

09/03/2021

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

RECEIVED

Per: jocelyn.aguiar

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: 2008 Lawson 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 my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
Date April 21, 2021		 Signature of Designer	
Initials: <u>PXV</u>			

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)										TYPE: 2008		DATE: Apr-21		WINTER NATURAL AIR CHANGE RATE		HEAT LOSS ΔT °F.		CSA-F280-1	
BUILDER: ROYAL PINE HOMES										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
ROOM USE										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
EXP. WALL										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
CLG. HT.										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
FACTORS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
GRS.WALL AREA										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
GLAZING										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
NORTH										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
EAST										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
SOUTH										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
WEST										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
SKYLT.										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
DOORS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
NET EXPOSED WALL										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
NET EXPOSED BSMT WALL ABOVE GR										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
EXPOSED CLG										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
NO ATTIC EXPOSED CLG										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
EXPOSED FLOOR										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
BASEMENT/CRAWL HEAT LOSS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
SLAB ON GRADE HEAT LOSS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
SUBTOTAL HT LOSS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
SUB TOTAL HT GAIN										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
LEVEL FACTOR / MULTIPLIER										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
AIR CHANGE HEAT LOSS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
AIR CHANGE HEAT GAIN										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
DUCT LOSS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
DUCT GAIN										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
HEAT GAIN PEOPLE										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
HEAT GAIN APPLIANCES/LIGHTS										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
TOTAL HT LOSS BTU/H										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	
TOTAL HT GAIN x 1.3 BTU/H										ENR		GFA: 1672		SUMMER NATURAL AIR CHANGE RATE		HEAT GAIN ΔT °F.		SB-12 PERFORMANCE	

ROOM USE	KJ/B/G	FOY	MUD	BAS
EXP. WALL CLG. HT.	20 10	26 11	26 12	67 10
FACORS				
GRS.WALL AREA	202	289	242	469
GLAZING	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN
NORTH	0 0 0	0 0 0	0 0 0	0 0 0
EAST	0 0 0	27 588 1122	0 0 0	12 261 499
SOUTH	0 0 0	0 0 0	0 0 0	0 0 0
WEST	78 1699 3241	0 0 0	0 0 0	0 0 0
SKYLT.	0 0 0	0 0 0	0 0 0	0 0 0
DOORS	0 0 0	40 1034 170	20 517 85	30 775 128
NET EXPOSED WALL	124 521 86	222 932 153	222 934 154	0 0 0
NET EXPOSED BSMT WALL ABOVE GR	0 0 0	0 0 0	0 0 0	201 740 122
EXPOSED CLG	0 0 0	0 0 0	0 0 0	0 0 0
NO ATTIC EXPOSED CLG	0 0 0	0 0 0	0 0 0	0 0 0
EXPOSED FLOOR	0 0 0	0 0 0	0 0 0	0 0 0
BASEMENT/CRAWL HEAT LOSS	0 0	0 0	0 0	2143
SLAB ON GRADE HEAT LOSS	0 0	0 0	0 0	3920
SUBTOTAL HT LOSS	2221	2554	1451	748
SUB TOTAL HT GAIN	0.30	0.37	0.30 0.37	0.50
LEVEL FACTOR / MULTIPLIER	819	942	535	3826
AIR CHANGE HEAT LOSS		80	13	41
AIR CHANGE HEAT GAIN		0	0	0
DUCT LOSS	0	0	0	0
DUCT GAIN	0	0	0	0
HEAT GAIN PEOPLE	0	0	0	0
HEAT GAIN APPLANCES/LIGHTS	0	0	0	0
TOTAL HT LOSS BTU/H	3039	3496	1985	7746
TOTAL HT GAIN X 1.3 BTU/H	5726	1983	327	2188

RECEIVED
Per: _____jocelyn.aguilar_____

09/03/2021

City of Richmond Hill
Building Division

HVAC REVIEWED

PXV

Initials: _____

CITY OF RICHMOND HILL
BUILDING DIVISION

BUILDING DIVISION

09/03/2021

RECEIVED

Per:____jocelyn.aguilar_

TOTAL HEAT GAIN BTU/H:	22915	TONS: 1.91	LOSS DUE TO VENTILATION LOAD BTU/H: 1336
------------------------	-------	------------	--

