FIRE HOUSE
HVAC DESIGNS INC.

Tay Township
450 Park Street, PO Box 100
Tay, On L0K 2A0

July 22, 2021

Re: Port McNicoll Fire Hall
37 Bay Street
Victoria Harbour, ON

Description: Heat Loss and Ventilation requirements have been completed for the above-mentioned address to the O.B.C. and with information provided by the designer from drawings dated 7-22-21.

Location: Tay (Midland), Ontario based on <5000 Degree Days (Zone 1)
Design: ASHRAE RTS Method, OBC SB-10 & Part 11.

Performed site visit and the interior renovation to an existing building is to be completed with no changes to the existing exterior portion of the building. Total equipment loads of 49,461 BTUH of HL with 19,427 BTUH of HG envelope of the addition only. Recommend an 60MBTU 2-stage 96% furnace set to approx. 875cfm hi speed heat tap with 2.5 ton of cooling for the people and equipment load set to approx. 895cfm hi speed cooling tap. Ventilation requirements are based on Ashrae and OBC Part 6 using a HRV as a simplified connection to provide fresh air set to 130cfm. Fire dampers are to be installed when the duct works break the fire separation of the mechanical room as per design. Existing tube heaters in the truck bay to remain for the remaining two bays.

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code

QUALIFCATION INFORMATION

Name: _____Scott Ellis_____ BCIN # __45964_____Date:___July 22, 2021

Signature: _____S Ellis_____

(705) 241•7189
info@fhhdesigns.ca
343 Ferndale Drive S.
Barrie, ON L4N 9Y6

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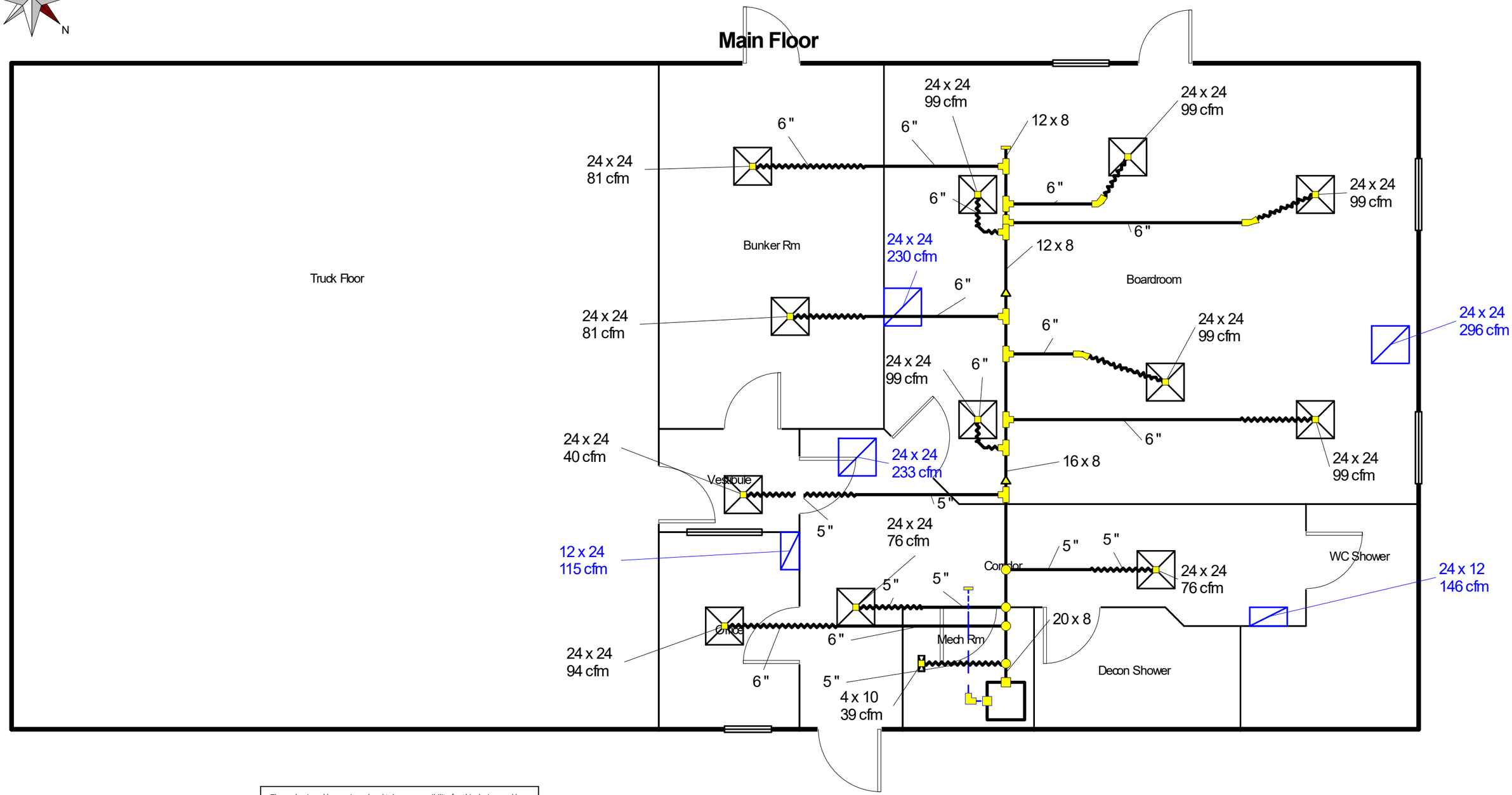
Main Floor



