

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 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.			
June 4, 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)

BUILDER: ROYAL PINE HOMES

TYPE: 4502

GFA: 2942

DATE: Jun-21
LO# 87508

WINTER NATURAL AIR CHANGE RATE 0.219
SUMMER NATURAL AIR CHANGE RATE 0.068

HEAT LOSS ΔT °F. 78
HEAT GAIN ΔT °F. 13

CSA-F280-12
SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LOSS	GAIN	MBR	ENS	BED-2	BED-3	BED-4	BATH	ENS-2
						34	11	35	33	35	8	11
						9	8	8	8	8	8	8
GRS.WALL AREA	GLAZING					306	88	280	264	280	64	88
						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	15.8	0	0	0	0	0	0	0	0	7	152
EAST	21.8	40.9	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.5	0	0	0	0	0	0	0	0	0	0
WEST	21.8	40.9	30	654	1228	17	370	26	566	1064	0	0
SKYLT.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	276	1161	191	71	299	254	1068	176	208	875
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	389	511	229	173	227	255	335	150	252	331
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	28	79
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	280	731
BASEMENT/CRAWL HEAT LOSS			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
SUBTOTAL HT LOSS			2325			896		1970			2232	
SUB TOTAL HT GAIN				1647		846		1390			1960	
LEVEL FACTOR / MULTIPLIER	0.20	0.19				0.20	0.19	0.20	0.19	0.20	0.19	0.20
AIR CHANGE HEAT LOSS			443			171		375			425	
AIR CHANGE HEAT GAIN				72		37		61			86	
DUCT LOSS			0			0		0			0	
DUCT GAIN			0			0		0			0	
HEAT GAIN PEOPLE	240	2	480	0	0	0	0	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS			539	0	0	0	0	539	539	539	539	0
TOTAL HT LOSS BTU/H			2769			1067		2345			2657	
TOTAL HT GAIN x 1.3 BTU/H			3560			1149		2899			3673	

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LOSS	GAIN	LIV	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
GRS.WALL AREA	GLAZING					300	340	370	170	176	60	288	121	1032
						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	15.8	0	0	0	0	0	0	0	8	174	126	0	0
EAST	21.8	40.9	34	741	1391	0	0	0	0	0	0	0	24	523
SOUTH	21.8	24.5	0	0	0	0	0	0	0	0	0	0	0	0
WEST	21.8	40.9	0	0	0	51	1111	2087	87	1895	3560	0	0	0
SKYLT.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	283	1190	196	150	631	104
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	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
NO ATTIC EXPOSED CLG	2.8	1.3	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
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			1859			2326		3105			1314		2066	
SUB TOTAL HT GAIN				1575		2287		3765			595		1236	
LEVEL FACTOR / MULTIPLIER	0.30	0.27				0.30	0.27	0.30	0.27	0.30	0.27	0.30	0.27	0.30
AIR CHANGE HEAT LOSS			510			638		852			292		360	
AIR CHANGE HEAT GAIN				69		100		165			26		14	
DUCT LOSS			0			0		0			0		0	
DUCT GAIN			0			0		0			0		0	
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			539	539	539	539	539	539	539	539	539	539	539	539
TOTAL HT LOSS BTU/H			2369			2964		3957			1359		1674	
TOTAL HT GAIN x 1.3 BTU/H			2839			3804		5809			1508		1127	

TOTAL HEAT GAIN BTU/H:

36233

TONS: 3.02

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 45240

TOTAL COMBINED HEAT LOSS BTU/H: 46910

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

TYPE: 4502

DATE: Jun-21

GFA: 2942

LO# 87508

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,240 TOTAL HEAT GAIN 35,958
AIR FLOW RATE CFM 25.31 AIR FLOW RATE CFM 31.84

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	11	10	4
R/A	0	0	5	3	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 1145
MEDIUM HIGH 0
HIGH 1520

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

TEMPERATURE RISE 47 °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	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	LIV	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	2.37	1.48	1.98	1.98	1.36	1.67	0.48	2.63	0.65	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	35	27	54	59	54	34	13	13	34	35	20	60	38	50	50	34	42	12	67	16	90	90	90	90
RM GAIN MBH.	1.78	1.15	2.60	2.90	2.60	1.84	0.19	0.19	1.84	1.78	0.33	2.84	1.90	2.90	2.90	1.51	1.13	0.28	1.68	0.11	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	57	37	83	92	83	58	6	6	58	57	11	90	61	92	92	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	275	301	275	250	149	149	250	257	229	306	279	255	255	390	482	138	492	184	459	459	459	459
COOLING VELOCITY (ft/min)	419	424	423	469	423	426	69	69	426	419	126	459	448	469	469	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	38
RM GAIN MBH.	1.90
CFM PER RUN COOLING	61
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)	279
COOLING VELOCITY (ft/min)	448
OUTLET GRILL SIZE	3X10
TRUNK	A

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY		TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)		CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK A	283	0.08	8.7	10	x	8	509	TRUNK G	0	0.00	0	0	8
TRUNK B	570	0.08	11.4	16	x	8	641	TRUNK H	0	0.00	0	0	8
TRUNK C	297	0.08	8.9	10	x	8	535	TRUNK I	0	0.00	0	0	8
TRUNK D	575	0.08	11.4	16	x	8	647	TRUNK J	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK O	0	0.05	0	0	x	8
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	0	0.05	0	0	x	8
TRUNK X	1145	0.05	16.6	32	x	8
TRUNK Y	315	0.05	10.2	12	x	8
TRUNK Z	465	0.05	11.8	16	x	8
DROP	1145	0.05	16.6	24	x	10

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	95	75	85	75	95	155	150	240	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
ACTUAL DUCT LGH.	47	79	54	40	47	32	27	38	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	135
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	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	6.9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	14	16	0	0	0	0	0	0	0	14

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87508

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
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	☒ 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:	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#: 87508	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)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
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		12,621	0.274																																																								
3	0.2		12,105	0.191																																																								
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: 4502	BUILDER: ROYAL PINE HOMES
SFQT: 2942	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87508	

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

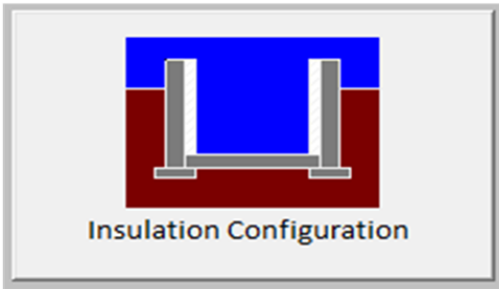
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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	 Insulation Configuration
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

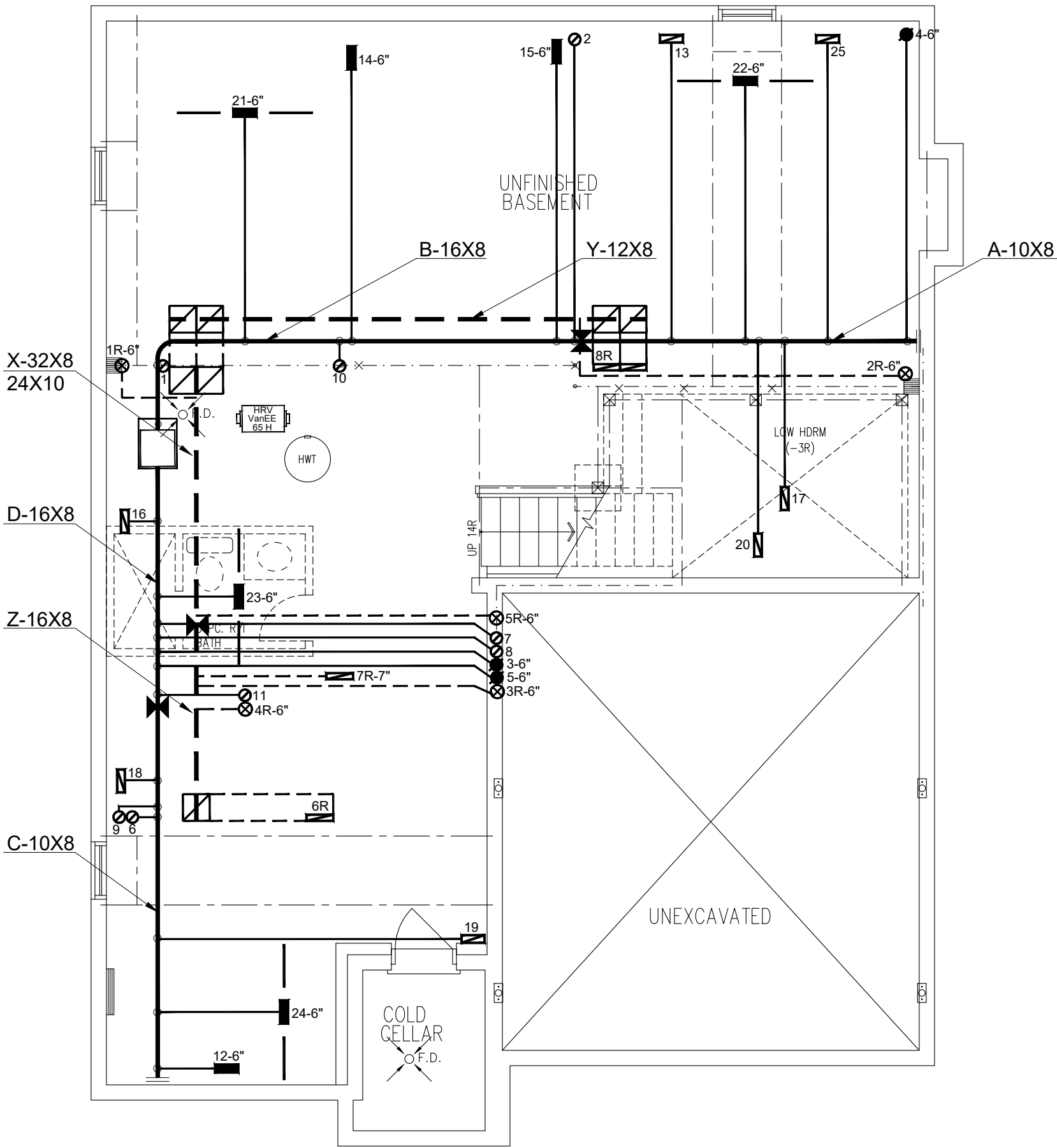
TYPE: 4502
LO# 87508

Air Infiltration Residential Load Calculator

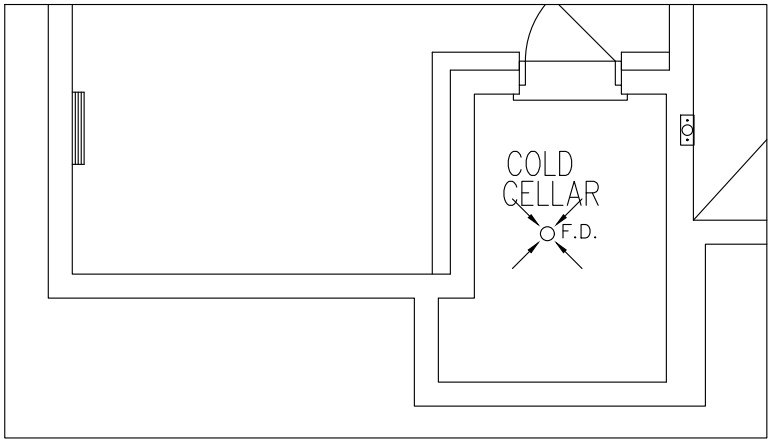
Supplemental tool for CAN/CSA-F280

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# 87508



BASEMENT PLAN, ELEVATION 'A' & 'B'



BASEMENT PLAN, ELEVATION '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, BCIN# 19669
HVAC DESIGNS LTD.

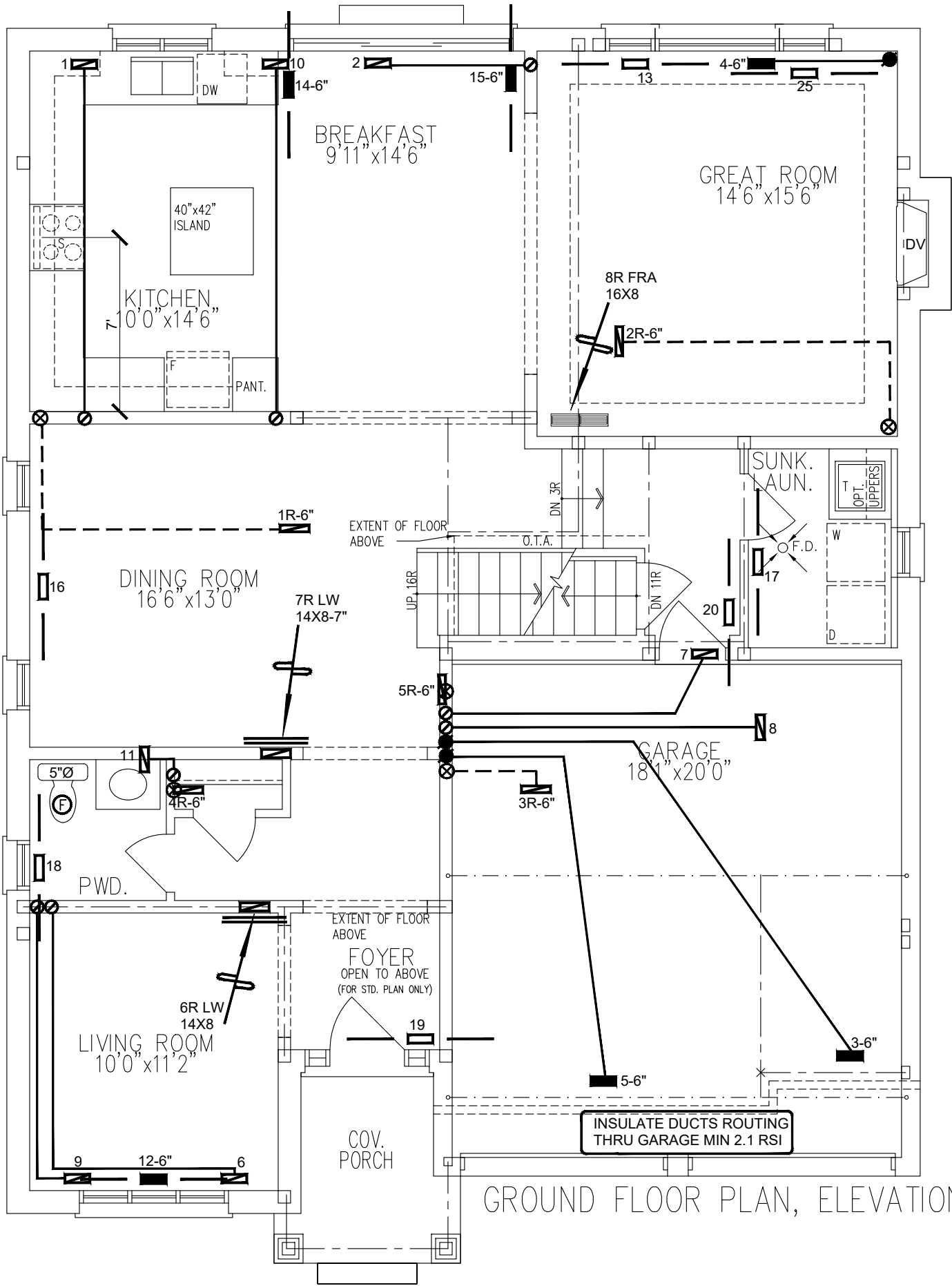
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
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

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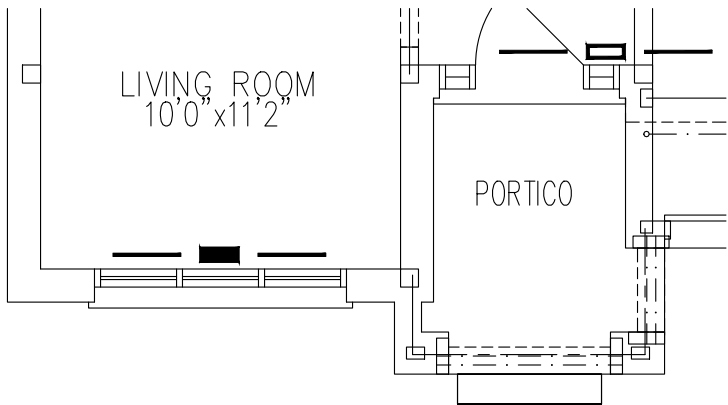
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 46910 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	59SP5A-60-14	2ND FLOOR	11	5	3		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT	60 MBTU/H	1ST FLOOR	10	3	2		
			OUTPUT	58 MBTU/H	BASEMENT	4	1	0	Date	SEPT/2020
		COOLING	3.0 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	1145 cfm @ 0.6" w.c.					BCIN# 19669		
4502 2942 sqft						LO# 87508				

4502

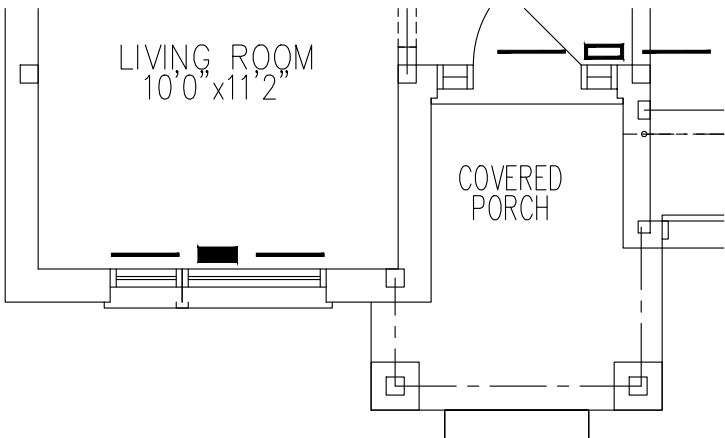
2942 sqft



GROUND FLOOR PLAN, ELEVATION 'A'



GROUND FLOOR PLAN, ELEVATION 'B'



GROUND FLOOR PLAN, ELEVATION 'C'

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

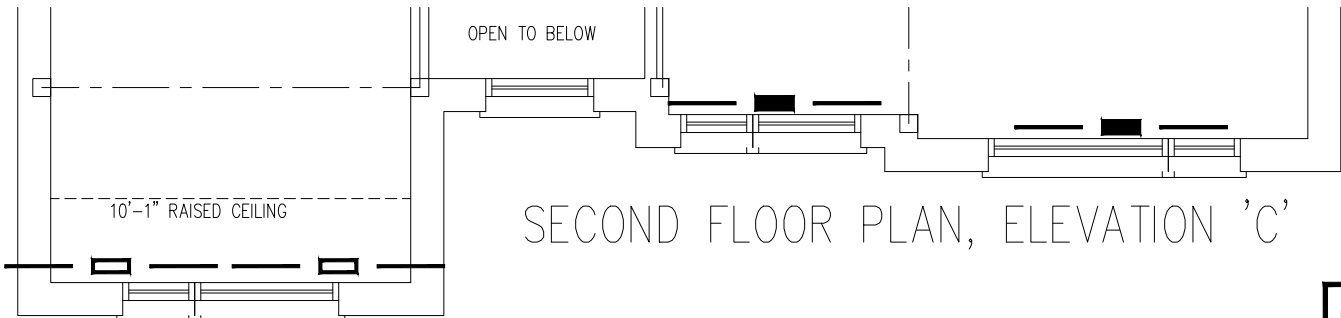
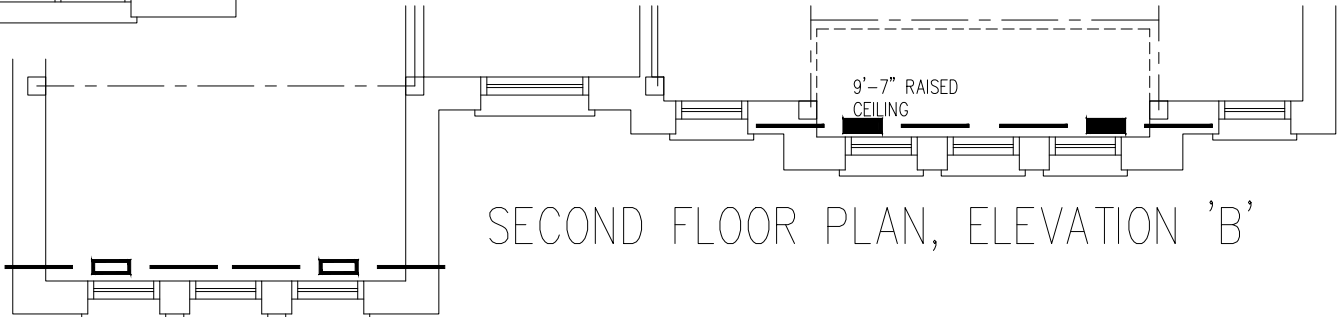
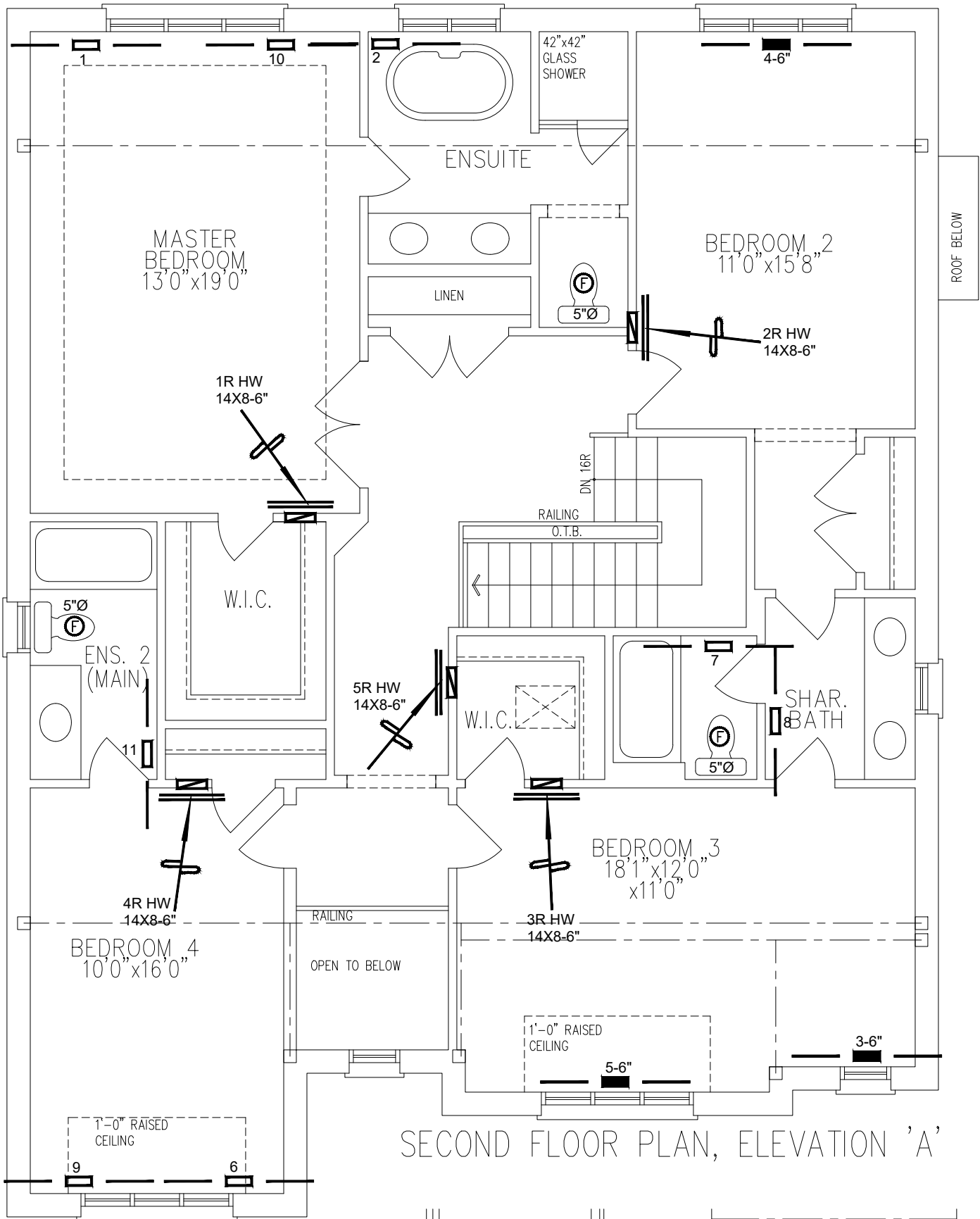
CSA-F280-12

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
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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	
Project Name			FIRST FLOOR HEATING LAYOUT	
ROYAL PINE HOMES			Date SEPT/2020	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		Scale 3/16" = 1'-0"		
		BCIN# 19669		
4502	2942 sqft	LO#	87508	



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

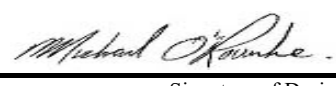
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
45022942 sqft			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	87508	
		Installation 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.		

