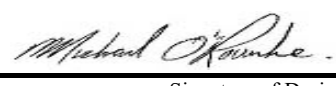


Schedule 1: Designer Information

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: 2007 FIN BSMT & 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.			
April 20, 2021			
Date		Signature of Designer	

NOTE:

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

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

SITE NAME: CENTREFIELD (WEST GORMLEY)										FIN BSMT & OPT 2ND										DATE: Apr-21										WINTER NATURAL AIR CHANGE RATE 0.236										HEAT LOSS ΔT °F. 78										CSA-F280-12																			
BUILDER: ROYAL PINE HOMES										TYPE: 2007										GFA: 1662										LO# 87527										SUMMER NATURAL AIR CHANGE RATE 0.072										HEAT GAIN ΔT °F. 13										SB-12 PERFORMANCE									
ROOM USE				MBR				ENS				BED-2		BED-3				BATH																																																			
EXP. WALL				14				6				10		16				0																																																			
CLG. HT.				9				9				9		10				9																																																			
FACTORS																																																																					
GRS.WALL AREA		LOSS GAIN		126				54				90		160				0																																																			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN		LOSS GAIN				LOSS GAIN																																																			
NORTH		21.8	16.0	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0	0					0	0	0																																									
EAST		21.8	41.6	0	0	0		0	0	0		29	632	1205	36	784	1496	0	0	0						0	0	0																																									
SOUTH		21.8	24.9	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0						0	0	0																																									
WEST		21.8	41.6	28	610	1163		8	174	332		0	0	0	0	0	0	0	0	0						0	0	0																																									
SKYLT.		35.8	101.2	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0						0	0	0																																									
DOORS		25.8	4.3	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	98	412	68		46	193	32		61	257	42	124	521	86	0	0	0						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																																									
EXPOSED CLG		1.3	0.6	295	388	173		138	181	81		245	322	144	166	218	98	63	83	37						0	0	0																																									
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0		0	0	0		0	0	0	26	73	33	0	0	0						0	0	0																																									
EXPOSED FLOOR		2.6	0.4	0	0	0		0	0	0		239	624	103	25	65	11	0	0	0						0	0	0																																									
BASEMENT/CRAWL HEAT LOSS																																																																					
SLAB ON GRADE HEAT LOSS																																																																					
SUBTOTAL HT LOSS				1410				549				1834		1662				83																																																			
SUB TOTAL HT GAIN						1405				445				1494		1723				37																																																	
LEVEL FACTOR / MULTIPLIER				0.20		0.27		0.20		0.27		0.20		0.27				0.20		0.27																																																	
AIR CHANGE HEAT LOSS				386				150				503		456				23																																																			
AIR CHANGE HEAT GAIN				77				24				82		94				2																																																			
DUCT LOSS				0				0				234		212				0																																																			
DUCT GAIN				0				0				289		313				0																																																			
HEAT GAIN PEOPLE		240		2		480		0				1		240	1			0		0						0		0																																									
HEAT GAIN APPLIANCES/LIGHTS						1077		0				1077		1077				0																																																			
TOTAL HT LOSS BTU/H				1796				700				2571		2329				105																																																			
TOTAL HT GAIN x 1.3 BTU/H				3950				611				4136		4481				51																																																			

