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:** 40-3 **Project:** VALES OF HUMBER

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.

March 21, 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 | DATE: Mar-22 | WINTER NATURAL AIR CHANGE RATE 0.248 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 40-3 | GFA: 3223 | LO# 92069 | SUMMER NATURAL AIR CHANGE RATE 0.081 | HEAT GAIN ΔT °F. 11 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH					ENS-4			LAND		
EXP. WALL			36			26			12			16			30			37			7					12			12		
CLG. HT.			9			9			9			9			9			9			9					11			12		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN	324			234			108			144			270			333			63					132			144		
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	18	374	278	0	0	0	0	0	0	7	145	108			0	0	0	0	0	0
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	44	914	1806	36	748	1478	0	0	0			16	332	657	0	0	0
SOUTH	20.8	24.4	10	208	244	0	0	0	13	270	317	0	0	0	0	0	0	10	208	244	0	0	0			0	0	0	11	229	268
WEST	20.8	41.0	36	748	1478	19	395	780	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	10	247	37
NET EXPOSED WALL	3.5	0.5	278	964	143	215	745	111	95	329	49	126	437	65	226	784	116	287	995	148	56	194	29			116	402	60	123	426	63
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	396	496	221	168	210	94	144	180	80	224	281	125	282	353	157	262	328	146	140	175	78			70	88	39	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	54	24	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	282	702	104	0	0	0	0	0	0			70	174	26	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			2416			1351			780			1092			2753			2333			515					997			902		
SUB TOTAL HT GAIN					2085			984			446			468			2184			2039			215				781			368	
LEVEL FACTOR / MULTIPLIER			0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23				0.20	0.23		0.30	0.36	
AIR CHANGE HEAT LOSS				565			316			182			255			644			545			120					233			323		
AIR CHANGE HEAT GAIN					111			53			24			25			117			109			11				42			20	
DUCT LOSS				0			0			0			0			340			0			0				123			0		
DUCT GAIN					0			0			0			0			329			0			0				82			0	
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0			0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					753			0			0			753			753			753			0				0			0	
TOTAL HT LOSS BTU/H				2981			1666			962			1347			3737			2878			635				1353			1225		
TOTAL HT GAIN x 1.3 BTU/H					4458			1348			611			1931			4708			4083			295				1177			504	

ROOM USE			LV/DN				KIT			FAM			LAUN			PWD			FOY			MUD					WOD			BAS	
EXP. WALL			39				51			39			12			8			29			24					43			194		
CLG. HT.			10				10			10			9			10			11			12					10			10		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	390				510			390			108			80			319			288					430			1487		
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	11	229	170			0	0	0	7	145	108
EAST	20.8	41.0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	14	291	575	0	0	0			0	0	0	0	0	0
SOUTH	20.8	24.4	42	873	1025		16	332	390	0	0	0	7	145	171	0	0	0	0	0	0	0	0	0			0	0	0	10	208	244
WEST	20.8	41.0	0	0	0		57	1184	2340	34	706	1396	0	0	0	0	0	0	0	0	0	0	0	0			5	104	205	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		15	370	55	0	0	0	0	0	0	0	0	0	30	740	110	30	740	110			0	0	0	20	493	73
NET EXPOSED WALL	3.5	0.5	348	1207	179		422	1463	217	356	1234	183	101	350	52	80	277	41	275	954	141	247	856	127			0	0	0	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			253	889	132	453	1592	236
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0	0	0	0	108	135	60	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		75	201	90	10	27	12	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	0	0	0
BASEMENT/CRAWL HEAT LOSS			0				0			0			0			0			0			0								6829		
SLAB ON GRADE HEAT LOSS			0				0			0			0			0			0			0					0					
SUBTOTAL HT LOSS			2079				3551			1968			631			277			1984			1824					993			9267		
SUB TOTAL HT GAIN					1203				3091			1591			283			41			826			407					337			661
LEVEL FACTOR / MULTIPLIER			0.30	0.36			0.30	0.36		0.30	0.36		0.20	0.23		0.30	0.36		0.30	0.36		0.30	0.36							0.50	0.73	
AIR CHANGE HEAT LOSS				745				1273			705			148			99			711			654							7520		
AIR CHANGE HEAT GAIN					64				165			85			15			2			44			22								53
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	0		0	0		0	0		0			0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					753				753			753			753			0			0			0					0			0
TOTAL HT LOSS BTU/H				2825				4824			2673			778			377			2695			2479				993			16787		
TOTAL HT GAIN x 1.3 BTU/H					2626				5212			3156			1366			56			1131			557					438			929

