

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 Bloomington 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			
Date		Signature of Designer	

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	17	370	272	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	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	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	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	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	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		93		18					93								
DUCT LOSS					0		0		0		0		329		0		93		0						0								
DUCT GAIN					0		0		0		0		303		0		34		0					34		0							
HEAT GAIN PEOPLE			240		2		480	0	0	0	1		240	1	240	1	240	0	0	0	0	0	0	0	0	0	0						
HEAT GAIN APPLIANCES/LIGHTS							526		0		0		526		526		526		526		526		526		526		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	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	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	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						
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						
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	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					694						
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					5323						
AIR CHANGE HEAT GAIN				80			140			35		13			18			60			9					40						
DUCT LOSS			0			0			0			88			0			0			0					0						
DUCT GAIN				0			0			0		77			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	0							
HEAT GAIN APPLIANCES/LIGHTS					526		526			526		526			0			0			0					526						
TOTAL HT LOSS BTU/H			2603			3219			1809			971			977			4106			1228					13171						
TOTAL HT GAIN x 1.3 BTU/H				2609		4048			1526			1107			434			1446			214					1637						

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		<u>79.5</u> 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:	<i>Michael O'Rourke</i>
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
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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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**LO#** 87610**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):	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%	-

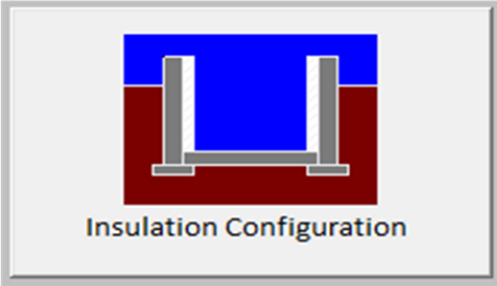
INDIVIDUAL BCIN: 19669

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	 Insulation Configuration
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

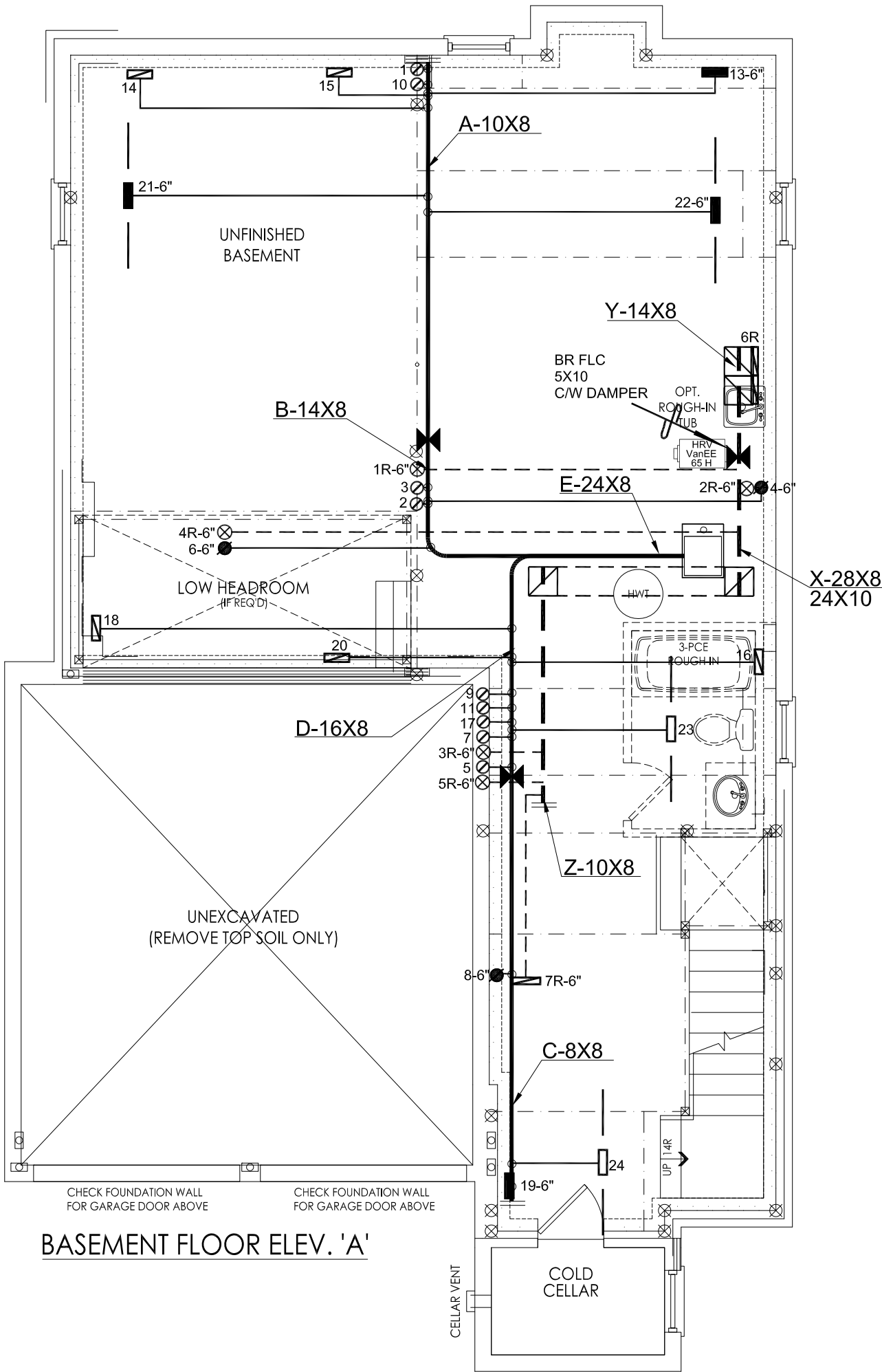
TYPE: 38-9
LO# 87610

Air Infiltration Residential Load Calculator

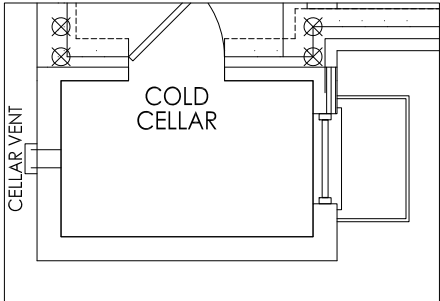
Supplemental tool for CAN/CSA-F280

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			

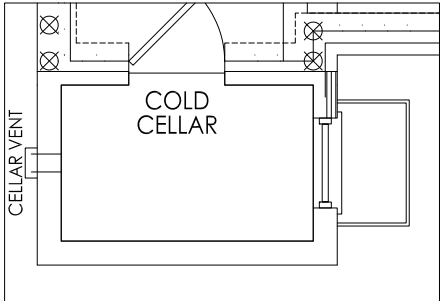
TYPE: 38-9
LO# 87610



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

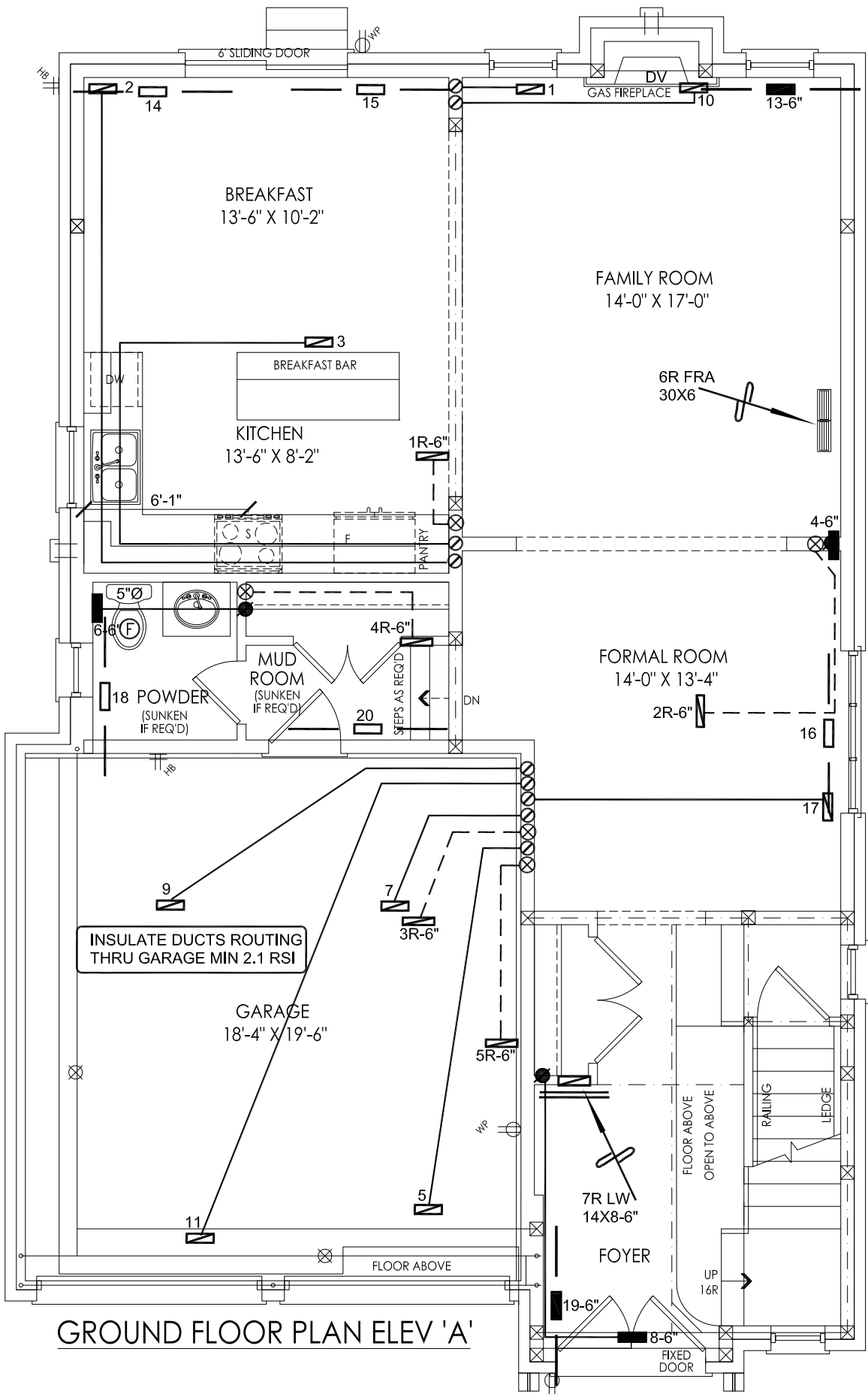
SB-12 PERFORMANCE

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.

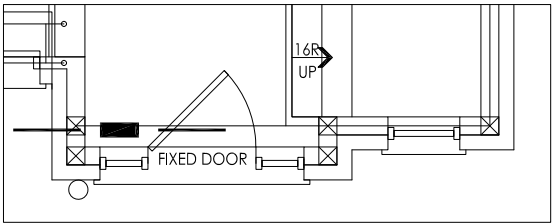
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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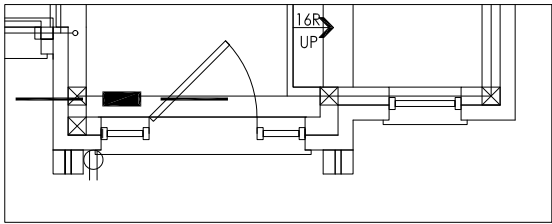
Client	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets 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		MODEL 59TN6A-060-14V	2ND FLOOR			12	5	3	Date SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		INPUT 60 MBTU/H	1ST FLOOR			7	2	2	
		OUTPUT 58 MBTU/H	BASEMENT			4	1	0	Date SEPT/2020
	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			Scale 3/16" = 1'-0"			BCIN# 19669	
38-9	2444 sqft	FAN SPEED 970 cfm @ 0.6" w.c.				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.

