

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 50-1 OPT 5 BED Project: CENTERFIELD	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
August 29, 2022			
Date		Signature of Designer	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTERFIELD				OPT 5 BED				DATE: Aug-22				WINTER NATURAL AIR CHANGE RATE 0.332				HEAT LOSS ΔT °F. 78				CSA-F280-12															
BUILDER: ROYAL PINE HOMES				TYPE: 50-1				GFA: 3446				LO# 98678				SUMMER NATURAL AIR CHANGE RATE 0.104				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE											
ROOM USE				MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS-2		ENS-3		BED-5		SH BTH													
EXP. WALL				16		27		20		13		32		31		13		6		14		6													
CLG. HT.				9		9		9		9		9		9		9		9		9		9													
FACTORS																																			
GRS.WALL AREA		LOSS GAIN		144		243		180		117		288		279		117		54		126		54													
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN													
NORTH		21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	72	1569	2992	58	1264	2410	43	937	1787	0	0	0	0	0	0	0							
SOUTH		21.8	24.9	0	0	0	10	218	249	0	0	0	0	0	0	0	0	0	8	174	199	20	436	498	0	0	0	0							
WEST		21.8	41.6	28	610	1163	22	479	914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
SKYLT.		35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
DOORS		20.5	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
NET EXPOSED WALL		4.2	0.7	116	488	80	211	887	146	180	757	125	95	400	66	216	908	149	221	929	153	74	311	51	46	193	32	106	446	73	54	227	37		
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
EXPOSED CLG		1.3	0.6	319	419	188	163	214	96	94	124	55	252	331	148	278	365	163	235	309	138	46	60	27	55	72	32	261	343	153	77	101	45		
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	33	93	41	30	84	38	20	56	25	0	0	0	0	0	0	0	0			
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	259	676	111	0	0	0	0	0	0	24	63	10	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS				0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
SLAB ON GRADE HEAT LOSS				0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
SUBTOTAL HT LOSS				1517		1799		881		1210		3611		2586		1365		503		1225		328													
SUB TOTAL HT GAIN				1431		1405		180		565		3457		2739		1890		274		725		83													
LEVEL FACTOR / MULTIPLIER		0.20	0.31				0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31									
AIR CHANGE HEAT LOSS				467		554		271		373		1112		797		420		155		377		101													
AIR CHANGE HEAT GAIN				89		87		11		35		214		169		117		17		45		5													
DUCT LOSS				0		0		0		0		472		0		0		66		0		0													
DUCT GAIN				0		0		0		0		449		0		0		29		0		0													
HEAT GAIN PEOPLE		240		2		480	0	0	0	1		240	1		240	1		240	0	0	0	1		240	0										
HEAT GAIN APPLIANCES/LIGHTS				581		0		0		0		581		581		581		581		581		0				581		0							
TOTAL HT LOSS BTU/H				1984		2353		1152		1583		5196		3383		1785		723		1602		429													
TOTAL HT GAIN x 1.3 BTU/H				3354		1939		248		1847		6423		4847		2609		416		2067		114													