The undersigned has reviewed and taken responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to be a designer.

QUALIFICATION INFORMATION (Required unless the design is exempt under OBC Div C-3.2.4.1 or 3.2.5.1.)

NAME: Scott Ellis SIGNATURE: S Ellis BCIN 45964.

REGISTRATION INFORMATION (Required unless the design is exempt under OBC Div C-3.2.4.1 or 3.2.5.1.)

FIRM NAME: Firehouse HVAC Designs BCIN 103706.

Job #: 21-1089
Performed by Scott Ellis BCIN 45964 for:
Port McNicoll Fire Hall
714 Third Ave
Port McNicoll, ON

Firehouse HVAC Designs Inc
343 Ferndale Dr S
Barrie, ON L4N 9Y6
Phone: 705-241-7189
fhdesigns@rogers.com

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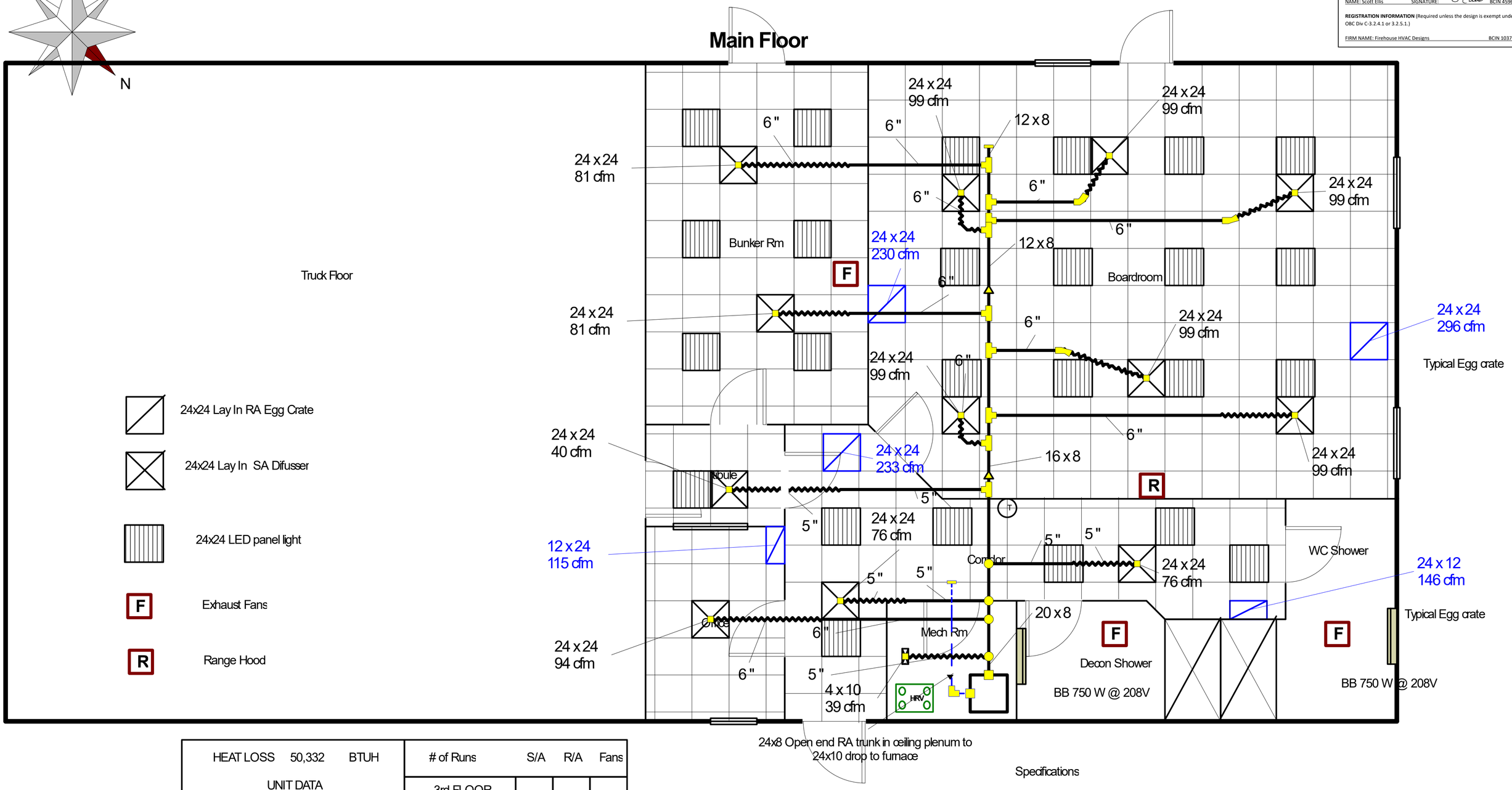
NAME: Scott Ellis SIGNATURE: S Ellis BCIN 45964.

REGISTRATION INFORMATION (Required unless the design is exempt under OBC Div C-3.2.4.1 or 3.2.5.1.)

