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:** 40-7 CNR **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 22, 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 0.227 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 40-7 CNR | GFA: 3709 | LO# 94327 | SUMMER NATURAL AIR CHANGE RATE 0.074 | HEAT GAIN ΔT °F. 11 | SB-12 PERFORMANCE

ROOM USE			PRI			ENS			DRESS			BED-2			BED-3			BED-4			BATH			WIC-3				ENS-2				
EXP. WALL				49			33			11			21			41			29			5			8				5				
CLG. HT.				9			9			9			9			11			9			9			9				9				
	FACTORS																																
GRS.WALL AREA	LOSS	GAIN		441			297			99			189			451			261			45			72				45				
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN			
NORTH	20.8	15.5	12	249	186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		9	187	139		
EAST	20.8	41.0	39	810	1601	30	623	1231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
SOUTH	20.8	24.4	0	0	0	28	582	683	0	0	0	28	582	683	31	644	756	0	0	0	9	187	220	0	0	0		0	0	0		
WEST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	45	935	1847	24	499	985	0	0	0	10	208	410		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	390	1352	200	239	829	123	99	343	51	161	558	83	375	1300	193	237	822	122	36	125	19	62	215	32		36	125	19		
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	437	548	244	245	307	137	122	153	68	263	330	147	293	367	163	348	436	194	85	107	47	38	48	21		59	74	33		
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	34	91	41	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	298	742	110	0	0	0	38	95	14		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				2959			2341			496			1561			3246			2498			418			565				386				
SUB TOTAL HT GAIN					2230			2174			119			953			2959			1411			285			478				191			
LEVEL FACTOR / MULTIPLIER			0.20	0.22		0.20	0.22		0.20	0.22		0.20	0.22		0.20	0.22		0.20	0.22		0.20	0.22		0.20	0.22			0.20	0.22			
AIR CHANGE HEAT LOSS				648			513			109			342			711			547			92			124				85				
AIR CHANGE HEAT GAIN					104			101			6			44			138			66			13			22				9			
DUCT LOSS				0			0			0			0			0			305			0			69				0				
DUCT GAIN					0			0			0			0			0			240			0			50				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					682			0			682			682			682			682			682			0				0		
TOTAL HT LOSS BTU/H				3608			2854			605			1903			3958			3350			510			758				470				
TOTAL HT GAIN x 1.3 BTU/H					4545			2957			1048			2495			5224			3429			1274			715				259			

ROOM USE			FAM			HOME			K/B			DN/LV			LN/MD			PWD			FOY							BAS		
EXP. WALL				37			28			48			39			31			5			26							196		
CLG. HT.				10			11			10			10			12			11			11							10		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN		370			308			480			390			372			55			286							1372		
GLAZING				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	0	0	0					4	83	62
EAST	20.8	41.0	35	727	1437	0	0	0	65	1350	2668	0	0	0	0	0	0	0	0	0	0	0	0					0	0	0
SOUTH	20.8	24.4	24	499	585	29	603	707	0	0	0	36	748	878	0	0	0	12	249	293	0	0	0					16	332	390
WEST	20.8	41.0	0	0	0	29	603	1190	0	0	0	0	0	0	0	0	0	0	0	0	14	291	575					4	83	164
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
DOORS	24.7	3.7	0	0	0	0	0	0	20	493	73	0	0	0	40	986	146	0	0	0	30	740	110					20	493	73
NET EXPOSED WALL	3.5	0.5	311	1078	160	250	867	129	395	1370	203	354	1227	182	332	1151	171	43	149	22	242	839	124					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					588	2066	306
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					0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	40	107	48	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				0			0			0			0			0			0			0							6943		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0									
SUBTOTAL HT LOSS				2411			2072			3213			1975			2137			398			1869							10000		
SUB TOTAL HT GAIN					2230			2026			2944			1060			317			315			809							996	
LEVEL FACTOR / MULTIPLIER			0.30	0.34		0.30	0.34		0.30	0.34		0.30	0.34		0.30	0.34		0.30	0.34		0.30	0.34						0.50	0.79	
AIR CHANGE HEAT LOSS				815			700			1086			667			722			135			632							7926		
AIR CHANGE HEAT GAIN					104			94			137			49			15			15			38							46	
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
HEAT GAIN APPLIANCES/LIGHTS					682			682			682			682			682			0			0							682	
TOTAL HT LOSS BTU/H				3226			2772			4299			2643			2859			533			2501							17926		
TOTAL HT GAIN x 1.3 BTU/H					3920			3643			4892			2328			1317			428			1100							2241	