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> (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.			
June 4, 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			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					
GRS.WALL AREA	FACTORS		306		88		280		264		280		64						88					
GLAZING	LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						LOSS GAIN					
NORTH	21.8	15.6	0	0	0	0	0	0	0	0	0	0	7	152	109				7	152	109			
EAST	21.8	40.3	0	0	0	0	0	0	56	1220	2256	40	871	1611	0	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				
WEST	21.8	40.3	30	654	1209	17	370	685	26	566	1047	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				
DOORS	25.8	4.3	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	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			
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			
SUBTOTAL HT LOSS			2325		896		1970		3235		2232		778		668		243							
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		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		0	
HEAT GAIN APPLIANCES/LIGHTS			539		0		539		539		539		0		0									
TOTAL HT LOSS BTU/H			2769		1067		2345		4237		2657		1019		795		330							
TOTAL HT GAIN x 1.3 BTU/H			3535		1134		2876		5150		3638		374		330									

	ROOM USE			DEN	GRT	KT/BR	DIN	LAUN	PWD	FOY	MUD			BAS
	EXP. WALL			30	34	37	17	16	6	18	11			172
	CLG. HT.			10	10	10	10	11	10	16	11			9
	FACTORS													
	GRS.WALL AREA			LOSS	GAIN									1032
	GLAZING			LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	15.6	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
SOUTH	21.8	24.2	0	0	0	0	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
SKYL.T.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	277	1165	192	150	631	104
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	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
NO ATTIC EXPOSED CLG	2.8	1.3	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
BASEMENT/CRAWL HEAT LOSS			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0		
SUBTOTAL HT LOSS			1859			2326			3211			1066		
SUB TOTAL HT GAIN				1554		2255			3947			588		
LEVEL FACTOR / MULTIPLIER	0.30	0.27				0.30	0.27		0.30	0.27		0.30	0.27	
AIR CHANGE HEAT LOSS			506			633			873			290		
AIR CHANGE HEAT GAIN				68		99			173			26		
DUCT LOSS			0			0			0			0		
DUCT GAIN				0		0			0			0		
HEAT GAIN PEOPLE	240		0			0			0			0		
HEAT GAIN APPLIANCES/LIGHTS				539		539			539			539		
TOTAL HT LOSS BTU/H			2365			2959			4084			1357		
TOTAL HT GAIN x 1.3 BTU/H				2809		3760			6057			1498		

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					
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 B	572	0.08	11.4	16	x	8	644			TRUNK H	0	0.00	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 D	572	0.08	11.4	16	x	8	644			TRUNK J	0	0.00	0	0	x	8	0		
TRUNK E	0	0.00	0	0	x	8	0			TRUNK K	0	0.00	0	0	x	8	0		
TRUNK F	0	0.00	0	0	x	8	0			TRUNK L	0	0.00	0	0	x	8	0		

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	95	75	85	75	95	155	150	240	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	0.15
ACTUAL DUCT LGH.	47	79	54	40	47	32	27	38	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	225	215	255	175	230	145	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	6	6	6	6	6	7.5	6.7	8.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	6	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	X
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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		<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
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	☒ 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:	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="3" style="text-align: right;">Total:</td> <td>37,891.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</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
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 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																														
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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

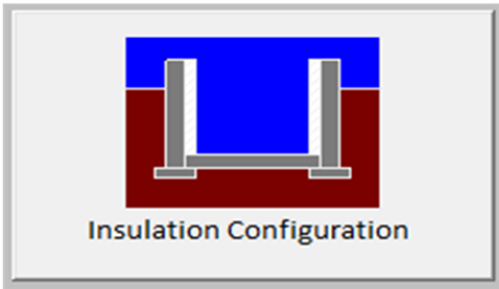
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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

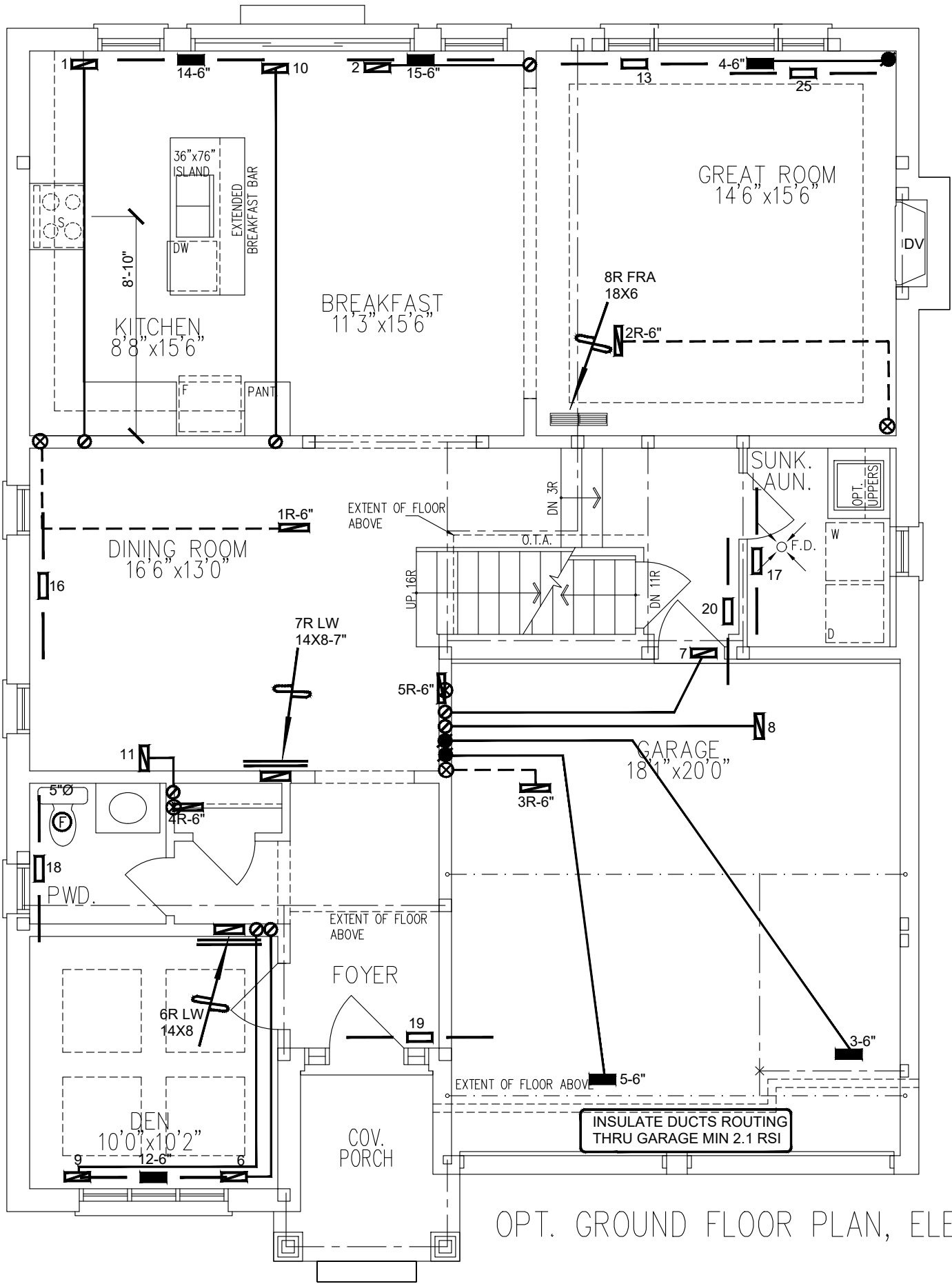
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

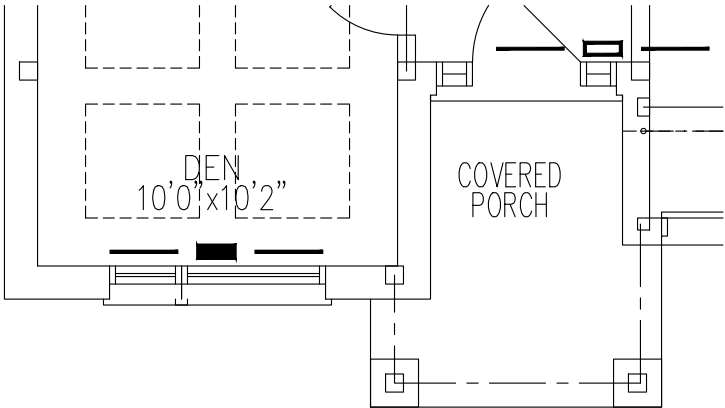
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.40			
Building Configuration				
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

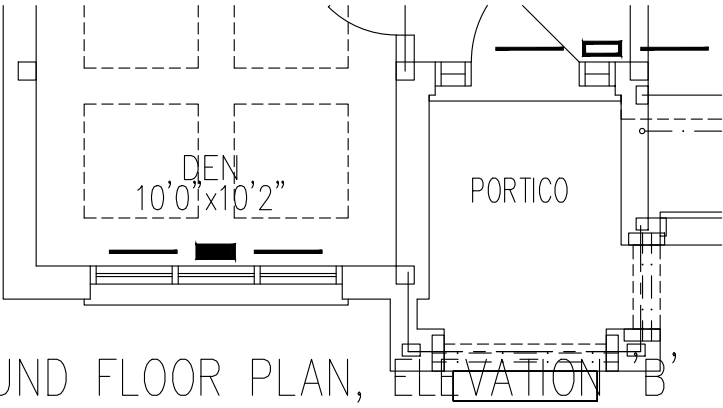
OPT GROUND



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.

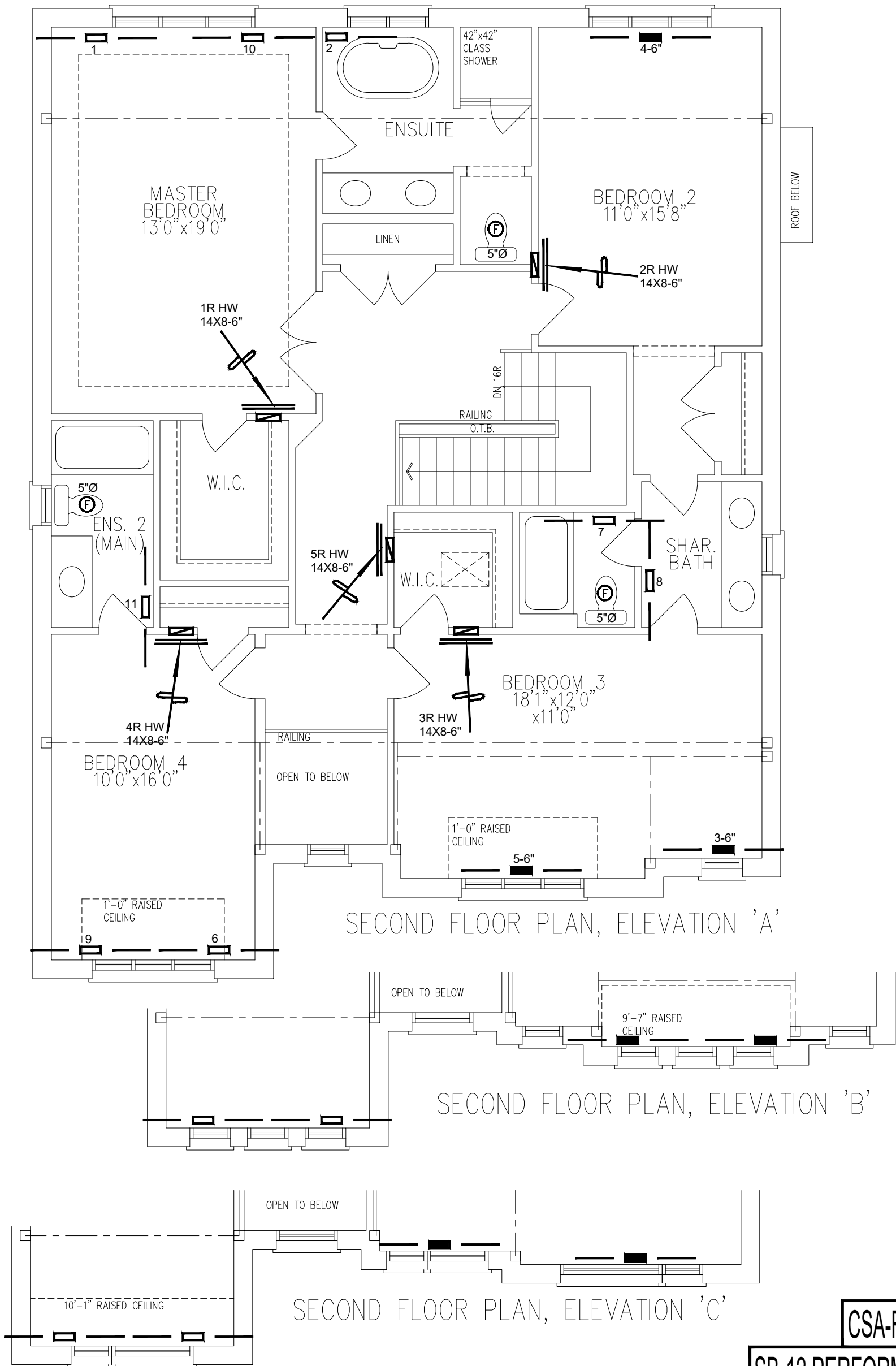
CSA-F280-12

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			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND 4502			BCIN# 19669	
2942 sqft		LO#	87509	



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

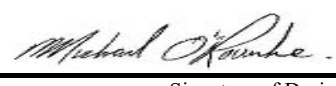
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
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

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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			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	

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 2ND 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 2ND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12							
BUILDER: ROYAL PINE HOMES				TYPE: 4502				GFA: 2942				LO# 87510				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE			
ROOM USE		MBR		ENS		WIC		BED-4		BED-2		BED-3		BATH		BED-5		ENS-2									
EXP. WALL		32		11		14		11		33		33		9		25		9									
CLG. HT.		9		8		8		8		8		8		8		8		8									
FACTORS																											
GRS.WALL AREA		LOSS GAIN		288		88		112		88		264		264		72		200		72		LOSS GAIN					
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN					
NORTH		21.8	15.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	110				
EAST		21.8	40.9	0	0	0	0	0	0	0	0	56	1220	2291	40	871	1637	9	196	368	0	0	0				
SOUTH		21.8	24.5	0	0	0	0	0	0	0	18	392	442	0	0	0	0	0	0	0	0	0	0				
WEST		21.8	40.9	26	566	1064	17	370	696	0	0	0	0	0	0	0	0	0	0	17	370	696					
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	262	1102	181	71	299	49	112	471	77	70	294	48	208	875	144	224	942	155	63	265	44			
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				
EXPOSED CLG		1.3	0.6	255	335	150	187	246	110	266	350	156	154	202	91	252	331	148	192	252	113	90	118	53			
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	110	287	47	0	0	0	280	731	120	0	0	0	24	63	10			
BASEMENT/CRAWL HEAT LOSS				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					
SUBTOTAL HT LOSS				2003		915		1108		889		3235		2133		642		1342		603							
SUB TOTAL HT GAIN				1395		855		281		581		2739		1935		475		913		235							
LEVEL FACTOR / MULTIPLIER		0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18				
AIR CHANGE HEAT LOSS		359				164				199				159		580		382		115		241					
AIR CHANGE HEAT GAIN				65		40		13		27		128		91				22		43		11					
DUCT LOSS		0				0		131		0		382		0		76		0		0		0					
DUCT GAIN				0		0		29		0		360		0		50		0		0		0					
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	0	1	240	0	1	240	0	0				
HEAT GAIN APPLIANCES/LIGHTS				490		0		0		490		490		490		490		0		490		0					
TOTAL HT LOSS BTU/H				2362		1079		1437		1048		4197		2516		833		1583		711							
TOTAL HT GAIN x 1.3 BTU/H				3160		1163		421		1740		5145		3582		711		2192		319							

ROOM USE		LIV	GRT	KT/BR	DIN	LAUN	PWD	FOY	MUD				BAS
EXP. WALL		30	34	37	17	16	6	18	11				172
CLG. HT.		10	10	10	10	11	10	10	11				9
FACTORS													
GRS.WALL AREA	LOSS GAIN	300	340	370	170	176	60	180	121				1032
GLAZING		LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN				LOSS GAIN
NORTH	21.8 15.8	0 0 0	0 0 0	0 0 0	0 0 0	8 174 126	0 0 0	0 0 0	0 0 0				0 0 0
EAST	21.8 40.9	34 741 1391	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	14 305 573	0 0 0				0 0 0
SOUTH	21.8 24.5	0 0 0	0 0 0	0 0 0	20 436 491	0 0 0	7 152 172	0 0 0	0 0 0				6 131 147
WEST	21.8 40.9	0 0 0	51 1111 2087	87 1895 3560	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				3 65 123
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	20 517 85	0 0 0	20 517 85	0 0 0				20 517 85
NET EXPOSED WALL	4.2 0.7	266 1119 184	289 1215 200	283 1190 196	150 631 104	148 622 102	53 223 37	146 614 101	121 509 84				0 0 0
NET EXPOSED BSMT WALL ABOVE GR	3.7 0.6	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				516 1901 313
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 0
NO ATTIC EXPOSED CLG	2.8 1.3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				0 0 0
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 0
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0				5884
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0				
SUBTOTAL HT LOSS		1859	2326	3105	1066	1314	375	1436	509				8498
SUB TOTAL HT GAIN		1575	2287	3765	595	314	208	759	84				668
LEVEL FACTOR / MULTIPLIER	0.30 0.29		0.30 0.29	0.30 0.29	0.30 0.29	0.30 0.29	0.30 0.29	0.30 0.29	0.30 0.29				0.50 0.68
AIR CHANGE HEAT LOSS		537	672	896	308	379	108	414	147				5769
AIR CHANGE HEAT GAIN		74	107	176	28	15	10	36	4				31
DUCT LOSS		0	0	0	0	0	0	0	0				0
DUCT GAIN		0	0	0	0	0	0	0	0				0
HEAT GAIN PEOPLE	240	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0				0
HEAT GAIN APPLIANCES/LIGHTS		490	490	490	490	490	490	0	0				490
TOTAL HT LOSS BTU/H		2396	2998	4001	1374	1693	484	1850	656				14267
TOTAL HT GAIN x 1.3 BTU/H		2781	3750	5761	1447	1064	284	1033	114				1546

TOTAL HEAT GAIN BTU/H:

36542

TONS: 3.05

LOSS DUE TO VENTILATION LOAD BTU/H: 2004

STRUCTURAL HEAT LOSS: 45486

TOTAL COMBINED HEAT LOSS BTU/H: 47490

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

OPT 2ND
TYPE: 4502

DATE: Jun-21

GFA: 2942 LO# 87510

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,486 TOTAL HEAT GAIN 36,213
AIR FLOW RATE CFM 25.17 AIR FLOW RATE CFM 31.62

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	11	10	4
R/A	0	0	5	3	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 1145
MEDIUM HIGH 0
HIGH 1520

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

TEMPERATURE RISE 47 °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	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	BED-5	ENS	BED-2	MBR	BED-2	BED-3	BATH	WIC	BED-3	ENS-2	BED-4	LIV	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.58	1.08	2.10	2.36	2.10	1.26	0.83	1.44	1.26	0.71	1.05	2.40	1.50	2.00	2.00	1.37	1.69	0.48	1.85	0.66	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	40	27	53	59	53	32	21	36	32	18	26	60	38	50	50	35	43	12	47	17	90	90	90	90
RM GAIN MBH.	2.19	1.16	2.57	3.16	2.57	1.79	0.71	0.42	1.79	0.32	1.74	2.78	1.87	2.88	2.88	1.45	1.06	0.28	1.03	0.11	0.39	0.39	0.39	0.39
CFM PER RUN COOLING	69	37	81	100	81	57	22	13	57	10	55	88	59	91	91	46	34	9	33	4	12	12	12	12
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	43	45	38	19	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	200	140	190	200	110	110	150	130	120	140	140	140	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	243	185	228	219	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	0.07	0.09	0.08	0.08	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	6	4	6	6	6	5	4	4	5	4	6	6	5	6	6	4	4	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	204	310	270	301	270	235	241	413	235	207	133	306	279	255	255	402	493	138	539	195	459	459	459	459
COOLING VELOCITY (ft/min)	352	424	413	510	413	419	252	149	419	115	280	449	433	464	464	528	390	103	379	46	61	61	61	61
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	C	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.	1.50
CFM PER RUN HEAT	38
RM GAIN MBH.	1.87
CFM PER RUN COOLING	59
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)	279
COOLING VELOCITY (ft/min)	433
OUTLET GRILL SIZE	3X10
TRUNK	A

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY		TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)		CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK A	285	0.08	8.8	10	x	8	513	TRUNK G	0	0.00	0	0	8
TRUNK B	560	0.08	11.3	14	x	8	720	TRUNK H	0	0.00	0	0	8
TRUNK C	294	0.07	9.2	10	x	8	529	TRUNK I	0	0.00	0	0	8
TRUNK D	587	0.07	11.9	16	x	8	660	TRUNK J	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK O	0	0.05	0	0	x	8
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	0	0.05	0	0	x	8
TRUNK X	1145	0.05	16.6	32	x	8
TRUNK Y	315	0.05	10.2	12	x	8
TRUNK Z	465	0.05	11.8	16	x	8
DROP	1145	0.05	16.6	24	x	10

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	95	75	85	75	95	155	150	240	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
ACTUAL DUCT LGH.	47	79	54	40	47	32	27	38	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	135
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	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	6.9
INLET GRILL SIZE	8	8	8	8	8	8	8	6	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	14

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87510
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 <u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms <u>4</u> @ 10.6 cfm <u>42.4</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>190.8</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 95.4 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>190.8</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>95.4</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 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	☒ 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:	
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#: 87510	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
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 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																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 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>11,991</td> <td>0.289</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>12,871</td> <td>0.179</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	11,991	0.289	3	0.2	12,871	0.179	4	0	0	0.000	5	0	0	0.000																														
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4502	OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 87510	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:	6
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

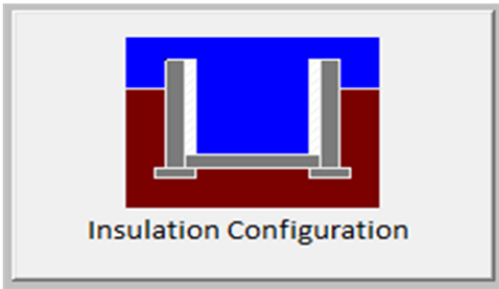
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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# 87510

