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**		
RICHMOND HILL				

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:** 38-12 FIN BSMT WUB **Project:** CENTREFIELD (WEST GORMLEY)

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 19, 2021
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.

HVAC DESIGNS LTD.
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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | FIN BSMT WUB | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.227 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 38-12 | GFA: 2579 | LO# 87663 | SUMMER NATURAL AIR CHANGE RATE 0.071 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH					ENS-2			B-BATH		
EXP. WALL			33			21			6			16			35			34			9					9			9		
CLG. HT.			9			9			9			9			10			9			9					9			10		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN	297			189			54			144			350			306			81					81			63		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN			LOSS		GAIN	LOSS		GAIN
NORTH	21.8	15.6	0	0	0	8	174	124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			8	174	124	0	0	0
EAST	21.8	40.3	18	392	725	17	370	685	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
SOUTH	21.8	24.2	18	392	435	0	0	0	0	0	0	45	980	1088	43	937	1040	0	0	0	7	152	169			0	0	0	0	0	0
WEST	21.8	40.3	0	0	0	0	0	0	0	0	0	0	0	0	51	1111	2055	35	762	1410	0	0	0			0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
DOORS	25.8	4.3	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
NET EXPOSED WALL	4.2	0.7	261	1098	181	164	690	113	54	227	37	99	416	68	256	1077	177	271	1140	188	74	311	51			73	307	51	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	27	99	16
EXPOSED CLG	1.3	0.6	296	389	174	120	158	71	71	93	42	140	184	82	168	221	99	203	267	119	115	151	68			95	125	56	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	35	98	44	40	112	50	40	112	50	0	0	0			0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	243	634	104	0	0	0			0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0					0			270		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0					0			0		
SUBTOTAL HT LOSS			2271			1392			320			1679			3457			2916			615					606			370		
SUB TOTAL HT GAIN					1515			993			79			1283			3421			1871			288				231			16	
LEVEL FACTOR / MULTIPLIER			0.20	0.17		0.20	0.17		0.20	0.17		0.20	0.17		0.20	0.17		0.20	0.17		0.20	0.17				0.20	0.17		0.50	0.63	
AIR CHANGE HEAT LOSS			377			231			53			278			573			484			102					101			234		
AIR CHANGE HEAT GAIN					62			41			3			52			140			76			12				9			1	
DUCT LOSS			0			0			0			0			0			340			0					0			0		
DUCT GAIN					0			0			0			0			0			266			0				0			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					470			0			0			470			470			470			0				0			0	
TOTAL HT LOSS BTU/H			2647			1623			374			1957			4031			3739			717					707			604		
TOTAL HT GAIN x 1.3 BTU/H					3285			1344			107			2659			5551			3801			390				312			22	

ROOM USE			DIN			FAM			KT/BR			LIV			LAUN			PWD			FOY			MUD					WUB			BAS	
EXP. WALL			19			32			32			35			0			6			16			20					17			144		
CLG. HT.			10			10			10			10			9			11			10			11					10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	192			323			323			354			0			67			162			222					170			1008		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN			LOSS		GAIN	LOSS		GAIN
NORTH	21.8	15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	109	0	0	0	0	0	0			0	0	0	0	0	0
EAST	21.8	40.3	0	0	0	24	523	967	62	1351	2498	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			3	65	121	3	65	121
SOUTH	21.8	24.2	49	1067	1185	24	523	581	0	0	0	47	1024	1137	0	0	0	0	0	0	24	523	581	0	0	0			0	0	0	9	196	218
WEST	21.8	40.3	0	0	0	0	0	0	0	0	0	47	1024	1893	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85			20	517	85	20	517	85
NET EXPOSED WALL	4.2	0.7	143	601	99	275	1157	190	261	1098	181	260	1091	180	0	0	0	60	251	41	98	410	68	202	849	140			147	618	102	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	432	1591	262
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	82	108	48	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	75	196	32	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			0								4832		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0					106					
SUBTOTAL HT LOSS			1668			2203			2449			3139			304			403			1967			1366					1306			7202		
SUB TOTAL HT GAIN					1284			1738			2678			3210			80			150			818			225				308			685
LEVEL FACTOR / MULTIPLIER			0.30	0.26		0.30	0.26		0.30	0.26		0.30	0.26		0.20	0.17		0.30	0.26		0.30	0.26		0.30	0.26							0.50	0.63	
AIR CHANGE HEAT LOSS			426			563			626			802			50			103			503			349								5388		
AIR CHANGE HEAT GAIN					52			71			109			131			3			6			33			9							41
DUCT LOSS			0			0			0			0			35			0			0			0								0		
DUCT GAIN					0			0			0			0			55			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	0		0
HEAT GAIN APPLIANCES/LIGHTS					470			470			470			470			470			0			0			0					0			470
TOTAL HT LOSS BTU/H			2095			2766			3075			3941			389			506			2470			1716					1306			12590		
TOTAL HT GAIN x 1.3 BTU/H					2348			2962			4235			4954			792			203			1107			304				400			1555