ROOM USE		GREAT	DEN	KT/BR	LV/DN	LAUN		FOY					
EXP. WALL		36	21	44	43	9		29					
CLG. HT.		11	11	11	11	11		11					
FACTORS													
GRS.WALL AREA	LOSS GAIN	396	231	484	473	99		319					
GLAZING		LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN		LOSS GAIN					
NORTH	21.8 16.0	0 0 0	23 501 367	0 0 0	0 0 0	0 0 0		0 0 0					
EAST	21.8 41.6	0 0 0	0 0 0	0 0 0	52 1133 2161	0 0 0		28 610 1163					
SOUTH	21.8 24.9	0 0 0	0 0 0	0 0 0	28 610 697	0 0 0		0 0 0					
WEST	21.8 41.6	46 1002 1911	0 0 0	73 1590 3033	0 0 0	0 0 0		0 0 0					
SKYLT.	35.8 101.2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0					
DOORS	20.5 3.4	0 0 0	0 0 0	20 411 68	0 0 0	20 411 68		20 411 68					
NET EXPOSED WALL	4.2 0.7	350 1472 242	208 875 144	391 1644 271	393 1653 272	79 332 55		271 1140 188					
NET EXPOSED BSMT WALL ABOVE GR	3.7 0.6	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0					
EXPOSED CLG	1.3 0.6	0 0 0	0 0 0	0 0 0	6 8 4	0 0 0		0 0 0					
NO ATTIC EXPOSED CLG	2.8 1.3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0					
EXPOSED FLOOR	2.6 0.4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0					
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0		0					
SLAB ON GRADE HEAT LOSS		0	0	0	0	0		0					
SUBTOTAL HT LOSS		2474	1376	3645	3404	743		2160					
SUB TOTAL HT GAIN		2154	511	3371	3133	122		1419					
LEVEL FACTOR / MULTIPLIER	0.30 0.50		0.30 0.50	0.30 0.50	0.30 0.50	0.30 0.50		0.30 0.50					
AIR CHANGE HEAT LOSS		1244	692	1833	1712	374		1086					
AIR CHANGE HEAT GAIN		133	32	209	194	8		88					
DUCT LOSS		0	0	0	0	0		0					
DUCT GAIN		0	0	0	0	0		0					
HEAT GAIN PEOPLE	240	0	0	0	0	0		0					
HEAT GAIN APPLIANCES/LIGHTS		581	581	581	581	581		0					
TOTAL HT LOSS BTU/H		3718	2068	5479	5115	1116		3247					
TOTAL HT GAIN x 1.3 BTU/H		3728	1461	5409	5080	923		1958					

TOTAL HEAT GAIN BTU/H: 44972

TONS: 3.75

LOSS DUE TO VENTILATION LOAD BTU/H: 2004

STRUCTURAL HEAT LOSS: 61571

TOTAL COMBINED HEAT LOSS BTU/H: 63575

SITE NAME: CENTERFIELD
BUILDER: ROYAL PINE HOMES

OPT 5 BED
TYPE: 50-1

DATE: Aug-22

GFA: 3446 LO# 98678

HEATING CFM 1260 COOLING CFM 1260
TOTAL HEAT LOSS 61,571 TOTAL HEAT GAIN 44,643
AIR FLOW RATE CFM 20.46 AIR FLOW RATE CFM 28.22

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35

**CARRIER
59TN6B-080-14V
FAN SPEED 80

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	17	9	5
R/A	0	0	6	2	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

DESIGN CFM = 1260
CFM @ .6" E.S.P.
MEDIUM HIGH 1280
TEMPERATURE RISE 57 °F

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-3	ENS	MBR	SH BTH	GREAT	DEN	KT/BR	KT/BR	LV/DN	LAUN	FOY	LV/DN	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.99	1.18	1.15	0.79	1.73	1.69	1.78	0.72	1.18	0.99	0.43	1.86	2.07	2.74	2.74	2.56	1.12	3.25	2.56	4.13	4.13	4.13	4.13
CFM PER RUN HEAT	20	24	24	16	35	35	37	15	24	20	9	38	42	56	56	52	23	66	52	84	84	84	84
RM GAIN MBH.	1.68	0.97	0.25	0.92	2.14	2.42	2.61	0.42	0.97	1.68	0.11	1.86	1.46	2.70	2.70	2.54	0.92	1.96	2.54	0.44	0.44	0.44	0.44
CFM PER RUN COOLING	47	27	7	26	60	68	74	12	27	47	3	53	41	76	76	72	26	55	72	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	60	31	72	65	57	33	46	69	35	58	56	51	60	43	34	4	49	25	21	57	46	29	10
EQUIVALENT LENGTH	180	170	170	130	130	120	170	190	160	190	140	160	130	170	110	150	120	140	100	130	110	120	130
TOTAL EFFECTIVE LENGTH	240	201	242	195	187	153	216	259	195	248	196	211	190	213	144	154	169	165	121	187	156	149	140
ADJUSTED PRESSURE	0.07	0.09	0.07	0.09	0.09	0.11	0.08	0.07	0.09	0.07	0.09	0.08	0.09	0.08	0.12	0.11	0.1	0.1	0.14	0.09	0.1	0.11	0.12
ROUND DUCT SIZE	5	4	4	4	5	5	5	4	4	5	4	5	5	6	6	5	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	147	275	275	184	257	257	272	172	275	147	103	279	308	286	286	382	264	485	382	428	428	428	428
COOLING VELOCITY (ft/min)	345	310	80	298	441	499	543	138	310	345	34	389	301	388	388	529	298	404	529	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	C	A	A	E	D	D	A	C	B	E	B	A	B	C	C	B	D	D	A	B	C	C