OPT 2ND

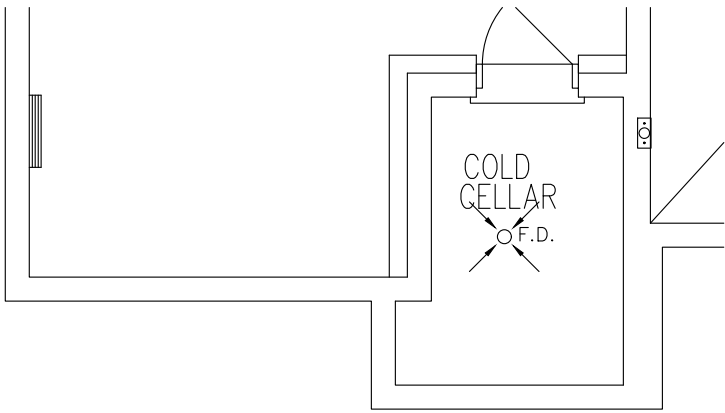
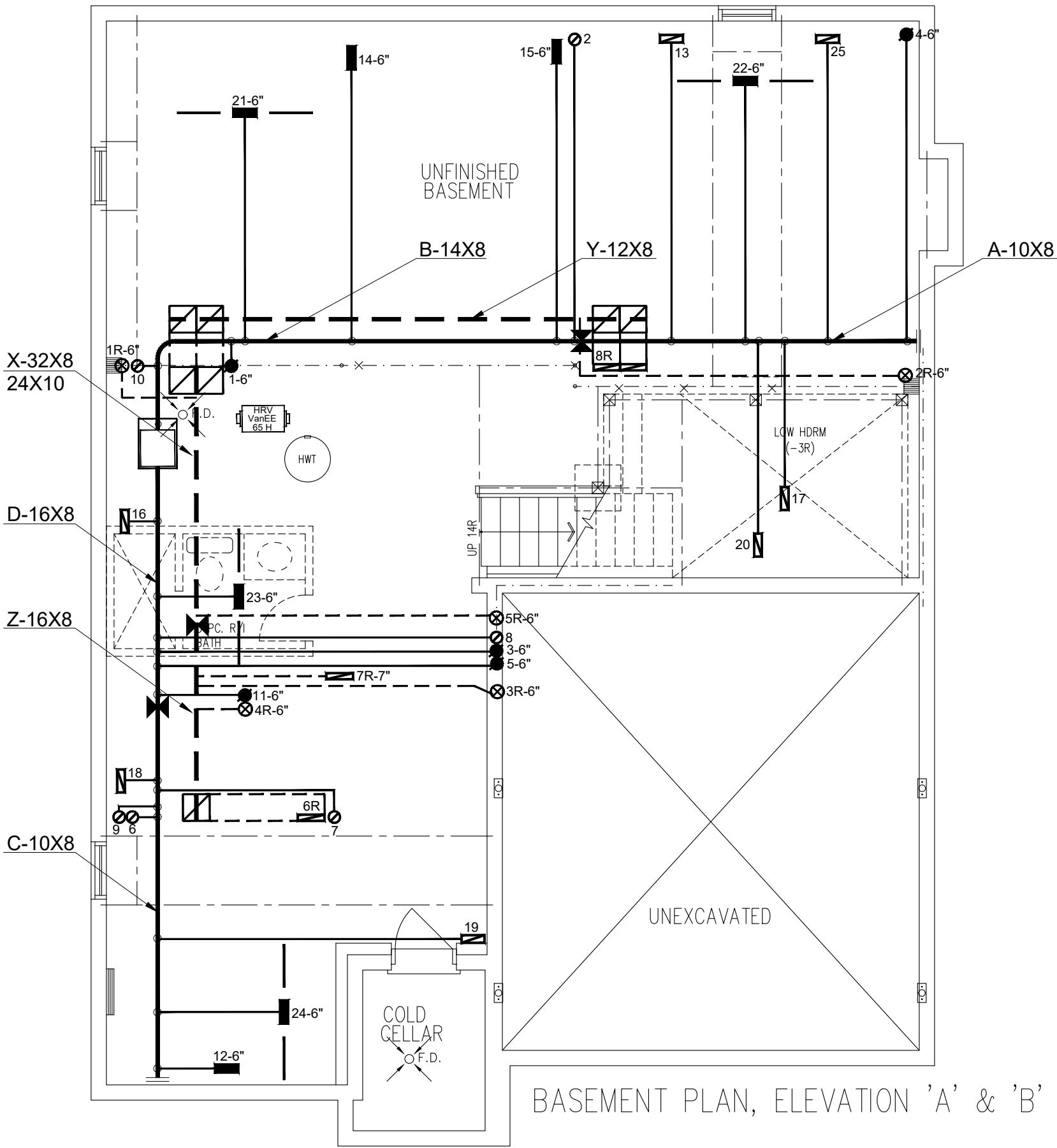
Air Infiltration Residential Load Calculator

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):	6.40			
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	
	45.0		45.0	
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# 87510

OPT 2ND



CSA-F280-12

SB-12 PERFORMANCE

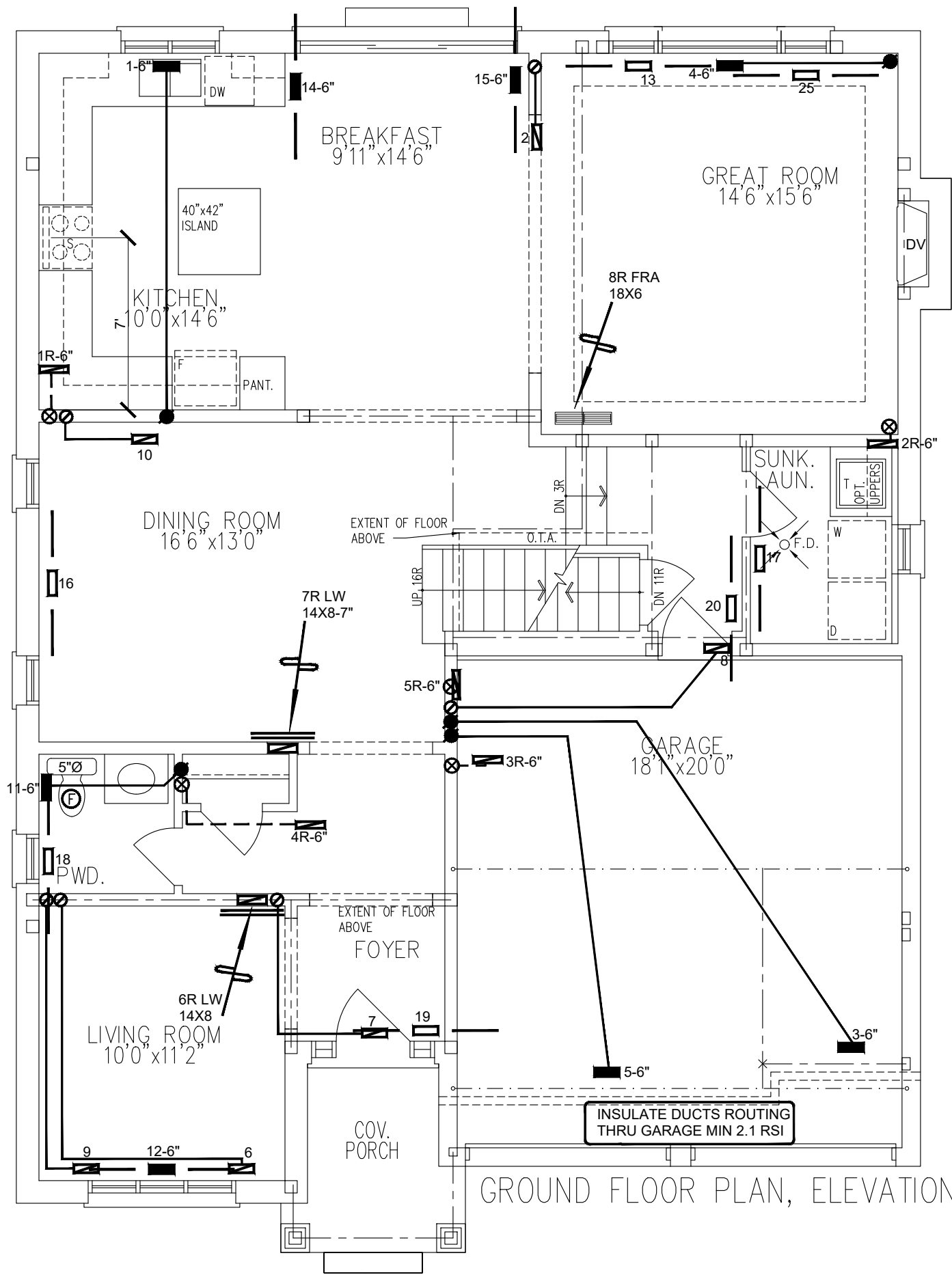
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

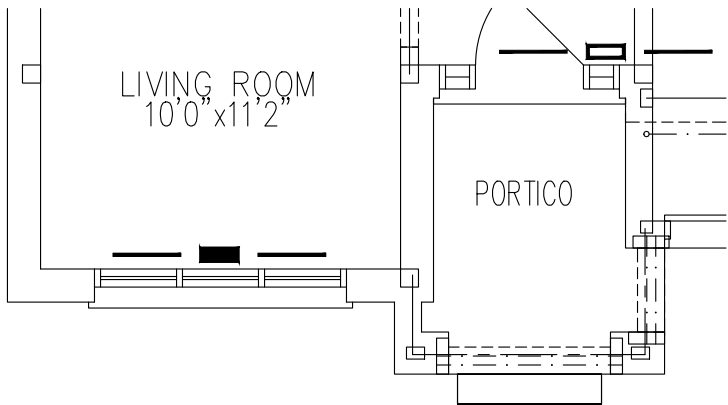
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
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

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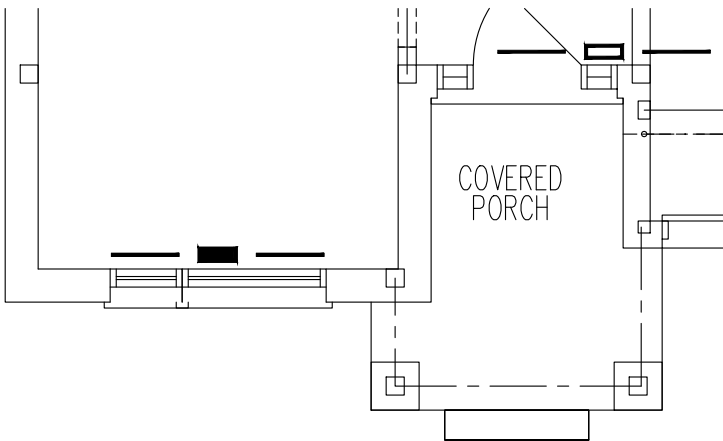
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 47490 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		11	5	3	
			INPUT 60 MBTU/H	1ST FLOOR		10	3	2	
OPT 2ND 4502			OUTPUT 58 MBTU/H	BASEMENT		4	1	0	Date SEPT/2020
2942 sqft			COOLING 3.0 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 1145 cfm @ 0.6" w.c.					BCIN# 19669		
							LO#	87510	



GROUND FLOOR PLAN, ELEVATION 'A'



GROUND FLOOR PLAN, ELEVATION 'B'



GROUND FLOOR PLAN, ELEVATION 'C'

CSA-F280-12

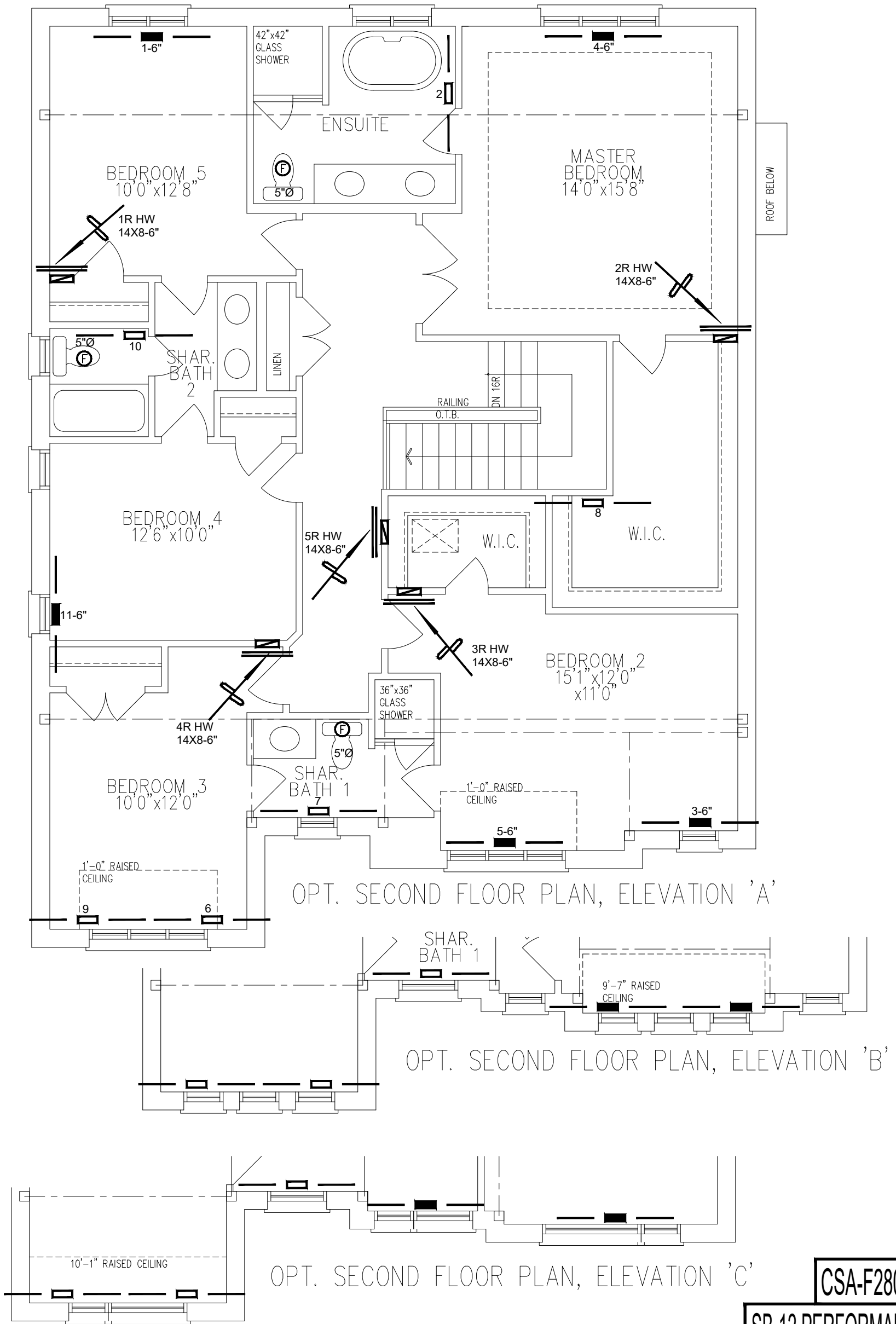
SB-12 PERFORMANCE

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.	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			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"
OPT 2ND 4502			BCIN# 19669	
2942 sqft			LO#	87510



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	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2. REVISED AS PER ARCHITECTURALS APR/2021
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1. REVISED TO PERFORMANCE SEPT/2020
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date
						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			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
OPT 2ND 4502 2942 sqft			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	87510	

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 & OPT 2ND 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 & OPT 2ND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12							
BUILDER: ROYAL PINE HOMES				TYPE: 4502				GFA: 2942				LO# 90462				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE			
ROOM USE		MBR		ENS		WIC		BED-4		BED-2		BED-3		BATH		BED-5		ENS-2									
EXP. WALL		32		11		14		11		33		33		9		25		9									
CLG. HT.		9		8		8		8		8		8		8		8		8									
FACTORS																											
GRS.WALL AREA		LOSS GAIN		288		88		112		88		264		264		72		200		72							
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN							
NORTH		21.8	15.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	110					
EAST		21.8	40.9	0	0	0	0	0	0	0	0	56	1220	2291	40	871	1637	9	196	368	0	0	0				
SOUTH		21.8	24.5	0	0	0	0	0	0	0	18	392	442	0	0	0	0	0	0	0	0	0					
WEST		21.8	40.9	26	566	1064	17	370	696	0	0	0	0	0	0	0	0	0	17	370	696						
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	262	1102	181	71	299	49	112	471	77	70	294	48	208	875	144	224	942	155	63	265	44			
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				
EXPOSED CLG		1.3	0.6	255	335	150	187	246	110	266	350	156	154	202	91	252	331	148	192	252	113	90	118	53			
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	28	79	35	24	67	30	0	0	0			
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	110	287	47	0	0	0	280	731	120	0	0	0	24	63	10			
BASEMENT/CRAWL HEAT LOSS				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					
SUBTOTAL HT LOSS				2003		915		1108		889		3235		2133		642		1342		603							
SUB TOTAL HT GAIN				1395		855		281		581		2739		1935		475		913		235							
LEVEL FACTOR / MULTIPLIER		0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18				
AIR CHANGE HEAT LOSS				359		164		199		159		580		382		115		241		108							
AIR CHANGE HEAT GAIN				65		40		13		27		128		91		22		43		11							
DUCT LOSS				0		0		131		0		382		0		76		0		0							
DUCT GAIN				0		0		29		0		360		0		50		0		0							
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	0	0	1	240	0	0	0					
HEAT GAIN APPLIANCES/LIGHTS				490		0		0		490		490		490		0		490		0							
TOTAL HT LOSS BTU/H				2362		1079		1437		1048		4197		2516		833		1583		711							
TOTAL HT GAIN x 1.3 BTU/H				3160		1163		421		1740		5145		3582		711		2192		319							

ROOM USE			DEN		GRT		KT/BR		DIN		LAUN		PWD		FOY		MUD						BAS			
EXP. WALL			30		34		37		17		16		6		18		11						172			
CLG. HT.			10		10		10		10		11		10		10		11						9			
FACTORS																										
GRS.WALL AREA	LOSS	GAIN	300		340		370		170		176		60		180		121					1032				
GLAZING			LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN				LOSS	GAIN			
NORTH	21.8	15.8	0	0	0	0	0	0	0	0	8	174	126	0	0	0	0	0	0	0	0	0	0			
EAST	21.8	40.9	34	741	1391	0	0	0	0	0	0	0	0	0	0	14	305	573	0	0	0	0	0			
SOUTH	21.8	24.5	0	0	0	0	0	0	0	0	20	436	491	0	0	0	7	152	172	0	0	0	6	131	147	
WEST	21.8	40.9	0	0	0	51	1111	2087	87	1895	3560	0	0	0	0	0	0	0	0	0	0	0	3	65	123	
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	
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	0	0	0	0	20	517	85	
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	283	1190	196	150	631	104	53	223	37	146	614	101	121	509	84	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	516	1901	313	
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	
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	
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	
BASEMENT/CRAWL HEAT LOSS			0		0		0		0		0		0		0		0						5884			
SLAB ON GRADE HEAT LOSS			0		0		0		0		0		0		0		0						0			
SUBTOTAL HT LOSS			1859		2326		3105		1066		1314		375		1436		509						8498			
SUB TOTAL HT GAIN			1575		2287		3765		595		314		208		759		84						668			
LEVEL FACTOR / MULTIPLIER	0.30	0.29	0.30		0.29		0.30		0.29		0.30		0.29		0.30		0.29		0.30		0.29		0.50		0.68	
AIR CHANGE HEAT LOSS			537		672		896		308		379		108		414		147						5769			
AIR CHANGE HEAT GAIN			74		107		176		28		15		10		36		4						31			
DUCT LOSS			0		0		0		0		0		0		0		0						0			
DUCT GAIN			0		0		0		0		0		0		0		0						0			
HEAT GAIN PEOPLE	240		0		0		0		0		0		0		0		0		0		0		0			
HEAT GAIN APPLIANCES/LIGHTS			490		490		490		490		490		490		0		0						490			
TOTAL HT LOSS BTU/H			2396		2998		4001		1374		1693		484		1850		656						14267			
TOTAL HT GAIN x 1.3 BTU/H			2781		3750		5761		1447		1064		284		1033		114						1540			

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

OPT GROUND & OPT 2ND
TYPE: 4502

DATE: Jun-21

GFA: 2942 LO# 90462

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,486 TOTAL HEAT GAIN 36,213
AIR FLOW RATE CFM 25.17 AIR FLOW RATE CFM 31.62

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	11	10	4
R/A	0	0	5	3	1

plenum pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 1145
MEDIUM HIGH 0
HIGH 1520

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

TEMPERATURE RISE 47 °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	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	BED-5	ENS	BED-2	MBR	BED-2	BED-3	BATH	WIC	BED-3	ENS-2	BED-4	DEN	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.58	1.08	2.10	2.36	2.10	1.26	0.83	1.44	1.26	0.71	1.05	2.40	1.50	2.00	2.00	1.37	1.69	0.48	1.85	0.66	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	40	27	53	59	53	32	21	36	32	18	26	60	38	50	50	35	43	12	47	17	90	90	90	90
RM GAIN MBH.	2.19	1.16	2.57	3.16	2.57	1.79	0.71	0.42	1.79	0.32	1.74	2.78	1.87	2.88	2.88	1.45	1.06	0.28	1.03	0.11	0.39	0.39	0.39	0.39
CFM PER RUN COOLING	69	37	81	100	81	57	22	13	57	10	55	88	59	91	91	46	34	9	33	4	12	12	12	12
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	43	45	38	19	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	200	140	190	200	110	110	150	130	120	140	140	140	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	243	185	228	219	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	0.07	0.09	0.08	0.08	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	6	4	6	6	6	5	4	4	5	4	6	6	5	6	6	4	4	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	204	310	270	301	270	235	241	413	235	207	133	306	279	255	255	402	493	138	539	195	459	459	459	459
COOLING VELOCITY (ft/min)	352	424	413	510	413	419	252	149	419	115	280	449	433	464	464	528	390	103	379	46	61	61	61	61
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	C	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.	1.50
CFM PER RUN HEAT	38
RM GAIN MBH.	1.87
CFM PER RUN COOLING	59
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)	279
COOLING VELOCITY (ft/min)	433
OUTLET GRILL SIZE	3X10
TRUNK	A

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT	VELOCITY						TRUNK	STATIC	ROUND	RECT	VELOCITY					
CFM	PRESS.	DUCT	DUCT	(ft/min)						CFM	PRESS.	DUCT	DUCT	(ft/min)					
TRUNK A	285	0.08	8.8	10	x	8	513			TRUNK G	0	0.00	0	0	x	8	0		
TRUNK B	560	0.08	11.3	14	x	8	720			TRUNK H	0	0.00	0	0	x	8	0		
TRUNK C	294	0.07	9.2	10	x	8	529			TRUNK I	0	0.00	0	0	x	8	0		
TRUNK D	587	0.07	11.9	16	x	8	660			TRUNK J	0	0.00	0	0	x	8	0		
TRUNK E	0	0.00	0	0	x	8	0			TRUNK K	0	0.00	0	0	x	8	0		
TRUNK F	0	0.00	0	0	x	8	0			TRUNK L	0	0.00	0	0	x	8	0		

RETURN AIR #	1	2	3	4	5	6	7	8	BR										
AIR VOLUME	95	75	85	75	95	155	150	240	0	0	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	0.15	0.15
ACTUAL DUCT LGH.	47	79	54	40	47	32	27	38	1	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	0	135	
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	1	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	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	0	6.9	
INLET GRILL SIZE	8	8	8	8	8	8	8	6	0	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	X	
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	0	0	14	

TRUNK	STATIC	ROUND	RECT	VELOCITY					
CFM	PRESS.	DUCT	DUCT	(ft/min)					
TRUNK O	0	0.05	0	0	x	8	0		
TRUNK P	0	0.05	0	0	x	8	0		
TRUNK Q	0	0.05	0	0	x	8	0		
TRUNK R	0	0.05	0	0	x	8	0		
TRUNK S	0	0.05	0	0	x	8	0		
TRUNK T	0	0.05	0	0	x	8	0		
TRUNK U	0	0.05	0	0	x	8	0		
TRUNK V	0	0.05	0	0	x	8	0		
TRUNK W	0	0.05	0	0	x	8	0		
TRUNK X	1145	0.05	16.6	32	x	8	644		
TRUNK Y	315	0.05	10.2	12	x	8	473		
TRUNK Z	465	0.05	11.8	16	x	8	523		
DROP	1145	0.05	16.6	24	x	10	687		

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 90462
OPT GROUND & 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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>4</u> @ 10.6 cfm <u>42.4</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>190.8</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	95.4 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>190.8</u> cfm	
Less Principal Ventil. Capacity	<u>95.4</u> cfm	
Required Supplemental Capacity	<u>95.4</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 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	☒ 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:	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#: 90462	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%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">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 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	0.219	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)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 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																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 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 _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,538	8,498	0.679																																																								
2	0.3		11,991	0.289																																																								
3	0.2		12,871	0.179																																																								
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: 4502	OPT GROUND & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 90462	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:	6
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%	-