ROOM USE					K/G/B				B-BATH		FOY		MUD								BAS			
EXP. WALL					23				0		32		12								68			
CLG. HT.					10				10		11		11								10			
FACTORS																								
GRS.WALL AREA	LOSS	GAIN			232				0		355		133								476			
GLAZING					LOSS		GAIN		LOSS		GAIN		LOSS		GAIN						LOSS		GAIN	
NORTH	21.8	16.0			0		0		0		0		0		0		0		0		0		0	
EAST	21.8	41.6			0		0		0		0		0		0		0		0		0		0	
SOUTH	21.8	24.9			8		174		199		30		654		1247		0		0		0		0	
WEST	21.8	41.6			78		1699		3241		0		0		0		0		0		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		35		905		149		20		517		85		20	
NET EXPOSED WALL	4.2	0.7			146		615		101		0		0		0		290		1220		201		113	
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			0		0		0		0		0		0		0		0		0		0	
NO ATTIC EXPOSED CLG	2.8	1.3			30		84		38		0		0		0		0		0		0		0	
EXPOSED FLOOR	2.6	0.4			0		0		0		0		0		0		0		0		0		0	
BASEMENT/CRAWL HEAT LOSS					0						163		0		0								2045	
SLAB ON GRADE HEAT LOSS					0						0		0		0									
SUBTOTAL HT LOSS					2573						163		2779		993								3466	
SUB TOTAL HT GAIN							3579				0		1596		163								500	
LEVEL FACTOR / MULTIPLIER	0.30	0.36									0.50		1.05		0.30		0.36				0.50		1.05	
AIR CHANGE HEAT LOSS					923						171		997		356								3624	
AIR CHANGE HEAT GAIN							196				0		87		9								27	
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	
HEAT GAIN APPLIANCES/LIGHTS					1077						0		0		0								0	
TOTAL HT LOSS BTU/H					3496						334		3776		1349								7089	
TOTAL HT GAIN x 1.3 BTU/H					6307						0		2188		224								685	

TOTAL HEAT GAIN BTU/H:

22853

TONS: 1.90

LOSS DUE TO VENTILATION LOAD BTU/H: 1336

STRUCTURAL HEAT LOSS: 23545

TOTAL COMBINED HEAT LOSS BTU/H: 24881

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

TYPE: 2007
DATE: Apr-21

GFA: 1662 LO# 87527

HEATING CFM 820 COOLING CFM 820
TOTAL HEAT LOSS 23,545 TOTAL HEAT GAIN 22,633
AIR FLOW RATE CFM 34.83 AIR FLOW RATE CFM 36.23

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	8	5	4
R/A	0	0	4	1	1

plenium pressure s/a 0.18
max s/a dif press. loss 0.03
min adjusted pressure s/a 0.15
r/a pressure 0.17
r/a grille press. Loss 0.02
adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 0
HIGH 1520

DESIGN CFM = 820
CFM @ .6" E.S.P.

TEMPERATURE RISE 65 °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	10	14	15	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	MBR	K/G/B	K/G/B	FOY	FOY	MUD	BAS	B-BATH	BAS	BAS
RM LOSS MBH.	0.90	0.70	1.29	1.29	1.16	1.16	0.11	0.90	1.75	1.75	1.89	1.89	1.35	2.36	0.33	2.36	2.36
CFM PER RUN HEAT	31	24	45	45	41	41	4	31	61	61	66	66	47	82	12	82	82
RM GAIN MBH.	1.97	0.61	2.07	2.07	2.24	2.24	0.05	1.97	3.15	3.15	1.09	1.09	0.22	0.23	0.00	0.23	0.23
CFM PER RUN COOLING	72	22	75	75	81	81	2	72	114	114	40	40	8	8	0	8	8
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.15	0.15	0.17	0.17	0.17	0.16	0.17	0.16	0.16
ACTUAL DUCT LGH.	40	56	43	45	33	30	15	36	35	39	18	24	26	55	25	36	10
EQUIVALENT LENGTH	120	150	160	170	120	140	150	150	120	150	100	80	110	170	90	140	110
TOTAL EFFECTIVE LENGTH	160	206	203	215	153	170	165	186	155	189	118	104	136	225	115	176	120
ADJUSTED PRESSURE	0.11	0.08	0.08	0.08	0.11	0.1	0.1	0.09	0.1	0.08	0.15	0.17	0.13	0.07	0.15	0.09	0.14
ROUND DUCT SIZE	5	4	6	6	5	5	4	5	6	6	5	5	4	6	4	6	6
HEATING VELOCITY (ft/min)	228	275	229	229	301	301	46	228	311	311	485	485	539	418	138	418	418
COOLING VELOCITY (ft/min)	529	252	382	382	595	595	23	529	581	581	294	294	92	41	0	41	41
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10
TRUNK	A	B	B	B	C	C	C	A	A	A	C	C	B	A	B	A	C

