area

Floor Area

1-MECH,storage,parking (Parking Garage) : Residential	6839
2-o level (Dormitory) : Residential	4166
3-1 level (Dormitory) : Residential	3611
4-mezz (Dormitory) : Residential	2752
5-2 level (Dormitory) : Residential	7047
6-3 level (Dormitory) : Residential	6455
7-4 level (Dormitory) : Residential	6455
8-penthouse mech room (Dormitory) : Residential	2006
9-0 level corridor (Dormitory) : Residential	964
10-0 level laundry (Dormitory) : Residential	550
11-1 level coordior lobby CACF mail (Dormitory) : Residential	2864
12-mezz corridor (Dormitory) : Residential	477
13-2 level corridor (Dormitory) : Residential	981
14-3 level corridor (Dormitory) : Residential	981
15-4 level (Dormitory) : Residential	981



Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U- Factor ^(a)
Roof 1: Other Metal Building Roof, [Bldg. Use 8 - penthouse mech room] (b)	2006	---	---	0.030	0.033
Roof 2: Other Metal Building Roof, [Bldg. Use 7 - 4 level] (b)	3000	---	---	0.030	0.033
Roof 3: Other Metal Building Roof, [Bldg. Use 5 - 2 level] (b)	544	---	---	0.030	0.033
Floor 1: Steel Joist, Exposed Framing Depth > 10 inch (254 mm), [Bldg. Use 5 - 2 level]	1150	5.0	30.0	0.027	0.032
NORTH					
Basement Wall 1: Solid Concrete:10" Thickness, Light Density, Furring:	3781	---	20.0	0.043	0.063

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U- Factor ^(a)
None, Wall Ht 9.5, Depth B.G. 9.5, [Bldg. Use 1 - MECH,storage,parking]					
Basement Wall 2 copy 1: Concrete Block:10", Solid Grouted, Light Density, Furring: None, Wall Ht 9.5, Depth B.G. 4.0, [Bldg. Use 9 - 0 level corridor]	400	---	20.0	0.045	0.063
0 level: Steel-Framed, 24" o.c., [Bldg. Use 2 - o level]	984	19.0	5.0	0.064	0.050
Window 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 2 - o level] (c)	190	---	---	0.250	0.290
0 level: Steel-Framed, 24" o.c., [Bldg. Use 9 - 0 level corridor]	400	19.0	5.0	0.064	0.050
Window 1 copy 1: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 9 - 0 level corridor] (c)	70	---	---	0.250	0.290
1st level: Steel-Framed, 24" o.c., [Bldg. Use 3 - 1 level]	2034	19.0	5.0	0.064	0.050
Window 1 copy 2: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 3 - 1 level] (c)	400	---	---	0.250	0.290
mezz level: Steel-Framed, 24" o.c., [Bldg. Use 4 - mezz]	2233	19.0	5.0	0.064	0.050
Window 1 copy 4: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 4 - mezz] (c)	400	---	---	0.250	0.290
2nd level: Steel-Framed, 24" o.c., [Bldg. Use 5 - 2 level]	3437	19.0	5.0	0.064	0.050
Window 1 copy 6: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 5 - 2 level] (c)	600	---	---	0.250	0.290
3rd level: Steel-Framed, 24" o.c., [Bldg. Use 6 - 3 level]	3000	19.0	5.0	0.064	0.050
Window 1 copy 7: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 6 - 3 level] (c)	600	---	---	0.250	0.290
4th level: Steel-Framed, 24" o.c., [Bldg. Use 7 - 4 level]	3000	19.0	5.0	0.064	0.050
Window 1 copy 9: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 7 - 4 level] (c)	600	---	---	0.250	0.290
penthouse: Steel-Framed, 24" o.c., [Bldg. Use 8 - penthouse mech room]	2527	19.0	5.0	0.064	0.050
Window 1 copy 10: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 8 - penthouse mech room] (c)	500	---	---	0.250	0.290
SOUTH					
Basement Wall 2: Concrete Block:10", Solid Grouted, Light Density, Furring: None, Wall Ht 9.5, Depth B.G. 4.0, [Bldg. Use 2 - o level]	984	---	20.0	0.045	0.063
Basement Wall 2 copy 2: Concrete Block:10", Solid Grouted, Light Density, Furring: None, Wall Ht 9.5, Depth B.G. 4.0, [Bldg. Use 10 - 0 level laundry]	400	---	20.0	0.045	0.063
0 level: Steel-Framed, 24" o.c., [Bldg. Use 10 - 0 level laundry]	400	19.0	5.0	0.064	0.050
Window 1 copy 2: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 10 - 0 level laundry] (c)	80	---	---	0.250	0.290
1st level: Steel-Framed, 24" o.c., [Bldg. Use 11 - 1 level coordior lobby CACF mail]	1587	19.0	5.0	0.064	0.050
Window 1 copy 3: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 11 - 1 level coordior lobby CACF mail] (c)	700	---	---	0.250	0.290
mezz level: Steel-Framed, 24" o.c., [Bldg. Use 12 - mezz corridor]	1520	19.0	5.0	0.064	0.050
Window 1 copy 5: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 12 - mezz corridor] (c)	300	---	---	0.250	0.290
2nd level: Steel-Framed, 24" o.c., [Bldg. Use 13 - 2 level corridor]	570	19.0	5.0	0.064	0.050
Window 1 copy 6: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 13 - 2 level corridor] (c)	100	---	---	0.250	0.290
3rd level: Steel-Framed, 24" o.c., [Bldg. Use 13 - 2 level corridor]	400	19.0	5.0	0.064	0.050
Window 1 copy 8: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 13 - 2 level corridor] (c)	80	---	---	0.250	0.290
4th level: Steel-Framed, 24" o.c., [Bldg. Use 15 - 4 level]	400	19.0	5.0	0.064	0.050
Window 1 copy 11: Vinyl/Fiberglass Frame, Perf. Specs.: Product ID by1, SHGC 0.40, VT 0.44, [Bldg. Use 15 - 4 level] (c)	80	---	---	0.250	0.290

