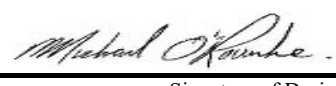


Schedule 1: Designer Information

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: 4502 OPT GROUND 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.			
June 4, 2021		 Signature of Designer	
Date			

NOTE:

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

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

SITE NAME: CENTREFIELD (WEST GORMLEY)										OPT GROUND										DATE: Jun-21			WINTER NATURAL AIR CHANGE RATE 0.219										HEAT LOSS AT °F. 78			CSA-F280-12					
BUILDER: ROYAL PINE HOMES										TYPE: 4502										GFA: 2942			LO# 87509			SUMMER NATURAL AIR CHANGE RATE 0.068										HEAT GAIN AT °F. 13			SB-12 PERFORMANCE		
ROOM USE				MBR		ENS				BED-2		BED-3		BED-4		BATH								ENS-2																	
EXP. WALL				34		11				35		33		35		8								11																	
CLG. HT.				9		8				8		8		8		8								8																	
FACTORS																																									
GRS.WALL AREA		LOSS GAIN		306		88				280		264		280		64								88																	
GLAZING				LOSS GAIN		LOSS GAIN				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN								LOSS GAIN																	
NORTH		21.8	15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	109					7	152	109															
EAST		21.8	40.3	0	0	0	0	0	0	0	0	56	1220	2256	40	871	1611	0	0	0				0	0	0															
SOUTH		21.8	24.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0																
WEST		21.8	40.3	30	654	1209	17	370	685	26	566	1047	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																
DOORS		25.8	4.3	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	276	1161	191	71	299	49	254	1068	176	208	875	144	240	1009	166	57	240	39			81	341	56															
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																
EXPOSED CLG		1.3	0.6	389	511	229	173	227	102	255	335	150	252	331	148	216	284	127	105	138	62			133	175	78															
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	28	79	35	24	67	30	0	0	0			0	0	0															
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	280	731	120	0	0	0	95	248	41			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				2325		896				1970		3235		2232		778								668																	
SUB TOTAL HT GAIN						1628		836				1373		2704		1935		251								243															
LEVEL FACTOR / MULTIPLIER		0.20		0.19				0.20		0.19				0.20		0.19		0.20		0.19				0.20		0.19															
AIR CHANGE HEAT LOSS				443		171				375		617		425		148								127																	
AIR CHANGE HEAT GAIN				71		37				60		118		85		11								11																	
DUCT LOSS				0		0				0		385		0		93								0																	
DUCT GAIN				0		0				0		360		0		26								0																	
HEAT GAIN PEOPLE		240		2		480		0		1		240		1		240		0		0				0		0															
HEAT GAIN APPLIANCES/LIGHTS						539		0				539		539		539		0						0																	
TOTAL HT LOSS BTU/H				2769		1067				2345		4237		2657		1019								795																	
TOTAL HT GAIN x 1.3 BTU/H				3535		1134				2876		5150		3638		374								330																	

ROOM USE		EXP. WALL		CLG. HT.		DEN		GRT		KT/BR		DIN		LAUN		PWD		FOY		MUD								BAS																	
						30		34		37		17		16		6		18		11								172																	
						10		10		10		10		11		10		16		11								9																	
FACTORS		LOSS		GAIN																								1032																	
GRS.WALL AREA		LOSS		GAIN		300		340		370		170		176		60		288		121								LOSS																	
GLAZING						LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN																	
NORTH		21.8	15.6	0	0	0	0	0	0	0	0	0	0	0	8	174	124	0	0	0	0	0	0	0	0	0	0	0	0																
EAST		21.8	40.3	34	741	1370	0	0	0	0	0	0	0	0	0	0	0	0	24	523	967	0	0	0	0	0	0	0	0																
SOUTH		21.8	24.2	0	0	0	0	0	0	0	0	0	20	436	484	0	0	0	7	152	169	0	0	0	0	0	0	0	0																
WEST		21.8	40.3	0	0	0	51	1111	2055	93	2026	3747	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
SKYLT.		35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
DOORS		25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	20	517	85	0	0	0	20	517	85	0	0	0	0	0	0																
NET EXPOSED WALL		4.2	0.7	266	1119	184	289	1215	200	277	1165	192	150	631	104	148	622	102	53	223	37	244	1026	169	121	509	84	0	0																
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
EXPOSED CLG		1.3	0.6	0	0	0	0	0	0	15	20	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
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	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						1859				2326				3211				1066				1314				375				2066				509											
SUB TOTAL HT GAIN						1554				2255				3947				588				312				206				1221				84											
LEVEL FACTOR / MULTIPLIER		0.30				0.27				0.30				0.27				0.30				0.27				0.30				0.27				0.50											
AIR CHANGE HEAT LOSS						506				633				873				290				357				102				562				138											
AIR CHANGE HEAT GAIN						68				99				173				26				14				9				53				4											
DUCT LOSS						0				0				0				0				0				0				0				0											
DUCT GAIN						0				0				0				0				0				0				0				0											
HEAT GAIN PEOPLE		240				0				0				0				0				0				0				0				0											
HEAT GAIN APPLIANCES/LIGHTS						539				539				539				539				539				0				0				0											
TOTAL HT LOSS BTU/H						2365				2959				4084				1357				1671				477				2628				647											
TOTAL HT GAIN x 1.3 BTU/H						2809				3760				6057				1498				1124				280				1656				114											
																																						14267							
																																										1600			