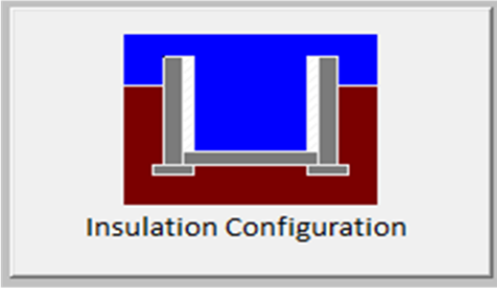
INDIVIDUAL BCIN: 19669

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# 90462

OPT GROUND & OPT 2ND

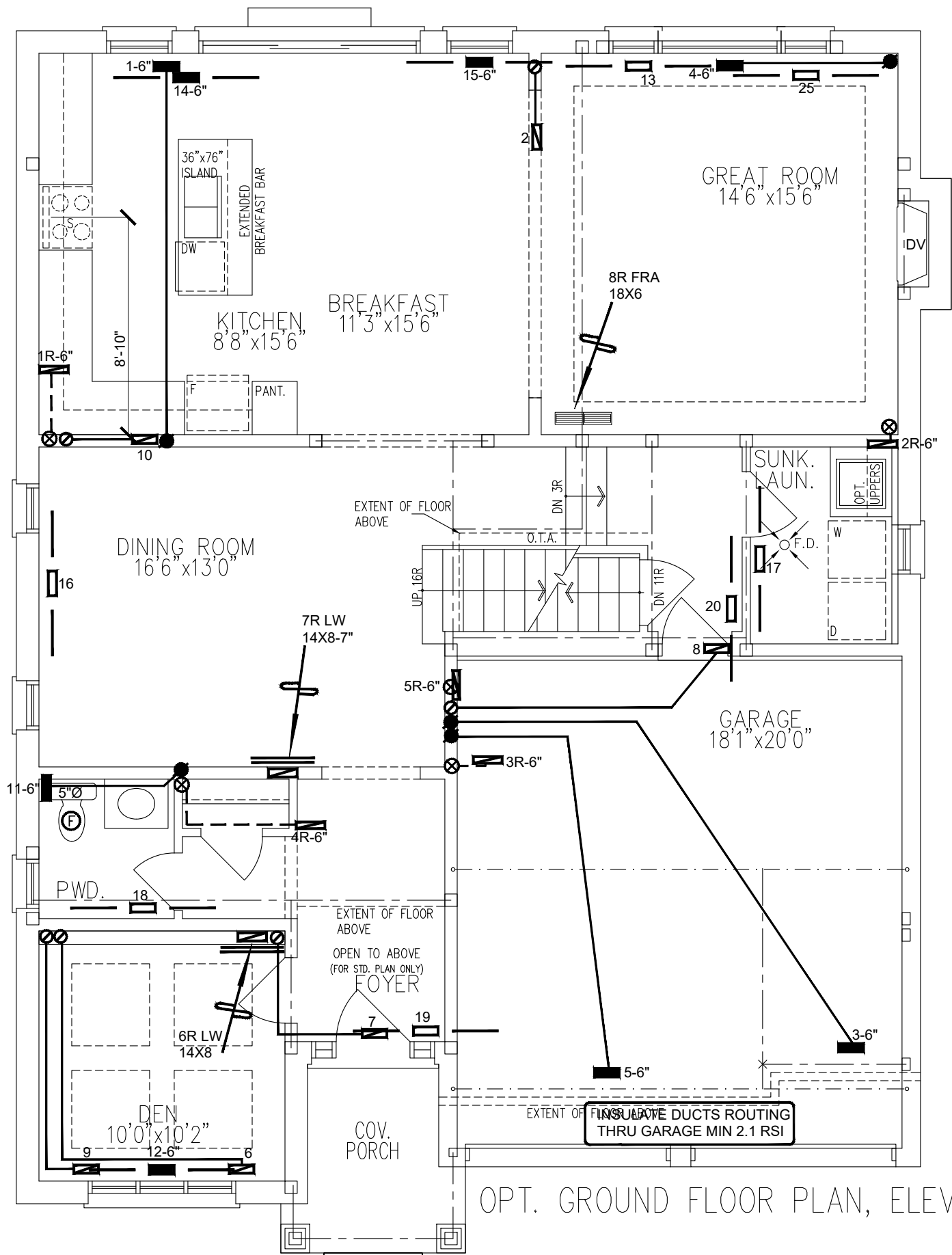
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

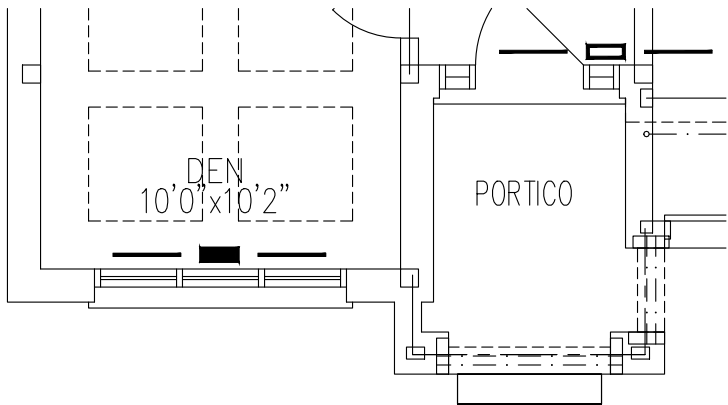
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.40			
Building Configuration				
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	
	45.0		45.0	
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# 90462

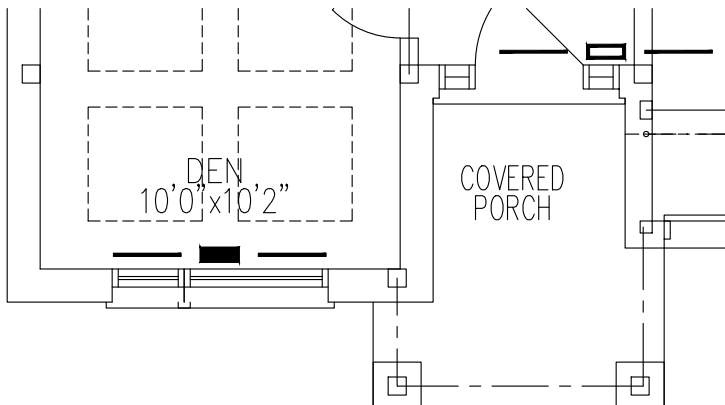
OPT GROUND & OPT 2ND



OPT. GROUND FLOOR PLAN, ELEVATION 'A'



OPT. GROUND FLOOR PLAN, ELEVATION 'B'



OPT. GROUND FLOOR PLAN, ELEVATION '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, BCIN# 19669
HVAC DESIGNS LTD.

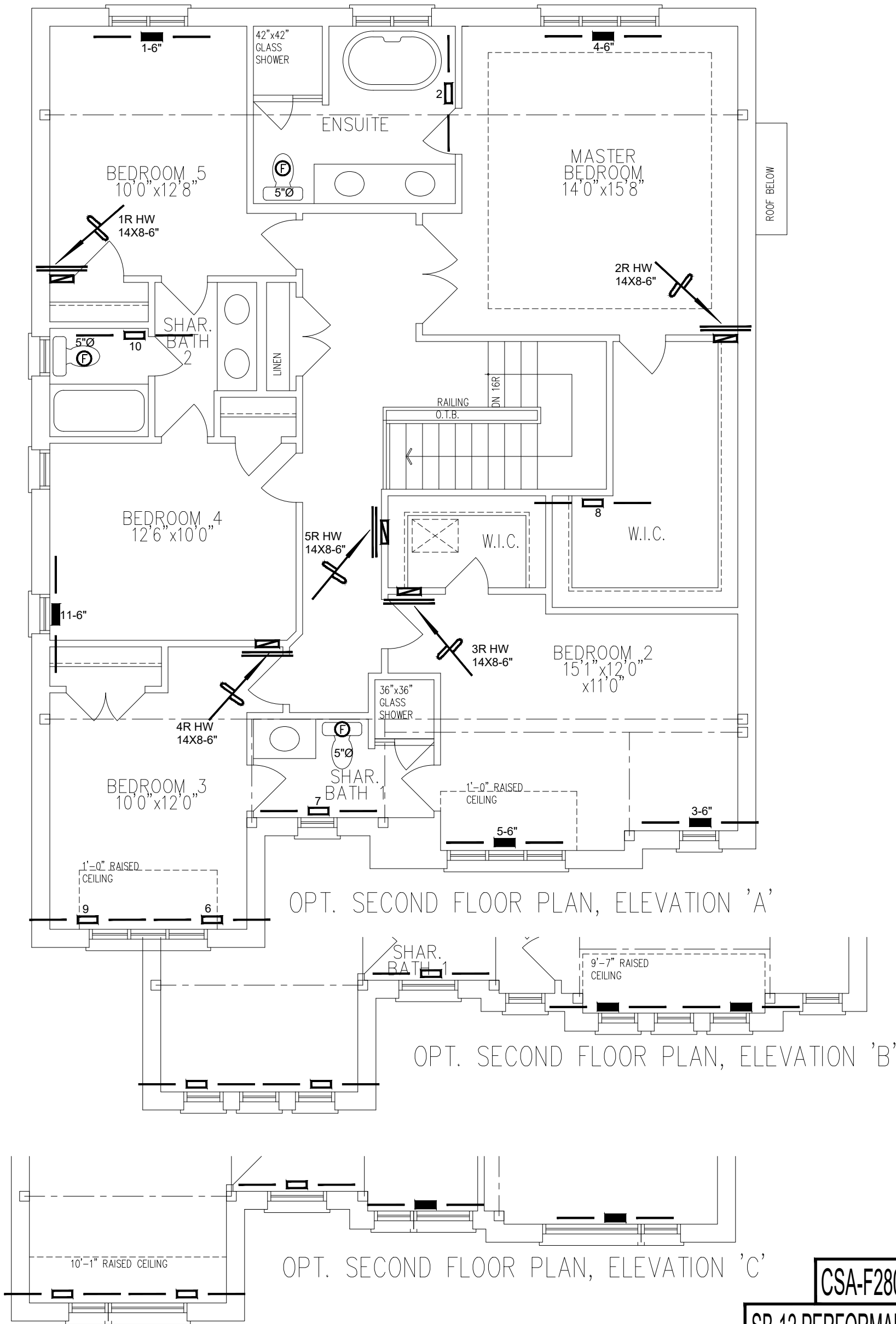
CSA-F280-12

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.	REVISED AS PER CAD	JUNE/2021
	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	APR/2021
OPT GROUND & OPT 2ND 4502 2942 sqft			Scale	3/16" = 1'-0"
			BCIN# 19669	
		LO#	90462	



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.	REVISED AS PER CAD	JUNE/2021
	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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	APR/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND & OPT 2ND 4502			BCIN# 19669	
2942 sqft			LO#	90462

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: 4502 OPT GROUND - 4 BED 4 BATH 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.				
June 4, 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) OPT GROUND - 4 BED 4 BATH TYPE: 4502 DATE: Jun-21 LO# 91143 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS AT °F. 78 CSA-F280-12
BUILDER: ROYAL PINE HOMES GFA: 2942 WINTER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN AT °F. 13 SB-12 PERFORMANCE

ROOM USE	MBR	ENS	BED-2	BED-3	BED-4	ENS-2	ENS-3	WIC-3	ENS-4	
EXP. WALL CLG. HT.	34 9	11 8	35 8	33 8	35 8	8 8	8 8	7 8	11 8	
GRS.WALL AREA	306	88	280	264	280	64	0	56	88	
GLAZING	21.8	15.6	0	0	0	7	0	0	0	LOSS GAIN
NORTH	0	0	0	0	0	152	0	0	0	152
EAST	21.8	40.3	0	55	40	0	0	14	0	305
SOUTH	21.8	24.2	0	0	0	0	0	0	0	564
WEST	21.8	40.3	26	0	0	0	0	0	0	0
SKYL.T.	35.8	101.2	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	276	1161	191	71	239	49	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	389	511	229	173	227	102	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS	2.6	0.4	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2325	896	1970	1373	2232	739	183	546	668	243
SUB TOTAL HT GAIN	1628	836	0.20	0.18	0.20	0.18	0.20	0.18	0.20	0.18
LEVEL FACTOR / MULTIPLIER	423	163	358	571	406	134	33	99	121	10
AIR CHANGE HEAT LOSS	69	36	0	58	82	87	22	0	0	0
AIR CHANGE HEAT GAIN	0	0	0	371	0	24	5	0	0	0
DUCT LOSS	2	0	1	240	1	0	0	0	0	0
DUCT GAIN	539	0	539	539	539	0	0	0	0	0
HEAT GAIN PEOPLE	240	1059	2328	4083	2637	960	238	645	789	330
HEAT GAIN APPLIANCES/LIGHTS	2748	3532	1133	5109	3535	843	75	843	330	
TOTAL HT LOSS BTU/H										
TOTAL HT GAIN x 1.3 BTU/H										

ROOM USE	DEN	GRT	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS
EXP. WALL CLG. HT.	30 10	34 10	37 10	17 10	16 11	6 10	18 10	11 11	172 9
GRS.WALL AREA	300	340	370	170	176	60	180	121	1032
GLAZING	21.8	15.6	0	0	0	0	0	0	0
NORTH	0	0	0	0	8	0	0	0	0
EAST	21.8	40.3	0	0	0	0	24	0	0
SOUTH	21.8	24.2	0	20	0	7	523	0	6
WEST	21.8	40.3	93	436	0	152	0	0	131
SKYL.T.	35.8	101.2	2026	3747	0	0	0	0	65
DOORS	25.8	4.3	0	0	0	0	0	0	121
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	20
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	517
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	85
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS	2.6	0.4	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	1859	2326	3211	1066	1314	375	1612	509	8498
SUB TOTAL HT GAIN	1554	2255	3947	588	312	206	1146	84	664
LEVEL FACTOR / MULTIPLIER	0.30	0.28	0.30	0.28	0.30	0.30	0.30	0.30	0.50
AIR CHANGE HEAT LOSS	524	656	906	301	371	106	455	144	5769
AIR CHANGE HEAT GAIN	66	96	168	25	13	9	49	4	28
DUCT LOSS	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	1059	2328	4083	5109	3535	843	75	0
HEAT GAIN APPLIANCES/LIGHTS	2748	3532	1133	5109	3535	843	75	843	539
TOTAL HT LOSS BTU/H									14267
TOTAL HT GAIN x 1.3 BTU/H									1601

TOTAL HEAT GAIN BTU/H: 36936 TONS: 3.08 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 45489 TOTAL COMBINED HEAT LOSS BTU/H: 47159

Michael O'Rourke

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

OPT GROUND - 4 BED 4 BATH
TYPE: 4502

GFA: 2942 LO# 91143

DATE: Jun-21

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,489 TOTAL HEAT GAIN 36,661
AIR FLOW RATE CFM 25.17 AIR FLOW RATE CFM 31.23

****CARRIER**
59TN6B-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	10	4
R/A	0	0	5	3	1

plenum pressure s/a 0.18
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.16

r/a pressure 0.17
r/a grille press. loss 0.02
adjusted pressure r/a 0.15

DESIGN CFM = 1145
CFM @ .6" E.S.P. 0

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	ENS-3	ENS-2	BED-4	MBR	ENS-4	DEN	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.37	1.06	2.04	2.33	2.04	1.32	0.24	0.96	1.32	1.37	0.79	2.38	1.49	2.06	2.06	1.37	1.68	0.48	2.07	0.65	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	35	27	51	59	51	33	6	24	33	35	20	60	38	52	52	34	42	12	52	16	90	90	90	90
RM GAIN MBH	1.77	1.13	2.55	2.87	2.55	1.82	0.07	0.35	1.82	1.77	0.33	2.81	1.88	3.03	3.03	1.50	1.12	0.28	1.55	0.11	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	55	35	80	90	80	57	2	11	57	55	10	88	59	94	94	47	35	9	49	4	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	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	51	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	150	150	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	194	201	228	177	136	140	190	155	155	145	179	156	165	190	149	182	140	140
ADJUSTED PRESSURE	0.1	0.1	0.09	0.08	0.1	0.08	0.09	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	260	301	260	242	69	275	242	257	229	306	279	265	265	390	482	138	382	184	459	459	459	459
COOLING VELOCITY (ft/min)	404	402	408	459	408	419	23	126	419	404	115	449	433	479	479	539	402	103	360	46	61	61	61	61
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	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	26
ROOM NAME	GRT	WIC-3
RM LOSS MBH	1.49	0.65
CFM PER RUN HEAT	38	16
RM GAIN MBH	1.88	0.84
CFM PER RUN COOLING	59	26
ADJUSTED PRESSURE	0.17	0.17
ACTUAL DUCT LGH	47	28
EQUIVALENT LENGTH	110	180
TOTAL EFFECTIVE LENGTH	157	208
ADJUSTED PRESSURE	0.11	0.08
ROUND DUCT SIZE	5	4
HEATING VELOCITY (ft/min)	279	184
COOLING VELOCITY (ft/min)	433	298
OUTLET GRILL SIZE	3X10	3X10
TRUNK	A	C

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	283	0.08	8.7	10	8	509	0	0.00	0	8
TRUNK B	574	0.08	11.4	16	8	546	0	0.00	0	8
TRUNK C	296	0.08	8.9	10	8	533	0	0.00	0	8
TRUNK D	572	0.08	11.4	16	8	644	0	0.00	0	8
TRUNK E	0	0.00	0	0	8	0	0	0.00	0	8
TRUNK F	0	0.00	0	0	8	0	0	0.00	0	8

RETURN AIR #	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
RETURN AIR #	1	2	3	4	7	8	0	0	0	BR
AIR VOLUME	95	75	85	75	150	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
ACTUAL DUCT LGH	47	79	54	40	32	1	1	1	1	1
EQUIVALENT LENGTH	175	225	215	255	230	145	190	0	0	135
TOTAL EFFECTIVE LENGTH	222	304	269	295	262	172	228	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.06	0.05	0.06	0.09	0.06	0.06	0.06	0.10
ROUND DUCT SIZE	6	6	6	6	6	6	6	6	6	6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8
INLET GRILL SIZE	14	14	14	14	14	14	14	14	14	14

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91143
OPT GROUND - 4 BED 4 BATH

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
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	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:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																							
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																							
LO#: 91143	Model: 4502	Builder: ROYAL PINE HOMES	Date: 2021-06-04																																																																				
Volume Calculation		Air Change & Delta T Data																																																																					
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5.2.3.1 Heat Loss due to Air Leakage																																																																							
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$																																																																							
0.219	x	298.04	x																																																																				
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			11538 Btu/h																																																																				
5.2.3.2 Heat Loss due to Mechanical Ventilation																																																																							
$HL_{paitrb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																							
80 CFM	x	78 °F	x																																																																				
		1.08	x																																																																				
		0.25	=																																																																				
			1670 Btu/h																																																																				
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																							
$HL_{airrr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclvl} + HL_{bgclvl})\}$																																																																							
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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: 4502	OPT GROUND - 4 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 91143	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):	37891.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	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

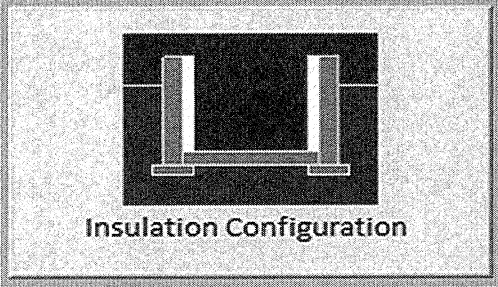
Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum 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):	14.6	 Insulation Configuration
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# 91143

OPT GROUND - 4 BED 4 BATH

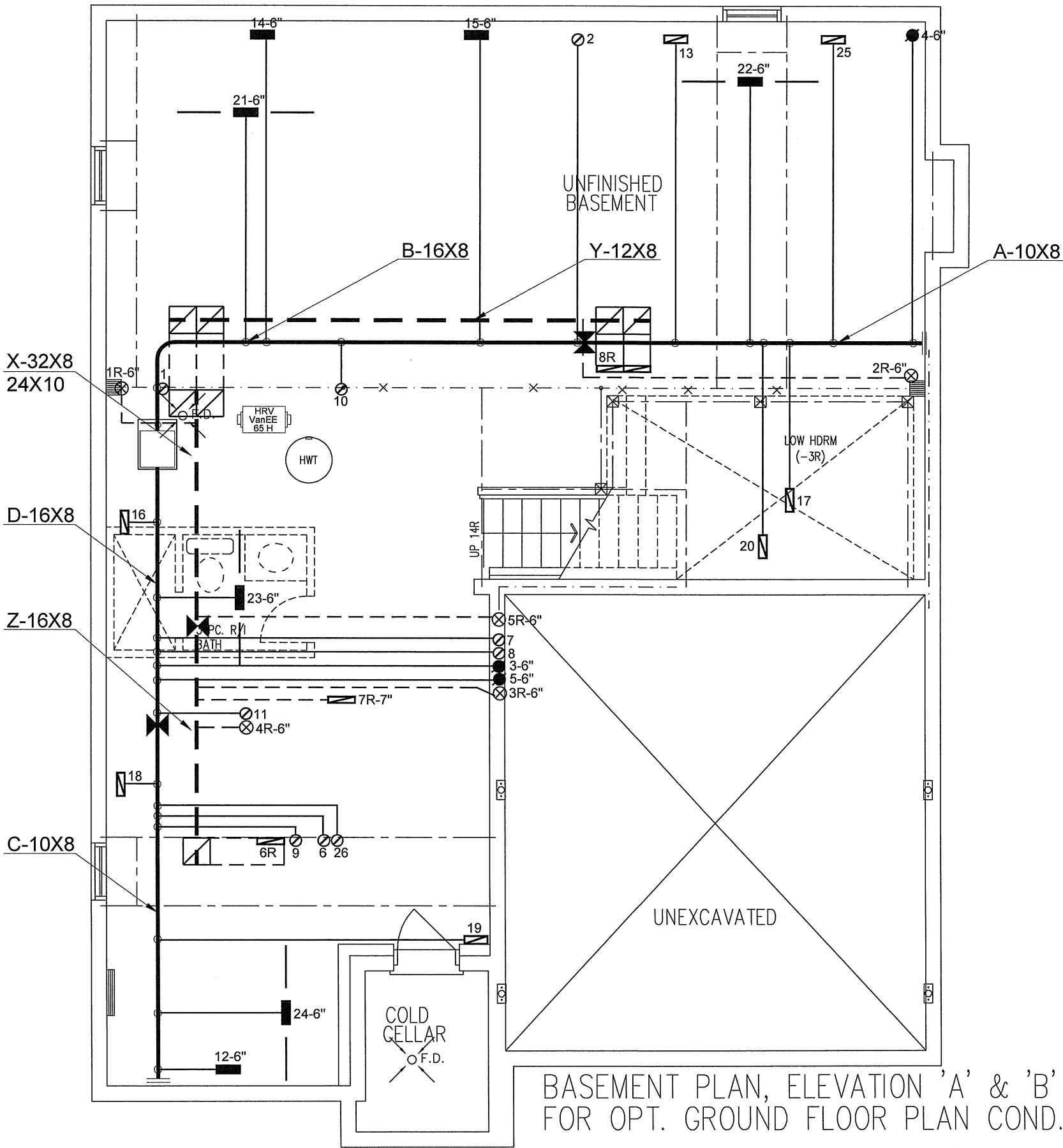
Air Infiltration Residential Load Calculator

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# 91143

OPT GROUND - 4 BED 4 BATH



BASEMENT PLAN, ELEVATION 'C'
FOR OPT. GROUND FLOOR PLAN COND.