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

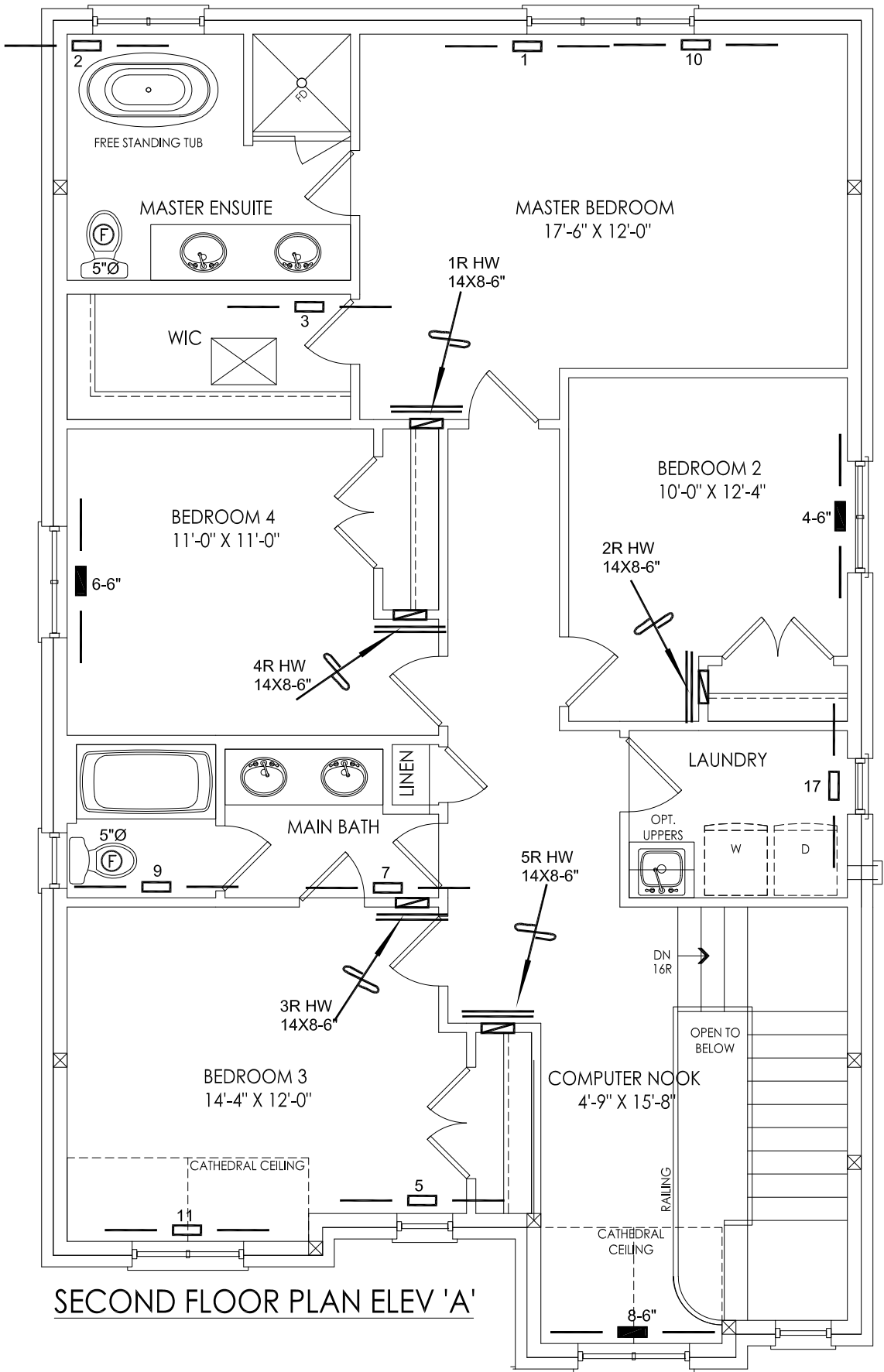
CSA-F280-12

SB-12 PERFORMANCE

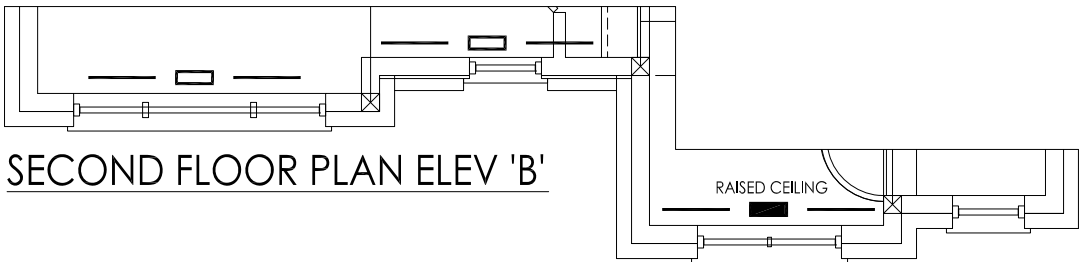
HVAC LEGEND								3.		
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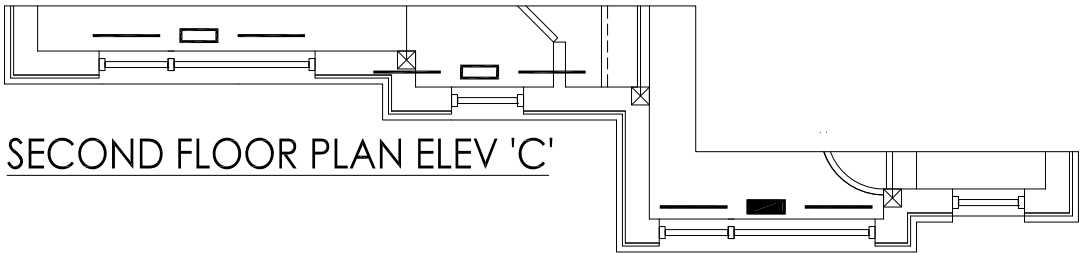
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		2444 sqft	Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
38-9			BCIN# 19669	
			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
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
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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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
			Scale	3/16" = 1'-0"
		BCIN# 19669		
38-9	2444 sqft	LO#	87610	

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 ☐ 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		Model:		
HEAT LOSS / GAIN CALCULATIONS		38-9		
DUCT SIZING		Bloomington		
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY		OPT 2ND		
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		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 22, 2021				
Date		Signature of Designer		

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.

SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDER: ROYAL PINE HOMES OPT 2ND TYPE: 38-9 DATE: Apr-21 LO# 90458 GFA: 2444 WINTER NATURAL AIR CHANGE RATE 0.227 SUMMER NATURAL AIR CHANGE RATE 0.071 HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13 CSA-F280-12 SB-12 PERFORMANCE

ROOM USE	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK		
EXP. WALL CLG. HT.	31 9	21 9	5 9	13 9	30 9	11 9	6 9	26 9		
GRS.WALL AREA	279	189	45	117	270	99	54	234		
GLAZING	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS		
NORTH	0	0	0	17	0	0	0	0		
EAST	0	0	0	0	42	0	0	0		
SOUTH	0	0	0	0	915	0	0	0		
WEST	0	0	0	0	0	17	7	0		
SKYLT.	17	370	706	0	0	0	152	174		
DOORS	0	0	0	0	0	0	0	0		
NET EXPOSED WALL	172	723	119	100	228	82	47	198		
NET EXPOSED BSMT WALL ABOVE GR	4.2	0	0	0	0	0	0	0		
EXPOSED CLG	3.7	0	0	0	0	0	0	0		
NO ATTIC EXPOSED CLG	257	338	151	114	150	186	110	145		
EXPOSED FLOOR	2.8	0	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS	2.6	0	0	0	0	0	0	0		
SLAB ON GRADE HEAT LOSS	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		
AIR CHANGE HEAT LOSS	364	230	46	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	0	0	1	240	1	240	0		
HEAT GAIN APPLIANCES/LIGHTS	526	0	0	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	462	2925		

ROOM USE	FAM	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS
EXP. WALL CLG. HT.	35 10	34 10	20 10	14 9	14 10	44 11	11 11	158 10
GRS.WALL AREA	354	343	202	126	141	488	122	1106
GLAZING	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
NORTH	0	0	31	7	0	0	0	3
EAST	0	0	0	152	0	0	0	65
SOUTH	0	0	0	0	0	14	0	65
WEST	0	12	261	0	9	305	0	125
SKYLT.	28	610	1163	0	0	0	0	6
DOORS	0	0	0	0	0	0	0	131
NET EXPOSED WALL	326	1369	225	119	132	434	20	517
NET EXPOSED BSMT WALL ABOVE GR	4.2	0	0	0	0	0	0	0
EXPOSED CLG	3.7	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	10	28	13	70	0	0	0	0
EXPOSED FLOOR	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2007	2481	1394	745	753	3166	946	7848
SUB TOTAL HT GAIN	1401	2449	614	235	316	1052	156	694
LEVEL FACTOR / MULTIPLIER	0.30	0.30	0.30	0.20	0.30	0.30	0.30	0.50
AIR CHANGE HEAT LOSS	596	737	414	138	224	941	281	5323
AIR CHANGE HEAT GAIN	80	140	35	13	18	60	9	40
DUCT LOSS	0	0	0	88	0	0	0	0
DUCT GAIN	0	0	0	25	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	526	526	526	526	526	0	526	526
TOTAL HT LOSS BTU/H	2603	2609	1809	971	977	4106	1228	13171
TOTAL HT GAIN x 1.3 BTU/H	2609	4048	1526	356	434	1446	897	1637

TOTAL HEAT GAIN BTU/H: 28929 TONS: 2.41 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 41260 TOTAL COMBINED HEAT LOSS BTU/H: 42930

Michael O'Toourke

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

TYPE: 38-9
OPT 2ND

GFA: 2444 LO# 90458

DATE: Apr-21

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 41,260
AIR FLOW RATE CFM 23.51

