

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 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		WUB		GFA: 3446		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				LO# 98679		SUMMER NATURAL AIR CHANGE RATE 0.124		HEAT GAIN ΔT °F. 13		SB-12 PERFORMANCE	
ROOM USE		MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-3		ENS-4		
EXP. WALL		42	11	15	34	29	37	0	10		15		
CLG. HT.		9	9	9	9	9	9	9	9		9		
FACTORS													
GRS.WALL AREA	LOSS GAIN	378	99	135	306	261	333	0	90		135		
GLAZING	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	8 174 128		0 0 0		
EAST	21.8 41.6	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	72 1569 2992	58 1264 2410	0 0 0		43 937 1787		
SOUTH	21.8 24.9	0 0 0	16 349 398	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0		
WEST	21.8 41.6	34 741 1413	0 0 0	0 0 0	28 610 1163	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 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 0 0		
NET EXPOSED WALL	4.2 0.7	344 1447 238	83 349 57	135 568 93	278 1169 192	189 795 131	275 1156 190	0 0 0	82 345 57		92 387 64		
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		
EXPOSED CLG	1.3 0.6	390 513 229	175 230 103	60 79 35	343 451 202	329 432 193	297 390 175	55 72 32	66 87 39		66 87 39		
NO ATTIC EXPOSED CLG	2.8 1.3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	33 93 41	30 84 38	0 0 0		20 56 25		
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		
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0		0		
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0		0		
SUBTOTAL HT LOSS		2700	928	647	2230	3565	2895	72	669		1467		
SUB TOTAL HT GAIN		1880	559	129	1557	3469	2813	32	234		1914		
LEVEL FACTOR / MULTIPLIER	0.20 0.37		0.20 0.37	0.20 0.37	0.20 0.37	0.20 0.37	0.20 0.37	0.20 0.37	0.20 0.37		0.20 0.37		
AIR CHANGE HEAT LOSS		986	339	236	814	1302	1057	26	244		535		
AIR CHANGE HEAT GAIN		130	39	9	107	239	194	2	16		132		
DUCT LOSS		0	0	0	0	487	0	0	91		0		
DUCT GAIN		0	0	0	0	459	0	0	25		0		
HEAT GAIN PEOPLE	240	2	480	0	0	1	240	1	240		0		
HEAT GAIN APPLIANCES/LIGHTS		639	0	0	639	639	639	0	0		0		
TOTAL HT LOSS BTU/H		3686	1266	883	3044	5353	3952	99	1004		2002		
TOTAL HT GAIN x 1.3 BTU/H		4067	776	179	3306	6559	5051	45	357		2660		

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
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	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		149	35	232	216	8		98					87
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		639	639	639	639	639		0				0	639
TOTAL HT LOSS BTU/H		3963	2204	5840	5452	1190		3461				2155	21178
TOTAL HT GAIN x 1.3 BTU/H		3823	1541	5515	5184	1000		1971				986	1601

TOTAL HEAT GAIN BTU/H:

44896

TONS: 3.74

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 66731

TOTAL COMBINED HEAT LOSS BTU/H: 68401

SITE NAME: CENTERFIELD
BUILDER: ROYAL PINE HOMES

WUB
TYPE: 50-1

DATE: Aug-22

GFA: 3446 LO# 98679

HEATING CFM 1260 COOLING CFM 1260
TOTAL HEAT LOSS 66,731 TOTAL HEAT GAIN 44,621
AIR FLOW RATE CFM 18.88 AIR FLOW RATE CFM 28.24

