

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 BRAMPTON	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: 5003 CNR Project: VALES OF HUMBER SOUTH	
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.			
March 4, 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: VALES OF HUMBER SOUTH										DATE: Mar-22			WINTER NATURAL AIR CHANGE RATE 0.335					HEAT LOSS ΔT °F. 74		CSA-F280-12									
BUILDER: ROYAL PINE HOMES										TYPE: 5003 CNR			GFA: 4066		LO# 95283		SUMMER NATURAL AIR CHANGE RATE 0.109					HEAT GAIN ΔT °F. 11		SB-12 PACKAGE A1					
ROOM USE				MBR				ENS				BED-2		BED-3		BED-4		BTH-2/3				MD/B5		BTH-4/5					
EXP. WALL				46				28				18		18		36		25				18		10					
CLG. HT.				10				9				9		10		11		9				9		9					
FACTORS																													
GRS.WALL AREA		LOSS GAIN		460				252				162		180		396		225				162		90					
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN			
NORTH		20.8	15.5	0	0	0	0	22	457	340		24	499	371	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EAST		20.8	41.0	0	0	0	0	0	0	0		0	0	0	44	914	1806	44	914	1806	13	270	534	0	0	0	0	0	
SOUTH		20.8	24.4	40	831	976	0	0	0	0		0	0	0	0	0	0	35	727	854	0	0	0	36	748	878	24	499	585
WEST		20.8	41.0	46	956	1888	13	270	534		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SKYLT.		36.4	100.7	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		24.7	3.7	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		4.4	0.6	374	1630	242	217	945	140		138	601	89	136	593	88	317	1381	205	212	924	137	126	549	81	66	288	43	
NET EXPOSED BSMT WALL ABOVE GR		3.5	0.5	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	593	743	330	195	244	109		360	451	201	249	312	139	84	105	47	126	158	70	350	439	195	170	213	95	
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0	0	0	0		0	0	0	31	83	37	182	488	217	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR		2.5	0.4	0	0	0	0	0	0		80	199	30	280	697	103	0	0	0	126	314	47	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS				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	
SUBTOTAL HT LOSS				4159		1917		1750		2599		3616		1665		1735		999											
SUB TOTAL HT GAIN				3436		1123		691		2173		3129		787		1155		723											
LEVEL FACTOR / MULTIPLIER		0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29
AIR CHANGE HEAT LOSS				1198		552		504		748		1041		480		500		288											
AIR CHANGE HEAT GAIN				182		59		37		115		166		42		61		38											
DUCT LOSS				0		0		225		335		0		214		0		0											
DUCT GAIN				0		0		197		353		0		83		0		0											
HEAT GAIN PEOPLE		240	2	480	0	0	1	240	1	240	1	240	0	0	0	0	1	240	0	0	0	0	1	240	0	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS				1002		0		1002		1002		1002		0		1002		0						1002		0		0	
TOTAL HT LOSS BTU/H				5357		2469		2480		3682		4657		2359		2235		1287											
TOTAL HT GAIN x 1.3 BTU/H				6630		1537		2816		5048		5898		1185		3195		989											

