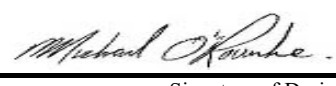


Schedule 1: Designer Information

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 RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 38-9 Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
April 19, 2021		 Signature of Designer	
Date			

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)										DATE: Apr-21		WINTER NATURAL AIR CHANGE RATE 0.227						HEAT LOSS ΔT °F. 78		CSA-F280-12													
BUILDER: ROYAL PINE HOMES										TYPE: 38-9		GFA: 2444		LO# 87610		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			NOOK									
EXP. WALL			31			21			5			13			30			11			6			26									
CLG. HT.			9			9			9			9			9			9			9			9									
FACTORS																																	
GRS.WALL AREA			LOSS GAIN			279			189			45			117			270			99			54			234						
GLAZING						LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN									
NORTH			21.8	16.0	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			
EAST			21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	42	915	1745	0	0	0	0	0	0	0	0	0	34	741	1413			
SOUTH			21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	370	423	7	152	174	0	0	0	0	0	0			
WEST			21.8	41.6	26	566	1080	17	370	706	0	0	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			
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			
NET EXPOSED WALL			4.2	0.7	253	1064	175	172	723	119	45	189	31	100	421	69	228	959	158	82	345	57	47	198	33	200	841	138					
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			
EXPOSED CLG			1.3	0.6	257	338	151	114	150	67	55	72	32	166	218	98	189	248	111	186	244	109	110	145	65	51	67	30					
NO ATTIC EXPOSED CLG			2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	0	0	0	0	0	0	40	112	50					
EXPOSED FLOOR			2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	219	572	94	0	0	0	110	287	47	0	0	0					
BASEMENT/CRAWL HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0		0						
SLAB ON GRADE HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0		0						
SUBTOTAL HT LOSS					1968		1243		262		1009		2778		960		782		1761														
SUB TOTAL HT GAIN						1406		892		63		438		2146		589		319		1631													
LEVEL FACTOR / MULTIPLIER			0.20	0.19			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19							
AIR CHANGE HEAT LOSS					364		230		48		187		514		178		145		326														
AIR CHANGE HEAT GAIN						80		51		4		25		122		34		18		93													
DUCT LOSS					0		0		0		0		329		0		93		0														
DUCT GAIN					0		0		0		0		303		0		34		0														
HEAT GAIN PEOPLE			240		2		480		0		0		1		240		1		240		0		0		0		0						
HEAT GAIN APPLIANCES/LIGHTS							526		0		0		526		526		526		526		0				526								
TOTAL HT LOSS BTU/H					2332		1474		310		1196		3621		1137		1019		2087														
TOTAL HT GAIN x 1.3 BTU/H						3240		1226		87		1598		4338		1805		482		2925													

ROOM USE			FAM			KT/BR			FORM			LAUN			PWD			FOY			MUD									BAS		
EXP. WALL			35			34			20			14			14			44			11									158		
CLG. HT.			10			10			10			9			10			11			11									10		
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	354			343			202			126			141			488			122						1106					
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				
NORTH	21.8	16.0	0	0	0	0	0	0	31	675	495	7	152	112	0	0	0	0	0	0	0	0	0	0	0	0	3	65	48			
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	14	305	582	0	0	0	0	0	0	0	0	3	65	125				
SOUTH	21.8	24.9	0	0	0	12	261	299	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0	0	0	6	131	149				
WEST	21.8	41.6	28	610	1163	47	1024	1953	0	0	0	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			
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85						20	517	85				
NET EXPOSED WALL	4.2	0.7	326	1369	225	284	1196	197	171	719	118	119	500	82	132	557	92	434	1827	301	102	429	71			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			474	1746	287				
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	70	92	41	0	0	0	0	0	0	0	0	0			0	0	0				
NO ATTIC EXPOSED CLG	2.8	1.3	10	28	13	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	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			2007			2481			1394			745			753			3166			946											
SUB TOTAL HT GAIN				1401			2449			614		235			316			1052			156											
LEVEL FACTOR / MULTIPLIER	0.30	0.30				0.30	0.30		0.30	0.30		0.20	0.19		0.30	0.30		0.30	0.30		0.30	0.30				0.50	0.68					
AIR CHANGE HEAT LOSS			596			737			414			138			224			941			281											
AIR CHANGE HEAT GAIN				80			140			35		13			18			60			9											
DUCT LOSS			0			0			0			88			0			0			0											
DUCT GAIN				0			0			0		77			0			0			0											
HEAT GAIN PEOPLE	240		0			0			0		0	0			0		0	0		0	0					0						
HEAT GAIN APPLIANCES/LIGHTS					526		526			526		526			0			0			0					0						
TOTAL HT LOSS BTU/H			2603			3219			1809			971			977			4106			1228											
TOTAL HT GAIN x 1.3 BTU/H				2609			4048			1526		1107			434			1446			214											