TOTAL HEAT GAIN BTU/H: 42052 | TONS: 3.50 | LOSS DUE TO VENTILATION LOAD BTU/H: 1593 | STRUCTURAL HEAT LOSS: 54774 | TOTAL COMBINED HEAT LOSS BTU/H: 56366

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: 40-7 CNR

DATE: Mar-22

GFA: 3709 LO# 94327

HEATING CFM	1370		COOLING CFM	1370			furnace pressure	0.6										#CARRIER			AFUE =	97 %		
TOTAL HEAT LOSS	54,774		TOTAL HEAT GAIN	41,816			furnace filter	0.05										59SP5A-80-16	80		INPUT (BTU/H) =	80,000		
AIR FLOW RATE CFM	25.01		AIR FLOW RATE CFM	32.76			a/c coil pressure	0.2										FAN SPEED			OUTPUT (BTU/H) =	**78,000**		
							available pressure											LOW	0					
							for s/a & r/a	0.35										MEDLOW	975		DESIGN CFM =	**1370**		
RUN COUNT	4th	3rd	2nd	1st	Bas													MEDIUM	1200		CFM @ .6 " E.S.P.			
S/A	0	0	13	10	6		plenum pressure s/a	0.18			r/a pressure	0.17						MEDIUM HIGH	1370					
R/A	0	0	5	3	1		max s/a dif press. loss	0.02			r/a grille press. Loss	0.02												
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	1540		TEMPERATURE RISE	53	°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	PRI	ENS	DRESS	BED-2	BED-3	BED-4	BATH	WIC-3	ENS	PRI	ENS-2	FAM	HOME	K/B	K/B	DN/LV	LN/MD	PWD	FOY	BED-3	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.80	2.14	0.60	1.90	1.98	1.68	0.51	0.76	0.71	1.80	0.47	1.61	1.39	2.15	2.15	2.64	2.86	0.53	2.50	1.98	2.99	2.99	2.99	2.99
CFM PER RUN HEAT	45	54	15	48	49	42	13	19	18	45	12	40	35	54	54	66	72	13	63	49	75	75	75	75
RM GAIN MBH.	2.27	2.22	1.05	2.49	2.61	1.71	1.27	0.71	0.74	2.27	0.26	1.96	1.82	2.45	2.45	2.33	1.32	0.43	1.10	2.61	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	74	73	34	82	86	56	42	23	24	74	8	64	60	80	80	76	43	14	36	86	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	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	41	52	53	52	74	61	61	62	53	49	66	25	59	15	21	53	27	51	67	71	17	14	25	38
EQUIVALENT LENGTH	120	210	110	230	210	150	200	130	210	120	180	130	160	140	120	150	170	170	230	190	110	130	100	150
TOTAL EFFECTIVE LENGTH	161	262	163	282	284	211	261	192	263	169	246	155	219	155	141	203	197	221	297	261	127	144	125	188
ADJUSTED PRESSURE	0.11	0.07	0.11	0.06	0.06	0.08	0.07	0.09	0.07	0.1	0.07	0.11	0.08	0.11	0.12	0.08	0.09	0.08	0.06	0.06	0.14	0.12	0.14	0.09
ROUND DUCT SIZE	**6**	**6**	4	**6**	**6**	5	5	4	4	**6**	4	5	**6**	**6**	**6**	**6**	5	4	**6**	**6**	5	5	5	5
HEATING VELOCITY (ft/min)	229	275	172	245	250	308	95	218	207	229	138	294	178	275	275	337	529	149	321	250	551	551	551	551
COOLING VELOCITY (ft/min)	377	372	390	418	438	411	308	264	275	377	92	470	306	408	408	388	316	161	184	438	88	88	88	88
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10
TRUNK	A	C	A	C	B	C	B	C	C	A	C	D	B	A	D	B	A	B	B	B	A	D	D	C

