

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 -WUB 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 -WUB										DATE: Aug-22										WINTER NATURAL AIR CHANGE RATE 0.398										HEAT LOSS ΔT °F. 78										CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
BUILDER: ROYAL PINE HOMES										TYPE: 50-1										GFA: 3446										LO# 98680										SUMMER NATURAL AIR CHANGE RATE 0.124										HEAT GAIN ΔT °F. 13										SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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ROOM USE		GREAT	DEN	KT/BR	LV/DN	LAUN		FOY				WUB	BAS
EXP. WALL		36	21	44	43	9		29				31	151
CLG. HT.		11	11	11	11	11		11				10	10
FACTORS													
GRS.WALL AREA	LOSS GAIN	396	231	484	473	99		319				310	1057
GLAZING		LOSS GAIN	LOSS GAIN	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				0 0 0	4 87 64
EAST	21.8 41.6	0 0 0	0 0 0	0 0 0	52 1133 2161	0 0 0		28 610 1163				0 0 0	0 0 0
SOUTH	21.8 24.9	0 0 0	0 0 0	0 0 0	28 610 697	0 0 0		0 0 0				0 0 0	4 87 100
WEST	21.8 41.6	46 1002 1911	0 0 0	73 1590 3033	0 0 0	0 0 0		0 0 0				12 261 499	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
DOORS	20.5 3.4	0 0 0	0 0 0	20 411 68	0 0 0	20 411 68		20 411 68				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				278 1169 192	0 0 0
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	453 1669 275
EXPOSED CLG	1.3 0.6	0 0 0	0 0 0	0 0 0	6 8 4	0 0 0		0 0 0				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				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				0 0 0	0 0 0
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0		0				0	5077
SLAB ON GRADE HEAT LOSS		0	0	0	0	0		0				0	
SUBTOTAL HT LOSS		2474	1376	3645	3404	743		2160				314	7330
SUB TOTAL HT GAIN		2154	511	3371	3133	122		1419				2155	506
LEVEL FACTOR / MULTIPLIER	0.30 0.60		0.30 0.60	0.30 0.60	0.30 0.60	0.30 0.60		0.30 0.60				0.50 1.46	
AIR CHANGE HEAT LOSS		1489	828	2194	2049	447		1300					13848
AIR CHANGE HEAT GAIN		152	36	238	222	9		100					89
DUCT LOSS		0	0	0	0	0		0				0	0
DUCT GAIN		0	0	0	0	0		0				0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0		0				0	0
HEAT GAIN APPLIANCES/LIGHTS		581	581	581	581	581		0				0	581
TOTAL HT LOSS BTU/H		3963	2204	5840	5452	1190		3461				2155	21178
TOTAL HT GAIN x 1.3 BTU/H		3752	1466	5447	5116	925		1975				986	1528

TOTAL HEAT GAIN BTU/H: 45542 TONS: 3.80 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 66569 TOTAL COMBINED HEAT LOSS BTU/H: 68573

SITE NAME: CENTERFIELD
BUILDER: ROYAL PINE HOMES

OPT 5 BED -WUB
TYPE: 50-1

DATE: Aug-22

GFA: 3446 LO# 98680

HEATING CFM 1600 COOLING CFM 1600
TOTAL HEAT LOSS 66,569 TOTAL HEAT GAIN 45,213
AIR FLOW RATE CFM 24.04 AIR FLOW RATE CFM 35.39

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

#*CARRIER

AFUE = 97 %

59SP5A-80-20

INPUT (BTU/H) = 80,000

FAN SPEED

OUTPUT (BTU/H) = 78,000

LOW 0

DESIGN CFM = 1600

MEDLOW 1335

CFM @ .6" E.S.P.