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

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	BATH-2	PWD	FOY	LAUN	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	0.36	0.43	1.45	0.90	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	42	3	54	73	61	8	99	8	55	73	88	69	69	52	12	15	49	30	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	130	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	0.11	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	308	34	275	536	311	92	505	92	404	536	449	507	507	507	382	138	172	344	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 #	ROOM NAME	RM LOSS MBH	CFM PER RUN HEAT	RM GAIN MBH	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	TRUNK A	345	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
2	TRUNK B	442	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
3	TRUNK C	223	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
4	TRUNK D	528	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
5	TRUNK E	970	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6	TRUNK F	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUPPLY AIR TRUNK SIZE											RETURN AIR TRUNK SIZE										
TRUNK	STATIC	ROUND	RECT	VELOCITY	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)	CFM	PRESS.	DUCT	DUCT	(ft/min)		
TRUNK A	0.08	9.4	10	8	345	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8		
TRUNK B	0.08	10.3	14	8	442	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8		
TRUNK C	0.07	8.3	8	8	223	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8		
TRUNK D	0.07	11.4	16	8	528	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8		
TRUNK E	0.07	14.3	24	8	970	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8		
TRUNK F	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.05	0	0	0		
TRUNK G																					
TRUNK H																					
TRUNK I																					
TRUNK J																					
TRUNK K																					
TRUNK L																					
TRUNK M																					
TRUNK N																					
TRUNK O																					
TRUNK P																					
TRUNK Q																					
TRUNK R																					
TRUNK S																					
TRUNK T																					
TRUNK U																					
TRUNK V																					
TRUNK W																					
TRUNK X																					
TRUNK Y																					
TRUNK Z																					
DROP																					
BR																					
AIR VOLUME	1	2	3	4	5	6	7														
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15														
ACTUAL DUCT LGH.	46	40	51	58	53	20	37														
EQUIVALENT LENGTH	235	195	205	155	245	120	230														
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267														
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06														
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6														
INLET GRILL SIZE	8	8	8	8	8	8	8														
INLET GRILL SIZE	14	14	14	14	14	30	14														

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

LO # 90458
OPT 2ND

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

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

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

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

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

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	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
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	☒ HVI Approved	
@ 32 deg F (0 deg C)		

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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																									
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																									
LO#: 90458		Model: 38-9		Builder: ROYAL PINE HOMES		Date: 4/22/2021																																																			
Volume Calculation				Air Change & Delta T Data																																																					
<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;"> <thead> <tr> <th colspan="4" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> </tr> </thead> <tbody> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> <td>43</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> </tr> </tbody> </table>						Design Temperature Difference					Tin °C	Tout °C	ΔT °C	Winter DTDh	22	-21	43	Summer DTDc	24	31	7
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																						
Bsmt	1060	10	10600																																																						
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5.2.3.1 Heat Loss due to Air Leakage				6.2.6 Sensible Gain due to Air Leakage																																																					
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$				$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																					
0.227 x 265.56 x 43 °C x 1.2 = 3120 W				= 0.071 x 265.56 x 7 °C x 1.2 = 160 W																																																					
= 10647 Btu/h				= 546 Btu/h																																																					
5.2.3.2 Heat Loss due to Mechanical Ventilation				6.2.7 Sensible heat Gain due to Ventilation																																																					
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$				$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																					
80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h				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)																																																									
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clevel})</th> <th>Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL_{clevel})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center;">10,647</td> <td>7,848</td> <td>0.678</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,747</td> <td>0.297</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,508</td> <td>0.185</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table>										Level	Level Factor (LF)	Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL _{clevel})	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																						
Level	Level Factor (LF)	Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL _{clevel})																																																					
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	OPT 2ND	BUILDER:	ROYAL PINE HOMES
SFQT:	2444	LO#	90458	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):	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%	-

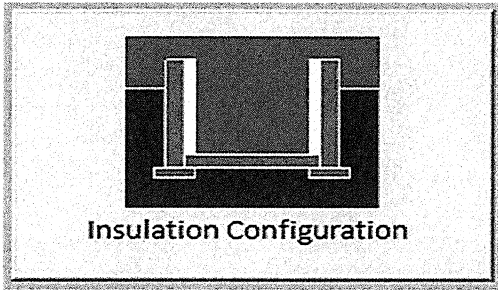
INDIVIDUAL BCIN: 19669

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	 Insulation Configuration
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# 90458

OPT 2ND

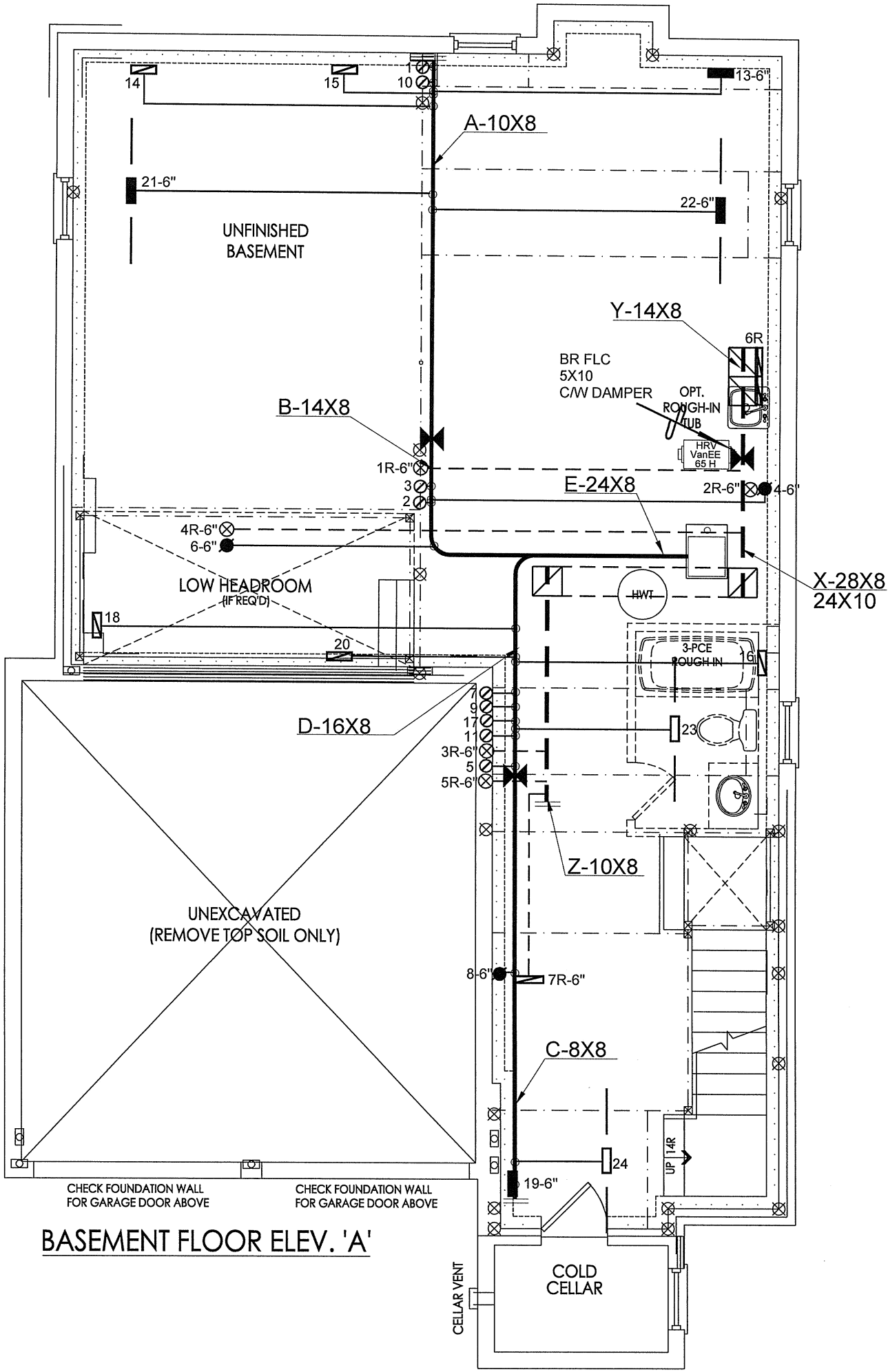
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

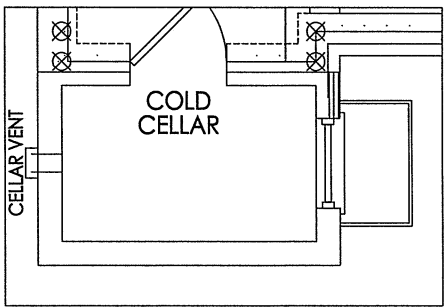
Weather Station Description			
Province:	Ontario		
Region:	Richmond Hill		
Weather Station Location:	Open flat terrain, grass		
Anemometer height (m):	10		
Local Shielding			
Building Site:	Suburban, forest		
Walls:	Heavy		
Flue:	Heavy		
Highest Ceiling Height (m):	6.74		
Building Configuration			
Type:	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# 90458

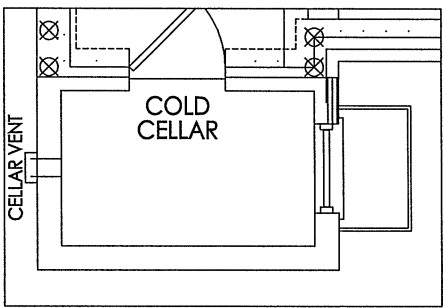
OPT 2ND



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

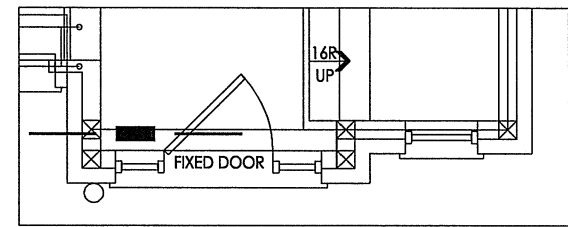
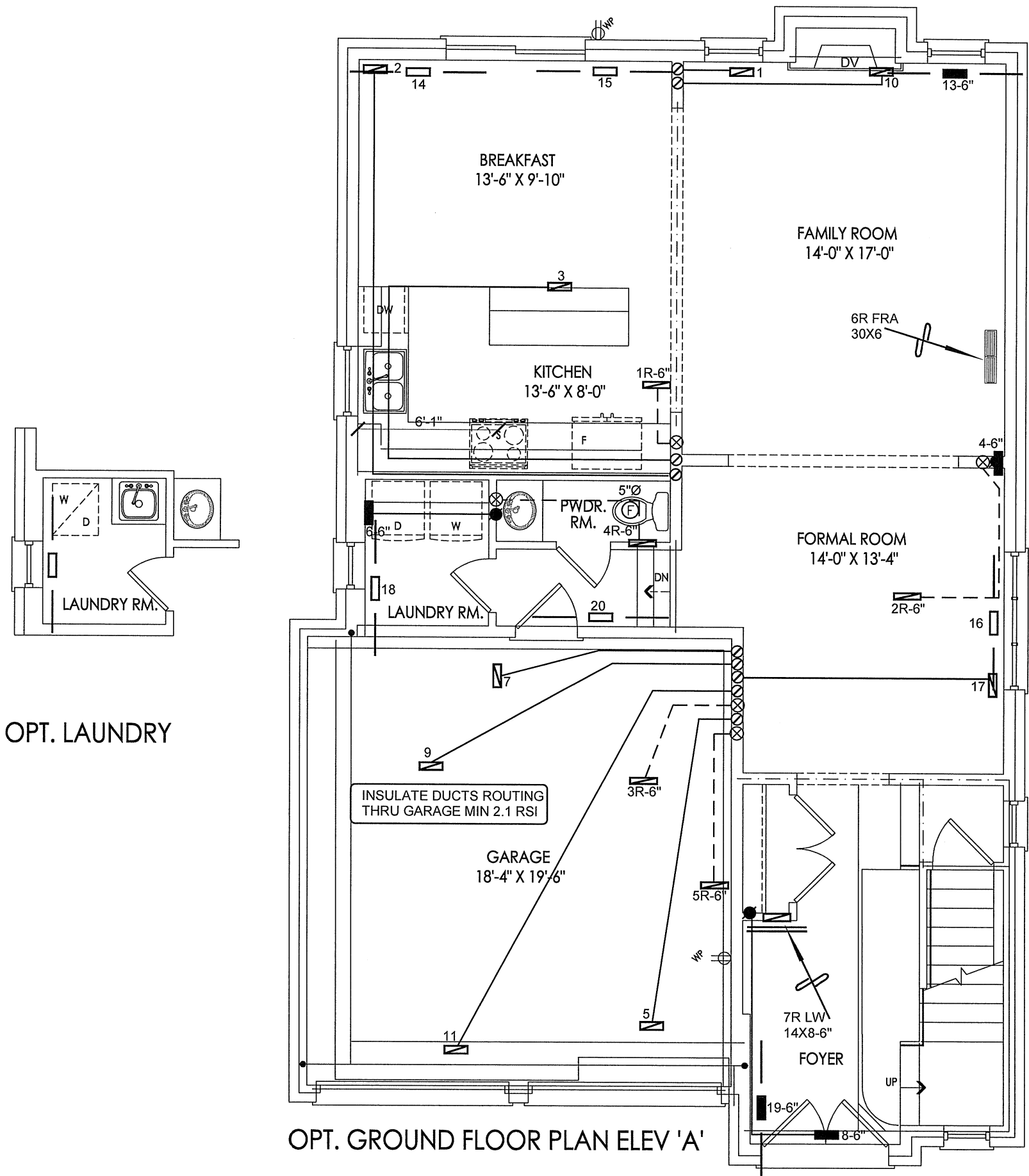
SB-12 PERFORMANCE