TOTAL HEAT GAIN BTU/H: 34822 TONS: 2.90 LOSS DUE TO VENTILATION LOAD BTU/H: 1593 STRUCTURAL HEAT LOSS: 51213 TOTAL COMBINED HEAT LOSS BTU/H: 52806

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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SITE NAME: VALES OF HUMBER
BUILDER: ROYAL PINE HOMES

TYPE: 40-3 DATE: Mar-22 GFA: 3223 LO# 92069

HEATING CFM	1145		COOLING CFM	1145			furnace pressure	0.6																
TOTAL HEAT LOSS	51,213		TOTAL HEAT GAIN	34,585			furnace filter	0.05									#*CARRIER						AFUE =	97 %
AIR FLOW RATE CFM	22.36		AIR FLOW RATE CFM	33.11			a/c coil pressure	0.2									59SP5A-60-14	60					INPUT (BTU/H) =	60,000
							available pressure										FAN SPEED						OUTPUT (BTU/H) =	**58,000**
							for s/a & r/a	0.35									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	785					DESIGN CFM =	**1145**
S/A	0	0	12	9	5		plenum pressure s/a	0.18		r/a pressure	0.17						MEDIUM	960					CFM @ .6 " E.S.P.	
R/A	0	0	5	2	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1145						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.16		adjusted pressure r/a	0.15						HIGH	1440					TEMPERATURE RISE	47 °F
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	WIC	BED-2	BED-3	BED-4	BATH	BED-3	BED-4	MBR	ENS-4	LV/DN	KIT	KIT	FAM	FAM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.49	1.67	0.96	1.35	1.87	1.44	0.64	1.87	1.44	1.49	1.35	2.82	2.41	2.41	1.34	1.34	0.78	0.38	2.70	2.48	3.56	3.56	3.56	3.56
CFM PER RUN HEAT	33	37	22	30	42	32	14	42	32	33	30	63	54	54	30	30	17	8	60	55	80	80	80	80
RM GAIN MBH.	2.23	1.35	0.61	1.93	2.35	2.04	0.29	2.35	2.04	2.23	1.18	2.63	2.61	2.61	1.58	1.58	1.37	0.06	1.13	0.56	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	74	45	20	64	78	68	10	78	68	74	39	87	86	86	52	52	45	2	37	18	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	53	48	39	44	58	59	26	63	66	47	54	41	43	34	31	42	42	14	43	14	36	38	25	26
EQUIVALENT LENGTH	140	160	130	200	150	170	260	160	190	140	140	150	180	160	140	180	170	190	150	190	170	160	100	90
TOTAL EFFECTIVE LENGTH	193	208	169	244	208	229	286	223	256	187	194	191	223	194	171	222	212	204	193	204	206	198	125	116
ADJUSTED PRESSURE	0.09	0.08	0.1	0.07	0.08	0.08	0.06	0.08	0.07	0.09	0.09	0.08	0.07	0.08	0.1	0.08	0.08	0.08	0.09	0.08	0.08	0.09	0.14	0.15
ROUND DUCT SIZE	**6**	5	4	**6**	**6**	**6**	4	**6**	**6**	**6**	4	**6**	**6**	**6**	5	5	5	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	168	272	252	153	214	163	161	214	163	168	344	321	275	275	220	220	125	92	441	404	408	408	408	408
COOLING VELOCITY (ft/min)	377	330	229	326	398	347	115	398	347	377	447	444	438	438	382	382	330	23	272	132	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	B	D	C	D	D	C	A	D	C	A	A	A	A	D	D	C	D	A	A	B	B

RUN #	25	26
ROOM NAME	BAS	LAND
RM LOSS MBH.	3.56	1.22
CFM PER RUN HEAT	80	27
RM GAIN MBH.	0.27	0.50
CFM PER RUN COOLING	9	17
ADJUSTED PRESSURE	0.17	0.17
ACTUAL DUCT LGH.	42	25
EQUIVALENT LENGTH	160	180
TOTAL EFFECTIVE LENGTH	202	205
ADJUSTED PRESSURE	0.09	0.08
ROUND DUCT SIZE	**6**	4
HEATING VELOCITY (ft/min)	408	310
COOLING VELOCITY (ft/min)	46	195
OUTLET GRILL SIZE	4X10	3X10
TRUNK	C	D