CSA-F280-12

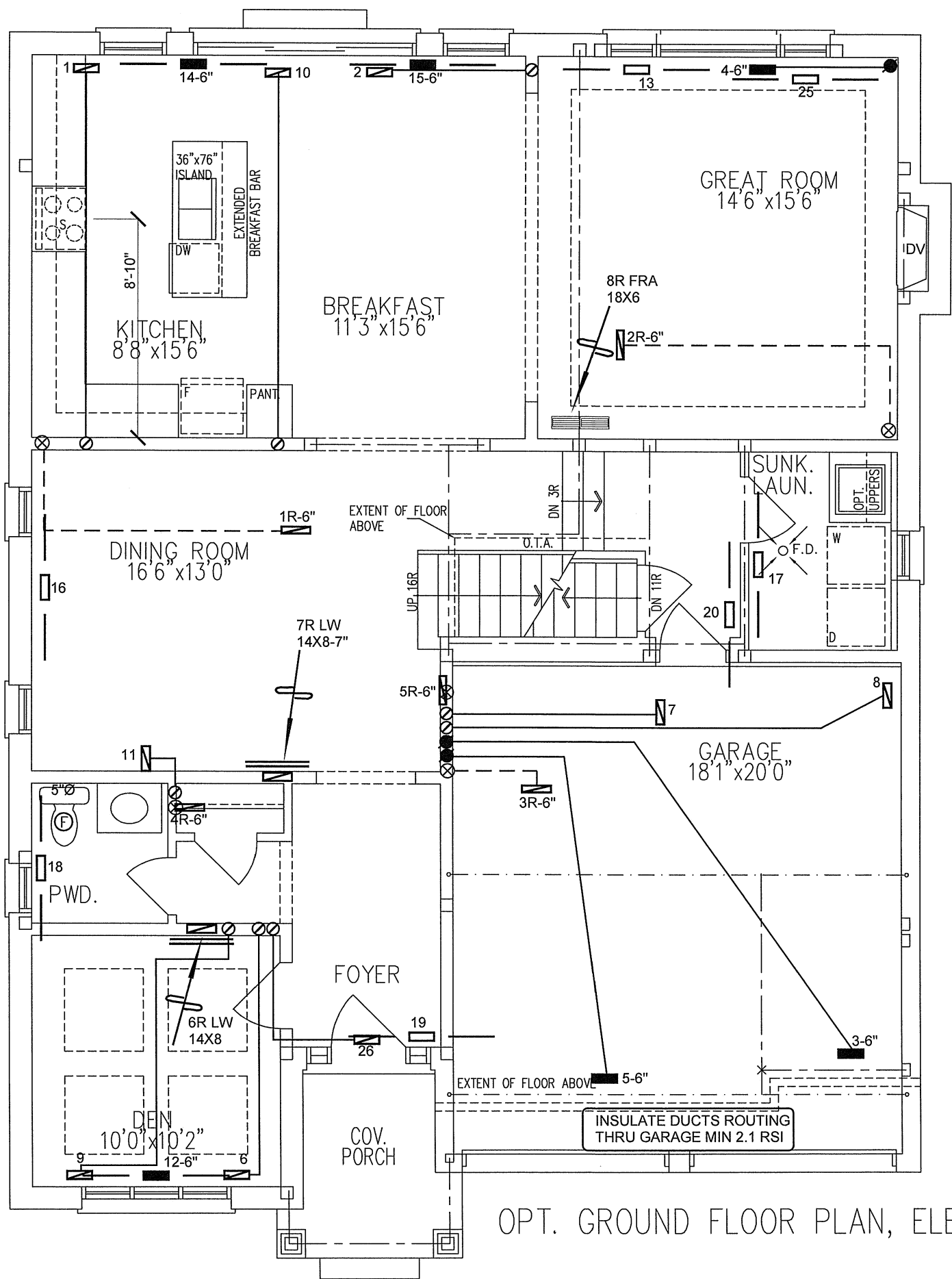
SB-12 PERFORMANCE

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.

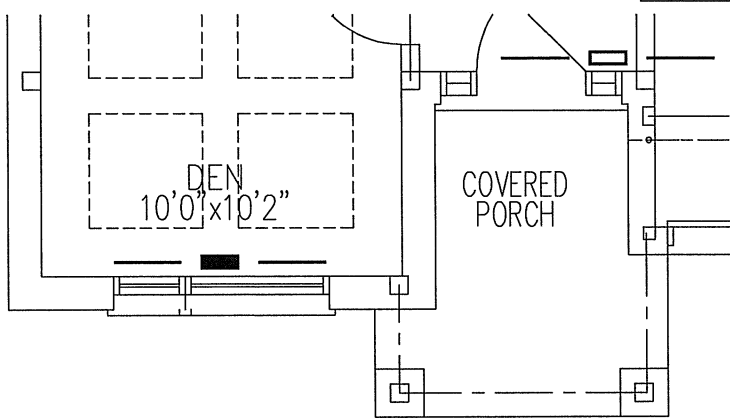
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 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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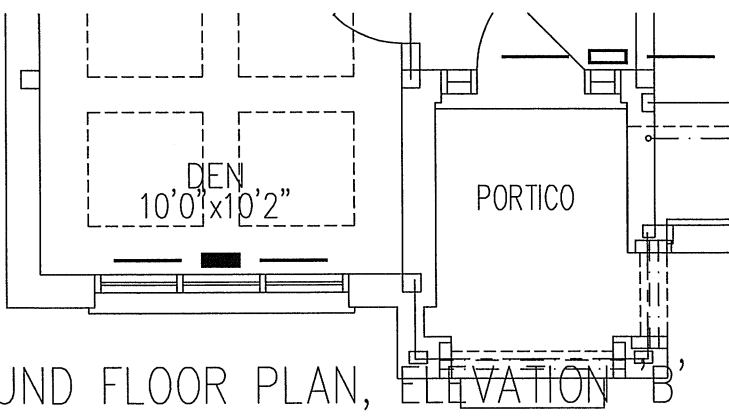
Client ROYAL PINE HOMES	Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO 4 BED 4 BATH OPT GROUND 4502	2942 sqft	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential 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 47159 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
				MAKE CARRIER		3RD FLOOR				BASEMENT HEATING LAYOUT	
				MODEL 59TN6B-060-14V		2ND FLOOR 12 5 4				Date JUNE/2021	
				INPUT 60 MBTU/H		1ST FLOOR 10 3 2				Scale 3/16" = 1'-0"	
				OUTPUT 58 MBTU/H		BASEMENT 4 1 0				BCIN# 19669	
				COOLING 3.0 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				LO# 91143	
				FAN SPEED 1145 cfm @ 0.6" w.c.							



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.

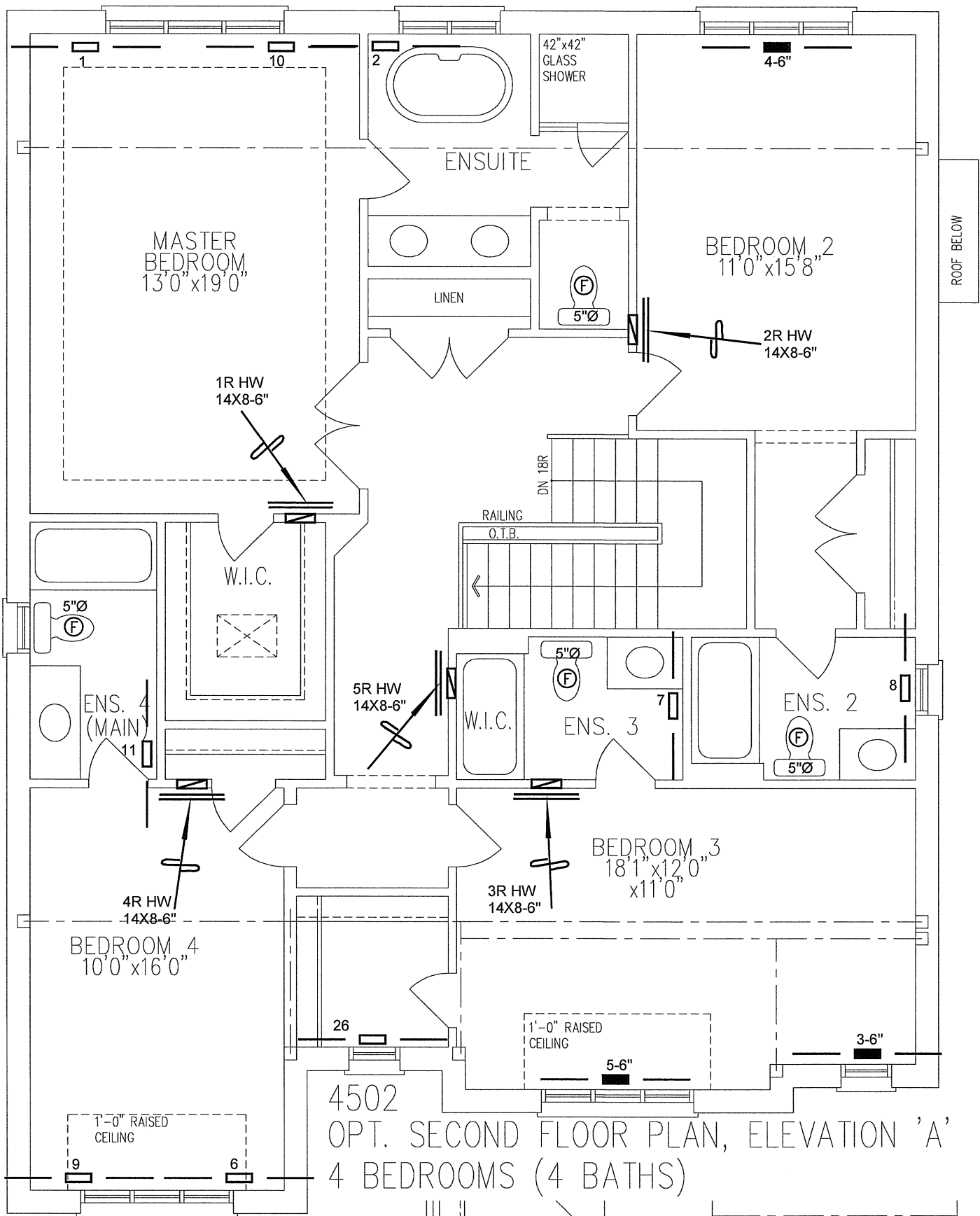
CSA-F280-12

SB-12 PERFORMANCE

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

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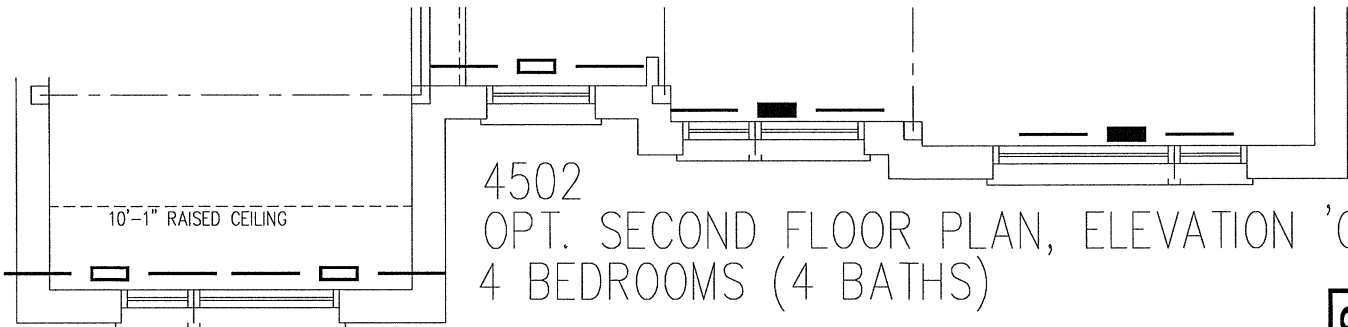
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		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	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
4 BED 4 BATH			BCIN# 19669	
OPT GROUND			LO#	91143
4502	2942 sqft			



4502
OPT. SECOND FLOOR PLAN, ELEVATION 'A'
4 BEDROOMS (4 BATHS)



4502
OPT. SECOND FLOOR PLAN, ELEVATION 'B'
4 BEDROOMS (4 BATHS)



4502
OPT. SECOND FLOOR PLAN, ELEVATION 'C'
4 BEDROOMS (4 BATHS)

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.	
	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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO 4 BED 4 BATH OPT GROUND 4502			Date JUNE/2021	
2942 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 91143	

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@hvacadesigns.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 - 5 BED 4 BATH 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.			
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)				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS AT °F. 78				CSA-F280-12			
BUILDER: ROYAL PINE HOMES				LO# 9145				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN AT °F. 13				SB-12 PERFORMANCE			
TYPE: 4502				GFA: 2342				BED-4				BED-3				BED-2			
OPT GROUND - 5 BED 4 BATH				BATH-3				BATH-4				BATH-1				BED-5			
ROOM USE				ENS				MUR				BATH-2				BATH-1			
EXP. WALL				CLG. HT.				CLG. HT.				CLG. HT.				CLG. HT.			
FACTORS				FACTORS				FACTORS				FACTORS				FACTORS			
GRS.WALL AREA				288				288				288				288			
GLAZING				0				0				0				0			
NORTH				0				0				0				0			
EAST				0				0				0				0			
SOUTH				0				0				0				0			
WEST				0				0				0				0			
SKYLT.				17				17				17				17			
DOORS				0				0				0				0			
NET EXPOSED WALL				4.2				4.2				4.2				4.2			
NET EXPOSED BMT WALL ABOVE GR				3.7				3.7				3.7				3.7			
EXPOSED CLG				1.3				1.3				1.3				1.3			
NO ATTIC EXPOSED CLG				0				0				0				0			
EXPOSED FLOOR				0				0				0				0			
BASEMENT/CRAWL HEAT LOSS				0				0				0				0			
SLAB ON GRADE HEAT LOSS				0				0				0				0			
SUBTOTAL HT LOSS				2003				2003				2003				2003			
SUB TOTAL HT GAIN				1395				1395				1395				1395			
LEVEL FACTOR / MULTIPLIER				0.20				0.20				0.20				0.20			
AIR CHANGE HEAT LOSS				359				359				359				359			
AIR CHANGE HEAT GAIN				65				65				65				65			
DUCT LOSS				0				0				0				0			
DUCT GAIN				0				0				0				0			
HEAT GAIN PEOPLE				240				240				240				240			
HEAT GAIN APPLIANCES/LIGHTS				490				490				490				490			
TOTAL HT LOSS BTU/H				2362				2362				2362				2362			
TOTAL HT GAIN x 1.3 BTU/H				3160				3160				3160				3160			

ROOM USE	DEN		GRT		KTB/R		DIN		LAUN		PWD		FOY		MUD		BAS	
EXP. WALL	30	10	34	10	37	10	17	10	16	11	6	10	18	11	11	172	9	
CLG. HT.	10																	
FACTORS	LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS	
GRS.WALL AREA	300		340		370		170		176		60		180		121		1032	
GLAZING																		
NORTH	21.8	15.8	0	0	0	0	0	0	8	174	0	0	0	0	0	0	0	
EAST	21.8	40.9	0	0	0	0	0	0	0	0	0	0	14	305	0	0	0	
SOUTH	21.8	24.5	0	0	0	0	20	436	0	0	7	152	172	0	0	6	131	
WEST	21.8	40.9	0	0	87	1895	0	0	0	0	0	0	0	0	0	3	123	
SKYLT.	35.8	101.2	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	20	517	0	0	20	517	0	20	517	
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	283	1190	196	150	631	104	148	622	102	
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	146	614	101	
EXPOSED CLG	1.3	0.6	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	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS																		
SLAB ON GRADE HEAT LOSS																		
SUBTOTAL HT LOSS	1859		2326		3106		1066		1314		375		1436		509		5884	
SUB TOTAL HT GAIN		1575		2287		3765		595		314		208		759		8498		
LEVEL FACTOR / MULTIPLIER	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.50	0.68	
AIR CHANGE HEAT LOSS	537		672		896		308		379		108		414		147		5769	
AIR CHANGE HEAT GAIN		74		107		176		28		15		10		36		4	31	
DUCT LOSS	0		0		0		0		0		0		0		0		0	
DUCT GAIN		0		0		0		0		0		0		0		0	0	
HEAT GAIN PEOPLE	240		0		0		0		0		0		0		0		0	
HEAT GAIN APPLANCES/LIGHTS		490		490		490		490		490		0		0		0	490	
TOTAL HT LOSS BTU/H	2395		2998		4001		1374		1693		484		1850		656		14267	
TOTAL HT GAIN x 1.3 BTU/H		2781		3750		5761		1447		1064		284		1033		114	1546	

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

OPT GROUND - 5 BED 4 BATH

TYPE: 4502 DATE: Jun-21 GFA: 2942 LO# 91145

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,486 TOTAL HEAT GAIN 36,213
AIR FLOW RATE CFM 25.17 AIR FLOW RATE CFM 31.62

59TN6A-060-14V

FAN SPEED 60

LOW 820

MEDIUM 1145

HIGH 1520

AFUE = 97 %

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

DESIGN CFM = 1145

CFM @ 8" 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	BED-5	ENS	BED-2	MBR	BED-2	BED-3	BATH-1	BATH-2	BED-3	BED-3	BED-4	DEN	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.58	1.08	2.10	2.36	2.10	1.26	0.83	1.44	1.26	0.71	1.05	2.40	1.50	2.00	2.00	1.37	1.69	0.48	1.85	0.66	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	40	27	53	59	53	32	21	36	32	18	26	60	38	50	50	35	43	12	47	17	90	90	90	90
RM GAIN MBH	2.19	1.16	2.57	3.16	2.57	1.79	0.71	0.42	1.79	0.32	1.74	2.78	1.87	2.88	2.88	1.45	1.06	0.28	1.03	0.11	0.39	0.39	0.39	0.39
CFM PER RUN COOLING	69	37	81	100	81	57	22	13	57	10	55	88	59	91	91	46	34	9	33	4	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	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	43	45	38	19	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	200	140	190	200	110	150	130	120	140	140	140	150	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	243	185	228	219	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	0.07	0.09	0.08	0.08	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	6	4	6	6	6	5	4	4	5	4	6	6	5	6	6	4	4	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	204	310	270	301	270	235	241	413	235	207	133	306	279	255	255	402	493	138	539	195	459	459	459	459
COOLING VELOCITY (ft/min)	352	424	413	510	413	419	252	149	419	115	280	449	433	464	464	528	390	103	379	46	61	61	61	61
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	C	D	C	B	D	C	A	B	B	D	A	C	C	A	B	A	D	C

25

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

A

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	285	0.08	8.8	10	513	TRUNK G	0	0.00	0	0	0	TRUNK O	0	0.05	0	0	8
TRUNK B	560	0.08	11.3	16	630	TRUNK H	0	0.00	0	0	0	TRUNK P	0	0.05	0	0	8
TRUNK C	294	0.07	9.2	10	529	TRUNK I	0	0.00	0	0	0	TRUNK Q	0	0.05	0	0	8
TRUNK D	587	0.07	11.9	16	660	TRUNK J	0	0.00	0	0	0	TRUNK R	0	0.05	0	0	8
TRUNK E	0	0.00	0	0	0	TRUNK K	0	0.00	0	0	0	TRUNK S	0	0.05	0	0	8
TRUNK F	0	0.00	0	0	0	TRUNK L	0	0.00	0	0	0	TRUNK T	0	0.05	0	0	8
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
AIR VOLUME	95	75	85	75	95	155	150	240	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
ACTUAL DUCT LGH	40	79	54	40	47	32	27	38	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	225	215	255	175	230	145	190	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	222	304	289	295	222	262	172	228	1	1	1	1	1	1	1	1	1
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	14.80	14.80
ROUND DUCT SIZE	6	6	6	6	6	6	6	6	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
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	0	0

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91145
OPT GROUND - 5 BED 4 BATH

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	4 @ 10.6 cfm	42.4 cfm
Kitchen & Bathrooms	5 @ 10.6 cfm	53 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		95.4 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	95.4	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model: VANEE 65H	Location: BSMT		
95.4 cfm	☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
95.4 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-1	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH-2	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5

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

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

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

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																			
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																			
LO#: 91145		Model: 4502		Builder: ROYAL PINE HOMES		Date: 2021-06-04																																																													
Volume Calculation				Air Change & Delta T Data																																																															
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <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">Total:</td> <td></td> <td>37,891.0 ft³</td> </tr> <tr> <td colspan="2">Total:</td> <td></td> <td>1073.0 m³</td> </tr> </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 colspan="2">WINTER NATURAL AIR CHANGE RATE</td> <td>0.219</td> </tr> <tr> <td colspan="2">SUMMER NATURAL AIR CHANGE RATE</td> <td>0.068</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">Design Temperature Difference</th> </tr> <tr> <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> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></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	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																																																															
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$				$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																															
0.219 x 298.04 x 43 °C x 1.2 = 3382 W				= 0.068 x 298.04 x 7 °C x 1.2 = 173 W																																																															
= 11538 Btu/h				= 592 Btu/h																																																															
5.2.3.2 Heat Loss due to Mechanical Ventilation				6.2.7 Sensible heat Gain due to Ventilation																																																															
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$				$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																															
95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h				95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h																																																															
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																			
$HL_{airrr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agcleve} + HL_{bgcleve})\}$																																																																			
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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: 4502	OPT GROUND - 5 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 91145	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):	37891.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	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

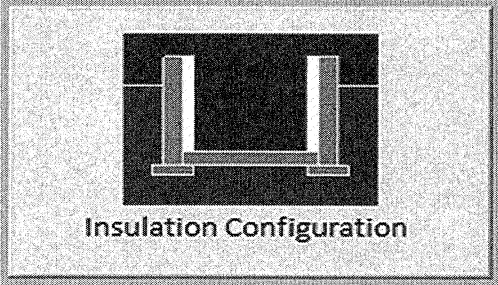
Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum 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):	14.6	 Insulation Configuration
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# 91145

OPT GROUND - 5 BED 4 BATH

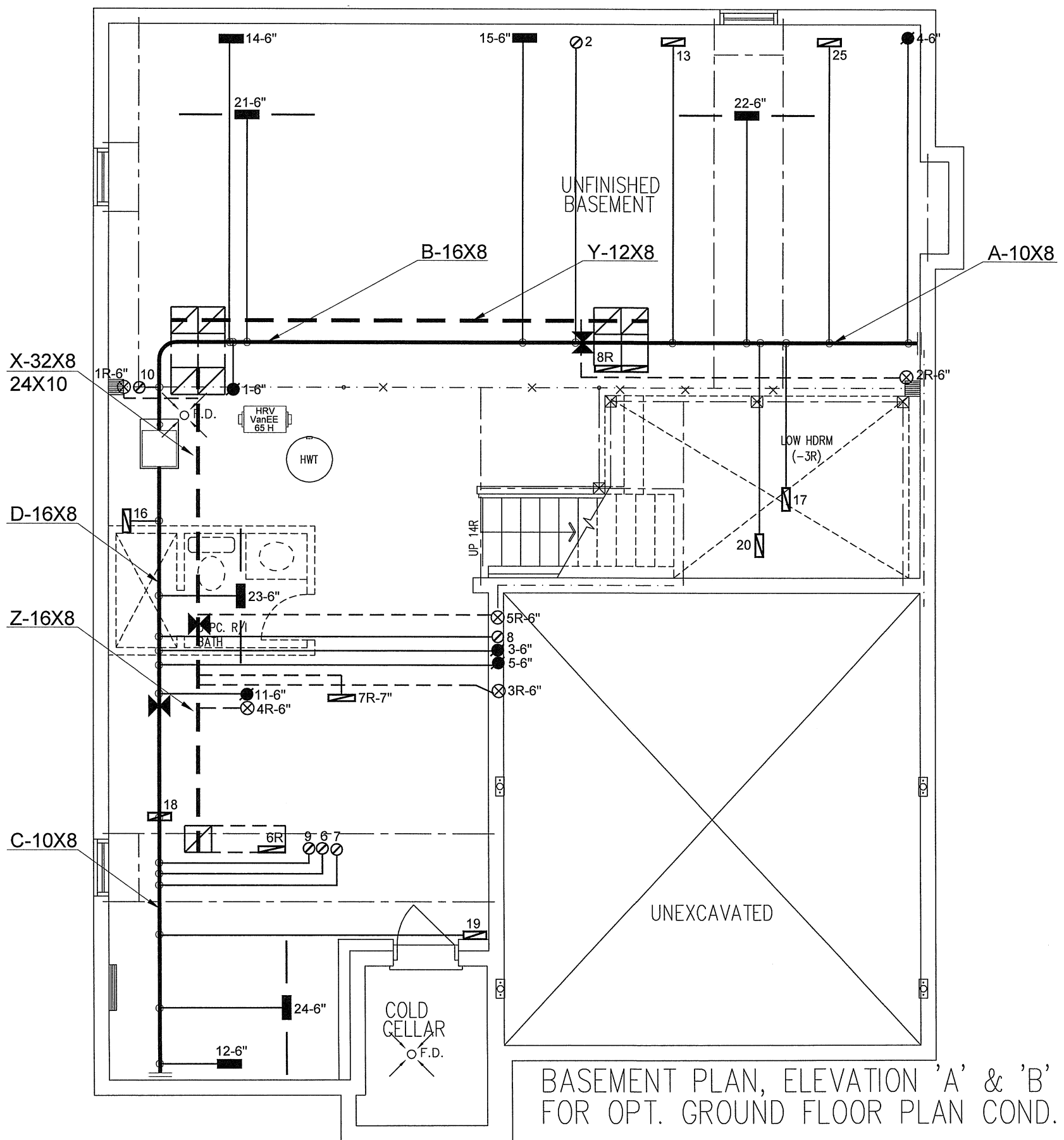
Air Infiltration Residential Load Calculator

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		
	45.0	45.0		
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# 91145

OPT GROUND - 5 BED 4 BATH



BASEMENT PLAN, ELEVATION 'A' & 'B'
FOR OPT. GROUND FLOOR PLAN COND.