ROOM USE			FAM			DIN			KT/DN			LIV			LIB			PWD			FOY			LND												BAS		
EXP. WALL			39			20			40			13			32			7			20			25												206		
CLG. HT.			11			11			11			11			11			11			20			11									10					
FACTORS																																						
GRS.WALL AREA			429			220			440			143			352			77			400			275									2060					
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN									LOSS GAIN					
NORTH			20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	519	387					4	83	62						
EAST			20.8	41.0	0	0	0	0	0	0	0	0	0	49	1018	2011	0	0	0	49	1018	2011	0	0	0					0	0	0						
SOUTH			20.8	24.4	0	0	0	48	997	1171	31	644	756	48	997	1171	28	582	683	0	0	0	0	0	0					8	166	195						
WEST			20.8	41.0	84	1745	3448	0	0	0	61	1267	2504	0	0	0	0	0	0	0	0	0	0	0	0					8	166	328						
SKYLT.			36.4	100.7	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			24.7	3.7	0	0	0	0	0	0	10	247	37	0	0	0	0	0	0	0	0	0	30	740	110					20	493	73						
NET EXPOSED WALL			4.4	0.6	345	1503	223	172	749	111	338	1473	218	95	414	61	275	1198	178	77	335	50	321	1399	207					0	0	0						
NET EXPOSED BSMT WALL ABOVE GR			3.5	0.5	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	96	43					0	0	0							
NO ATTIC EXPOSED CLG			2.7	1.2	10	27	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					0	0	0						
EXPOSED FLOOR			2.5	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																																				7350		
SLAB ON GRADE HEAT LOSS																																						
SUBTOTAL HT LOSS						3275			1747			3631			1411			2798			335			3253			2116						8259					
SUB TOTAL HT GAIN						3683			1282			3515			1232			2872			50			2371			623						659					
LEVEL FACTOR / MULTIPLIER			0.30	0.43			0.30	0.43			0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43			0.50	1.61							
AIR CHANGE HEAT LOSS						1405			749			1558			605			1201			144			1396			908						13277					
AIR CHANGE HEAT GAIN						195			68			186			65			152			3			126			33						35					
DUCT LOSS						0			0			0			0			0			0			0			0						0					
DUCT GAIN						0			0			0			0			0			0			0			0						0					
HEAT GAIN PEOPLE			240		0		0		0		0		0		0		0		0		0		0		0		0		0		0							
HEAT GAIN APPLIANCES/LIGHTS						1002			1002			1002			1002			1002			0			0			1002						1002					
TOTAL HT LOSS BTU/H						4680			2496			5188			2017			3998			479			4648			3024						21536					
TOTAL HT GAIN x 1.3 BTU/H						6344			3058			6114			2990			5234			68			3246			2156						2204					

SITE NAME: VALES OF HUMBER SOUTH
BUILDER: ROYAL PINE HOMES

TYPE: 5003 CNR

DATE: Mar-22

GFA: 4066 LO# 95283

HEATING CFM 1930 COOLING CFM 1930
TOTAL HEAT LOSS 72,594 TOTAL HEAT GAIN 58,714
AIR FLOW RATE CFM 26.59 AIR FLOW RATE CFM 32.87

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 = **1930**
CFM @ .6" E.S.P.

MEDLOW 1335

MEDIUM 1140

MEDIUM HIGH 1600

HIGH 1930

TEMPERATURE RISE 37 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	12	6
R/A	0	0	6	3	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	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	MBR	BED-2	BED-3	BED-4	BTH-2/3	BTH-2/3	MD/B5	MBR	BTH-4/5	FAM	DIN	KT/DN	KT/DN	LIV	LIB	PWD	FOY	LND	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.79	1.23	1.79	2.48	1.84	1.55	1.18	1.18	1.12	1.79	1.29	2.34	2.50	2.59	2.59	2.02	2.00	0.48	2.32	3.02	3.59	3.59	3.59	3.59
CFM PER RUN HEAT	47	33	47	66	49	41	31	31	30	47	34	62	66	69	69	54	53	13	62	80	95	95	95	95
RM GAIN MBH.	2.21	0.77	2.21	2.82	2.52	1.97	0.59	0.59	1.60	2.21	0.99	3.17	3.06	3.06	3.06	2.99	2.62	0.07	1.62	2.16	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	73	25	73	93	83	65	19	19	53	73	33	104	101	100	100	98	86	2	53	71	12	12	12	12
ADJUSTED PRESSURE	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	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	55	31	64	27	82	93	96	82	57	58	69	27	49	31	42	58	68	20	69	10	15	42	13	40
EQUIVALENT LENGTH	140	100	170	130	150	210	200	160	170	160	200	140	170	110	120	150	130	140	140	150	100	130	130	180
TOTAL EFFECTIVE LENGTH	195	131	234	157	232	303	296	242	227	218	269	167	219	141	162	208	198	160	209	160	115	172	143	220
ADJUSTED PRESSURE	0.09	0.13	0.07	0.1	0.07	0.06	0.06	0.07	0.08	0.08	0.06	0.1	0.07	0.11	0.1	0.08	0.08	0.11	0.08	0.11	0.14	0.09	0.11	0.07
ROUND DUCT SIZE	6	4	6	6	6	6	4	4	5	6	5	6	6	6	6	6	6	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	240	379	240	337	250	209	356	356	220	240	250	316	337	352	352	275	270	149	455	587	484	484	484	484
COOLING VELOCITY (ft/min)	372	287	372	474	423	331	218	218	389	372	242	530	515	510	510	500	438	23	389	521	61	61	61	61
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	E	C	E	B	A	A	B	C	D	B	E	B	D	D	B	A	E	A	E	E	C	D	B