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BED-3	BED-4	BED-2	GREAT	BAS	BED-3	BED-5	BED-5
RM LOSS MBH.	1.73	1.69	0.79	1.86	4.13	1.73	0.80	0.80
CFM PER RUN HEAT	35	35	16	38	84	35	16	16
RM GAIN MBH.	2.14	2.42	0.92	1.86	0.44	2.14	1.03	1.03
CFM PER RUN COOLING	60	68	26	53	13	60	29	29
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	69	39	65	62	21	61	24	21
EQUIVALENT LENGTH	150	150	200	120	100	140	160	170
TOTAL EFFECTIVE LENGTH	219	189	265	182	121	201	184	191
ADJUSTED PRESSURE	0.08	0.09	0.06	0.09	0.13	0.09	0.09	0.09
ROUND DUCT SIZE	5	5	4	5	6	5	4	4
HEATING VELOCITY (ft/min)	257	257	184	279	428	257	184	184
COOLING VELOCITY (ft/min)	441	499	298	389	66	441	333	333
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10
TRUNK	E	D	A	A	E	E	C	C

SUPPLY AIR TRUNK SIZE								RETURN AIR TRUNK SIZE							
TRUNK	STATIC	ROUND	RECT	VELOCITY				TRUNK	STATIC	ROUND	RECT	VELOCITY			
CFM	PRESS.	DUCT	DUCT		(ft/min)			CFM	PRESS.	DUCT	DUCT		(ft/min)		
TRUNK A	235	0.06	8.8	10	x	8	423	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	476	0.06	11.4	16	x	8	536	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	832	0.06	14.1	24	x	8	624	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	225	0.08	8	10	x	8	405	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	423	0.08	10.2	14	x	8	544	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	7	8	BR							
AIR VOLUME	85	85	85	85	85	320	320	85	0	0	0	0	0	0	0	110
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	46	74	55	55	53	59	29	46	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	215	205	175	185	180	160	215	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	241	289	260	230	238	239	189	261	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.06	0.06	0.06	0.06	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6	6.3	6	6	6	9.8	9.2	6	0	0	0	0	0	0	0	5.8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	30	14	0	0	0	0	0	0	0	14

TYPE: 50-1
SITE NAME: CENTERFIELD

LO # 98678
OPT 5 BED

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>201.4</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>106.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
SH BTH	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE V150H		
<u>150</u> cfm high	<u>35</u> cfm low	
<u>75</u> % Sensible Efficiency	☒ HVI Approved	
@ 32 deg F (0 deg C)		

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER:	
ROYAL PINE HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	August-22

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

Michael O'Rourke

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 98678	Model: 50-1	Builder: ROYAL PINE HOMES	Date: 8/29/2022																																																									
Volume Calculation		Air Change & Delta T Data																																																										
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr><td>Bsmt</td><td>1582</td><td>10</td><td>15820</td></tr> <tr><td>First</td><td>1582</td><td>11</td><td>17402</td></tr> <tr><td>Second</td><td>1864</td><td>9</td><td>16776</td></tr> <tr><td>Third</td><td>0</td><td>9</td><td>0</td></tr> <tr><td>Fourth</td><td>0</td><td>9</td><td>0</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>49,998.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1415.8 m³</td></tr> </tbody> </table>		Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1582	10	15820	First	1582	11	17402	Second	1864	9	16776	Third	0	9	0	Fourth	0	9	0	Total:			49,998.0 ft³	Total:			1415.8 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.332</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.104</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>			WINTER NATURAL AIR CHANGE RATE	0.332	SUMMER NATURAL AIR CHANGE RATE	0.104	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage		6.2.6 Sensible Gain due to Air Leakage																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.332 x 393.27 x 43 °C x 1.2 = 6781 W = 23137 Btu/h		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.104 x 393.27 x 7 °C x 1.2 = 348 W = 1187 Btu/h																																																										
5.2.3.2 Heat Loss due to Mechanical Ventilation		6.2.7 Sensible heat Gain due to Ventilation																																																										
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h		$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h																																																										
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{clevel})																																																								
1	0.5	23,137	9,070	1.275																																																								
2	0.3		13,802	0.503																																																								
3	0.2		15,024	0.308																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												
				Michael O'Rourke BCIN# 19669 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 50-1	OPT 5 BED	BUILDER: ROYAL PINE HOMES
SFQT: 3446	LO# 98678	SITE: CENTERFIELD

