


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]			
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings </div> <div> <input checked="" type="checkbox"/> HVAC Systems <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection </div> <div> <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> On-site Sewage Systems </div> </div>			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		<div style="text-align: center;"> HVAC REVIEWED Initials: PXV Date: 2007 </div>	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
<input type="checkbox"/> 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: _____			
<input checked="" type="checkbox"/> 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>			
<input type="checkbox"/> 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)										DATE: Apr-21										WINTER NATURAL AIR CHANGE RATE 0.229										HEAT LOSS ΔT °F. 78										CSA-F280-12																													
BUILDER: ROYAL PINE HOMES										TYPE: 2007										GFA: 1662										LO# 87524										SUMMER NATURAL AIR CHANGE RATE 0.069										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.				8				8				8				9				8																																																	
FACTORS																																																																					
GRS.WALL AREA		LOSS GAIN		112				48				80				144				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 0 0		0 0 0																																															
EAST		21.8 41.6		0 0 0		0 0 0		0 0 0				29 632 1205		36 784 1496		0 0 0				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				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		0 0 0																																															
SKYLT.		35.8 101.2		0 0 0		0 0 0		0 0 0				0 0 0		0 0 0		0 0 0				0 0 0		0 0 0																																															
DOORS		25.8 4.3		0 0 0		0 0 0		0 0 0				0 0 0		0 0 0		0 0 0				0 0 0		0 0 0																																															
NET EXPOSED WALL		4.2 0.7		84 353 58		40 168 28						51 214 35		108 454 75		0 0 0				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		0 0 0																																															
EXPOSED CLG		1.3 0.6		295 388 173		138 181 81						245 322 144		166 218 98		63 83 37																																																					
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		0 0 0																																															
EXPOSED FLOOR		2.6 0.4		0 0 0		0 0 0						203 530 87		25 65 11		36 94 15																																																					
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				1351		524						1698		1595		177																																																					
SUB TOTAL HT GAIN				1395		441						1472		1712		52																																																					
LEVEL FACTOR / MULTIPLIER		0.20 0.26				0.20 0.26						0.20 0.26		0.20 0.26		0.20 0.26																																																					
AIR CHANGE HEAT LOSS				357		138						448		421		47																																																					
AIR CHANGE HEAT GAIN				73		23						77		90		3																																																					
DUCT LOSS				0		0						215		202		22																																																					
DUCT GAIN				0		0						287		312		6																																																					
HEAT GAIN PEOPLE		240		2		480		0				1		240		1		240		0		0																																															
HEAT GAIN APPLIANCES/LIGHTS						1077		0						1077				1077				0																																															
TOTAL HT LOSS BTU/H				1708		662						2361		2218		246																																																					
TOTAL HT GAIN x 1.3 BTU/H				3932		604						4098		4459		79																																																					

ROOM USE																FOY		MUD									BAS	
EXP. WALL																32		12									68	
CLG. HT.																11		11									10	
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN																									476	
GLAZING																355		133									LOSS	GAIN
NORTH	21.8	16.0														0	0	0	0	0	0					0	0	0
EAST	21.8	41.6														30	654	1247	0	0	0					0	0	0
SOUTH	21.8	24.9														0	0	0	0	0	0					0	0	0
WEST	21.8	41.6														0	0	0	0	0	0					7	152	291
SKYLT.	35.8	101.2														0	0	0	0	0	0					0	0	0
DOORS	25.8	4.3														35	905	149	20	517	85					20	517	85
NET EXPOSED WALL	4.2	0.7														290	1220	201	113	476	78					0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6														0	0	0	0	0	0					204	751	124
EXPOSED CLG	1.3	0.6														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
EXPOSED FLOOR	2.6	0.4														0	0	0	0	0	0					0	0	0
BASEMENT/CRAWL HEAT LOSS																											2208	
SLAB ON GRADE HEAT LOSS																												
SUBTOTAL HT LOSS																2779		993									3629	
SUB TOTAL HT GAIN																	1596		163								500	
LEVEL FACTOR / MULTIPLIER	0.30	0.33														0.30	0.33		0.30	0.33						0.50	0.97	
AIR CHANGE HEAT LOSS																927		331									3527	
AIR CHANGE HEAT GAIN																	84		9								26	
DUCT LOSS																0		0									0	
DUCT GAIN																	0		0								0	
HEAT GAIN PEOPLE	240															0		0	0		0					0		0
HEAT GAIN APPLIANCES/LIGHTS																	0		0		0					0		0
TOTAL HT LOSS BTU/H																3706		1324									7156	
TOTAL HT GAIN x 1.3 BTU/H																	2184		224								683	