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

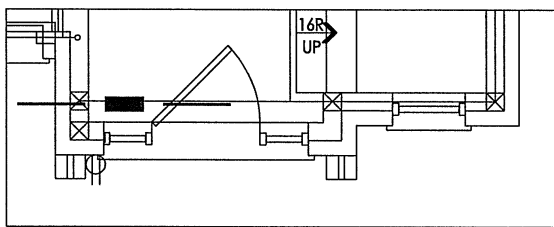
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS	

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

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	Date APR/2021	
			OUTPUT 58 MBTU/H	BASEMENT	4	1	0	Scale 3/16" = 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				BCIN# 19669		
38-9 - OPT 2ND 2444 sqft		FAN SPEED 970 cfm @ 0.6" w.c.					LO#	90458	



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.

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

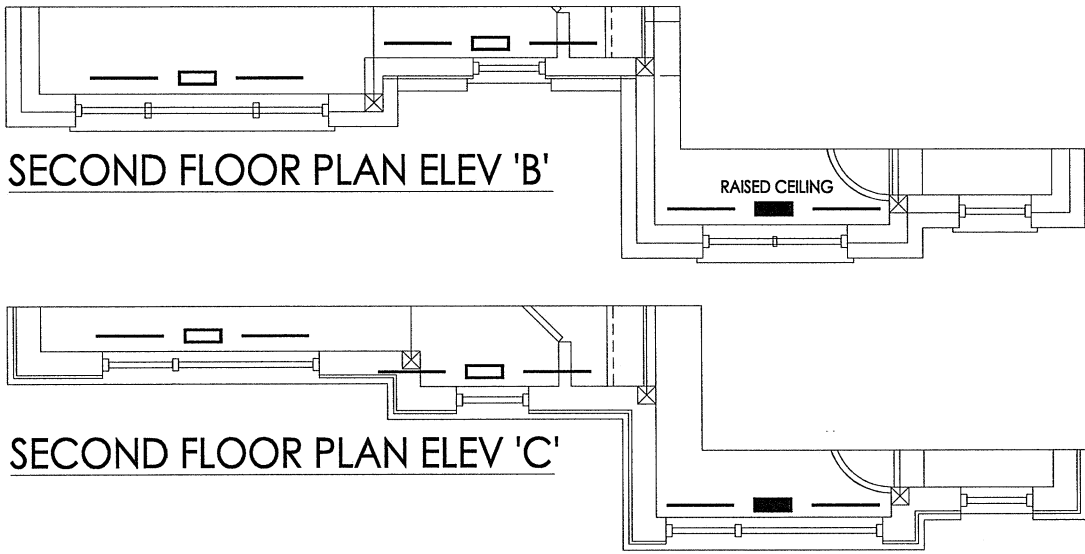
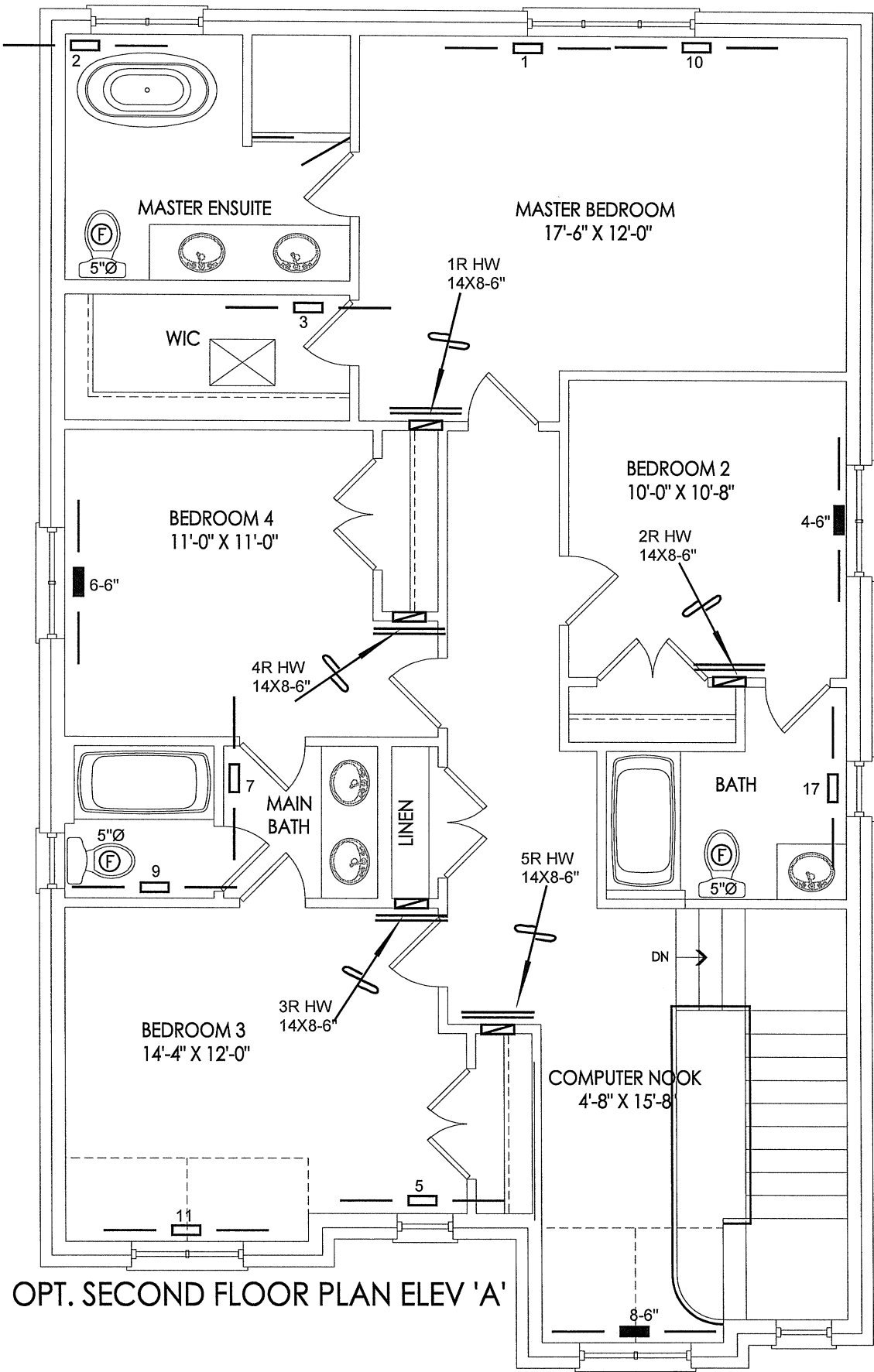
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	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 ROYAL PINE HOMES		 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.	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
38-9 - OPT 2ND 2444 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 90458	



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.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	Description	Date
							REVISIONS		

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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	APR/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
			BCIN# 19669	
38-9 - OPT 2ND			LO#	90458
2444 sqft				

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 Aspen FIN BSMT WUB 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			
Date		Signature of Designer	

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)										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: 38-9										GFA: 2444										LO# 87611										SUMMER NATURAL AIR CHANGE RATE 0.071										HEAT GAIN ΔT °F. 13										SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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GRS.WALL AREA			LOSS			GAIN			279			189			45			117			270			99			54			234			63																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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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			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			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			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			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			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			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			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			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			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			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			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			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			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			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		

ROOM USE					FAM		KT/BR		FORM		LAUN		PWD		FOY		MUD						WUB		BAS			
EXP. WALL					35		34		20		14		14		44		11						17		132			
CLG. HT.					10		10		10		9		10		11		11						10		10			
FACTORS																												
GRS.WALL AREA	LOSS	GAIN			354		343		202		126		141		488		122						170		924			
GLAZING			LOSS GAIN		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	0	31	675	495	7	152	112	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	0	0	0	0	0	0	0	0	3	65	125	0	0	
SOUTH	21.8	24.9	0	0	0	12	261	299	0	0	0	0	0	0	0	9	196	224	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	
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	
DOORS	25.8	4.3	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	326	1369	225	284	1196	197	171	719	118	119	500	82	132	557	92	434	1827	301	102	429	71	147	618	102	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	
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	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	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	0	
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0									4401	
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0						136				
SUBTOTAL HT LOSS			2007			2481			1394			745			753			3166			946			1336			6573	
SUB TOTAL HT GAIN				1401			2449			614		235			316			1052			156			311			522	
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	0.64		
AIR CHANGE HEAT LOSS			596			737			414			138			224			941			281						5088	
AIR CHANGE HEAT GAIN				79			138			35		13			18			59			9						47	
DUCT LOSS			0			0			0			88			0			0			0						0	
DUCT GAIN				0			0			0		77			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	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS				526			526			526		526			0			0			0			0			526	
TOTAL HT LOSS BTU/H			2603			3219			1809			971			977			4106			1228			1336			11661	
TOTAL HT GAIN x 1.3 BTU/H				2608		4046			1526			1107			434			1445			214			405			1423	

TOTAL HEAT GAIN BTU/H:

29199

TONS: 2.43

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 41687

TOTAL COMBINED HEAT LOSS BTU/H: 43357

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

FIN BSMT WUB
TYPE: 38-9

DATE: Apr-21

GFA: 2444 LO# 87611

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 41,687 TOTAL HEAT GAIN 28,925
AIR FLOW RATE CFM 23.27 AIR FLOW RATE CFM 33.54