- (a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
- (b) 'Other' components require supporting documentation for proposed U-factors.
- (c) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.

Envelope TBD: All building area types must be assigned to at least one envelope assembly



Interior Lighting Compliance Certificate

Project Information

Energy Code: 2012 Ontario Building Code and Chapter 2 of Division 3 of SB-10(2017)
 Project Title: 409 Huron Street
 Project Type: New Construction

Construction Site:
 409 Huron Street
 Toronto, Ontario M5S 2S5

Owner/Agent:

Designer/Contractor:
 Jason Li
 S & I Ideas Inc.
 4165741682
 jasonmech@gmail.com

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B X C)
1-Parking Garage:Garage Area	6839	0.19	1299
2-Common Space Types:Corridor/Transition >=8 ft wide	9266	0.66	6116
3-Dormitory:Living Quarters	30486	0.38	11585
4-Common Space Types:Storage	538	0.14	75
Total Allowed Watts =			19075

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
<u>1-Parking Garage:Garage Area</u> LED 1: LED Linear 8W:	1	539	0	0
<u>2-Common Space Types:Corridor/Transition >=8 ft wide</u> LED 2: LED Linear 8W:	1	764	0	0
<u>3-Dormitory:Living Quarters</u> LED 3: LED Linear 20W:	1	914	0	0
<u>4-Common Space Types:Storage</u> LED 4: LED Linear 20W:	1	18	0	0
Total Proposed Watts =				0

Interior Lighting TBD: Invalid fixture wattage



Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2012 Ontario Building Code and Chapter 2 of Division 3 of SB-10(2017)
 Project Title: 409 Huron Street
 Project Type: New Construction
 Exterior Lighting Zone: 2 (Residentially zoned area)

Construction Site:
 409 Huron Street
 Toronto, Ontario M5S 2S5

Owner/Agent:

Designer/Contractor:
 Jason Li
 S & I Ideas Inc.
 4165741682
 jasonmech@gmail.com

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
			Total Tradable Watts (a) =	20
			Total Allowed Watts =	20
			Total Allowed Supplemental Watts (b) =	600

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.

(b) A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
<u>Driveway (500 ft2): Tradable Wattage</u>				
	Total Tradable Proposed Watts =			0

Exterior Lighting TBD: No exterior fixtures are defined.