STRUCTURAL HEAT LOSS: 23927

TOTAL COMBINED HEAT LOSS BTU/H: 25263

15.10
bbtu/ft
2
design
ed and
34.68
btu/ft2
installe
d

Michael S. Kunkle

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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

TYPE: 2008 DATE: Apr-21
GFA: 1672 LO# 87528

HEATING CFM 820 COOLING CFM 820
TOTAL HEAT LOSS 23,927 TOTAL HEAT GAIN 22,695
AIR FLOW RATE CFM 34.27 AIR FLOW RATE CFM 36.13

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000
DESIGN CFM = 820
CFM @ .6" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	8	5	3
R/A	0	0	4	1	1

All S/A diffusers 4"x10" unless noted otherwise on layout.
All R/A runs 5"Ø unless noted otherwise on layout.

ROOM NAME	1	2	3	4	5	6	7	10	14	15	18	19	20	21	23	24
MBR	0.93	0.93	0.91	1.40	1.40	1.40	0.54	0.65	1.52	1.52	1.75	1.75	1.99	2.58	2.58	2.58
RM LOSS MBH	32	32	31	48	48	48	18	22	52	52	60	60	68	88	88	88
CFM PER RUN HEAT	1.87	1.87	1.81	1.81	2.19	2.19	0.15	0.59	2.86	2.86	0.99	0.99	0.33	0.73	0.73	0.73
RM GAIN MBH	68	68	65	65	79	79	5	21	103	103	36	36	12	26	26	26
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16
ADJUSTED PRESSURE	35	27	64	63	76	72	51	29	8	7	56	62	40	12	26	57
ACTUAL DUCT LGH.	140	130	150	140	190	210	190	170	110	180	130	130	150	130	120	140
EQUIVALENT LENGTH	175	157	214	203	266	282	241	199	118	187	186	192	190	142	146	197
TOTAL EFFECTIVE LENGTH	0.1	0.11	0.08	0.08	0.06	0.06	0.07	0.09	0.14	0.09	0.09	0.09	0.09	0.11	0.11	0.08
ADJUSTED PRESSURE	5	5	5	5	6	6	4	4	6	6	5	5	5	6	6	6
ROUND DUCT SIZE	235	235	228	245	245	245	207	252	265	265	441	441	441	449	449	449
HEATING VELOCITY (ft/min)	499	499	477	477	403	403	57	241	525	525	264	264	88	133	133	133
COOLING VELOCITY (ft/min)	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10
OUTLET GRILL SIZE	C	C	B	B	A	A	B	C	C	C	A	A	B	C	C	A
TRUNK	C	C	B	B	A	A	B	C	C	C	A	A	B	C	C	A

ROOM NAME	1	2	3	4	5	6	7	10	14	15	18	19	20	21	23	24
RM LOSS MBH	32	32	31	48	48	48	18	22	52	52	60	60	68	88	88	88
CFM PER RUN HEAT	1.87	1.87	1.81	1.81	2.19	2.19	0.15	0.59	2.86	2.86	0.99	0.99	0.33	0.73	0.73	0.73
RM GAIN MBH	68	68	65	65	79	79	5	21	103	103	36	36	12	26	26	26
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16
ADJUSTED PRESSURE	35	27	64	63	76	72	51	29	8	7	56	62	40	12	26	57
ACTUAL DUCT LGH.	140	130	150	140	190	210	190	170	110	180	130	130	150	130	120	140
EQUIVALENT LENGTH	175	157	214	203	266	282	241	199	118	187	186	192	190	142	146	197
TOTAL EFFECTIVE LENGTH	0.1	0.11	0.08	0.08	0.06	0.06	0.07	0.09	0.14	0.09	0.09	0.09	0.09	0.11	0.11	0.08
ADJUSTED PRESSURE	5	5	5	5	6	6	4	4	6	6	5	5	5	6	6	6
ROUND DUCT SIZE	235	235	228	245	245	245	207	252	265	265	441	441	441	449	449	449
HEATING VELOCITY (ft/min)	499	499	477	477	403	403	57	241	525	525	264	264	88	133	133	133
COOLING VELOCITY (ft/min)	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10
OUTLET GRILL SIZE	C	C	B	B	A	A	B	C	C	C	A	A	B	C	C	A
TRUNK	C	C	B	B	A	A	B	C	C	C	A	A	B	C	C	A