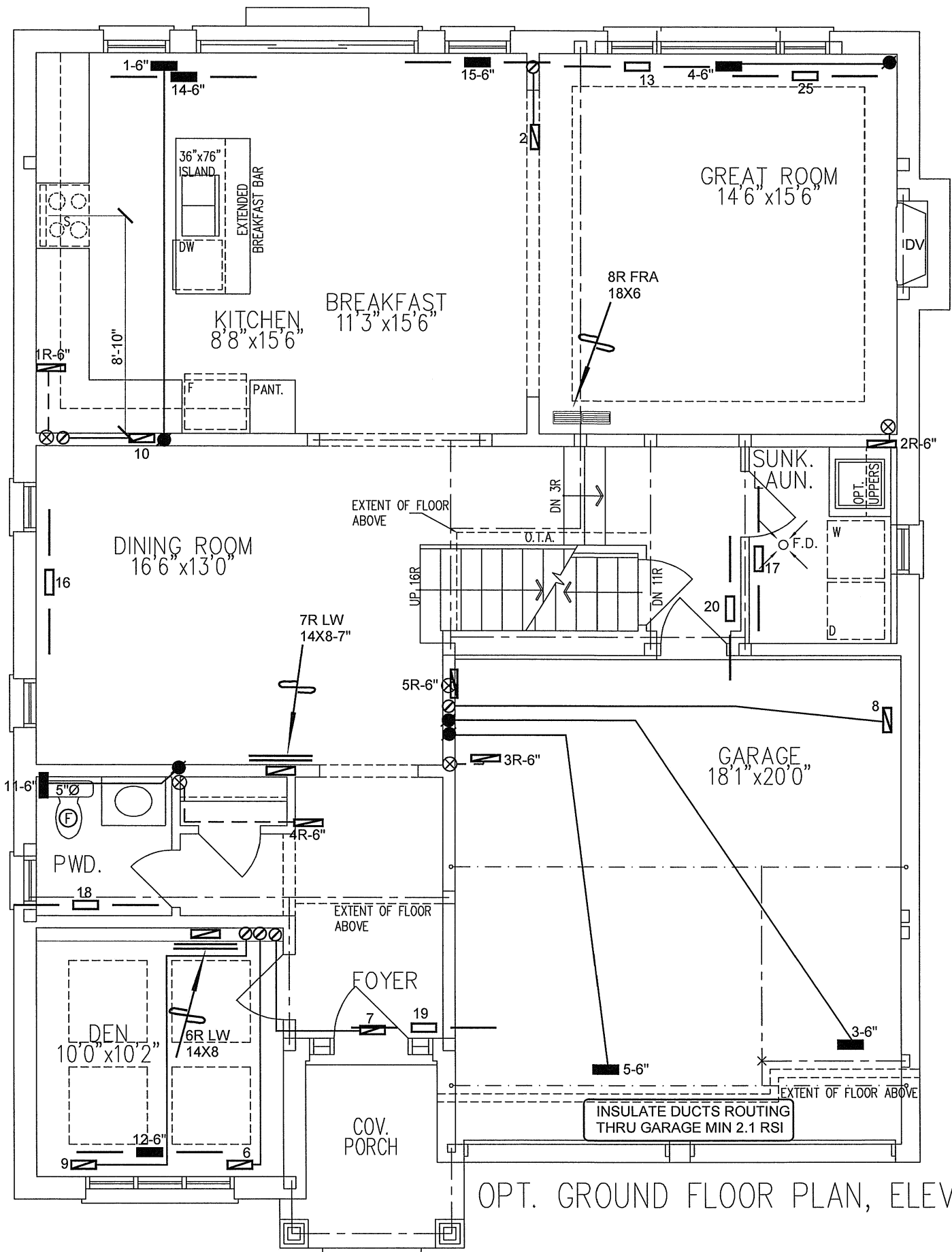
CSA-F280-12

I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.

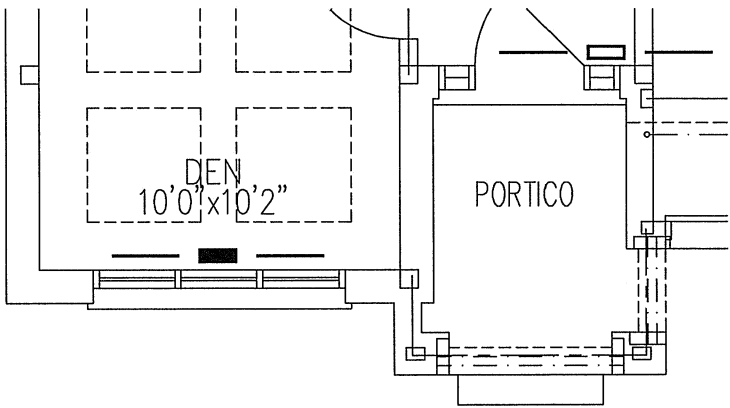


Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

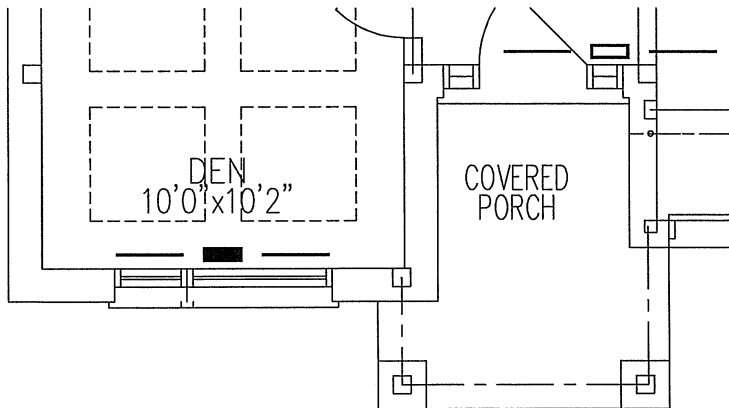
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 47490 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
ROYAL PINE HOMES			MAKE	CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name			MODEL	59TN6A-060-14V	2ND FLOOR	11	5	4		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT	60 MBTU/H	1ST FLOOR	10	3	2		
OPT GROUND - 5 BED 4 BATH 4502 2942 sqft			OUTPUT	58 MBTU/H	BASEMENT	4	1	0	Date	JUNE/2021
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.		COOLING	3.0 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	1145 cfm @ 0.6" w.c.					BCIN# 19669		LO#



OPT. GROUND FLOOR PLAN, ELEVATION 'A'



OPT. GROUND FLOOR PLAN, ELEVATION 'B'



OPT. GROUND FLOOR PLAN, ELEVATION '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.

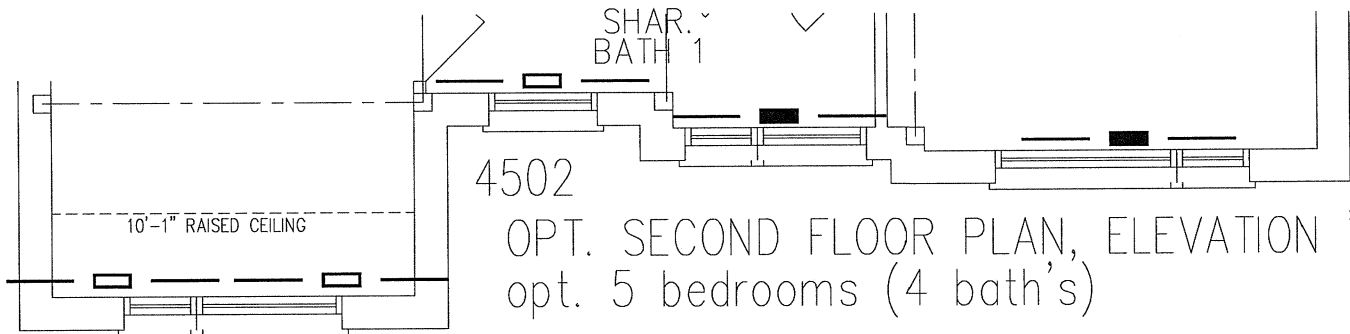
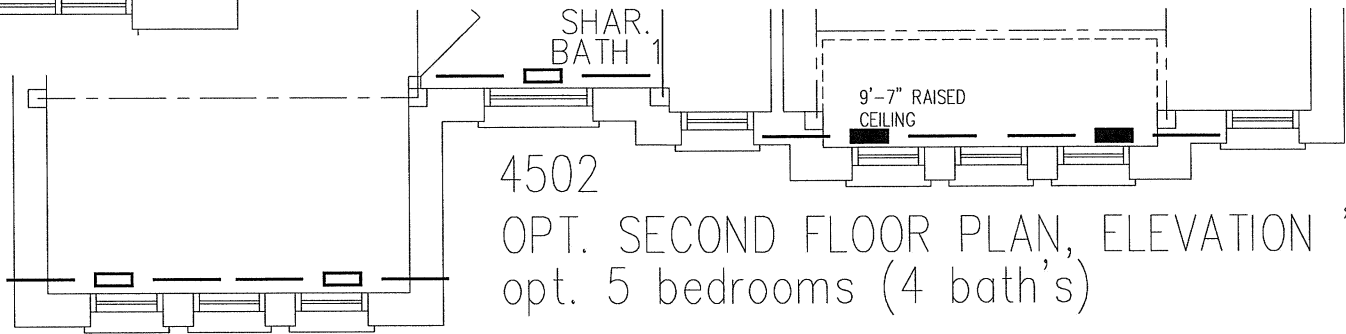
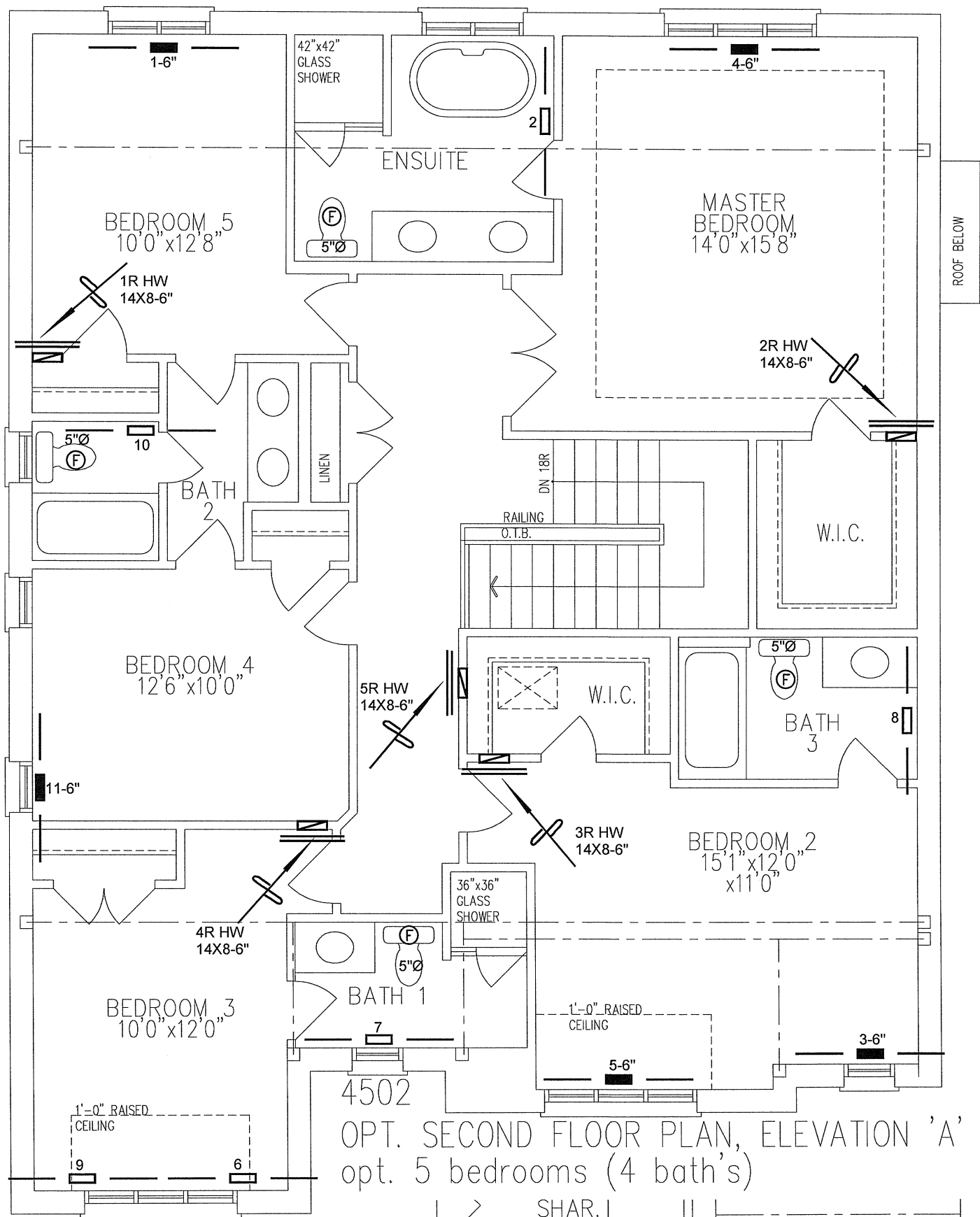
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	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 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 JUNE/2021	
OPT GROUND - 5 BED 4 BATH 4502 2942 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 91145	



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.		
	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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND - 5 BED 4 BATH 4502 2942 sqft			BCIN# 19669	
		LO#	91145	

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: 4502	
HEAT LOSS / GAIN CALCULATIONS		OPT 4 BED 4 BATH	
DUCT SIZING		Project: CENTREFIELD (WEST GORMLEY)	
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY			
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12			
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			
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) OPT 4 BED 4 BATH TYPE: 4502 DATE: Jun-21 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS AT °F. 78 CSA-F280-12
BUILDER: ROYAL PINE HOMES LO# 91142 SUMMER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN AT °F. 13 SB-12 PERFORMANCE

ROOM USE	MBR	ENS	KT/BR	DIN	LAUN	PWD	FOY	MUD	ENS-2	WIC-3	ENS-4	
EXP. WALL CLG. HT.	34 9	11 8	37 10	17 10	16 11	6 10	18 10	11 11	8 8	7 8	11 8	
FACTORS												
GRS.WALL AREA	306	88	370	170	176	60	180	121	64	56	88	
GLAZING												
NORTH	0	0	0	0	0	0	0	0	0	0	0	LOSS GAIN
EAST	0	0	0	0	0	0	0	0	0	0	0	7 152 110
SOUTH	0	0	0	0	0	0	0	0	0	0	0	0 0 0
WEST	0	0	0	0	0	0	0	0	0	0	0	0 0 0
SKYL.T.	30 654 1228	17 370 696	87 1895 3560	0 0 0 0	0 0 0 0	0 0 0 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	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	283 1190 196	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	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 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	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	133 175 78
NO ATTIC EXPOSED CLG	2.8 1.3 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	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 0	0 0 0	0 0 0	0 0 0
BASEMENT/CRAWL HEAT LOSS												0 0 0
SLAB ON GRADE HEAT LOSS												0 0 0
SUBTOTAL HT LOSS	2325	896	3105	1066	1314	375	1612	509	627	546	668	245
SUB TOTAL HT GAIN	1647	846	3765	303	374	208	1161	84	216	631	790	332
LEVEL FACTOR / MULTIPLIER	0.20 0.18	0.20 0.18	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.20 0.18	0.20 0.18	0.20 0.18	0.20 0.18
AIR CHANGE HEAT LOSS	426	164	883	303	374	107	459	145	115	100	122	10
AIR CHANGE HEAT GAIN	70	36	195	0	0	0	0	0	74	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	23	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	2	480	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	539	0	539	539	539	539	539	539	0	0	0	0
TOTAL HT LOSS BTU/H	2752	1061	3988	1370	1687	482	2070	654	816	646	790	332
TOTAL HT GAIN x 1.3 BTU/H	3558	1147	5803	1507	1126	283	1574	113	322	855	332	

ROOM USE	LIV	GRT	KT/BR	DIN	LAUN	PWD	FOY	MUD	ENS-2	WIC-3	ENS-4	
EXP. WALL CLG. HT.	30 10	34 10	37 10	17 10	16 11	6 10	18 10	11 11	8 8	7 8	11 8	
FACTORS												
GRS.WALL AREA	300	340	370	170	176	60	180	121	64	56	88	
GLAZING												
NORTH	0	0	0	0	0	0	0	0	0	0	0	LOSS GAIN
EAST	0	0	0	0	0	0	0	0	0	0	0	0 0 0
SOUTH	0	0	0	0	0	0	0	0	0	0	0	6 131 147
WEST	0	0	0	0	0	0	0	0	0	0	0	3 65 123
SKYL.T.	0 0 0 0	51 1111 2087	87 1895 3560	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	20 517 85
DOORS	0	0	0	0	0	0	0	0	0	0	0	0 0 0
NET EXPOSED WALL	4.2 0.7 266 1119 184	289 1215 200	283 1190 196	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	516 1901 313
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	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 0	0 0 0	0 0 0	0 0 0
NO ATTIC EXPOSED CLG	2.8 1.3 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	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 0	0 0 0	0 0 0	0 0 0
BASEMENT/CRAWL HEAT LOSS												5884
SLAB ON GRADE HEAT LOSS												8498
SUBTOTAL HT LOSS	1859	2326	3105	1066	1314	375	1612	509	627	546	668	668
SUB TOTAL HT GAIN	1575	2287	3765	303	374	208	1161	84	216	631	790	0.50 0.68
LEVEL FACTOR / MULTIPLIER	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28	0.20 0.18	0.20 0.18	0.20 0.18	5769
AIR CHANGE HEAT LOSS	529	662	883	303	374	107	459	145	115	100	122	28
AIR CHANGE HEAT GAIN	67	97	160	0	0	0	0	0	74	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	23	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	539	539	539	539	539	539	539	539	0	0	0	539
TOTAL HT LOSS BTU/H	2388	2988	3988	1370	1687	482	2070	654	816	646	790	14267
TOTAL HT GAIN x 1.3 BTU/H	2836	3801	5803	1507	1126	283	1574	113	322	855	332	

TOTAL HEAT GAIN BTU/H: 36941 TONS: 3.08 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 45259 TOTAL COMBINED HEAT LOSS BTU/H: 46929

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

OPT 4 BED 4 BATH
TYPE: 4502

DATE: Jun-21

GFA: 2942 LO# 91142

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,259 TOTAL HEAT GAIN 36,666
AIR FLOW RATE CFM 25.3 AIR FLOW RATE CFM 31.23

59TN6B-060-14V
FAN SPEED 60

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

DESIGN CFM = 1145
CFM @ 8" E.S.P.

ROOM	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th
ROOM NAME	BED-3	BED-2	BED-3	BED-3	BED-3	BED-4	ENS-3	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4
RM LOSS MBH	1.38	1.06	1.06	1.06	1.06	1.32	0.24	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
CFM PER RUN HEAT	35	27	27	27	27	33	6	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
RM GAIN MBH	1.78	1.15	2.58	2.90	2.58	1.83	0.07	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
CFM PER RUN COOLING	56	36	81	90	81	57	2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	27	51	56	65	51	45	44	52	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	150	150	150	140	110	110	150	130	120	140	140	140	130	150	140	130	140	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	194	202	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	0.09	0.09	0.09	0.08	0.1	0.13	0.12	0.09	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	6	4	4	4	5	5	6	5	6	6	4	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	310	265	301	265	242	69	241	242	257	229	306	279	255	255	402	493	138	382	195	459	459	459	459
COOLING VELOCITY (ft/min)	411	413	413	459	413	419	23	115	419	411	115	454	433	464	464	539	402	103	360	46	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	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	C	A	A	D	C

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

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

ROOM	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th
ROOM NAME	BED-3	BED-2	BED-3	BED-3	BED-3	BED-4	ENS-3	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4
RM LOSS MBH	1.38	1.06	1.06	1.06	1.06	1.32	0.24	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
CFM PER RUN HEAT	35	27	27	27	27	33	6	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
RM GAIN MBH	1.78	1.15	2.58	2.90	2.58	1.83	0.07	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
CFM PER RUN COOLING	56	36	81	90	81	57	2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	27	51	56	65	51	45	44	52	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	150	150	150	140	110	110	150	130	120	140	140	140	130	150	140	130	140	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	194	202	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	0.09	0.09	0.09	0.08	0.1	0.13	0.12	0.09	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	6	4	4	4	5	5	6	5	6	6	4	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	310	265	301	265	242	69	241	242	257	229	306	279	255	255	402	493	138	382	195	459	459	459	459
COOLING VELOCITY (ft/min)	411	413	413	459	413	419	23	115	419	411	115	454	433	464	464	539	402	103	360	46	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	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	C	A	A	D	C

ROOM	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th
ROOM NAME	BED-3	BED-2	BED-3	BED-3	BED-3	BED-4	ENS-3	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4	ENS-4
RM LOSS MBH	1.38	1.06	1.06	1.06	1.06	1.32	0.24	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
CFM PER RUN HEAT	35	27	27	27	27	33	6	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
RM GAIN MBH	1.78	1.15	2.58	2.90	2.58	1.83	0.07	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
CFM PER RUN COOLING	56	36	81	90	81	57	2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	27	51	56	65	51	45	44	52	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	150	150	150	140	110	110	150	130	120	140	140	140	130	150	140	130	140	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	194	202	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	0.09	0.09	0.09	0.08	0.1	0.13	0.12	0.09	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	6	4	4	4	5	5	6	5	6	6	4	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	310	265	301	265	242	69	241	242	257	229	306	279	255	255	402	493	138	382	195	459	459	459	459
COOLING VELOCITY (ft/min)	411	413	413	459	413	419	23	115	419	411	115	454	433	464	464	539	402	103	360	46	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	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	C	A	A	D	C

SUPPLY AIR TRUNK SIZE											RETURN AIR TRUNK SIZE										
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	
TRUNK A	285	0.08	8.8	10	8																
TRUNK B	572	0.08	11.4	16	8																
TRUNK C	296	0.08	8.9	10	8																
TRUNK D		0.08	11.4	16	8																
TRUNK E	572	0.08		0	8																
TRUNK F	0	0.00	0	0	0																
																				</	

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91142
OPT 4 BED 4 BATH

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
ENS-2	BY INSTALLING CONTRACTOR	50	☒ 3.5
ENS-4	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:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations			
Formula Sheet (For Air Leakage / Ventilation Calculation)			
LO#: 91142	Model: 4502	Builder: ROYAL PINE HOMES	Date: 2021-06-04
Volume Calculation			
House Volume	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Level			
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

5.2.3.1 Heat Loss due to Air Leakage $HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 298.04 x 43 °C x 1.2 = 3382 W = 11538 Btu/h	5.2.3.2 Heat Loss due to Mechanical Ventilation $HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h
---	--

5.2.6 Sensible Gain due to Air Leakage $HG_{satb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 298.04 x 7 °C x 1.2 = 173 W = 592 Btu/h	5.2.7 Sensible heat Gain due to Ventilation $HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})
1	0.5	11,538	8,498
2	0.3		12,167
3	0.2		12,588
4	0		0
5	0		0

*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: 4502	OPT 4 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 91142	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):	37891.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	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

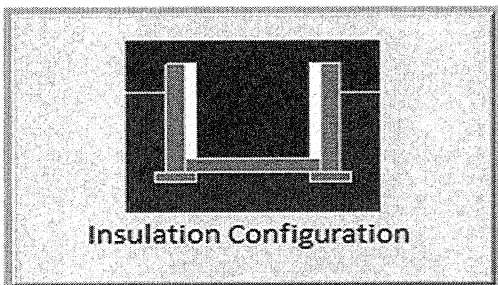
2012 OBC - COMPLIANCE PACKAGE		
Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	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):	14.6	 Insulation Configuration
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# 91142