TOTAL HEAT GAIN BTU/H: 36606 TONS: 3.05 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 47252 TOTAL COMBINED HEAT LOSS BTU/H: 48922

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: CENTREFIELD (WEST GORMLEY) — FIN BSMT WUB
BUILDER: ROYAL PINE HOMES — TYPE: 38-12 — DATE: Apr-21 — GFA: 2579 — LO# 87663

HEATING CFM	1145	COOLING CFM	1145	furnace pressure	0.6
TOTAL HEAT LOSS	47,252	TOTAL HEAT GAIN	36,331	furnace filter	0.05
AIR FLOW RATE CFM	24.23	AIR FLOW RATE CFM	31.52	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

**CARRIER
59TN6A-060-14V 60
AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	1145
MEDIUM HIGH	0
HIGH	1520

DESIGN CFM = **1145** CFM @ .6 " E.S.P.
TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	10	5
R/A	0	0	5	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	WIC	BED-2	BED-3	BED-4	BATH	BED-3	BED-4	MBR	ENS-2	DIN	FAM	KT/BR	KT/BR	LIV	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.32	1.62	0.37	1.96	2.02	1.87	0.72	2.02	1.87	1.32	0.71	2.09	1.38	1.54	1.54	1.97	0.39	0.51	2.47	1.72	3.47	3.47	0.60	3.47
CFM PER RUN HEAT	32	39	9	47	49	45	17	49	45	32	17	51	34	37	37	48	9	12	60	42	84	84	15	84
RM GAIN MBH.	1.64	1.34	0.11	2.66	2.78	1.90	0.39	2.78	1.90	1.64	0.31	2.35	1.48	2.12	2.12	2.48	0.79	0.20	1.11	0.30	0.49	0.49	0.02	0.49
CFM PER RUN COOLING	52	42	3	84	87	60	12	87	60	52	10	74	47	67	67	78	25	6	35	10	15	15	1	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	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	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH.	39	58	35	63	67	66	61	68	69	49	23	37	38	20	26	60	52	6	52	17	25	46	37	56
EQUIVALENT LENGTH	160	170	130	160	190	160	220	190	170	140	170	150	120	90	120	130	140	120	170	100	110	130	130	130
TOTAL EFFECTIVE LENGTH	199	228	165	223	257	226	281	258	239	189	193	187	158	110	146	190	192	126	222	117	135	176	167	186
ADJUSTED PRESSURE	0.09	0.08	0.1	0.07	0.06	0.08	0.06	0.06	0.07	0.09	0.09	0.09	0.11	0.16	0.12	0.09	0.09	0.14	0.08	0.15	0.12	0.09	0.1	0.09
ROUND DUCT SIZE	5	5	4	**6**	**6**	5	4	**6**	5	5	4	5	5	5	5	**6**	4	4	5	4	**6**	**6**	4	**6**
HEATING VELOCITY (ft/min)	235	286	103	240	250	330	195	250	330	235	195	374	250	272	272	245	103	138	441	482	428	428	172	428
COOLING VELOCITY (ft/min)	382	308	34	428	444	441	138	444	441	382	115	543	345	492	492	398	287	69	257	115	76	76	11	76
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10
TRUNK	D	D	D	C	B	C	B	B	C	A	E	C	A	E	D	B	C	E	B	E	E	A	C	B