RUN #	25	26	27	28	29
ROOM NAME	BED-4	FAM	HOME	BAS	BAS
RM LOSS MBH.	1.68	1.61	1.39	2.99	2.99
CFM PER RUN HEAT	42	40	35	75	75
RM GAIN MBH.	1.71	1.96	1.82	0.37	0.37
CFM PER RUN COOLING	56	64	60	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	64	42	90	60	19
EQUIVALENT LENGTH	140	220	200	160	150
TOTAL EFFECTIVE LENGTH	204	262	290	220	169
ADJUSTED PRESSURE	0.08	0.07	0.06	0.08	0.1
ROUND DUCT SIZE	5	5	**6**	**6**	5
HEATING VELOCITY (ft/min)	308	294	178	382	551
COOLING VELOCITY (ft/min)	411	470	306	61	88
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	3X10
TRUNK	C	D	B	B	A

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	381	0.09	9.5	10	x	8	686	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	398	0.06	10.7	14	x	8	512	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	708	0.06	13.2	22	x	8	579	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	992	0.06	15	26	x	8	687	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	1240	0.05	17.1	28	x	10	638
TRUNK Y	915	0.05	15.3	28	x	8	588
TRUNK Z	570	0.05	12.8	20	x	8	513
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	130	115	115	130	115	115	135	320	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.	40	70	82	77	66	72	46	48	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	130	235	205	185	235	255	245	250	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	170	305	287	262	301	327	291	298	1	1	1	1	1	1	1	169
ADJUSTED PRESSURE	0.09	0.05	0.05	0.06	0.05	0.05	0.05	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6.3	7	7	7	7	7	7.5	10.3	0	0	0	0	0	0	0	7.4
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	14	30	0	0	0	0	0	0	0	14

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.
375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 40-7 CNR LO # 94327
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	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	201.4	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	201.4	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	121.9	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-2	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#: 94327 Model: 40-7 CNR Builder: ROYAL PINE HOMES Date: 2022-03-22

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1722	10	17220
First	1722	10	17220
Second	2009	9	18081
Third	0	9	0
Fourth	0	9	0
		Total:	52,521.0 ft³
		Total:	1487.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.074

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

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

0.227 x 413.12 x 41 °C x 1.2 = 4646 W

= **15853 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.074 x 413.12 x 6 °C x 1.2 = 224 W

= **764 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	15,853	10,000	0.793
2	0.3		14,077	0.338
3	0.2		14,471	0.219
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: 40-7 CNR **BUILDER:** ROYAL PINE HOMES
SFQT: 3709 **LO#** 94327 **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:	WEST	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):	52521.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 58.0 ft	WIDTH: 40.0 ft	EXPOSED PERIMETER:	196.0 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

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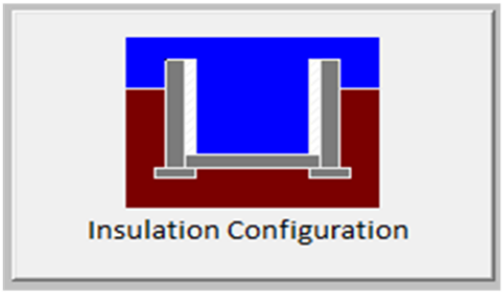
Ajax ON, L1S 2E2
905-619-2300

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):	**17.7**	 Insulation Configuration
Floor Width (m):	**12.2**	
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):		**2034**