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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	304	0.06	9.6	10	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK B	452	0.06	11.2	14	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK C	820	0.06	14	22	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK D	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK E	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK F	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
RETURN AIR #	1	2	3	4	5	0	0	0	0	0	0	0	0	0	0
AIR VOLUME	95	115	75	75	340	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
ACTUAL DUCT LGH.	69	64	72	76	21	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	215	255	225	230	175	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LENGTH	284	319	297	306	196	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	6.5	7	6	6	9.4	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
INLET GRILL SIZE	14	14	14	14	30	0	0	0	0	0	0	0	0	0	0

CITY OF RICHMOND HILL
BUILDING DIVISION
09/03/2021
RECEIVED
Per: Jocelyn Aguilar

TYPE: 2008
 SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87528

09/03/2021

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	2 @ 10.6 cfm	21.2 cfm
Kitchen & Bathrooms	4 @ 10.6 cfm	42.4 cfm
Other Rooms	2 @ 10.6 cfm	21.2 cfm
Table 9.32.3.A.	TOTAL	127.2 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	127.2	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	63.6	cfm

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

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

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

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANE 65H		
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:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																									
Formula Sheet (For Air Leakage / Ventilation Calculation)																																									
LO#: 87528		Model: 2008		Builder: ROYAL PINE HOMES		Date: 4/21/2021		Air Change & Delta T Data																																	
Volume Calculation																																									
<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>728</td> <td>10</td> <td>7280</td> </tr> <tr> <td>First</td> <td>728</td> <td>10</td> <td>7352.8</td> </tr> <tr> <td>Second</td> <td>959</td> <td>9</td> <td>8631</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>23,263.8 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>658.8 m³</td> </tr> </tbody> </table>										Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	728	10	7280	First	728	10	7352.8	Second	959	9	8631	Third	0	9	0	Fourth	0	9	0	Total:			23,263.8 ft³	Total:			658.8 m³
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																						
Bsmt	728	10	7280																																						
First	728	10	7352.8																																						
Second	959	9	8631																																						
Third	0	9	0																																						
Fourth	0	9	0																																						
Total:			23,263.8 ft³																																						
Total:			658.8 m³																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> </thead> <tbody> <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> </tbody> </table>										Design Temperature Difference					Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13													
Design Temperature Difference																																									
	Tin °C	Tout °C	ΔT °C	ΔT °F																																					
Winter DTDh	22	-21	43	78																																					
Summer DTDc	24	31	7	13																																					
6.2.6 Sensible Gain due to Air Leakage																																									
$HG_{satb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																									
$= 0.236 \times 182.99 \times 7 \times 1.2 = 112 \text{ W}$																																									
$= 7651 \text{ Btu/h}$																																									
6.2.7 Sensible heat Gain due to Ventilation																																									
$HL_{yairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																									
$64 \text{ CFM} \times 13 \text{ °F} \times 1.08 \times 0.25 = 220 \text{ Btu/h}$																																									
5.2.3.1 Heat Loss due to Air Leakage																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$																																									
$0.236 \times 182.99 \times 43 \text{ °C} \times 1.2 = 2242 \text{ W}$																																									
$= 7651 \text{ Btu/h}$																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation																																									
$HL_{yairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																									
$64 \text{ CFM} \times 78 \text{ °F} \times 1.08 \times 0.25 = 1336 \text{ Btu/h}$																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																									
$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclvel} + HL_{bgclvel})\}$																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>Hlaive Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x Hlaiveb / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="4" style="text-align: center;">7,651</td> <td>3,920</td> <td>0.976</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>6,225</td> <td>0.369</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>5,661</td> <td>0.270</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></td> <td>0</td> <td>0.000</td> </tr> </tbody> </table>										Level	Level Factor (LF)	Hlaive Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x Hlaiveb / HLlevel)	1	0.5	7,651	3,920	0.976	2	0.3	6,225	0.369	3	0.2	5,661	0.270	4	0	0	0.000	5	0		0	0.000					
Level	Level Factor (LF)	Hlaive Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x Hlaiveb / HLlevel)																																					
1	0.5	7,651	3,920	0.976																																					
2	0.3		6,225	0.369																																					
3	0.2		5,661	0.270																																					
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 Hlaive = 0																																									