OPT 4 BED 4 BATH

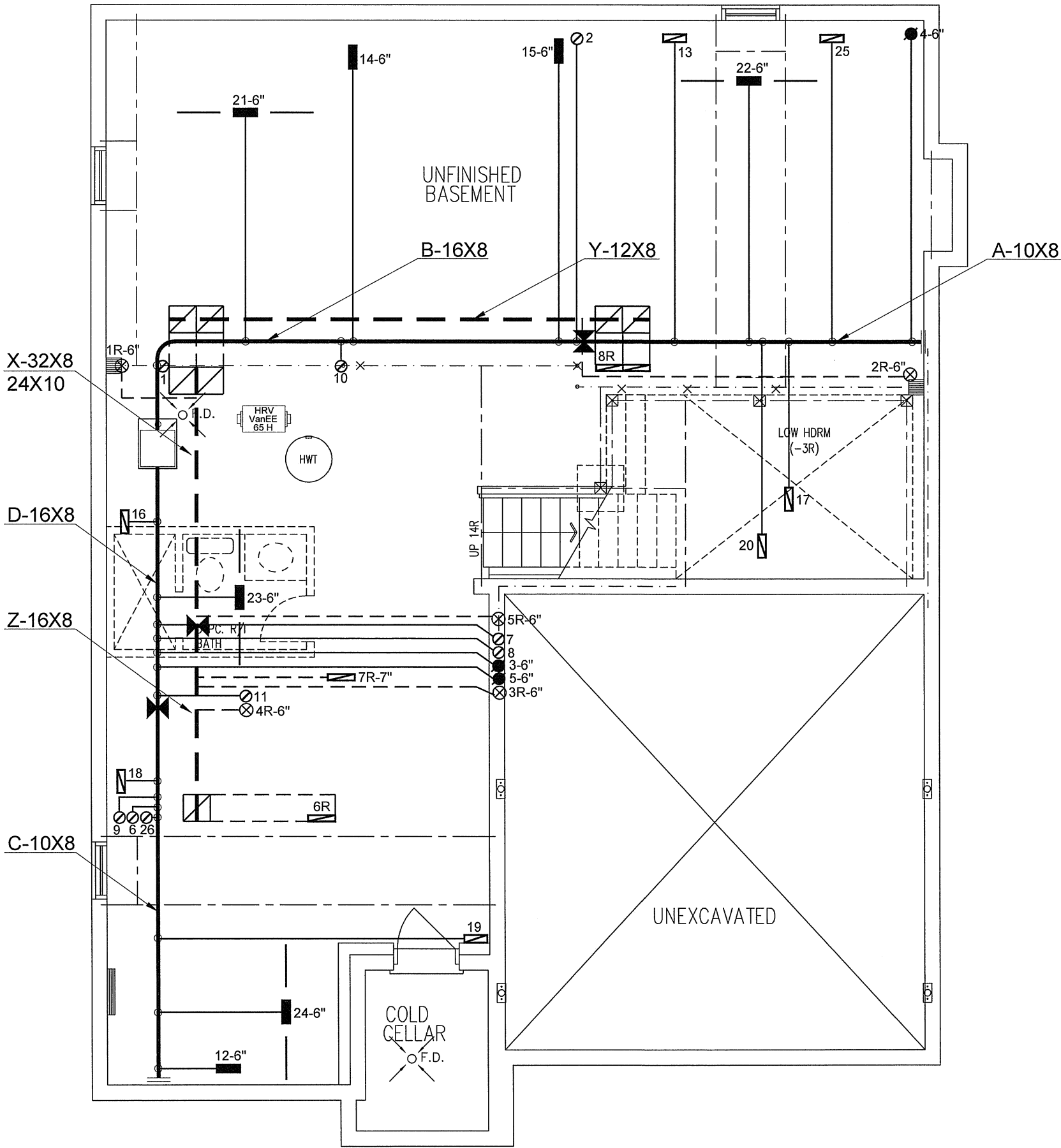
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

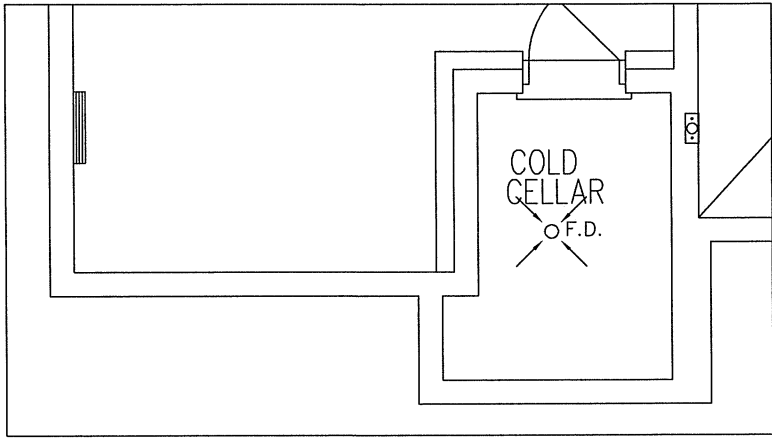
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.40			
Building Configuration				
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# 91142

OPT 4 BED 4 BATH



BASEMENT PLAN, ELEVATION 'A' & 'B'



BASEMENT PLAN, ELEVATION 'C'

CSA-F280-12

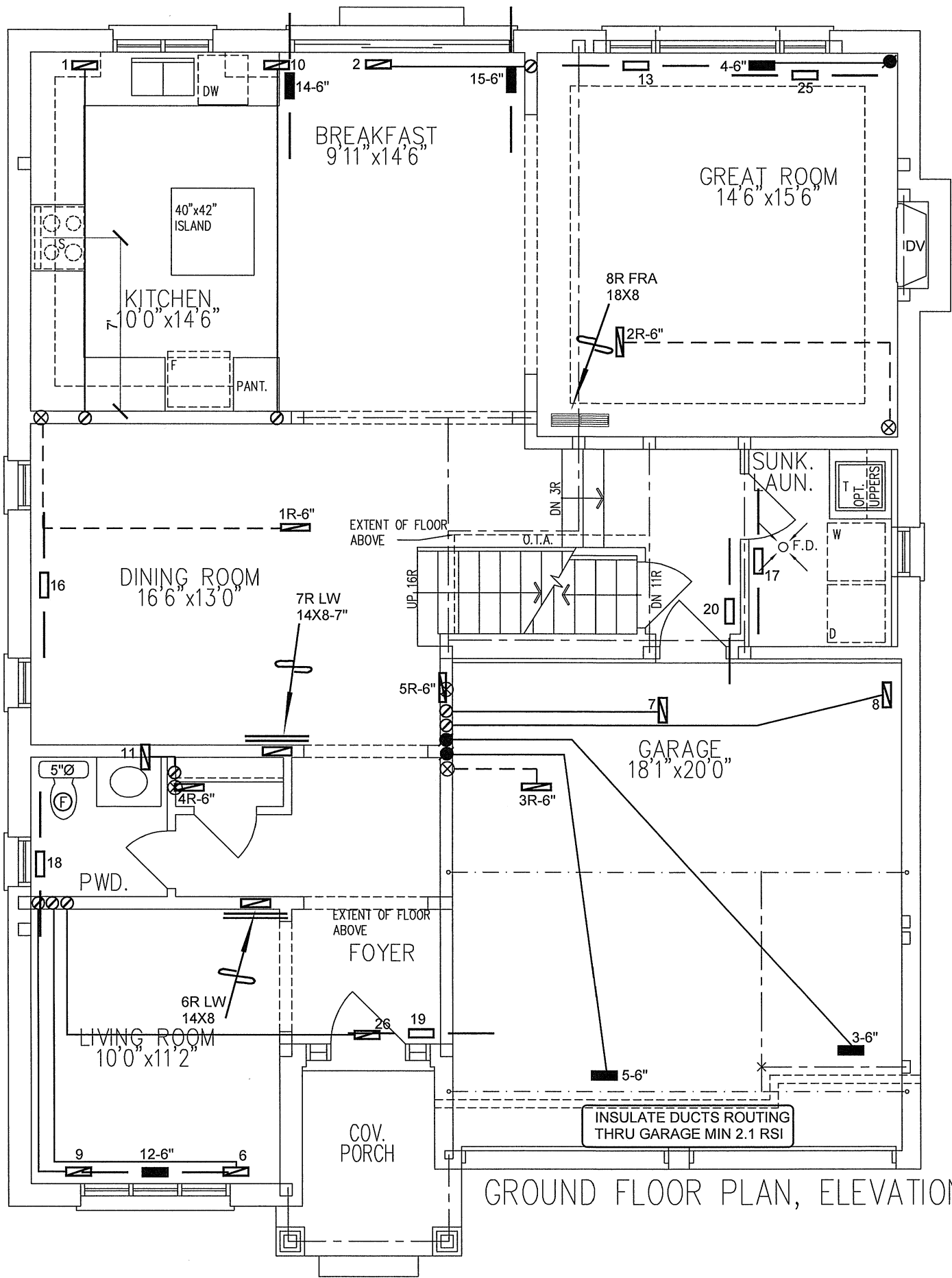
SB-12 PERFORMANCE

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

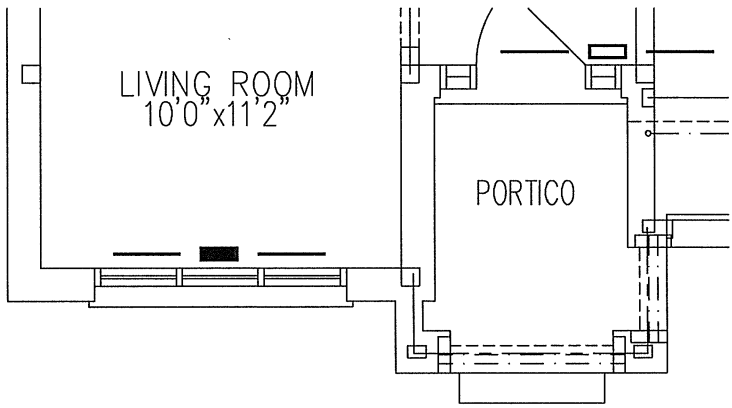
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK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

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.

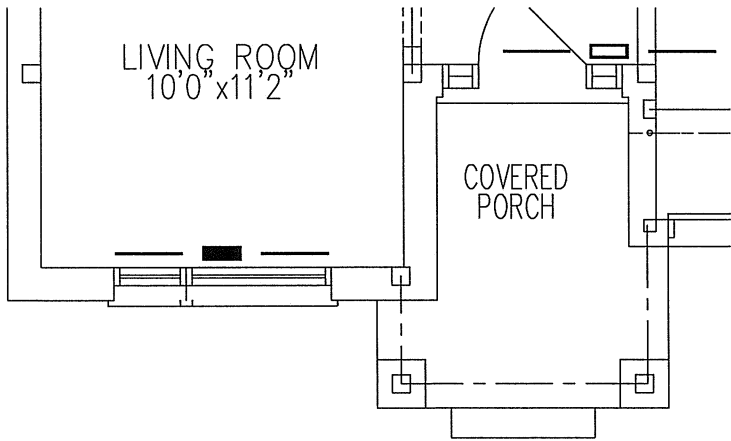
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services		HEAT LOSS 46929 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES				MAKE CARRIER		3RD FLOOR			BASEMENT HEATING LAYOUT	
Project Name		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.		MODEL 59TN6B-060-14V		2ND FLOOR			Date	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				INPUT 60 MBTU/H		1ST FLOOR			JUNE/2021	
OPT 4 BED 4 BATH 4502				OUTPUT 58 MBTU/H		BASEMENT			Scale	
2942 sqft				COOLING 3.0 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			3/16" = 1'-0"	
				FAN SPEED 1145 cfm @ 0.6" w.c.					BCIN# 19669	
							LO#		91142	



GROUND FLOOR PLAN, ELEVATION 'A'



GROUND FLOOR PLAN, ELEVATION 'B'



GROUND FLOOR PLAN, ELEVATION '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.

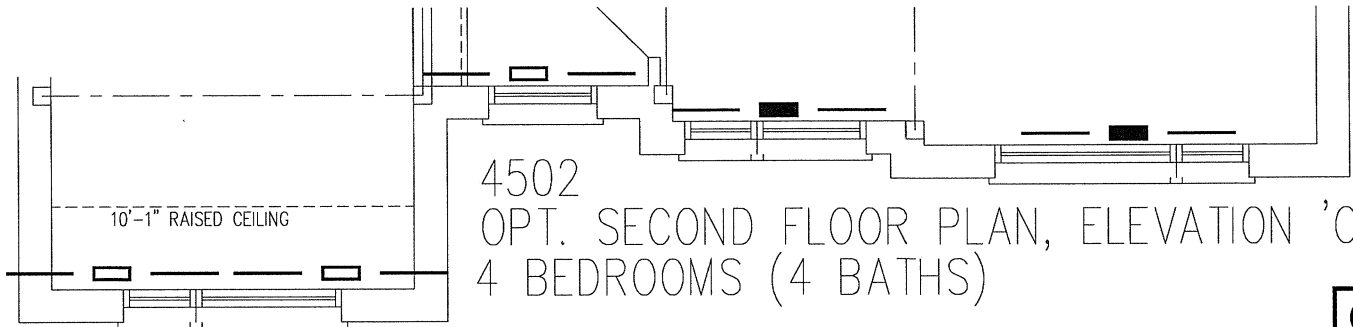
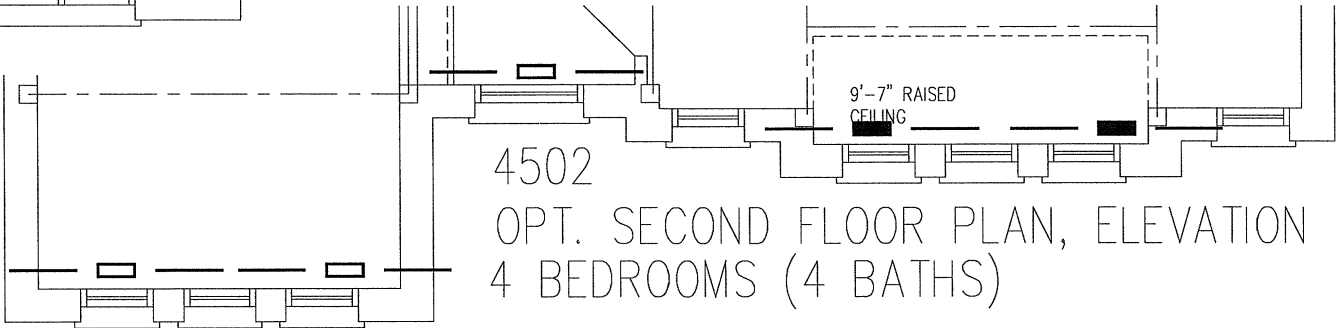
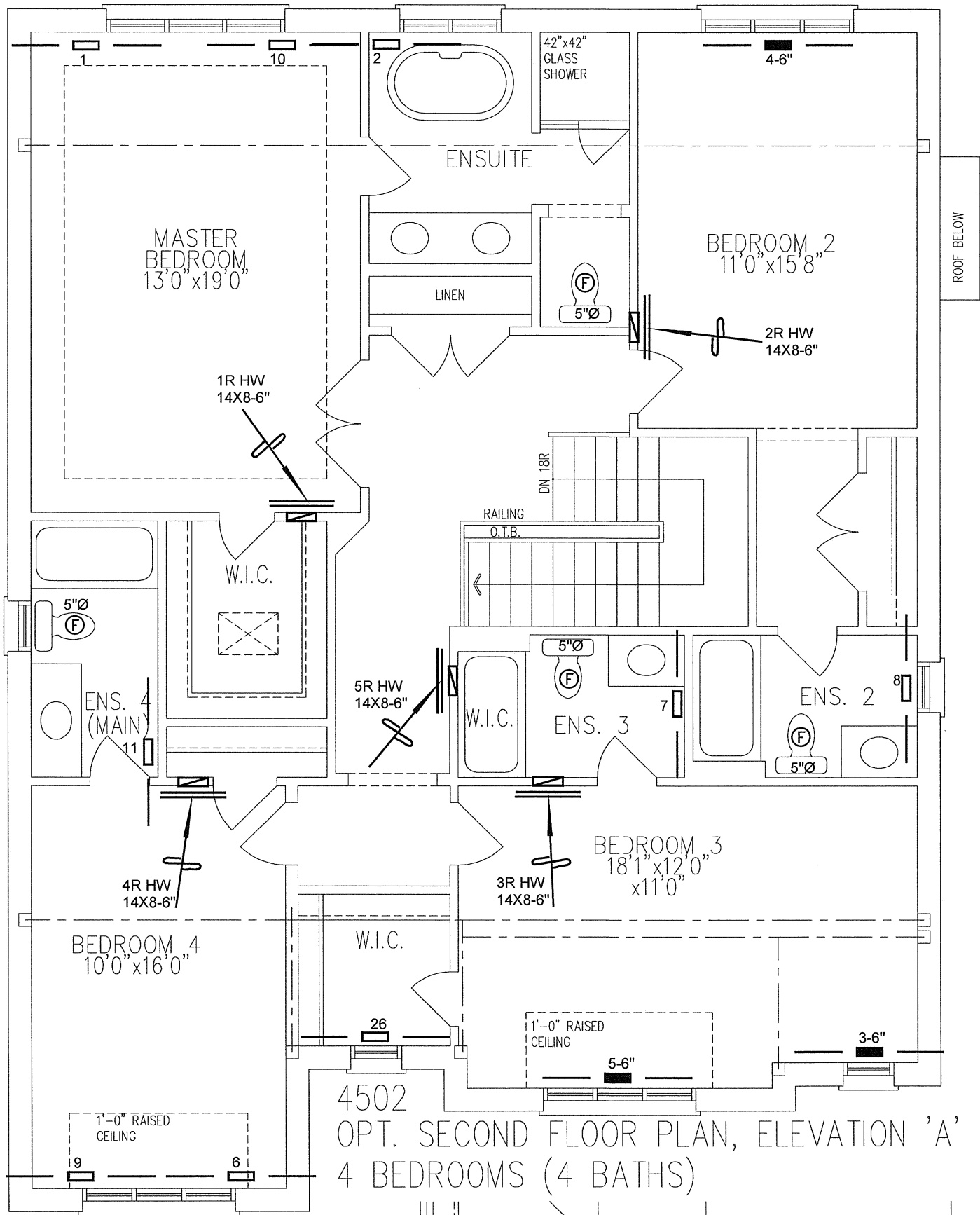
CSA-F280-12

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		HVACDESIGNS 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	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	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT 4 BED 4 BATH 4502			BCIN# 19669	
2942 sqft		LO# 91142		



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.	
	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	REVISIONS	
								Description	Date

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			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT 4 BED 4 BATH 4502			BCIN# 19669	
2942 sqft			LO#	91142

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.
Municipality			Lot/con.
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: 4502	
HEAT LOSS / GAIN CALCULATIONS		OPT 5 BED 4 BATH	
DUCT SIZING		Project: CENTREFIELD (WEST GORMLEY)	
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY			
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12			
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			
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) BUILDER: ROYAL PINE HOMES										DATE: Jun-21 LO# 91144	WINTER NATURAL AIR CHANGE RATE SUMMER NATURAL AIR CHANGE RATE	HEAT LOSS AT °F. HEAT GAIN AT °F.	CSA-F280-12 SB-12 PERFORMANCE
OPT 5 BED 4 BATH TYPE: 4502										GFA: 2842			
ROOM USE	MBR	ENS	BATH-3	BED-4	BED-3	BATH-1	BED-5	BATH-2					
EXP. WALL	32	11	14	11	33	33	264	72	25	9	72	9	
CLG. HT.	9	8	8	8	8	8	0	0	8	8	152	8	
FACTORS													
GRS.WALL AREA	288	88	112	88	264	264	264	200	200	72	72	72	
GLAZING	0	0	0	0	0	0	0	0	0	0	0	0	
NORTH	21.8	15.8	0	0	0	0	0	0	0	0	0	0	
EAST	21.8	40.9	0	0	0	0	0	0	0	0	0	0	
SOUTH	21.8	24.5	0	0	0	0	0	0	0	0	0	0	
WEST	21.8	40.9	0	0	0	0	0	0	0	0	0	0	
SKYL.T.	35.8	101.2	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	
NET EXPOSED WALL	4.2	0.7	262	1102	181	71	299	49	112	471	77	70	294
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	255	335	150	187	246	110	266	350	156	154	202
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	110	287	47	0	0
BASEMENT/CRAWL HEAT LOSS	0	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	0
SUBTOTAL HT LOSS	2003	915	1108	889	3235	2739	2133	642	1342	475	913	603	235
SUB TOTAL HT GAIN	0.20	0.18	0.20	0.18	0.20	0.18	0.20	0.18	0.20	0.18	0.20	0.18	0.20
LEVEL FACTOR / MULTIPLIER	359	164	199	159	580	580	382	115	241	108	108	108	108
AIR CHANGE HEAT LOSS	65	40	13	27	128	128	91	22	43	11	11	11	11
AIR CHANGE HEAT GAIN	0	0	131	0	382	382	0	76	0	0	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	29	240	1	240	1	50	0	0	0	0	0
HEAT GAIN PEOPLE	2	480	0	0	240	240	240	240	1	240	240	240	240
HEAT GAIN APPLIANCES/LIGHTS	480	0	0	490	490	490	490	490	0	490	490	490	490
TOTAL HT LOSS BTU/H	2362	1079	1437	1048	4197	5145	2516	833	1583	711	711	711	711
TOTAL HT GAIN x 1.3 BTU/H	3160	1163	421	1740	5145	5145	3582	711	2192	319	319	319	319

TOTAL HEAT GAIN BTU/H: 38542										TONS: 3.05	LOSS DUE TO VENTILATION LOAD BTU/H: 2004	STRUCTURAL HEAT LOSS: 45486	TOTAL COMBINED HEAT LOSS BTU/H: 47490
ROOM USE	LIV	GRT	KTBR	DIN	LAUN	PWD	FOY	MUD	BAS				
EXP. WALL	30	34	37	17	16	6	18	11	172				
CLG. HT.	10	10	10	10	11	10	10	11	9				
FACTORS													
GRS.WALL AREA	300	340	370	170	176	60	180	121	1032				
GLAZING	0	0	0	0	0	0	0	0	0				
NORTH	21.8	15.8	0	0	0	0	0	0	0				
EAST	21.8	40.9	0	0	0	0	0	0	0				
SOUTH	21.8	24.5	0	0	0	0	0	0	0				
WEST	21.8	40.9	0	0	0	0	0	0	0				
SKYL.T.	35.8	101.2	0	0	0	0	0	0	0				
DOORS	25.8	4.3	0	0	0	0	0	0	0				
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	20				
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0				
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0				
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0				
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0				
BASEMENT/CRAWL HEAT LOSS	0	0	0	0	0	0	0	0	0				
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0				
SUBTOTAL HT LOSS	1859	2326	3105	1066	1314	375	1436	509	8498				
SUB TOTAL HT GAIN	0.30	0.29	0.30	0.29	0.30	0.29	0.30	0.29	0.50				
LEVEL FACTOR / MULTIPLIER	537	672	896	308	379	108	414	147	5769				
AIR CHANGE HEAT LOSS	74	107	176	28	15	10	36	4	31				
AIR CHANGE HEAT GAIN	0	0	0	0	0	0	0	0	0				
DUCT LOSS	0	0	0	0	0	0	0	0	0				
DUCT GAIN	0	0	0	0	0	0	0	0	0				
HEAT GAIN PEOPLE	0	0	0	0	0	0	0	0	0				
HEAT GAIN APPLIANCES/LIGHTS	490	490	490	490	490	490	490	490	490				
TOTAL HT LOSS BTU/H	2396	2998	4001	1374	1693	484	1850	656	14267				
TOTAL HT GAIN x 1.3 BTU/H	2781	3750	5761	1447	1064	284	1033	114	1546				

Michael O'Rourke

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMESTYPE: 4502
OPT 5 BED 4 BATH

DATE: Jun-21

GFA: 2942 LO# 91144

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 45,486 TOTAL HEAT GAIN 36,213
AIR FLOW RATE CFM 25.17 AIR FLOW RATE CFM 31.62furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure for s/a & r/a 0.35r/a pressure 0.17
r/a grille press. loss 0.02
adjusted pressure r/a 0.1559TNGA-060-14V 60
FAN SPEED
LOW 820
MEDIUM 1145
HIGH 1520

**CARRIER

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000DESIGN CFM = 1145
CFM @ 6" E.S.P.