TYPE: 40-7 CNR
LO# 94327

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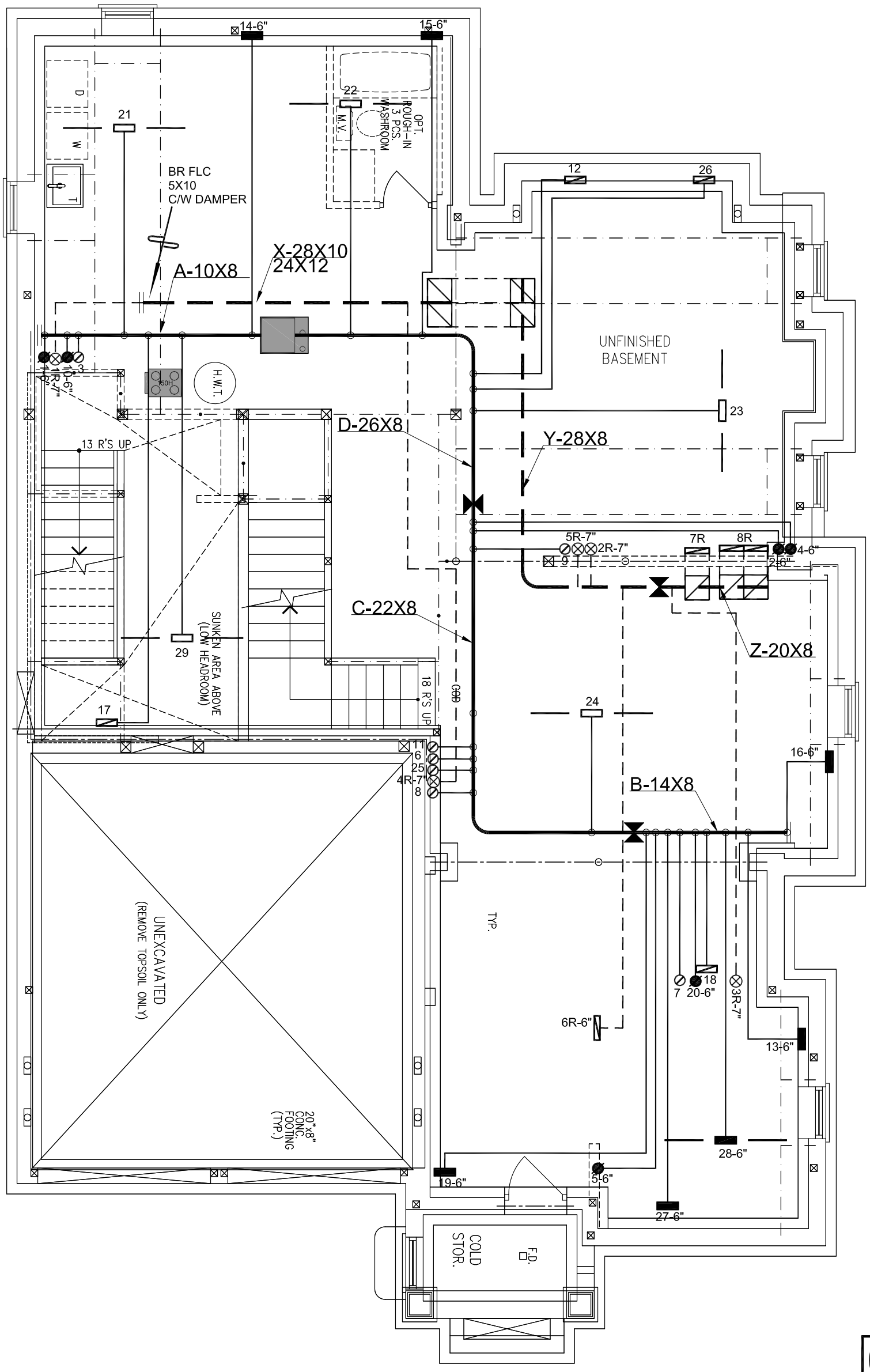
Ajax ON, L1S 2E2
905-619-2300

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):	6.71
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1487.2
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1388.3 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):	**0.227**
Cooling Air Leakage Rate (ACH/H):	**0.074**

TYPE: 40-7 CNR
LO# 94327



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.

BASEMENT FLOOR PLAN A

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.	REVISED PER CITY COMMENTS	MAR/2022
1.	REVISED TO PERFORMANCE PATH	MAR/2022

REVISIONS

Client

ROYAL PINE HOMES

Project Name

VALES OF HUMBER
BRAMPTON, ONTARIO

40-7 CNR 3709 sqft

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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 56366 BTU/H

UNIT DATA

MAKE	CARRIER	
MODEL	59SP5A-80-16	
INPUT	80	MBTU/H
OUTPUT	78	MBTU/H
COOLING	3.5	TONS
FAN SPEED	1370	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	5	4
1ST FLOOR	10	3	3
BASEMENT	6	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

