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	Postal code	Plan number/ other description
BRAMPTON		

B. Individual who reviews and takes responsibility for design activities

Name	Firm
MICHAEL O'ROURKE	**HVAC DESIGNS LTD.**

Street address	Unit no.	Lot/con.
375 FINLEY AVE	**202**	**N/A**

Municipality	Postal code	Province	E-mail
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**

Telephone number	Fax number	Cell number
(**905**) **619-2300**	(**905**) **619-2375**	( )

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

❑ House	☒ HVAC – House	❑ Building Structural
❑ Small Buildings	❑ Building Services	❑ Plumbing – House
❑ Large Buildings	❑ Detection, Lighting and Power	❑ Plumbing – All Buildings
❑ Complex Buildings	❑ Fire Protection	❑ 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:** 5008 - ELEV B OPT 2ND **Project:** VALES OF HUMBER SOUTH

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

❑ 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.

April 6, 2022
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

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SITE NAME: VALES OF HUMBER SOUTH | OPT 2ND | DATE Apr-22 | WINTER NATURAL AIR CHANGE RATE 0.234 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 5008 - ELEV B | GFA: 4398 | LO# 95291 | SUMMER NATURAL AIR CHANGE RATE 0.076 | HEAT GAIN ΔT °F. 11 | SB-12 PERFORMANCE

ROOM USE			STUDY			GREAT			KIT			DIN			LIV			FOY			LAUN		
EXP. WALL			30			27			44			16			40			19			41		
CLG. HT.			11			11			11			11			11			21			13		
	FACTORS																						
GRS.WALL AREA	LOSS	GAIN	330			297			484			176			440			399			533		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	20.8	15.5	0	0	0	12	249	186	0	0	0	0	0	0	0	0	0	0	0	0	21	436	325
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	48	997	1970	56	1163	2299	0	0	0
SOUTH	20.8	24.4	0	0	0	12	249	293	42	873	1025	26	540	634	0	0	0	0	0	0	0	0	0
WEST	20.8	41.0	36	748	1478	36	748	1478	71	1475	2914	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	34.1	100.3	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	20	493	73	20	493	73
NET EXPOSED WALL	3.5	0.5	294	1019	151	237	822	122	371	1286	191	150	520	77	392	1359	201	323	1120	166	492	1706	253
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
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	10	27	12	0	0	0	0	0	0	20	54	24	56	150	67	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
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				1767			2095			3634			1060			2410			2927			2635	
SUB TOTAL HT GAIN					1629			2090			4130			711			2196			2605			651
LEVEL FACTOR / MULTIPLIER			0.30	0.37		0.30	0.37		0.30	0.37		0.30	0.37		0.30	0.37		0.30	0.37		0.30	0.37	
AIR CHANGE HEAT LOSS				650			771			1337			390			887			1077			969	
AIR CHANGE HEAT GAIN					90			115			228			39			121			144			36
DUCT LOSS				0			0			0			0			0			0			0	
DUCT GAIN					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					1637			1637			1637			1637			1637			0			1637
TOTAL HT LOSS BTU/H				2417			2866			4971			1450			3297			4003			3605	
TOTAL HT GAIN x 1.3 BTU/H					4362			4994			7793			3103			5139			3573			3020

ROOM USE			BAS		
EXP. WALL			222		
CLG. HT.			10		
	FACTORS				
GRS.WALL AREA	LOSS	GAIN	1554		
GLAZING				LOSS	GAIN
NORTH	20.8	15.5	4	83	62
EAST	20.8	41.0	0	0	0
SOUTH	20.8	24.4	8	166	195
WEST	20.8	41.0	12	249	493
SKYLT.	34.1	100.3	0	0	0
DOORS	24.7	3.7	20	493	73
NET EXPOSED WALL	3.5	0.5	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	666	2340	347
EXPOSED CLG	1.3	0.6	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0
BASEMENT/CRAWL HEAT LOSS				8044	
SLAB ON GRADE HEAT LOSS					
SUBTOTAL HT LOSS				11375	
SUB TOTAL HT GAIN					1170
LEVEL FACTOR / MULTIPLIER			0.50	0.89	
AIR CHANGE HEAT LOSS				10134	
AIR CHANGE HEAT GAIN					65
DUCT LOSS				0	
DUCT GAIN					0
HEAT GAIN PEOPLE	240		0		0
HEAT GAIN APPLIANCES/LIGHTS					
TOTAL HT LOSS BTU/H				21509	
TOTAL HT GAIN x 1.3 BTU/H					1604