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	15	9	6
R/A	0	0	5	2	1

plenium pressure s/a 0.18
max s/a dif press. loss 0.01
min adjusted pressure s/a 0.17
r/a pressure 0.17
r/a grille press. Loss 0.02
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	ENS-4	GREAT	DEN	KT/BR	KT/BR	LV/DN	LAUN	FOY	LV/DN	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.84	0.63	0.88	1.52	1.78	1.98	0.10	1.00	0.63	1.84	2.00	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	35	12	17	29	34	37	2	19	12	35	38	37	42	55	55	51	22	65	51	73	73	73	73
RM GAIN MBH.	2.03	0.39	0.18	1.65	2.19	2.53	0.04	0.36	0.39	2.03	2.66	1.91	1.54	2.76	2.76	2.59	1.00	1.97	2.59	0.43	0.43	0.43	0.43
CFM PER RUN COOLING	57	11	5	47	62	71	1	10	11	57	75	54	44	78	78	73	28	56	73	12	12	12	12
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	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	66	25	39	63	57	33	73	69	35	54	46	51	60	43	34	4	49	25	21	67	46	41	10
EQUIVALENT LENGTH	180	170	170	180	180	120	180	190	160	190	160	160	130	170	110	150	120	140	100	140	110	140	130
TOTAL EFFECTIVE LENGTH	246	195	209	243	237	153	253	259	195	244	206	211	190	213	144	154	169	165	121	207	156	181	140
ADJUSTED PRESSURE	0.07	0.09	0.08	0.07	0.07	0.11	0.07	0.07	0.09	0.07	0.08	0.08	0.09	0.08	0.12	0.11	0.1	0.1	0.14	0.08	0.11	0.1	0.12
ROUND DUCT SIZE	5	4	4	5	6	5	4	4	4	5	6	5	5	6	6	6	4	6	6	6	6	6	6
HEATING VELOCITY (ft/min)	257	138	195	213	173	272	23	218	138	257	194	272	308	280	280	260	252	331	260	372	372	372	372
COOLING VELOCITY (ft/min)	419	126	57	345	316	521	11	115	126	419	382	396	323	398	398	372	321	286	372	61	61	61	61
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10
TRUNK	B	C	C	A	D	D	A	A	C	B	D	B	A	B	C	C	B	D	D	A	B	C	C

RUN #	25	26	27	28	29	30	33
ROOM NAME	BED-3	BED-4	BED-2	GREAT	BAS	BED-3	BAS
RM LOSS MBH.	1.78	1.98	1.52	1.98	3.89	1.78	3.89
CFM PER RUN HEAT	34	37	29	37	73	34	73
RM GAIN MBH.	2.19	2.53	1.65	1.91	0.43	2.19	0.43
CFM PER RUN COOLING	62	71	47	54	12	62	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	69	39	71	62	21	61	35
EQUIVALENT LENGTH	200	150	150	120	140	190	170
TOTAL EFFECTIVE LENGTH	269	189	221	182	161	251	205
ADJUSTED PRESSURE	0.06	0.09	0.08	0.09	0.11	0.07	0.08
ROUND DUCT SIZE	6	5	5	5	6	6	5
HEATING VELOCITY (ft/min)	173	272	213	272	372	173	536
COOLING VELOCITY (ft/min)	316	521	345	396	61	316	88
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10
TRUNK	D	D	A	A	D	D	B

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)
TRUNK A	231	0.07	8.4	8	x	8	520	TRUNK G	0	0.00	0	0	8
TRUNK B	561	0.07	11.7	16	x	8	631	TRUNK H	0	0.00	0	0	8
TRUNK C	854	0.07	13.7	22	x	8	699	TRUNK I	0	0.00	0	0	8
TRUNK D	403	0.06	10.7	16	x	8	453	TRUNK J	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	0	0.05	0	0	x	8
TRUNK X	1260	0.05	17.2	28	x	10
TRUNK Y	490	0.05	12.1	18	x	8
TRUNK Z	405	0.05	11.2	14	x	8
DROP	1260	0.05	17.2	24	x	12

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	85	85	85	85	85	320	320	0	0	0	0	0	0	0	0	195
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.	43	74	55	55	53	59	29	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	185	225	205	175	185	180	160	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	228	299	260	230	238	239	189	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.06	0.06	0.06	0.06	0.08	14.80	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	0	0	0	0	0	0	0	0	7.2
INLET GRILL SIZE	8	8	8	8	8	8	8	0	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	0	0	0	0	0	0	0	0	14