RUN #	ROOM NAME	RM LOSS MBH.	CFM PER RUN HEAT	RM GAIN MBH.	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	MBR	0.90	31	1.97	72	0.17	40	120	160	0.11	5	228	529	3X10	A
2	ENS	0.70	24	0.61	22	0.17	56	150	206	0.08	4	275	252	3X10	B
3	BED-2	1.29	45	2.07	75	0.17	43	160	203	0.08	6	229	382	4X10	B
4	BED-2	1.29	45	2.07	75	0.17	45	170	215	0.08	6	229	382	4X10	B
5	BED-3	1.16	41	2.24	81	0.16	33	120	153	0.11	5	301	595	3X10	C
6	BED-3	1.16	41	2.24	81	0.16	30	140	170	0.1	5	301	595	3X10	C
7	BATH	0.11	4	0.05	2	0.17	15	150	165	0.1	4	46	23	3X10	C
10	MBR	0.90	31	1.97	72	0.17	36	150	186	0.09	5	228	529	3X10	A
14	K/G/B	1.75	61	3.15	114	0.15	35	120	155	0.1	6	311	581	4X10	A
15	K/G/B	1.75	61	3.15	114	0.15	39	150	189	0.08	6	311	581	4X10	A
18	FOY	1.89	66	1.09	40	0.17	18	100	118	0.15	5	485	294	3X10	C
19	FOY	1.89	66	1.09	40	0.17	24	80	104	0.17	5	485	294	3X10	C
20	MUD	1.35	47	0.22	8	0.17	26	110	136	0.13	4	539	92	3X10	B
21	BAS	2.36	82	0.23	8	0.16	55	170	225	0.07	6	418	41	4X10	A
22	B-BATH	0.33	12	0.00	0	0.17	25	90	115	0.15	4	138	0	3X10	B
23	BAS	2.36	82	0.23	8	0.16	36	140	176	0.09	6	418	41	4X10	A
24	BAS	2.36	82	0.23	8	0.16	10	110	120	0.14	6	418	41	4X10	C

SUPPLY AIR TRUNK SIZE															RETURN AIR TRUNK SIZE														
	TRUNK	STATIC	ROUND	RECT						TRUNK	STATIC	ROUND	RECT						TRUNK	STATIC	ROUND	RECT							
	CFM	PRESS.	DUCT	DUCT				VELOCITY		CFM	PRESS.	DUCT	DUCT				VELOCITY		CFM	PRESS.	DUCT	DUCT				VELOCITY			
							(ft/min)										(ft/min)									(ft/min)			
TRUNK A	348	0.07	9.8	12	x	8	522	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0						
TRUNK B	521	0.07	11.4	16	x	8	586	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0						
TRUNK C	300	0.10	8.4	8	x	8	675	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0						
TRUNK D	0	0.00	0	0	x	8	0	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0						
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	0	0	x	8	0						
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0	TRUNK T	0	0.05	0	0	x	8	0						

RETURN AIR #	1	2	3	4	5												BR	TRUNK W	0	0.05	0	0	x	8	0																								
AIR VOLUME	95	120	75	95	320	0	0	0	0	0	0	0	0	0	0	0	115									TRUNK X	820	0.05	14.6	24	x	8	615																
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																	TRUNK Y	210	0.05	8.8	10	x	8	378								
ACTUAL DUCT LGH.	48	34	36	40	22	1	1	1	1	1	1	1	1	1	1	1	40																									TRUNK Z	0	0.05	0	0	x	8	0
EQUIVALENT LENGTH	175	205	245	165	220	0	0	0	0	0	0	0	0	0	0	0	160																																
TOTAL EFFECTIVE LH	223	239	281	205	242	1	1	1	1	1	1	1	1	1	1	1	200																																
ADJUSTED PRESSURE	0.07	0.06	0.05	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.07																																
ROUND DUCT SIZE	6	6.8	6	6	9.8	0	0	0	0	0	0	0	0	0	0	0	6.5																																
INLET GRILL SIZE	8	8	8	8	6	0	0	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																																
INLET GRILL SIZE	14	14	14	14	24	0	0	0	0	0	0	0	0	0	0	0	14																																