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.50

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	49998.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	182.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	96%	-
HRV/ERV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

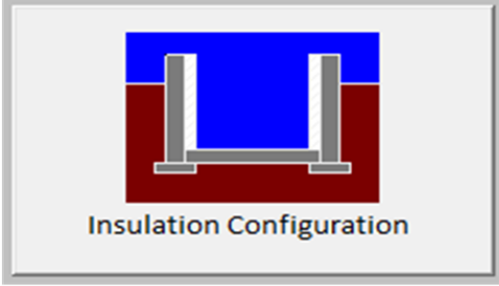
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	
Floor Width (m):	12.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.9	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1820

TYPE: 50-1
LO# 98678

OPT 5 BED

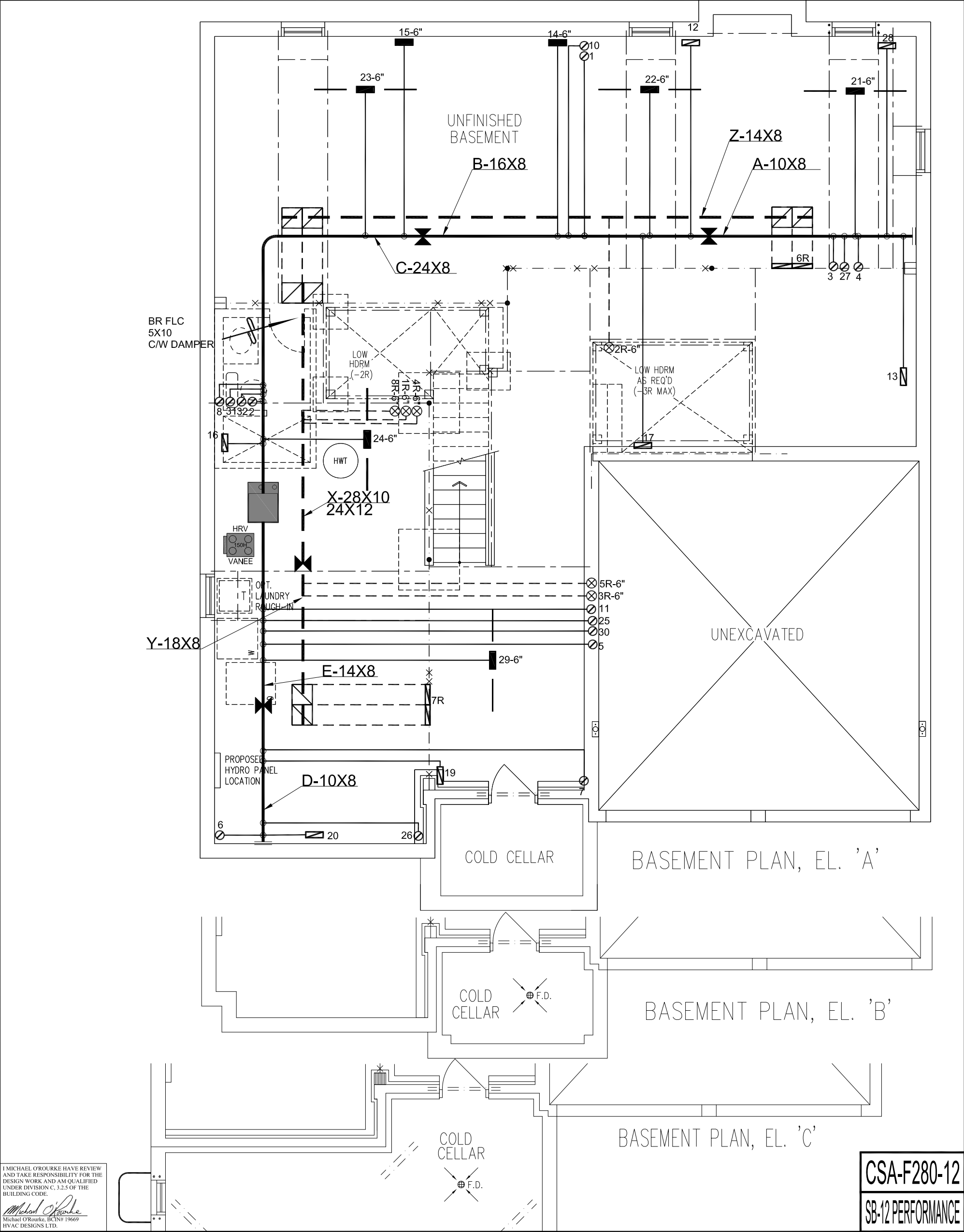
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.01			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1415.8			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1887.3 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.332			
Cooling Air Leakage Rate (ACH/H):	0.104			