TYPE: 50-1
SITE NAME: CENTERFIELD

LO # 98679
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>3</u> @ 10.6 cfm	<u>31.8</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>190.8</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>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>190.8</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>111.3</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 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
ENS-4	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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 98679	Model: 50-1	Builder: ROYAL PINE HOMES	Date: 8/29/2022																																																									
Volume Calculation		Air Change & Delta T Data																																																										
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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																																																										
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h		$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 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		15,171	0.365																																																								
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	WUB	BUILDER: ROYAL PINE HOMES
SFQT: 3446	LO# 98679	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:	5
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%	-

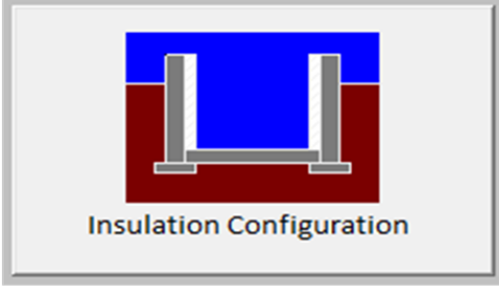
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

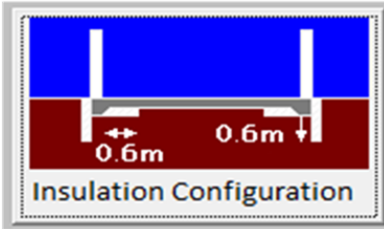
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	
Floor Width (m):	12.8	
Exposed Perimeter (m):	46.0	
Wall Height (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# 98679

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# 98679

WUB

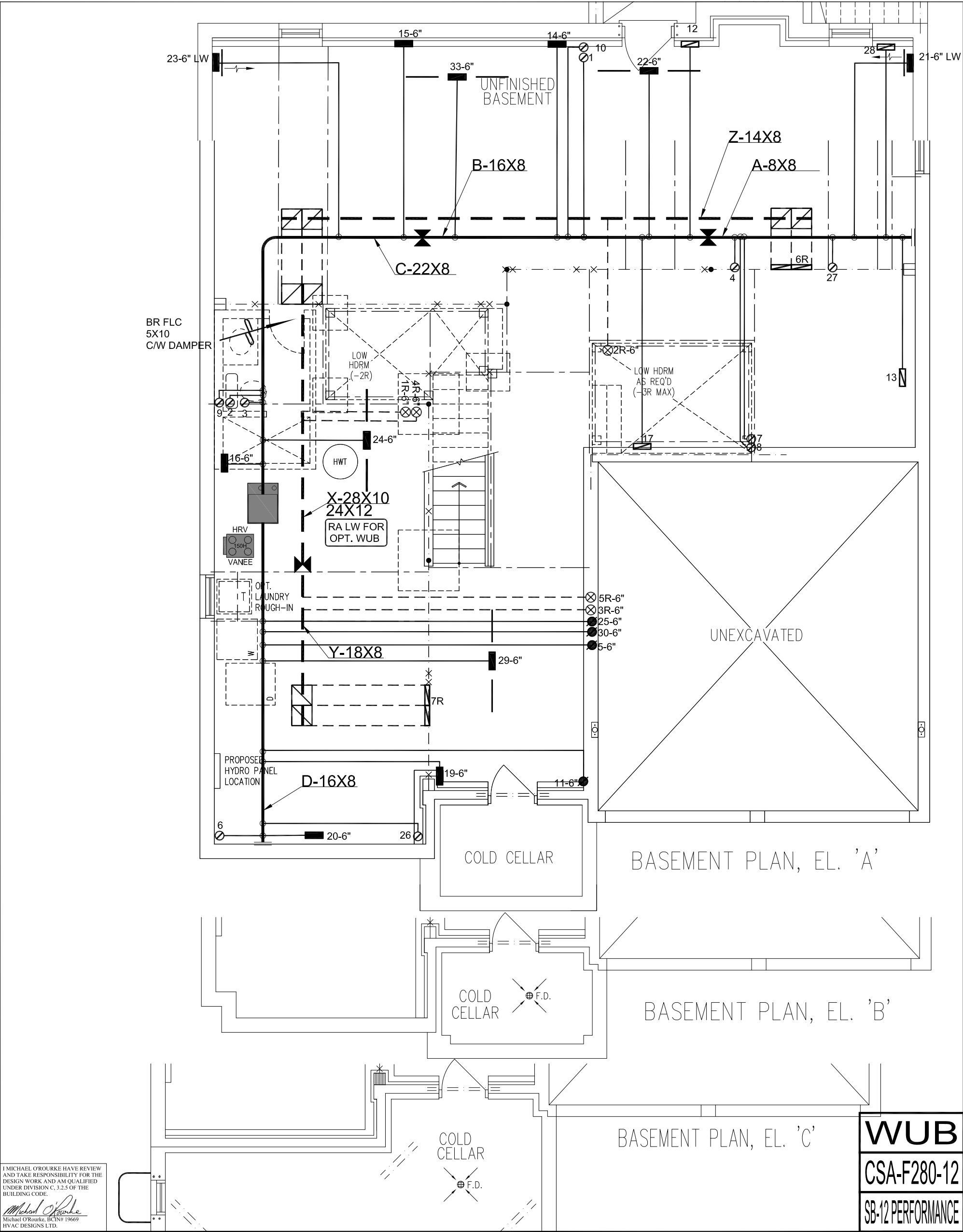
Air Infiltration Residential Load Calculator