TOTAL HEAT GAIN BTU/H: 63826 TONS: 5.32 LOSS DUE TO VENTILATION LOAD BTU/H: 6010 STRUCTURAL HEAT LOSS: 64304 TOTAL COMBINED HEAT LOSS BTU/H: 70314

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: VALES OF HUMBER SOUTH | OPT 2ND | DATE Apr-22 | WINTER NATURAL AIR CHANGE RATE 0.234 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
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ROOM USE			PRI			ENS			BED-5			MEDIA			BED-2			BED-3			BATH-1			BED-4				BATH-2				
EXP. WALL			28			24			14			21			39			40			7			16				10				
CLG. HT.			9			9			9			9			10			10			9			9				9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	252			216			126			189			390			400			63			144				90				
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		
NORTH	20.8	15.5	9	187	139	9	187	139	0	0	0	24	499	371	0	0	0	0	0	0	9	187	139	0	0	0		0	0	0		
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	55	1143	2258	42	873	1724	0	0	0	0	0	0		0	0	0		
SOUTH	20.8	24.4	9	187	220	0	0	0	18	374	439	0	0	0	0	0	0	0	0	0	0	0	0	18	374	439		0	0	0		
WEST	20.8	41.0	26	540	1067	18	374	739	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
SKYLT.	34.1	100.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		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		0	0	0		
NET EXPOSED WALL	3.5	0.5	208	721	107	189	655	97	108	374	56	165	572	85	335	1162	172	358	1241	184	54	187	28	126	437	65		90	312	46		
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		0	0	0		
EXPOSED CLG	1.3	0.6	404	506	225	143	179	80	210	263	117	441	553	246	306	383	171	260	326	145	84	105	47	320	401	178		150	188	84		
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	30	81	36	75	201	90	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	336	837	124	0	0	0	84	209	31	0	0	0		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				2142			1395			1012			1623			3605			2641			689			1212				500			
SUB TOTAL HT GAIN					1758			1055			612			702			2760			2142			245			682				130		
LEVEL FACTOR / MULTIPLIER			0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26			0.20	0.26			
AIR CHANGE HEAT LOSS				557			363			263			422			937			687			179			315				130			
AIR CHANGE HEAT GAIN					97			58			34			39			152			118			14			38				7		
DUCT LOSS				0			0			0			0			454			0			87			0				0			
DUCT GAIN					0			0			0			0			479			0			26			0				0		
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	0		0	1		240	1		240	0		0	1		240		0		0		
HEAT GAIN APPLIANCES/LIGHTS					1637			0			1637			1637			1637			1637			0			1637				0		
TOTAL HT LOSS BTU/H				2698			1758			1275			2045			4996			3327			954			1527				630			
TOTAL HT GAIN x 1.3 BTU/H					5163			1447			3279			3090			6848			5378			369			3375				178		

ROOM USE			ENS-5		
EXP. WALL			17		
CLG. HT.			9		
	FACTORS				
GRS.WALL AREA	LOSS	GAIN	153		
GLAZING				LOSS	GAIN
NORTH	20.8	15.5	0	0	0
EAST	20.8	41.0	0	0	0
SOUTH	20.8	24.4	0	0	0
WEST	20.8	41.0	9	187	369
SKYLT.	34.1	100.3	0	0	0
DOORS	24.7	3.7	0	0	0
NET EXPOSED WALL	3.5	0.5	144	499	74
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0
EXPOSED CLG	1.3	0.6	70	88	39
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0
BASEMENT/CRAWL HEAT LOSS				0	
SLAB ON GRADE HEAT LOSS				0	
SUBTOTAL HT LOSS				774	
SUB TOTAL HT GAIN					482
LEVEL FACTOR / MULTIPLIER			0.20	0.26	
AIR CHANGE HEAT LOSS				201	
AIR CHANGE HEAT GAIN					27
DUCT LOSS				0	
DUCT GAIN					0
HEAT GAIN PEOPLE	240		0		0
HEAT GAIN APPLIANCES/LIGHTS					0
TOTAL HT LOSS BTU/H				975	
TOTAL HT GAIN x 1.3 BTU/H					662

TOTAL HEAT GAIN BTU/H: 63826 | TONS: 5.32 | LOSS DUE TO VENTILATION LOAD BTU/H: 6010 | STRUCTURAL HEAT LOSS: 64304 | TOTAL COMBINED HEAT LOSS BTU/H: 70314

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.