TYPE: 2007
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87527
FIN BSMT & 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>2</u> @ 10.6 cfm	<u>21.2</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>2</u> @ 10.6 cfm	<u>21.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>148.4</u> cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>148.4</u>	cfm
Less Principal Ventil. Capacity	<u>63.6</u>	cfm
Required Supplemental Capacity	<u>84.8</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>63.6</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
63.6 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5
B-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5

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

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

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

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

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

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87527	Model: 2007	Builder: ROYAL PINE HOMES	Date: 4/20/2021																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>731</td> <td>10</td> <td>7310</td> </tr> <tr> <td>First</td> <td>731</td> <td>10</td> <td>7383.1</td> </tr> <tr> <td>Second</td> <td>931</td> <td>9</td> <td>8379</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>23,072.1 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>653.3 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	731	10	7310	First	731	10	7383.1	Second	931	9	8379	Third	0	9	0	Fourth	0	9	0	Total:			23,072.1 ft³	Total:			653.3 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;">0.236</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.072</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	0.236	SUMMER NATURAL AIR CHANGE RATE	0.072	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.236 x 181.48 x 43 °C x 1.2 = 2224 W = 7588 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.072 x 181.48 x 7 °C x 1.2 = 111 W = 378 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 64 CFM x 78 °F x 1.08 x 0.25 = 1336 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 64 CFM x 13 °F x 1.08 x 0.25 = 220 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	7,588	3,629	1.046																																																								
2	0.3		6,345	0.359																																																								
3	0.2		5,538	0.274																																																								
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: 2007	FIN BSMT & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 1662	LO# 87527	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:	ATTACHED	# 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):	23072.1	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.80	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 20.0 ft	EXPOSED PERIMETER:	68.0 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%	-

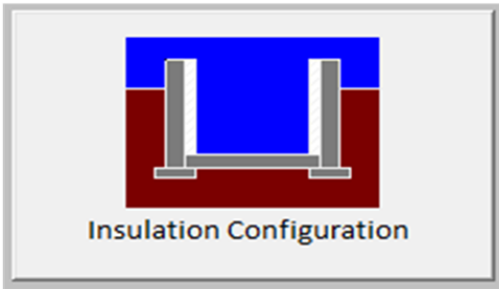
INDIVIDUAL BCIN: 19669

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):	15.8	 Insulation Configuration
Floor Width (m):	6.1	
Exposed Perimeter (m):	20.7	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	0.7	
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):		647