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	394	0.07	10.2	14	x	8	507	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	643	0.07	12.3	18	x	8	643	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	267	0.07	8.8	10	x	8	481	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	502	0.06	11.6	18	x	8	502	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	1145	0.05	16.6	32	x	8	644
TRUNK Y	625	0.05	13.2	20	x	8	563
TRUNK Z	315	0.05	10.2	12	x	8	473
DROP	1145	0.05	16.6	24	x	10	687

RETURN AIR #	1	2	3	4	5	6	7									**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	130	95	115	115	85	130	310	0	0	0	0	0	0	0	0	165
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.	45	33	57	62	54	38	25	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	205	165	245	250	205	205	145	0	0	0	0	0	0	0	0	225
TOTAL EFFECTIVE LH	250	198	302	312	259	243	170	1	1	1	1	1	1	1	1	239
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.06	0.06	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.06
ROUND DUCT SIZE	7	6	7	7	6	7	8.8	0	0	0	0	0	0	0	0	7.7
INLET GRILL SIZE	8	8	8	8	8	6	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	10	30	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

TYPE: 40-3 LO # 92069
SITE NAME: VALES OF HUMBER

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	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	180.2	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	**79.5**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 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	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	✓	3.5
PWD	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE V150H

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: March-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

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 92069 Model: 40-3 Builder: ROYAL PINE HOMES Date: 2022-03-21

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1498	10	14980
First	1498	10	14980
Second	1745	9	15705
Third	0	9	0
Fourth	0	9	0
		Total:	45,665.0 ft³
		Total:	1293.1 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.248
SUMMER NATURAL AIR CHANGE RATE	0.081

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

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

0.248 x 359.19 x 41 °C x 1.2 = 4408 W

= **15040 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.081 x 359.19 x 6 °C x 1.2 = 212 W

= **725 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 74 °F x 1.08 x 0.25 = **1593 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 11 °F x 1.08 x 0.25 = **236 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	15,040	10,260	0.733
2	0.3		12,585	0.359
3	0.2		12,866	0.234
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 40-3 **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 92069 **SITE:** VALES OF HUMBER

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:	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):	45665.0	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: 64.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	194.0 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	96%	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

HVAC Designs Ltd.
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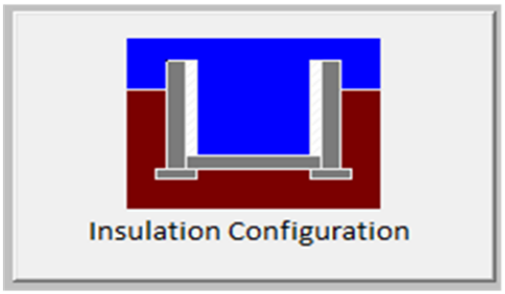
Ajax ON, L1S 2E2
905-619-2300

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):	**19.5**	 Insulation Configuration
Floor Width (m):	**10.1**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**2.0**	
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):		**2001**

TYPE: 40-3
LO# 92069

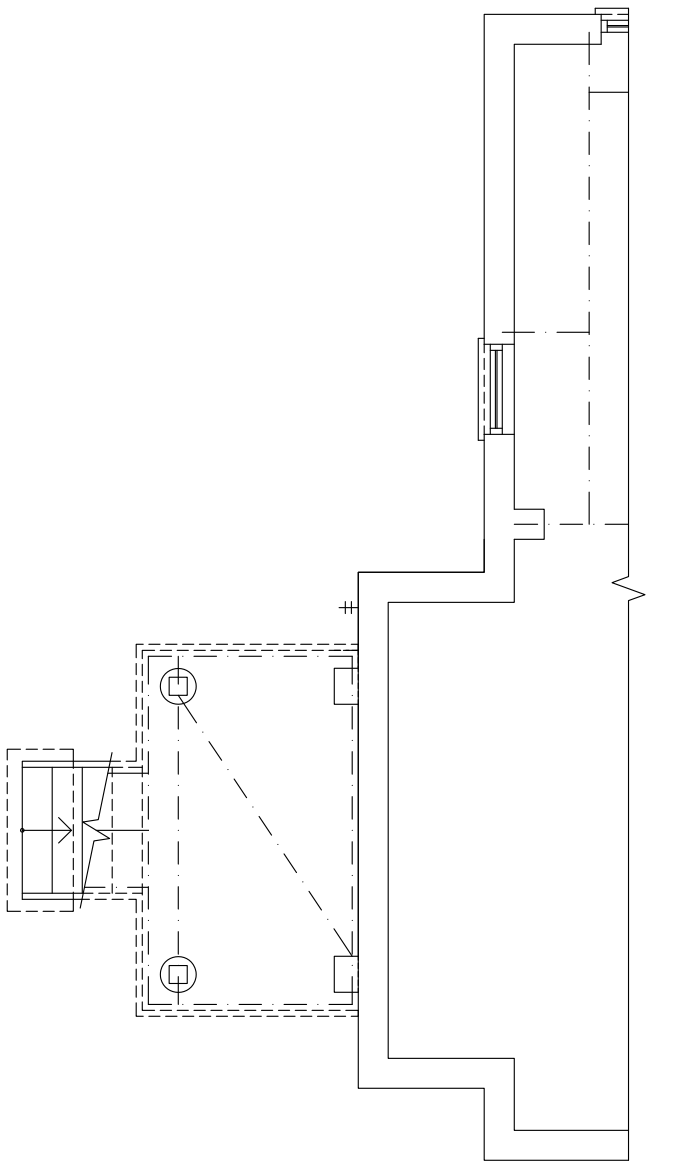
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