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

OPT 2ND
TYPE: 5008 - ELEV B

DATE: Apr-22

GFA: 4398 LO# 95291

FURNACE 1

HEATING CFM	1145	COOLING CFM	1145
TOTAL HEAT LOSS	44,118	TOTAL HEAT GAIN	33,589
AIR FLOW RATE CFM	25.95	AIR FLOW RATE CFM	34.09

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

FURNACE HEAT LOSS + HRV / ERV HEAT LOSS = 47123 BTUH

#*CARRIER
59SP5A-60-14 **60**

FAN SPEED	
LOW	0
MEDLOW	785
MEDIUM	960
MEDIUM HIGH	1145
HIGH	1440

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

DESIGN CFM = **1145**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	0	14	7
R/A	0	0	0	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	21	22	23	24
ROOM NAME	STUDY	STUDY	GREAT	GREAT	KIT	KIT	KIT	DIN	LIV	LIV	LIV	FOY	FOY	LAUN	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.21	1.21	1.43	1.43	1.66	1.66	1.66	1.45	1.10	1.10	1.10	2.00	2.00	3.60	3.07	3.07	3.07	3.07
CFM PER RUN HEAT	31	31	37	37	43	43	43	38	29	29	29	52	52	94	80	80	80	80
RM GAIN MBH.	2.18	2.18	2.50	2.50	2.60	2.60	2.60	3.10	1.71	1.71	1.71	1.79	1.79	3.02	0.23	0.23	0.23	0.23
CFM PER RUN COOLING	74	74	85	85	89	89	89	106	58	58	58	61	61	103	8	8	8	8
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	47	41	39	25	24	30	20	31	48	43	38	44	39	42	23	31	37	26
EQUIVALENT LENGTH	160	150	160	140	110	110	100	100	120	110	100	130	100	160	100	140	100	110
TOTAL EFFECTIVE LENGTH	207	191	199	165	134	140	120	131	168	153	138	174	139	202	123	171	137	136
ADJUSTED PRESSURE	0.08	0.09	0.08	0.1	0.12	0.12	0.14	0.12	0.1	0.11	0.12	0.1	0.12	0.08	0.14	0.1	0.13	0.13
ROUND DUCT SIZE	5	5	**6**	**6**	**6**	**6**	**6**	**6**	5	5	4	5	5	**6**	5	5	5	5
HEATING VELOCITY (ft/min)	228	228	189	189	219	219	219	194	213	213	333	382	382	479	587	587	587	587
COOLING VELOCITY (ft/min)	543	543	433	433	454	454	454	540	426	426	665	448	448	525	59	59	59	59
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10
TRUNK	A	A	A	A	A	A	B	D	C	C	C	C	D	B	B	A	B	B

RUN #	25	26	27
ROOM NAME	BAS	BAS	BAS
RM LOSS MBH.	3.07	3.07	3.07
CFM PER RUN HEAT	80	80	80
RM GAIN MBH.	0.23	0.23	0.23
CFM PER RUN COOLING	8	8	8
ADJUSTED PRESSURE	0.17	0.17	0.17
ACTUAL DUCT LGH.	27	26	39
EQUIVALENT LENGTH	140	100	120
TOTAL EFFECTIVE LENGTH	167	126	159
ADJUSTED PRESSURE	0.1	0.14	0.11
ROUND DUCT SIZE	5	5	5
HEATING VELOCITY (ft/min)	587	587	587
COOLING VELOCITY (ft/min)	59	59	59
OUTLET GRILL SIZE	3X10	3X10	3X10
TRUNK	D	D	C

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	302	0.08	9	12	x	8	453	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	679	0.08	12.1	18	x	8	679	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	219	0.10	7.5	8	x	8	493	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	469	0.10	10	12	x	8	704	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.07	0	0	x	8	0
TRUNK P	0	0.07	0	0	x	8	0
TRUNK Q	0	0.07	0	0	x	8	0
TRUNK R	0	0.07	0	0	x	8	0
TRUNK S	0	0.07	0	0	x	8	0
TRUNK T	0	0.07	0	0	x	8	0
TRUNK U	0	0.07	0	0	x	8	0
TRUNK V	0	0.07	0	0	x	8	0
TRUNK W	0	0.07	0	0	x	8	0
TRUNK X	940	0.07	14.2	26	x	8	651
TRUNK Y	205	0.07	8	8	x	8	461
TRUNK Z	0	0.07	0	0	x	8	0
DROP	1145	0.07	15.3	24	x	10	687