FIRM NAME: Firehouse HVAC Designs BCIN 103706.

Main Floor



24x8 Open end RA trunk in ceiling plenum to 24x10 drop to furnace

HEAT LOSS 50,332 BTUH				
UNIT DATA				
Make: York or Equivalent				
Model: TM9V060B12MP12				
Input: 60 MBTUH				
Output: 56 MBTUH				
Cooling: 2.5 TONS				
Fan Speed: 875/895 cfm @ 0.8 wc				
RA drop to furnace c/w filter rack 24x10				

# of Runs	S/A	R/A	Fans
3rd FLOOR			
2nd FLOOR			
1st FLOOR	12	7	4
BASEMENT			

ALL S/AREGIS TERSARE 24x24 UNLESS NOTE OTHERWISE ON THE LAYOUT. ALL S/ARUNS ARE 5" OR 6" OR AS NOTED ON THE LAYOUT. UNDERCUT DOORS 3/4" - 1" FOR R/A. SEAL DUCT TO A MIN OF "LEVEL C" AS PER SMACNA and OBC. INSTALL VOLUME AND BALANCING DAMPERS AS PER OBC.

Specifications

HRV Lifebreath RNC 155 set to 130cfm at 0.4 inwc using 6" smooth duct as a simplified connection. Set to run continously. Vented to outdoors with proper weather and bug hoods.