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 fans 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	BED-5	ENS	BED-2	MBR	BED-2	BED-3	BATH-1	BATH-3	BED-3	BATH-2	BED-4	LIV	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.56	1.08	2.10	2.36	2.10	1.26	0.83	1.44	1.26	0.71	1.05	2.40	1.50	2.00	2.00	1.37	1.69	0.48	1.85	0.66	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	40	27	53	59	53	32	21	36	32	18	26	60	38	50	50	35	43	12	47	17	90	90	90	90
RM GAIN MBH	2.19	1.16	2.57	3.16	2.57	1.79	0.71	0.42	1.79	0.32	1.74	2.78	1.87	2.88	2.88	1.45	1.06	0.28	1.03	0.11	0.39	0.39	0.39	0.39
CFM PER RUN COOLING	69	37	81	100	81	57	22	13	57	10	55	88	59	91	91	46	34	9	33	4	12	12	12	12
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	0.16	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	43	52	38	19	28	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	200	140	190	200	110	110	150	130	120	140	140	140	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	243	192	228	219	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	0.07	0.09	0.08	0.08	0.13	0.12	0.09	0.1	0.1	0.12	0.1	0.11	0.11	0.09	0.11	0.09	0.12	0.12
ROUND DUCT SIZE	6	4	6	6	6	5	4	4	5	4	6	6	5	6	6	4	4	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	204	310	270	301	270	235	241	413	235	207	133	306	279	255	255	402	493	138	539	195	459	459	459	459
COOLING VELOCITY (ft/min)	352	424	413	510	413	419	252	149	419	115	280	449	433	464	464	528	390	103	379	46	61	61	61	61
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	C	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	1.50
CFM PER RUN HEAT	38
RM GAIN MBH	1.87
CFM PER RUN COOLING	59
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)	279
COOLING VELOCITY (ft/min)	433
OUTLET GRILL SIZE	3X10
TRUNK	A

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	285	0.08	8.8	10	513	TRUNK G	0	0.00	0	0	TRUNK H	0	0.00	0	0
TRUNK B	560	0.08	11.3	16	630	TRUNK I	0	0.00	0	0	TRUNK J	0	0.00	0	0
TRUNK C	294	0.07	9.2	10	529	TRUNK K	0	0.00	0	0	TRUNK L	0	0.00	0	0
TRUNK D	587	0.07	11.9	16	660										
TRUNK E	0	0.00	0	0	0										
TRUNK F	0	0.00	0	0	0										

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	95	75	85	75	95	155	150	240	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	0.15
ACTUAL DUCT LGH	47	79	54	54	47	32	27	38	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	225	215	255	175	230	145	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.07	0.05	0.06	0.05	0.07	0.06	0.09	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
ROUND DUCT SIZE	8	6	6	6	8	7.5	6.7	8.8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	14	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: 4502
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91144
OPT 5 BED 4 BATH

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	4 @ 10.6 cfm	42.4 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	201.4 cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	201.4	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	106.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANE 65H	Location: BSMT
95.4 cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 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-1	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH-2	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANE 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:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																										
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																										
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6.2.6 Sensible Gain due to Air Leakage																																																																										
$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 298.04 x 7 °C x 1.2 = 173 W = 592 Btu/h																																																																										
6.2.7 Sensible heat Gain due to Ventilation																																																																										
$HL_{vaibr} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 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 style="text-align: center;">Level</th> <th style="text-align: center;">Level Factor (LF)</th> <th style="text-align: center;">HLaivr Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th style="text-align: center;">Level Conductive Heat Loss: (HL_{clevel})</th> <th style="text-align: center;">Air Leakage Heat Loss Multiplier (LF x HLaivr / HL_{clevel})</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0.5</td> <td rowspan="5" style="text-align: center;">11,538</td> <td style="text-align: center;">8,498</td> <td style="text-align: center;">0.679</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">0.3</td> <td style="text-align: center;">11,991</td> <td style="text-align: center;">0.289</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">0.2</td> <td style="text-align: center;">12,871</td> <td style="text-align: center;">0.179</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0.000</td> </tr> </tbody> </table> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLaivr = 0										Level	Level Factor (LF)	HLaivr Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLaivr / HL _{clevel})	1	0.5	11,538	8,498	0.679	2	0.3	11,991	0.289	3	0.2	12,871	0.179	4	0	0	0.000	5	0	0	0.000																																							
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4502	OPT 5 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 2942	LO# 91144	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:	6
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

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%	-

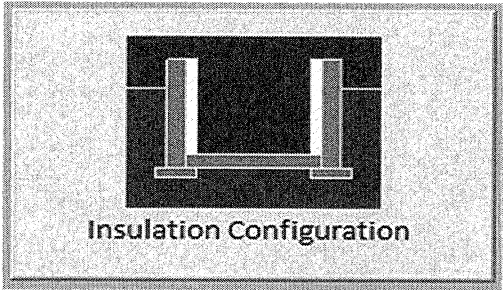
INDIVIDUAL BCIN: 19669

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):	14.6	 Insulation Configuration
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# 91144

OPT 5 BED 4 BATH

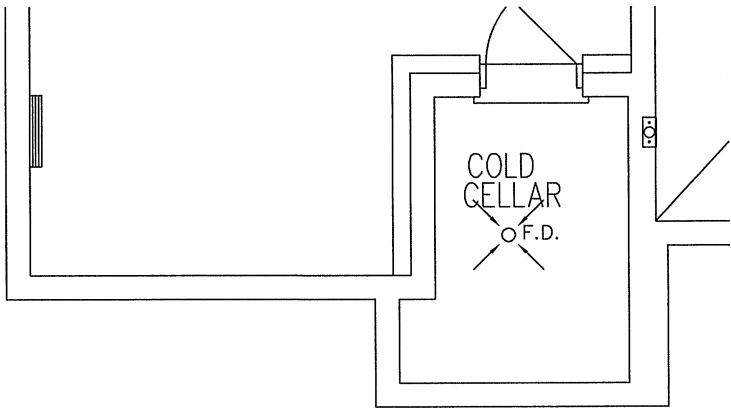
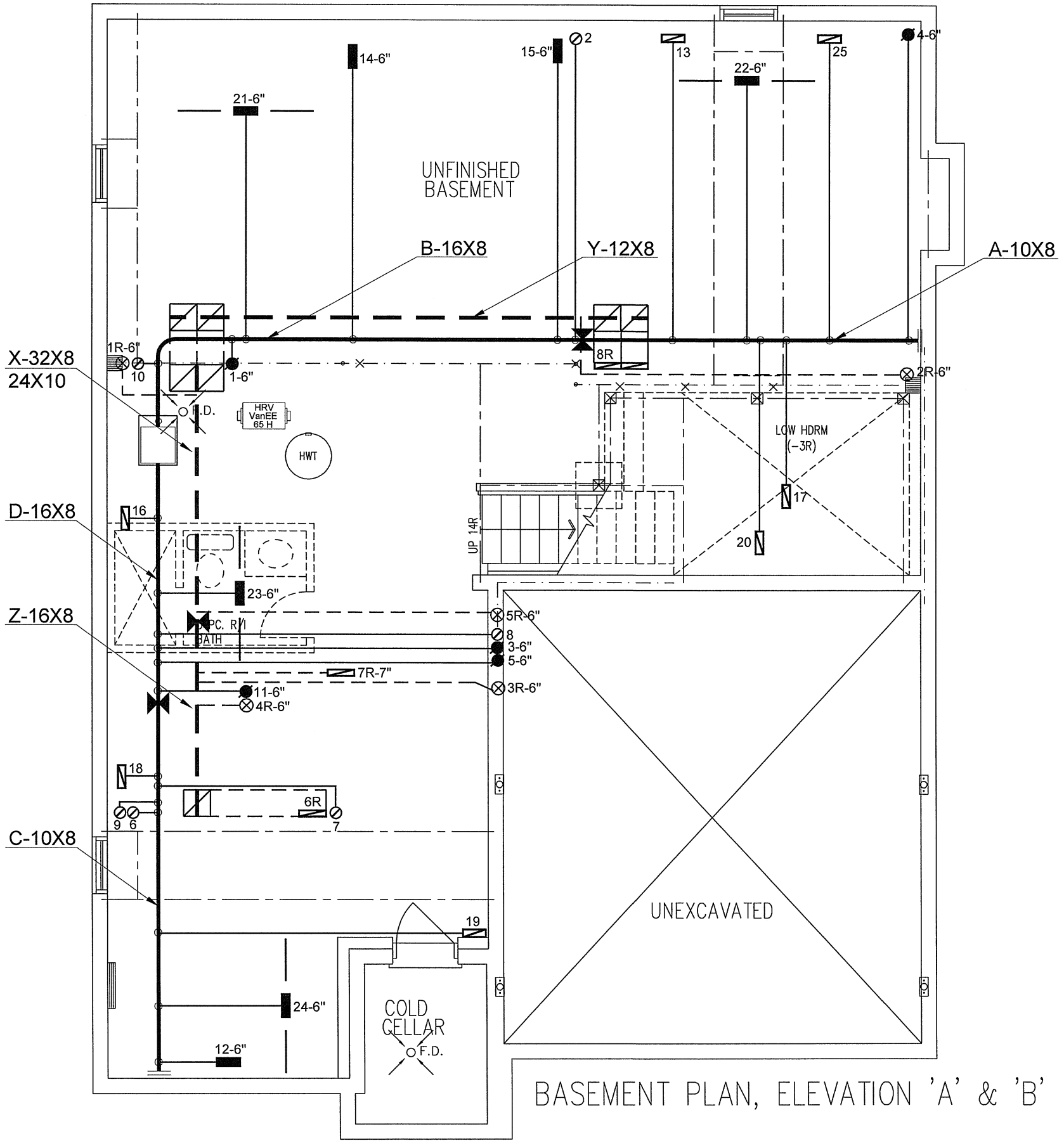
Air Infiltration Residential Load Calculator

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		
	45.0	45.0		
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# 91144

OPT 5 BED 4 BATH



I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.

Michael O'Rourke

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

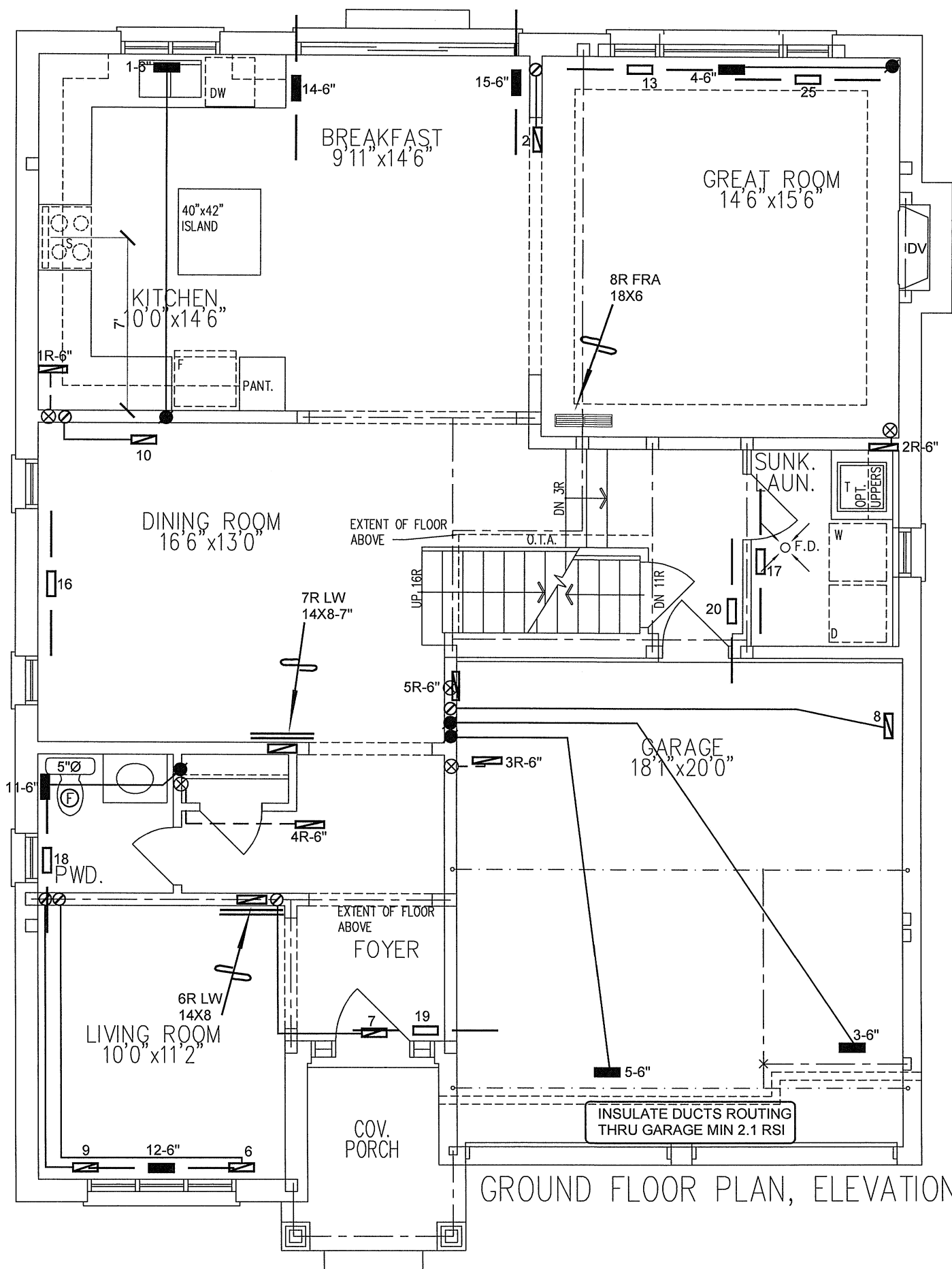
CSA-F280-12

SB-12 PERFORMANCE

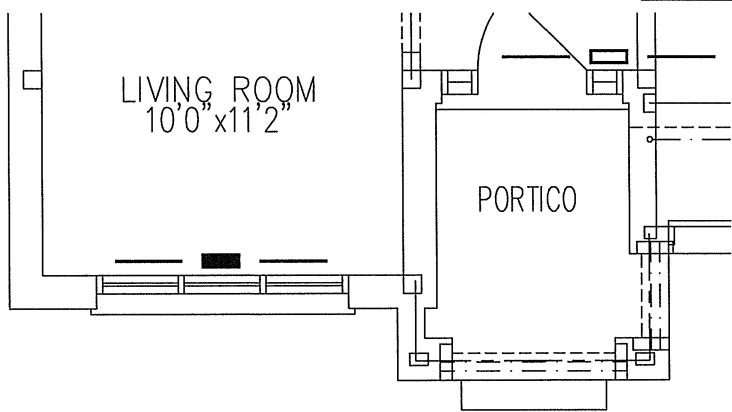
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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN 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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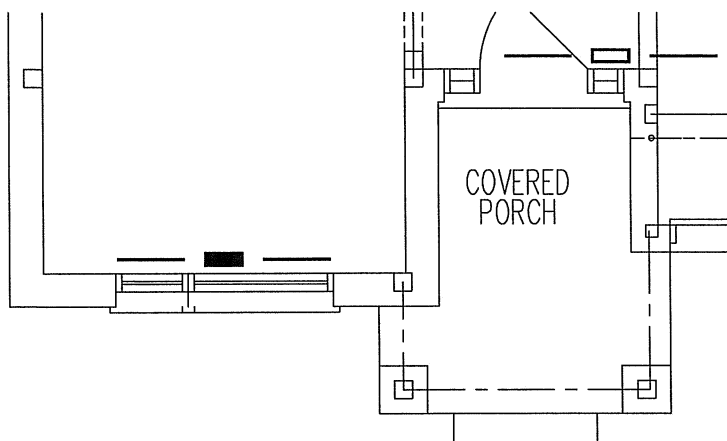
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 47490 BTU/H		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			UNIT DATA		3RD FLOOR			BASEMENT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		2ND FLOOR			HEATING	
			MODEL 59TN6A-060-14V		1ST FLOOR			LAYOUT	
			INPUT 60 MBTU/H		BASEMENT			Date JUNE/2021	
OPT 5 BED 4 BATH 4502 2942 sqft		OUTPUT 58 MBTU/H		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"		
		COOLING 3.0 TONS					BCIN# 19669		
		FAN SPEED 1145 cfm @ 0.6" w.c.					LO# 91144		



GROUND FLOOR PLAN, ELEVATION 'A'



GROUND FLOOR PLAN, ELEVATION 'B'



GROUND FLOOR PLAN, ELEVATION '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.

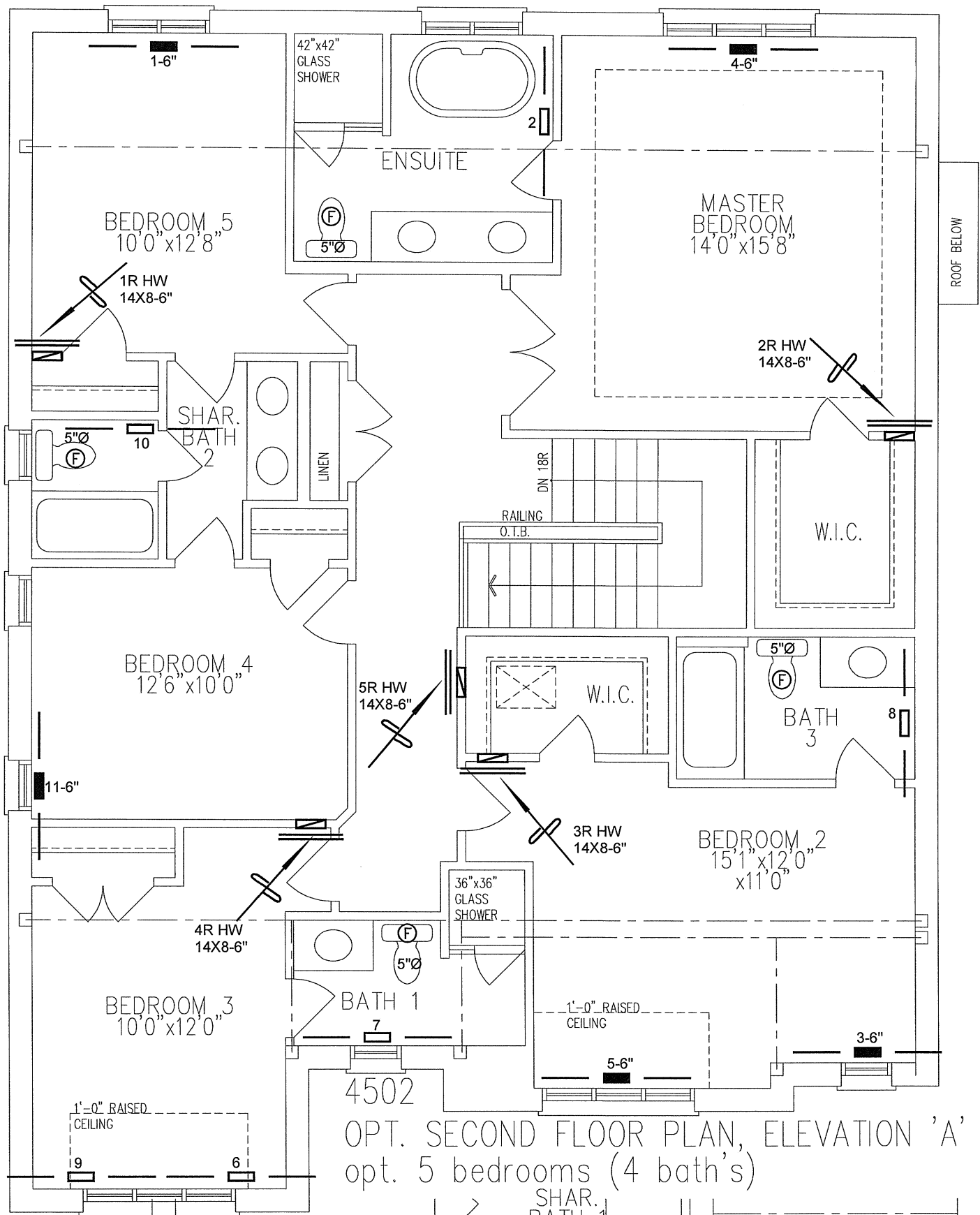
CSA-F280-12

SB-12 PERFORMANCE

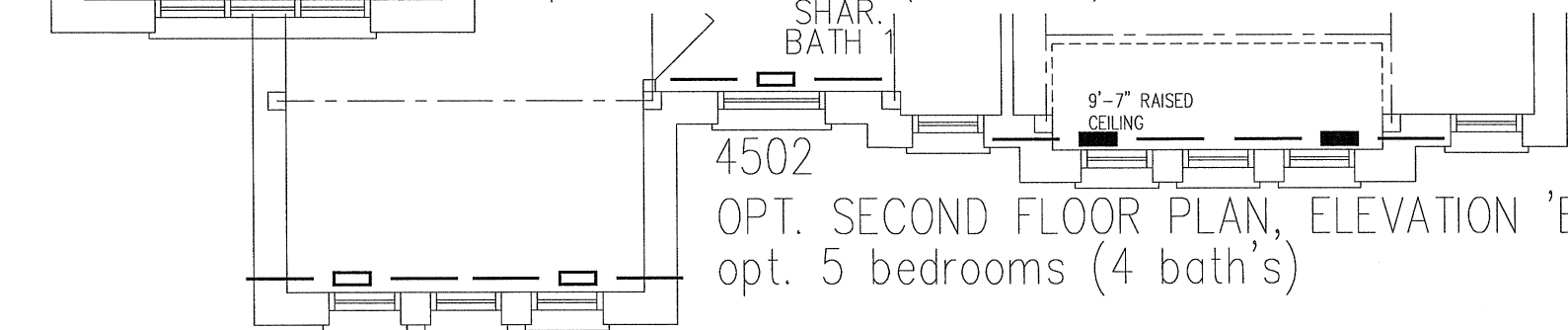
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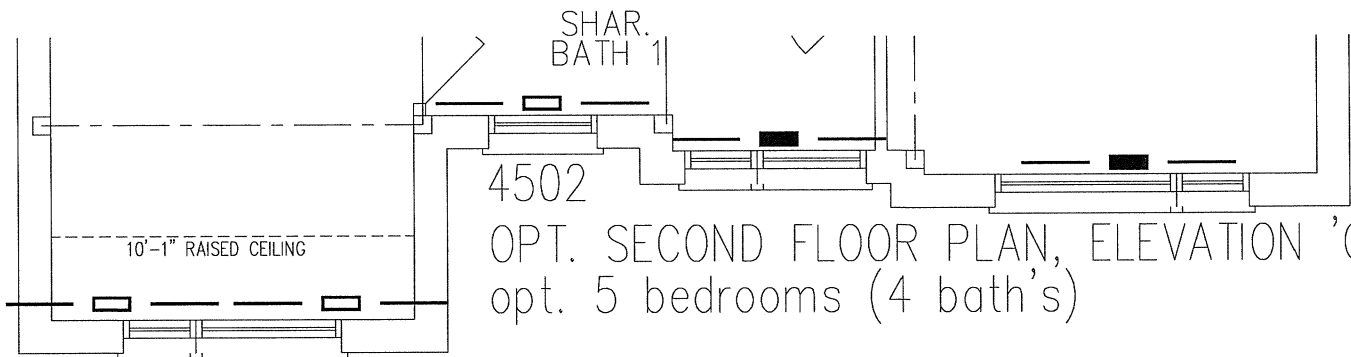
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 JUNE/2021	
OPT 5 BED 4 BATH 4502			Scale 3/16" = 1'-0"	
2942 sqft			BCIN# 19669	
			LO# 91144	



OPT. SECOND FLOOR PLAN, ELEVATION 'A'
opt. 5 bedrooms (4 bath's)



OPT. SECOND FLOOR PLAN, ELEVATION 'B'
opt. 5 bedrooms (4 bath's)



OPT. SECOND FLOOR PLAN, ELEVATION 'C'
opt. 5 bedrooms (4 bath's)

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.		
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT 5 BED 4 BATH 4502			BCIN# 19669	
2942 sqft			LO#	91144