RETURN AIR #	1	2	3														**BR**
AIR VOLUME	205	360	360	0	0	0	0	0	0	0	0	0	0	0	0	0	220
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	0.15
ACTUAL DUCT LGH.	43	23	23	1	1	1	1	1	1	1	1	1	1	1	1	1	18
EQUIVALENT LENGTH	130	145	150	0	0	0	0	0	0	0	0	0	0	0	0	0	190
TOTAL EFFECTIVE LH	173	168	173	1	1	1	1	1	1	1	1	1	1	1	1	1	208
ADJUSTED PRESSURE	0.09	0.09	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.07
ROUND DUCT SIZE	7.5	9.3	9.3	0	0	0	0	0	0	0	0	0	0	0	0	0	8.2
INLET GRILL SIZE	8	8	8	0	0	0	0	0	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	X
INLET GRILL SIZE	14	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	24

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: VALES OF HUMBER SOUTH — OPT 2ND
BUILDER: ROYAL PINE HOMES — TYPE: 5008 - ELEV B — DATE: Apr-22 — GFA: 4398 — LO# 95291 — **FURNACE 2**

HEATING CFM	875	COOLING CFM	875	furnace pressure	0.6	
TOTAL HEAT LOSS	20,186	TOTAL HEAT GAIN	29,791	furnace filter	0.05	FURNACE HEAT LOSS + HRV / ERV HEAT LOSS = 23191 BTUH
AIR FLOW RATE CFM	43.35	AIR FLOW RATE CFM	29.37	a/c coil pressure	0.2	
				available pressure for s/a & r/a	0.35	

#CARRIER
59SP5A-40-10 **40**
AFUE = 97 %
INPUT (BTU/H) = 40,000
OUTPUT (BTU/H) = **39,000**

FAN SPEED	
LOW	0
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	710
HIGH	875

DESIGN CFM = **875** CFM @ .6 " E.S.P.

TEMPERATURE RISE 41 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	0	0
R/A	0	0	7	0	0

plenum pressure s/a 0.18 — r/a pressure 0.17
max s/a dif press. loss 0.01 — r/a grille press. Loss 0.02
min adjusted pressure s/a 0.17 — adjusted pressure r/a 0.15

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
ROOM NAME	ENS-5	PRI	PRI	ENS	MEDIA	MEDIA	BATH-1	BED-2	BED-2	BED-2	BED-3	BED-3	BATH-2	BED-4	BED-4	BATH-1	BED-5	BED-5
RM LOSS MBH.	0.98	1.35	1.35	1.76	1.02	1.02	0.48	1.67	1.67	1.67	1.66	1.66	0.63	0.76	0.76	0.48	0.64	0.64
CFM PER RUN HEAT	42	58	58	76	44	44	21	72	72	72	72	72	27	33	33	21	28	28
RM GAIN MBH.	0.66	2.58	2.58	1.45	1.55	1.55	0.18	2.28	2.28	2.28	2.69	2.69	0.18	1.69	1.69	0.18	1.64	1.64
CFM PER RUN COOLING	19	76	76	43	45	45	5	67	67	67	79	79	5	50	50	5	48	48
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
ACTUAL DUCT LGH.	41	69	53	58	56	54	59	58	62	68	62	59	57	67	31	60	49	44
EQUIVALENT LENGTH	160	150	140	160	170	190	140	140	140	110	170	150	110	150	160	140	170	170
TOTAL EFFECTIVE LENGTH	201	219	193	218	226	244	199	198	202	178	232	209	167	217	191	200	219	214
ADJUSTED PRESSURE	0.09	0.08	0.09	0.08	0.08	0.07	0.09	0.09	0.09	0.1	0.07	0.08	0.1	0.08	0.09	0.09	0.08	0.08
ROUND DUCT SIZE	4	**6**	**6**	**6**	5	5	4	5	5	5	**6**	**6**	4	5	**6**	4	5	5
HEATING VELOCITY (ft/min)	482	296	296	388	323	323	241	529	529	529	367	367	310	242	168	241	206	206
COOLING VELOCITY (ft/min)	218	388	388	219	330	330	57	492	492	492	403	403	57	367	255	57	352	352
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10
TRUNK	C	C	C	C	C	C	B	A	A	B	A	A	B	B	B	B	C	C