TOTAL HEAT GAIN BTU/H: 22778 TONS: 1.90 LOSS DUE TO VENTILATION LOAD BTU/H: 1336 STRUCTURAL HEAT LOSS: 22811 TOTAL COMBINED HEAT LOSS BTU/H: 24147

14.53

34.89

Michael O'Rourke

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

TYPE: 2007

DATE: Apr-21

GFA: 1662

LO# 87524

HEATING CFM 820 COOLING CFM 820
TOTAL HEAT LOSS 22,811 TOTAL HEAT GAIN 22,559
AIR FLOW RATE CFM 35.95 AIR FLOW RATE CFM 36.35

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	3
R/A	0	0	4	1	1

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

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	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	BAS	BAS
RM LOSS MBH.	0.85	0.66	1.18	1.18	1.11	1.11	0.25	0.85	1.72	1.72	1.85	1.85	1.32	2.39	2.39	2.39
CFM PER RUN HEAT	31	24	42	42	40	40	9	31	62	62	67	67	48	86	86	86
RM GAIN MBH.	1.97	0.60	2.05	2.05	2.23	2.23	0.08	1.97	3.15	3.15	1.09	1.09	0.22	0.23	0.23	0.23
CFM PER RUN COOLING	71	22	74	74	81	81	3	71	114	114	40	40	8	8	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	0.16	0.16
ACTUAL DUCT LGH.	40	56	43	45	33	30	15	36	35	39	18	24	26	39	21	10
EQUIVALENT LENGTH	120	150	160	170	120	140	150	150	120	150	100	80	110	130	140	110
TOTAL EFFECTIVE LENGTH	160	206	203	215	153	170	165	186	155	189	118	104	136	169	161	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	0.1	0.1	0.14
ROUND DUCT SIZE	5	4	5	5	5	5	4	5	6	6	5	5	4	6	6	6
HEATING VELOCITY (ft/min)	228	275	308	308	294	294	103	228	316	316	492	492	551	438	438	438
COOLING VELOCITY (ft/min)	521	252	543	543	595	595	34	521	581	581	294	294	92	41	41	41
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	A	B	B	B	C	C	C	A	A	A	C	C	B	A	A	C

RUN #	1	2	3	4	5	6	7	10	14	15	18	19	20	21	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	BAS	BAS
RM LOSS MBH.	0.85	0.66	1.18	1.18	1.11	1.11	0.25	0.85	1.72	1.72	1.85	1.85	1.32	2.39	2.39	2.39
CFM PER RUN HEAT	31	24	42	42	40	40	9	31	62	62	67	67	48	86	86	86
RM GAIN MBH.	1.97	0.60	2.05	2.05	2.23	2.23	0.08	1.97	3.15	3.15	1.09	1.09	0.22	0.23	0.23	0.23
CFM PER RUN COOLING	71	22	74	74	81	81	3	71	114	114	40	40	8	8	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	0.16	0.16
ACTUAL DUCT LGH.	40	56	43	45	33	30	15	36	35	39	18	24	26	39	21	10
EQUIVALENT LENGTH	120	150	160	170	120	140	150	150	120	150	100	80	110	130	140	110
TOTAL EFFECTIVE LENGTH	160	206	203	215	153	170	165	186	155	189	118	104	136	169	161	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	0.1	0.1	0.14
ROUND DUCT SIZE	5	4	5	5	5	5	4	5	6	6	5	5	4	6	6	6
HEATING VELOCITY (ft/min)	228	275	308	308	294	294	103	228	316	316	492	492	551	438	438	438
COOLING VELOCITY (ft/min)	521	252	543	543	595	595	34	521	581	581	294	294	92	41	41	41
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	A	B	B	B	C	C	C	A	A	A	C	C	B	A	A	C