RUN #	25	26	27
ROOM NAME	LIV	FAM	BAS
RM LOSS MBH.	1.97	1.38	3.47
CFM PER RUN HEAT	48	34	84
RM GAIN MBH.	2.48	1.48	0.49
CFM PER RUN COOLING	78	47	15
ADJUSTED PRESSURE	0.17	0.17	0.16
ACTUAL DUCT LGH.	59	29	27
EQUIVALENT LENGTH	140	130	140
TOTAL EFFECTIVE LENGTH	199	159	167
ADJUSTED PRESSURE	0.09	0.11	0.1
ROUND DUCT SIZE	**6**	5	**6**
HEATING VELOCITY (ft/min)	245	250	428
COOLING VELOCITY (ft/min)	398	345	76
OUTLET GRILL SIZE	4X10	3X10	4X10
TRUNK	B	A	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	268	0.09	8.3	10	x	8	482	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	355	0.06	10.2	12	x	8	533	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	567	0.06	12.2	20	x	8	510	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	952	0.06	14.8	26	x	8	659	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1144	0.06	15.8	30	x	8	686	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	670	0.05	13.6	22	x	8	548
TRUNK Z	155	0.05	7.8	8	x	8	349
DROP	1145	0.05	16.6	24	x	10	687

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	140	115	115	75	75	165	135	155	0	0	0	0	0	0	0	170
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	67	75	64	72	31	49	58	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	155	205	250	225	255	175	275	170	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	200	272	325	289	327	206	324	228	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.05	0.05	0.05	0.07	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6.9	7	7	6	6	7.4	7.5	7.5	0	0	0	0	0	0	0	6.8
INLET GRILL SIZE	8	8	8	8	8	6	8	6	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	12	14	12	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.
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TYPE: 38-12 LO # 87663
SITE NAME: CENTREFIELD (WEST GORMLEY) FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	190.8	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	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	78 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	✓	3.5
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 65H

155 cfm high 64 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-21

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

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87663 Model: 38-12 Builder: ROYAL PINE HOMES Date: 4/19/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1121	10	11210
First	1121	10	11322.1
Second	1458	9	13122
Third	0	9	0
Fourth	0	9	0
		Total:	35,654.1 ft³
		Total:	1009.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.071

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

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 280.45 x 43 °C x 1.2 = 3295 W

= **11243 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.071 x 280.45 x 7 °C x 1.2 = 169 W

= **577 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 78 °F x 1.08 x 0.25 = **1670 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 13 °F x 1.08 x 0.25 = **275 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	11,243	8,878	0.633
2	0.3		13,196	0.256
3	0.2		13,560	0.166
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: 38-12 FIN BSMT WUB **BUILDER:** ROYAL PINE HOMES
SFQT: 2579 **LO#** 87663 **SITE:** CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

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):	35654.1	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: 53.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	153.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package SB-12 PERFORMANCE**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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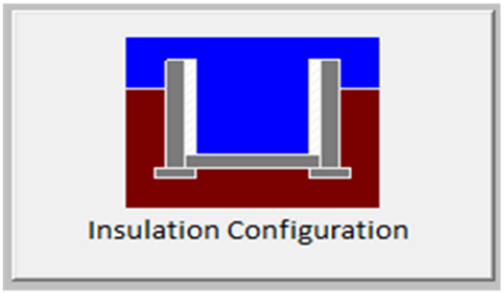
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**16.2**	 Insulation Configuration
Floor Width (m):	**9.8**	
Exposed Perimeter (m):	**46.6**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.4**	
Door Area (m^2):	**3.7**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1495**	

TYPE: 38-12 FIN BSMT WUB
LO# 87663

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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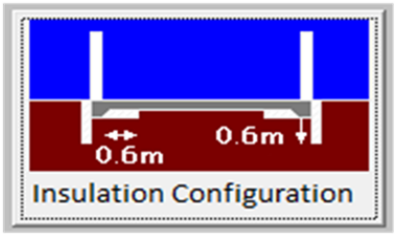
Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	**4.6**	
Width (m):	**0.6**	
Exposed Perimeter (m):	**5.2**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**31**	