MEDIUM 1140

MEDIUM HIGH 1600

HIGH 1930

TEMPERATURE RISE 45 °F

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

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.	1.04	1.23	1.21	0.83	1.81	1.77	1.87	0.76	1.23	1.04	0.45	1.98	2.20	2.92	2.92	2.73	1.19	3.46	2.73	3.89	3.89	3.89	3.89
CFM PER RUN HEAT	25	30	29	20	44	43	45	18	30	25	11	48	53	70	70	66	29	83	66	93	93	93	93
RM GAIN MBH.	1.69	0.98	0.25	0.93	2.16	2.44	2.63	0.42	0.98	1.69	0.12	1.88	1.47	2.72	2.72	2.56	0.92	1.97	2.56	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	60	35	9	33	76	86	93	15	35	60	4	66	52	96	96	91	33	70	91	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	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	67	46	41	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	197	156	161	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	0.11	0.11	0.1	0.1	0.13	0.08	0.1	0.1	0.12
ROUND DUCT SIZE	5	4	4	4	6	6	6	4	4	5	4	5	5	6	6	6	4	6	6	6	6	6	6
HEATING VELOCITY (ft/min)	184	344	333	229	224	219	229	207	344	184	126	352	389	357	357	337	333	423	337	474	474	474	474
COOLING VELOCITY (ft/min)	441	402	103	379	388	438	474	172	402	441	46	485	382	489	489	464	379	357	464	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	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	33
ROOM NAME	BED-3	BED-4	BED-2	GREAT	BAS	BED-3	BED-5	BED-5	BAS
RM LOSS MBH.	1.81	1.77	0.83	1.98	3.89	1.81	0.84	0.84	3.89
CFM PER RUN HEAT	44	43	20	48	93	44	20	20	93
RM GAIN MBH.	2.16	2.44	0.93	1.88	0.42	2.16	1.04	1.04	0.42
CFM PER RUN COOLING	76	86	33	66	15	76	37	37	15
ADJUSTED PRESSURE	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.16
ACTUAL DUCT LGH.	69	39	65	62	21	61	24	21	36
EQUIVALENT LENGTH	150	150	200	120	100	140	160	170	170
TOTAL EFFECTIVE LENGTH	219	189	265	182	121	201	184	191	206
ADJUSTED PRESSURE	0.08	0.09	0.06	0.09	0.13	0.09	0.09	0.09	0.08
ROUND DUCT SIZE	6	6	5	5	6	6	4	4	6
HEATING VELOCITY (ft/min)	224	219	147	352	474	224	229	229	474
COOLING VELOCITY (ft/min)	388	438	242	485	76	388	424	424	76
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10
TRUNK	E	D	A	A	E	E	C	C	B

SUPPLY 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	281	0.06	9.4	10	x	8	506	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	664	0.06	12.9	20	x	8	598	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	1086	0.06	15.5	28	x	8	698	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	280	0.08	8.7	12	x	8	420	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	516	0.08	10.9	18	x	8	516	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 TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY	
	CFM	PRESS.	DUCT	DUCT		(ft/min)	
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1600	0.05	18.8	28	x	12	686
TRUNK Y	580	0.05	12.9	20	x	8	522
TRUNK Z	405	0.05	11.2	14	x	8	521
DROP	1600	0.05	18.8	24	x	14	686

RETURN AIR #	1	2	3	4	5	6	7	8							BR
AIR VOLUME	130	85	130	130	130	320	320	85	0	0	0	0	0	0	270
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
ACTUAL DUCT LGH.	46	74	55	55	53	59	29	46	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	215	205	175	185	180	160	215	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	241	289	260	230	238	239	189	261	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	0.10
ROUND DUCT SIZE	7	6.3	7	7	7	9.8	9.2	6	0	0	0	0	0	0	8.1
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	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	24

TYPE: 50-1
SITE NAME: CENTERFIELD

LO # 98680
OPT 5 BED -WUB

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 98680	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;">0.398</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.124</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	0.398	SUMMER NATURAL AIR CHANGE RATE	0.124	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																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.398 x 393.27 x 43 °C x 1.2 = 8117 W = 27696 Btu/h		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.124 x 393.27 x 7 °C x 1.2 = 416 W = 1419 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 / HLlevel)																																																								
1	0.5	27,696	9,485	1.460																																																								
2	0.3		13,802	0.602																																																								
3	0.2		15,024	0.369																																																								
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 -WUB	BUILDER: ROYAL PINE HOMES
SFQT: 3446	LO# 98680	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 (ft ³):	49998.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	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:	151.0 ft