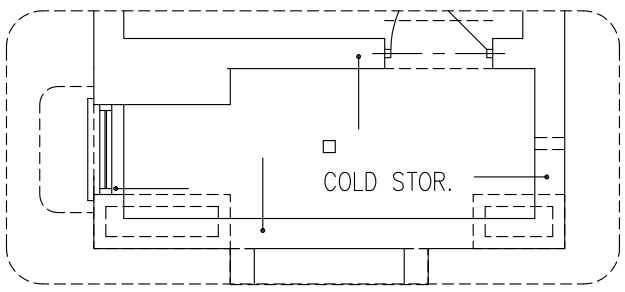
Supplemental tool for CAN/CSA-F280

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):	7.62
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1293.1
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1207.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 / Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.248**
Cooling Air Leakage Rate (ACH/H):	**0.081**

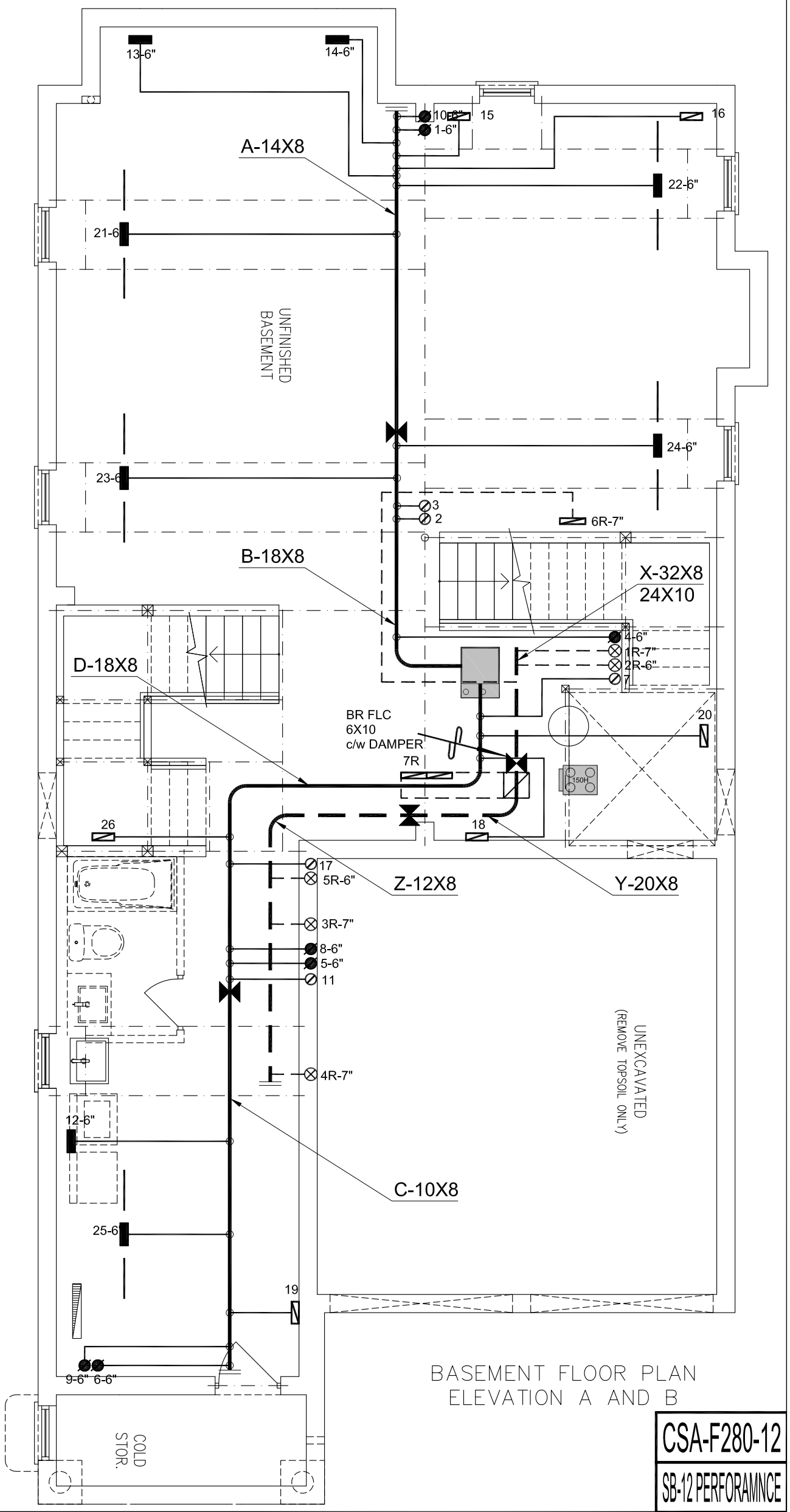
TYPE: 40-3
LO# 92069



PARTIAL BASEMENT FLOOR PLAN
WITH WOOD DECK CONDITION
FOR ELEVATION A AND B



BASEMENT FLOOR PLAN
ELEVATION B



BASEMENT FLOOR PLAN
ELEVATION A AND 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 PERFORAMNCE

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	MAR/2022

REVISIONS

Client
ROYAL PINE HOMES

Project Name
VALES OF HUMBER
BRAMPTON, ONTARIO

40-3 3223 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.

HEAT LOSS 52806 BTU/H

UNIT DATA

MAKE	CARRIER	
MODEL	59SP5A-60-14	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1145	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	3
1ST FLOOR	9	2	2
BASEMENT	5	1	0