TOTAL HEAT GAIN BTU/H:

28997

TONS: 2.42

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 41260

TOTAL COMBINED HEAT LOSS BTU/H: 42930

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

TYPE: 38-9

DATE: Apr-21

GFA: 2444

LO# 87610

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 41,260 TOTAL HEAT GAIN 28,722
AIR FLOW RATE CFM 23.51 AIR FLOW RATE CFM 33.77

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35

**CARRIER

59TN6A-060-14V

FAN SPEED

LOW 820

MEDLOW 0

MEDIUM 970

MEDIUM HIGH 0

HIGH 1520

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

DESIGN CFM = 970
CFM @ .6" E.S.P.

TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	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	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	1.11	0.43	1.45	0.21	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	41	3	54	73	61	8	99	8	55	73	88	68	68	52	37	15	49	7	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.1	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	301	34	275	536	311	92	505	92	404	536	449	499	499	382	424	172	250	80	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	1.11	0.43	1.45	0.21	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	41	3	54	73	61	8	99	8	55	73	88	68	68	52	37	15	49	7	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.1	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	301	34	275	536	311	92	505	92	404	536	449	499	499	382	424	172	250	80	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

SUPPLY AIR TRUNK SIZE											RETURN AIR TRUNK SIZE												
	TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)
TRUNK A	345	0.08	9.4	10	x	8	621	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	442	0.08	10.3	14	x	8	568	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	223	0.07	8.3	8	x	8	502	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	528	0.07	11.4	16	x	8	594	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	970	0.07	14.3	24	x	8	728	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	75	85	85	85	75	340	85	0	0	0	0	0	0	0	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	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	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	14.80	14.80	14.80
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	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	0	0	0	0	0	0	0

TYPE: 38-9
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87610

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES	9.32.3.1(1)
a) ☒ Direct vent (sealed combustion) only	
b) ☐ Positive venting induced draft (except fireplaces)	
c) ☐ Natural draft, B-vent or induced draft gas fireplace	
d) ☐ Solid Fuel (including fireplaces)	
e) ☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE	9.32.1(2)
☒ I Type a) or b) appliance only, no solid fuel	
☐ II Type I except with solid fuel (including fireplaces)	
☐ III Any Type c) appliance	
☐ IV Type I, or II with electric space heat	
☐ Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS	O.N.H.W.P.
☐ 1 Exhaust only/Forced Air System	
☐ 2 HRV with Ducting/Forced Air System	
☒ 3 HRV Simplified/connected to forced air system	
☐ 4 HRV with Ducting/non forced air system	
☐ Part 6 Design	

TOTAL VENTILATION CAPACITY	9.32.3.3(1)
Basement + Master Bedroom <u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms <u>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms <u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Other Rooms <u>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A. TOTAL <u>169.6</u> cfm	

PRINCIPAL VENTILATION CAPACITY REQUIRED	9.32.3.4.(1)
1 Bedroom 31.8 cfm	
2 Bedroom 47.7 cfm	
3 Bedroom 63.6 cfm	
4 Bedroom 79.5 cfm	
5 Bedroom 95.4 cfm	
TOTAL 79.5 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>169.6</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>90.1</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> 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
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER: ROYAL PINE HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	
HRAI #	001820
Date:	April-21

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
INDIVIDUAL BCIN: 19669  MICHAEL O'ROURKE

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87610	Model: 38-9	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>1060</td> <td>10</td> <td>10600</td> </tr> <tr> <td>First</td> <td>1060</td> <td>10</td> <td>10706</td> </tr> <tr> <td>Second</td> <td>1384</td> <td>9</td> <td>12456</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>33,762.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>956.0 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1060	10	10600	First	1060	10	10706	Second	1384	9	12456	Third	0	9	0	Fourth	0	9	0	Total:			33,762.0 ft³	Total:			956.0 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.071</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		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
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 265.56 x 43 °C x 1.2 = 3120 W = 10647 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 265.56 x 7 °C x 1.2 = 160 W = 546 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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	10,647	7,848	0.678																																																								
2	0.3		10,747	0.297																																																								
3	0.2		11,508	0.185																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-9	BUILDER: ROYAL PINE HOMES
SFQT: 2444	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87610	