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

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	288	0.07	9.1	10	x	8	518	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	495	0.07	11.1	14	x	8	636	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	378	0.07	10.1	12	x	8	567	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	0	0.00	0	0	x	8	0	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (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	615	0.05	13.1	20	x	8	554
TRUNK Y	455	0.05	11.7	16	x	8	512
TRUNK Z	260	0.05	9.5	10	x	8	468
DROP	875	0.05	15	24	x	10	525

RETURN AIR #	1	2	3	4	5	6	7									**BR**
AIR VOLUME	130	130	130	115	75	210	85	0	0	0	0	0	0	0	0	0
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.	62	57	61	82	66	64	58	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	180	175	175	220	215	215	165	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	242	232	236	302	281	279	223	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.06	0.06	0.05	0.05	0.05	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	7	7	7	7	6	8.8	5.8	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0
	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	14	0	0	0	0	0	0	0	0	0

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Michael O'Rourke - INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 5008 - ELEV B LO # 95291
SITE NAME: VALES OF HUMBER SOUTH OPT 2ND

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	222.6	cfm
Less Principal Ventil. Capacity	150	cfm
Required Supplemental Capacity	72.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT

150.0 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
150.0 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
BATH-1	BY INSTALLING CONTRACTOR	50	✓	3.5
BATH-2	BY INSTALLING CONTRACTOR	50	✓	3.5
BATH-3	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE V150H INSTALL 2 HRV / ERV's

150 cfm high 35 cfm low

75 % 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: Michael O'Rourke.

HRAI # 001820

Date: April-22

I REVIEW AND TAKE RESPONIBILITY 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 95291 Model: 5008 - ELEV B Builder: ROYAL PINE HOMES Date: 2022-04-06

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2073	10	20730
First	2073	11	22803
Second	2400	9	21600
Third	0	9	0
Fourth	0	9	0
		Total:	65,133.0 ft³
		Total:	1844.4 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.234
SUMMER NATURAL AIR CHANGE RATE	0.076

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.234 x 512.32 x 41 °C x 1.2 = 5940 W

= **20268 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.076 x 512.32 x 6 °C x 1.2 = 286 W

= **977 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

x 2 HRV / ERV's

300 CFM x 74 °F x 1.08 x 0.25 = **6010 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

300 CFM x 11 °F x 1.08 x 0.25 = **891 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	20,268	11,375	0.891
2	0.3		16,529	0.368
3	0.2		15,592	0.260
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5008 - ELEV B OPT 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 4398 **LO#** 95291 **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
		WINDOW SHGC	0.60

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft^3):	65133.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	3.00	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 69.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	222.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package SB-12 PERFORMANCE**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
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+1.5	21.40
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	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

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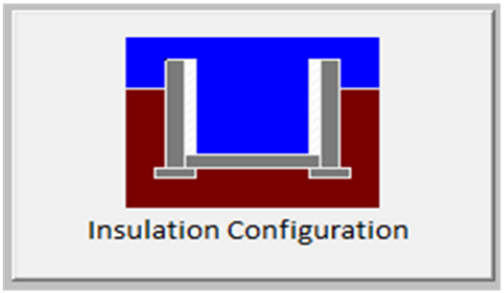
Ajax ON, L1S 2E2
905-619-2300

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):	**21.0**	 Insulation Configuration
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):	**2.2**	
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):	**2357**	