09/03/2021

RECEIVED

Per: jocelyn.aguilar

HEAT LOSS AND GAIN SUMMARY SHEET

09/03/2021

MODEL: 2008

BUILDER: ROYAL PINE HOMES

SFQT: 1672

LO# 87528

SITE: CENTREFIELD (WEST GORMLEY)

Per: jocelyn.aguilar
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 (ft³):	23263.8	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.85	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:	67.0 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%	-

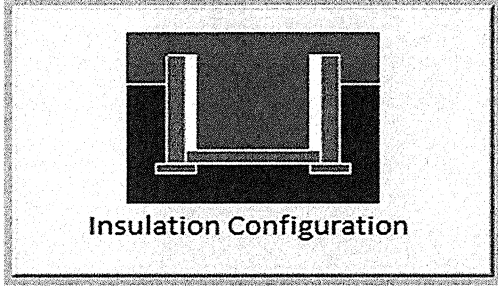
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



RECEIVED
Per: Jocelyn Aguilar**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):	20.4	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	2.8	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		628

RECEIVED
Per: jocelyn.aguilar

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):	658.8			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	614.9 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: 2008

LO# 87528



City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEPT/07/2021**

Building Permit #: **BP#-2021-50733**

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.

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.

CITY OF RICHMOND HILL
BUILDING DIVISION

09/03/2021

RECEIVED
Per: jocelyn.aguilar

UNEXCAVATED

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.

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.

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.

BASEMENT PLAN, EL. 'A' & 'B'

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description
	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	HEAT LOSS 24995 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	
2008		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			SEPT/2020		
1672 sqft		COOLING 2.0 TONS					Scale		
		FAN SPEED 820 cfm @ 0.6" w.c.					BCIN# 19669		
							LO# 87528		