TOTAL HEAT GAIN BTU/H:

36213

TONS: 3.02

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 45345

TOTAL COMBINED HEAT LOSS BTU/H: 47015

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

OPT GROUND
TYPE: 4502

DATE: Jun-21

GFA: 2942 LO# 87509

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,345 TOTAL HEAT GAIN 35,938
AIR FLOW RATE CFM 25.25 AIR FLOW RATE CFM 31.86

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
LOW 820
MEDLOW 0
MEDIUM 1145
MEDIUM HIGH 0
HIGH 1520

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

DESIGN CFM = 1145
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	11	10	4
R/A	0	0	5	3	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-3	BED-2	BED-3	BED-4	BATH	BATH	BED-4	MBR	ENS-2	DEN	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.07	2.12	2.35	2.12	1.33	0.51	0.51	1.33	1.38	0.80	2.36	1.48	2.04	2.04	1.36	1.67	0.48	2.63	0.65	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	35	27	53	59	53	34	13	13	34	35	20	60	37	52	52	34	42	12	66	16	90	90	90	90
RM GAIN MBH.	1.77	1.13	2.57	2.88	2.57	1.82	0.19	0.19	1.82	1.77	0.33	2.81	1.88	3.03	3.03	1.50	1.12	0.28	1.66	0.11	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	56	36	82	92	82	58	6	6	58	56	11	90	60	96	96	48	36	9	53	4	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	27	51	56	65	51	45	44	45	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	160	140	190	140	110	110	150	130	120	140	140	140	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	204	185	228	177	136	140	190	155	155	145	179	156	165	190	149	182	140	140
ADJUSTED PRESSURE	0.1	0.1	0.08	0.08	0.09	0.08	0.08	0.09	0.08	0.1	0.13	0.12	0.09	0.1	0.1	0.12	0.1	0.11	0.1	0.09	0.11	0.09	0.12	0.12
ROUND DUCT SIZE	5	4	6	6	6	5	4	4	5	5	4	6	5	6	6	4	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	310	270	301	270	250	149	149	250	257	229	306	272	265	265	390	482	138	485	184	459	459	459	459
COOLING VELOCITY (ft/min)	411	413	418	469	418	426	69	69	426	411	126	459	441	489	489	551	413	103	389	46	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	D	D	C	B	D	C	A	B	B	D	A	C	C	A	B	A	D	C

RUN #	25
ROOM NAME	GRT
RM LOSS MBH.	1.48
CFM PER RUN HEAT	37
RM GAIN MBH.	1.88
CFM PER RUN COOLING	60
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	47
EQUIVALENT LENGTH	110
TOTAL EFFECTIVE LENGTH	157
ADJUSTED PRESSURE	0.11
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	272
COOLING VELOCITY (ft/min)	441
OUTLET GRILL SIZE	3X10
TRUNK	A

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	281	0.08	8.7	10	x	8	506	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0		
TRUNK B	572	0.08	11.4	16	x	8	644	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0		
TRUNK C	296	0.08	8.9	10	x	8	533	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0		
TRUNK D	572	0.08	11.4	16	x	8	644	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0		
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0	TRUNK 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									BR	TRUNK W TRUNK X TRUNK Y TRUNK Z DROP	0 1145 315 465 1145	0.05 0.05 0.05 0.05 0.05	0 16.6 10.2 11.8 16.6	0 32 12 16 24	x x x x x	8 8 8 8 10	0 644 473 523 687
AIR VOLUME	95	75	85	75	95	155	150	240	0	0	0	0	0	0	0	0	175								
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								
ACTUAL DUCT LGH.	47	79	54	40	47	32	27	38	1	1	1	1	1	1	1	1	14								
EQUIVALENT LENGTH	175	225	215	255	175	230	145	190	0	0	0	0	0	0	0	0	135								
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	1	1	1	1	1	1	1	1	149								
ADJUSTED PRESSURE	0.07	0.05	0.06	0.05	0.07	0.06	0.09	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10									
ROUND DUCT SIZE	6	6	6	6	6	7.5	6.7	8.8	0	0	0	0	0	0	0	0	6.9								
INLET GRILL SIZE	8	8	8	8	8	8	8	6	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	X								
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	0	14								