Bunker room exhaust fan to be Broan Losone Series L150 120V or Equivalent set to run continous at 132cfm @ 0.375 inwc 6" smooth duct to proper weather hood

All electrical and control wiring to be rated for use in the return air ceiling plenun appplicaiton.

Decon Shower and WC Shower rooms exhaust fan to be Broan Losone Series L100 120V or Equivalent set to run intermittent by means of switch at 109cfm @ 0.125 inwc 6" smooth duct to proper weather hood.

Range hoods and Exhaust fans are to be discharged directly to the outdoors as per OBC 9.32.3.10

Cosmos Model# COS-63175S or equivalent 30 in Ducted wall mounted Range hood in SS. Ducted as per manufacturer.

Both Shower rooms Electric Base Board Dimplex T-Series TB3607W21 208V or equivalent. Each to come with built in Thermostat Electrical Contractor to comfirm building load.

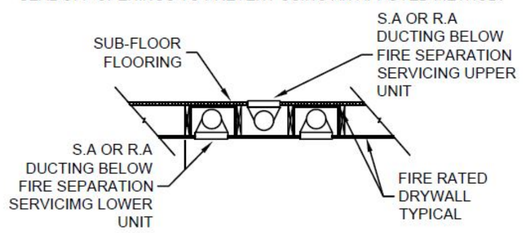
Fire dampers are to be installed when the duct works break the fire separation of the mechanical room as per design

Titus TMS 24x24 Lay in difussers or equivalent to come with balancing dampers as per good piping practices.

Lay in Egg Crate for return air ceiling tile. Dropped ceiling to be used as Return Air Plenum. Main return air trunk to be extended to plenum space for noice control.

GENERAL NOTES:

1. MAINTAIN FIRE SEPARATION BETWEEN FLOORS AS REQUIRED BY OBC.
2. WHERE DUCTWORK PASSES THROUGH FIRE SEPARATION INSTALL FIRE DAMPER WITH ACCESS DOOR AS PER OBC.
3. ALL FIRE RATED DRYWALL SHALL BE TYPE X.
4. WHERE ANY PLUMBING OR WIRING PASSED THROUGH FIRE SEPARATION SEAL OFF OPENINGS TO PREVENT USING AN APPOVED METHOD.



Job #: 21-1089
Performed by Scott Ellis BCIN 45964 for:
Port McNicoll Fire Hall
714 Third Ave
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ASHRAE/ACCA COMPLIANCE FORM FOR STANDARD 183

Building or Zone Name:

Entire Office Ar

Location or Address:

714 Third Ave, Port McNicoll, ON

Design Conditions:

	Cooling	Heating
Weather Data Used	Midland, ON, CA	
Indoor Dry Bulb Design Temperature	75 °F	70 °F
Indoor Design Relative Humidity	50 %	26 %

Load Calculation Method:
(Indicate which of the following methods is used.)

- ☐ **CLTD/CLF** — Cooling Load Tempratture Difference / Cooling Load Factor methods
- ☐ **HB** — Heat Balance methods
- ☐ **TETD/TA** — Total Equivalent Temperature Difference / Time Averaging methods
- ☐ **TFM** — Transfer Function methods
- ■ **RTS** — Radiant Time Series methods
- ☐ **OTHER** (please specify) _____

The undersigned attests that the above information is correct and that the procedures used to perform the load calculations comply with ANSI/ASHRAE/ACCA Standard 183