2012 OBC - COMPLIANCE PACKAGE	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%	-

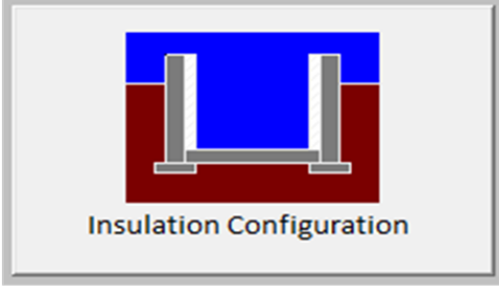
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

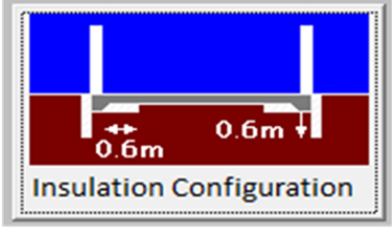
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	 Insulation Configuration
Floor Width (m):	12.8	
Exposed Perimeter (m):	46.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.9	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1487

TYPE: 50-1
LO# 98680

OPT 5 BED -WUB

Residential Slab on Grade 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		
Length (m):	1.8	
Width (m):	5.8	
Exposed Perimeter (m):	9.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		92

TYPE: 50-1
LO# 98680

OPT 5 BED -WUB

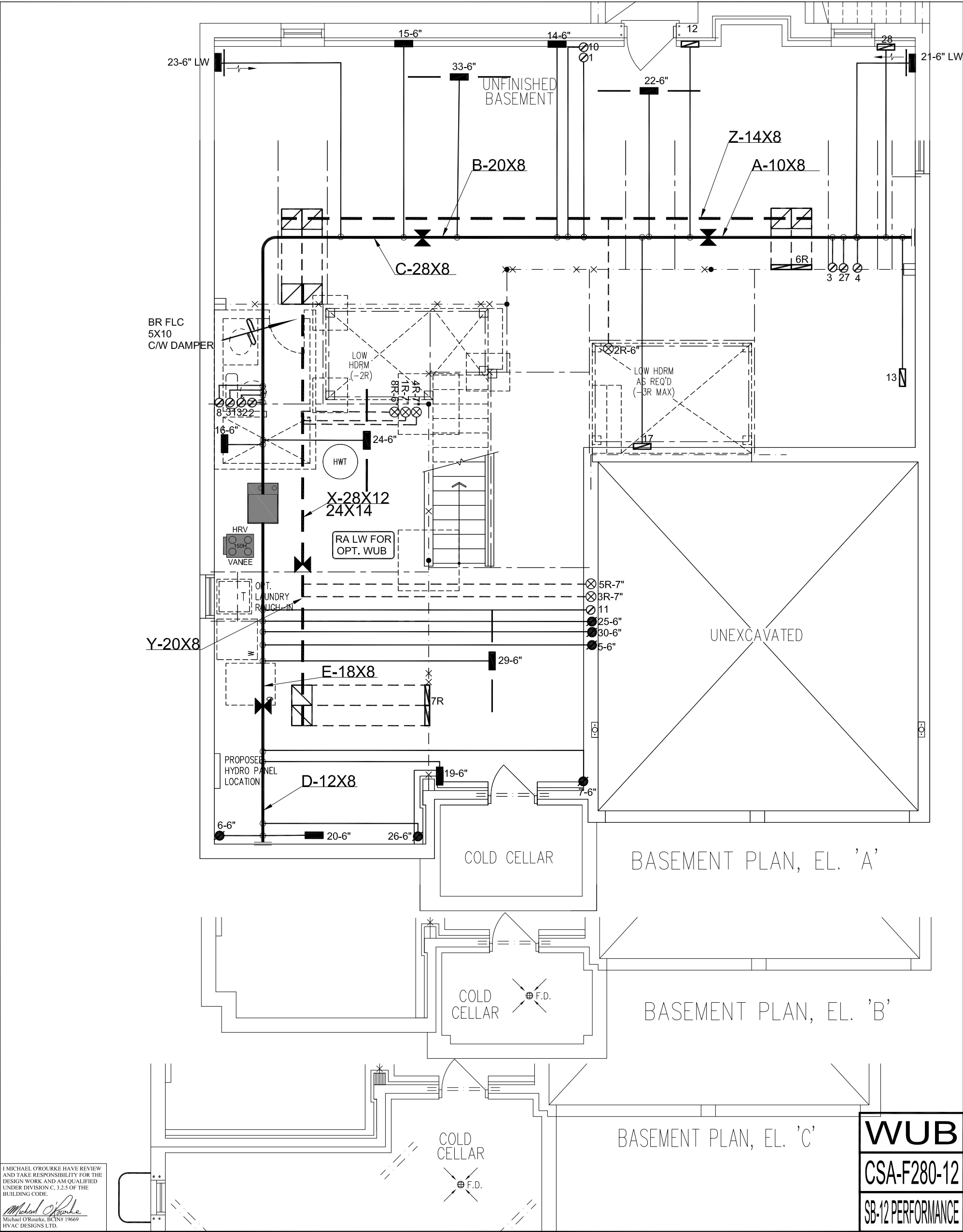
Air Infiltration Residential Load Calculator