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 60

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	1

plenium 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

LOW 820
MEDLOW 0
MEDIUM 970
MEDIUM HIGH 0
HIGH 1520

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

TEMPERATURE RISE 55 °F

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	B-BATH	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	3.25	3.25	0.60	3.25
CFM PER RUN HEAT	27	34	7	28	42	26	12	49	12	27	42	61	37	37	42	23	23	96	29	76	76	14	76
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.80	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	0.46	0.46	0.02	0.46
CFM PER RUN COOLING	54	41	3	54	73	61	8	98	8	54	73	87	68	68	51	37	15	48	7	15	15	1	15
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	53	53	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	190	190	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	243	243	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	0.07	0.07	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	4	5
HEATING VELOCITY (ft/min)	198	250	80	143	308	133	138	250	138	198	308	311	272	272	308	264	264	489	333	388	388	161	558
COOLING VELOCITY (ft/min)	396	301	34	275	536	311	92	500	92	396	536	444	499	499	374	424	172	245	80	76	76	11	110
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 #	25
ROOM NAME	BAS
RM LOSS MBH.	3.25
CFM PER RUN HEAT	76
RM GAIN MBH.	0.46
CFM PER RUN COOLING	15
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	27
EQUIVALENT LENGTH	100
TOTAL EFFECTIVE LENGTH	127
ADJUSTED PRESSURE	0.14
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	558
COOLING VELOCITY (ft/min)	110
OUTLET GRILL SIZE	3X10
TRUNK	B

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	341	0.07	9.7	12	x	8	512			TRUNK G	0	0.00	0	0	x	8	0		TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	512	0.07	11.3	16	x	8	576			TRUNK H	0	0.00	0	0	x	8	0		TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	221	0.07	8.2	8	x	8	497			TRUNK I	0	0.00	0	0	x	8	0		TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	460	0.07	10.8	14	x	8	591			TRUNK J	0	0.00	0	0	x	8	0		TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	972	0.07	14.3	24	x	8	729			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									BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140
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.	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	149
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	0.10
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	6.3
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	30	14	0	0	0	0	0	0	0	0	14

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

LO # 87611
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	<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>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>180.2</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		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>100.7</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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87611	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	8,274	0.643																																																								
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	FIN BSMT WUB	BUILDER: ROYAL PINE HOMES
SFQT: 2444	LO# 87611	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):	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:	141.0 ft

2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		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%	-

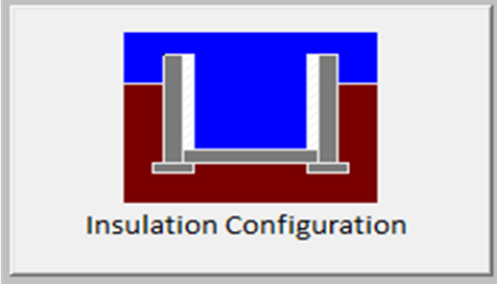
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

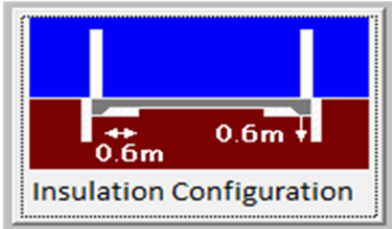
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	
Floor Width (m):	9.1	
Exposed Perimeter (m):	43.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1367

TYPE: 38-9
LO# 87611

FIN BSMT WUB

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):	0.6	
Width (m):	4.6	
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):		40

TYPE: 38-9
LO# 87611

FIN BSMT WUB

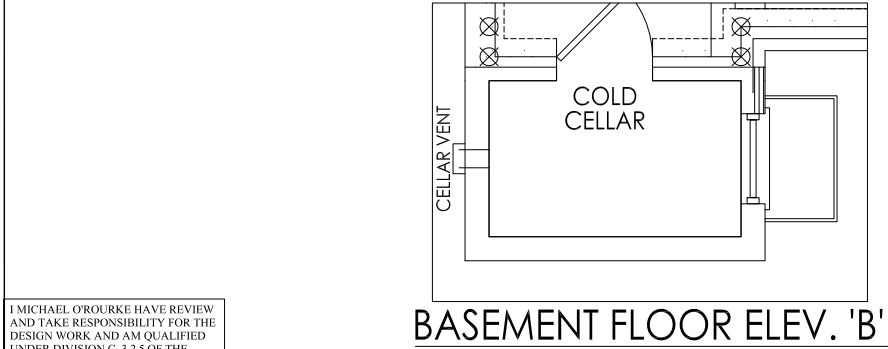
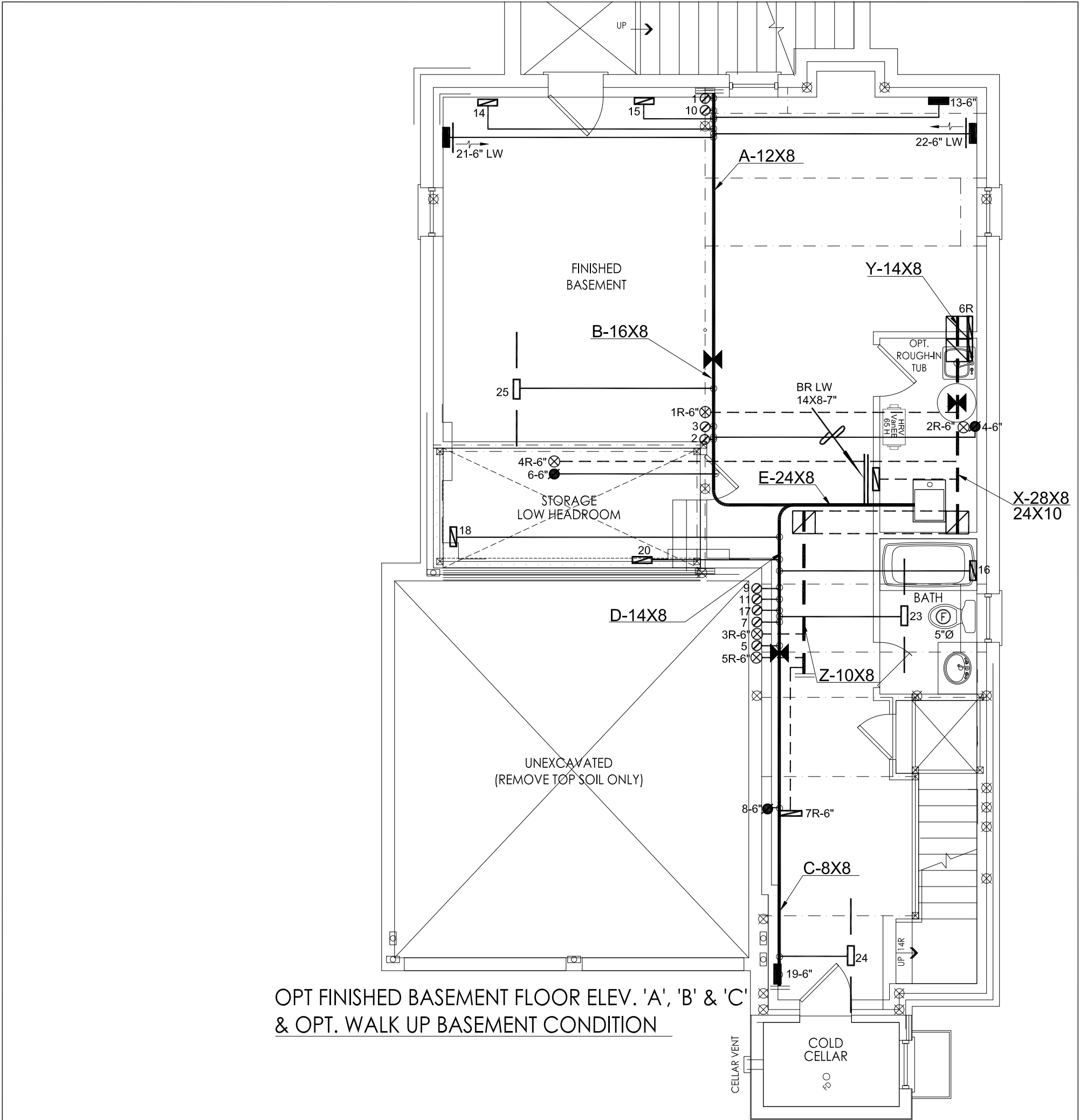
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

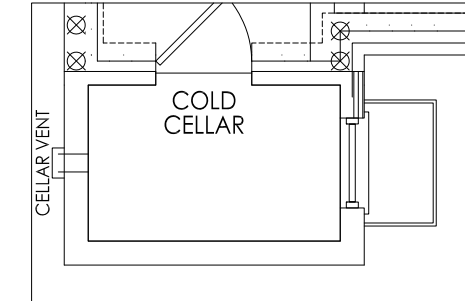
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
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# 87611

FIN BSMT WUB



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

WUB

CSA-F280-12

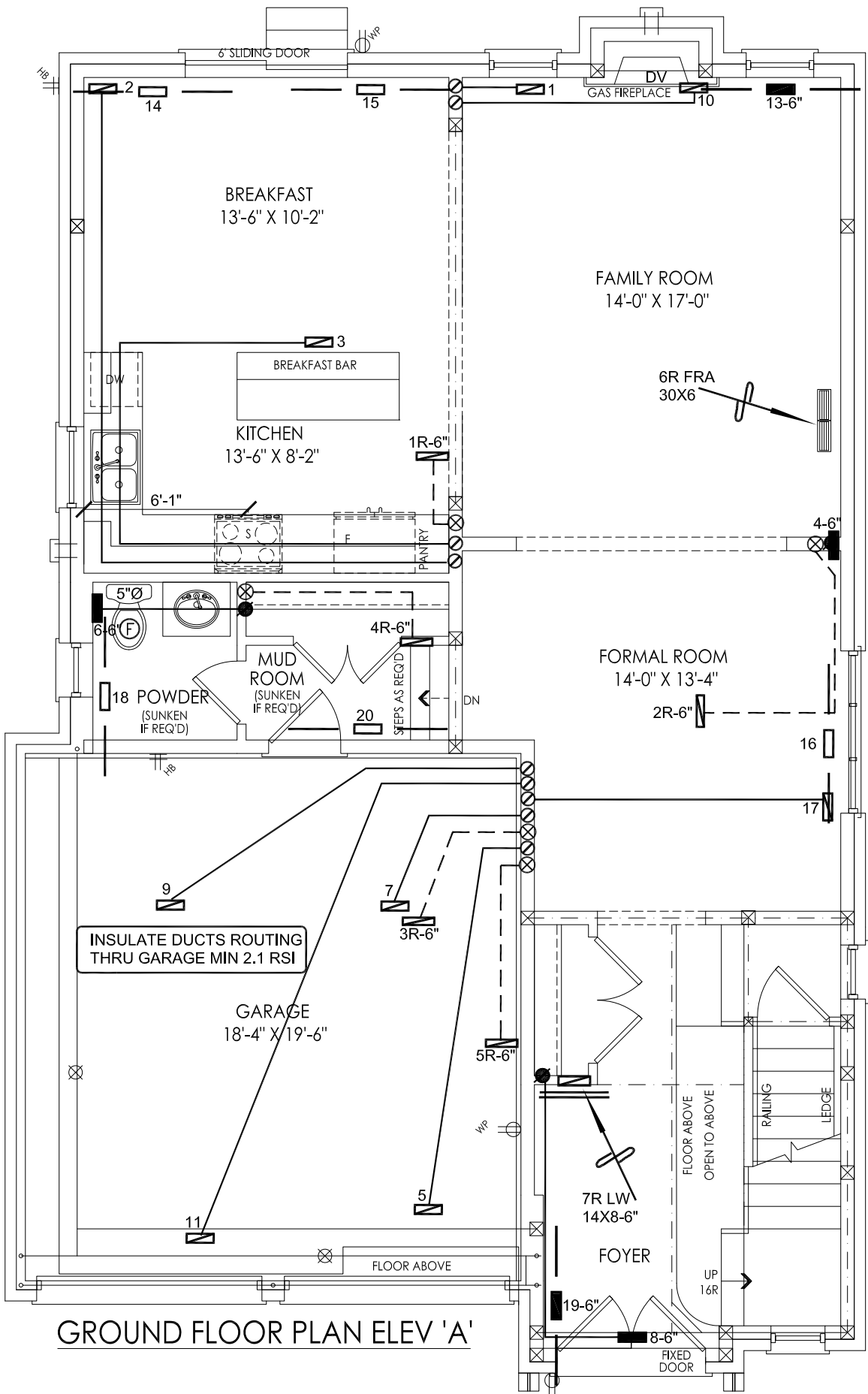
SB-12 PERFORMANCE

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.