RUN #	25	26	27	28	29	30	31	32	33	34
ROOM NAME	BAS	BED-3	BED-4	FAM	LIB	FOY	BED-4	BAS	MD/B5	ENS
RM LOSS MBH.	3.59	1.84	1.55	2.34	2.00	2.32	1.55	3.59	1.12	1.23
CFM PER RUN HEAT	95	49	41	62	53	62	41	95	30	33
RM GAIN MBH.	0.37	2.52	1.97	3.17	2.62	1.62	1.97	0.37	1.60	0.77
CFM PER RUN COOLING	12	83	65	104	86	53	65	12	53	25
ADJUSTED PRESSURE	0.16	0.16	0.17	0.16	0.16	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	55	91	75	28	76	61	85	67	61	20
EQUIVALENT LENGTH	130	150	200	120	130	150	170	130	230	130
TOTAL EFFECTIVE LENGTH	185	241	275	148	206	211	255	197	291	150
ADJUSTED PRESSURE	0.09	0.07	0.06	0.11	0.08	0.08	0.07	0.08	0.06	0.11
ROUND DUCT SIZE	6	6	6	6	6	5	6	6	5	4
HEATING VELOCITY (ft/min)	484	250	209	316	270	455	209	484	220	379
COOLING VELOCITY (ft/min)	61	423	331	530	438	389	331	61	389	287
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10
TRUNK	B	B	A	D	A	A	A	B	E	

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	479	0.06	11.4	16	x	8	539	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	982	0.06	15	26	x	8	680	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	219	0.07	8.2	8	x	8	493	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	1543	0.06	17.7	30	x	10	741	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1930	0.06	19.3	34	x	10	817	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	250	0.05	9.4	10	x	8	450
TRUNK X	1930	0.05	20.2	34	x	12	681
TRUNK Y	1100	0.05	16.3	30	x	8	660
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1930	0.05	20.2	24	x	18	643

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280
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.	47	43	70	85	90	57	42	23	73	1	1	1	1	1	1	23
EQUIVALENT LENGTH	175	195	235	240	235	255	275	145	220	0	0	0	0	0	0	225
TOTAL EFFECTIVE LH	222	238	305	325	325	312	317	168	293	1	1	1	1	1	1	248
ADJUSTED PRESSURE	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.09	0.05	14.80	14.80	14.80	14.80	14.80	14.80	0.06
ROUND DUCT SIZE	8	7	7	7	7	7	10.1	9.8	7.5	0	0	0	0	0	0	9.4
INLET GRILL SIZE	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	30	30	14	0	0	0	0	0	0	30

TYPE: 5003 CNR
SITE NAME: VALES OF HUMBER SOUTH

LO # 95283

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 74 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BTH-2/3	BY INSTALLING CONTRACTOR	50	☒	3.5
BTH-4/5	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 @ 32 deg F (0 deg C)	☒ HVI Approved

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:	March-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#: 95283	Model: 5003 CNR	Builder: ROYAL PINE HOMES	Date: 3/4/2022																																																									
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>1880</td> <td>10</td> <td>18800</td> </tr> <tr> <td>First</td> <td>1880</td> <td>11</td> <td>20680</td> </tr> <tr> <td>Second</td> <td>2253</td> <td>9</td> <td>20277</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>59,757.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1692.1 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1880	10	18800	First	1880	11	20680	Second	2253	9	20277	Third	0	9	0	Fourth	0	9	0	Total:			59,757.0 ft³	Total:			1692.1 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;">0.335</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.109</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;">-19</td> <td style="text-align: center;">41</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">30</td> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.335	SUMMER NATURAL AIR CHANGE RATE	0.109	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-19	41	74	Summer DTDc	24	30	6	11
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.335 x 470.04 x 41 °C x 1.2 = 7782 W = 26553 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.109 x 470.04 x 6 °C x 1.2 = 375 W = 1280 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 74 °F x 1.08 x 0.25 = 1911 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 11 °F x 1.08 x 0.25 = 283 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	26,553	8,259	1.608																																																								
2	0.3		18,566	0.429																																																								
3	0.2		18,442	0.288																																																								
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																																																												

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** 5003 CNR**BUILDER:** ROYAL PINE HOMES**SFQT:** 4066**LO#** 95283**SITE:** VALES OF HUMBER SOUTH**DESIGN ASSUMPTIONS**

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

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):	59757.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	2.00	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 57.0 ft	WIDTH: 46.0 ft	EXPOSED PERIMETER:	206.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
A1****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	96%	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