TYPE: 50-1
LO# 98678

OPT 5 BED



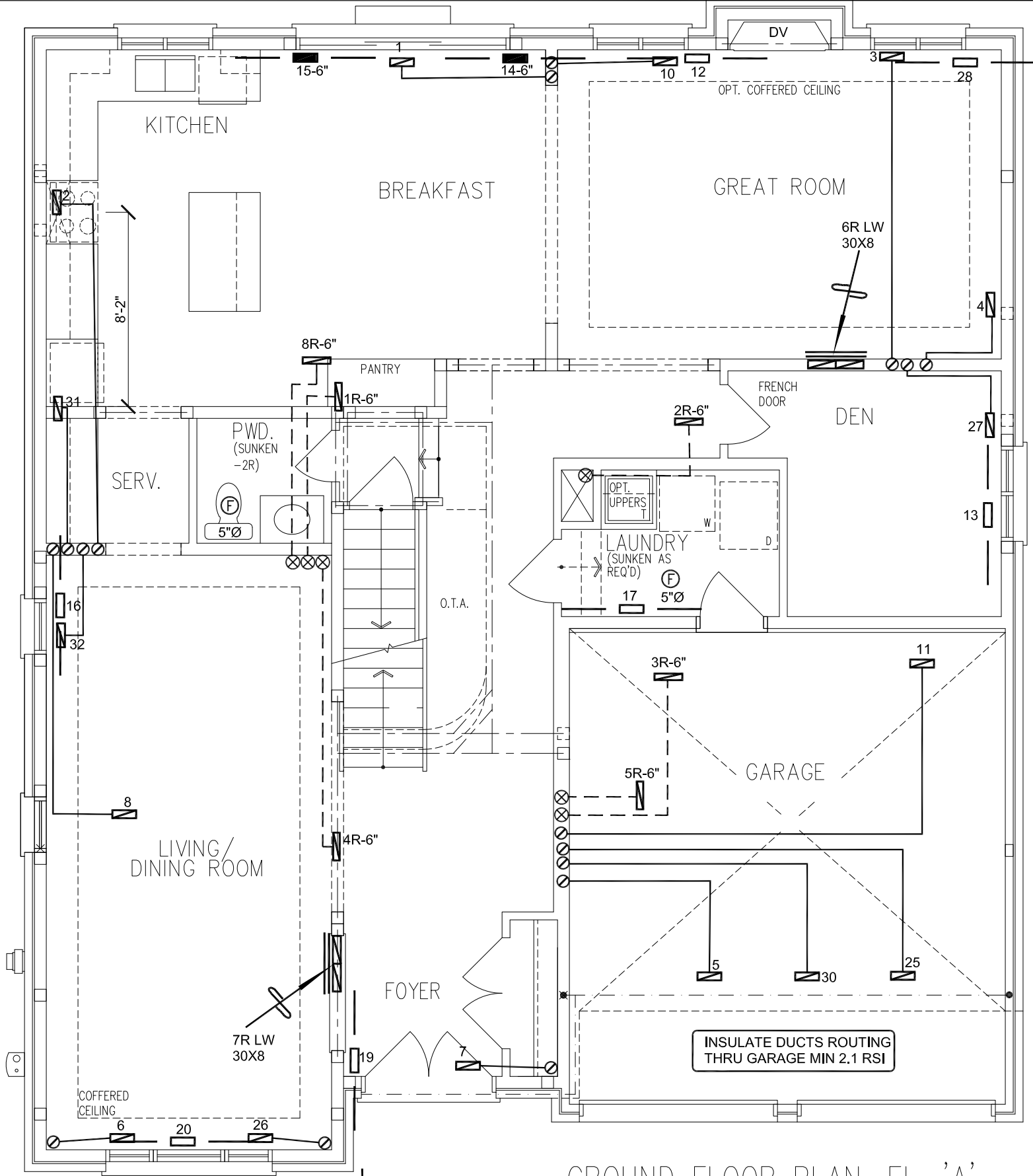
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