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87509
OPT GROUND

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	79.5 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
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<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:	June-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#: 87509	Model: 4502	Builder: ROYAL PINE HOMES	Date: 2021-06-04																																																									
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>1305</td> <td>9</td> <td>11745</td> </tr> <tr> <td>First</td> <td>1305</td> <td>10</td> <td>13050</td> </tr> <tr> <td>Second</td> <td>1637</td> <td>8</td> <td>13096</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>37,891.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1073.0 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1305	9	11745	First	1305	10	13050	Second	1637	8	13096	Third	0	9	0	Fourth	0	9	0	Total:			37,891.0 ft³	Total:			1073.0 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%;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.068</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>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	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)																																																									
Bsmt	1305	9	11745																																																									
First	1305	10	13050																																																									
Second	1637	8	13096																																																									
Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			37,891.0 ft³																																																									
Total:			1073.0 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.219																																																											
SUMMER NATURAL AIR CHANGE RATE	0.068																																																											
Design Temperature Difference																																																												
	Tin °C	Tout °C	ΔT °C	ΔT °F																																																								
Winter DTDh	22	-21	43	78																																																								
Summer DTDc	24	31	7	13																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 298.04 x 43 °C x 1.2 = 3382 W = 11538 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 298.04 x 7 °C x 1.2 = 173 W = 592 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">11,538</td> <td>8,498</td> <td>0.679</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>12,726</td> <td>0.272</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>12,105</td> <td>0.191</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> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0					Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	11,538	8,498	0.679	2	0.3	12,726	0.272	3	0.2	12,105	0.191	4	0	0	0.000	5	0	0	0.000																														
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,538	8,498	0.679																																																								
2	0.3		12,726	0.272																																																								
3	0.2		12,105	0.191																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4502	OPT GROUND	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 87509	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):	37891.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 48.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	172.0 ft

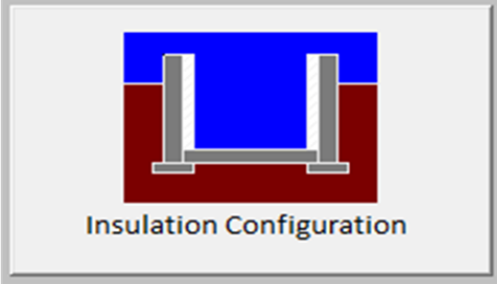
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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):	14.6	
Floor Width (m):	11.6	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	0.8	
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):		1724