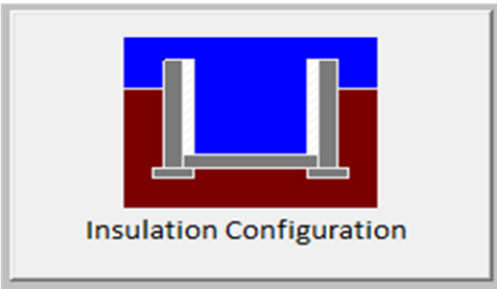
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	17.4	 Insulation Configuration
Floor Width (m):	14.0	
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):		2154

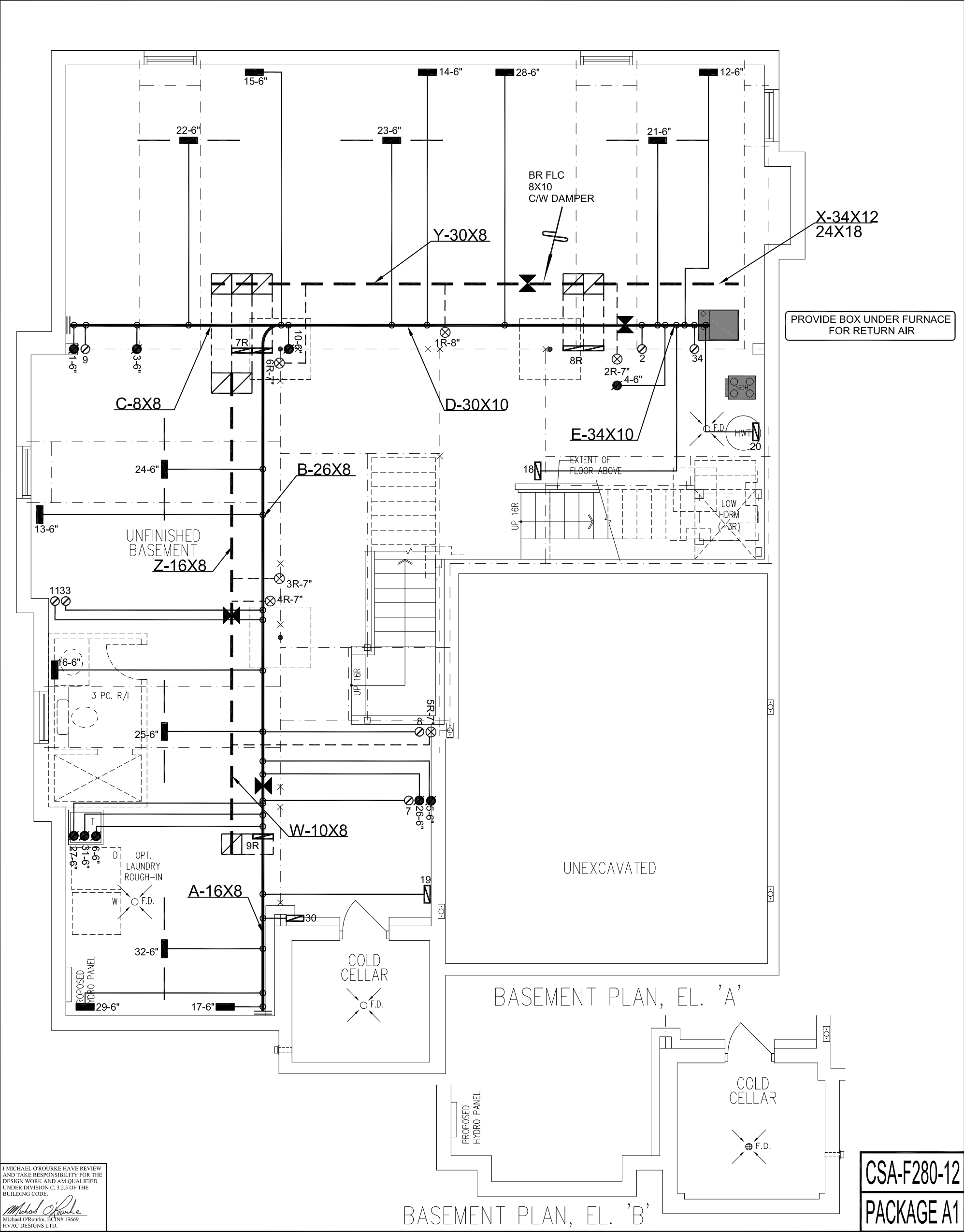
TYPE: 5003 CNR
LO# 95283

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Brampton			
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):	1692.1			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2255.7 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):	0.335			
Cooling Air Leakage Rate (ACH/H):	0.109			