TYPE: 5008 - ELEV B OPT 2ND
LO# 95291

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

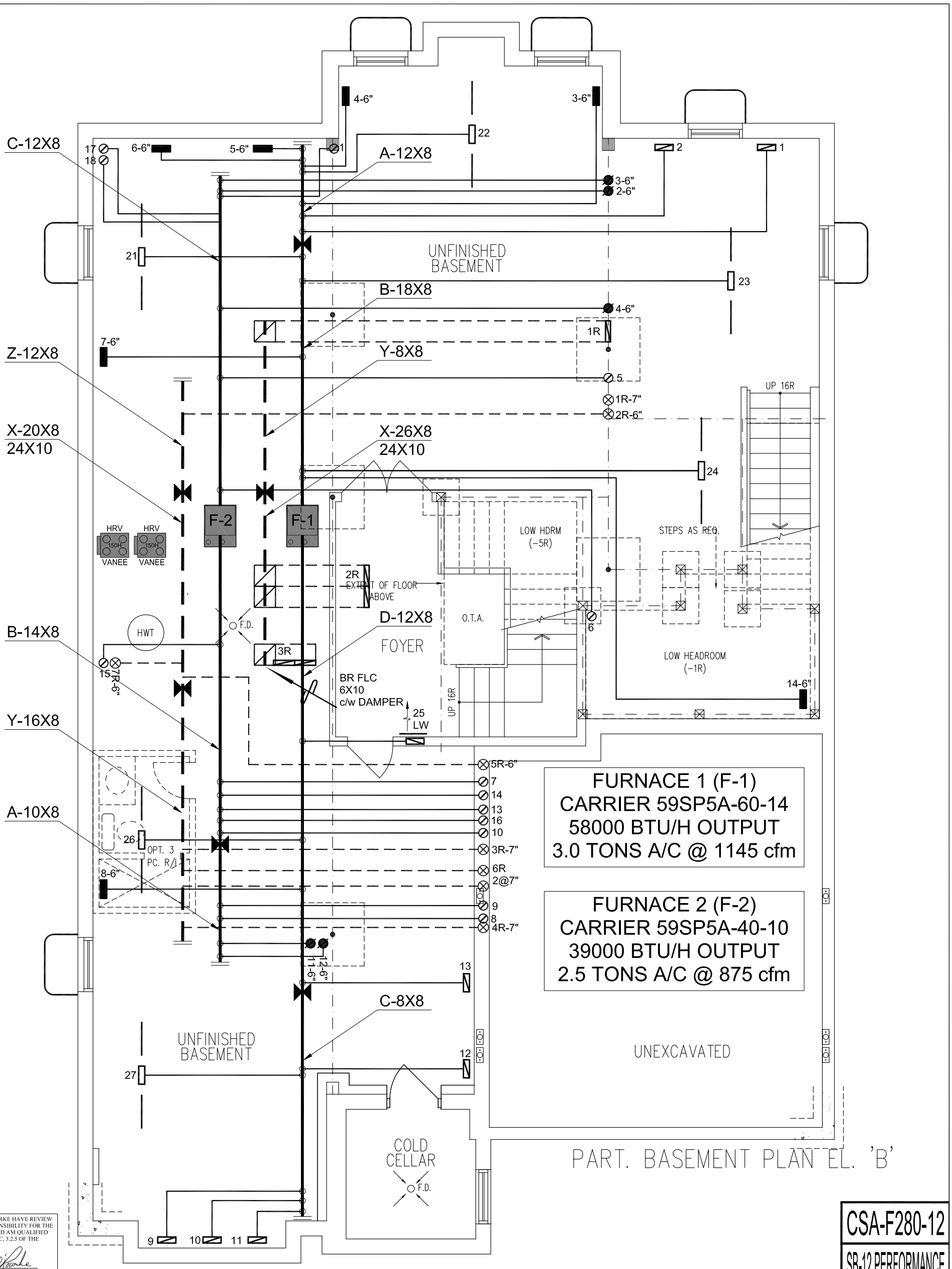
Air Infiltration Residential Load Calculator

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):	1844.4
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1721.7 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 70.8 / Total Exhaust 70.8
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.234**
Cooling Air Leakage Rate (ACH/H):	**0.076**

TYPE: 5008 - ELEV B OPT 2ND

LO# 95291



FURNACE 1 (F-1)
CARRIER 59SP5A-60-14
58000 BTU/H OUTPUT
3.0 TONS A/C @ 1145 cfm

FURNACE 2 (F-2)
CARRIER 59SP5A-40-10
39000 BTU/H OUTPUT
2.5 TONS A/C @ 875 cfm

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

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▨	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱	30"x8" RETURN AIR GRILLE	▩	RETURN AIR STACK 2nd FLOOR
▨	SUPPLY AIR BOOT ABOVE	⊘	6" SUPPLY AIR STACK 2nd FLOOR	▤	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED TO PERFORMANCE PATH	APR/2022