TYPE: 2007
LO# 87527

FIN BSMT & OPT 2ND

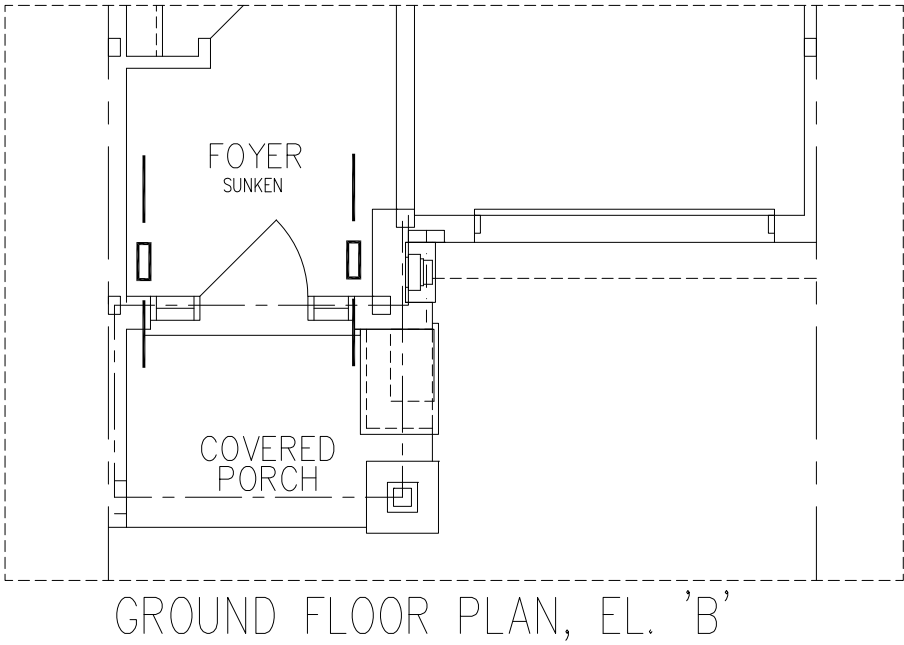
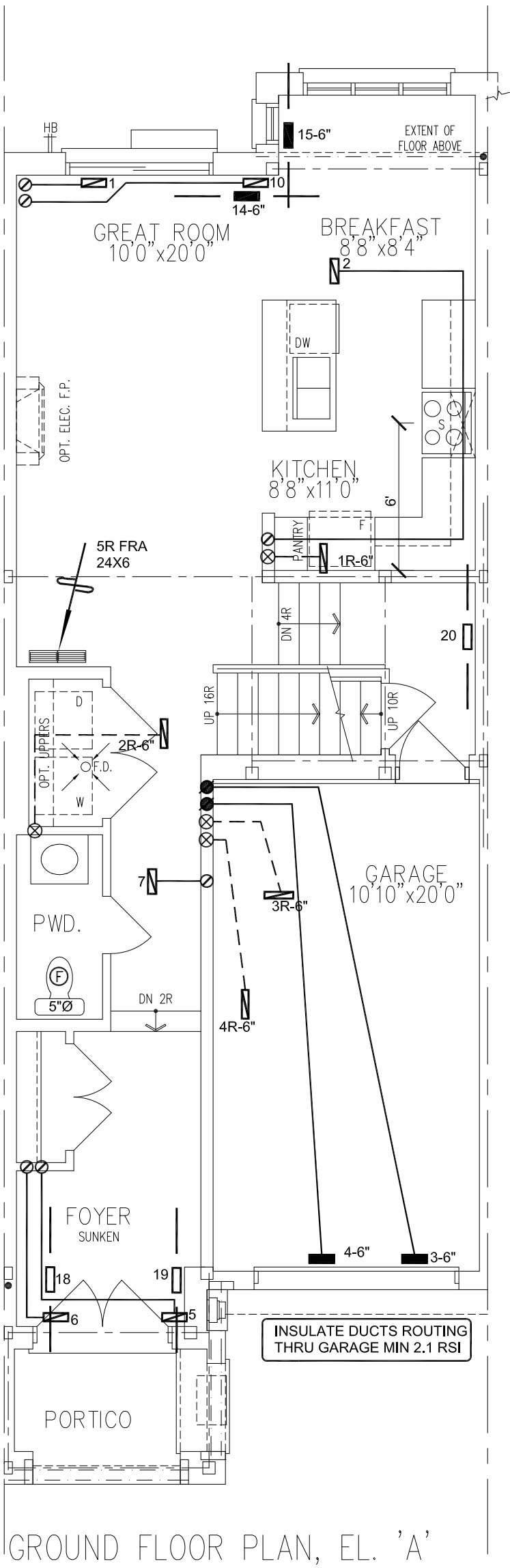
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Semi			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	653.3			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	609.9 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	30.0	30.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.236			
Cooling Air Leakage Rate (ACH/H):	0.072			