TYPE: 5003 CNR
LO# 95283



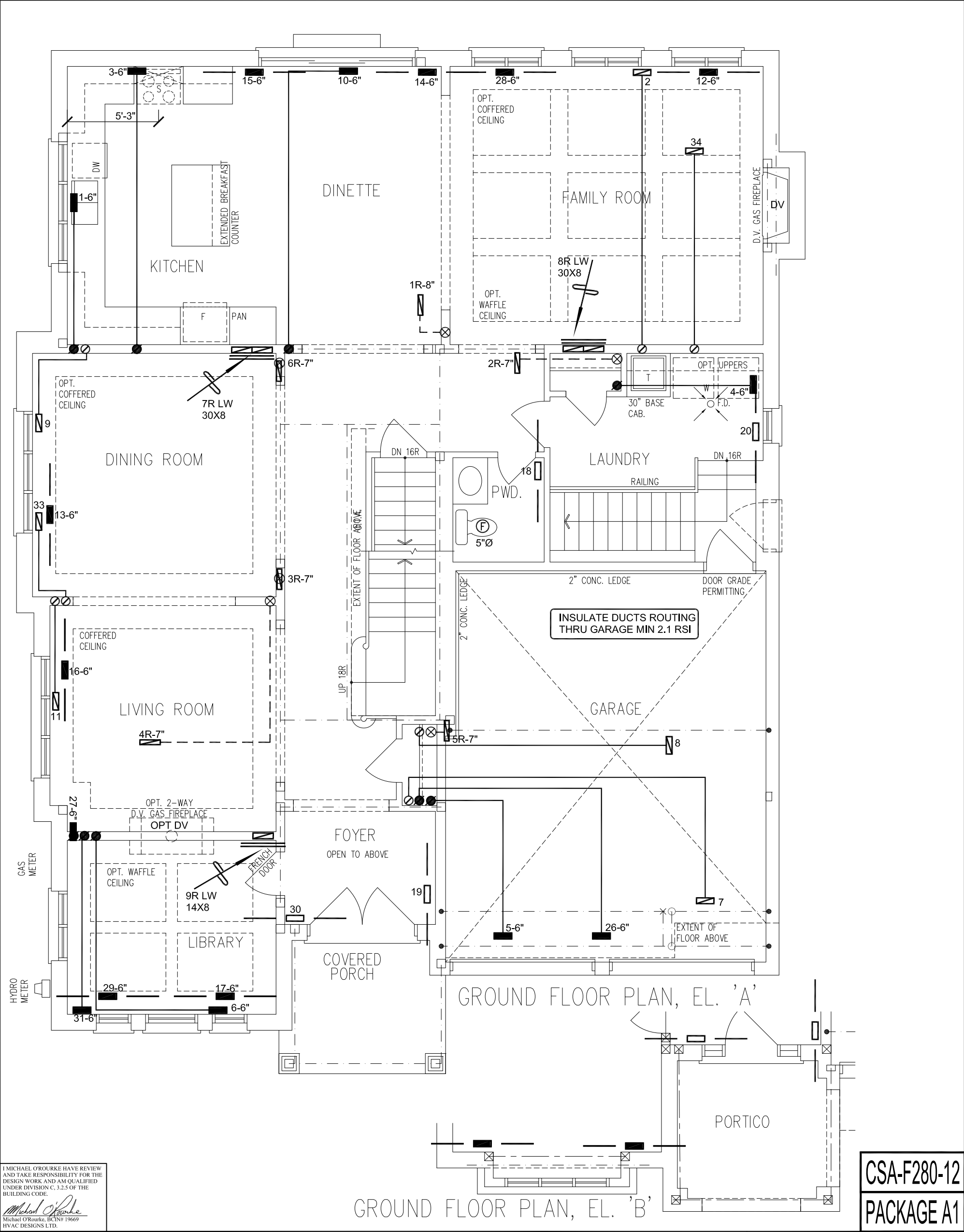
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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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 74505 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		16	6			4
VALES OF HUMBER SOUTH BRAMPTON, ONTARIO			MODEL 59SP5A-80-20		1ST FLOOR		12	3	2	Date	MAR/2022
5003 CNR			INPUT 80 MBTU/H		BASEMENT		6	1	0	Scale	3/16" = 1'-0"
4066 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 5.0 TONS								LO# 95283	
		FAN SPEED 1930 cfm @ 0.6" w.c.									