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	358	0.08	9.5	10	x	8	644			TRUNK G	0	0.00	0	0	x	8	0		
TRUNK B	514	0.08	10.9	14	x	8	661			TRUNK H	0	0.00	0	0	x	8	0		
TRUNK C	309	0.10	8.5	8	x	8	695			TRUNK I	0	0.00	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 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	10	14	15	18	19	20	21	23	24
AIR VOLUME	95	105	75	95	330	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
ACTUAL DUCT LGH.	48	34	36	40	22	1	1	1	1	1	1	1	1	1	1	17
EQUIVALENT LENGTH	160	205	245	165	155	0	0	0	0	0	0	0	0	0	0	265
TOTAL EFFECTIVE LH	208	239	281	205	177	1	1	1	1	1	1	1	1	1	1	282
ADJUSTED PRESSURE	0.07	0.06	0.05	0.07	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	6	6.5	6	6	9.3	0	0	0	0	0	0	0	0	0	0	7.1
INLET GRILL SIZE	8	8	8	8	6	0	0	0	0	0	0	0	0	0	0	8
INLET GRILL SIZE	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	14

TYPE: 2007
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87524

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/> Other:	Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	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>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>2</u> @ 10.6 cfm <u>21.2</u> cfm	
Table 9.32.3.A.	TOTAL <u>137.8</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	63.6 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>137.8</u> cfm	
Less Principal Ventil. Capacity	<u>63.6</u> cfm	
Required Supplemental Capacity	<u>74.2</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>63.6</u> cfm	<input checked="" type="checkbox"/> HVI Approved

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

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	
Location	Model	cfm	HVI
ENS	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>
BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>
PWD	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>

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	<input checked="" type="checkbox"/> HVI Approved	
@ 32 deg F (0 deg C)		

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

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

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

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87524	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>8</td> <td>7448</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>22,141.1 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>627.0 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	8	7448	Third	0	9	0	Fourth	0	9	0	Total:			22,141.1 ft³	Total:			627.0 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;">0.229</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.069</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	0.229	SUMMER NATURAL AIR CHANGE RATE	0.069	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p> 0.229 x 174.16 x 43 °C x 1.2 = 2068 W = 7055 Btu/h </p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p> = 0.069 x 174.16 x 7 °C x 1.2 = 103 W = 352 Btu/h </p>																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p> 64 CFM x 78 °F x 1.08 x 0.25 = 1336 Btu/h </p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p> 64 CFM x 13 °F x 1.08 x 0.25 = 220 Btu/h </p>																																																									
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	7,055	3,629	0.972																																																								
2	0.3		6,345	0.334																																																								
3	0.2		5,345	0.264																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
<p>*HLairbv = Air leakage heat loss + ventilation heat loss</p> <p>*For a balanced or supply only ventilation system HLairve = 0</p>																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 2007	BUILDER: ROYAL PINE HOMES
SFQT: 1662	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87524	

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):	22141.1	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

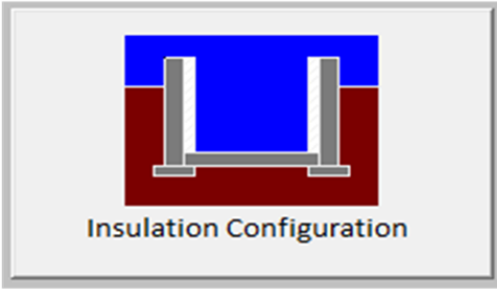
2012 OBC - COMPLIANCE PACKAGE		Compliance Package SB-12 PERFORMANCE	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value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