TYPE: 38-12 FIN BSMT WUB

LO# 87663

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

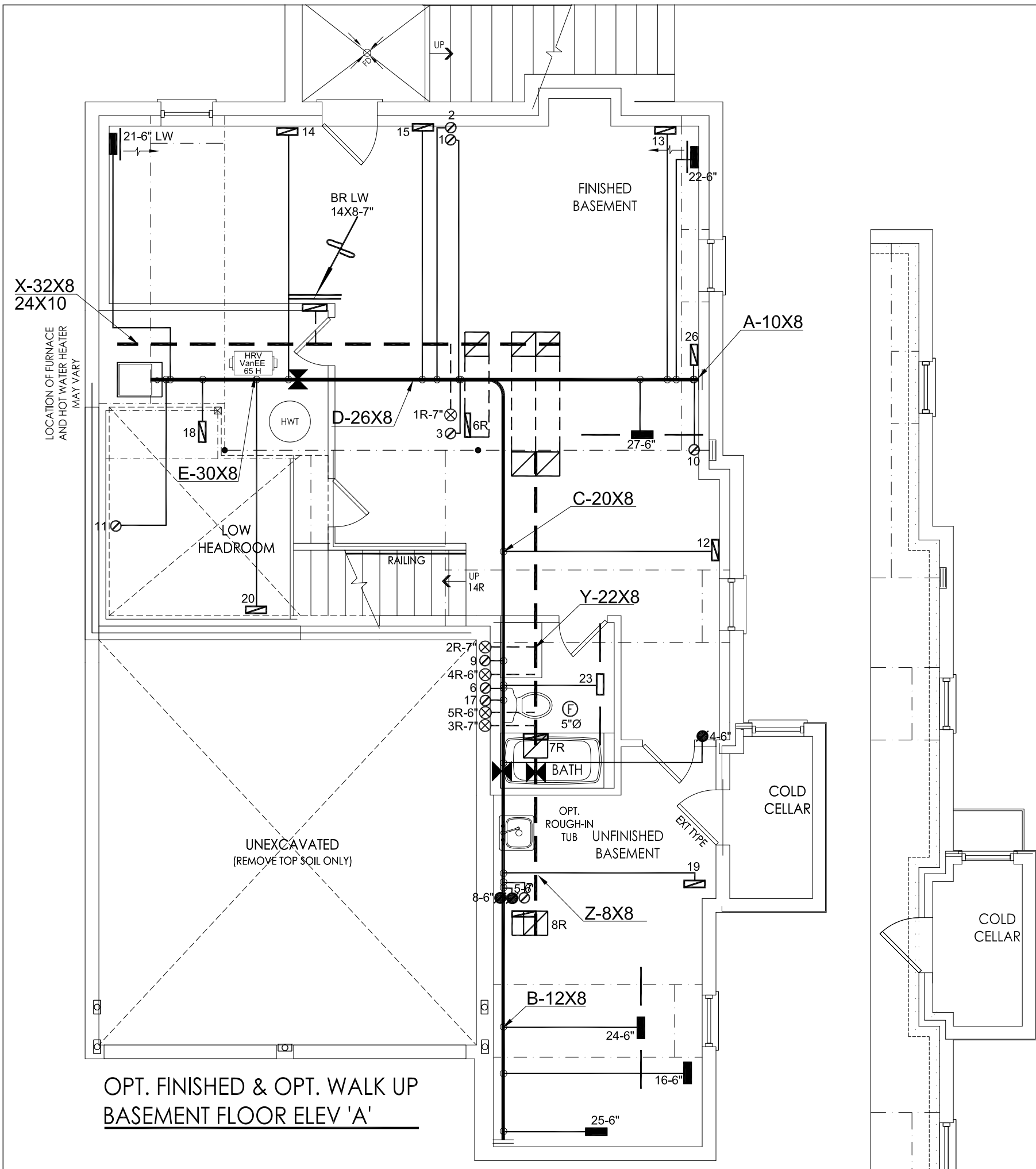
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.74
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1009.6
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 942.5 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):	**0.071**

TYPE: 38-12 FIN BSMT WUB

LO# 87663



OPT. FINISHED & OPT. WALK UP
BASEMENT FLOOR ELEV 'A'

BASEMENT FLOOR ELEV. 'B'

WUB

CSA-F280-12

SB-12 PERFORMANCE

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

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 AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT WUB
38-12 2579 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

HEAT LOSS 48922 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	4
1ST FLOOR	10	2	2
BASEMENT	5	1	1