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):	9.14			
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):	0.398			
Cooling Air Leakage Rate (ACH/H):	0.124			

TYPE: 50-1
LO# 98680

OPT 5 BED -WUB



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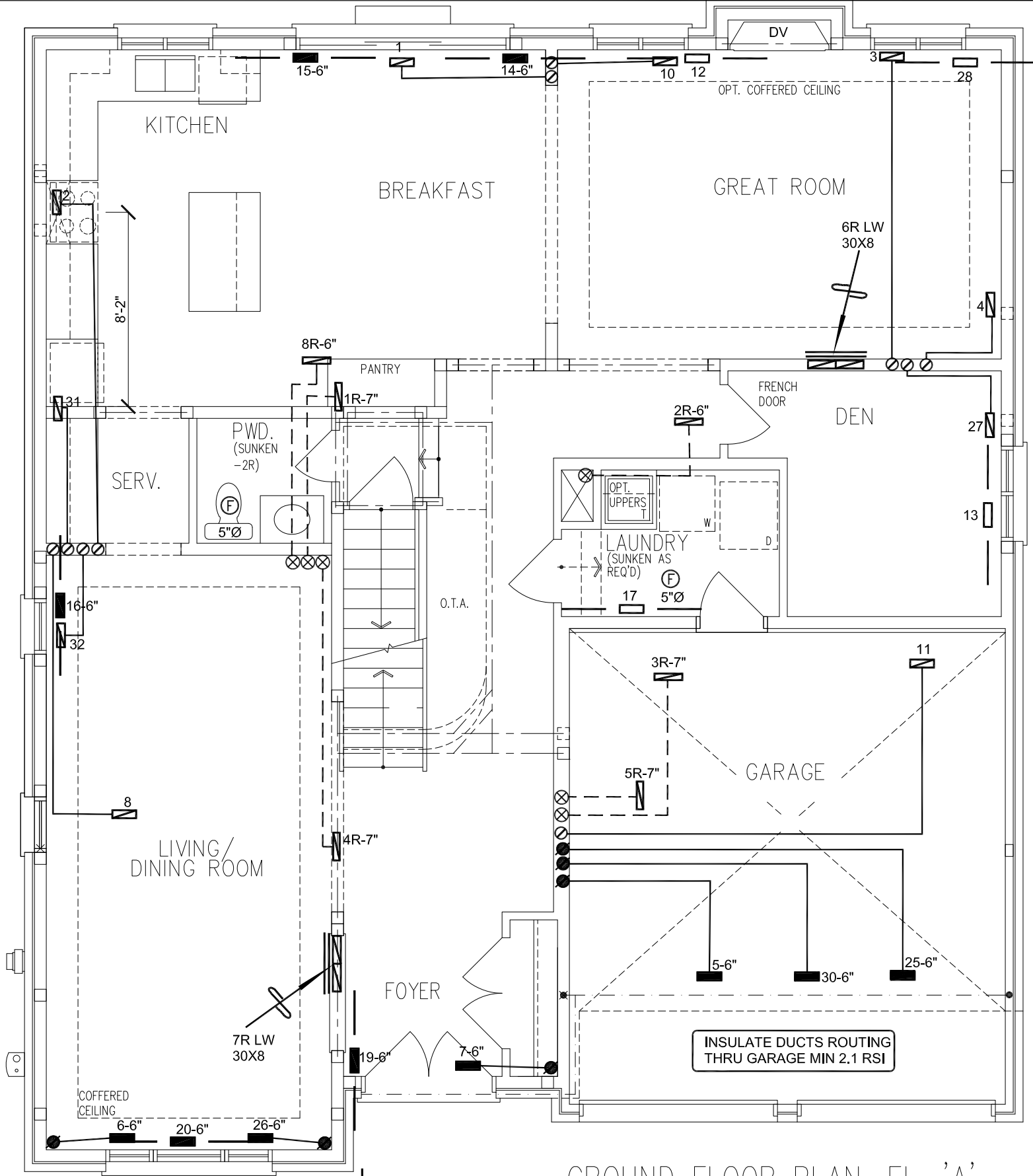
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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		