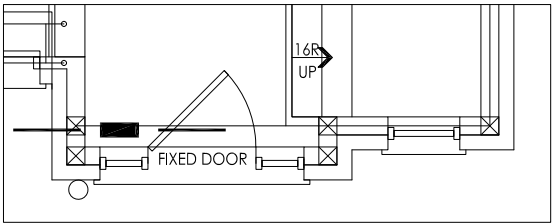
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

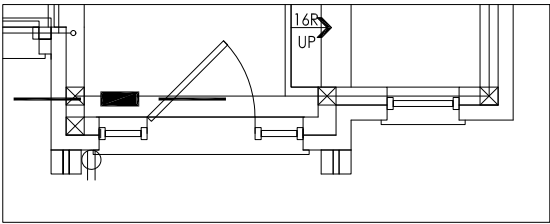
Client		HVAC DESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 43357 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		3RD FLOOR			BASEMENT HEATING LAYOUT	
			MODEL 59TN6A-060-14V		2ND FLOOR				
			INPUT 60 MBTU/H		1ST FLOOR				
			OUTPUT 58 MBTU/H		BASEMENT				
FIN BSMT WUB 38-9 2444 sqft			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		
							LO# 87611		



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.

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

WUB

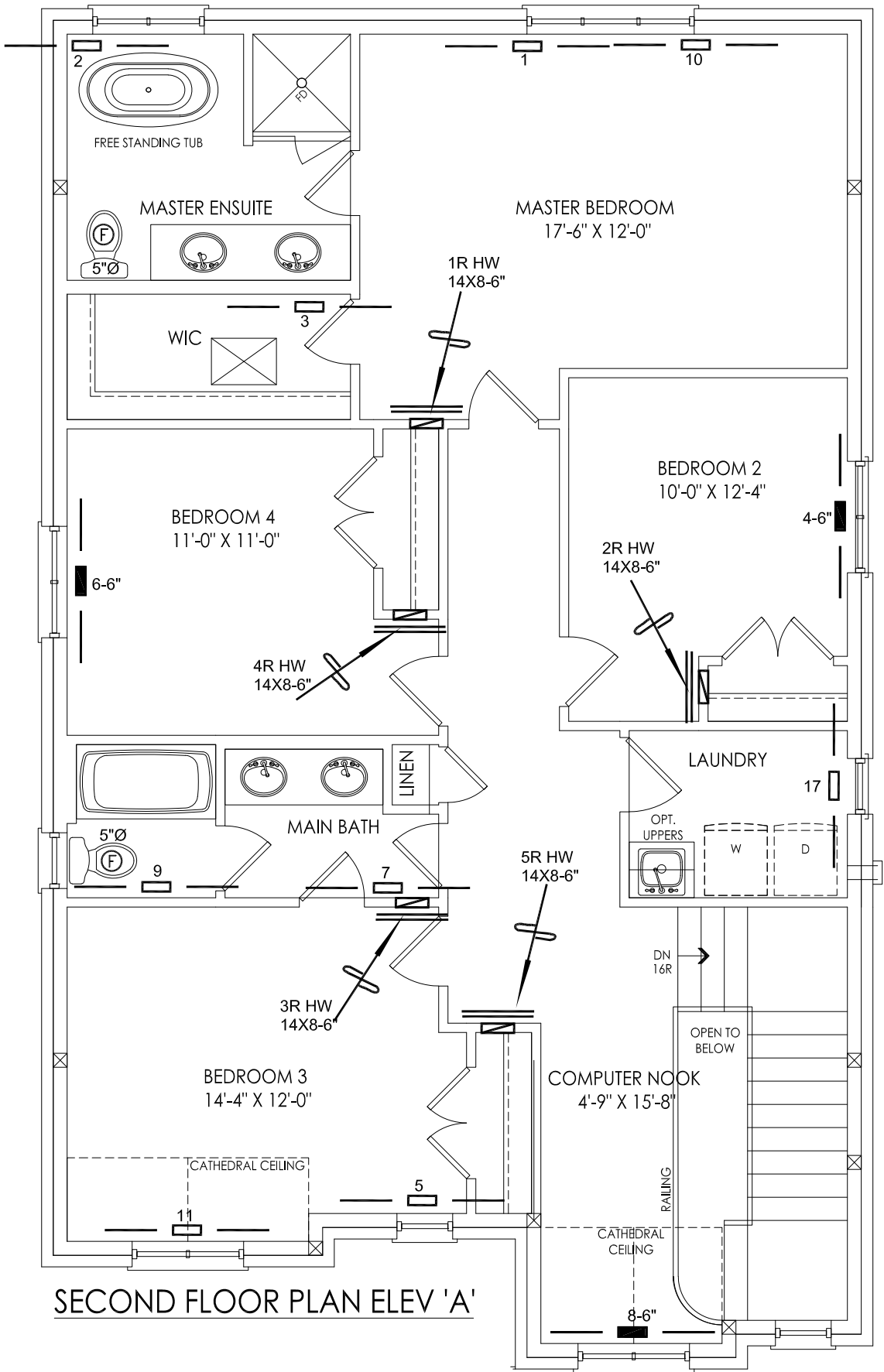
CSA-F280-12

SB-12 PERFORMANCE

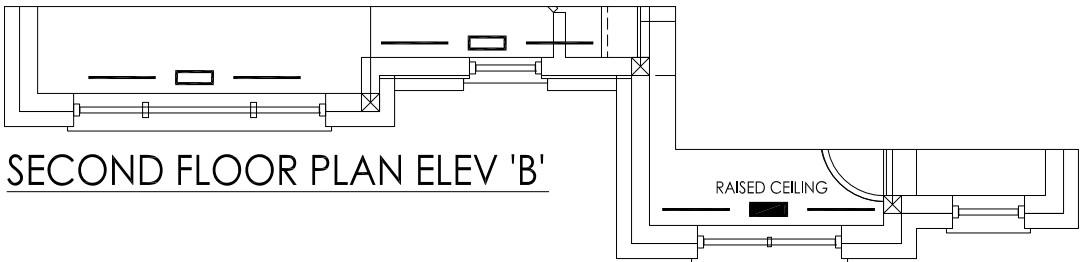
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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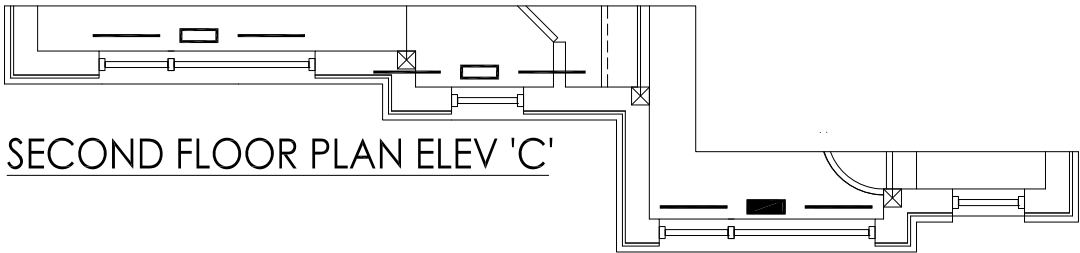
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		Installation 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"
FIN BSMT WUB 38-9			BCIN# 19669	
2444 sqft			LO#	87611



SECOND FLOOR PLAN ELEV 'A'



SECOND FLOOR PLAN ELEV 'B'



SECOND FLOOR PLAN ELEV 'C'

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
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
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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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-9			BCIN# 19669	
2444 sqft			LO#	87611

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@hvacdsgns.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 Bloomington OPT 2ND - FIN BSMT - WUB Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name) declare that (choose one as appropriate):			
☐ 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 22, 2021			
Date		Signature of Designer	

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

ROOM USE	FACTORS		FAM	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	WUB	BAS
EXP. WALL CLG. HT.	LOSS	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
GRS.WALL AREA	354	343			202	126	141	488	122	170	924
GLAZING											
NORTH	0	0	0	0	31	7	0	0	0	0	0
EAST	0	0	0	0	675	152	0	0	0	0	3
SOUTH	0	0	0	0	0	0	0	14	305	65	48
WEST	0	0	12	261	0	0	9	0	0	3	65
SKYLT.	28	610	47	1024	0	0	196	224	0	125	125
DOORS	0	0	0	0	0	0	0	0	0	0	6
NET EXPOSED WALL	326	1369	284	1196	171	500	132	1034	102	147	1459
NET EXPOSED BSMT WALL ABOVE GR	4.2	0.7	171	719	118	82	557	1827	429	618	396
EXPOSED CLG	0	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	10	28	0	0	0	70	0	0	0	0	0
EXPOSED FLOOR	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS	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
SUBTOTAL HT LOSS	2007	2481	1394	745	753	3166	1052	946	1336	6826	4389
SUB TOTAL HT GAIN											
LEVEL FACTOR / MULTIPLIER	0.30	0.30	0.30	0.20	0.30	0.30	0.30	0.30	0.30	0.30	0.50
AIR CHANGE HEAT LOSS	596	737	414	138	224	941	59	281	9	5090	647
AIR CHANGE HEAT GAIN											
DUCT LOSS	0	0	0	88	0	0	0	0	0	0	54
DUCT GAIN											
HEAT GAIN PEOPLE	240			25	0	0	0	0	0	0	0
HEAT GAIN APPLANCES/LIGHTS				0	0	0	0	0	0	0	0
TOTAL HT LOSS BTU/H	2603	3219	1809	971	977	4106	1445	1228	897	11717	1594
TOTAL HT GAIN x 1.3 BTU/H	2607	4944	1525	355	433	1445	405				

TOTAL HEAT GAIN BTU/H:	29253	LOSS DUE TO VENTILATION LOAD BTU/H:	1670	STRUCTURAL HEAT LOSS:	41740	TOTAL COMBINED HEAT LOSS BTU/H:	43410
TONS:	2.44						

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.

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

TYPE: 38-9 OPT 2ND - FIN BSMT - WUB

GFA: 2444 LO# 90459

DATE: Apr-21

HEATING CFM 970

COOLING CFM 970

TOTAL HEAT LOSS 41,740

AIR FLOW RATE CFM 33.43

4th	3rd	2nd	1st	Bas
0	0	0	7	5
0	0	5	2	1

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5'0" unless noted otherwise on layout.