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

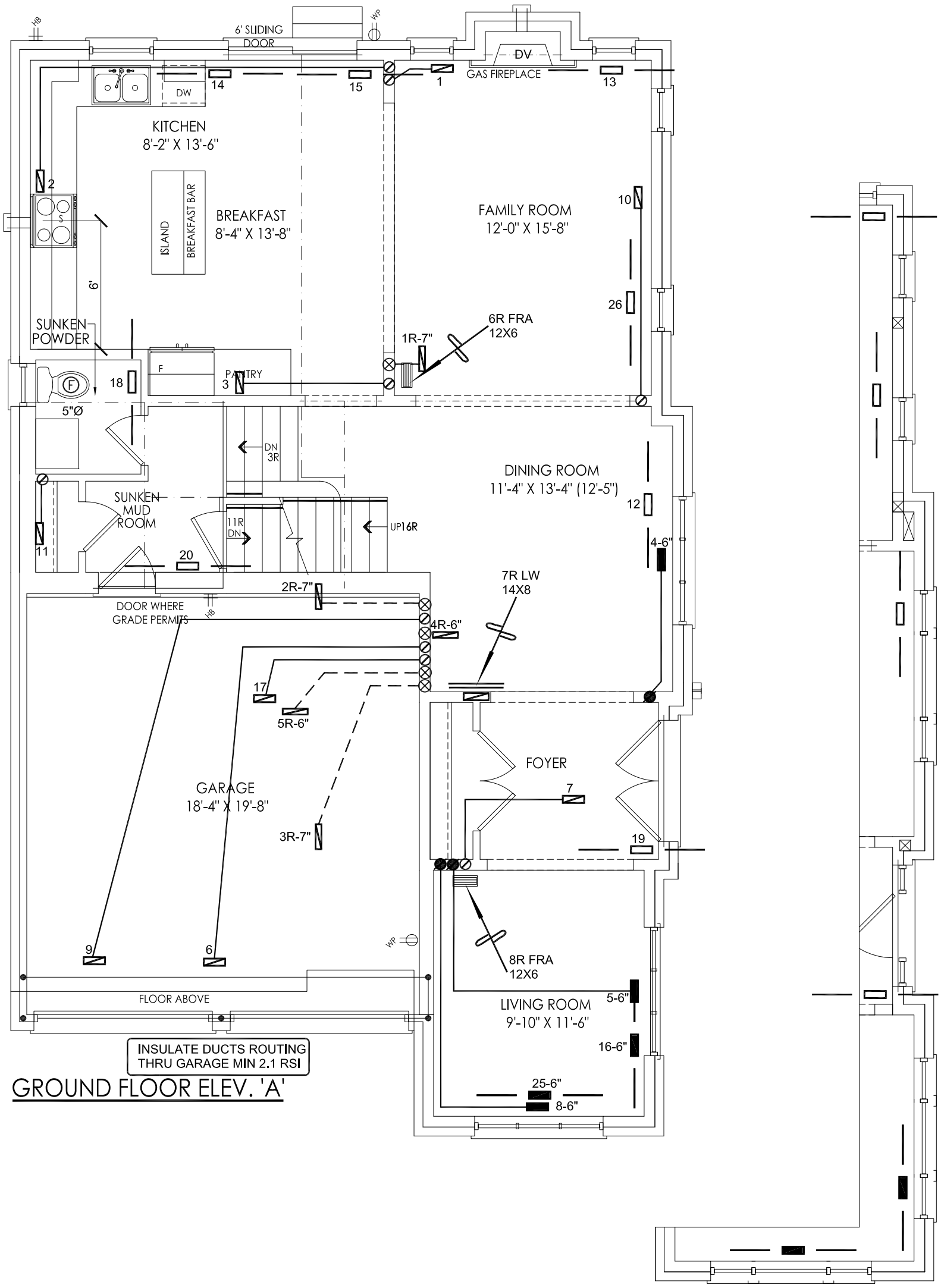
Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87663



GROUND FLOOR ELEV. 'A'

INSULATE DUCTS ROUTING THRU GARAGE MIN 2.1 RSI

GROUND FLOOR ELEV. '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.

WUB

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 AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT WUB
38-12 2579 sqft

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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