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		
	37.5	37.5		
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# 98679

WUB



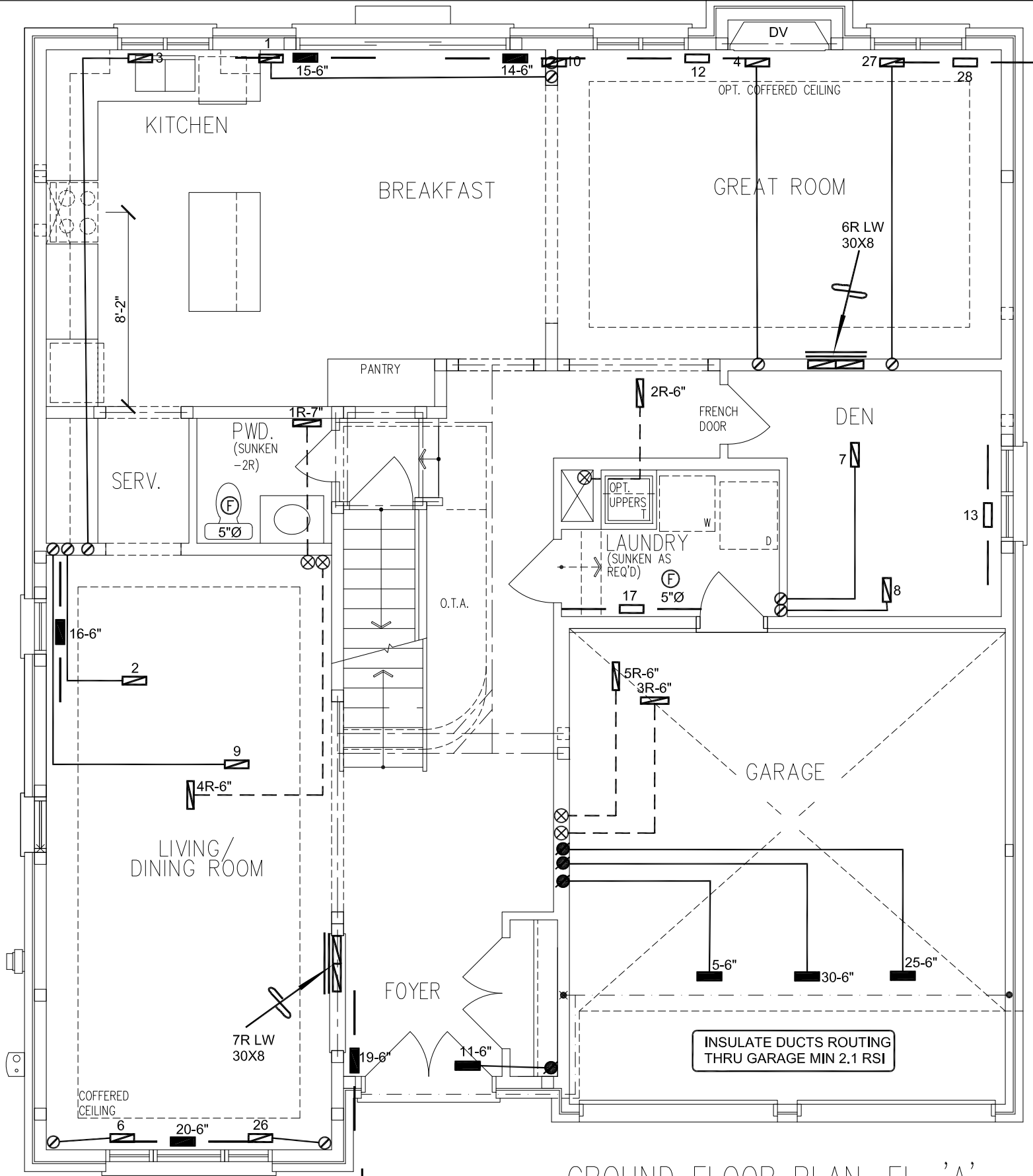
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