TYPE: 2007
LO# 87527

FIN BSMT & OPT 2ND



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

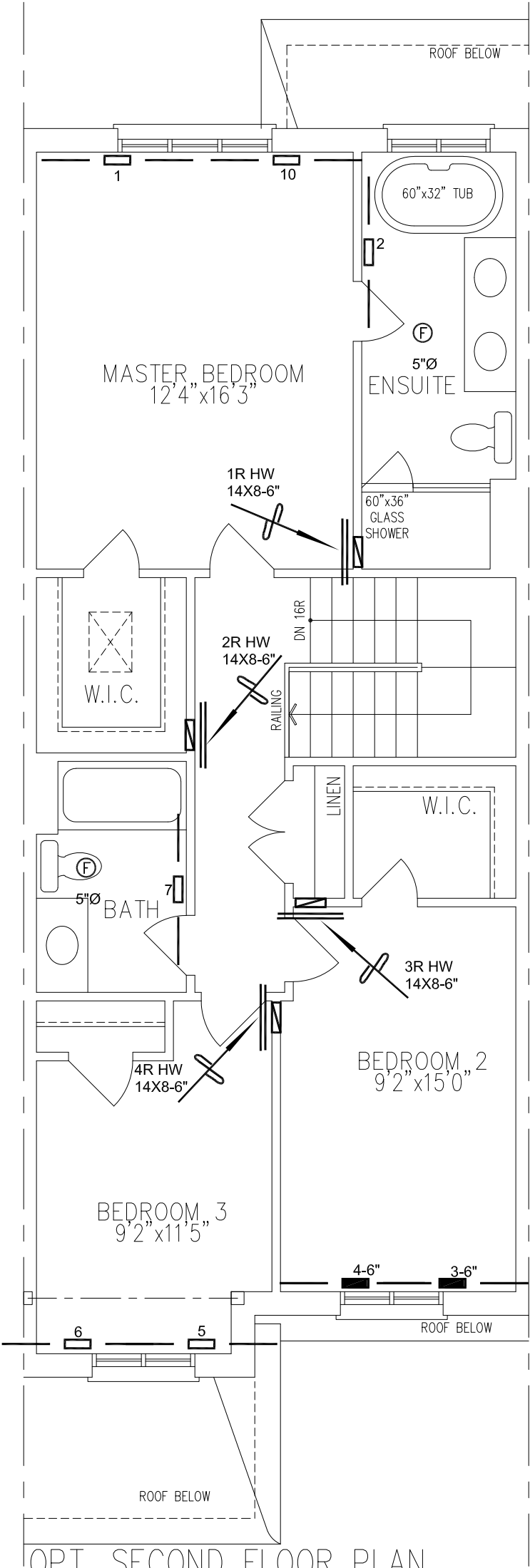
CSA-F280-12

SB-12 PERFORMANCE

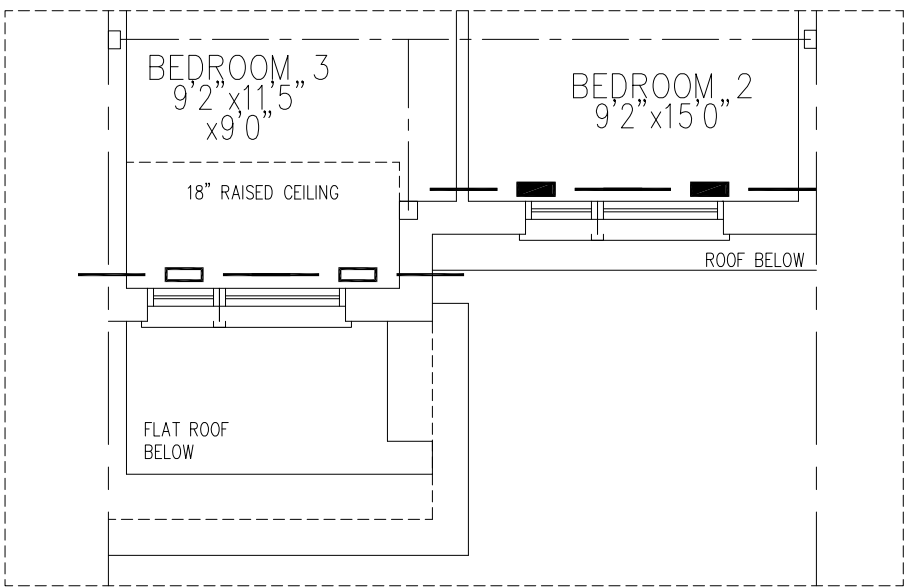
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT	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