Mechanical Compliance Certificate

Project Information

Energy Code: 2012 Ontario Building Code and Chapter 2 of Division 3 of SB-10(2017)
Project Title: 409 Huron Street
Location: Toronto / North York-Downsview, Ontario
Climate Zone: 5a
Project Type: New Construction

Construction Site:
409 Huron Street
Toronto, Ontario M5S 2S5

Owner/Agent:

Designer/Contractor:
Jason Li
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Mechanical Systems List

Quantity System Type & Description

- 1 mech storage (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 2 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 2 kBtu/h
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 4 | basement mech storage -- Compliance (Brake HP method) : Passes

Fans:
FAN 4 Supply, Constant Volume, 300 CFM, 0.5 motor nameplate hp, 0.5 design brake hp (0.5 max. BHP), 0.5 fan efficiency grade
- 1 basement corridor (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 4 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 1 kBtu/h
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 5 | basement corridor -- Compliance (Brake HP method) : Passes

Fans:
FAN 9 Supply, Constant Volume, 2000 CFM, 8.0 motor nameplate hp, 5.0 design brake hp (7.0 max. BHP), 0.8 fan efficiency grade
- 1 basement garage (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 70 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity Unknown
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 1 | basement parking -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Exhaust, Constant Volume, 7000 CFM, 2.0 motor nameplate hp, 2.0 design brake hp (2.0 max. BHP), 0.8 fan efficiency grade
FAN 12 Supply, Constant Volume, 7000 CFM, 2.0 motor nameplate hp, 2.0 design brake hp (2.0 max. BHP), 0.8 fan efficiency grade
- 1 basement bike storage (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 30 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity Unknown
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 3 | basement bike storage -- Compliance (Brake HP method) : Passes

Quantity System Type & Description

Fans:

FAN 3 Supply, Constant Volume, 1000 CFM, 1.0 motor nameplate hp, 0.5 design brake hp (1.0 max. BHP), 0.8 fan efficiency grade

- 1 0 level study room (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 0 level elevator corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 0 level laundry (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 30 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 14 0 level studio (14) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 1 st level 2B (2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 15 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 12 1 st level 1B (12) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Quantity System Type & Description

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 1 st level lobby (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 25 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 36 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 1 st level lobby corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 1 st level garage (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 5 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 1 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 2nd level 2B(2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 16 2nd level studio (16) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 2nd level 1B (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Quantity System Type & Description

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 2nd level 3B (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 15 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 2nd level corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 2nd level study room (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 3rd level 2B(2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 15 3rd level studio (15) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 3rd level 1B(2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Quantity System Type & Description

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 3rd level study room (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 3rd level corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 4th level 2B (2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 15 4th level studio (15) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 2 4th level 1B(2) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 10 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade

- 1 4th level study room (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 20 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes

Quantity System Type & Description

- Fans:
FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade
- 1 4th level corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 25 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 30 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 6 | occupants ventilation -- Compliance (Motor nameplate HP method) : Passes
- Fans:
FAN 6 Supply, Constant Volume, 12000 CFM, 8.0 motor nameplate hp, 0.5 fan efficiency grade
- 1 penthouse corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 25 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 12 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 7 | penthouse -- Compliance (Motor nameplate HP method) : Passes
- Fans:
FAN 7 Supply, Constant Volume, 1000 CFM, 0.5 motor nameplate hp, 0.5 fan efficiency grade
- 1 penthouse stair (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 14 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 1 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 7 | penthouse -- Compliance (Motor nameplate HP method) : Passes
- Fans:
FAN 7 Supply, Constant Volume, 1000 CFM, 0.5 motor nameplate hp, 0.5 fan efficiency grade
- 1 penthouse corridor (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 18 kBtu/h,
Proposed Efficiency = 11.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 1 kBtu/h,
Proposed Efficiency = 13.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 7 | penthouse -- Compliance (Motor nameplate HP method) : Passes
- Fans:
FAN 7 Supply, Constant Volume, 1000 CFM, 0.5 motor nameplate hp, 0.5 fan efficiency grade
- 1 Plant 1:
Heating: Hot Water Boiler, Capacity 1500000 kBtu/h, Gas, with Two-pipe changeover system
Proposed Efficiency: 83.00 % Ec, Required Efficiency: 82.00 % Ec
- 1 Water Heater 1:
Gas Storage Water Heater, Capacity: 500 gallons, Input Rating: 120 kBtu/h w/ Circulation Pump
Proposed Efficiency: 82.00 % Et, Required Efficiency: 80.00 % Et

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the Ontario Building Code, SB-10 (2017) and Amendments up to Jan. 1, 2017 requirements in COMcheck Version 4.1.1.0 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

2019-05-06

Jason
Name - Title

Signature

Date