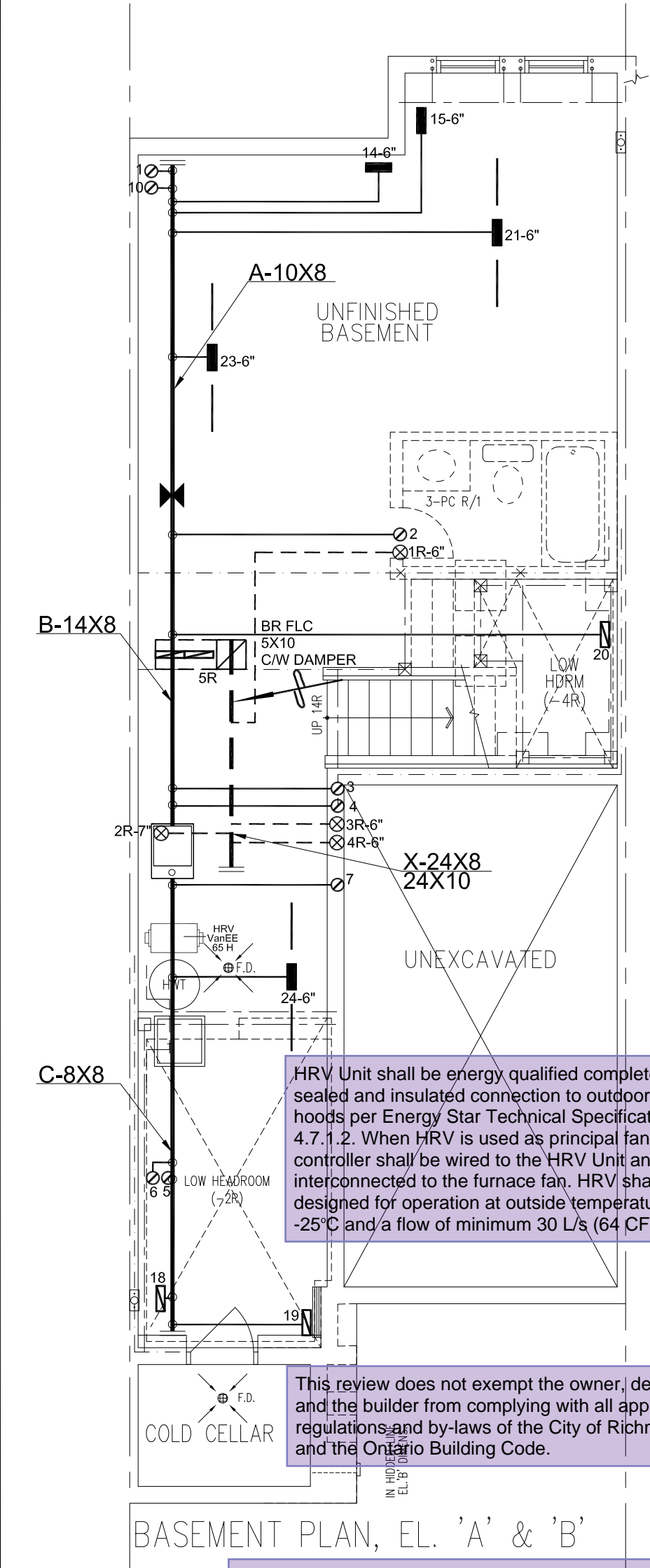
TYPE: 2007
LO# 87524

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):	6.43			
Building Configuration				
Type:	Semi			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	627.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		585.3 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):	0.229			
Cooling Air Leakage Rate (ACH/H):	0.069			

TYPE: 2007
LO# 87524



City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEPT/01/2021**

Building Permit #: **BP#-2021-50732**

All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.

Building inspection line: 905-771-5465 (24 hr)
buildinginspections@richmondhill.ca
Building inquiry line 905-771-8810
building@richmondhill.ca

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: **Energy Modeling/air leak test** and the values used for architectural design.

Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Penetration of Air Barrier System by ducts, wires, conduits or building materials shall be sealed as per OBC 2012, Div.B 9.25.3.3.(9) & (10).

Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Combustion air supply shall be provided to the furnace and hot water tank.

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

Air supply outlet shall not be installed on a furnace plenum or trunk duct. (HRAI Digest 2005, 4.6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

HRV Unit shall be energy qualified complete with sealed and insulated connection to outdoor vent hoods per Energy Star Technical Specification 4.7.1.2. When HRV is used as principal fan, the controller shall be wired to the HRV Unit and interconnected to the furnace fan. HRV shall be designed for operation at outside temperature of -25°C and a flow of minimum 30 L/s (64 CFM)

This review does not exempt the owner, designer and the builder from complying with all applicable regulations and by-laws of the City of Richmond Hill and the Ontario Building Code.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.