Signed: S Ellis **Date:** July 22, 2021

Submitted by: **Date:** Jul 22, 2021

Building Analysis
Entire Office Ar
Firehouse HVAC Designs Inc

Job: 21-1089
Date: Jul 22, 2021
By: Scott Ellis BCIN 45964

343 Ferndale Dr S, Barrie, ON L4N 9Y6 Phone: 705-241-7189 Email: fhdesigns@rogers.com License: BCIN 45964

Project Information

For: Port McNicoll Fire Hall
714 Third Ave, Port McNicoll, ON

Design Conditions

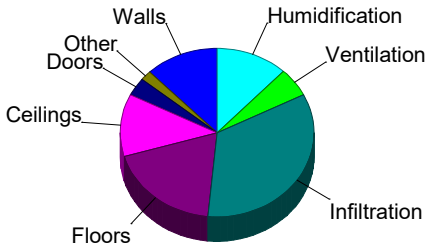
Location:
Midland, ON, CA
Elevation: 591 ft
Latitude: 45°N

Outdoor:	**Heating**	**Cooling**
Dry bulb (°F)	-11	84
Daily range (°F)	-	18 (M)
Wet bulb (°F)	-	73
Wind speed (mph)	5.6	3.7

Indoor:	**Heating**	**Cooling**
Indoor temperature (°F)	70	75
Design TD (°F)	81	9
Relative humidity (%)	26	50
Moisture difference (gr/lb)	30.9	41.1
Infiltration:		
Method	Simplified	
Construction quality	Average	

Heating

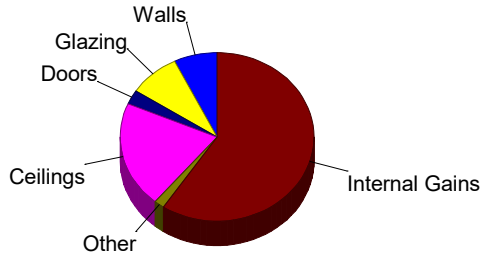
Component	Btuh/ft²	Btuh	% of load
Walls	2.9	6051	12.2
Glazing	25.2	929	1.9
Doors	14.8	1694	3.4
Ceilings	4.1	5964	12.1
Floors	6.5	9356	18.9
Infiltration	110.8	16798	34.0
Ducts		0	0
Piping		0	0
Humidification		5943	12.0
Ventilation		2727	5.5
Adjustments		0	
Total		**49461**	**100.0**



Cooling

Jul 1500 LST

Component	Btuh/ft²	Btuh	% of load
Walls	0.6	1176	7.2
Glazing	37.7	1391	8.6
Doors	3.9	443	2.7
Ceilings	2.3	3317	20.4
Floors	0	0	0
Infiltration	1.2	184	1.1
Ducts		0	0
Ventilation		96	0.6
Internal gains		9640	59.3
Blower		0	0
Adjustments		0	
Total		**16247**	**100.0**



Latent Cooling Load = 8373 Btuh
Overall U-value = 0.068 Btuh/ft²-°F

Data entries checked.

Right-Suite® Universal 2021 Short Form
Entire Office Ar
Firehouse HVAC Designs Inc

Job: 21-1089
Date: Jul 22, 2021
By: Scott Ellis BCIN 45964

343 Ferndale Dr S, Barrie, ON L4N 9Y6 Phone: 705-241-7189 Email: fhdesigns@rogers.com License: BCIN 45964

Project Information

For: Port McNicoll Fire Hall
714 Third Ave, Port McNicoll, ON

		Htg	Clg			Htg	Clg
Outside db	(°F)	-11	84	Inside db	(°F)	70	75
Outside RH	(%)	-	59	Inside RH	(%)	-	50
Outside wb	(°F)	-	73	Inside wb	(°F)	-	62
Daily range	(°F)	-	18	Design TD	(°F)	81	9
Moisture diff.	(gr/lb)	-	41				

Heating Equipment

Make	York or Equivalent	
Model	TM9V060B12MP12	
Type	Gas furnace	
Efficiency	96 AFUE	
Heating Input	60.0	MBtuh
Heating Output	58.0	MBtuh
Humidifier	15.9	gpd
Leaving Air Temp	130.5	°F
Actual Heating Fan	890	cfm