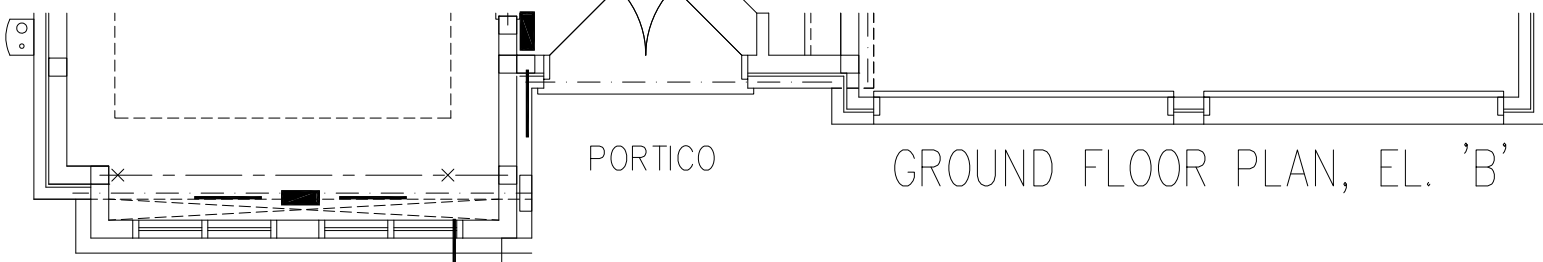
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 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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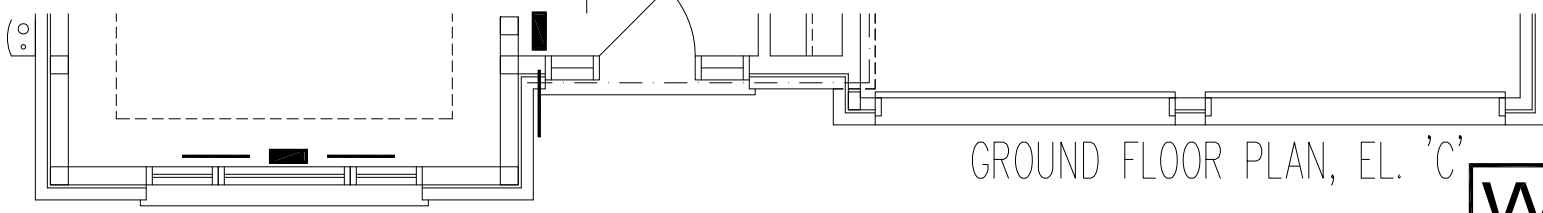
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 68401 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT		
ROYAL PINE HOMES			UNIT DATA		3RD FLOOR						
Project Name			MAKE CARRIER		2ND FLOOR		15	5			5
CENTERFIELD RICHMOND HILL,ONTARIO			MODEL 59TN6B-080-14V		1ST FLOOR		9	2	3	Date	AUG/2022
WUB 50-01			INPUT 80 MBTU/H		BASEMENT		6	1	0	Scale	3/16" = 1'-0"
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						BCIN# 19669
		COOLING 3.5 TONS								LO# 98679	
		FAN SPEED 1260 cfm @ 0.6" w.c.									