TYPE: 4502
LO# 87509

OPT GROUND

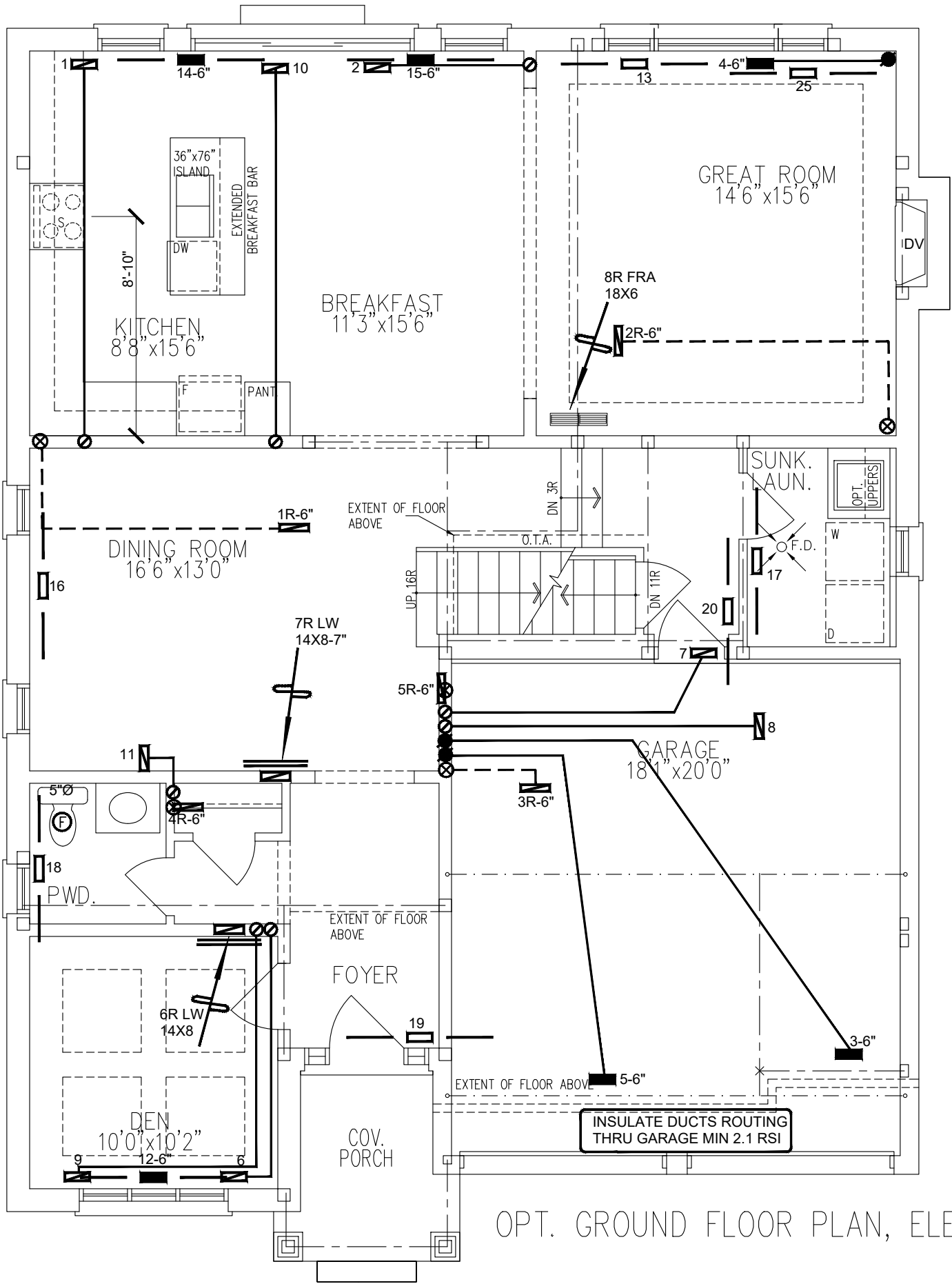
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

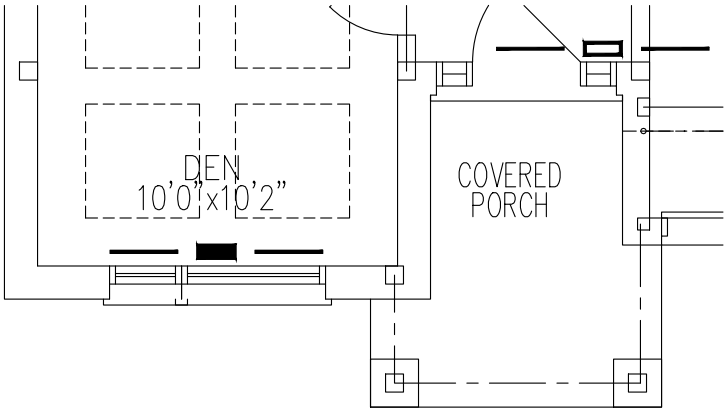
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1073.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		1001.6 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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4502
LO# 87509

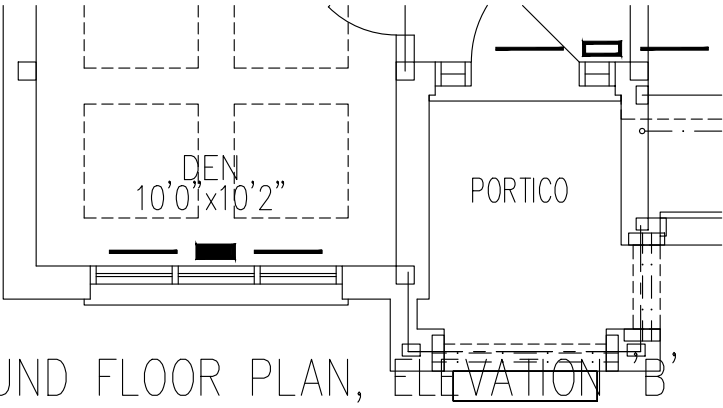
OPT GROUND



OPT. GROUND FLOOR PLAN, ELEVATION 'A'



OPT. GROUND FLOOR PLAN, ELEVATION 'C'



OPT. GROUND FLOOR PLAN, ELEVATION 'B'

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.