Cooling Equipment

Make	Generic 2.5 ton AC	
Model	SEER 13.0	
Type	Split AC	
COP / EER / SEER	13.0	
Sensible Cooling	15.9	MBtuh
Latent Cooling	6.8	MBtuh
Total Cooling	22.7	MBtuh
Leaving Air Temp	55.0	°F
Actual Cooling Fan	895	cfm

Equipment Location	Entire Office Ar	
System Type	PEAKCV	
Fan Motor Heat Type	PACKAGE	
Fan & Motor Combined Efficiency	0	%
Static Pressure Across Fan	0	in H2O

NAME	Area ft²	Heat Loss	Sensible Gain	Latent Gain	Htg cfm	Clg cfm	Time
Mech Rm	46	1540	399	99	30	19	Jul 1500 LST
Decon Shower	68	4498	0	0	85	0	Jul 1500 LST
WC Shower	91	6225	0	0	121	0	Jul 1500 LST
Corridor	217	6483	1355	475	117	95	Jul 1500 LST
Office	79	4014	1028	497	71	94	Jul 1500 LST
Bunker Rm	234	6339	1181	512	124	54	Jul 1500 LST
Boardroom	662	18990	8303	4697	316	592	Jul 1500 LST
Vestibule	41	1372	604	276	26	40	Jul 1500 LST
Entire Office Ar	1438	49461	12871	6556	890	895	Jul 1500 LST

Right-Suite® Universal 2021 Load Summary

Entire Office Ar

Firehouse HVAC Designs Inc

Job: 21-1089
Date: Jul 22, 2021
By: Scott Ellis BCIN 45964

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Project Information

For: Port McNicoll Fire Hall
714 Third Ave, Port McNicoll, ON

Zone: Entire Office Ar

COOLING LOAD

1.	**DESIGN CONDITIONS**	at Jul 1500 LST		Peak load at Jul 1900 LST			
	Inside:	75 °F	Outside: 84 °F	TD:	9 °F		
	RH:	59 %	MoistDiff: 41.1 gr/lb	Mult:	1.0	lns.wb	62 °F
						Sensible	Latent
2.	**SOLAR RADIATION THROUGH GLASS**					896	-
3.	**TRANSMISSION GAINS**		Sensible			2025	-
	Walls:		670			-	-
	Glass:		69			-	-
	Doors:		505			-	-
	Partitions:		0			-	-
	Floors:		0			-	-
	Ceilings:		781			-	-
4.	**INTERNAL HEAT GAIN**		Sensible	Latent		5975	3709
	Occupants:		3595	3709		-	-
	Lights:		896	-		-	-
	Motors:		0	-		-	-
	Appliances:		1484	0		-	-
5.	**INFILTRATION:**	Outside air cfm:		104		1032	2847
6.	**SUBTOTAL:**	Space load	Sensible	Latent		9927	6556
	Envelope		9927	6556		-	-
	Less external		0	-		-	-
	Redistribution		0	0		-	-
7.	**SUPPLY DUCT**					0	-
8.	**SUBTOTAL:**	Space load + supply duct				9927	-
	Actual cfm:	895	at supply TD:	20		-	-
9.	**VENTILATION:**	Make-up air cfm:		0		0	0
10.	**RETURN AIR LOAD:**	Lighting + plenum (net)				2943	-
11.	**RETURN DUCT**					0	-
12.	**TOTAL LOADS ON EQUIPMENT**					12871	6556

HEATING LOAD

13.	**DESIGN CONDITIONS**			Mult:	1.0
	Inside:	70 °F	Outside: -11 °F	TD:	81 °F
14.	**TRANSMISSION LOSSES**				23994
	Walls:		6051		-
	Glass:		929		-
	Doors:		1694		-
	Partitions:		0		-
	Floors:		9356		-
	Ceilings:		5964		-
15.	**INFILTRATION:**	Outside air cfm:		192	16798
16.	**SUBTOTAL:**	Space load			40792
	Envelope		40792		-
	Less external		0		-
	Less transfer		0		-
	Redistribution		0		-
17.	**SUPPLY DUCT:**				0
18.	**VENTILATION:**	Make-up air cfm:		125	2727
19.	**HUMIDIFICATION**				5943
	Piping				0
20.	**RETURN DUCT**				0
21.	**TOTAL HEATING LOAD ON EQUIPMENT**				49461