09/03/2021

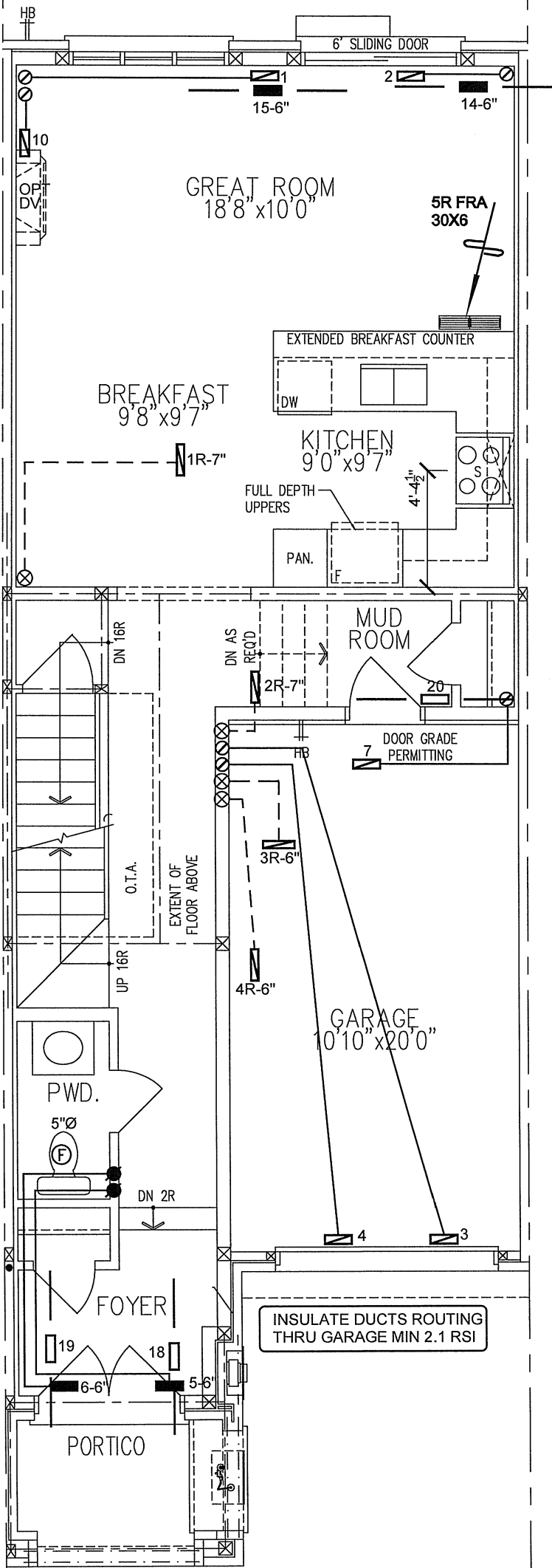
RECEIVED

Per: jocelyn.aguilar

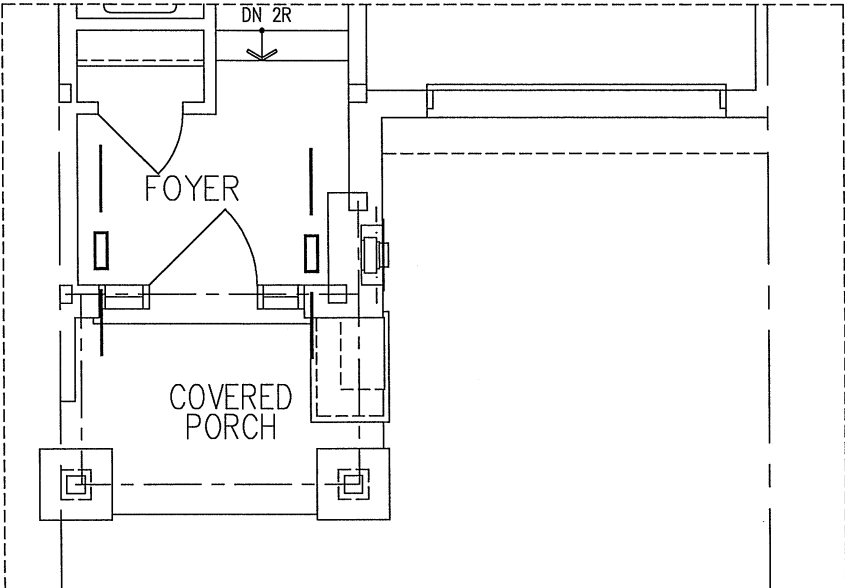
Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

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.

Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).



GROUND FLOOR PLAN, EL. 'A'



GROUND FLOOR PLAN, EL. 'B'

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	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 ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date SEPT/2020	
2008			Scale 3/16" = 1'-0"	
1672 sqft			BCIN# 19669	
			LO#	87528