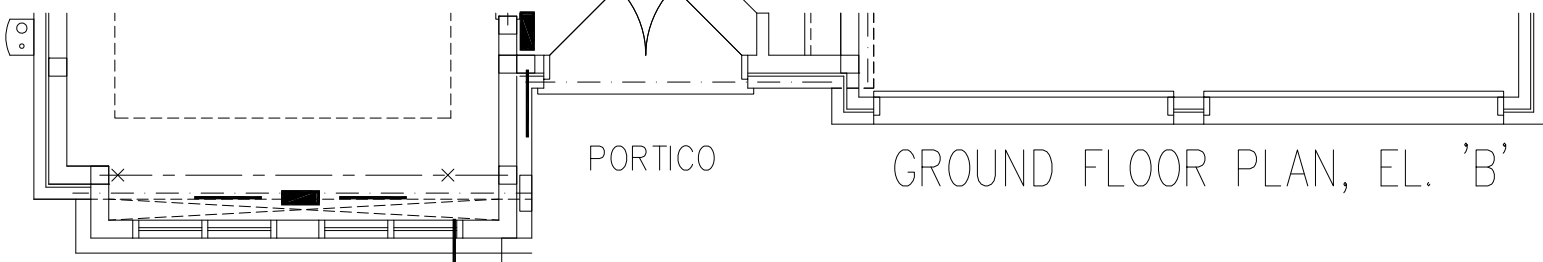
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Client	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply 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 68573 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title		
ROYAL PINE HOMES		UNIT DATA		3RD FLOOR				BASEMENT HEATING LAYOUT		
Project Name		MAKE CARRIER		2ND FLOOR		17	6	4	Date AUG/2022	
CENTERFIELD RICHMOND HILL,ONTARIO		MODEL 59SP5A-80-20		1ST FLOOR		9	2	3		
		INPUT 80 MBTU/H		BASEMENT		6	1	0		
OPT 5 BED - WUB 50-01	3446 sqft	OUTPUT 78 MBTU/H	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						Date	AUG/2022
		COOLING 4.0 TONS							Scale	3/16" = 1'-0"
		FAN SPEED 1600 cfm @ 0.6" w.c.							BCIN# 19669	
									LO#	98680

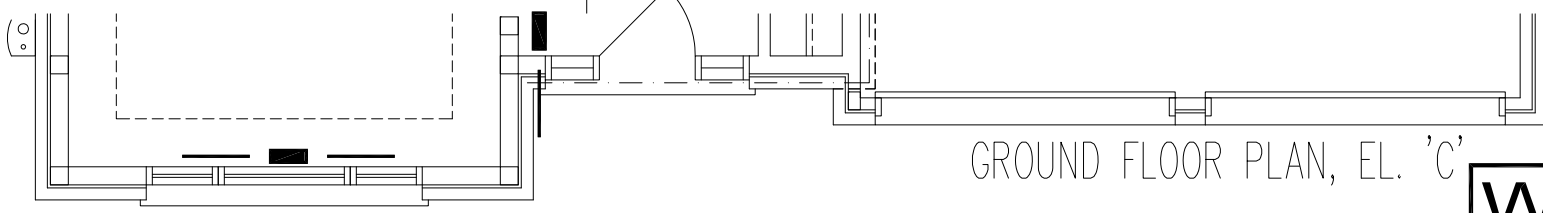
WUB
CSA-F280-12
SB-12 PERFORMANCE



GROUND FLOOR PLAN, EL. 'A'



GROUND FLOOR PLAN, EL. 'B'



GROUND FLOOR PLAN, EL. 'C'