Duct System Summary
Entire Office Ar
Firehouse HVAC Designs Inc

Job: 21-1089
Date: Jul 22, 2021
By: Scott Ellis BCIN 45964

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Project Information

For: Port McNicoll Fire Hall
714 Third Ave, Port McNicoll, ON

	Heating	Cooling
External static pressure	0.80 in H2O	0.80 in H2O
Pressure losses	0.38 in H2O	0.38 in H2O
Available static pressure	0.42 in H2O	0.42 in H2O
Supply / return available pressure	0.210 / 0.210 in H2O	0.210 / 0.210 in H2O
Lowest friction rate	0.100 in/100ft	0.100 in/100ft
Actual air flow	890 cfm	895 cfm
Total effective length (TEL)	133 ft	

Supply Branch Detail Table

Name		Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Boardroom	c	1505	68	99	0.100	6.0	0x 0	VlFx	27.5	92.0	st1B
Boardroom-A	c	1505	68	99	0.100	6.0	0x 0	VlFx	41.3	92.0	st1B
Boardroom-B	c	1505	68	99	0.100	6.0	0x 0	VlFx	30.5	80.0	st1A
Boardroom-C	c	1505	68	99	0.100	6.0	0x 0	VlFx	15.5	87.0	st1A
Boardroom-D	c	1505	68	99	0.100	6.0	0x 0	VlFx	33.4	72.0	st1B
Boardroom-E	c	1505	68	99	0.100	6.0	0x 0	VlFx	26.2	77.0	st1A
Bunker Rm	h	2850	81	27	0.100	6.0	0x 0	VlFx	41.0	65.0	st2
Bunker Rm-A	h	2850	81	27	0.100	6.0	0x 0	VlFx	31.0	50.0	st1A
Corridor-A	h	2686	76	48	0.100	5.0	0x 0	VlFx	12.0	75.0	st15
Corridor-B	h	2686	76	48	0.100	5.0	0x 0	VlFx	14.0	65.0	st14
Mech Rm	h	1378	39	19	0.100	5.0	0x 0	VlFx	5.5	95.0	st1
Office	c	1436	92	94	0.100	6.0	0x 0	VlFx	18.0	85.0	st16
Vestibule	c	612	34	40	0.100	5.0	0x 0	VlFx	24.0	55.0	st13

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1A	Peak AVF	573	646	0.100	727	9.0	8 x 16	ShtMetl	st1
st1B	Peak AVF	286	323	0.100	484	9.0	8 x 12	ShtMetl	st1A
st1	Peak AVF	890	895	0.100	806	13.2	8 x 20	ShtMetl	
st15	Peak AVF	76	48	0.100	559	5.0	0 x 0	ShtMetl	st1
st13	Peak AVF	34	40	0.100	294	5.0	0 x 0	ShtMetl	st1
st2	Peak AVF	81	27	0.100	412	6.0	0 x 0	ShtMetl	st1B
st16	Peak AVF	92	94	0.100	480	6.0	0 x 0	ShtMetl	st1
st14	Peak AVF	76	48	0.100	559	5.0	0 x 0	ShtMetl	st1

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb5	0x 0	195	233	0	0	737	0	3.25x14	10x9	SJSp	
rb2	0x 0	230	152	0	0	728	0	3.25x14	10x9	SJSp	
rb4	0x 0	205	296	0	0	937	0	3.25x14	10x9	SJSp	
rb1	0x 0	145	146	0	0	463	0	3.25x14	10x9	SJSp	
rb3	0x 0	115	67	0	0	365	0	3.25x14	10x9	SJSp	