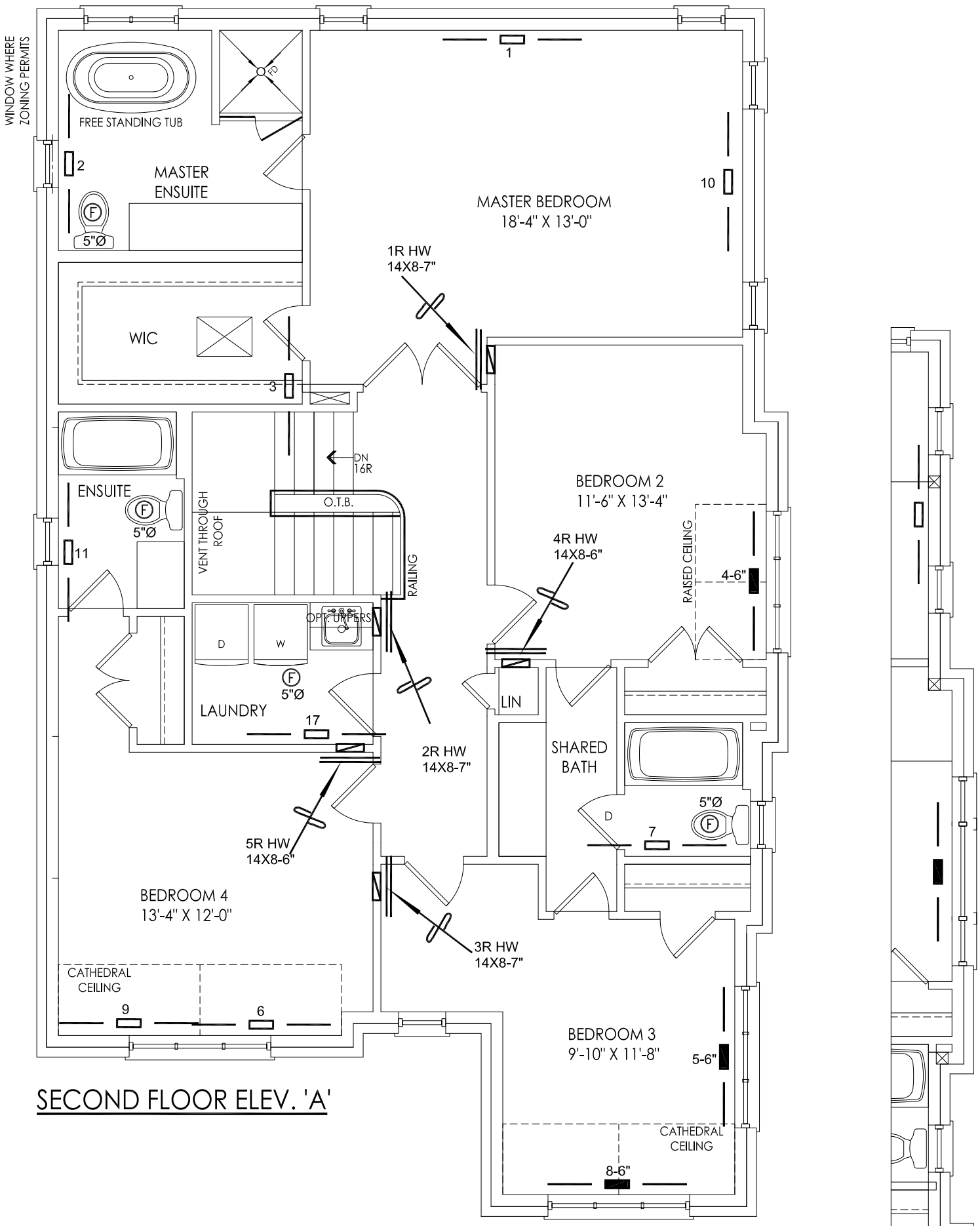
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020

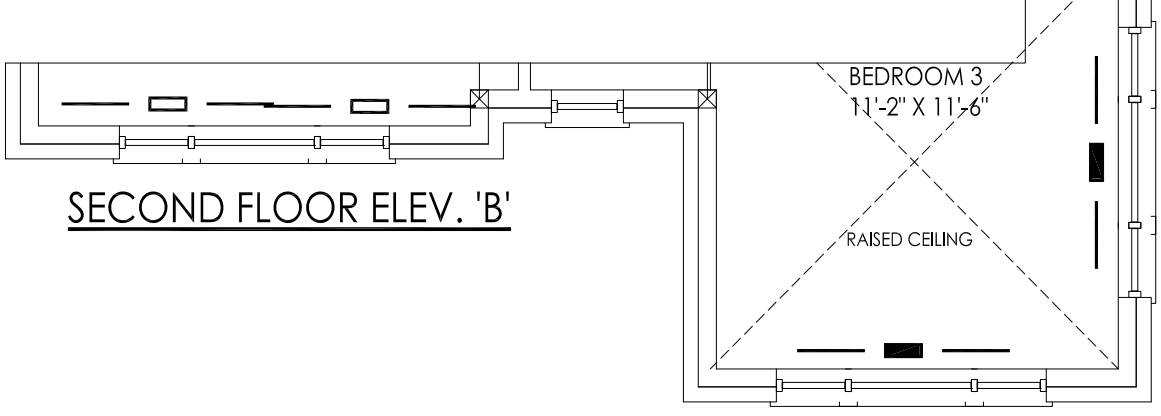
Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87663



SECOND FLOOR ELEV. 'A'



SECOND FLOOR ELEV. 'B'

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WUB
CSA-F280-12
SB-12 PERFORMANCE

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	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 SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87663