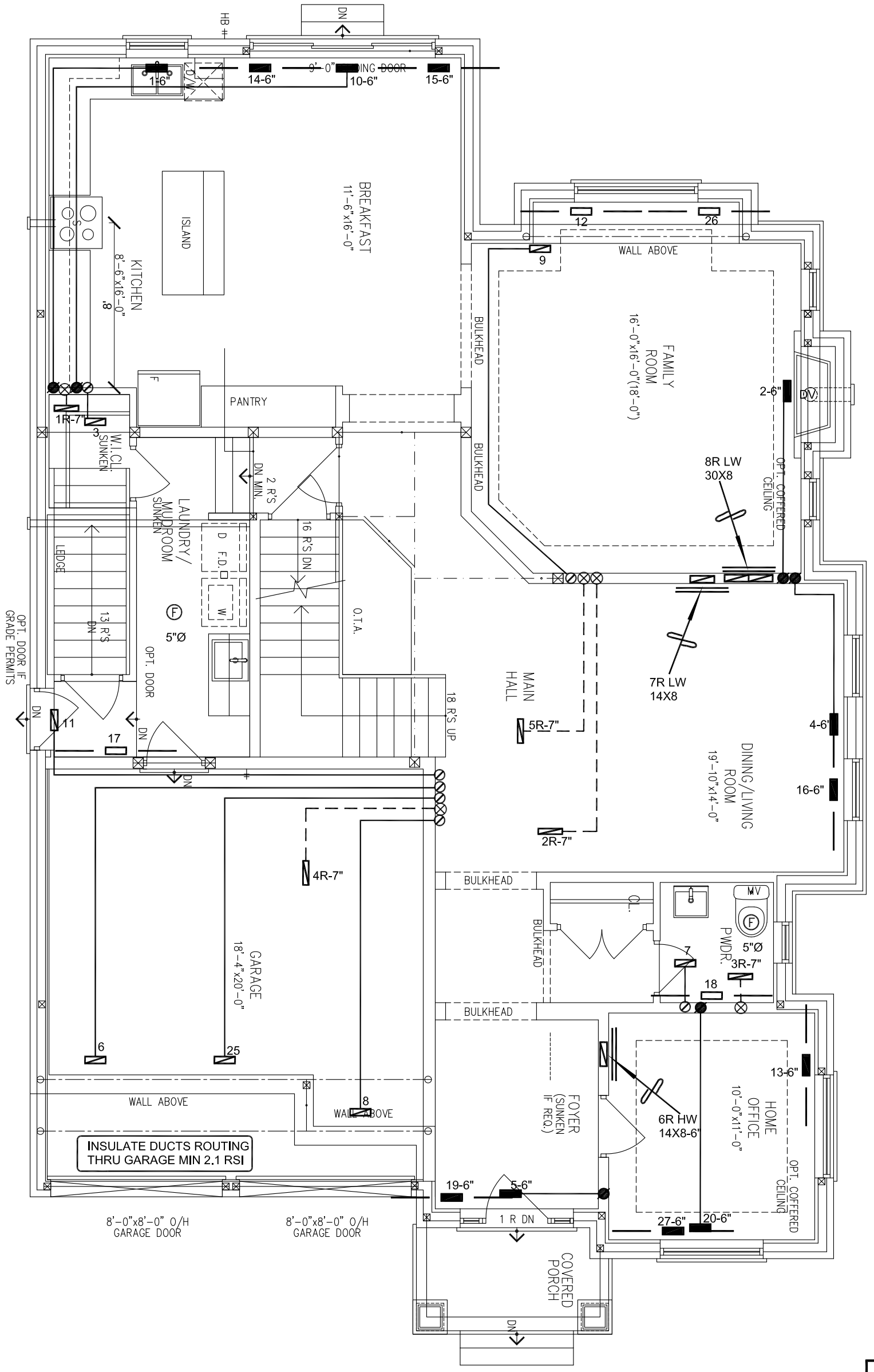
BASEMENT HEATING LAYOUT

Date AUG/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 94327



GROUND FLOOR PLAN A

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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
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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.	REVISED PER CITY COMMENTS	MAR/2022
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ROYAL PINE HOMES