GROUND FLOOR PLAN, EL. 'A'



GROUND FLOOR PLAN, EL. 'B'



GROUND FLOOR PLAN, EL. 'C'

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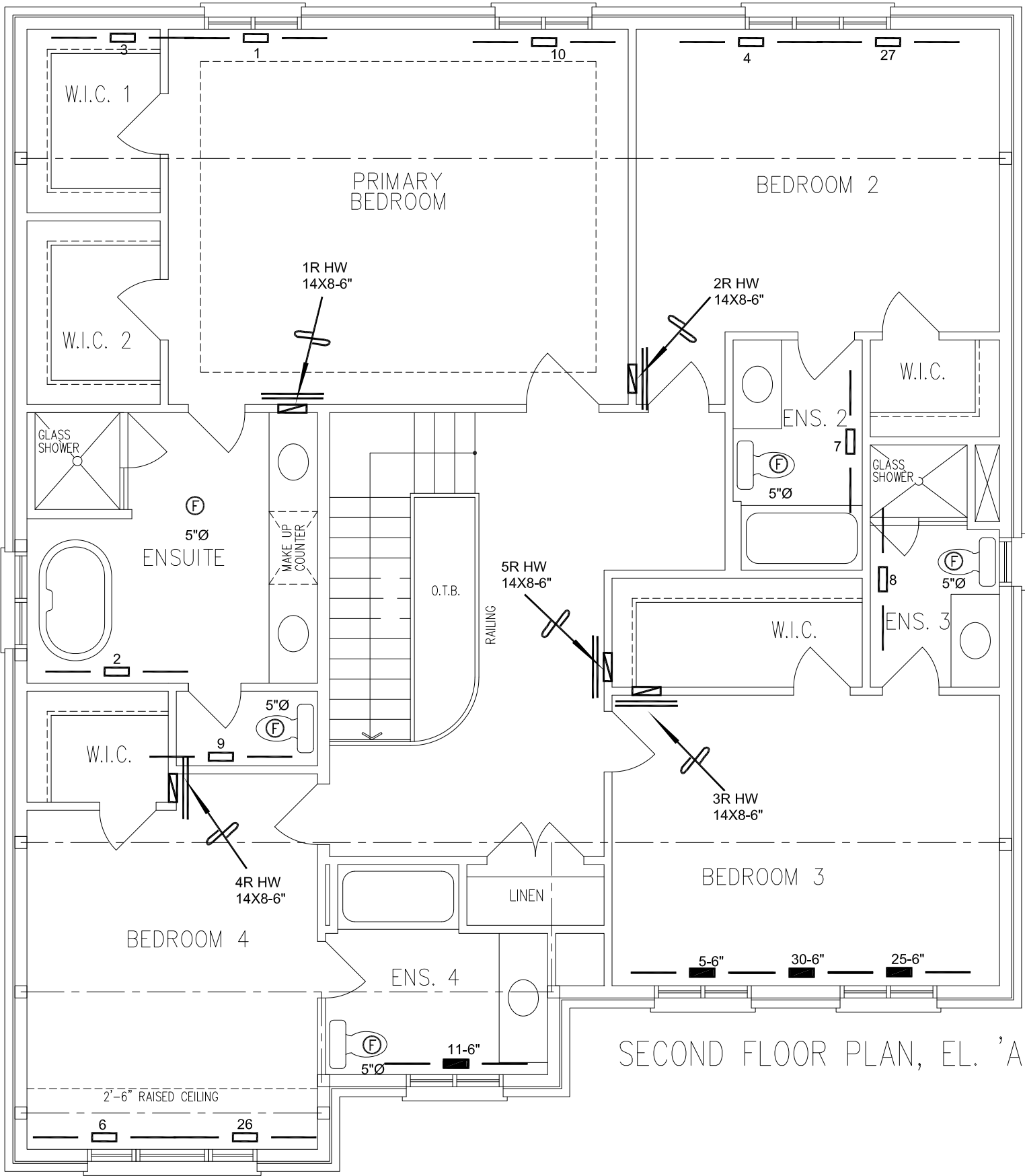
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
SB-12 PERFORMANCE