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure 0.35
for s/a & r/aplenium pressure s/a 0.18
max s/a diff press. loss 0.02
min adjusted pressure s/a 0.1659TNS6-060-14V 60
FAN SPEED
LOW 820
MEDIUM 970
HIGH 1520

**CARRIER

AFUE = 97 %

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

DESIGN CFM = 970
CFM @ .5" E.S.P.

TEMPERATURE RISE 55 °F

ROOM #	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	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS	BAS	B-BATH	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	1.61	1.81	0.97	0.98	4.11	1.23	3.26	3.26	0.60	3.26
CFM PER RUN HEAT	27	34	7	28	42	26	12	49	12	27	42	61	37	37	37	42	23	23	95	29	76	76	14	76
RM GAIN MBH	1.62	1.22	0.09	1.60	2.17	1.80	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	2.02	1.53	0.36	0.43	1.44	0.90	0.50	0.50	0.02	0.50
CFM PER RUN COOLING	54	41	3	53	72	60	8	98	8	54	72	87	68	68	68	51	12	14	48	30	17	17	1	17
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	0.17	0.16	0.17	0.17	0.17	0.17	0.17
EQUIVALENT LENGTH	150	150	170	120	120	150	130	170	170	150	160	150	160	150	150	150	140	170	110	180	190	190	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	172	176	198	144	199	243	243	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	0.09	0.1	0.1	0.09	0.11	0.09	0.07	0.07	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	5	4	4	6	4	6	6	4	5
HEATING VELOCITY (ft/min)	198	250	80	143	308	133	138	250	138	198	308	311	272	272	272	308	264	264	484	333	388	388	161	558
COOLING VELOCITY (ft/min)	396	301	34	270	529	306	92	500	92	396	529	444	499	499	499	374	138	161	245	344	87	87	11	125
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	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	A	D	D	D	C	D	A	A	D	C

ROOM #	25
ROOM NAME	BAS
RM LOSS MBH	3.26
CFM PER RUN HEAT	76
RM GAIN MBH	0.50
CFM PER RUN COOLING	17
ADJUSTED PRESSURE	0.17
EQUIVALENT LENGTH	27
ACTUAL DUCT LGH.	100
TOTAL EFFECTIVE LENGTH	127
ADJUSTED PRESSURE	0.14
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	558
COOLING VELOCITY (ft/min)	125
OUTLET GRILL SIZE	3X10
TRUNK	B

TRUNK	CFM	RECT	ROUND	STATIC	TRUNK	VELOCITY	RECT	ROUND	STATIC	TRUNK	VELOCITY
TRUNK A	341	12	9.7	0.07	0	512	0	0	0.00	0	0
TRUNK B	512	16	11.3	0.07	0	576	0	0	0.00	0	0
TRUNK C	220	8	8.2	0.07	0	495	0	0	0.00	0	0
TRUNK D	459	14	10.8	0.07	0	590	0	0	0.00	0	0
TRUNK E	971	24	14.3	0.07	0	728	0	0	0.00	0	0
TRUNK F	0	0	0	0.00	0	0	0	0	0.00	0	0
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11
AIR VOLUME	75	85	85	85	75	340	85	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
ACTUAL DUCT LGH.	46	40	51	58	53	20	37	1	1	1	1
EQUIVALENT LENGTH	235	195	256	213	298	140	267	1	1	1	1
TOTAL EFFECTIVE LENGTH	281	235	256	213	298	140	267	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	0.14	0.14	0.14	0.14
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0

TRUNK	CFM	RECT	ROUND	STATIC	TRUNK	VELOCITY	RECT	ROUND	STATIC	TRUNK	VELOCITY
TRUNK O	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK P	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK Q	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK R	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK S	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK T	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK U	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK V	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK W	0	0	0	0.05	0	0	0	0	0.05	0	0
TRUNK X	970	28	15.6	0.05	15.6	140	0	0	0.05	140	0
TRUNK Y	340	10.5	10.5	0.05	10.5	140	0	0	0.05	140	0
TRUNK Z	245	9.3	9.3	0.05	9.3	140	0	0	0.05	140	0
DROP	970	24	15.6	0.05	15.6	140	0	0	0.05	140	0

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

LO # 90459
OPT 2ND - 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	<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>7</u> @ 10.6 cfm	<u>74.2</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>201.4</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		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>121.9</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANE 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: VANE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency	☒ HVI Approved	
@ 32 deg F (0 deg C)		

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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																							
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																							
LO#: 90459	Model: 38-9	Builder: ROYAL PINE HOMES	Date: 4/22/2021																																																																				
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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	265.56	x																																																																				
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			10647 Btu/h																																																																				
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$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																							
80 CFM	x	78 °F	x																																																																				
		1.08	x																																																																				
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			1670 Btu/h																																																																				
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																							
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																																							
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*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	OPT 2ND - FIN BSMT - WUB	BUILDER: ROYAL PINE HOMES
SFQT: 2444	LO# 90459	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 (ft³):	33762.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	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:	141.0 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%	-

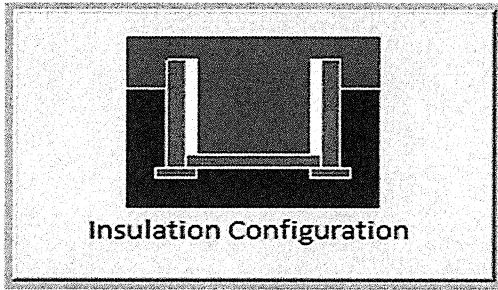
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

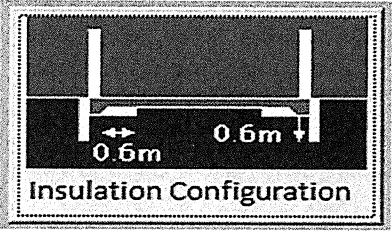
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	 Insulation Configuration
Floor Width (m):	9.1	
Exposed Perimeter (m):	43.0	
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):		1364

TYPE: 38-9
LO# 90459

OPT 2ND - FIN BSMT - WUB

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):	0.6	
Width (m):	4.6	
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):		40

TYPE: 38-9
LO# 90459

OPT 2ND - FIN BSMT - WUB

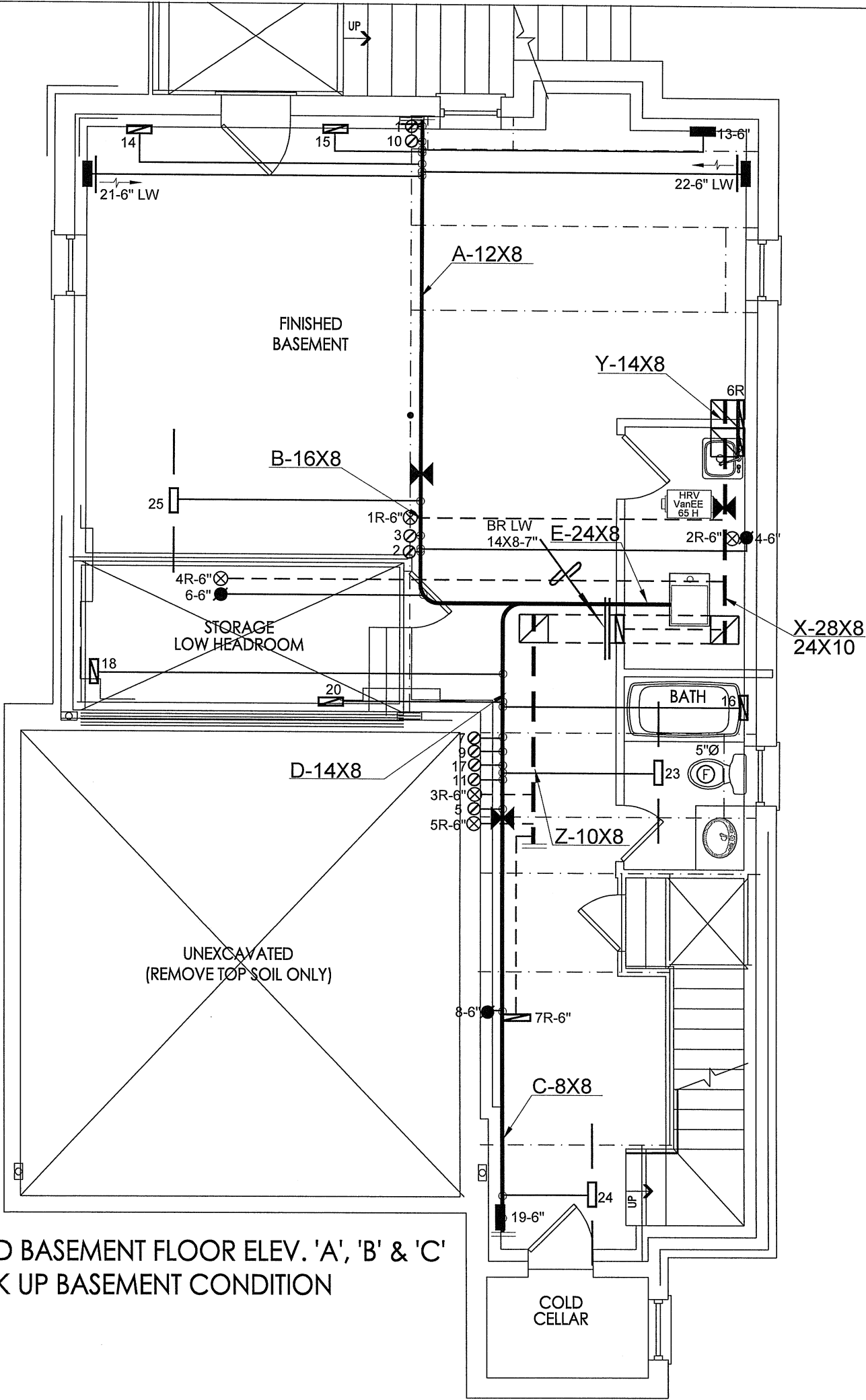
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

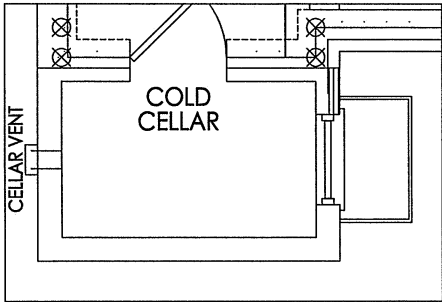
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
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# 90459