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):	33762.0	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: 49.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	158.0 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%	-

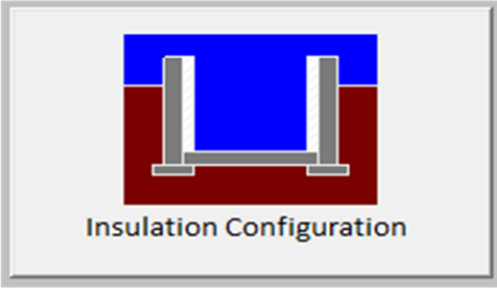
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



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):	14.9	
Floor Width (m):	9.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1560

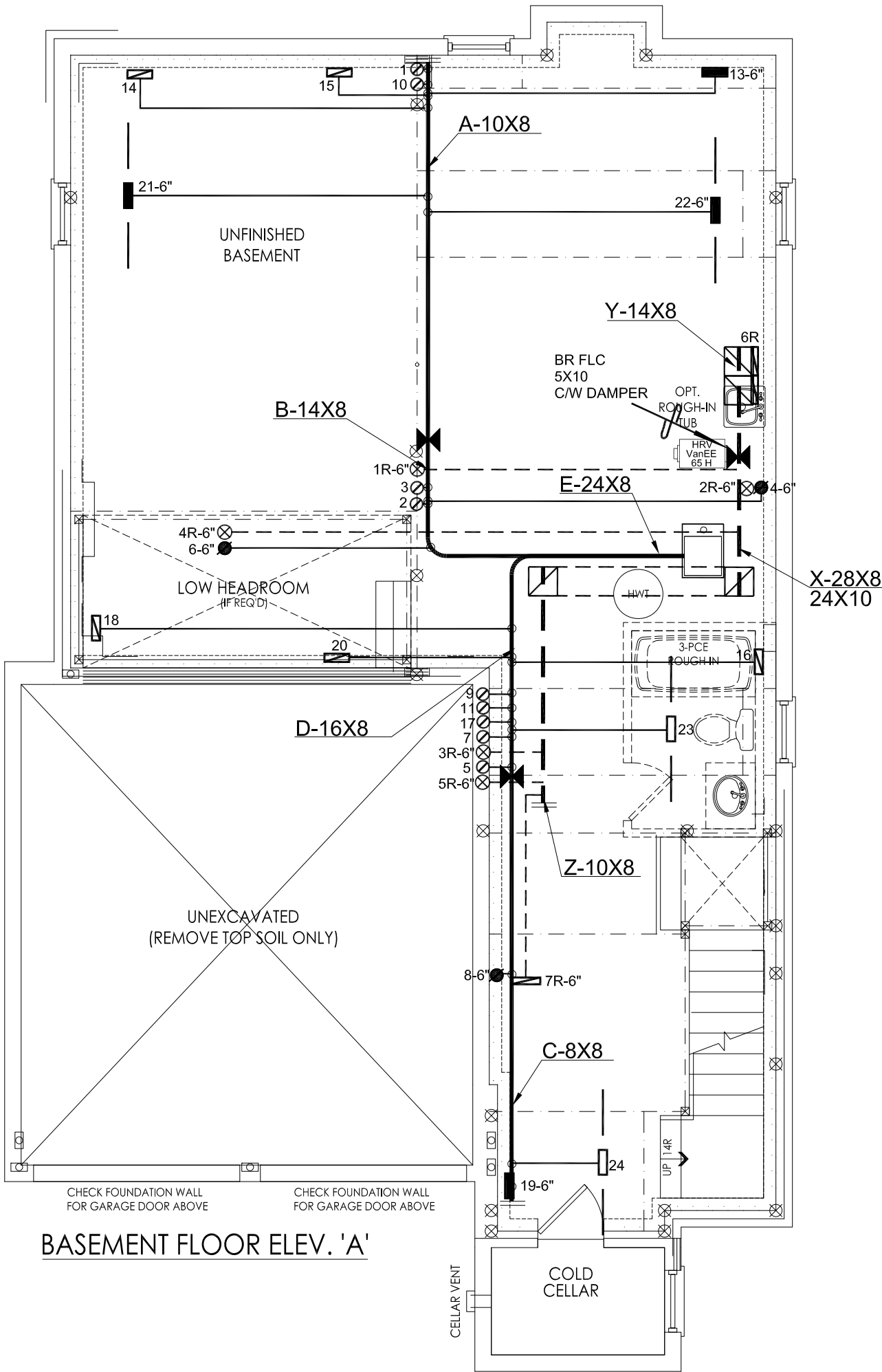
TYPE: 38-9
LO# 87610

Air Infiltration Residential Load Calculator

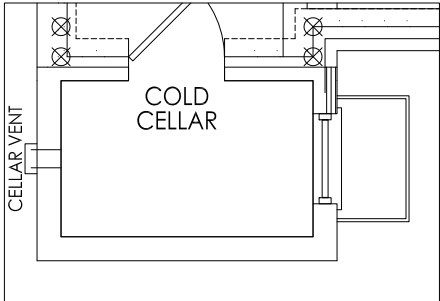
Supplemental tool for CAN/CSA-F280

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):	956.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		892.5 cm ²	
	2.50		ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply		Total Exhaust	
	37.5		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			