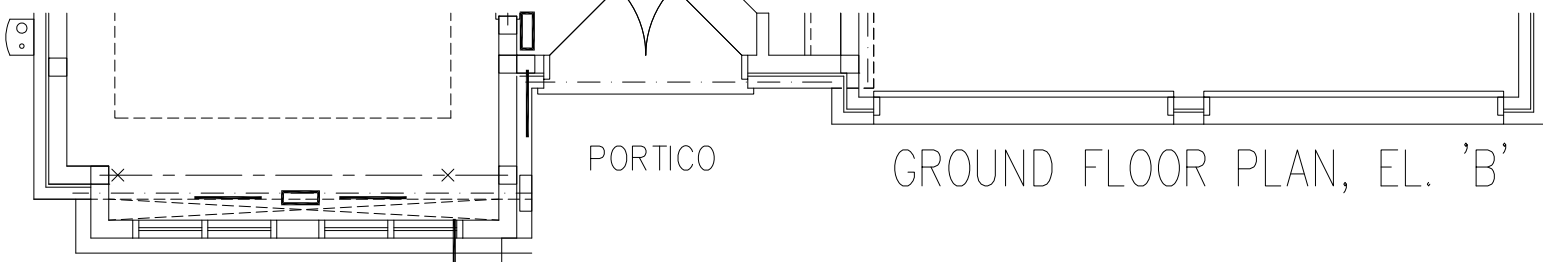
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS	

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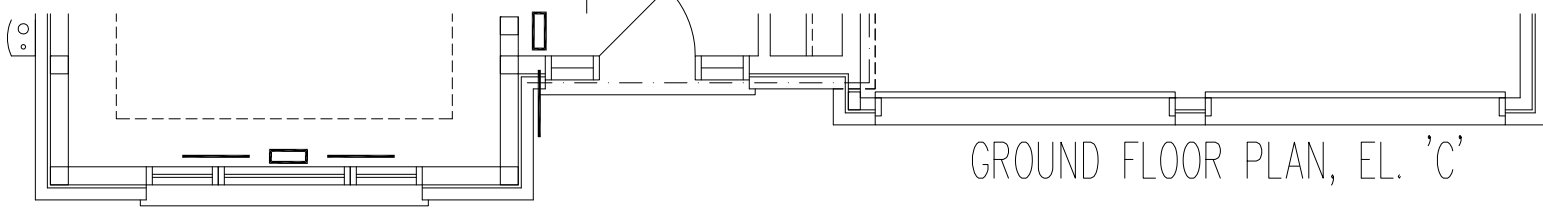
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	HEAT LOSS 63575 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT		
ROYAL PINE HOMES			UNIT DATA		3RD FLOOR						
Project Name			MAKE		2ND FLOOR		17	6	4	Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			MODEL		1ST FLOOR		9	2	3		
OPT 5 BED 50-01			INPUT		BASEMENT		5	1	0	Scale	3/16" = 1'-0"
			80 MBTU/H							BCIN# 19669	
			OUTPUT							LO# 98678	
			78 MBTU/H								
3446 sqft		COOLING		TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A					
		3.5									
		FAN SPEED		cfm @ 0.6" w.c.							
		1260									