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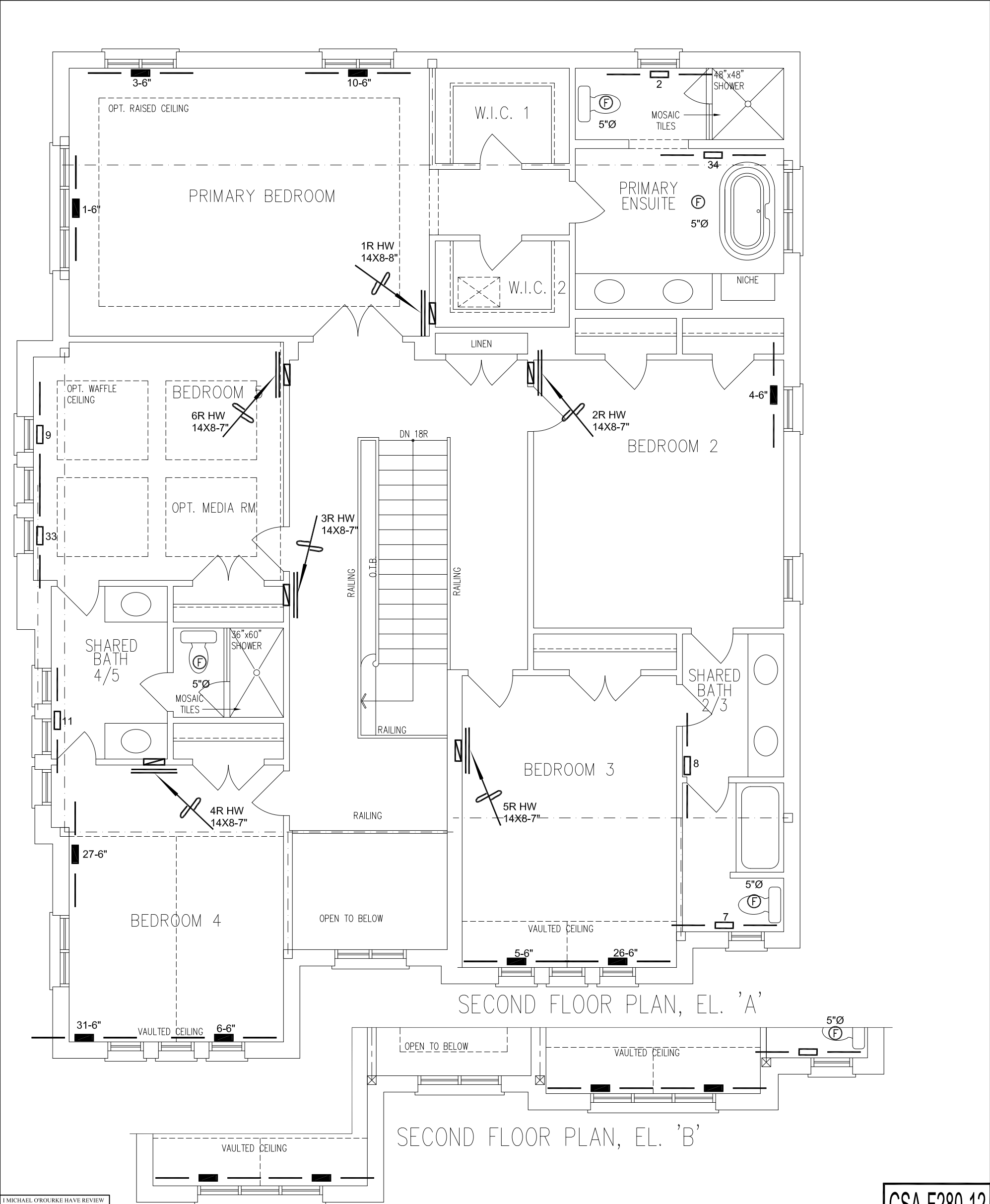
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

HVAC LEGEND							3.		
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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			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	MAR/2022
VALES OF HUMBER SOUTH BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
			BCIN# 19669	
			LO#	95283
5003 CNR		4066 sqft		



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Michael O'Rourke, BCIN# 19669
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	MAR/2022
VALES OF HUMBER SOUTH BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
5003 CNR			BCIN# 19669	
4066 sqft			LO#	95283