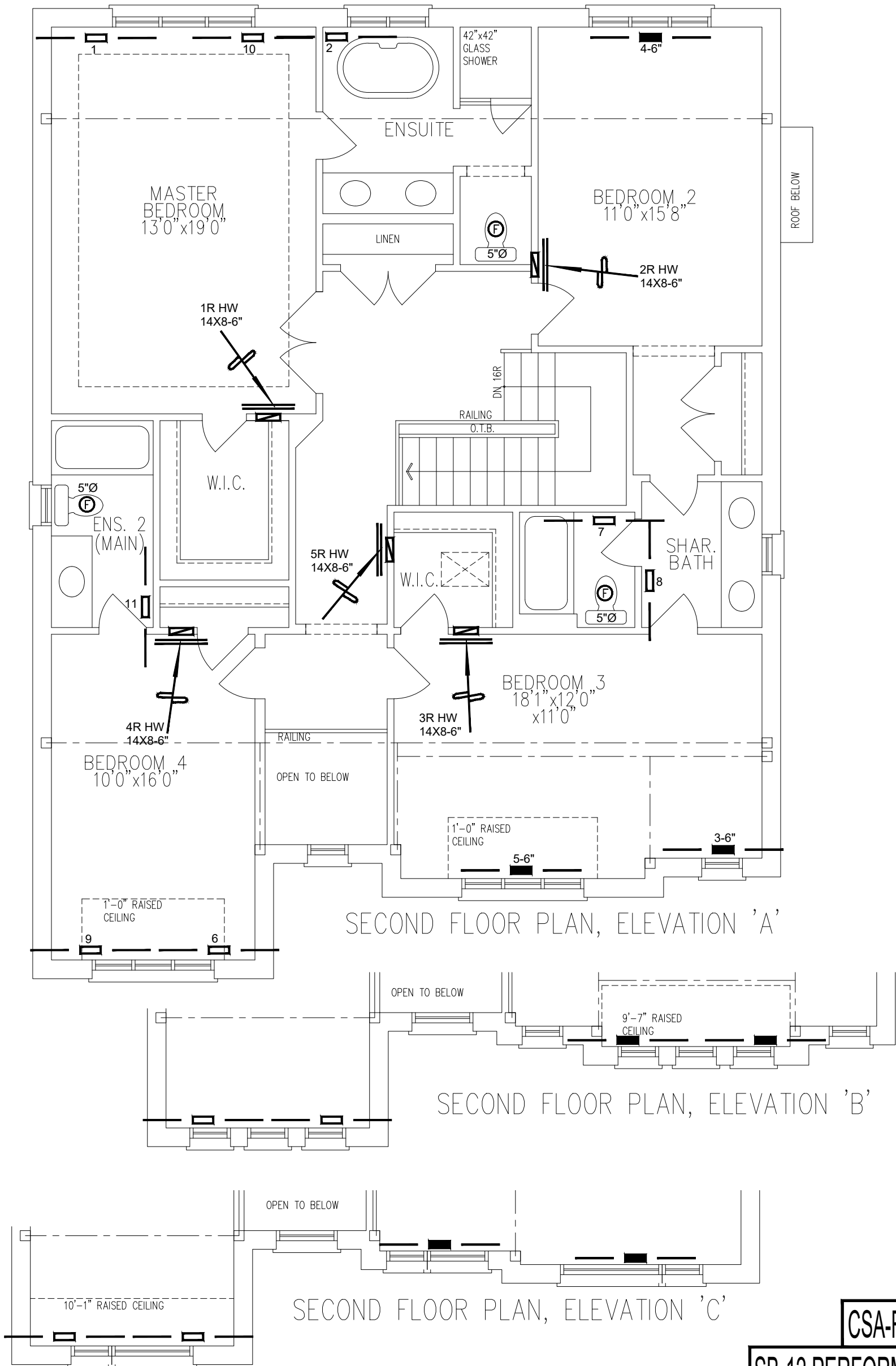
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
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		 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			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
OPT GROUND 4502			Scale	3/16" = 1'-0"
			BCIN# 19669	
			LO#	87509
2942 sqft				



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.	REVISED AS PER CAD	JUNE/2021
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		 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			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
OPT GROUND 4502 2942 sqft			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	87509	