GROUND FLOOR PLAN, EL. 'A'



GROUND FLOOR PLAN, EL. 'B'



GROUND FLOOR PLAN, EL. 'C'

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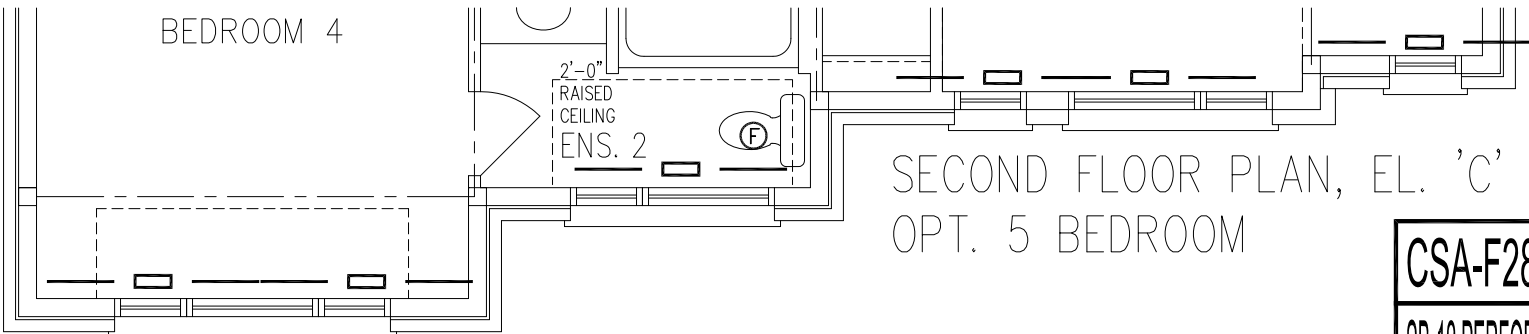
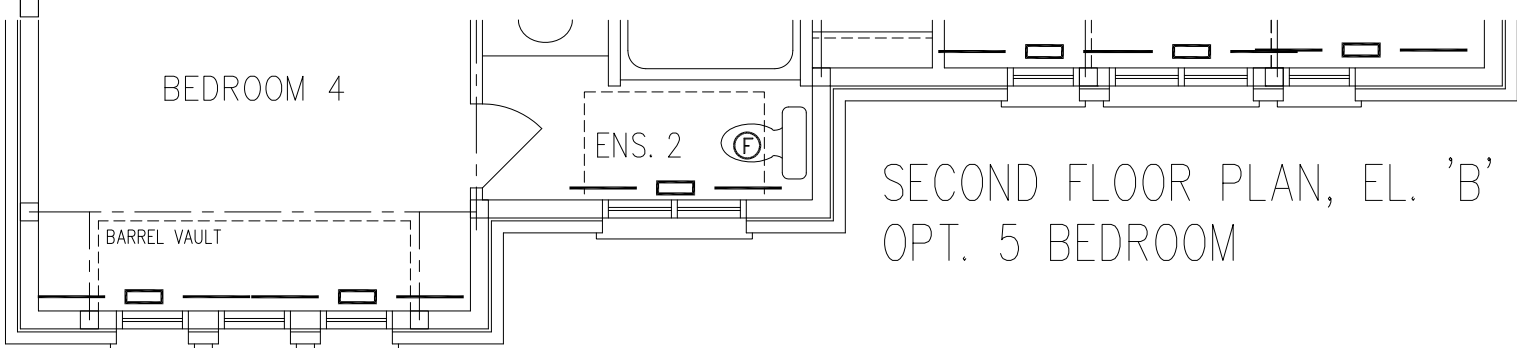
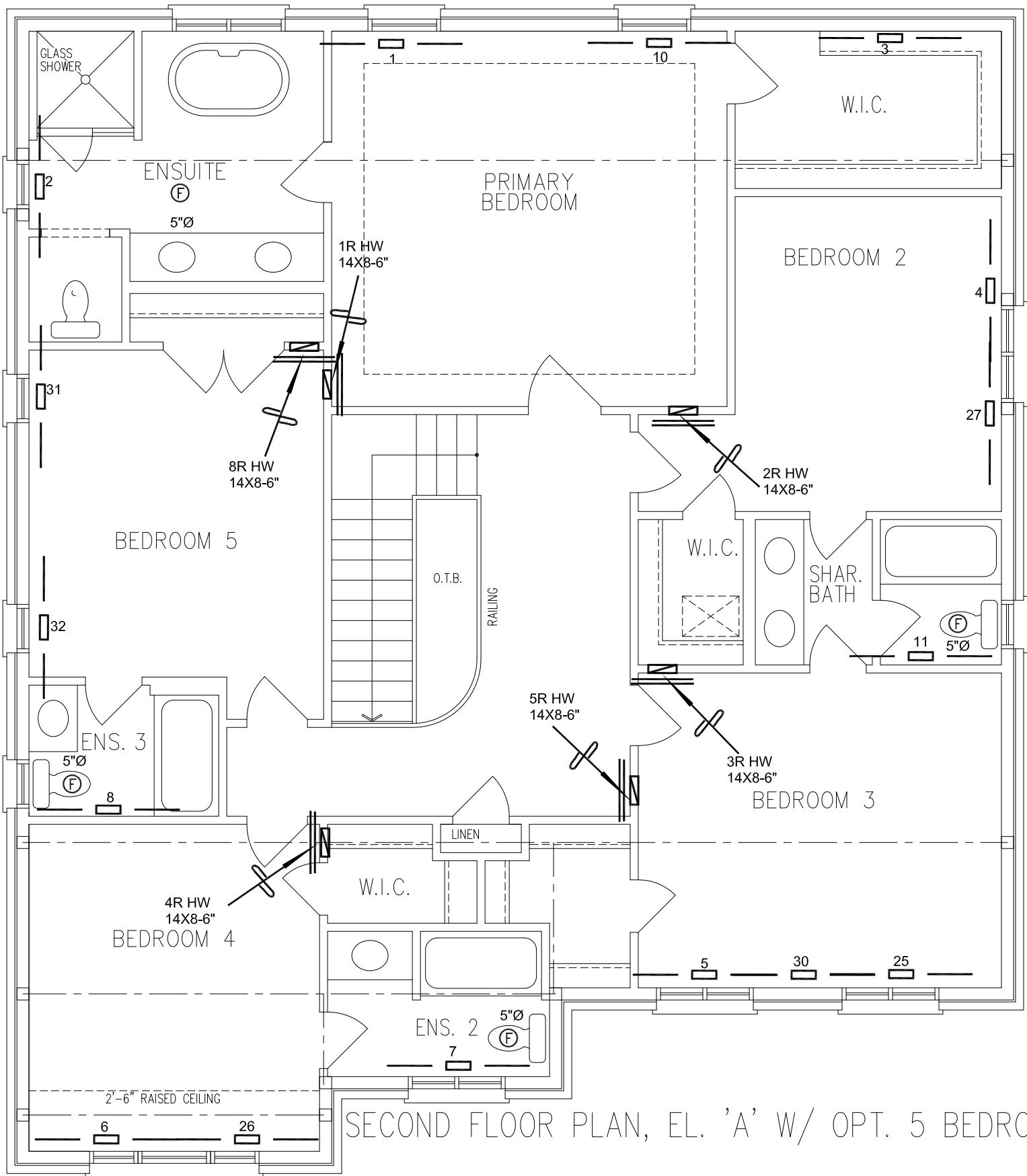
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTERFIELD RICHMOND HILL,ONTARIO			Date	AUG/2022
OPT 5 BED 50-01			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	98678	
3446 sqft				



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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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							REVISIONS		

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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			Scale	3/16" = 1'-0"
OPT 5 BED 50-01			BCIN# 19669	
3446 sqft			LO#	98678