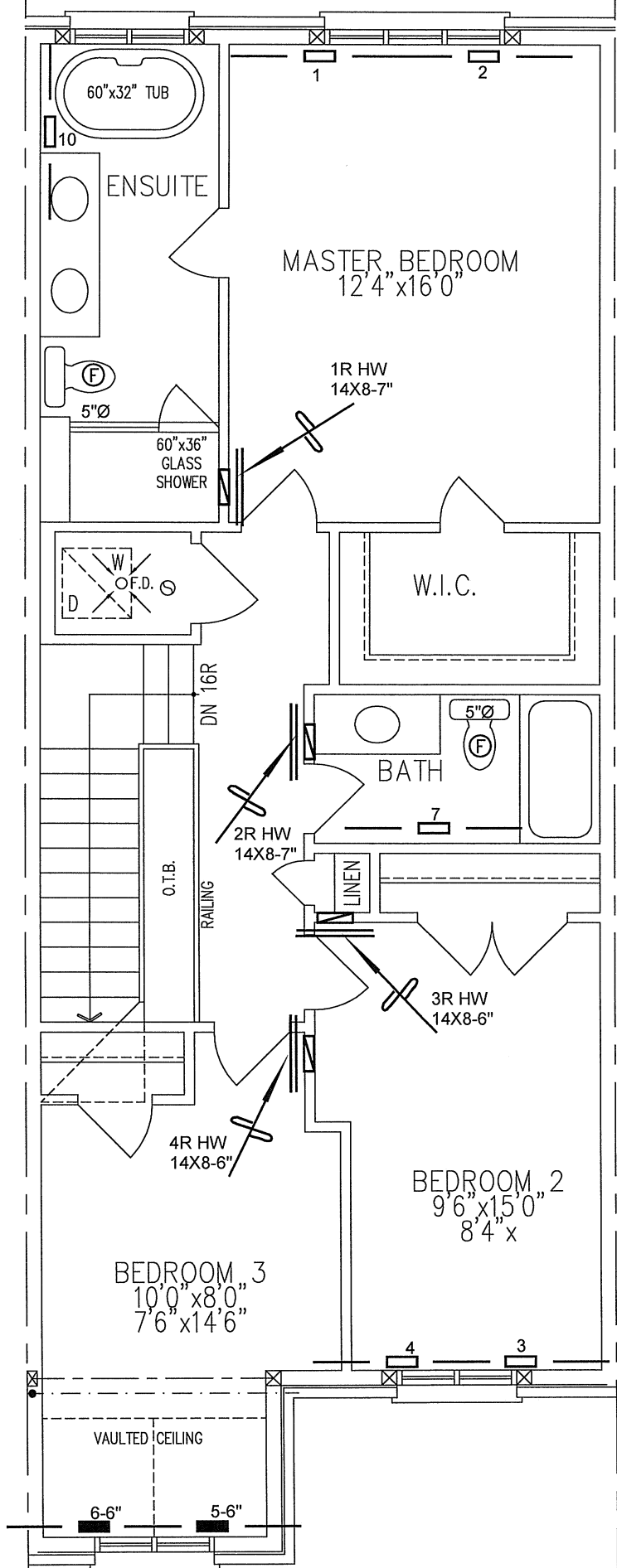
09/03/2021

RECEIVED

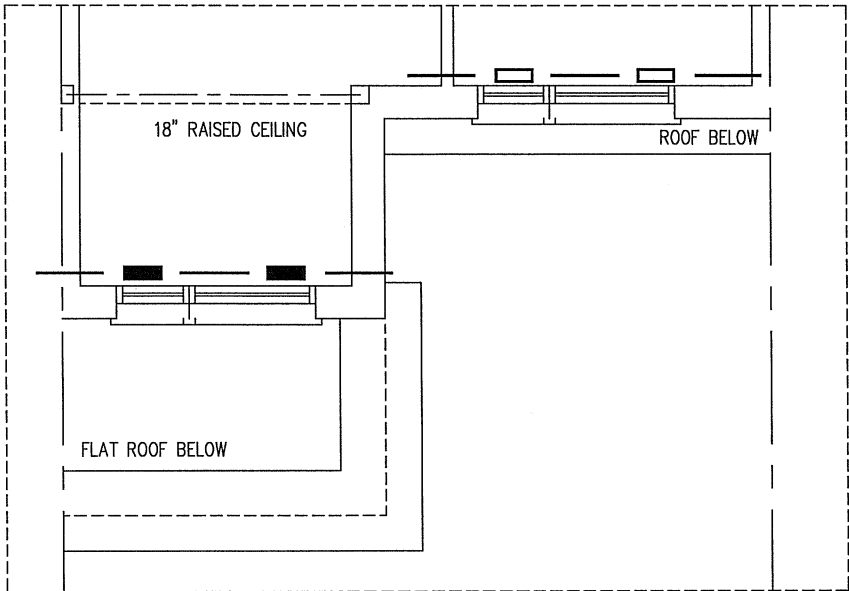
Per: jocelyn.aguilar

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)

Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).



SECOND FLOOR PLAN,
EL. 'A1/A2'



SECOND FLOOR PLAN, EL. 'B'

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

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		

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

Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
		BCIN# 19669		
2008		LO# 87528		
1672 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.		