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

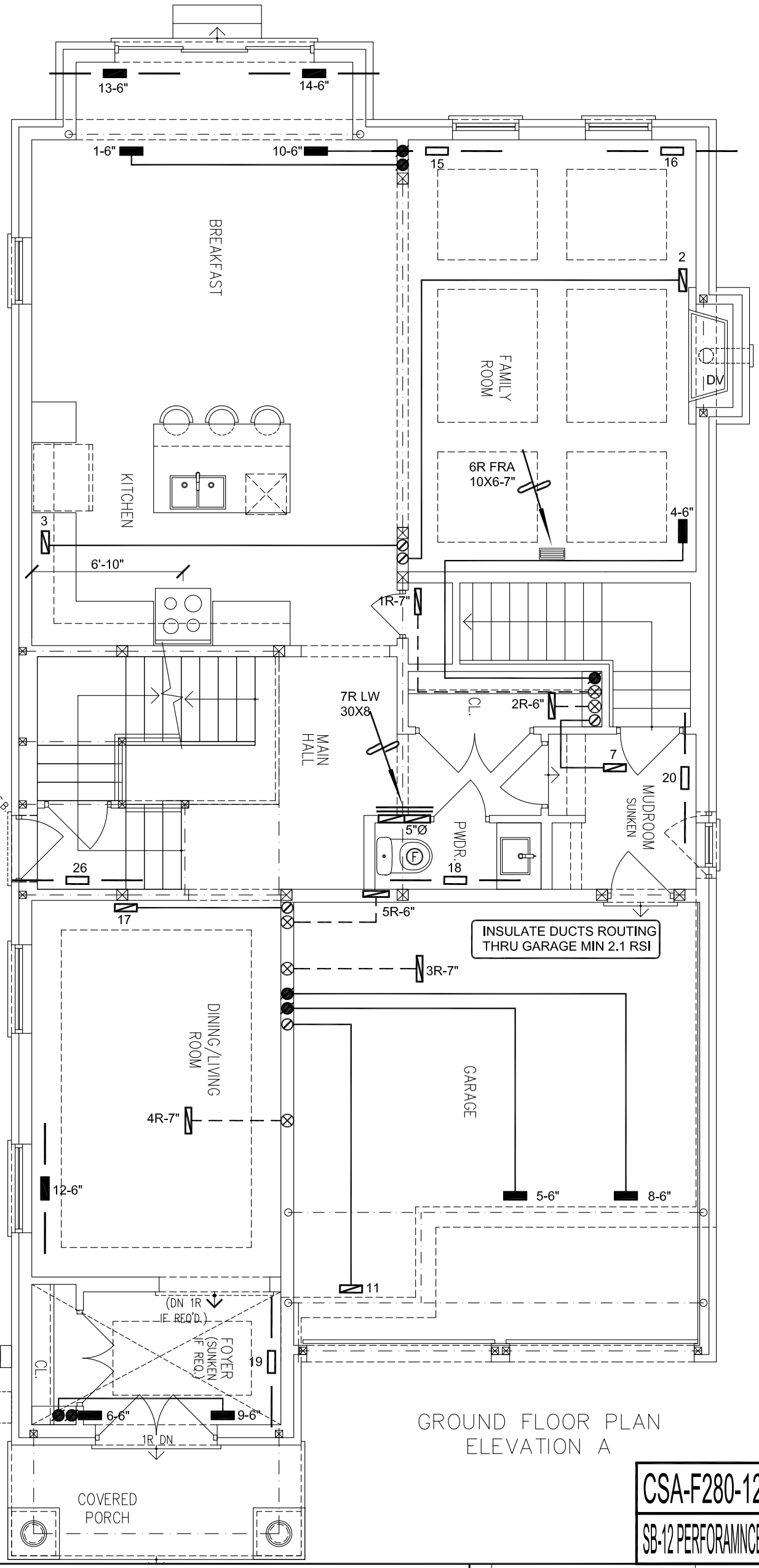
Sheet Title
BASEMENT HEATING LAYOUT

Date AUG/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 92069



GROUND FLOOR PLAN
ELEVATION B

GROUND FLOOR PLAN
ELEVATION A

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 PERFORAMNCE

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▰	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	MAR/2022