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

WUB

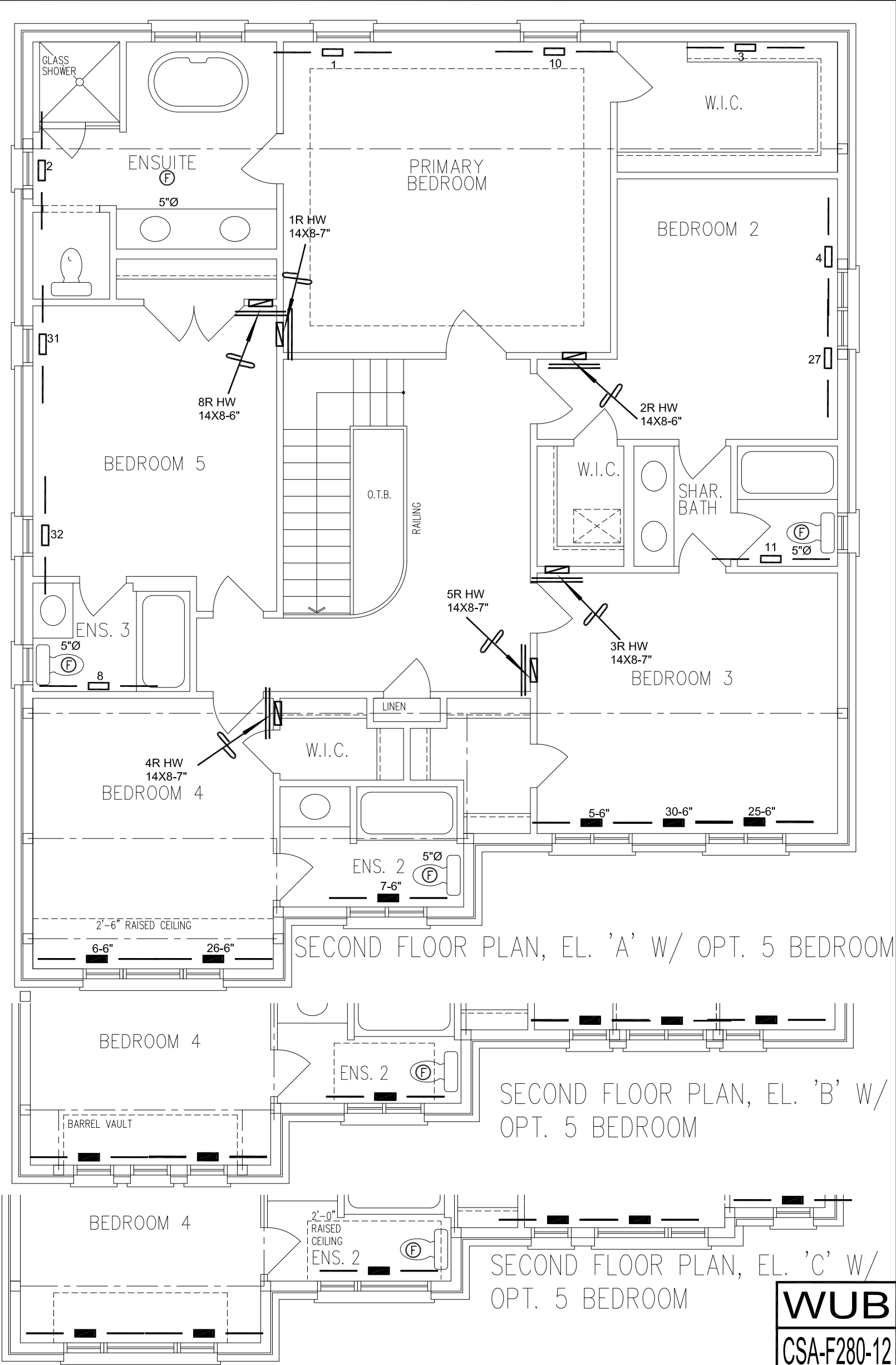
CSA-F280-12

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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			Scale	3/16" = 1'-0"
OPT 5 BED - WUB 50-01		BCIN# 19669		
3446 sqft		LO#	98680	



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.

WUB
CSA-F280-12
SB-12 PERFORMANCE

HVAC LEGEND							3.		
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS	

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Client		 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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			Scale	3/16" = 1'-0"
OPT 5 BED - WUB 50-01			BCIN# 19669	
3446 sqft			LO#	98680