Project Name
VALES OF HUMBER
BRAMPTON, ONTARIO

40-7 CNR 3709 sqft

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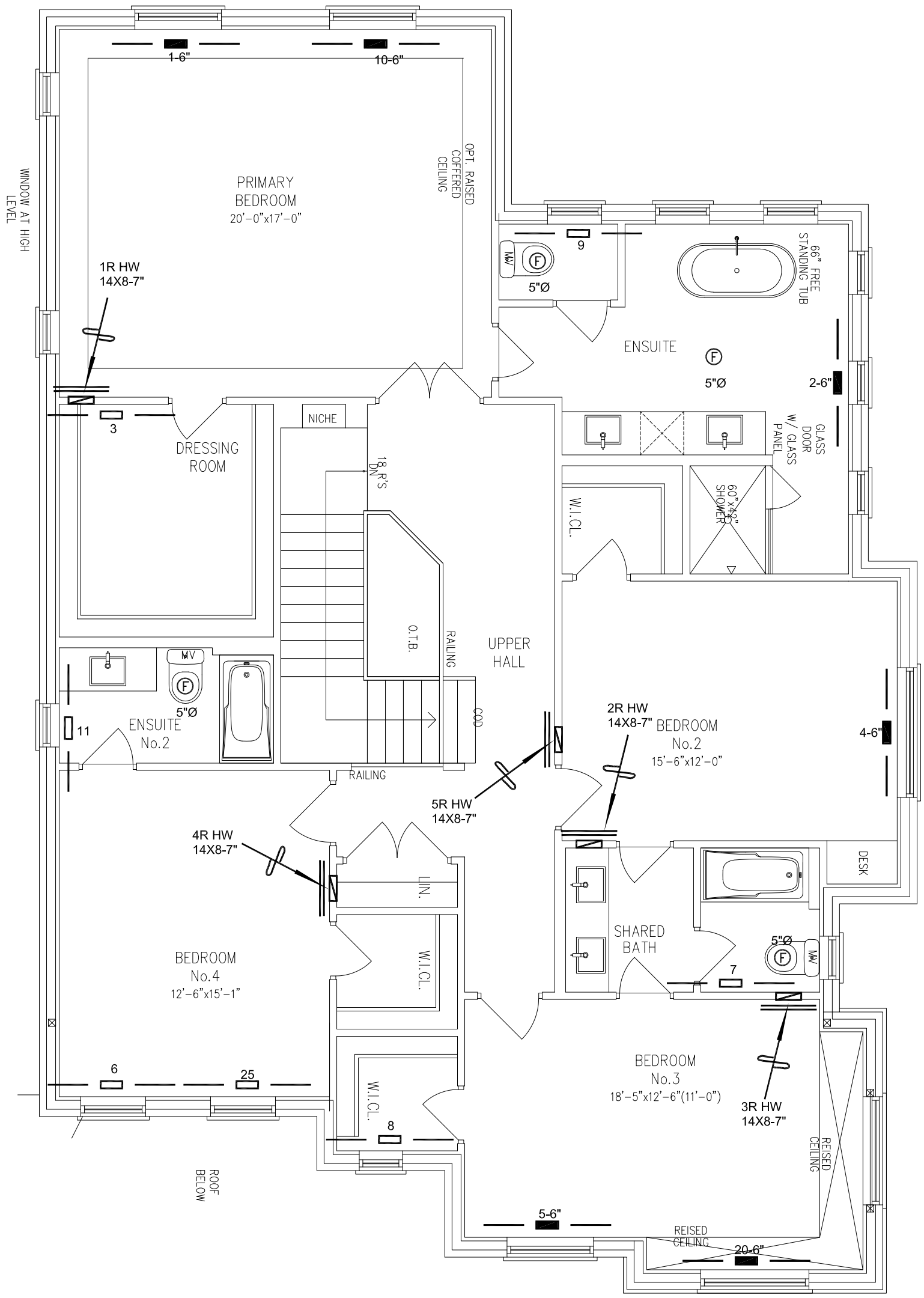
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date AUG/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 94327



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HVAC DESIGNS LTD.

SECOND FLOOR PLAN A

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

REVISIONS		
No.	Description	Date
3.		
2.	REVISED PER CITY COMMENTS	MAR/2022
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date AUG/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 94327