CSA-F280-12

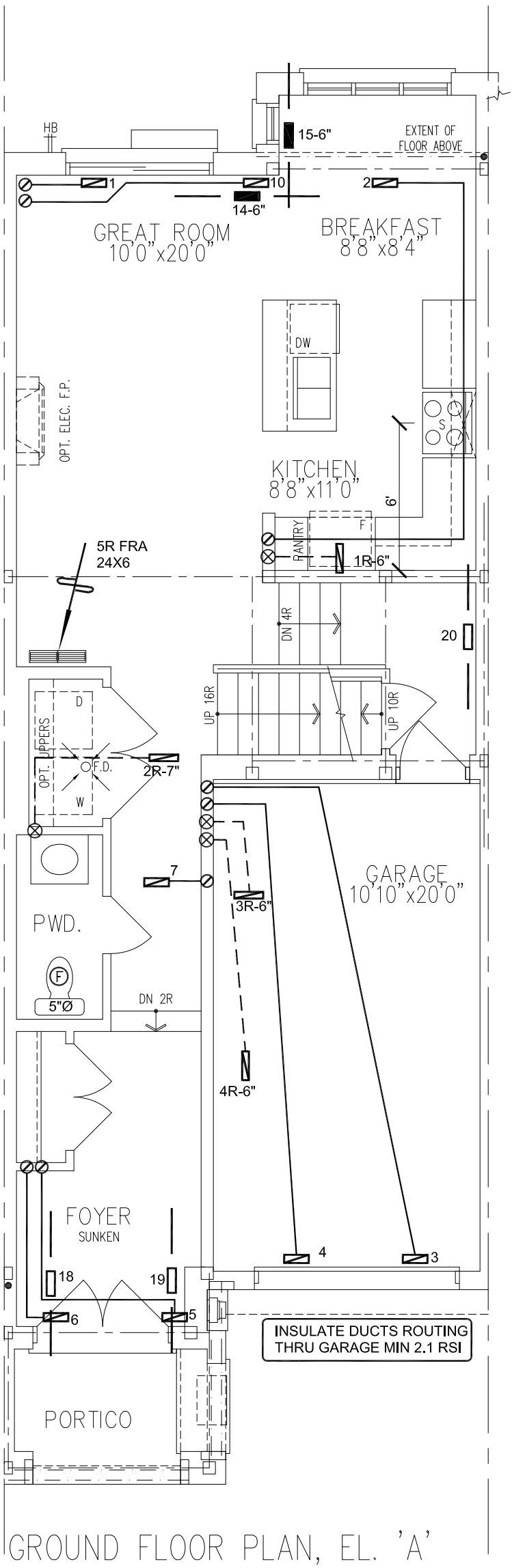
SB-12 PERFORMANCE

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

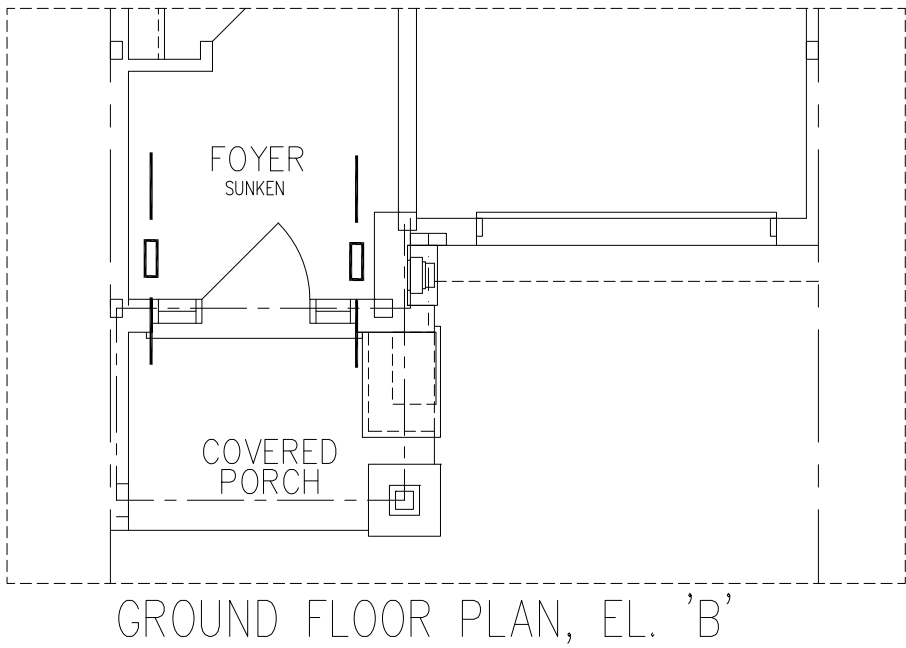
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT	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

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

Client		<div><p>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</p></div>	HEAT LOSS 24147 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	8	4	2		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT 60 MBTU/H	1ST FLOOR	5	1	2		
2007			OUTPUT 58 MBTU/H	BASEMENT	3	1	0	Date	SEPT/2020
1662 sqft		COOLING 2.0 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 820 cfm @ 0.6" w.c.					BCIN# 19669		
							LO#	87524	



- Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).
- Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).
- Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.
- Penetration of Air Barrier System by ducts, wires, conduits or building materials shall be sealed as per OBC 2012, Div.B 9.25.3.3.(9) & (10).
- Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
- Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)



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

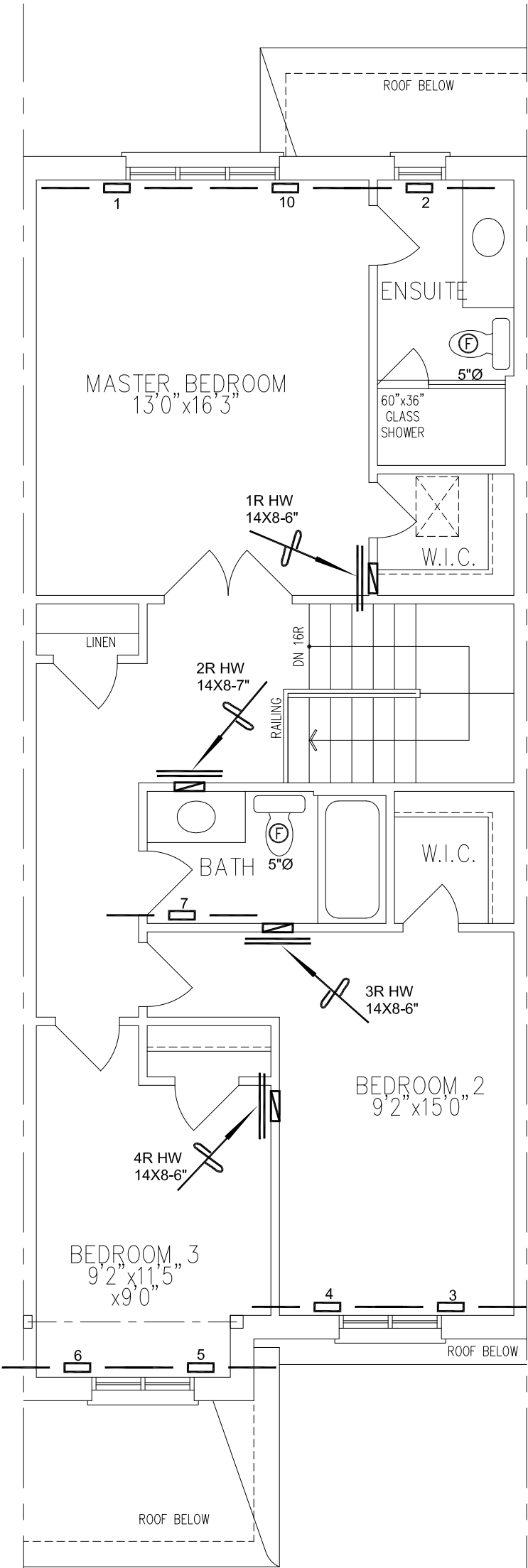
SB-12 PERFORMANCE

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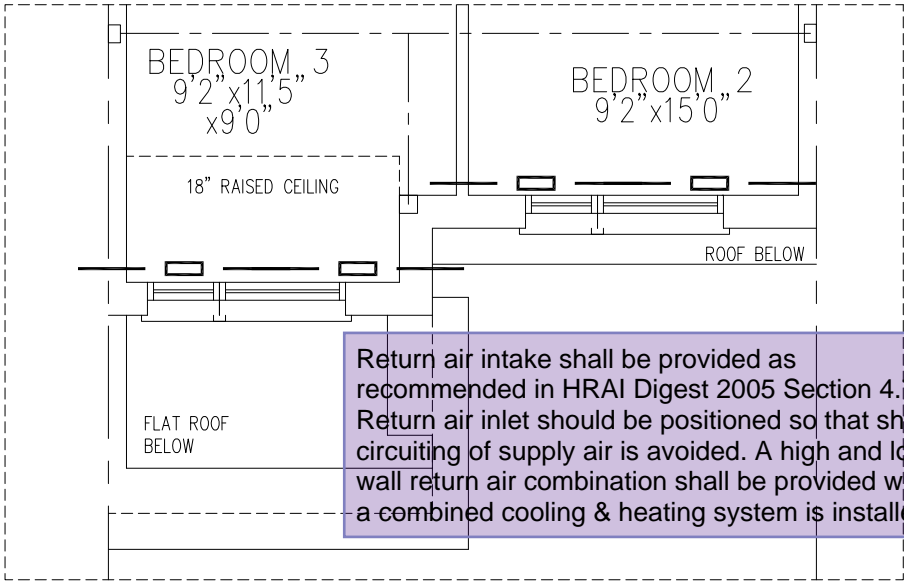
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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
			BCIN# 19669	
			LO#	87524
2007	1662 sqft	Installation to comply with the latest Ontario Building 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.		