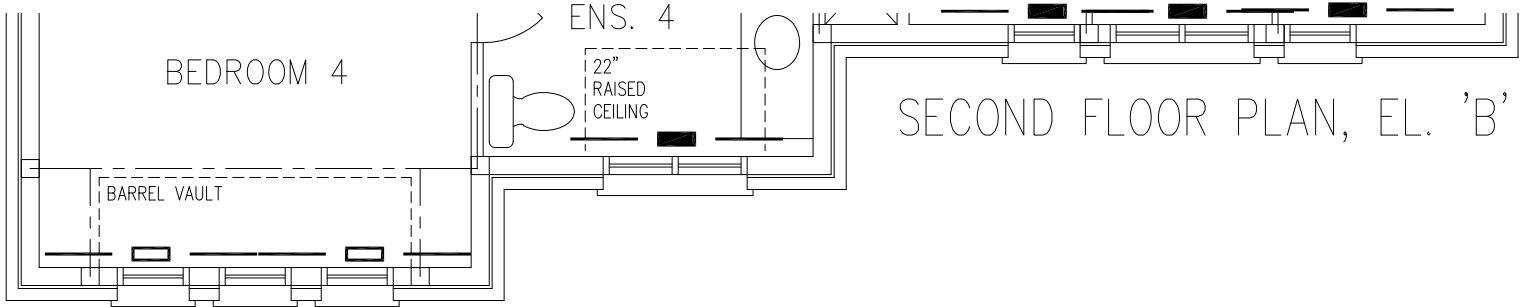
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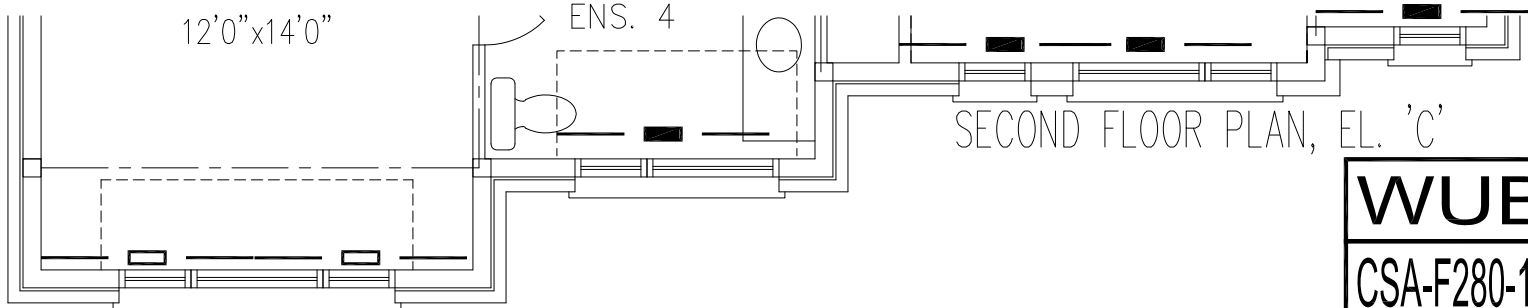
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		Installation 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.	Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			Scale	3/16" = 1'-0"
WUB 50-01			BCIN# 19669	
3446 sqft			LO#	98679



SECOND FLOOR PLAN, EL. 'A'



SECOND FLOOR PLAN, EL. 'B'



SECOND FLOOR PLAN, EL. 'C'

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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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Project Name			SECOND FLOOR HEATING LAYOUT	
ROYAL PINE HOMES			Date	AUG/2022
CENTERFIELD RICHMOND HILL,ONTARIO			Scale	3/16" = 1'-0"
WUB 50-01		BCIN# 19669		
3446 sqft		LO#	98679	