REVISIONS

Client

ROYAL PINE HOMES

Project Name

VALES OF HUMBER
BRAMPTON, ONTARIO

40-3 3223 sqft

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Sheet TItle

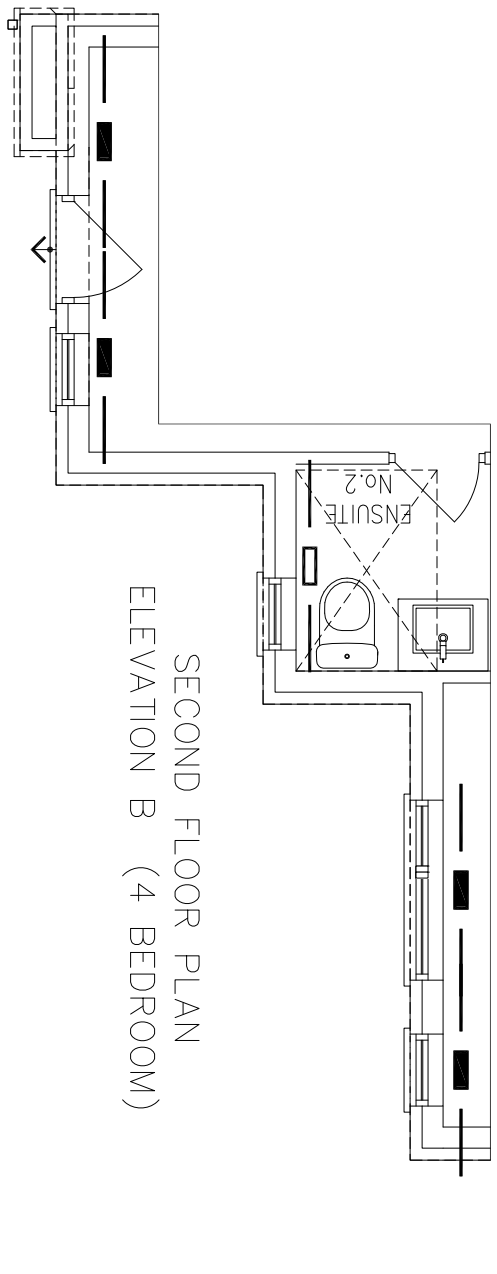
FIRST FLOOR
HEATING
LAYOUT

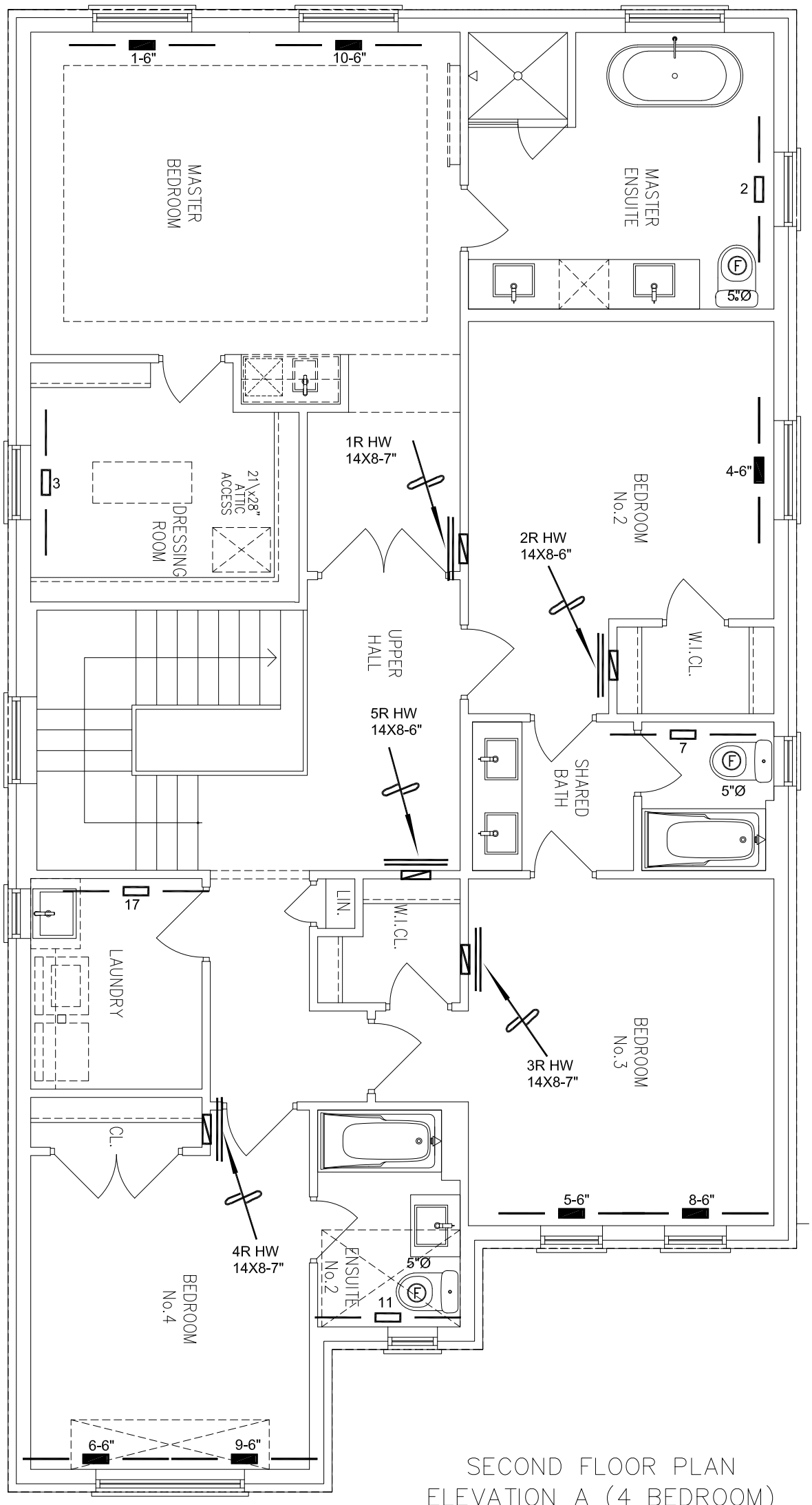
Date AUG/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 92069





SECOND FLOOR PLAN
ELEVATION A (4 BEDROOM)

CSA-F280-12

SB-12 PERFORAMNCE

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.

HVAC LEGEND

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— ▬ —	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

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Sheet TItle

SECOND FLOOR HEATING LAYOUT

Date AUG/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 92069