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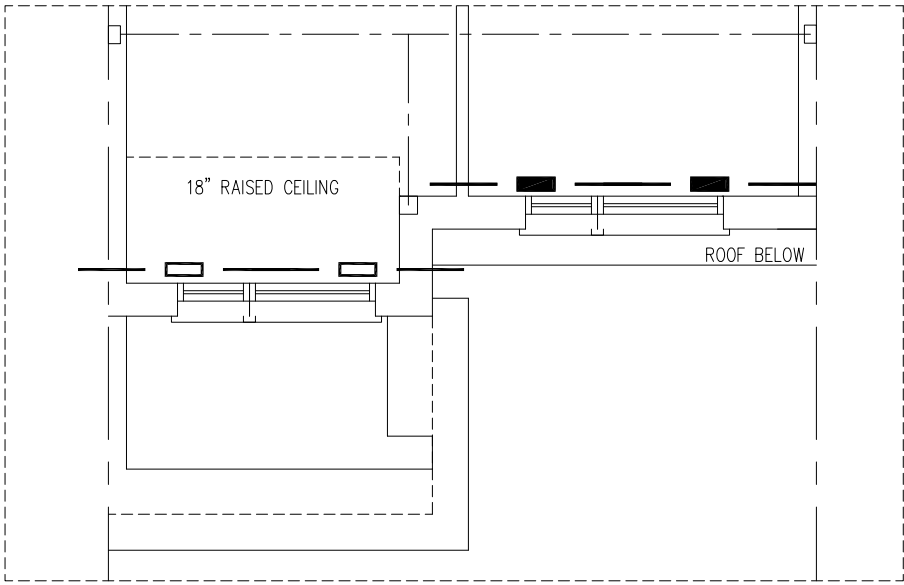
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	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"
FIN BSMT & OPT 2ND 2007			BCIN# 19669	
1662 sqft			LO#	87527



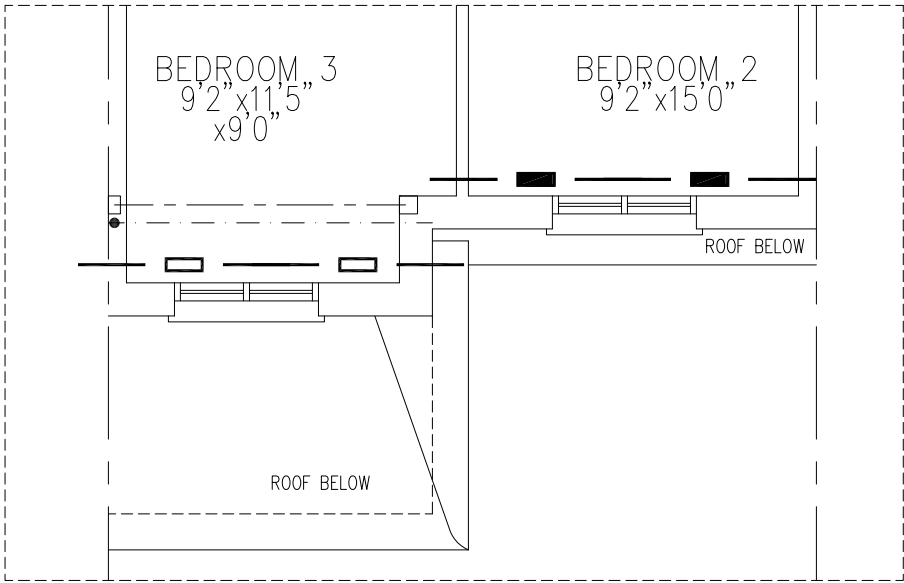
OPT. SECOND FLOOR PLAN,
EL. 'A1'



PART. SECOND FLOOR PLAN,
EL. 'B2'



SECOND FLOOR PLAN, EL. 'B1'



PART. SECOND FLOOR PLAN,
EL. 'A2'

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CSA-F280-12

SB-12 PERFORMANCE

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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
FIN BSMT & OPT 2ND 20071662 sqft		Scale	3/16" = 1'-0"	
		BCIN# 19669		
		LO#	87527	