REVISIONS

Client
ROYAL PINE HOMES

Project Name
VALES OF HUMBER SOUTH
BRAMPTON, ONTARIO

OPT 2ND
5008 - ELEV B 4398 sqft

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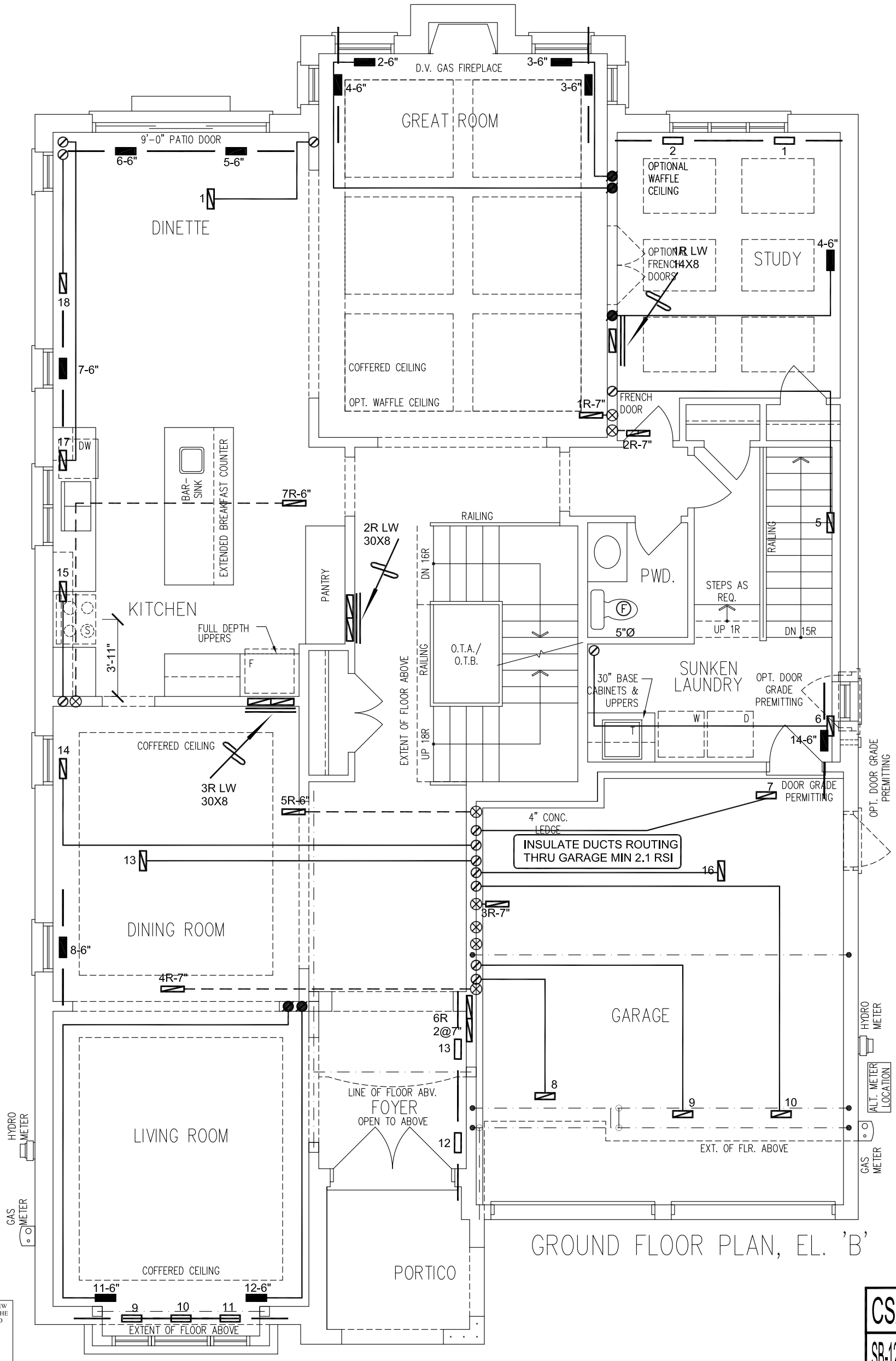
Specializing in Residential Mechanical Design Services

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.

	S/A	R/A	FANS
2ND	18	7	4
1ST	14	3	2
BAS	7	1	0

Sheet Title
BASEMENT HEATING LAYOUT

Date MAR/2022
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 95291



GROUND FLOOR PLAN, EL. 'B'

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

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▰	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▰	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▤	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED TO PERFORMANCE PATH	APR/2022

REVISIONS

Client

ROYAL PINE HOMES

Project Name

VALES OF HUMBER SOUTH
BRAMPTON, ONTARIO

OPT 2ND
5008 - ELEV B 4398 sqft

HVAC DESIGNS 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.