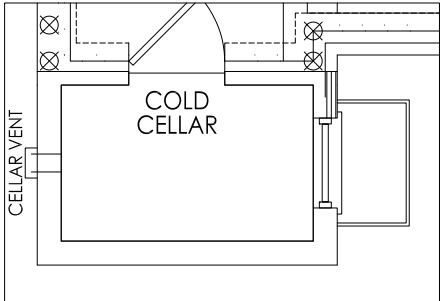
TYPE: 38-9
LO# 87610



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

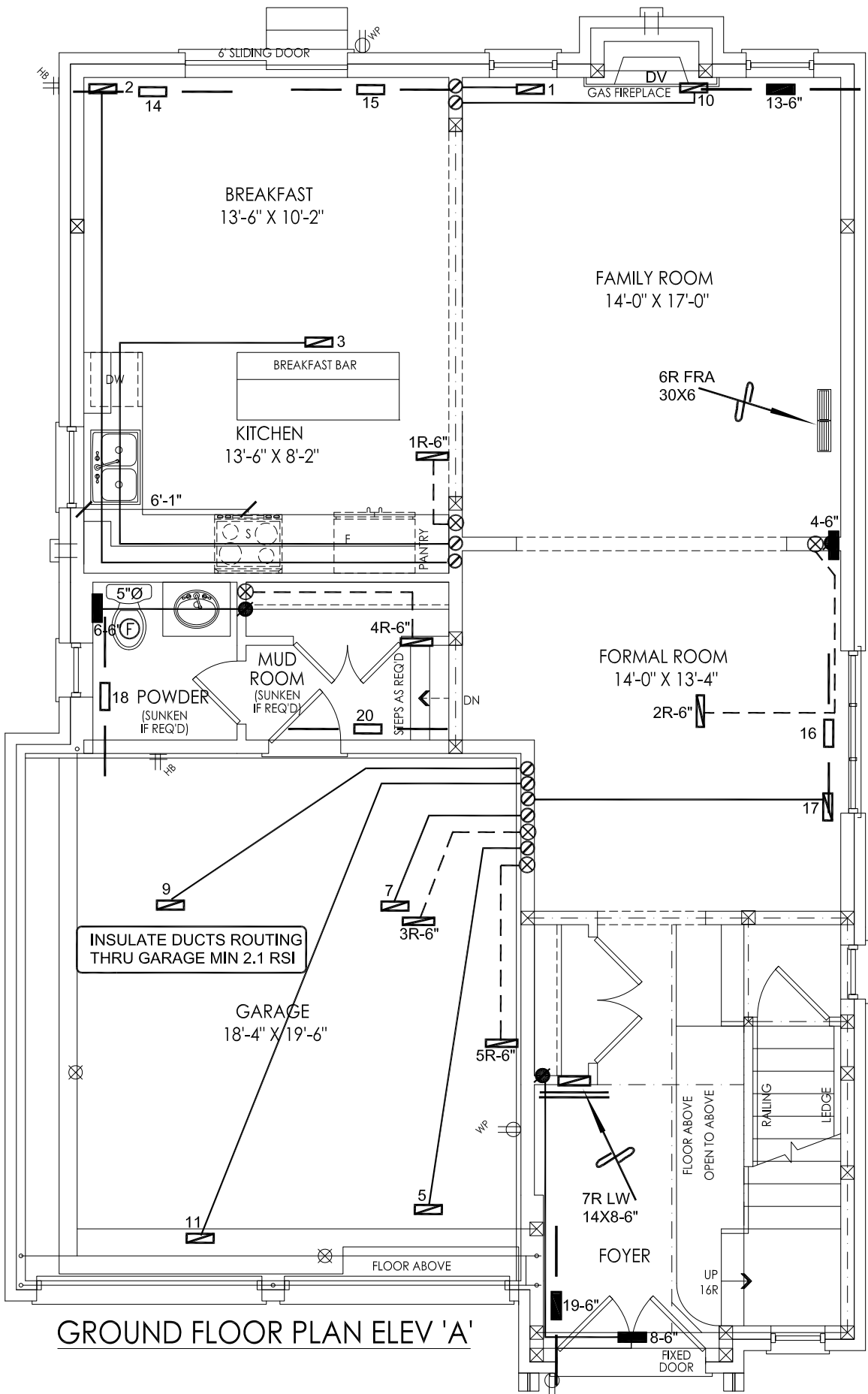
SB-12 PERFORMANCE

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

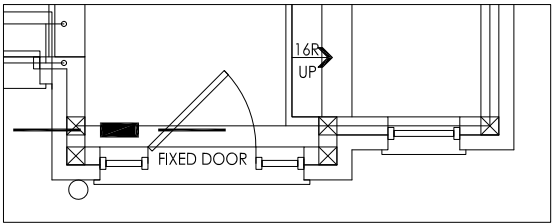
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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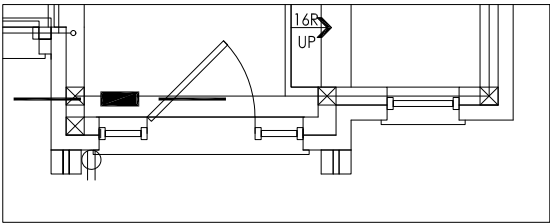
Client	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets 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 42930 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title			
ROYAL PINE HOMES		MAKE CARRIER		3RD FLOOR			BASEMENT HEATING LAYOUT			
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		MODEL 59TN6A-060-14V		2ND FLOOR	12	5				3
		INPUT 60 MBTU/H		1ST FLOOR	7	2				2
		OUTPUT 58 MBTU/H		BASEMENT	4	1	0			
	COOLING 2.5 TONS		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			Date	SEPT/2020			
	FAN SPEED 970 cfm @ 0.6" w.c.					Scale	3/16" = 1'-0"			
						BCIN# 19669				
38-9	2444 sqft					LO#	87610			



GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

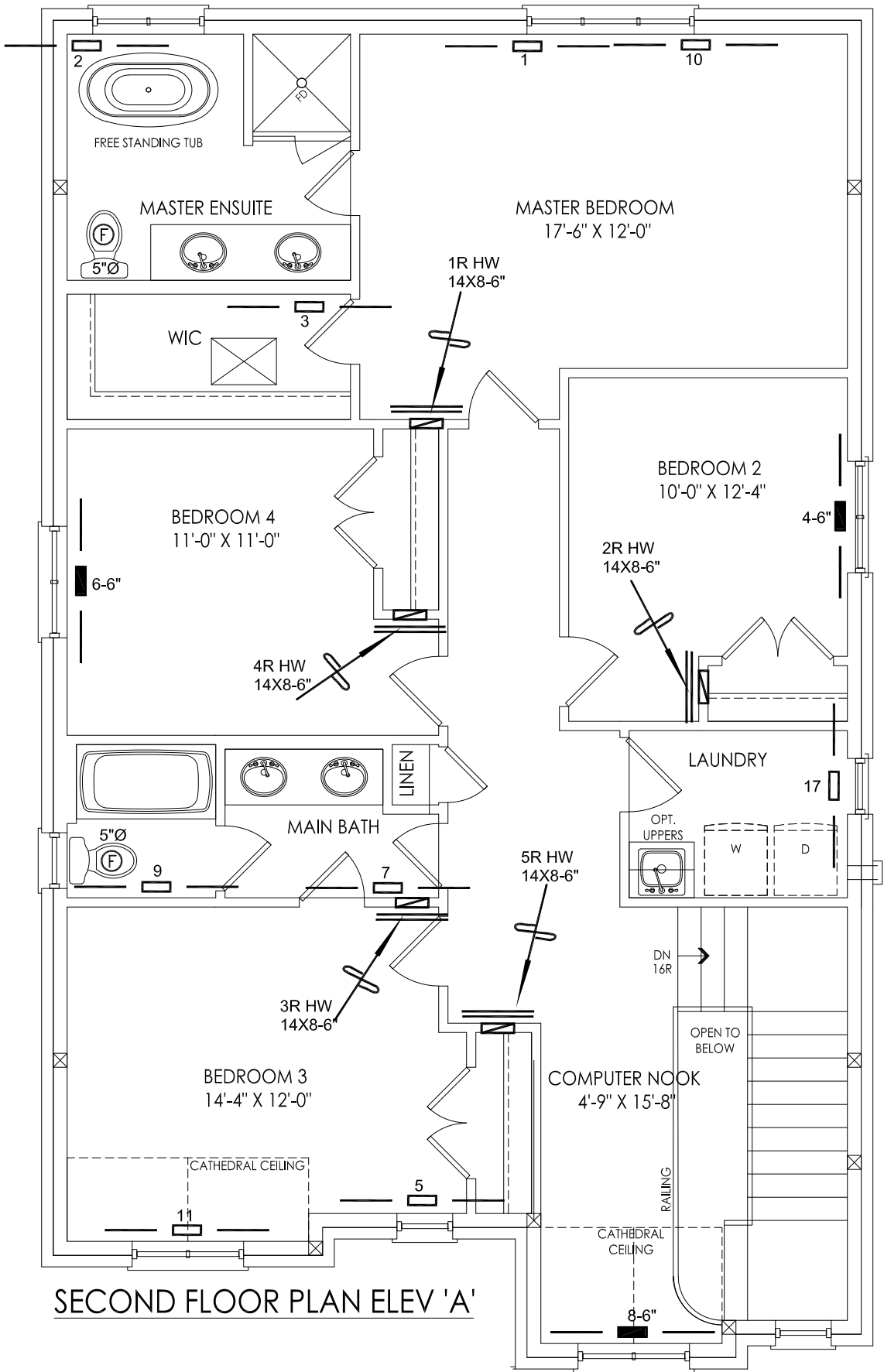
CSA-F280-12

SB-12 PERFORMANCE

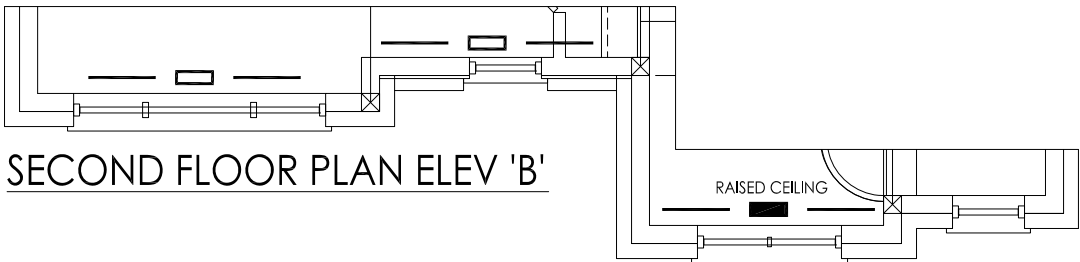
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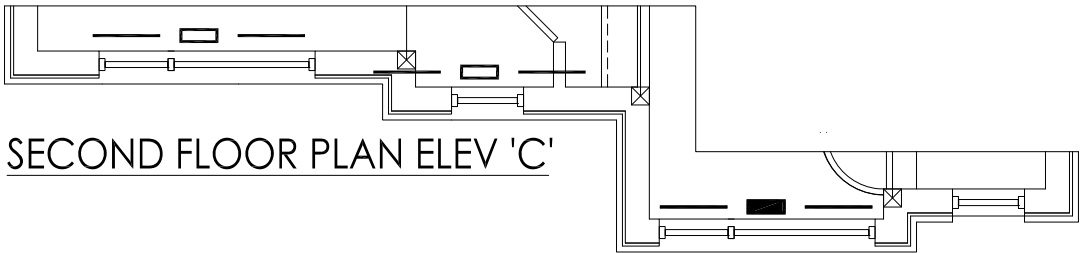
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		Installation 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.	Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
			BCIN# 19669	
38-9	2444 sqft		LO#	87610



SECOND FLOOR PLAN ELEV 'A'



SECOND FLOOR PLAN ELEV 'B'



SECOND FLOOR PLAN ELEV 'C'

I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
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CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
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Project Name			Date	SEPT/2020
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38-9			BCIN# 19669	
2444 sqft			LO#	87610