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.



SECOND FLOOR PLAN, EL. 'A1'



PART. SECOND FLOOR PLAN,
EL. 'B2'

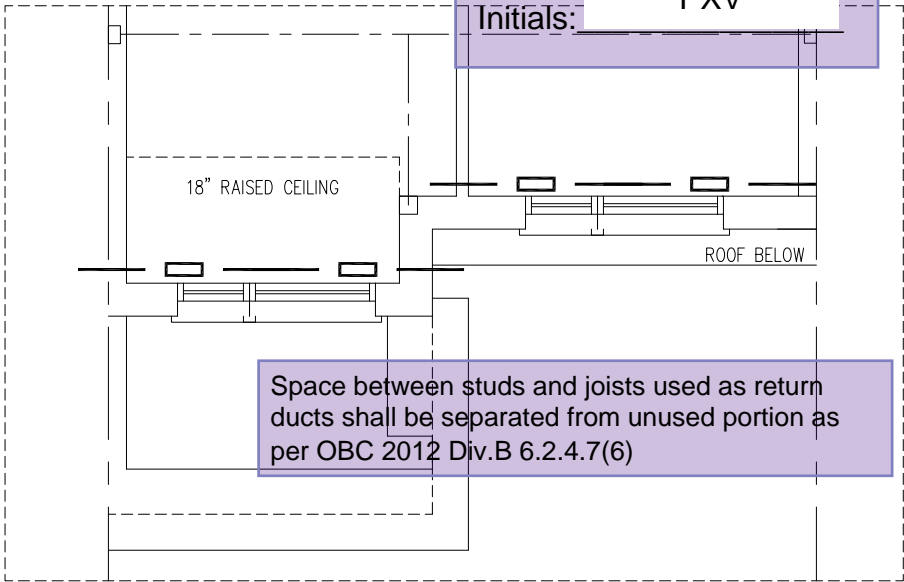


City of Richmond Hill
Building Division

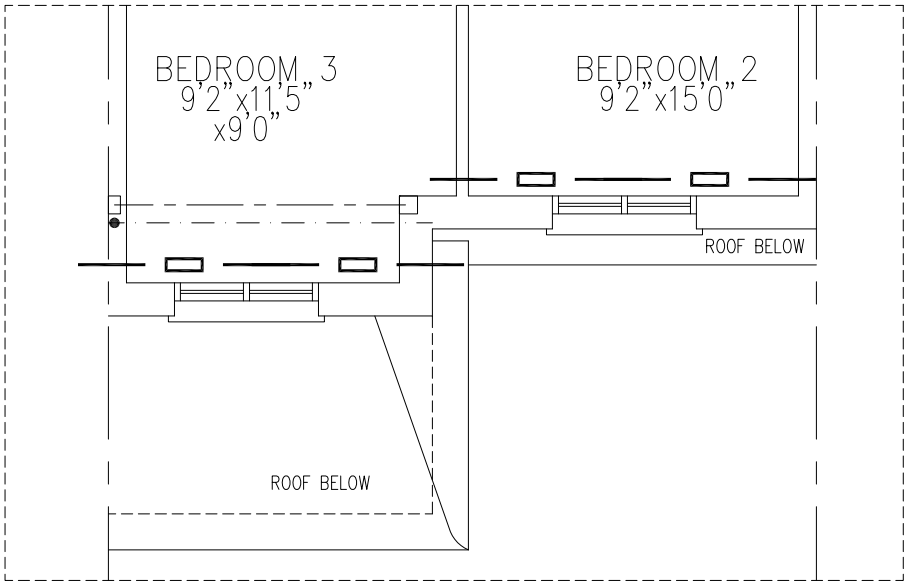
HVAC REVIEWED

Initials:

PXV



SECOND FLOOR PLAN, EL. 'B1'







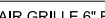







PART. SECOND FLOOR PLAN,
EL. 'A2'

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.

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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
2007			BCIN# 19669	
1662 sqft			LO#	87524