	S/A	R/A	FANS
2ND	18	7	4
1ST	14	3	2
BAS	7	1	0

Sheet Title

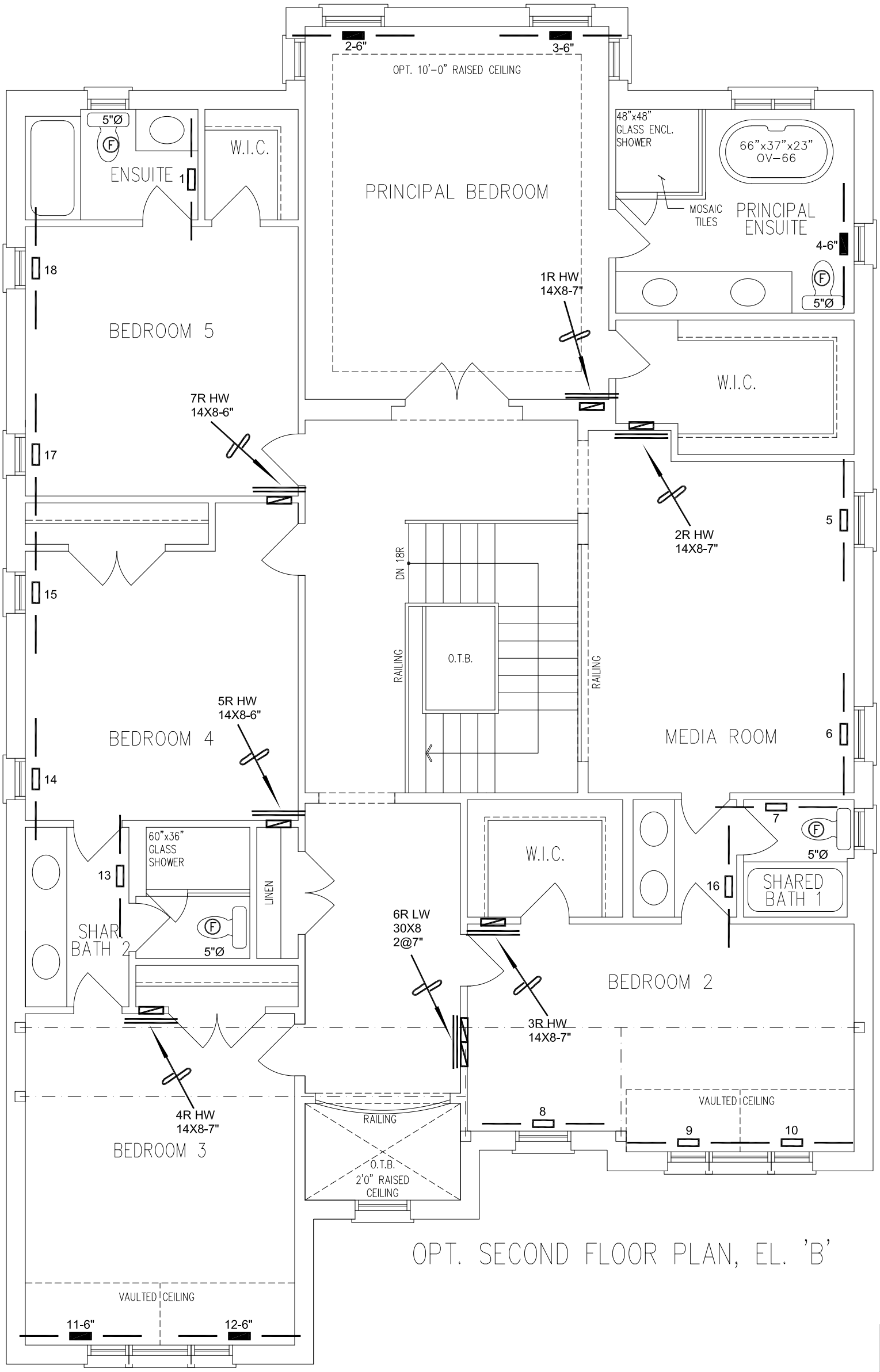
FIRST FLOOR HEATING LAYOUT

Date MAR/2022

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 95291



OPT. SECOND FLOOR PLAN, EL. 'B'

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

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
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REVISIONS

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	S/A	R/A	FANS
2ND	18	7	4
1ST	14	3	2
BAS	7	1	0

Sheet Title

SECOND FLOOR HEATING LAYOUT

Date MAR/2022

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 95291