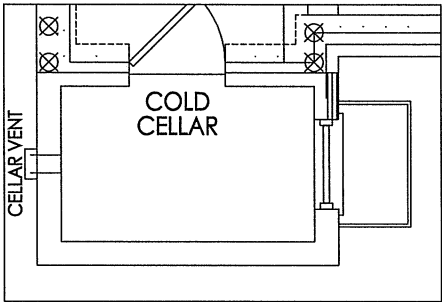
OPT 2ND - FIN BSMT - WUB



OPT FINISHED BASEMENT FLOOR ELEV. 'A', 'B' & 'C'
& OPT. WALK UP BASEMENT CONDITION



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

WUB

CSA-F280-12

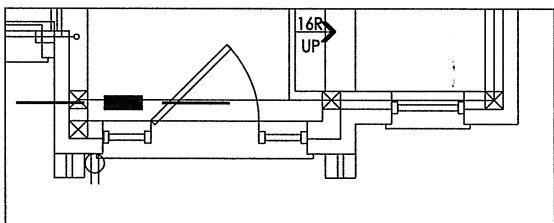
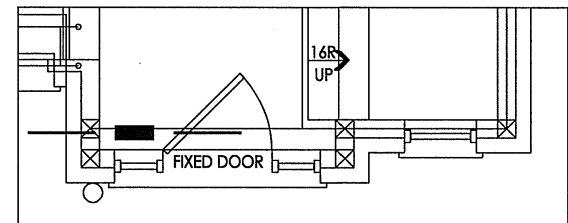
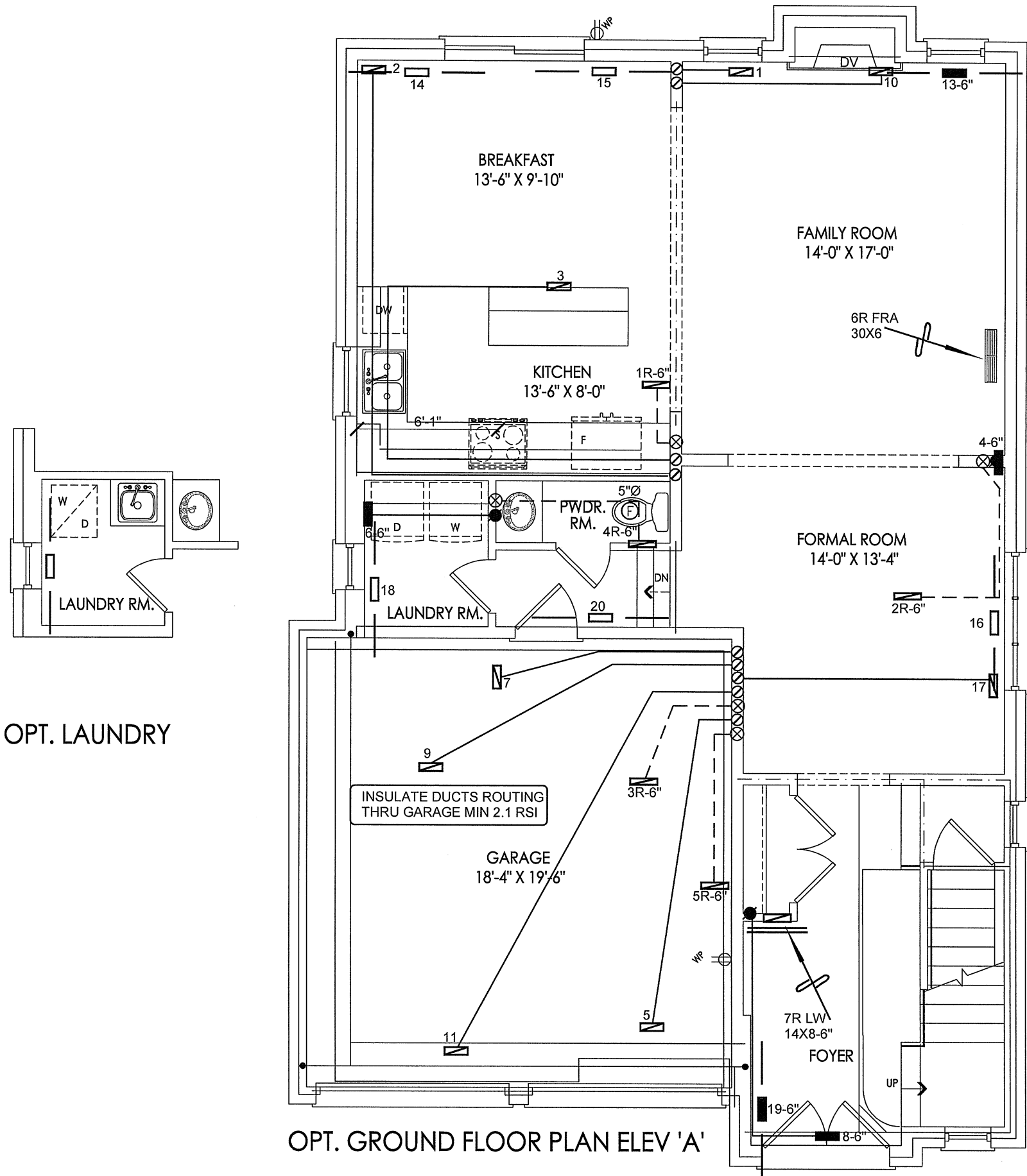
SB-12 PERFORMANCE

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.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.		
	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 43410 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			MODEL	59TN6A-060-14V	2ND FLOOR	12	5	3		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT	60 MBTU/H	1ST FLOOR	7	2	2		
FIN BSMT - WUB 38-9 - OPT 2ND 2444 sqft			OUTPUT	58 MBTU/H	BASEMENT	5	1	1	Date	SEPT/2020
			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				Scale	3/16" = 1'-0"
		FAN SPEED	970 cfm @ 0.6" w.c.	BCIN# 19669						
						LO#	90459			



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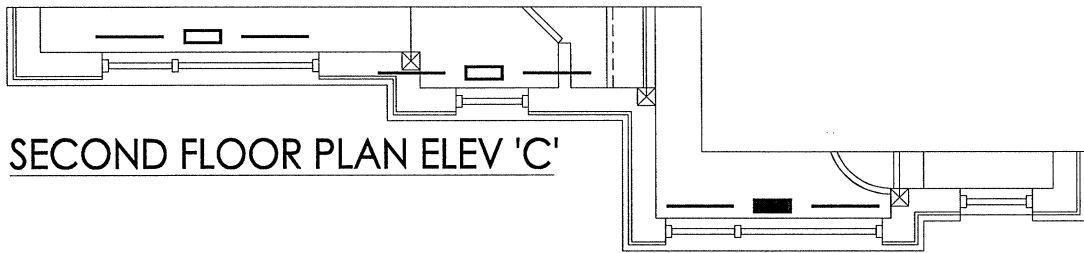
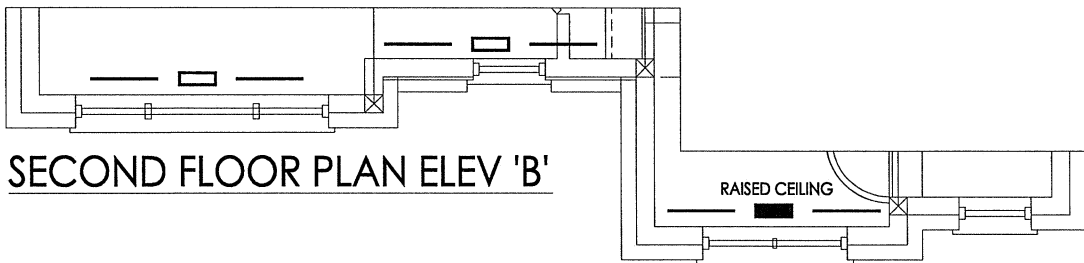
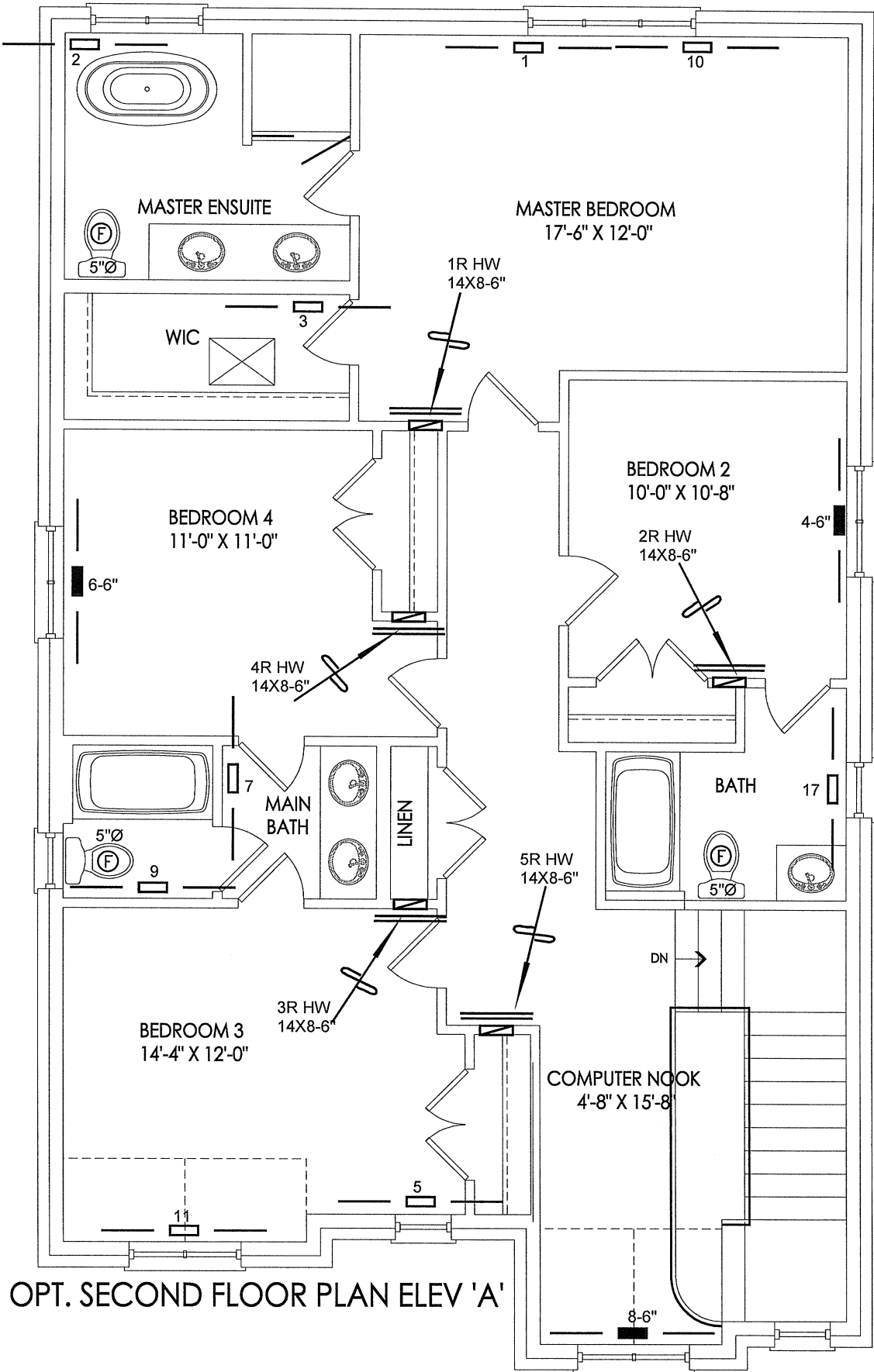
WUB
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND							3.		
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Client ROYAL PINE HOMES		 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.	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date SEPT/2020	
FIN BSMT - WUB 38-9 - OPT 2ND 2444 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 90459	



WUB

CSA-F280-12

SB-12 PERFORMANCE

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

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS	

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ROYAL PINE HOMES			SECOND 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	
FIN BSMT - WUB 38-9 - OPT 2ND 2444 sqft			LO#	90459